


THE STREET RAILWAY JOURNAL



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THE STREET RAILWAY JOURNAL.

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The Directory of Street Railways. Readers will confer a favor by sending us promptly changes in their own road, no matter how slight, and also those in other roads that come under their observation. We shall also be much obliged for having our attention called to any errors that may be noticed in the directory.

THE STREET RAILWAY JOURNAL,
113 Liberty St., New York.

NEW ADVERTISEMENTS.

J. B. SLAWSON'S fare box advertisement has a change of cuts.

H. H. LITTELL advertises his track scrapers for snow, ice, mud, etc.

LALEDE CAR Co. show cuts of some of their make of cars.

W. N. LEWIS gives illustration and advantages at the Messer Car Brake.

EVANS & PATRIQUIN will be found among the car builder advertisements.

WM. H. HEWITT places an advertisement among the contractors and builders.

EUPHRAT ELECTRIC RAILWAY-CABLE Co. have a rearrangement of their advertisement.

RIES ELECTRIC RAILWAY AND TRACTION INCREASING SYSTEM'S advertisement will be found in our columns.

SPRAGUE ELECTRIC RAILWAY & MOTOR Co. show a cut of their automatic motor, and add their list of officers.

THOMSON-HOUSTON ELECTRIC Co. use a page to call attention to their dynamos and motors for electric tramways.

BEMIS CAR BOX Co. add their Chicago branch to their advertisements and add to the list of roads on which the Bemis Box is being used.

Various property is offered for sale in new advertisements in our Special Notice column. Parties wanting positions also advertise in that place. Street railway managers will find it to their advantage to avail themselves of the advantages afforded by this department of the STREET RAILWAY JOURNAL.

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AMERICAN STREET RAILWAY ASSOCIATION.

ORGANIZED, 1882.

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Subjects of Papers and Special Committees Reported at Last Convention.

ELECTRICITY AS A MOTIVE POWER.—WILLIAM WHARTON, JR., Pres., Cape May and Schellenger's Landing Railroad Company, Cape May City, N. J. p. 949.
MOTORS OTHER THAN CABLE OR ELECTRIC.—D. ATWOOD, General Supt., Cream City Railroad, Milwaukee, Wis. p. 955.
ROADWAY CONSTRUCTION.—CALVIN A. RICHARDS, Pres., Metropolitan Railroad Company, Boston, Mass. p. 956.
STREET RAILWAY MUTUAL FIRE INSURANCE.—JOHN MAGUIRE, Sec., City Railroad Company, Mobile, Ala. p. 959.

NEXT ANNUAL MEETING.

The next regular meeting of the Association will be held in Washington, D. C. the third Wednesday in October, (the 17th), 1888. Communications concerning Membership, Reports, etc., should be addressed to the Secretary.
We hope to give in our next issue the subjects on which papers will be prepared for the Washington convention and also the names of those who are to give them.

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OF

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 Lewis & Fowler, Brooklyn, N. Y. 1004-1005
 Martin, Rufus, & Co., 13 Park row, New York 1018
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 Philadelphia, Pa. 997
 Miller, D. J., 234 Broadway, New York 994
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 st., St. Louis, Mo. 994
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 st., N. Y. 994
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 York 1015
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 Toledo Car Heater Co., Toledo, O. 1012

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 Evans & Patriquin, Newburyport, Mass. 1024
 Feigel Car Co., 108 Wall st., N. Y. 1029
 Jones', J. M., Sons, West Troy, N. Y. 1028
 Kuhlmann Car Co., Cleveland, O. 1024
 Laclade Car Co., St. Louis, Mo. 1026
 Pullman's Palace Car Co., Chicago, Ill. 1025
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 Stephenson, John, Co., New York 1032
 St. Louis Car Co., St. Louis, Mo. 1027

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 Williams, Chicago representative, 117 Adams
 Express Bldg.: A. W. Slee, St. Louis represen-
 tative, 104 N. 3d st. 1023

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 Brill, J. G. Co., Philadelphia, Pa. 1030-1031
 Fulton Foundry, Cleveland, O. 1010
 Lewis & Fowler, Brooklyn, N. Y. 1004-1005
 Peckham Car Wheel Co., Syracuse, N. Y. 1007
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 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O. 1009
 Whitney, A., & Sons, Philadelphia, Pa. 1010

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 Bowler & Co., Cleveland, O. 1010
 Fulton Foundry, Cleveland, O. 1010
 Jesup, F. W., & Co., 67 Liberty st., N. Y. 996

Lewis & Fowler, Brooklyn, N. Y. 1004-1005
 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O. 1009
 Whitney, A., & Sons, Philadelphia, Pa. 1010

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 Craig, Wm. P., 95 Liberty st., N. Y. 997
 Fulton Foundry, Cleveland, O. 1010
 Johnson Steel Street Rail Co., Johnstown, Pa. 993
 Lewis & Fowler, Brooklyn, N. Y. 1004-1005
 Pugh & Russell, Stewart Building, New York 1001

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 Fulton Foundry, Cleveland, O. 1010
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa. 997
 Lewis & Fowler, Brooklyn, N. Y. 1004-1005
 Pennsylvania Steel Co., 2 Wall st., New York 999

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 Ayres, A., 502 to 518 W. 45th st., New York 996
 Craig, Wm. P., 95 Liberty st., N. Y. 997

DUST GUARDS.

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DOOR HANGERS.

Prescott Mfg. Co., 61-63 Oliver st., Boston 1012

DOOR STOPS.

Haycox Door Fastener Co., 1158 Euclid ave.,
 Cleveland, O. 1012

ELECTRIC RAILWAYS.

Bentley-Knight Electric Ry. Co., 115 Broadway,
 New York 93
 Chadbourne & Hastings, Philadelphia, Pa. 993
 Daft Electric Light Co., 115 Broadway, N. Y. 982
 Euphrat Electric Railway Cable Co. of the U.S.,
 137 Broadway, New York 974
 Julien Electric Co., 120 Broadway, New York 977
 Overhead Conductor Electric Ry. Co., Pitts-
 burg, Pa. 984
 Safety Electric Ry. & Power Co., 41-43 Wall st.,
 New York 984
 Sprague Electric Ry. & Motor Co., 16 & 18 Broad
 st., New York 981
 U. S. Electric Co., Denver, Col. 983
 Van Depoele Electric Manufg. Co., 263 Van Bu-
 ren st., Chicago, Ill.; New York office, 41-45
 Broadway and 17-21 Trinity place 980

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 Fulton Foundry, Cleveland, O. 1010
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa. 997
 Lewis & Fowler, Brooklyn, N. Y. 1004-1005
 Pennsylvania Steel Co., 2 Wall st., New York 999
 Pugh & Russell, Stewart Building, New York 1001

FARE BOXES.

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 Brill, J. G. Co., Philadelphia, Pa. 1030-1031
 Johnson, Tom L., Indianapolis, Ind. 1021
 Keefer, Horace A., & Co., Kansas City, Mo. 1019
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y. 1004-1005
 Martin, Rufus, & Co., 13 Park row, New York 1018
 Slawson, J. B., 365 Ave. A, New York 1019
 Stephenson, John, Co., New York 1032
 Wales Manuf. Co., 76 and 78 East Water st.,
 Syracuse, N. Y. 1020

FARE REGISTERS, STATIONARY.

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 Martin, Rufus, & Co., 13 Park row, New York 1018
 Railway Register Mfg. Co., 1198 Bdy., N. Y. 1015
 Standard Index & Register Co., 138 Fulton st.,
 New York 1017

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Lewis & Fowler Mfg. Co., Brooklyn, N. Y. 1004-1005

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Bowler & Co., Cleveland, O. 1010

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Clark Grooming Machine, 760 Warren ave., Chicago, Ill. 1000

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 Craig, Wm. P., 95 Liberty st., N. Y. 997
 Fulton Foundry, Cleveland, O. 1010
 Humphreys & Sayce, 1 Broadway, N. Y. 974
 Johnson Steel Rail Co., Johnstown, Pa. 998
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y. 1004-1005
 Pugh & Russell, Stewart Building, New York. 1001

HARNESS.

Martin, Rufus, & Co., 13 Park row, New York. 1018

HOOF CLASPS.

Cruce, Dan'l, & Co., 25 Spring st., N. Y. 990

HORSESHOES.

Bryden Forged Horseshoe Co., Catasauqua, Pa. 989
 Burke, P. F., 860 Dorchester ave., South Boston 991
 Greenwood Horse Shoe Co., American & York sts., Philadelphia, Pa. 988

HORSE NAILS.

Champion Horse Nail Co., Appleton, Wis. 991
 Kimbark, S. D., Mich. ave. & Lake st., Chicago, Ill. 996
 Putnam Nail Co., Neponset P. O., Boston, Mass. 991

HYDRAULIC JACKS.

Watson & Stillman, 204-210 E. 43d st., N. Y. 1009

KNEES.

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 Craig, Wm. P., 95 Liberty st., New York. 997
 Fulton Foundry, Cleveland, O. 1010
 Johnston Frog and Switch Co., 307 Walnut st., Philadelphia, Pa. 997
 Lewis & Fowler, Brooklyn, N. Y. 1004-1005
 Pugh & Russell, Stewart Building, New York. 1001

LOCOMOTIVES.

Baldwin Locomotive Works, Philadelphia, Pa. 1024

LUBRICANTS.

Leib Lubricating Co., 196 Chicago st., Buffalo, N. Y. 1011
 Martin, Rufus, & Co., 13 Park row, New York. 1018

METALLIC RAILWAY.

Humphreys & Sayce, 1 Broadway, N. Y. 974
 Longstreet, D. F., Providence, R. I. 999
 Metallic Street Railway Supply Co., Albany N. Y. 999

MATTING.

Beadle, Edward, 1193 Broadway, N. Y. 1011
 Brill, J. G. Co., Philadelphia, Pa. 1030-1031
 Everit, W. L., New Haven, Conn. 1011
 Lynn & Pettit, 707 Market st. Phila. 1911
 Martin, Rufus, & Co., 13 Park row, New York. 1018
 Warneck & Toffler, 211 E. 22d st., N. Y. 1011

MOTORS.

Baldwin Locomotive Works, Philadelphia, Pa. 1024
 Connelly Motor Co., 177 Broadway, New York 975
 Pole St. Car Motor System, 310 Chestnut st., Philadelphia, Pa. 986

MOTORS—Electric.

Bentley-Knight Electric Ry. Co., 115 Broadway, New York. 983
 Chadbourne & Hastings, Philadelphia, Pa. 993
 Daft Electric Light Co., 115 Broadway, N. Y. 982
 Euphrat Electric Railway Cable Co. of the U.S. 137 Broadway, N. Y. 974
 Jullen Electric Co., 120 Broadway, N. Y. 977
 N. Y. Railway Supply Co., Ltd., 40 42 Wall st., New York. 996
 Overhead Conductor Electric Ry. Co., Pittsburgh, Pa. 984
 Sprague Electric Ry. & Motor Co., 16 & 18 Broad st., New York. 981
 Safety Electric Ry. & Power Co., 41-43 Wall st., New York. 984
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 U. S. Electric Co., Denver, Col. 983

Van Depoele Electric Mfg. Co., 203 Van Buren st., Chicago, Ill.; New York Office, 41-45 Broadway and 17-21 Trinity place. 980

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PEDESTALS.

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 Fulton Foundry, Cleveland, O. 1010
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 Jesup, F. W., & Co., 67 Liberty st., N. Y. 996
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 Pugh & Russell, Stewart Building, N. Y. 1001
 Ries Electric Railway and Traction Increasing System, A. H. Henderson, Business Manager, 27 Chamber of Commerce, Baltimore, Md. 979

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 Jordan-Mills Mfg. Co., 32 Nassau st., N. Y. 1015

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 Fulton Foundry, Cleveland, O. 1010
 Humphreys & Sayce, 1 Broadway, N. Y. 974
 Johnston Frog and Switch Co., 307 Walnut st., Philadelphia, Pa. 997
 Jesup, F. W., & Co., 67 Liberty st., N. Y. 996
 Johnson Steel Rail Co., Johnstown, Pa. 998
 N. Y. Railway Supply Co., Ltd., 40-42 Wall st., New York. 996
 Pennsylvania Steel Co., 2 Wall st., New York. 999
 Worcester Steel Works, Worcester, Mass. 999

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 Craig, Wm. P., 95 Liberty st., N. Y. 997
 Hathaway & Robison, 14 Case Block, Cleveland. 996
 Harris Wm. T., & Co., 2 Nassau st., New York. 997
 Hewitt, Wm. H., Muscatine, Iowa. 996
 Hutchinson, A. J., 120 Broadway, N. Y. 996
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y. 1004-1005
 Metallic St. Railway Supply Co., Albany, N. Y. 999
 Nefel & Oothout, 41 Liberty st. N. Y. City. 996
 Raymond, James, 45 Broadway, N. Y. 996
 Sea Shore Construction Co., 13 Park row, N. Y. 996

STREET RAILWAY SUPPLIES.

Andrews, Frank H., 545 W. 33rd st., N. Y. 1002-1003
 Ayres, A., 502 to 518 W. 45th st., New York. 996

Beadle, Edward, 1193 Broadway, N. Y. City. 1011
 Brill, J. G. Co., Philadelphia, Pa. 1030-1031
 Brooklyn Railway Supply Co., 37 Walworth st., Brooklyn. 992

Cambria Iron & Steel Works, 218 So. Fourth st., Philadelphia, Pa. 974

Conway, M. W., 487 Monroe st., Brooklyn, N. Y. 996
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THE STREET RAILWAY JOURNAL



Vol. III.

NEW YORK & CHICAGO, NOVEMBER, 1887.

No. 13.

To Subscribers.

In order to begin the volume of the STREET RAILWAY JOURNAL with the beginning of the calendar year, we shall issue fourteen numbers in Vol. III., thus beginning Vol. IV. with the January issue. The index to Vol. III. will, therefore, appear in the next, or December issue.

This issue of the STREET RAILWAY JOURNAL contains 104 pages.

The Ohio State Tramway Association will hold its sixth annual meeting in Springfield, Nov. 16th.

Our convention report is so arranged that any paper or address may be readily referred to by consulting the index.

The next annual convention of the American Street Railway Association will be held in Washington, D. C., beginning the third Wednesday in October, 1888.

Our report of the Philadelphia convention in this issue, is very full, containing reports of all committees read and an abstract of the discussions upon each.

One Hundred and Twenty-fifth street, since the cable cars began running there, shows a marked improvement in cleanliness. The advantage of removing so many horses from the street is very obvious.

Companies having property of any kind about the premises which for any reason is unused, would do well to give us a description of it for insertion in our column of Special Notices, on terms given in that column.

A transfer man who is too smart for his business, who persists in giving no directions clear enough for a stranger in the city to understand, is a little worse than none, as he misleads and prevents inquiry of others.

That the very general adoption of electricity as a power for hauling street cars is a thing of the comparatively near future, it would seem, is a pretty general conviction among those who have given the matter most attention.

This is about the time when the railroad manager begins to ask himself if it would not pay to use heaters of some kind in his cars this winter. In many localities the warmed car is found to be much more profitable than the cold one.

The humane treatment of horses is on the whole the most economical use of horse flesh, and therefore, the best business policy. Cruelty to animals only occurs when a short-sighted management seeks immediate pennies rather than ultimate dollars.

Had the paper on Cable Traction been prepared and read at the convention it would have been interesting to have compared the interest felt in cable and electric propulsion. As it was, the time of the convention was almost wholly taken up by listening to speakers on, and discussing, electric power.

Why is it that uniform signals are not adopted on all roads? It is of interest to passengers as well as drivers and conductors that this be done. Where one bell means stop the car and the same signal means go ahead, there is constant uncertainty in the minds of passengers what a stroke of the bell is intended for.

At the banquet of the street railway men in Philadelphia, much truth was eloquently expressed by the speakers. When so many true and valuable thoughts are being uttered as to the importance of the street railway to the growth of the city and the public welfare, one cannot repress the feeling that the flattery usually indulged in at such places can readily be dispensed with.

As the fact becomes generally recognized that managing a horse car is an art, the conductor and driver will come to take an increased pride in their calling, and the better class of men will be attracted to the positions. The false notion that anybody can run a street car tends to attract the incompetent and to repel those of the higher grade who desire to make the best use of their abilities.

In forbidding the use of sand on street railways, Mayor Hewitt takes a position in opposition to Henry Bergh and the best in-

terests of the patrons of street railways. To say nothing of the cruelty to animals resulting from smooth paving stones, there is much danger to passengers and the horses on account of the absence of sand on the rail in descending sharp grades. A number of narrow escapes from accidents have occurred in this city recently from that cause.

According to a recent test made on the Chicago City Railway, it was ascertained that about 36 per cent of the gross power used in running that road was required to move the empty cable. Figures were made on a day of heavy traffic, and were as follows: 1,022 H. P. were used to move 300 cars, only 360 of which was required to draw the empty cable. The cars were heavily loaded, perhaps 20 per cent more than usual, and Secretary Windsor, to whom we are indebted for these facts, assures us that the amount of power required to haul the cable will not exceed 40 per cent on the average. The amount of power required per car for additional cars is about as the above figures show, viz., 2 H. P. each.

One of the direct results of obstructing projects for improved street transportation within a city is to send the business men beyond the city limits to reside. The amount of taxable property thus removed to the suburbs, where it does the city no good, is enormous. New York city, for example, which is one of the worst cities in the country for opposing improved motive power and other appliances, has lost millions in this way. There is a vast quantity of unoccupied land on Manhattan Island which with better transportation facilities would very soon be built up. The short-sightedness of city authorities in passing obstructive measures, and, for that matter, imposing unjust taxes, works in this way.

The sense of the convention was clearly in favor of the establishment of a street railway mutual insurance company. The one fact brought out by Mr. Maguire's paper that about one-third of the amount of premium paid was expended for soliciting business, is alone sufficient to show the wisdom of the establishment of a company where no such expense would be incurred. The managers of street railway property feel that the placing of their risks in the same class with those of livery stables is

injustice to street railway interests. Of course, the suggestion that street railway property could be insured at a much lower rate in the ordinary companies if modern safety appliances were adopted, is true, but the best way to bring about their adoption is their recommendation by a mutual company. The better inspection of street railway risks, where one company is devoted wholly to that line, would also be a decided advantage.

The absence of an exhibition of street railway appliances at the Philadelphia street railway convention was regretted by many of the delegates present, who had watched the growth of this feature of the annual gathering with satisfaction. Aside from one or two of the officers of the Association, the management and membership of that organization cordially welcome the manufacturers to their meetings, and are glad to have exhibitions of the latest developments and improvements in mechanical appliances. The exclusive and closed-door spirit that was conspicuous three years ago is very nearly extinct. The delegate and manufacturer are coming to recognize and understand the relation of equality and co-operation that exists between them.

The Crime of Dividends.

The Montreal Star of recent date contains a bitter wail because the Montreal Street Railway has declared a seven per cent semi-annual dividend, with a one per cent bonus. This is a sample: "Horse cars, slow and irregular as they must of necessity be, may become obsolete in every city of the continent, but if in the opinion of the street car company the adoption of the improvements necessary to keep Montreal up with the times will decrease its dividends, Montreal must wait until the monopoly expires and the stockholders of the company have made their pile before it can have them."

The inference from this is that a company should be so "regulated" as to be compelled to adopt mechanical power or other appliances for the comfort of its passengers, whether it pays or not. The trouble is that this sort of twaddle is too apt to be taken in earnest by the reader of the daily paper.

Vis-a-vis vs. Reversible Seats.

A leading car builder, speaking recently of the relative merits of reversible and *vis-a-vis* seats for open cars, says that the sale of "back-to-back" seated cars is almost exactly in the inverse ratio to the refinement of the community in which they are to be used. There is therefore hardly a car of that description in use on the better streets in the large cities, the reversible being far more popular on such routes. The reason for this seems obvious. There are people who do not seem to object to crowding their shoulders against whoever sits back of them, or rubbing

hats with them, but as a rule the other fellow decidedly does object. Again there are women who do not seem to be annoyed by having their legs tangled up with the passenger in front, but as a rule the other passenger is very much annoyed.

The car builder referred to also informs us that, on some roads leading to summer resorts, the patrons of the road seem much pleased with the *vis-a-vis* seat. On the best roads reversible seats are growing in popularity.

Managed for Profit.

A St. Louis paper makes the bold and startling assertion that "some of the local street car lines, particularly those on Pine street, have been managed with an eye to the greatest profits on the least expenditure during the past two weeks." Now it is very strange, and of course diabolical, that any business should be so conducted, and last of all a street railway the managers of which are known far and wide for their philanthropic habits. Who ever heard of a newspaper, for example, being run upon that principle? It is further related that a certain road, exhibiting an unheard-of depravity, actually carried during the rush hours of a busy day all the passengers that could be crowded upon the car. The journal proceeds to denounce the road roundly for such unbecoming conduct. Of course the road in question has complied and is complying with all the conditions of its charter, paying its men regularly and liquidating its honest debts by paying one hundred cents on the dollar; but to think of property "being managed with an eye to the greatest profits," etc.

The Conductor.

There is not necessarily connected with the position of street car conductor anything to make it other than respectable. On the other hand, it can be made a very respectable and attractive position. Faithfulness and tact in promoting the pecuniary interests of the company, and unflinching courtesy toward the public, requires a good man to begin with, and then his best efforts. We believe the importance of the position of the conductor is far more apt to be underestimated by the company and the conductor himself than by the public.

To tardily stop the car for those who stand ready to get on, and then awkwardly collect what fares can be easily got, and then squirt tobacco juice from the rear platform, is one thing; and to be constantly on the alert for possible passengers, handle the car with skill and treat the passengers with attention and courtesy, and get every fare, is quite another thing. When a conductor is fully alive to the requirements of his position, and anxious to meet them, he will welcome the fare register and everything else that can assist him to properly discharge his duties, and after every effort is made will realize that he comes far short of the ideal conductor.

The Manufacturers and the Association.

The manufacturers and supply men contribute more to the success of the conventions of the Street Railway Association than many of its members seem to realize. It would seem that in the discussion of improved appliances the manufacturer of the particular article under consideration would be able to contribute quite as much as the user. While the manufacturer or inventor, as such, has no right upon the floor, some of the most valuable papers thus far have been prepared by delegates who are also patentees, engineers or supply men; and at the last convention all recognized the value of the remarks of the electricians.

While there might be objections made to the admission of other than railroad companies to full membership in the Association, the supply men, whose interests are nearly identical with the roads, will welcome any plan that will clearly recognize them and not occasionally and unexpectedly leave them out in the cold. The resolution of the Executive Committee, at its session after the convention, that "the President be authorized to issue a ticket to any gentleman not a delegate who may desire to attend the annual banquet upon the recommendation of a delegate," will probably have the approval of all parties. "The price of each ticket to be ten dollars," puts the supply men upon an independent basis, where they desire to be. On the whole, this is probably better than the motion to admit them to associate membership, with no right to speak and the obligation to pay regular admission and dues.

The Tangible in Electricity.

Among the large number of street railway managers who are looking with more or less hope to electricity as a motive power, there is felt and frequently expressed a desire for something tangible in the way of performance or guarantees of performance. This is now abundantly forthcoming. The electric railway is ready for the market, and will be guaranteed by the manufacturer as to efficiency, certainty and economy of performance.

No one claims that any electric system is perfect, but the defects of any of the better systems are more mechanical than electrical, and in its main features electric street car apparatus is as nearly perfect as a great deal of machinery that is sold every day for standard. That the rigid scrutiny the electric power appliances are being subjected to reveals many defects is very true, but it is not clear that any more radical improvement will be made in the very near future than in various departments of mechanics. Meantime street railways are successfully and profitably run by electricity, and are destined to multiply during the next twelve months. In fact horse railroads are seldom built at the present time without some foreboding as to the wisdom of the power used or the intention of substituting mechanical power.

FACTS AND OPINIONS.

‡ * * * Motto for the employer, "Put yourself in his place."

* * * Yes, I say, let us try the street railway mutual insurance plan.—J. E. Rugg.

* * * In 1778 Philadelphia had thirty-eight vehicles. In 1886 it has 350 miles of railway track on its streets.

* * * I don't think any road that tries eight-wheel cars will ever go back to the four-wheel cars.—Moses Humphrey.

* * * Give us a cable road on Third avenue, New York, and we will make faster time than the elevated road, right along.—D. J. Miller.

* * * Manners are more valuable than muscles or even brains in a conductor. They have even more to do with increasing business than fine cars.

* * * What has been done by the mill owners can be done by the street railroad companies, associated together for mutual fire insurance protection.—John Maguire.

* * * The success of the car-drivers in their recent strike has stirred them up a bit, and it is among the possibilities that other strikes will take place before long.—Exchange.

* * * If a reasonable reduction were made in the price of storage batteries, even upon the present guarantee of a life of two years, we could book immediately \$500,000 worth of additional orders.—A leading electric railway builder.

* * * The courtesies of a small and trivial character are the ones which strike deepest to the grateful and appreciating heart. It is the picayune compliments which are most appreciated; far more than the double ones which we sometimes pay.—Henry Clay.

* * * Everything now points to electricity, applied from storage batteries, as the coming motor for street railways. The progress of the last few years and even of the past six months has been truly remarkable in the demonstration of the fact that street cars can be run swiftly, economically and efficiently by electricity, and this without the use of the overhead wires.—Cleveland Leader.

* * * Electricity is ready to do the work, and it can to-day demonstrate its superiority over any other known power for the service in question. When the street railway men of the country give it a fair chance, treat the offers made as business propositions, and do not condemn it unseen, simply on the ground of novelty, electric tramways will become an established fact—certainly not before.—Robert Blackwell, of the Bentley-Knight company.

* * * The coal we now squander, using but a small percentage of its theoretical dynamic force, is capable of yielding its energy either as heat or as electricity; and the time will come when we will not burn this coal to boil water, and in that boiling lose say 1,000 units of its heat at

the moment of the conversion of water into steam, lose all this, never to be getting it back, but we will take from the coal its energy in the form of electricity, we hope in more near ratio to its true value.—Coleman Sellers.

BANQUET BRIEFS.

* * * No country on the globe has as good street car accommodation as the United States.—John Lawson.

* * * It has never been my fortune to hear so grand a defense of our institutions and our beloved business.—C. A. Richards.

* * * With education well diffused and a pure press, the public is safe. If the press does not reflect on truth, the people will judge for themselves.—Col. A. J. Snowden.

* * * In no way have the interests of Philadelphia been so much advanced as by its transportation facilities. No single service has promoted their interests as passenger railways.—A. L. Snowden.

* * * We have not on the road of which I am President, a single receiver or other employee in a position above driver and conductor, which has not been filled by promotion from the ranks.—William Richardson.

* * * All large cities are composed of two classes, the Presidents of passenger railway companies and the people. I am at present of the people. I hope some day to be a President of a passenger railway.—Charles F. Warwick.

* * * By the exercising of discretion in their selection, and treating them as we ourselves would be treated, there is no trouble in securing faithful employees and establishing a personal attachment.—William Richardson.

* * * The street railway and the newspaper are identical in one respect, and that is that their success depends upon faithfulness in their dealings with the public. Demands must be paid and it is their just demand.—Col. A. J. McClure.

* * * Less than a generation ago there was not a street railway laid in this city that was not constructed in defiance of the protest of nine-tenths of the people, and no city has received such munificent results from its street railways as Philadelphia.—Col. A. J. McClure.

* * * Yes, the horse as a street railway motive power will soon be a thing of the past, but whether the coming power is that which Franklin picked from the clouds or not, the time will soon come when passengers will be transported in better shape than to-day.—Col. A. L. Snowden.

* * * Men seem to think that corporate power meanstaking away some of the rights of the people. Corporations are, therefore, regarded with suspicion, while as a matter of fact the development of the results of our country is almost wholly due to corporate power. It is well enough to be jealous and to fume, but it is also justly due to recognize the blessings of God in whatever form they may come.—Col. A. J. Snowden.

PERSONAL MENTION.

F. DE H. ROBISON is in Saginaw.

CHARLES HATHAWAY recently called at the JOURNAL office.

J. H. MCGRAW just returned from a trip to Colorado.

CHARLES HATHAWAY is soon to make a trip to California.

W. BRACKEN, President of the Julien Electric Co., has returned from Europe.

T. WILLIAM HARRIS, contracting engineer, was recently married to Miss Emma Joyce.

N. S. ELLIOTT is manager of the Topeka office of the Sprague Electric Railway & Motor Co.

COL. W. H. PAINE, Engineer of the Tenth Avenue Cable road, served on the staff of Gen. Meade.

CHARLES B. ALLYN, of the Brooklyn Railway Supply Co., has just returned from a Western trip.

MOSES HUMPHREY, President and Superintendent of the Concord Horse Railroad, was formerly Mayor of that city.

PRESIDENT WILLIAM WHITE, of the Dry Dock, East Broadway & Battery Railroad Co., has been ill, but is improving.

F. J. SPRAGUE has fully recovered. With Mr. Harding, also of the Sprague company, he has recently made a Western trip.

J. H. BOOK, of Los Angeles, Cal., has come East to investigate the different electric systems. He favors storage batteries.

PRESIDENT W. S. THORN, of the Second Avenue Railroad Co., of New York, has been absent from the city some time on account of ill health.

M. E. JULIEN has been awarded the Cross of the Order of Leopold, in recognition of his services in the application of electricity for traction purposes, as employed on the Brussels tramway lines.

JOHN W. FOWLER, of the Lewis & Fowler Manufacturing Co., was formerly Superintendent of the Brooklyn City road. He was fifteen years with that road, remaining several years after the establishment of the more extensive supply house.

THE DUKE OF MARLBOROUGH, Clayton Webb, Arthur Leary and Thomas McLean were recently shown the Julien storage battery car on the Harlem road by Superintendent Alfred Skitt. The car is doing good work. The Duke manifested a ready knowledge of the electrical system, and was about making a trip West to examine the cable system.

THOMAS LOWRY, the tall, nervous, dark-eyed gentleman with the long black mustache, who of late is frequently seen about the corridors of the Fifth Avenue, was a poor man less than six years ago. It is said that he is now the richest man in Minnesota. He owns the controlling interest in the street car systems of three cities—St. Paul, Minneapolis and Duluth. Mr. Lowry is one of the greatest financiers in the Northwest.—New York Sun.

At the Convention.

W. H. PIERCE, Albany.
 Mr. GOODENOUGH, New York.
 Mr. LOEWENSTEIN, New York.
 N. P. BOWLER, Bowler & Co.
 ADAMS & WESTLAKE showed lamps.
 SANFORD NORTHROP, Concord, N. H.
 CHARLES B. CLEGG's daughter came with him.
 E. V. CHERRY, of Post & Co., Cincinnati, O.
 FRANK H. ANDREWS and Mr. Garey, New York.
 J. M. PENDLETON and H. A. Foster, New York.
 WILLIAM SUTTON, Laclede Car Co., St. Louis.
 A. G. CLARK, Cincinnati, was there with his wife.
 Representative A. Whitney & Son, Philadelphia.
 RUFUS MARTIN, of Rufus Martin & Co., New York.
 WALTER JONES, of J. M. Jones' Sons, West Troy.
 G. W. CARLETON and wife, from Boston, were there.
 H. C. EVANS, Boston, Johnson Steel Street Rail.
 B. C. POLE, of the Pole Motor Co., Philadelphia.
 G. H. CONDUCT and A. Reckenzaun, of Philadelphia.
 THE DUPLEX SUPPLY Co. showed one of their registers.
 W. P. SEGUINE represented Frost & Peterson, veneers.
 CCL. H. M. WATSON, Buffalo, was thought of for President.
 JOHN AND WILLIAM SILVER, of Richard Vose, New York.
 C. E. STUMP and T. C. Martin, of the Electrical World.
 HENRY HURT, Washington, was mentioned for President.
 G. W. MANSFIELD, of the Thomson-Houston Co., Boston.
 T. C. WHITE, St. Louis agent of Fulton Foundry, Cleveland, O.
 HORACE A. KEEFER, of Kansas City, Mo., showed his new fare box.
 W. S. WALES, Treasurer Wales Manufacturing Co., Syracuse.
 E. P. HARRIS and J. H. MCGRAW of the STREET RAILWAY JOURNAL.
 G. L. WRIGHT, President of the River & Rail Electric Co., New York.
 J. N. KAUFHOLZ, of Cleveland, inventor, showed a new journal bearing.
 GEORGE B. HIBBARD, President of the Watkeys Adjustable Clutch Axle.
 SHELDON BECKWITH, proprietor Street Railway Supply Co., Cleveland, O.
 JOHN N. REYNOLDS, proprietor of the National Car Builders' Supplement.
 D. F. LONGSTREET, Providence, was accompanied by his wife and daughter.
 Mr. PULLEN and Mr. Stearns, of the Bemis Car Box Co., Springfield, Mass.

R. W. BLACKWELL and W. H. Knight, representing the Bentley-Knight Electric Co.

CHARLES B. ALLYN, President Brooklyn Railway Supply Co. and the Fleming Manufacturing Co.

W. L. EVERIT, of New Haven, was at the convention in the interests of his patent car-floor rack.

A. L. BALDWIN, Secretary and Treasurer Standard Index & Register Co., showed one of their registers.

WILLIAM KIRBY, of the National Stove Co., has just returned from a trip South; was at the convention.

R. T. WHITE, inventor of the Acme Girder Steel Street Railway Roadbed, showed samples of rail and joint.

AUGUSTUS DAY, of Detroit, sent circulars and catalogues of his snow plows, but was prevented from attending.

D. W. PUGH, J. S. Pugh and F. D. Russell, of Pugh & Russell and the John Stephenson Co., New York.

W. H. LAWRENCE, John Kent, H. J. Kerrigan, salesmen, representing the A. French Spring Co., Pittsburgh, Pa.

CAPT. SAMUEL L. ENNIS represented the Leib Lubricating Co., manufacturers of the Dux grease for street railroads.

P. F. GREENWOOD, Manager of the Greenwood Horse Shoe Co., Philadelphia, Pa., showed samples of their shoes.

J. C. ROBINSON, of Scotland, inventor of the Hansom cab, which is coming into quite general use in this country.

W. T. BUTLER, General Manager of the Car Track Friction Appliance Co., of Boston, showed one of their new sand boxes.

WILLIAM KIRBY, representing the National Stove Co., 243 Water street, New York, showed one of their car heaters.

DANIEL F. LEWIS, J. W. Fowler, L. E. Robert and E. Packer, of the Lewis & Fowler Manufacturing Co., Brooklyn, N. Y.

Mr. SMALL, of the Hale & Kilburn Manufacturing Co., Philadelphia, had a very creditable display of seats for railway cars.

A. K. STILES, General Manager, and C. J. Van Depoele, Electrician, of the Van Depoele Electric Co., New York and Chicago.

W. N. LEWIS, Albany, N. Y., showed the Messier car brake; will be illustrated in a future number of the STREET RAILWAY JOURNAL.

H. C. SIMPSON, Secretary Lewis & Fowler Manufacturing Co., whose familiar face was missed, was prevented from attending by illness.

W. P. SEGUINE, representing Frost & Peterson, of New York, exhibited samples of car ceilings and panels, and perforated veneer car seats and backs.

ELIAS E. RIES, Electrician, and Albert H. Henderson, General Manager, of the Ries Electric Rail and Traction Increasing Apparatus for railways.

F. J. SPRAGUE, General Manager, and T. McL. Harding, General Agent, Chadbourne

(A. H.) & Hastings (E. H.), of the Sprague Electric Railway & Motor Co.

EDWARD BEADLE and John F. Courtney, of the Railway Register Manufacturing Co., showed a sample of each class of their registers, also Mr. B.'s New Eureka folding mat.

A. M. CLAPP, the venerable gentleman from Washington, who spoke in behalf of that city as the place for the next convention, was formerly Government Printer.

CHARLES CLEMINSHAW, President of the Troy & Lansingburgh, is one of the foremost among many who have the best interests of the Association at heart. While he is interested in various enterprises outside of street railways, such for instance as the manufacture of the celebrated "C. & C." brand of collars and cuffs, he puts his whole soul into the Association work. This was manifested by the earnest but fair defense of the nominating committee at the Thursday session.

JOHN A. BRILL, representing the J. G. Brill Co., showed several appliances for street railways, among which was a new cable grip support for grip cars. The idea is to run the car so that it will not be subject to the lateral motion of the wheels and axles. Also a new style of track brake, which lifts not only the car body but also the wheels and axles. Also a draw head and safety pin, a one, two, three and four-sided reversible sign board, and patent summer car seat and back.

Friday, After the Convention.

On Friday a large number of the delegates who remained over till that time, visited by invitation the Baldwin Electric Works, the car wheel works of A. Whitney & Sons, a number of places of public interest in the city, and the works of the Electrical Car Co. of America, Washington avenue and Ninety-third street. William Wharton, Jr., who is at the head of this company, exhibited to the delegates present a car intended to run with overhead connection. They were given frequent rides around the track in a car equipped with the Sprague motor and the storage battery of the Electrical Accumulator Co., which have been in successful operation or the last two or three months and were fully described in the July issue of the JOURNAL. A fine new car with the Reckenzaun motors was nearly completed and an attempt was made to exhibit it, but the switch, imported from England, was found faulty and a section of it burned out, interfering with this exhibit, but successful trips were made later, when the switch had been repaired. An elegant lunch was provided at the works, and speeches were made. Among those taking part were Messrs. Wharton and C. A. Richards, both of whom spoke in very strong terms as to the certainty of the success of the storage system. This ended the exhibition and consideration of electricity at the Sixth Annual Convention of the American Street Railway Association, which on the whole has been very profitable.

Charles B. Holmes.

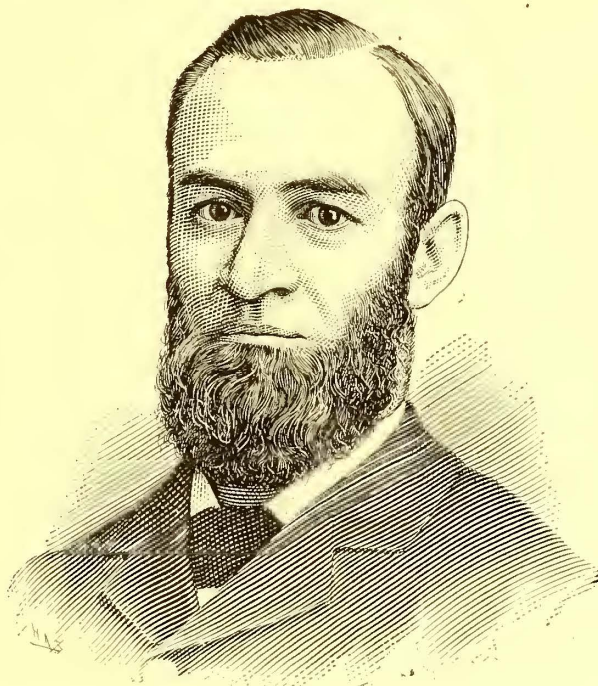
Charles Butler Holmes, the newly elected President of the American Street Railway Association, is the eldest son of Rev. Henry B. Holmes and Harriet Butler Holmes, and was born March 18, 1840, in Springfield, Vt. His father was a well-known preacher, of marked pulpit power and greatly beloved by all the congregations to whom he ministered, both in New England and the West. His mother was the daughter of Judge Butler, of Stuyvesant, N. Y., and sister of Hon. B. F. Butler, Attorney General under Van Buren.

The subject of this sketch removed to Massachusetts in his infancy, living first at Springfield and afterwards at Auburn, near Worcester. When eight years of age his family moved to Andover, where they resided for eight years, and he received in Phillips Academy the foundations of his education. He was especially fond of mathematics, which he studied under the late James S. Eaton, widely known as the author of "Eaton's Arithmetic."

When he was sixteen years of age his family moved to the West, and his father became pastor of the Presbyterian Church in Belvidere, Ill., while the son set out in life for himself, worked a few months on a farm at \$12 per month, and in the winter taught school, "boarding around," as was the custom in those days. In the spring of 1857 he was appointed member of the Engineering Corps engaged in surveying a line of railway for the Chicago, St. Paul & Fond du Lac R. R. Co., from Lake Superior through Northern Michigan to Wisconsin, which was then an unbroken wilderness; and the party did not meet a white man in four months, and only occasionally an Indian, although the Indian trails were crossed a number of times during the season. In the fall he again became a school teacher, and early the next spring, equipped with a full outfit of a surveyor, made his way to Northern Iowa, and settled in Mitchell county, where he was constantly engaged in land surveying during the season and in the winter was again found in the school room.

He alternately taught school and surveyed till early in the year 1859, when he engaged in farming in Central Illinois by breaking 80 acres of prairie in Livingston county, and getting it ready for farming proper the coming season. During the winter he was appointed Deputy County Clerk, and also filled the office of County Surveyor of Boone county, Ill., and in the

spring of 1860 with three yoke of oxen, a span of horses, two wagons and two cows made the trip, with a young man to help him, of one hundred and fifty miles, with mud hub deep, to the new farm, where a house was built and the two "kept bachelor's hall," doing their own cooking, besides fourteen hours a day of good solid farm work on a new farm, three miles from the nearest neighbor. Deer came every day within five rods of the house, and the prairie wolves made night hideous. Prairie chickens were so plenty that a dozen could be caught any hour in the simplest kind of a trap; and sand-hill crows walked in their grandeur or flapped their mammoth wings in flocks of a thousand together. But the house where the young men lived



CHARLES B. HOLMES, PRESIDENT OF THE AMERICAN STREET RAILWAY ASSOCIATION.

was on a high knoll, with an outlook of twenty miles in all directions, and was a land-mark for the "prairie schooners" carrying their loads of immigrants over the boundless prairie to people the mighty West.

Probably the communion with nature in the opening of his manhood, on an arena vast as the eye could sweep, and with nothing conventional or artificial in its entire scope, had much to do with forming the ideas which have enabled him to grasp and hold large interests in later life.

In the early summer of 1881, then twenty-one years of age, he married Miss Eliza J. Robinson, of Cherry Valley, Ill., and brought his bride to his romantic "Prairie Lodge."

The failure of his wife's health caused him to dispose of his farm in 1863, and remove to Chicago, where suitable medical

skill could be secured. Previous to doing so he had at one time over six hundred head of cattle herding on the prairie; his assistant met with an accident, and Mr. Holmes was left alone several miles from any human abode, exposed to constant rain for a week, with such vivid lightning and crashing thunder as drove his herd wild with terror, and nearly killed his three horses by constant effort to keep the herd intact. He speaks of that week as the one week of his life when the heavens and the earth seemed to have conspired against him. Utterly exhausted and nearly starved, he was thankful to secure the aid of a lone traveler and lie down on the wet grass for an hour's sleep.

Upon settling in Chicago, Mr. Elisha S.

Wadsworth, who had recently retired as the leading and original dry goods merchant of that city, became interested in Mr. Holmes, and induced him to take the management of some of his interests, chiefly the Union Line Transportation Co., which had just lost its Manager by death; and Mr. Holmes at the age of twenty-three years found himself with three steamboats and fifty canal boats engaged in supplying the government with provisions and grain, to be managed, the contracts to be completed and business wound up. No sooner was this done than he was engaged to superintend some extensive coal mines in Northern Illinois, which occupied seven years.

In the beginning of 1873 he was called to the management of the Chicago Street Railway Co., then operating 22 miles of track and some 70 cars, with 600 horses. The wonderful development of that company's interests, till it now owns 130 miles of track, some 800 cars,

1,800 horses and a cable plant doing the work of 4,000 horses, attests that for fifteen years Mr. Holmes has had no idle time on his hands.

For the last six years Mr. Holmes has been President as well as Superintendent of the company, and has done the work of a lifetime in the compass of a few years.

His wife died in 1880, after a five years' battle with disease, and one year later the youngest of his boys died, a lad of nine years, leaving him two boys, now eighteen and sixteen years of age. In 1883 Mr. Holmes was married to Miss Kate K. Raworth, a lady of great refinement and beloved by all who know her; and their home, on Prairie avenue, is the abode of love and mutual helpfulness.

A sketch of his home life would not be complete without some reference to his recreation, or, as he calls it, his "play

ground." This consists of "the largest Sunday School in the world," with a membership of some 5,000 children gathered from the foreign born population in the North Division of Chicago, where for the last ten years Mr. Holmes has acted as teacher of a class often numbering 3,000 girls and boys.

C. B. Holmes has become known beyond the limits of this country by his carrying to successful issue the cable system of Chicago. It was a most difficult and harassing undertaking, opposed by many and derided by thousands, but has proved a grand success, giving the people of Chicago the best surface railway in the world, quick and reliable, and has added more than \$15,000,000 to the value of real estate. In the beginning meetings of excited citizens were held to protest against the construction and endeavor to prevent it. How completely public opinion has changed is shown by the fact that in the last two years large and enthusiastic meetings have been held to induce his company to extend the system.

Mr. Holmes must have possessed in most extraordinary degree the confidence of his stockholders when he persuaded them to invest several millions of dollars in building and equipping twenty miles of cable road as a first venture, and then soon after add fifteen miles to the plant. This confidence is also shared by the employees of his company, who through all the fifteen years of his management have found him ready to meet them fairly, and no rupture has occurred to the mutual good will and respect.

Mr. Holmes is well known to the other members of the Association as one of its most eloquent and valued members, and as its President will reflect as much credit upon that body as any of his able predecessors. It is not too much to say that as a cable railway manager he is the foremost in the world.

Electric Railways in Mines.

Electric railways are being used in mines in Germany at three places—near Dresden, at Beuthen in Upper Silesia, and at Neu-Stassfurt, under the system of Siemens and Halske, of Berlin. The first experiments were made in 1882. The conductor in these railways is formed of two rails of T iron bolted to insulators fastened to the roof. The collector is a carriage running on these T's. The generating dynamo makes 750 to 850 revolutions per minute, and is driven by a 15 H. P. steam engine. The trains consist of from ten to fifteen cars, 5 cwt. each, and carrying 10 cwt. of coal each. The speed is about six miles an hour. In two shifts of eight hours the plant will remove about 380 tons of coal. The whole cost of one of these electric railways, including steam engine, conductors, locomotive and erection, was \$4,050. As compared with other power it stands per ton mile as follows: Electrical traction, 4 cents; horse traction, 5 cents; traction by men, 9 cents,

CORRESPONDENCE.

Paris Tramways.

EDITORS STREET RAILWAY JOURNAL:—

Can you oblige me with the name and address of the writer of the article on Paris Tramways in the September JOURNAL? The method there described of making a grooved track is new to me, and I would like to get some further information, being especially interested in such tracks.

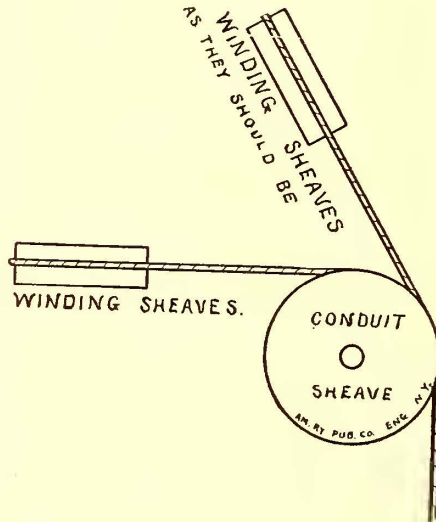
E. E. R. T.

The article in question was written by George L. Fowler, Mechanical Editor of the JOURNAL. EDS.

A Conundrum for Cable Engineers.

EDITORS STREET RAILWAY JOURNAL:—

I should like to ask why the cable engineers run a cable out of the power house at right angles to the track, since, if it were run at a less angle, the strain on the



sheaves at the turn would be much less. The greatest strain might just as well be on the winding sheaves.

C. H.

Divided Axles.

EDITORS STREET RAILWAY JOURNAL:—

In a circular setting forth the advantages of a divided axle, I notice that the inventor claims that one of those advantages is that "a car will start much easier, as only one wheel will likely be obstructed at a time." I am in doubt whether this claim is well founded. Will some of your readers inform me, preferably from experience, whether a wheel on a divided axle will run over a stone any easier than if it were on a rigid axle? In either case there is only one obstruction, and it would seem to me as easily overcome with a rigid as with a divided axle, but I ask for information.

C. J. L.

Chicago, Oct. 15.

The Cincinnati Cable Accident.

Sunday evening, Oct. 3, a strand came loose in the cable of the Mt. Adams & Eden Park road, Cincinnati, and wrapped

around the grip of a car coming west on Sixth street. The car, which was full of passengers, ran wild, overtaking another car near Sixth and Main streets which was full of people. This car it pushed along. Brakes were applied and the wheels were locked dead on both cars, but on they went, the passengers screaming and hundreds of excited people following it in the middle of the street. The runaway cars wheeled into Walnut street and from Walnut into Fifth street at Fountain square, and dashing on eastward they struck a horse car going east near Sycamore street. The latter street is ditched deeply where Fifth crosses it, and at this crossing the horse car, horses, passengers and all were piled in the ditch. At the same time the runaway cars were thrown from the track and stopped with a wrench to the cable, so violent that every car on the track clear up to Walnut Hill was derailed. The shock of derailing was greatest to four cars that were coming behind the runaway. These four cars were in pairs on Sixth street, between Broadway and Walnut street, and were full of people. Thirty or forty persons were bruised, and Lewis Kolb was probably fatally hurt.

The following explanation, from President Kerper, of the road, will be read with interest:—

EDITORS STREET RAILWAY JOURNAL:—

In reply to your inquiry as to the accident on our cable line, Sunday, Oct. 2, we have on our line from the engine to the city a mile and a half of a grade of 7 ft. to the 100 ft., and from the foot of the hill to the city for the distance of a mile we have seven curves. At the time of the accident all our cars were on the down grade, and they threw the slack ahead of the fourth car down and twisted it up for a distance of thirty feet in the shape of a corkscrew. When the grip struck this part of the cable it cut two strands, and the strands wound around the grip, and the car run wild for a distance of four blocks before we stopped the machinery.

Ordinarily we have been able to throw the cable out of the grip, but in this case failed. We believe we shall be able to stop a recurrence by blocking our tension carriage and not permitting any slack to go out of the engine house and down the hill. We shall be pleased to receive any suggestions or information on this point. If we had not so many curves in the city our slack would be taken up readily from the foot of the hill; but on this account we lay the cause to the heavy down hill travel causing the cable, which was new (having been put in use only the night previous) to stretch, and the tension carriage having some play it permitted the stretch to be carried down the hill and threw it in front of the down going cars.

G. B. KERPER.

Cincinnati, O., Oct. 12.

If a superintendent is wanted or any other skilled employee, use our Special Notice column, which this month is on pages 973 and 974.

AM. STREET RAILWAY ASSOCIATION.

Sixth Annual Convention.

The Sixth Annual Convention of the American Street Railway Association was called to order in Parlor C of the Continental Hotel, Philadelphia, at 10.45 A. M., Wednesday, Oct. 19. Following is a list of

DELEGATES PRESENT:

AUGUSTA, Ga.—Edward J. Mosher, Secretary.
BALTIMORE, Md.—Nelson Perin, President, and A. G. Clark, Director.
BOSTON, Mass.—Charles E. Powers, President; Julius E. Rugg, General Superintendent; John H. Studley, Superintendent. Calvin A. Richards, President; A. P. Martin, Director; I. H. Randall, Master Mechanic; Daniel Coolidge, Superintendent.
BRIDGEPORT, Conn.—Albert Eames, President, and B. F. Lasher, General Superintendent.
BROOKLYN, N. Y.—William Richardson, President; William J. Richardson, Secretary. Daniel F. Lewis, President, and H. M. Thompson, Secretary. John R. Partridge, President; W. N. Morrison, Superintendent. Charles E. Harris, Superintendent.
BUFFALO, N. Y.—Col. Henry M. Watson, President.
CAMBRIDGE, Mass.—Prentiss Cummings, President.
CHICAGO, Ill.—Henry H. Windsor, Secretary, and Thomas C. Pennington, Treasurer.
CINCINNATI, O.—E. V. Cherry, Director. John Kilgour, President.
CLEVELAND, O.—Dr. A. Everett, President; Henry A. Everett, Secretary; and J. B. Hanna, Secretary. M. S. Robison, Jr., Superintendent. Charles Hathaway, President; Charles Hathaway, Jr., General Manager.
CONCORD, N. H.—Moses Humphrey, President and Superintendent.
DAYTON, Ky.—W. W. Bean, President.
DETROIT, Mich.—James H. Vane, Director. George S. Hazard, Superintendent. Geo. Hendrie, Secretary and Treasurer.
EASTON, Pa.—Henry A. Sage, President.
GLOUCESTER, Mass.—Morris C. Fitch, President; Walter A. Jones, Vice President; and Thomas Hodge, Director.
HARTFORD, Conn.—E. S. Goodrich, President.
INDIANAPOLIS, Ind.—A. A. Anderson, Secretary.
JERSEY CITY, N. J.—Charles B. Thurston, President.
LONDON, Can.—V. Cronyn, President.
MEMPHIS, Tenn.—R. Dudley Frayser, President.
MILWAUKEE, Wis.—Winfield Smith, President.
NEWBURYPORT, Mass.—Charles Odell, President; W. B. Ferguson, Superintendent.
NEW YORK, N. Y.—C. Densmore Wyman, Vice President.
NIAGARA FALLS, N. Y.—Benjamin Flagler, President; and Arthur Schoellkopf, General Manager.

OMAHA, Neb.—W. A. Smith, Superintendent.

PAWTUCKET, R. I.—D. A. Longstreet, Vice President; and E. G. Littlefield, Treasurer.

PHILADELPHIA, Pa.—John B. Parsons, President; Ed. Barr, Director; and Thomas C. Barr, Secretary and Treasurer. William H. Kemble, President. E. B. Edwards, President. Thomas B. Ackley, President; William Penn Cooper, General Superintendent; William R. Warren.

PITTSBURGH, Pa.—William McCreery, President. Charles Atwell, President.

PROVIDENCE, R. I.—D. F. Longstreet, Vice President.

READING, Pa.—Benjamin F. Owen, President; James L. Douglas, Vice President.

SALEM, Mass.—Charles Odell, President.

ROCHESTER, N. Y.—C. C. Woodworth, Secretary; C. B. Woodworth, Treasurer.

SAVANNAH, Ga.—James H. Johnston, President.

SPRINGFIELD, Mass.—A. E. Smith, Treasurer.

ST. LOUIS, Mo.—Julius S. Walsh, President. William D. Henry, Secretary and Treasurer. E. J. Bagnall. John Scullin, President; Christian Peper, President.

TOLEDO, O.—John E. Bailey, President.

TORONTO, Can.—George W. Kelly, Director.

TRENTON, N. J.—W. H. Skirm.

TROY, N. Y.—Charles Cleminshaw, President, and Charles Smith, Superintendent.

WASHINGTON, D. C.—Henry Hurt, President. George W. Pearson, President; A. M. Clapp, Director.

WILKESBARRE, Pa.—William J. Harvey, President.

WILMINGTON, Del.—William Canby, President. John F. Miller, Treasurer; George H. Bates and John Jones, Directors.

Cards of application were presented by the following roads: Ansonia, Conn.; Ashtabula, O.; Charlotte, N. C.; St. Clair Street, of Cleveland, O., represented by Chas. Hathaway, Jr.; Colfax Avenue, Denver, Col.; Keyport & Matawan (D. W. Pugh); Minneapolis West Side; St. Charles Street, New Orleans; Newton (Mass.) Street; Orange (N. J.) Crosstown & Orange Valley; Capital, No. O Street & So. Washington, of Washington; York, (Pa.) Street; Wilmington (Del.) City Railway Co., William Canby, President; John F. Miller, Secretary; and George H. Bates and John Jones, Directors.

The Secretary's report was then called for. Being a printed volume of 128 pages, on motion of Mr. Woodworth, of Rochester, its reading was dispensed with.

The meeting then listened to the
PRESIDENT'S ADDRESS.

GENTLEMEN OF THE ASSOCIATION:—

I congratulate this Association upon the large attendance of its members and delegates at this meeting. It is an evidence of the great interest felt in the deliberations of this body of intelligent railway managers, an assurance of fraternal feel-

ings and cordial greeting in coming together from the far and extreme sections of the United States and Canada. Each one can contribute and become an important factor in the prosperity of the cause in which we are engaged. When once in operation the street railway of the period becomes an indispensable necessity, an important auxiliary in the growth of towns and cities, a medium by which distance is overcome, a guarantee of prosperity to follow, the people's benefactor.

This Association, although moderately new in its formation, this being the sixth annual session, yet shows thrift with rapid advancement by the large accessions to its membership.

The enterprise in which we are engaged is one of endless study. Representing as it does the carrying of passengers by street surface railways, with new inventions and new ideas forcing themselves upon us, it compels progressive action, which is essential to success in our business. The public, our patrons, seldom if ever satisfied with the accommodations given them by the carrying companies, spur us to a greater sense of duty and energy in catering to their demands. The present and future of street railways suggest a field of thought for their better management, more rapid and safe carrying of its patrons.

The free interchange of experience and discussion of subjects relative to passenger conveyance should produce laudable results. As your presiding officer, I ask the fullest, freest expression upon the various interesting topics that will be brought before you. Let no one hesitate or withhold his experience in railway management, thereby exerting his influence for an improving standard of our business. After the several reports upon special subjects shall have been read and discussed, an opportunity will be given for the introduction of new matter.

The tendency during the past year has been the development of some economical power other than horses for the propelling of street cars. In this city the cable system can be seen in operation. The Electric Storage Battery System will be shown you, with a practical exhibition of its workings, with some probability of other motors being exhibited of novel construction.

The labor question, which threatened a revolution in railway management, has to a great extent subsided; the employer and employee working again harmoniously. The business of the year might be summed up as generally prosperous, with indications for the future full of encouragement for like result.

By the report of your able Treasurer will be shown the financial condition of your Association.

Let each of us at the closing of this conference carry back to our scenes of labor a feeling that it has been both profitable and entertaining to have been here.

I commit the business of the convention to your better judgments. Let us in our deliberations be actuated by motives of

public benefactors, that we can go before the world, our patrons, with the congratulation of "well done, good and faithful servants."

The address was received with hearty cheers.

The Secretary then read the following

EXECUTIVE COMMITTEE'S REPORT.

Your Executive Committee respectfully submit the following report:—

MEMBERSHIP.

The Association at the commencement of the meeting in Cincinnati had a membership of 140 companies. At the meeting and during the year the membership has been increased by the following companies, making with the changes noted in the succeeding paragraph, a total of 153 companies now members of the Association:—Chicago Passenger Railway Co., Chicago, Ill.; Lincoln Street Railway Co., Lincoln, Neb.; Galveston City Railway Co., Galveston, Tex.; Citizens' Street Railway Co., Memphis, Tenn.; Augusta & Summerville Railroad Co., Augusta, Ga.; Metropolitan Street Railway Co., Kansas City, Mo.; College City Street Railway Co., Galesburg, Ill.; Wilmington City Railway Co., Wilmington, Del.; Canal & Claiborne Street Railroad Co., New Orleans, La.; City & Suburban Railroad Co., Savannah, Ga.; Canton Street Railway Co., Canton, O.; Hastings Improvement Co., Hastings, Neb.; Sandusky Street Railway Co., Sandusky, O.; Mobile Street Railroad Co., Mobile, Ala.

CHANGES IN NAMES.

The following changes in the names of members have taken place:—

The City Railway Co., of Memphis, having been consolidated with the Citizens' Street Railroad Co., both members, the former is merged in the latter under one membership.

The New Bedford & Fairhaven Street Railroad Co., of New Bedford, Mass., at the time a member, was consolidated with the Acushnet Street Railway Co., of the same place, forming the Union Street Railway Co., which latter company has been substituted in place of the first named.

The East Saginaw Street Railway Co., of East Saginaw, Mich., has changed its name to the Union Street Railway Co., of East Saginaw.

The Washington Street & State Asylum Railroad Co., of Binghamton, N. Y., has withdrawn, and the City Railway Co., of the same place, has taken its place.

The Oakwood Street Railway Co., of Dayton, O., has withdrawn.

LEGAL OPINIONS.

The following legal opinions have been issued with more or less regularity, covering the entire year, and inclusive of September and October, 1886, which at the time of the last meeting had not been issued:—

1886.

September, Lewis H. McDade against Washington & Georgetown Railroad Co.

October, Columbia & Cincinnati Street Railway Co., against S. V. Wiseman.

November, The City of Cincinnati against the Columbia & Cincinnati Street Railway Co.

December, Portland & Willamette Valley Railroad Co. against the city of Portland.

1887.

January, The New York Cable Co., against the Mayor of the city of New York, and others.

February, The Corporation of the Borough of Easton against the Easton & South Easton & West End Passenger Railway Co.

March, Galveston City Railway Co., against James M. Hewitt.

April, George Lahr against the Metropolitan Elevated Railroad Co.

May, Charles G. Rochat, Adm'r., against the North Hudson County Railway Co.

June, Des Moines Street Railroad Co. against Des Moines Broad Gauge Street Railway Co.

July, John Harmon against the Washington & Georgetown Railway Co.

August, Coast Line Railroad Co. against the Mayor and Aldermen of the city of Savannah.

September, James N. Carpenter against the Washington & Georgetown Railroad Co.

October, City of Waterloo against Waterloo Street Railroad Co.

The Committee takes this occasion to express the desire that the individual companies would manifest greater interest in this feature of the Associational work; it being vital, and the value of the information derived from important street railway decisions cannot be overestimated. We ask that each company will send promptly the opinion of the court in any case in which it may be interested.

STREET RAILWAY FIRE INSURANCE.

An effort was made by the American Street Railway Mutual Fire Insurance Co., whose directors, to the number of fifteen, it will be remembered, are representative street railway men throughout the country, to have its capital reduced from \$500,000 to \$200,000. It was not successful; but there is reason to believe that it will be during the coming legislative session in the State of New York. It will then, undoubtedly, be in a position shortly thereafter to undertake to insure street railway property. It is believed that all that is necessary to its successful development is that it be in the hands of a thoroughly competent and efficient fire insurance man, who fully understands the business. The men who would have charge of its financial affairs, being the officers of leading street railway companies, and prominently known to the gentlemen interested in this Association, would inspire confidence, and it is believed receive hearty support and lead to a successful business of the company. When the company is ready to do business, we heartily commend its support by the street railway companies of America, inasmuch as we firmly believe, from facts

hitherto elicited direct from companies, that street railway insurance is fifty per cent higher than it should be, while the moral risk of the property is of the highest order, and the fire risk one of the safest.

STREET RAILROAD TAXATION.

Street railroad taxation, which was commented upon in the report of the last Executive Committee, has not as yet been in any wise materially affected by legislation. Taxed in every conceivable way, a grievous burden is laid upon the companies. A united and determined effort by all honorable means should be made to endeavor to lighten these excessive burdens. The people are more benefited by the lowest possible fare than by the highest possible taxation.

KNIGHTS OF LABOR.

During the last fiscal year of the Association the Knights of Labor have not to any considerable extent disturbed the business prosperity of the country, at least so far as annoying the street railway companies is concerned, by "strikes," and the consequent violent interference with the running of the cars. In one or more individual instances, however, the companies have been grievously and unjustly interfered with in the prosecution of their business. This has been done without rhyme or reason, and to the ultimate discomfort, not to say defeat, of the Knights of Labor engaged in these "strikes." We should not be considered egotistic when we say that we deal fairly with our employees as between man and man, and are ever ready to listen to so-called grievances, complaints or differences that may exist in the minds of our men, concerning them in the management of our business. Willing to treat them justly, we should in turn be treated fairly. We are happy to record the fact that where local labor organizations are managed by broad-minded men, little or no inconvenience has been or need be experienced from the society in question. When, however, unscrupulous or narrow-minded men are selected to come in contact with the managers of large corporations, the brief authority conferred is apt to be unwisely taken advantage of, to afford temporary notoriety, to the irreparable loss and detriment of their associates, who find out when it is too late that their confidence has been misplaced. In such cases these organizations are rather to be pitied. We believe that the improved intimacy existing between employer and employed has been a means of benefit to the companies in many instances.

One thing is tolerably certain in America, namely, that a man will reach his level, if he be free to do so. Another thing equally certain is, that the tendency of great combinations of labor is to drag down and handicap the skilled artisan. We believe there is sufficient wisdom in the managers of street railway companies to take care of this enormous business, and as questions of labor in their different forms come before them they will be able successfully to cope therewith.

UNION INTERNATIONALE PERMANENTE DE
TRAMWAYS.

We are pleased to record that there is in European organization known as the Permanent International Union of Tramways, and of the desire on the part of that Association as expressed through its General Secretary, M. Nonnenberg, to become informed of all matters of interest that concern the American Street Railway Association. Copies of the reports of these Associations have been exchanged; and any of the officers of the members of this Association desiring to inspect European tramways when abroad will undoubtedly be facilitated by the members of that Association.

Notices of this meeting have been sent not only to every company that is a member of the Association, but to all the companies in the United States and Canada, inviting representation at this meeting. We are pleased to note that, from the replies received, it is evident that at this meeting, as at every preceding meeting, large accessions to the membership will be made.

OBITUARY.

We take occasion at this time to note the demise of several who have been more or less prominently connected with the Association.

William H. Hays was for many years President of the Eighth Avenue Railroad Co., of New York city, and died suddenly at the end of a well-rounded life. A kind father, a true friend, and an esteemed Christian gentleman, he was mourned by a large circle of friends and acquaintances.

James W. Foshay was for many years President of the Broadway & Seventh Avenue R. R. Co., of New York. Under his able administration the business done by that company became of great magnitude. He was a hard worker, a genial companion, a sincere friend and a courteous gentleman.

George W. Appleton was the Auditor of the People's Passenger Railway Co., of Philadelphia. That company writes of him, "It is with regret that we inform you of the death of George W. Appleton, after a brief illness. He was a man of ability and ripe experience, highly honored and esteemed in all the walks of life."

Robert Bell was the Superintendent of the Detroit City Railway Co. He was a man of action and good judgment, and the welfare of the company as well as that of all those employed under him was his continual care. He was a man without ostentation, and was admired most by those who knew him best. He passed away quietly after a long illness.

THOMAS W. ACKLEY,
ALBERT G. CLARK,
PRENTISS CUMMINGS,
JULIUS S. WALSH,
HENRY HURT,
C. DENSMORE WYMAN,
A. EVERETT,

Executive Committee.

Moved to adopt and place on file.

The Secretary then read the following abstract of the report of the Treasurer, showing the condition of the Association's finances:

TREASURER'S REPORT.	
Receipts:	
Balance on hand.....	\$1,018 07
Annual dues from 140 members, \$15 each	2,100 00
Admission Fee, 14 new members, \$25 each	350 00
Sale of Salt Bags.....	2 40
Sale of Annual Reports.....	7 00
Total.....	\$3,477 47
Disbursements:	
Treasurer's Salary.....	\$1,000
Sundry.....	222
Printing Reports and Other Printing.....	800 \$2,022 81
Balance on hand.....	\$1,454 66

The President then announced that the next thing on the programme was the report of the Committee on Motive Power. The Secretary stated that the committee on that subject notified the President and Secretary of his inability to serve too late for the reappointment.

The President then called for the report of the Committee on

Electricity as a Motive Power.

BY WILLIAM WHARTON, JR.

Since the last annual meeting of this Association the subject of using electricity as a substitute for horse power on street railways, has received much attention, and great advances have been made in the practical application of it to that purpose, so that it may now be stated broadly there is no longer any doubt or uncertainty that electricity can be successfully and economically employed in a great many places, if not most places, as a substitute for animal power. Quite a number of electric railways are in operation in the United States, running satisfactorily under all the requirements of public service, so that there is much greater familiarity with and a more general knowledge of electricity among railroad men and the public than ever before. There is so much confidence in the practicability of electrical propulsion of cars being well established, that the subject is no longer treated with doubt or disdain; on the contrary, great interest and respectful attention are at once manifested whenever the subject is brought up. Although some parties, interested perhaps in pushing forward their own special inventions, may claim too much, the actual facts as presented daily in the regular work of the cars are good enough to warrant this belief and confidence.

Electricity in its manifestations, applications and capabilities, has been hitherto a subject the knowledge of which has been confined mainly to scientific circles, but it is evident that the time has come when it will be put in harness in place of the horse to draw cars, and to perform many other duties which a few years ago would have been considered entirely chimerical and visionary. So long as the oxidation of metals or other chemical action was the only available method by which electricity could be produced, the expense attendant upon such means limited its use to a very

narrow sphere. Since, however, steam power and water power have been so successfully employed to generate electricity, and to do it so cheaply, the range of its usefulness and application has been wonderfully enlarged from year to year. It is not intended in this paper to make use of scientific terms, or to discuss the question from any standpoint but that of practical observation and experience; nor is it intended that any comparisons shall be drawn between electric motors and steam locomotives; but there is a wide field for work in which neither the locomotive nor the horse is able to satisfactorily accomplish the duty called for.

The systems at present in use for electrical propulsion of cars are divided into two classes.

First, that in which the electricity is conducted from one or more active generating sources along a suitable conductor or conductors to be used in the cars with proper return connections; and secondly, that system in which the electrical power is obtained from accumulators or secondary batteries carried along with or within the body of the car. Of the first there are several methods, viz:

That in which the electricity is carried along a conductor above the ground, considerably above the car, either directly over it or towards one side.

That in which the electrical conductor is situated at the side of the railroad and elevated a few feet only above the ground.

That in which the electricity is carried upon the surface, either by a third rail, or other conductor, running on the level of the ground or pavement.

That in which the electricity is carried beneath the surface by a conductor placed within a suitable conduit for its protection, access being had to said conductor through a slot in the top of the conduit, so as to allow of electrical connection with the motor on the car.

The plans of having the conductor along the surface or at the side of the railroad not much above the surface have so many evident and practical disadvantages that they need not be taken into consideration in this paper; therefore the question is reduced to the three methods of overhead conduction, underground conduction, and storage batteries.

It is evident that better service must be furnished at the same cost, the same service furnished at a cheaper rate, or that both objects combined shall be attained by the use of electricity, before it takes the place claimed for it. The writer believes fully that the last proposition of both better and cheaper service has already been proved by actual service and daily use, but in the nature of things improvements upon the present methods will be discovered, and "the survival of the fittest," which applies as well to mechanical appliances as to animated life, will by its inexorable laws weed out and discard those which are deficient or incompetent. There are so many intelligent, persevering and scientific minds engaged in active ex-

periments and researches into the mysteries of nature's powers, and more especially those relating to electricity, that discoveries are constantly being made, human knowledge in this age extending more rapidly than at any previous time. The subject is fascinating and the prizes sought after are brilliant and valuable.

The increased cheapness in production of electricity which may fairly be assumed for the future, will of course add to the advantages, and enlarge the scope, of its use. At present there are many places where electricity can be generated at a nominal cost by the use of water power, and this energy can be carried a number of miles without any loss or leakage of practical consequence. Where this can be done of course the parties have special advantages. So also there are many towns and cities in coal regions, or natural gas regions, where the same result of cheapness in production can be obtained, although by different means.

THE SCRANTON ROAD.

As a case in point it may be mentioned that the electrical railway in Scranton, Pa., has its power station located about midway of the route, and immediately at the foot of a large hill or great mass of hundreds of thousands of tons of culm, which is principally composed of the small fine particles of coal produced in mining or left after the screening and preparation of the commercial sizes of coal for the market. This has been accumulating for many years, is still accumulating, and has hitherto been considered only an inevitable nuisance, which the mining proprietors would gladly have given away for nothing to get rid of it, and not have it occupy their land.

The price which the railroad company pays for this culm is but ten cents per ton, and as it only has to be wheeled through the door of the engine house, the whole distance from the culm hill to the furnace under the boilers not being over fifty feet, and as the whole consumption per day is on the average but five tons, or in money value but fifty cents per day, it is evident that the cost of electricity in this case is exceedingly small indeed, that sum being sufficient for the fuel to produce the steam power which generates electricity enough to run four and sometimes five cars, carrying at times seventy-five passengers each, over a railroad track about four and a half miles in length, having long grades, a number of which are five or six feet to the hundred, and the steepest of which is seven and a quarter feet per hundred. The tractive power required upon some of these grades is still further increased by curves or switches occurring upon them.

It may be well to mention some other points about this railroad in Scranton, which has been running about one year, with great success, and exhibits in many respects a favorable example of an electrical railway with overhead conductors. The cars have four wheels; two of them are open cars, each carrying one motor of 20 H. P. The motor is placed in the body of

the car midway of its length, and all four of the wheels are driving wheels, the connections between the motor and the wheel axles being made by means of chains and sprocket wheels. Three of the cars are closed cars, each with one motor of 15 H. P., which is placed on a closed platform at the forward end of the car. In these the forward wheels only are driving wheels, and their connection with the motor is made in the same way as on the open cars, with chains and sprocket wheels. The company will shortly place four more cars upon the line, each with a motor of 25 H. P. These larger cars are intended not only to propel themselves, but to be able each to haul in addition two other cars loaded with passengers up all the grades.

The running time of the round trip on the main line, being in all eight miles, is one hour, which includes all stoppages and the waiting at each end of the route, so that the average speed attained is more than eight miles per hour. There is no difficulty in going much faster, in fact the men in control of the cars have to be watched to prevent their running at excessively high speed, particularly on the return trip to the city, where the grades allow the car to be run for the most of the distance by gravity alone.

At the generating station there are two stationary engines of 180 H. P. each, two dynamos of 100 H. P. each, and four boilers of 100 H. P. each. Only one engine and dynamo, however, and two of the boilers are in use at one time. The railway company expects also to furnish in the future electricity for the lighting of the town of Dunmore, situated at one end of the line, by which the income of the company will be materially increased. The duplicate engine and dynamo and the duplicate set of two boilers, are for the purpose of providing against contingencies of accident to those in use, and also to allow of alternations in service, thus giving opportunities of frequent examination and inspection.

Upon this railway, as before stated, the overhead system of conduction is employed, having flexible connection between the motor on the car and the carrier traversing the conductor, which is a solid copper wire of 5-16 in. diameter, suspended on a part of the route from transverse wires attached to wooden poles placed on both sides of the street about 100 ft. apart lineally, about 20 ft. high and about 6 in. in diameter at the surface of the ground, and on the rest of the line suspended from arms projecting sideways from wooden poles at the side of the railway about 20 ft. above the ground. The line is a single track railroad, with several turnouts or passing places, at which points the electric overhead conductor branches off over the side track also, and an ingenious system is in use by which the carrier, running upon the overhead wire, with two grooved wheels of about 2½ in. diameter, automatically shifts the connections at the points of divergence from the main line, so that the carrier always follows that one of the overhead conductors which is above the

track upon which the car is traveling. It is contemplated, however, to use two separate and independent overhead conducting wires throughout the whole length of the route, so as to avoid the possibility of any difficulty with the carriers at the points of intersection at the turnouts, although this has not happened often. The return current of electricity is taken by the rails.

The electrical current has a tension of about 600 volts, which while sufficient to give a shock, could not produce any dangerous effect on man in case the current should by any means be diverted.

Part of the road is laid with tram rails and the rest with T rails, and a part is paved and the rest unpaved, so that these different conditions in connection with the many grades and the curves and turnouts, give ample opportunity to thoroughly test the working of the system. Although the overhead wires in this case do not present any more unsightly appearance than the numerous telegraph cables and wires to which we are so accustomed, it is evident that the use of the overhead system will be prohibited in most cities and towns, especially since the general determination to place all electrical wires through cities underground. The noise of the carriers running on the conductors is not much, although it can be readily noticed, but the noise produced by the motors and the chain and sprocket connections, is quite considerable. This latter could be entirely avoided by the use of a noiseless motor and a better method of connection, of which motors and connections there are several kinds easily obtainable. Noiseless, efficient and durable electric motors suitable for use on cars can be had in which the weight per horse power does not exceed 60 lbs.

In a paper of the length to which this must necessarily be limited, it will be impossible to do much more than treat of the subject in a general manner, but it can be stated specifically and certainly that electric railways with overhead conduction have demonstrated beyond a doubt their capability to propel a few cars, even if heavily loaded, at less cost and much greater speed than could be obtainable on railways operated with horse power. This is true in places where the coal required must be bought at usual rates, and the exceptional advantage of fuel at merely nominal cost does not exist, as is the case at Scranton, and likewise at Wilkesbarre, where an electrical railway is under construction, upon which the cost of coal used will not exceed 60 or 70 cents per day for five cars.

UNDERGROUND CONDUCTION.

In the case of electrical railways with underground conduction, the effort has been made to give all the advantages of the overhead system, and at the same time remove the objection, which in most places is absolutely prohibitive, of having the conductors and poles or other supports obstructing the streets. In doing this, however, great difficulties arise, some of them of a very serious character. The costly

conduit, with the needful arrangements for drainage and for cleaning out, together with the increased care necessary to provide against the considerable loss or leakage of electricity, which nevertheless generally takes place in spite of all precautions, detracts greatly from the apparent advantages of the plan. Many inventions have been patented, and numberless devices contrived to overcome the many objections to this method, but there is great room for doubt whether practical success has yet been obtained.

Neither by overhead nor underground conduction have more than a few cars as yet been moved simultaneously upon railways, although many ingenious arrangements are offered by various parties who confidently assert they can run any number of cars. This, however, yet remains to be proved. Both plans also are open to another serious objection, in the entire stoppage of travel on the whole line in case of breakage or derangement to any part of the conducting apparatus or the generating machinery. In this respect they are under the same disability as the cable system of car traction is hampered with. Possibly by suitable arrangements of duplicate engines, boilers and dynamos, duplicate conductors, and auxiliary, sectional or relay systems of conduction, this disability, threatening as it appears to be, may be so reduced as to be of no great detriment. This, however, remains to be demonstrated. Taken altogether, underground conduction does not compare favorably with overhead conduction up to this time. One great trouble with the latter plan, however, is that, although it can be used to great advantage and economy on lines running a few cars in towns, or in suburban districts outlying large cities, it will probably never be allowed by the municipal authorities in large cities, which of course are the very places where the advantages of electrical propulsion are needed the most. To move a large number of cars, as for instance upon the Third Avenue or Broadway lines in New York city, the electrical conductor, whether overhead or underground, must be of great size if the current is of low tension; while on the other hand if a small or moderate sized conductor be used the current must then be of dangerously high tension, and of course it would then be very difficult to avoid great loss of electricity by leakage.

STORAGE BATTERIES.

There remains to be considered the accumulator, or secondary battery, system. In this each car carries its own supply of energy, and is entirely independent of any method of continuous electrical conduction. No change of track or roadway is required, nor any costly conduit or unsightly poles or other supports, while the cars can run anywhere that a car can be taken by horses. These points are of immense advantage, and are the chief merits advanced by its advocates, independent of its economy over horse power.

In practice, cars of the size of the

usual two-horse cars are provided with about 80 accumulators, weighing when filled with fluid and ready for use about 40 lbs. each. These cells are placed under the seats, one-half being on each side of the car. Their combined weight is 3,200 lbs. and the weight of two motors each of 5 H. P. should not, together with their connections to the car axles, exceed 800 lbs.; so that the additional weight imposed upon the car is, say, 4,200 lbs., which allows 200 lbs. for the apparatus to control the current and for other electrical appliances. This added weight, if placed upon a four-wheel car, may be of disadvantage to the car or to the track. If this should be the case, the difficulty is removed by the use of eight wheels, on two swinging trucks, which support the car much better, and distribute the weight upon the track.

Both these kinds of storage battery cars are in service with entire success. The charging of the cells is done by a dynamo driven by steam power or any other desirable means, and it takes four hours to charge cells which are able to perform four hours' work. To remove from the car the cells which have done their work, and to replace them by freshly charged cells, takes no more time than the time required to change horses. It requires 10 H. P. exerted for four hours to charge the batteries or cells of each car, so that 40 H. P. hours are needed to accomplish it.

The cost of running large stationary steam engines of say 200 to 400 H. P., constructed with the modern improved cut-off appliances and other economical devices, has been found after extensive investigations not to exceed two-thirds of one cent per H. P. hour. This allowance is a liberal one, and is above rather than below the actual average cost, including fuel at average market prices, attendance, repairs to engines and boilers, oil, etc. We will, however, take it at one cent per H. P. hour: 40 H. P. hours, at 1 cent, cost 40 cents, which is the cost of four hours' car service, and as the day's work of a car should be taken as sixteen hours, we have, as the whole cost of a day's supply of electricity, 4 times 40 cents, or \$1.60. Since four teams of horses are required to draw a car for sixteen hours, and as one additional horse per car is the usual allowance for sick or disabled horses, nine horses per car are needed for a day's work, which at 50 cents per horse for feed, bedding, attendance, shoeing, etc., is \$4.50, as against \$1.60 for the storage battery electricity. Making extraordinary allowance for possible errors in this comparison, the difference is still astonishing to those who have not looked into the matter critically. With motors properly constructed, a speed of eight or nine miles per hour is readily accomplished; in fact, eight miles per hour may be taken as the speed at which such motors will work to the best advantage, and return the greatest percentage of mechanical efficiency. The requirements of street car service demand variable rates of speed, as for instance in crowded streets, behind other vehicles, or in turning curves

and entering switches, it is necessary to go slowly and cautiously; and the weight of the load carried at different times will vary from an almost empty car to one overloaded. These conditions, together with increased power needed to ascend grades, and to start loaded cars, especially on up grades, call for electric motors, which will under such greatly varying circumstances respond at all times almost equally well.

There are motors which, while engaged in performing an equable work and running at an equable speed, for both of which purposes the motor was specially made, will return ninety or possibly ninety-five per cent of efficiency, while the same motor when run at some different speed or under some different load may return but thirty or thirty-five per cent. So that the average performance of such motors in street car service would probably give only fifty per cent return of efficiency. Motors can, however, be obtained which will under all the variations of street car work constantly return seventy-five per cent of efficiency.

The durability of storage batteries is a point which those interested in other systems are prone to doubt, but it has been proved in actual use in cars that they will continue in good serviceable condition for eighteen months or two years. Makers of these batteries offer to guarantee them good for two years of street car service. The lead-lined wooden containing boxes will last for many years; the negative plates are good for more than two years; while the positive plates are certainly good for eighteen months, if not more.

The plates, being of lead and lead oxide, are still of value when they become unserviceable, for the metal can be recast into new plates, and the lead can be recovered from the oxide. The first cost of storage battery cars and the engine and dynamos is at present prices considerably more than the first cost of cars provided with a suitable complement of horses and harness, but when the saving in first cost obtained by dispensing with the ground and the stables required for horses is taken into account, the balance will in many cases be in favor of storage battery cars. This is of course applicable more particularly to large cities, where ground is very valuable. By methods now being introduced into the manufacture of storage batteries, their production will shortly be made at a reduced cost, and their durability increased at the same time.

It should be remembered that the increased speed at which electric cars can travel is so much greater than horses could draw them, that two cars can readily do the work of three horse cars, especially as the electric cars require no time for resting at the ends of the route; but although they can easily do this, so much increase of speed would not be allowed or be practicable through the streets of most cities or towns. It could be done with safety and advantage through wide streets or avenues and in suburban districts. It will, however, be perfectly safe to say that three electric cars can do the

work of four horse cars, and if desired they can at the same time be of greater capacity than horse cars, for while the horses can do no more, no such difficulty exists with electricity. Without referring to the excessive first cost required for the expensive cable traction system, and comparing the first cost of the entire plant and equipment needed for a storage battery electric railway, on which three cars will perform the service of four horse cars, with the first cost of the entire plant and equipment of a railway using horse power, it will be found that the advantage will in most cases be in favor of storage electricity. Let us now compare the operating expenses.

RUNNING EXPENSES OF FOUR TWO-HORSE CARS FOR ONE YEAR.

Conductors, 365 days, at \$3 each car per day of 16 hours,.....	\$4,380.00
Drivers, 365 days, at \$2.50 each car per day of 16 hours,.....	3,650.00
36 horses, 365 days, at 50 c. each per day,....	6,570.00
	\$14,600.00
One year's deterioration and repair of 4 cars, at \$200 each,.....	\$800.00
One year's deterioration of 36 horses at \$40 each,.....	1,440.00
Total.....	\$16,840.00

RUNNING EXPENSES OF THREE STORAGE BATTERY CARS FOR ONE YEAR.

Conductors, 365 days, at \$3 each car per day of 16 hours,.....	\$3,285.00
Drivers, 365 days, at \$2.50 each car per day of 16 hours,.....	2,737.50
Electricity, 365 days, at \$2 each car per day of 16 hours,.....	2,190.00
	\$8,212.50
One year's deterioration and repair of 3 cars, including dynamos, storage batteries and motors, \$1,600 each,.....	4,800.00
	\$13,012.50

This leaves a balance to the credit of the storage battery cars of \$3,827.50.

The fact of each storage battery car carrying within itself its own energy gives to the individual cars an independence of action which neither the cable traction plan nor the overhead or underground system of electrical propulsion possesses, for all of these depend upon central sources of power, which may at any time be interrupted, so that breakage or accident to any part involves the stoppage of the whole line.

In a sanitary and cleanly point of view, the withdrawal of the car horses from our streets would be of great benefit, and this would be accomplished without having, as in the case of the cable railway, an open drain, which, although supposed to be kept clean, in fact nearly always contains a deposit of street refuse to a greater or less extent.

The leakage of electricity in storage batteries, charged but not in use, need not be taken into account for any length of time that cars would probably stand idle. In fact the leakage from batteries in good condition would not exceed ten per cent in three months.

The percentage of mechanical energy given by the steam engine, which is recovered in actual work under the variable conditions of street car service on the driving axles, with storage battery cars properly equipped is at least forty per

cent, and with electricity by direct conduction at least fifty per cent. In cable traction, after deducting the power needed to move the cable, and to revolve the wheels guiding and carrying the cable, not over twenty-five per cent is left for drawing the cars, and on some cable railways even less.

The increased speed so easily and advantageously obtained on electric railways as a class, not only enables three cars to do the work of at least four horse cars, and effect the great annual saving shown above, but it has a tendency to invite travel and thereby increase receipts, also to give street railways the opportunity to extend their lines advantageously further into outlying districts, and to compete on better terms with elevated roads and steam railroads than would be possible with horse power.

The rapid deterioration and destruction of street car horses shows the exacting and terrible nature of their work, although it is for only four hours per day. Their powers are already overtaxed, and they can do nothing more either in speed or in load carried.

Electric cars, by dispensing with horses, allow more room in the streets for other vehicles, and this advantage in crowded streets is of moment. Take for instance Washington street, Boston, or Broadway, New York, and it will be readily seen that this relief to the clogged traffic would be great.

Electric cars can go backward or forward with equal facility, they are under perfect control, can stop and start more quickly than horse cars, and in case of delay can make up lost time. They never get sick with epizooty or other disease, and during strikes or other periods of enforced idleness, do not require to be fed. On down grades they will run by gravity without the expenditure of other force, and on level or nearly level stretches a very little electric energy continues their motion when once they are started.

The electricity, beside running the motors, will supply the car with incandescent electric lights, actuate an electric signal gong, and operate electric bells for the use of the conductor and passengers in stopping or starting the car. It is usual to have the regular hand brake for stopping the cars, but the motors can be instantly reversed by electricity, if desired. This method, however, should only be employed when it is necessary to stop the car very quickly, to avoid accident or for some other imperative reason. By this means the car can be stopped in much less distance than is possible by the hand brake, which of course operates with the same efficiency whether upon electric cars or horse cars.

It has been questioned whether in winter, when the tracks are liable to be obstructed with snow or ice, the electric cars will be able to propel themselves, owing to the fact that they obtain their power of propulsion from the adhesion of the wheels upon the rails, so that if the wheels are prevented from reaching the track there

would be a great liability of their slipping and turning around without giving any forward motion to the car itself. In answer to this it may be stated that during last winter, on the electric railway in Scranton, having the overhead conduction system, and from experiments made in Philadelphia with a storage battery car, it was found that there was no unusual difficulty presented in snow storms, the wheels, owing to the added weight, settling more readily through the snow, and thus reaching the rails. Upon roads properly equipped with snow plows, or snow sweepers with revolving brushes, propelled by powerful electric motors, the clearing of snow from the tracks would no doubt be much more efficient than horse power could effect. Street car electric motors of 50 H. P. or more, if required, can be as easily made and are as easily controlled as motors of 5 or 10 H. P., so that electricity has ample ability to keep the tracks clear from accumulations of snow. As with locomotives, sand boxes should be placed upon electric cars, so that if any slipping of the wheels should be observed, either from the greasy, slippery condition of the track, sometimes seen in damp weather when the streets are not properly cleaned, or from snow or ice upon the track, the driver by opening a suitable valve can let out a little sand upon the rail and thus at once overcome the difficulty.

It is sometimes asked why two motors of 5 H. P. each should be needed upon a car usually drawn by two horses. In explanation of this it may be stated that a car horse can, and very often does, exert for a short time, in starting a car or upon steep grades, a force of 5 or even more H. P. A mechanical H. P. is the measure of the moderate duty which a horse can constantly and regularly exert day after day in a regular day's work without injury, but car horses are constantly temporarily called upon to exert unusual and unreasonable power, which is the reason they are so rapidly destroyed in street car service. It is evident, therefore, that the electric motors must be able, when called upon, to exert the same power that the horses under pressure can be made to perform temporarily, so that a maximum of 5 H. P. in each of the two motors will develop only such force as the requirements of street car service are constantly demanding during short periods of time.

It is not intended in this report to indicate that cable railways for use on steep hills or high grades will be superseded by electric railways, for the latter are limited to such grades as the adhesion of their wheels upon the rails will enable them to surmount, just as in the case of the steam locomotive, so that there is a suitable and proper sphere of usefulness for cable railways in the many places for which they are particularly adapted.

It has been proposed to increase the tractive power of electric cars upon inclines by causing magnetic attraction to be developed between the wheels and the rails, and also by the use of other devices. All these

methods present complications which probably will more than outweigh the advantages sought to be attained.

In developing the best construction and management of electric cars and railways, careful attention to details, some of which at first sight may appear trivial, should be exercised in order to obtain the best results, no matter which of the three plans be adopted. It should, however, be said that in practice, at the present time, the running of electric cars requires no more intelligence or skill than the running of horse cars, and also that the electric current with continuous conduction on lines using a few cars, need not be of such tension as to endanger human life, 500 volts being sufficient. With the storage battery system the tension of the current is so low, 160 volts being sufficient, that no shock whatever could be experienced by a man taking through his body the whole current required to propel the car. This has been repeatedly done, some of the people stating they felt nothing at all, and others no more than a slight tingling sensation.

The term "storage batteries," so generally in use, is apt to give a wrong impression, no electricity whatever being stored or contained within them, for in charging the batteries a chemical action is forced to take place, and when this chemical action is allowed to reverse itself, electricity is generated thereby. The car motor immediately uses this, and when the motor is stopped, the chemical action and therefore the generation of electricity ceases.

In this report care has been taken not to refer by name to any patented inventions, or to recommend any particular make of electrical appliances. As to these matters, those proposing to use electricity, whether by overhead or underground conduction or by storage batteries, should of course be careful to select such methods as are the most reliable, efficient and durable, and to deal with parties not only responsible as to the validity of their patents, but capable of doing what they undertake to perform.

Any one who peruses the railway journals and notices the number of electric railways now in operation, and the still greater number of those in course of actual construction or projected, has cause for surprise if he has not closely been following the course of events.

That electricity by some of the present methods of its use, or by better ones yet to be invented, will entirely supersede the use of horses and cable traction upon all street railways, excepting under the special conditions for which cable traction is occasionally applicable, is a question that admits of very little doubt.

Mr. FRAYSER asked as to the weight of the motor and batteries.

Mr. CLARK, of Cincinnati, desired to know of the details of the expense given in the road supposed by Mr. Wharton, that is to say, the expense of each particular item.

Mr. WHARTON said he could not divide

the expense in detail, and only gave the result of his experiment.

Mr. SMITH, of Milwaukee, asked as to what price coal was figured in the report.

Mr. WHARTON stated that he was unable to arrive at the average price of coal throughout the country, and therefore took the usual price in Philadelphia, New York and Boston. Mr. Wharton stated that he was not disposed to take advantage of the low price at which screenings or other low grades of coal could be obtained, but based his figures on a fair quality of coal.

Mr. CLARK, of Cincinnati, referred to the electric roads of Montgomery, Mansfield and Lima, the latter being run by oil.

Mr. MOSS, of Cincinnati, inquired as to the size of cars referred to, and said that, in a communication which he had received, 15 H. P. motors had been recommended.

Mr. WHARTON said that a motor of 15 H. P. had been found sufficient for an average car of 16 ft., with no excessive grades. He did not mean such motors as, like a sieve, would leak nearly as fast as the electricity was poured into them. He had found 25 H. P. motors to be sufficient for say 40 passengers under the conditions above referred to; that there were differences of opinion, and there were advantages and disadvantages as to using two motors instead of one. Spoke of the difficulty where only one motor was used of finding an unobjectionable method of conveying the power from the motor to a more distant axle. He objected to the ordinary gearing of sprocket wheel and chain.

Mr. FITCH, of Gloucester, would like to know the power on the cars now in use by Mr. Wharton.

Mr. MOSS, of Sandusky, asked as to the time to store.

Mr. WHARTON said, "We charge batteries in four hours sufficient to last four hours."

Mr. RICHARDS, of Boston, spoke in very glowing terms of the advance that had been made during the last year, and thought that Mr. Wharton's report was the most exhaustive that could be made in the light of the present developments, and thought it specially valuable, as it was the result of practical experiment. Said that he was one of the earliest to advocate electricity, and was, therefore, very much gratified with the results obtained up to the present time. He indulged in a good deal of eloquence, in the course of which he said that he presumed the progress that would be made in the next year would be such that everything now given would be old fashioned and almost obsolete. Said that Mr. Wharton's modesty was only equaled by his electrical success; that electricity was the greatest blessing that had ever come to street railroads; that now, instead of feeding his horses \$400,000 worth of provender, he could feed his motors with electricity, which would cost the expense of running a 500 H. P. engine. He spoke of a ride on Mr. Wharton's car and the car running off the track; but with forty passengers on board, over the

worst pavement on earth, the motor hauled it on again. Mr. Richards rather discouraged the inquiry into details of the Wharton paper and experiments, claiming that the general results were sufficient.

Mr. HUMPHREYS wanted to endorse what Mr. Richards said as to the success of Wharton's car. Said that the steam motors used by him doubled his receipts, but if there was anything better he wanted it.

Mr. CLEMINSHAW, of Troy, took exceptions to one point in Mr. Richards' remarks, thinking that every inquiry should not only be permitted but encouraged; that no one wanted to criticise, but all wanted to inquire.

Mr. WHARTON did not want to be construed as not wanting to answer questions, but could only tell what had been done up to date. Said that the results at present were far beyond his anticipation, and, while he hoped for great progress in the future, he would be perfectly satisfied if no advance was made beyond the present attainments. Said he did not look at the motor, nor did he consider it necessary to do so, from the standpoint of an electrical expert, but on the basis of practical work and money value.

Moved by Mr. Little and seconded by Mr. Hood to accept the report of the Committee on Electrical Propulsion and extend a vote of thanks for the able paper.

The Secretary read a letter from the Electrical Car Co., of America, and William Wharton, Jr., & Co., inviting the delegates of the convention to inspect their works and to ride on their electric cars any time Friday.

Mr. MCCREERY, of Pittsburgh, wanted to know if they could see the motors of the Wharton cars; said he was much of a child, and wanted to hold in his hands and look at a thing, and, like Helen's Baby, wants to "see the wheels go round"; also wanted, if convenient, to see the car before Friday.

Mr. WHARTON invited people who desired to take a ride on his car that evening, the first load starting at 7.30. He spoke of an eight-wheel car, also to be on exhibition during the evening. This car would contain two motors weighing 900 lbs. each, nominal capacity 11 H. P., but with a maximum of 15 H. P. each.

Mr. VANE, of Detroit, wanted to know if the builders of electric roads and the patentees controlling the invention would not soon combine and compel the roads to pay about ninety per cent of their possible profits for electrical apparatus.

Mr. WHARTON thought there were so many devices on which patents had run out that there was no danger of street railway companies being obliged to pay too much. He advised roads not to be in too much of a hurry, and urged that it was the business of the electrical companies to stand the expense of experiments, and not that of the roads.

Mr. HURT, of Washington, asked as to the steepest grade that Mr. Wharton would advise applying electrical power to.

Mr. WHARTON replied that 6 per cent

was the greatest that he would advocate, although in Scranton the cars were regularly mounting a grade of $7\frac{1}{2}$ per cent, and a representative of his had seen a road in Pittsburgh where $12\frac{1}{2}$ per cent grades were ascended and 14 per cent was expected to be overcome. [We believe that cars for ascending grades referred to are to be supplied with a special sprocket wheel device for helping up the steepest grades. Eds.] Mr. Wharton urged, however, that electricity should not be required to meet the worst grades in the country and rest its merits alone on that test; said that a car capable of ascending a 6 per cent grade would meet the requirements of probably seven-eighths of the roads in the country.

Mr. RICHARDS suggested that an hour be named for riding on the electrical car.

Letters were then read from the following institutions and companies, inviting the delegates to visit them: Girard College, Union League House, Masonic Temple, A. Whitney & Sons, the Baldwin Locomotive Works. An invitation was also received from the present presidents of passenger railways of Philadelphia, extending an invitation to the members of the Association to attend a banquet at the Union League. Motions were made to accept all these invitations, Friday being set apart for visiting the places of interest.

Mr. SMITH, of Milwaukee, referring again to the motor question, inquired whether the subject of steam motors was not a proper one for inquiry, and suggested that their comparison with electric motors would be profitable, and that it was not apparent to him why steam should be converted into electricity before its application.

Mr. WHARTON gave, as advantages for electricity, that by generating power with a large engine it could be much more economically done than if divided up among several small engines, each one requiring an engineer. He said that where cities would allow them he would say steam motors, unless the economy to be had by generating power by large plants, and dividing it up by the medium of electricity, would be more economical than the use of dummy engines.

Mr. BELL, of Omaha, spoke of the greater economy of dividing power by electrical motors than generating it by small steam motors, and also spoke of the nuisance of steam motors on account of frightening horses, etc.

The convention then, 1.20 P. M., adjourned to meet at three o'clock in the afternoon.

WEDNESDAY AFTERNOON SESSION.

Mr. POWERS, of Boston, moved to invite Mr. F. G. Sprague, of the Sprague Electric Co., to speak on the subject of electricity. Mr. Sprague spoke as follows:—

MR. SPRAGUE ON ELECTRIC ROADS.

MR. PRESIDENT AND MEMBERS OF THE ASSOCIATION:—

To be asked to say something to the members here comes to me rather in the form of a surprise, as I had come here only for a few hours to hear the practical

suggestions and criticisms by the men who are operating the street railways of the country, and not to attempt to instruct them. On account of the limited time at my disposal, I can only briefly refer to the application of electricity to street railways.

As most of you are aware, there are three different systems by which it is possible to apply electricity to street railways: Overhead conductors, underground conduits and storage batteries. The overhead system in point of cost is the cheapest, and is the only one up to the present which has been developed, and is in most frequent operation. The conduit system is receiving the attention of a large number of workers in this field, and unquestionably will be used in some cases where a large number of cars are in operation and where the return will be in proportion to the investment. The storage battery system is likewise in an experimental stage in Philadelphia, Baltimore, Boston, St. Louis and New York. We will soon have cars of different kinds and equipped with different makes of storage batteries in operation, some of them under our own and others under local control, and in this way we will be able to get hold of the practical views which on consideration may be of value to you. In point of cost the overhead line is of course the cheapest, and either this or the storage battery system will be the one to be used where there are only a few cars and where running under long headways.

The conduit system is of course to a certain extent preferable to the overhead line, as overhead wires of every kind, for whatever use, are objectionable, and possibly of a tentative character, in view of the ultimate development of the storage batteries. The conduit system, as I have said, is in a somewhat experimental stage. It is impossible to put in such a system except by liberal investment of money, because it must stand the same strains and conditions of weather and traffic which a cable conduit must stand, and in addition must afford ample protection for the conductors on which the operation of the whole system depends. Such an investment of course cannot be made where cars are run at long intervals, because the traffic receipts would not afford a dividend sufficiently attractive on the investment. The storage battery offers the advantage over all others of perfect independence of action, but it has the disadvantages that the capacity of the storage battery is limited, the weight of the battery is large, and the life and duration of it is somewhat uncertain. Storage battery companies are in the habit of guaranteeing their batteries for two years' operation, provided no unreasonable strain on their capacity is made. The system will soon be presented for your consideration.

The question of traction, which has been objected to by some street railway men, seems to have been met. We have had a car take a six per cent grade, driven with

only one pair of wheels. This may have been exceptional, and have been done under favorable circumstances, but it was done and over sharp curves, and if both axles are independently driven, not the one made dependent upon the other, there is no question about its being done under all circumstances. In the adoption of any system or any method of operating cars by electricity, the question of the number of cars to be operated is a most serious one. If operating one or two cars over five or six miles, electricity had better be let alone, and even when operating two or three cars the question of headway is important unless the power is derived from some existing station or under exceedingly economical conditions. There is a point in any system, whether overhead, conduit or storage batteries, in which a certain number of cars under certain conditions of station operation must be operated before the economy will exceed that of horse traffic; the greater number of cars, the greater economy.

The conduit has not only to withstand the strains and changes of the surface, but it has got to afford ample protection to the electrical conductors. The placing of wires under ground for lighting, telegraph, etc., has been very successfully done in several cities, but, even with the advantages of a supposed-to-be-well-protected conductor, many difficulties have arisen. When such a conductor, however, has its protection removed and is carried in an open conduit entirely exposed, without a good condition of drainage, such as appears in Boston, where oftentimes in spring the water will collect in pools six or eight inches deep, it is useless to construct poorly or cheaply. You have got to put the money into the ground if you are going to have a system economical and free from accidents.

You ask: Would you use electricity on a line running six cars? If I were you and I believed in electricity I would certainly use it, as it would be more economical in that case than horses.

Mr. CLEMENSHAW asked what would be the cost of a 5 or 10 H. P. motor.

Mr. SPRAGUE. I am not here to say what the price of motors is. But in plants of that kind there are four elements of cost: there is the steam plant, the dynamos, the apparatus which carries the electricity to the motors, whether it be overhead line, conduit system or storage battery, and finally the cost of the motors themselves.

As regards the probability of this application of electricity, I may instance the fact that we have now under way a contract at Richmond on which eleven miles of track are being equipped with forty cars to be operated with overhead line. The grades run as high as eight per cent, although ordinarily I do not favor going above six per cent where I depend upon the rails for adhesion. This plant is to be operated from a power station which has been specially put in for it.

In the matter of handling excessive grades, it seems to me unadvisable to subordinate an entire system to a capacity which

is necessary to climb some one grade which will occur. It would seem as if it would be advisable to use an independent motor or cable at the point where the grade occurs. For instance, if the ordinary grades on a line run two or three per cent, and there should be for a short distance a grade of seven or eight per cent, then instead of subordinating that entire line to this fact and putting on motors unnecessarily heavy for all ordinary conditions of work on the cars, it would seem advisable to equip the line for its nominal duties and at the excessive grade put in some additional source of traction. This would be found to be cheaper and more satisfactory.

Mr. Thurston said, "You have given some of the disadvantages of the conduit and storage battery systems; are there none to the overhead system?" Unquestionably there are. There is, as I have said, the unsightliness of all overhead wires; there is of course the possibility of a wire breaking, but if properly put up this ought not to occur. It must not be understood that I am here to promote or to advocate any particular system. I am just as firm a friend as any one can be of the storage battery, and hope just as much for its success as any one can, but I do not want to take the position of claiming more for any system than it can in honesty hold.

In regard to putting the motors upon cars. It would seem to me that, although greater care must be exercised in the construction of the motor, the proper place for it is under the car, out of sight. My own opinion and experience is that each axle should be equipped, in the case of a four-wheel car, and each truck, in the case of an eight-wheel car. Both because of the increased traction.

Not only ought they to be equipped but independently equipped, because in this way greater traction and much greater certainty of operation is secured on the track in bad condition, and especially in order not to obstruct the track because of any accident. Of course the object of every one should be to make as little change as possible in the recognized and accepted features of street cars, and in the application of motors to the cars absolute certainty of operation of axles, and flexibility so as to stand the shock of constant strains, should be sought after.

The meeting then listened to the reading by the Secretary of the report of the special committee on

Mechanical Motors for Street Cars Other Than Electrical.

MR. PRESIDENT AND GENTLEMEN OF THE ASSOCIATION:—

I have hesitated to undertake to make a report to this body as requested by you, and it is with regret that I do so, on Mechanical Motors for Street Cars other than Electrical, the text which has been selected for me.

Probably no other question that will come before this meeting is of more inter-

est than the problem of what is best, if anything, in the line of mechanical powers to substitute for horses. The immense development of street railway interests during the last few years seems by common consent to call for some change from horse power to that which will offer the public more rapid transit, and at a cost which will justify the companies in making the change.

Under some circumstances I believe it is now settled that the cable meets the requirements. To determine in my own mind whether any other appliance has reached such a degree of perfection as even to warrant a practical test, I would have to spend more time than it would have been in my power to have given the matter. Hence I say, I regret that I was selected to make a report on this subject. It is of sufficient gravity to warrant the most exhaustive personal examination of the different systems offered, and I am compelled to say to you that I have not been able to do this in any one case, much less in all of them. Perhaps my long experience in connection with street railway construction and management may entitle my views, from the information I have, to some consideration, and such as they are I briefly give you.

And first, a brief history of the actual result of street experiments with different motors as given by that veteran street railroader, Mr. John Stephenson, of New York, will, I think be considered in point.

Mr. Stephenson was interested in the first experiments in this line, which were made between 1832 and 1834 in New York. The New York & Harlem Railroad (Fourth avenue) having been in operation for two years with horses on the lower end of its road, and finding that they could not successfully compete with omnibus time, then on the Third avenue, commenced the era of steam motors, made by William T. James, of New York city, and such efforts with modifications of motors were continued about four years.

In 1860 the Second Avenue Railroad Co. commenced operating the upper end of its road (three and a half miles) with cars having the steam motor in the front end of the car, in an apartment separate from the passengers, which in about twelve months was changed to the system of independent motors, which were increased to heavy engines and steam road cars (eight-wheel cars). This era of steam occupied about six years, and was then abandoned.

The Market Street road of Philadelphia adopted steam motors in 1876, continuing them about one year.

Brooklyn, having many roads reaching to the sea shore, very largely adopted steam motors in 1877, but all, or nearly all, were abandoned within five years. Various efforts were made to use compressed air engines; also water heated to a high degree, giving off vapor under pressure, also springs compressed, electrical engines and gas engines, with all of which we have been familiar, but failure only has resulted.

England has been for fourteen years vigorously pushing such experiments, regardless of cost, but without any better results, and the French efforts may be summed up by the following quotation from a recent report:—

"After an experiment of five years and exhaustive tests of twenty different systems, the Paris Tramway Co. has abandoned the use of steam and reverted to horses as a cheaper and in all respects more satisfactory motive power. Scarcely a week has passed without some accident on the steam lines which proved costly to the company and led to complaints from the public. At last the authorities forbade the further use of steam, and the railroad company was perfectly ready to acquiesce."

Mr. Stephenson sums up the following opinion:—

"To the above may be added that an ordinary tramway plant is not sufficient for such use, but is soon destroyed because of the weight of motors (from 12,000 to 20,000 lbs.), in addition to the wriggling motion of the engines.

"We regard the question as fairly settled that no mechanical motor is yet in sight to take the place of animal power in propelling street cars.

"To this conclusion may be excepted in part the cable system, which has only developed superiority on grades where animal power could not be used. The heavy first cost of the cable system, with its complicated machinery subject to accident, causing delays, widespread inconveniences and loss, are serious drawbacks for which a remedy has not yet been found."

The more prominent candidates for favor that differ materially from those mentioned by Mr. Stephenson may be said to be the Connolly Motor, which relies upon a naphtha engine for power; the Pardy System of California, which proposes to use compressed air; the Pole Street Car, which, using any form of power, relies for success upon a very ingenious device consisting of two legs, so called, that may be applied to the ground when necessary to push the car over grades, or move it when the track is slippery. As described by the inventor the automatic foot action in this motor is a perfect step action, made so that there is a perfect rise and fall accurately placed on the ground, there held down, and the motor forced forward; giving, as the inventor says, a step like that of the front legs of a horse.

Then the Soda Motor and the Ammonia Motor I think about complete the list.

Beyond the claims made by the owners of these different systems I can report nothing. That all forms of power proposed will drive a car under certain circumstances and conditions I have no doubt. That this can be done practically so as to be economical, there has been no demonstration made that warrants my indorsement.

All independent motors in my judgment are governed by the same laws that affect a steam locomotive; where the conditions thus settled to be essential are met by any

other form of power that is to be used to drive the car, then I would think that the car could be moved successfully.

Where these conditions in the strength and character of the track or in the weight of the motor are lost sight of, I would expect any form of independent motor to fail.

Again, if it is conceded that a motor of proper weight and a track of sufficient strength can be devised with a power to drive the motor that is practical, and all right every way, still it is not clear in my mind that such a machine can be successfully operated and controlled in the crowded streets of a large city; much less that the rails in the street can at all times of the year, winter and summer, be kept in a condition at any reasonable expense where a traction engine would be reliable.

In taking this position I do not mean to offer any special criticisms on any special kind of motor; I would like to have done this if I could have done so fairly with that kind of close knowledge of each that alone would justify it. But generally I must say none of them impress me, even from the claims made, as likely to cover the ground I think essential.

I have stated my objections in the main, and to me these are serious enough to require any independent motor which is offered to be put in actual, successful, everyday service for a year or more before the owners would have a right to expect the street railway interests to indorse it.

From this it will hardly be necessary for me to add, that, having been accustomed to seeing a street car pulled positively by a pair of horses through the crowded streets, up hills and around curves, in the mud and through snow storms, under conditions where a steam railroad could not be operated at all, that I believe the mechanical power that takes the place of horses must also be able to do the same thing. I believe in a fair statement and I think it will be the sense of this convention that up to this date, to all intents and purposes, the issue is narrowed down between the horse and the cable.

If the first cost of the cable system could be reduced to a price within the reach of the business done by the ordinary metropolitan roads, and the cost of the maintenance of such a plant could be reduced to the ordinary and usual depreciation in machinery, say not to exceed 10 per cent, I am convinced there would be but little left to look for, in the light of present experiences.

I have been watching for over a year past experiments being made by some parties with what is called the Rasmussen Cable System in Chicago. It ought to be named the McNeill System, all the work and designs for the road having been made by H. W. McNeill.

As a result of these experiments this gentleman is now constructing between four and five miles of road on Market street, in Newark, N. J., which will be in operation this winter. I believe it will succeed. I have personally no doubt

about it; and if it does, the result will be a mechanical power having all the advantages of the California System, with practically none of its drawbacks either in construction or operation, and at a first cost of say one-third or less.

The Secretary then read the report of the committee on

Roadway Construction.

BY C. A. RICHARDS.

AMERICAN STREET RAILWAY ASSOCIATION:—

GENTLEMEN:—There are to-day two distinct types of street railroad construction—the stringer and the girder. Without wasting time in any definition of the differences which are well known to the members of this association, we will slightly outline the history of the two types and then deal with their practical details.

We have, in this country, been inclined to regard old England as very conservative—and one who left it to younger blood to “originate,” and who only followed the march of improvement when others led. The history of street railroad construction somewhat negatives this. We will show that England was the originator of both the stringer and the girder system of street railroads, but it will be also our task to show that to this country is due the progressive development of both systems.

Over two centuries ago the original tramway was developed and brought into use in the mineral districts of England. It was used principally for the transportation of coal; and we find that the great inducement to its use was the defective condition of the ordinary roads. The early tramway consisted of scantlings of good, sound oak, laid upon cross ties, and pinned with oak treenails. It is a matter of interest to note that the cross ties were laid tolerably close together—about every two feet. From this primitive construction, the evolution of the perfect system of to-day has been as gradual and regular as that of man from Darwin's “Ape.”

First, we find that the rapid wear of the timber called for the use of a rail. But it was a rail of wood. Clarke, in his valuable treatise on “Tramways,” tells us that the rapid abrasion of the timber led to the placing of a wearing rail on top of the stringer. He says this second rail became the wearing piece, and was made of hard wood—beech or sycamore.

As a step forward, it became a common practice to nail down bars of wrought iron, generally 2 in. wide by half an inch thick. Now, gentlemen, note:—

We have the first lesson in one of the essentials of good construction, viz., the need of rigidity and true surface. Clarke continues: “But the iron bars, not being stiff, were considerably bent when the trucks were loaded, and the resistance, according to Mr. Wood (an English authority), was reduced below that of a well constructed wooden railway.”

We shall see, as we proceed, how “history repeats itself,” and how this experi-

ence has been borne out in modern American practice. England thus having originated the stringer system, it remained for America to develop and improve.

It is well to note that the rapid introduction and development of tramways in this country was largely brought about by the same considerations which prompted the early use of the coal tramways in England, viz., defective roads and consequent difficulty of rapid transportation. We think this a point to be remembered, as we purpose showing that, in dealing with the subject of roadbed construction, the condition of the streets through which we build is a factor that must largely influence the construction.

In New York, in 1832, the New York & Harlem constructed its road. The flat strip of iron was improved upon by a substantially heavy rail. In other respects the construction was not much varied. This line, living through some early vicissitudes, was the forerunner of others, and in but a few years the American system of tramways had increased to magnificent proportions. In details of construction there is but little to note. We find an infinite variety in the shape of the rails, but so far as the construction of the roadbed on the stringer system is concerned—none.

During this rapid development here we find a more gradual and conservative growth in England, and, as we purpose touching upon the various types of rails and their causes, we can best do so by dealing with English progress contemporaneously with our own. The early rails used in this country were like those now used in England, grooved rails. That is to say, flat on the upper surface, provided with a groove for the passage of the wheel flanges. In 1856 the rail used in Boston was a slight departure, tending more to our rail of to-day. The groove was tapered out to the edge of the tram, and shortly afterward the outer edge of this taper was entirely lowered in the city of Philadelphia, thus developing in its entirety the ordinary side bearing tram rail of to-day, still largely known as the Philadelphia tram rail. Of late years this type of rail has been remodeled by moving the head from one side to the center, giving rise to what is known as the center bearing rail. In the mean time, the flat rail, with a small central groove, has been persistently adhered to in England, and largely, also, on the continent.

TRAM VS. FLAT RAILS.

It behooves us to ask why this difference? It is the more important to dwell on this point now, as there is a growing tendency on the part of the authorities of the large cities to demand the use in this country of the English groove rail.

Looking into the English tramway we find a rail neatly bedded in the road surface, nothing obstructive. A passing carriage or wagon drives at random over the English track, and at any angle. There is no denying the fact that the system is a perfect and non-obstructive one. Nor is it surprising when our legislators, who are

over there (generally, by the by, those who own their own carriages), see this perfect system that they want here. But we, as practical street railway men, know, by sad experience, that there are two sides to such questions as this—and that it behooves us to look always at “the other” side before we leap. Stop and think a minute. We have tried this rail, and we did not at once throw it away. We departed from it gradually—first, by a slight taper—we then parted from it still further, and, finally, left it entirely. When progress tends slowly and gradually in a given direction, does it not prove that it is not hasty or ill-advised? Does it not carry on the face of it the certainty that a cause exists for its continuing in the path in which it is treading?

To the bystander a street is a street, and a street railroad is a street railroad. To the engineer, the contractor and the street railroad man they are both something more. A street to them is one of a hundred different types of construction. At best, these hundred types can be narrowed down to but three classes—good, bad and indifferent. In this country, generally bad—and, gentlemen, what the street is that must the street railroad largely be.

Given a bad and poorly kept-up street, and do what you will, you cannot, in that poorly kept-up street, put any rail or build any track that will be entirely non-obstructive. Even in the best of our street constructions, we to-day fall far short of the English and Continental roadbed. We use granite paving, it is true, but such is our rapid growth, we lay it upon made ground that, perhaps, a few years back, was a marsh, and we replace, almost between winter and summer, the croak of the frog by the jingle of the street car bell. Abroad they lay their granite on a roadbed that has been settled by the weight of centuries, built, perhaps, by the Romans, and they can well afford to construct, regardless of cost, certain that when once laid, they are immovable till worn out.

And when the municipal authorities do their part, and furnish us such streets as this, we may find that it is possible to use a grooved rail like that used there; but until then it would seem folly to throw away the experience of years; and any effort to force the use of the narrow groove rail will but react upon itself. Two things are needed for an absolutely non-obstructive tramway:—

First—A track well built, with non-obstructive rail.

Second—And most important, a uniform and well constructed roadbed that will keep level with this track.

Given the perfect roadbed, and it will soon be found that the street railway man will, in his own interest, put in the perfect rail.

We do not apologize for taking up the time of the convention with this subject, for we believe it to be one of greatest importance, and worthy of due and careful consideration.

In this country, therefore, the rail has really been the product of the street.

So much for the stringer system.

THE GIRDER SYSTEM.

As we found that England originated the stringer system—but left it to us to develop—so we find that she originated the girder system, and left it to us to develop it as to bring it within the range of the American roadbed construction and the American pocketbook.

In 1866 England first developed the girder system by replacing the stringer with metallic construction, and so perfect are their roadbeds that the benefit of a long living track construction, under these circumstances, was such that at once it was taken hold of and developed there almost regardless of cost. We consequently find that, though possessing a comparatively small mileage as compared to ours, the English have a great number of different sections and different systems in use. But in the main their system is one that in cost is prohibitive, and in type not suited to our practice, the depth of rail being from 7 to 7½ in.—the head narrow—and the lower flange very wide. It is from 80 to 100 lbs. per yard, most of which weight is buried.

We took up the problem in this country in 1872, and, as with cable roads, so with girder rails, California was the originator of the improvement. The rail used there was of shallow depth, and narrow, and while it has answered well the purpose in San Francisco, it needed improvement to be generally adopted elsewhere. This was forthcoming, and to-day we have many different systems and as many different sections of rails as there are letters in the alphabet.

We are advised that at this writing there are over 1,000 miles of girder track construction in use in this country.

It is not our purpose, nor is it, perhaps, the province of this convention, to pass judgment upon patented specialties or to discriminate between different makers; but we have already gathered sufficient experience to outline in a general way what is the desideratum of a good and available construction. The American girder system may be classified into three types.

First—That provided with a depth of girder that permits of direct attachment to the cross ties below the paving sets.

Second—That in which the depth of girder is governed by considerations of strength and swiftness only, and in which connection to the cross tie is made by special attachments.

Third—That in which the girder is of a minimum depth, and which depends upon a supporting medium, *e. g.*, longitudinal chairs, etc., for swiftness. The web or girder in this case being a means of connection to the sub-way, and not materially acting as a stiffener.

Of the three classes, the greatest amount of success has been with the second. It has been found most economical to reach a full amount of stiffness and stop there. It has been found that ample stiffness can be secured long before reaching the depth of the cross tie. And it is certainly more eco-

nomical to use a supporting device over the tie, say from every five to every six feet, than to bury a useless amount of material the whole length of the rail.

Against the third class may be urged the fact that the rail being more or less flexible, its stiffness must be dependent upon the sub-way and its connections thereto, *e. g.*, bolts, keys, etc.

No one knows better than the street railway man what flexibility means in a roadbed.

The experiments in the direction of the third type have not been followed by any extensive use. We will, therefore, deal principally with the second class.

The demand is a rail that in its own construction shall be capable of sufficient rigidity to hold its own true alignment under the heaviest loads. The experiments made by a valued member of this association, Mr. Augustine Wright, emphasize this. His experiments show that, whereas with a good track it takes 15.6 lbs. per ton to move a load, with a track in bad condition it calls for 32.3 lbs. per ton. This means twice the amount of work for our horse flesh, and greatly increased wear and tear on the running gear. A depth of about 4½ in. has been found amply sufficient to give the desired stiffness, provided the form of the rail is double flanged. The provision of the lower flange approximates the rail to the shape of the Hodgkinson beam, which, it is well known, gives the greatest amount of stiffness with the minimum of weight.

Having secured this depth it is folly to go further. If any increase of weight is called for, better put it in the head, where it will repay its presence by greater wear.

The next point in order is the connection of the cross tie. We have found a great diversity of opinion on this score. The rail is attached by supports called “chairs,” and we find that a chair which has given entire satisfaction in one case has been found yielding in another. We find one man using and recommending a heavy and substantial chair, and another considers it too heavy and a useless expense. After sifting it all down, it seems to resolve itself very largely into a purely local question. With a track subject to extremely heavy usage, a substantial heavy chair will be a wise investment, particularly if the supporting roadbed be defective. With a track subject to light usage, a lighter chair will answer.

One point is worth noting. It seems to have been demonstrated that the province of the chair should be well decided. It should be used to support the track only; never as a joint if it can be avoided. In such cases where the exigencies of construction force its use as a joint, it should be of ample width, never less than 18 in. Upon this subject we have before us the experience of the steam railroad, and it is safe to say that the joint which has been found best by them will be found best in the street railroad man's effort to assimilate his practice to theirs. For, after all, what is the girder system but the adapta-

tion of steam railroad practice to street railroad needs, and what better guide can we have than the experience so dearly and thoroughly acquired by our steam railroad friends?

A joint should be of the fish-plate type. It should, when tightened, hold the rail both ways. It does not merely suffice to hold a joint up; it must also be held down and should be of such construction as to keep the two ends of the rail in alignment, no matter what defects or flexibility may otherwise exist.

Many experiments have been made in this country to avoid the fish-plate joint, and so far none of them have reached the same measure of success.

If necessary to use a rail devoid of the lower flange, a rib or button should be provided on the lower edge of the web, to enable the use of the fish-plate at the joint. And it may be added that the same experience largely applies in such a case to the chair—in fact, to every connection, no matter of what sort. When the connection provides against movement both ways, the structure becomes more homogeneous than can otherwise be the case. A connection which depends upon the fit of a bolt or a key is always liable to work loose.

As to the shape of the head of the rail, it can only be said that this must vary with local and municipal requirements and the habits of the community, though it may be perhaps well to note that in Boston, Rochester, Buffalo, and many points in New England, a rail has come into extensive use, which may be defined as a "naturalized English groove rail." It is less obstructive in passing vehicles than the side or center bearing rail, as the width of its upper surfaces is less, and the curved outer tram nearly approximates the level of the head.

It is purposely not made quite level, and for reasons that have been already pointed out.

First, because where the paving settles in case of defective streets, and in our streets it does settle, the small difference safely guides a vehicle that is tracking on the rail, over the defective points. It is well known that very little suffices for this; and as one side of the groove is lower than the other, it does not hold dirt or snow to anything like the extent of the English rail.

Second, because the slightly lower tram brings the scope of the groove below the head, and permits of the groove entirely filling without lifting the tread of the wheel off the head, and thus making the cars track hard.

It seems that in this rail the difference in level of tram and head, while too small to make the head obstructive, is sufficiently great to offer the advantages named. It seems to be giving thorough satisfaction.

We will close with one word about the cross tie. Even this has of late years been constructed of steel, and a few forms are now in the market at a reasonably economical price to tempt their use.

But as will be seen by a reference to the report on track repairs, made at this convention in 1885, the life of a cross tie, when buried to a depth of eight or nine inches, is very great. So great that we incline to think the use of the metallic a luxury rather than a necessity. When we reach the Arcadia of perfect pavement, we can, perhaps, afford to put in such a weight of rail as will, by its great life, justify the use of a metallic tie.

We have not reached that yet.

The time is fast approaching, if not already here, when electric motors will come into general use for the propulsion of our cars. When accumulators or storage batteries are used our cars will have to carry an increased weight of 3,000 or 4,000 lbs. It is probable also that in time we shall find it profitable to replace our present cars with longer ones, capable of seating a larger number of passengers; all this will require heavier rails and better road, and we shall have to construct our tramway when building new tracks, or reconstruct our old ones for this purpose.

A section of rail weighing from 55 to 60 lbs., with the cross ties placed 4 ft. apart, will be sufficiently stiff to answer the purpose. Great care should be exercised, however, to have every part of the track construction well and solidly done, especially at the rail joints, and the whole track rigidly held in place, so that inaccuracies in this respect will not cause the motors to leave the track, nor settle it and throw it out of place, by the increased weight and speed of our cars.

In the light of the present progress of the electric motor system, these facts seem worthy of our consideration. For the committee,

C. A. RICHARDS,
Chairman.

Mr. THURSTON spoke in favor of the center bearing rail, which he used almost exclusively in Jersey City. Said of course if the convenience and pleasure of the city authorities were to be consulted they would prefer side bearing or English rails, but that the center bearing was decidedly better for the railway company. Gave as the result of a trial of the Johnson girder rail a piece of track in complete order after two years of service where an average of two cars per minute and a heavy wagon traffic went over the rail; no repairs had been made in two years, while in case of a sixty pound rail repairs were needed within a year.

Mr. WHARTON spoke of the unpopularity of the center bearing rail, said that the New York State authorities were not only preventing the putting of it down but were talking of compelling roads which had it to remove them. Said that the call for center bearing rail was so light that it did not pay the maker to keep a stock in hand, that a decided halt had been called in the use of the center bearing rail. Of course the center bearing rail was the best for the company as compared with side bearing or English groove, as it is practically a T rail with the stem left out. He said that in the

use of the English rail the groove might be so narrow as not to permit the dirt and vehicle wheels entering it, but that even then it was decidedly objectionable. Said that in Baltimore on a road in which he was interested he had down two miles of grooved rail so constructed as to be the least objectionable to the road and at the same time comply with the requirements of that city, but found it very objectionable for several reasons, one of which was that teams trying to follow the rails for smooth track would slide off the iron and jam the pavements down, thus making a large rut on either side of the rail, much worse than the center bearing rail does; that the pavements must be kept in the most perfect order either by laying paving stones in concrete or by some other equally substantial method.

Mr. PERRIN, of Baltimore, endorsed what Mr. Thurston said.

Mr. THURSTON asked Mr. Wharton as to whether any trouble was experienced in keeping the grooves open in freezing muddy weather.

Mr. WHARTON said that it was not only very expensive but exceedingly annoying, that with the best of care mud would freeze into the groove. The wheel then ran on the mud, making the car run about as rough as though it were on the pavement; that he knew of no way of keeping the grooves entirely clear without an enormous expenditure of money or carting the dirt from the streets at once, which was not done in this country; that this trouble was experienced on all ordinary winter days; that the mud in the grooves also caused the cars to run off the track very frequently.

Mr. RICHARDS, of Boston, thought that the old stringer system had passed away, that to put iron on wood was folly. Spoke of the disadvantage of the bearing being on the side of the stringer, thus tipping it over and producing inconvenience of gauge; said that the average track on springers was uneven as to gauge; said that the rail laid by them in Boston was perfectly center bearing, and that in the girder system the fastenings which before were worn off by vehicles were now underneath, all out of the way; that with that rail no trouble was experienced from team traffic. Spoke of aldermen who on visiting Europe were delighted with the English street railway, and who would come at once to their native city advocates of such roads, regardless of the fact that the American streets were not to be compared with the English; said that they would recommend rails weighing 960 lbs. apiece; said we have no such roads here as they have in English cities; spoke of streets in Boston where the land was made by carting in sand, etc., a few months ago, and the pavement is now being laid; doubted if any one could ride over those streets a few months hence, if the track be laid now, without becoming seasick; stated that he had no interest in the Richards rail, having sold out entirely; said that they had no cars off during the whole of last winter. He hoped delegates would pick the report

to pieces in order to get the greatest possible good out of it.

Meeting then adjourned.

THURSDAY MORNING'S SESSION.

Mr. HASBROUCK, on the convening of the morning session, moved that Mr. Humphrey, of Concord, N. H., be given the floor for a few minutes.

Mr. HUMPHREY spoke in favor of eight-wheel cars; said that they ran much easier, could draw bigger loads with two horses up grade and especially around curves; said that he could draw loads with eight wheels without help where with four-wheel cars help was needed; said they were smooth riding; truck of wood should be made light, ordinary wheels should be used; not quite as easy to get on track if they ran off as four-wheel cars; said that he ran five miles with motors and two miles with horses; said that no one after using eight-wheel cars would go back to four-wheel cars.

Mr. HENRY inquired as to the height of the eight-wheel cars, which Mr. Humphrey gave as about 14 in.

Mr. FRAYSER asked as to the weight of the wheel.

Mr. HUMPHREY said about 175 lbs. In reply to a question as to gauge, Mr. Humphrey said that 3 ft. was the gauge of their road, and in his judgment was the proper gauge, that they had no wear on rail from wagon traffic with that gauge.

Mr. HENRY stated that they were required to use standard gauge. A letter of regret was then read from Mr. Maguire.

The Secretary then read the report of the Committee on

Mutual Fire Insurance for Street Railway Companies.

BY JOHN MAGUIRE, OF MOBILE, ALA.

We have the honor to make the following report on the subject of Street Railway Mutual Fire Insurance. The subject is an important one, and I fear we have done it scant justice.

The order of the hour seems to be combinations of individuals and corporations with mutual interests; why should not the street railroads combine and form an incorporation for the protection of their extensive properties from fire?

The fire insurance companies of the United States, and the agents of foreign insurance companies in this country, have formed a combination which they term tariff associations, and have sub-divided this extensive country into territories. Two of these sub-divisions are under our immediate notice, to wit, the Northwestern, with headquarters at Chicago, and the Southeastern Tariff Association, with headquarters at Atlanta, Ga.

These associations have State and local organizations, the latter of which are called "compacts." Their province is to enforce the rules and rates of the territorial organizations. They adjust the rates of insurance, and discipline their members. We have only to deal with their action in regard to street railroad property,

on which they have increased the rates from twenty-five to fifty per cent additional. The latter figure is the experience at this point. When you complain of the excessive rate, you are informed that is the rate fixed, and "if no you no likee, you no takee."

The more courteous will argue and say that of late years the insurance capital of the country has not been profitable, and they were obliged to advance the rate of insurance or retire from the insurance business.

Let us criticise the methods of doing insurance agency business and see the necessity of the charges added to pay for their method of doing business, and compare it with the mutual insurance companies of New England, and let us profit by the comparison.

In the first place, to do a general insurance agency business, you encounter the genial and clever local agent, whose first and last motto is, Get insurance premiums, and swell the commission account, upon which he lives and thrives. Upon the volume of business he secures he is never allowed less than fifteen per cent, and in some instances as much as twenty per cent.

Another plan frequently adopted is for a company to have a State, or several States, general agency, and such agent is compensated at the rate of twenty to twenty-five per cent of the premium receipts of his territory, he paying the local agent his share of the commissions.

Now the necessity exists to supervise this business, and a general agent and adjuster is appointed, whose duty it is to inspect all the business of the several territories or sub-divisions, over which he is appointed. This is a salaried position, and varies with the volume of business done, with expenses paid. It is approximately three per cent of the premium receipts.

Now we get near to the home office, but before getting to the officers of the corporation you reach the very important official, Superintendent of Agencies, with his clerical corps. This office will absorb two or three per cent of the premium receipts to run it. Now we are at headquarters, and the officers of the corporation have to be paid. Let us now see what all this amounts to. The statistics for the year ending Dec. 31, 1886, exhibit the startling fact that the expense account of some ten of the largest companies in the United States approximates forty per cent of the premium receipts; the smaller companies, a larger per cent.

The experience of these insurance companies for the year 1886 is as follows:—Premium receipts, \$102,000,000; losses, \$53,000,000, or 52 6-10 per cent.

The experience in the State of New York, where the largest values exist, shows the losses approximate fifty-one per cent.

Now let us look for an explanation. We have it: the statistics made by the insurance journals give the item of incendiary fires, for the year 1886, in the United

States, at twenty-six per cent. You hear insurance experts talk of the "moral hazard;" others discuss it, and call it the friction of a large insurance policy upon a small stock of goods. Now in making up the insurance rate, this per cent is added to the insurance rate, then add forty per cent for expense account, and you have fully sixty per cent, which, if deducted, leaves you the absolute cost of the insurance, providing you eliminate the two items mentioned. The incendiary hazard is exceedingly small in connection with street railroads; none internal. Where could profit arise by the destruction of the only means a company has to do business, which would if destroyed take months to replace, and in the mean time no revenue, and an expense account of organization going on?

It is true street railroad property does sometimes burn, so do fire-proof warehouses. No one expects to get insurance on street railroad property as low as many of the first-class risks, which are taken for about one-quarter of one per cent, or, say, one-half of one per cent for three years. On the other hand it is not fair to class street railroad stables and car sheds as ordinary livery stables, which is the classification of the insurance rating committees.

Now let us examine the experience of the New England mutual insurance companies, organized to protect the mill property of that thriving section. Before the organization of these mutual insurance companies, the rates on mill property ranged from one and one-half per cent for a first-class risk to three per cent for an ordinary risk, or fully two per cent as an average rate. Now things have changed, and the said mills are charged only the actual cost of insurance, and have returned them annually about one-half of the premiums charged them, which approximate eight-tenths of one per cent, and one-half returned to them, on average years. One year's basis is not a fair one to quote, so let us take five years, from 1882 to 1887, and the following statistics of six of the largest mutual companies in the State of Massachusetts:—

Their insurance premiums, collected for the average of this period, were each year, approximately,.....	\$1,520,000
Losses paid, average for each year were..	370,000
Returned to policy holders each year.....	1,002,000
Expense account of doing business per annum	115,000

This approximates eight per cent of the premium receipts.

Prior to the establishment of the mutual companies, the stock companies claimed that the rates were not profitable to them because of the nature of the hazard. The mills paid but little attention to the improvement of their risks, fires were of frequent occurrence, and large losses were entailed. The practical mill men and the expert insurance inspector put their heads together, and for each suggested improvement a lower rate of insurance was fixed, so that now they are first-class risks, as the past five years' experience shows that four-

tenths of one per cent is abundant rate to cover losses, the higher rate being charged to establish a reserve fund in the event of extraordinarily heavy losses occurring in any one year.

What has been done by the mill owners can be done by the street railroad companies, associated together for mutual fire insurance protection.

Why should corporations whose capital invested equals the combined fire insurance capital, pay a tribute of upwards of forty per cent for expense of management of insurance companies, when it can be done by themselves for less than one-quarter of the amount, and but a fractional portion of the incendiary experience needs be entertained? Then let us dispense with the middleman, and do our business at absolute cost.

It may be said, "How can so small capitalization carry so much risk?" True, to do so would be like unto gambling. If any risk is offered which is greater in amount than it is wisdom to carry, you have large insurance companies which will contract to take the surplus or excessive lines of insurance, for which they will contract to take at the rate, and give twenty-five to thirty per cent for the business, if the main office is dealt with, as they would be exempt from the payment of commissions to their agents.

This direct business is done every day. The main offices of the several foreign agencies take large lines of insurance upon the steam railroads of the country, and the rate is fixed by private arrangement, regardless of local agents. It is largely upon this character of business, and re-insurance of local companies, that the enormous premiums of such agencies are aggregated, one of which has an income in the United States of \$4,000,000, far greater than any American insurance corporation.

The value of a rigid inspection of fire risks can hardly be estimated, it is invaluable. An expert will detect a hazard that will be passed by hourly and no attention paid to it. Improve the fire risk and the rate per cent can be materially reduced. There is no reason why street railroad insurance cannot be reduced one-half, to say naught of the return dividend made by mutual companies.

The rate under the present system of insurance is almost prohibitory, and many corporations are not one-half insured; many others have no insurance, preferring to carry the risk than to make so large an expenditure of money. In many instances said insurance will be equal to an interest on the capital involved.

Now, how to organize a mutual street railroad insurance company, thus: Let each company of this association deposit an amount equal to one year's insurance premium as a guarantee capital, which will amount to fully the suggested capital of \$200,000. This money can be invested in undoubted securities, which will pay say four per cent interest, which can be paid to the companies making the deposit as so

much dividend, and if only a few of the companies enter into the capitalization a greater rate of interest can be paid to the capital furnished, which might be considered a hazard, and fully entitled to remuneration. Allow all street railroad companies in the association to participate in the mutual insurance benefit. Aggregate the insurance premiums say for three years, so as to establish a surplus or guarantee fund. At the end of each year issue a scrip dividend (bearing annual interest), payable at no fixed date, but which should be paid within three years unless extraordinary losses occur. This method allows an accumulation of a surplus capital and contingent fund from which dividends can be made with some regularity, even if more than ordinary loss occurs. Thus the company would make haste slowly. Organize a mutual insurance for street railroad property, and proceed so that the most timid can appreciate the benefit, and take but little risk. Do this until the organization is placed on a firm foundation. Re-insure all but small amounts to be carried by the company, and profit by the re-insurance of not less than twenty-five per cent. This amount you cannot possibly procure without organization.

As previously stated, rigid inspection must be undertaken by a qualified person whose direction must be followed to secure a reduced rate. Insurance companies hold this inspection business as a necessary incident to their success. Now they who have a hundred variety of risks to inspect, and cannot afford to employ a special expert for each character of business, they regard their inspection as superficial as compared to the inspection by a special expert in the business.

What has been done by others can be done by us, more particularly as we have the benefit of their experience. Organize, organize, and do so without further delay. No other interest so large as the street railroad would tamely submit to the arbitrary rates charged by the insurance corporations, which rate is necessitated by their method of doing business. Your committee will be repaid for their research if this report will get you to think and cause you to act on this important question.

Mr. HASBROUCK spoke of steps that had been taken in New York city, but arrangements were not yet perfected for the organization of a street railway mutual insurance company. Hoped that this paper would serve to spur up the companies and move them to action in that matter; said that the arbitrary and in his judgment entirely unreasonable rates to which they were compelled to submit should be reduced; that agents when spoken to of these rates would tartly reply, that they were the tariff, and leave you to assume, substantially, take it or leave it. Said that in their barns, those of the Broadway & Seventh Avenue roads, they were putting in automatic sprinklers at an expense of \$25,000, after which the insurance companies agreed to reduce their rates from

33 to 50 per cent. He described the sprinkler.

Mr. MAGUIRE asked as to the certainty of the operation of the automatic sprinkler.

Mr. HASBROUCK said it had been in use and was now used very successfully in several places.

Mr. PATRICK, of Pittsburgh, gave as the rate in their city $1\frac{1}{2}$ per cent, and asked as to rates elsewhere.

Mr. RICHARDSON gave as the rate in New York $1\frac{1}{2}$ per cent on brick and 2 per cent on frame buildings.

DANIEL F. LEWIS, of Brooklyn, stated that he had just effected an insurance of \$1,000,000 at 1 per cent.

Mr. HARE, of Fort Clark, said that their rate was from $1\frac{1}{2}$ per cent to 2 per cent.

Mr. PATRICK stated that he understood that the insurance was now being carried by the insurance companies at a loss, and if so questioned if the street railway companies could insure themselves cheaper. The Secretary read the portion of Mr. Maguire's report misconstrued by Mr. Patrick.

Mr. ATWELL, of Pittsburgh, stated that the only data that would be of value was the actual premium charged and loss realized on street railway property alone by the various companies.

The Secretary then read as bearing on that point, from the report of 1885, a compilation of replies received from 187 companies:—

Total value of property insured.....	\$23,599,782.58
Insured for.....	14,784,561.63
Percentage of value insured.....	nearly 63 per cent.
Amount of premiums paid.....	207,472.26
Percentage of loss to premiums paid, about	35 per cent.

Mr. JOHNSON, of Salem, stated that the low rates obtained by the mills was due largely to the fact that the best of appliances were put into them, and the street railroads could materially reduce the rate to them by following the same course; thought that the companies could not insure themselves as cheaply as the insurance companies could do it.

Mr. RICHARDS, of Boston, asked why.

Mr. JOHNSON stated that they could not for the reason it was not their business.

Mr. RICHARDS heartily agreed with the sentiment expressed in the report of the committee, especially certain parts of it. He spoke of rates as being arbitrary and high, and that there was no alternative at present but to pay them, and that any one who had not given the matter consideration would be surprised at the enormous running expenses of the insurance companies, also at the earnings of the life insurance companies, monuments of which in the form of large edifices were to be seen in all the principal cities. He thought it stood the street railways in hand to ascertain what part of these enormous expenses was wasted money; referred to the fact that four fires in their buildings during the past year had resulted in a raise of rates, and that now horses were insured, say, at \$100, and cars from \$700 to \$800 only against loss while in the barn. He believed street railway companies better do their own insurance, and wished to know

of Mr. Johnson or any other insurance man what advantage insurance companies had over the street railroad companies in this matter. He had tried in vain to find arguments based upon facts that would tend to show that the street railroads could not save 50 or even 75 per cent of the amount now paid. Spoke of the wonderful reduction effected in mill insurance; said he used automatic sprinklers in his shops, doors at the head of stairs, and various other safety devices.

WILLIAM RICHARDSON spoke of the anticipation of the American Street Railway Insurance Co., as made in New York, depending originally upon a number of unsatisfactory experiences of the Atlantic Avenue road; spoke of the narrow treatment of the Atlantic Avenue road in the case of one or two small fires; said that the companies were very willing to receive their dividends, but when a loss of \$6,000 or \$7,000 occurred treated the railways in a very exasperating manner. He thought the American Street Railway Mutual Fire Insurance Co. perhaps made a mistake at the time of the passage of the law incorporating it by trying to raise \$2,000,000 at once, and endeavoring to establish a cash capital and at the same time to insure on the mutual plan. He thought if the company had placed its capital at \$200,000 instead of \$2,000,000, it would have been permanently organized, and thought that a wise plan at the present moment was to incorporate the company with a capital of \$200,000, thus demonstrating the feasibility of the plan, and establish the confidence of street railways in it, the company not of course undertaking to carry the entire risk of its members.

Mr. WOODWORTH, of Rochester, moved that a committee of five be appointed to investigate the matter and take such steps as it deemed best and to report to this Association. Carried.

Committee appointed: C. C. Woodworth; R. Dudley Frayser; A. C. Moss; C. Densmore Wyman; V. Cronyn.

DANIEL F. LEWIS, of Brooklyn, then moved to invite Mr. Charles J. Van Depoele to address the convention on electric motors.

Mr. VAN DEPOELE proceeded to give a few facts with regard to roads now in operation and under construction by the Van Depoele Co. He gave the following list of roads now in operation; Capital City Street Railway, Montgomery, Ala., 15 miles track; 18 cars; steam power used. Dix road, Detroit, Mich., 2 miles track; 4 cars; use steam power. Windsor Electric Railway, Windsor, Ont., 2 miles; 2 cars; steam. Appleton Electric Railway, Appleton, Wis., 4½ miles; 5 cars; water power. Port Huron Electric Railway, Port Huron, Mich., 3 miles track; 4 cars; steam from gas. Scranton, Pa., 4 miles, 8 cars; steam power. Lima Street Railway, Motor & Power Co., Lima, O., 4 miles; 5 cars; steam power. Washington Street & State Asylum Electric Railway, Binghamton, N. Y., 5 miles; 5 cars; steam power. St. Catharine's Electric Railway, St. Cath-

arine's, Ont., 8 cars; 7 miles; water power. Roads being equipped: Omaha Motor Railway Co., Omaha, Neb.; 10 cars. Derby Horse Railway Co., Ansonia, Conn., 4 passenger cars; 10 freight cars; steam power. White Line Street Railway, Dayton, O., 12 cars; 10 miles track; steam power. Jamaica & Brooklyn road, Jamaica to Brooklyn, N. Y., 10 cars; 6 miles; steam. He said that the electric street railway was now ready for the market, and such defects as existed in present roads were of a mechanical and not of an electrical character. He gave the expense of running different roads: Windsor, Ont., \$2 per day per car; Detroit, \$1.33 per car per day; Appleton (water power), \$1.12½ per day per car; Port Huron, \$2 per day per car; Scranton, \$1 per day per car; Binghamton, \$1.66; Lima, O., (crude petroleum fuel), 75 cents per day. At St. Catharine's, Ont., the road owned the water power and the cost of running the road was simply attendance; said the Montgomery, Ala., road, being the largest in the United States and in fact in the world, fifteen miles long and eighteen cars, was being run at an expense of from 75 cents to 80 cents per day per car. Said that the company was ready to guarantee, where coal was not more than \$1 per ton, to run cars at an expense not exceeding \$2 per day of eighteen hours; said that the Scranton road was running as high as fifteen miles per hour; said that they were now building in Omaha seven miles track and eight cars; Dayton, O., seven miles and six cars. An overhead wire could be put up for \$1,000 per mile, and a good underground conduit could be laid for \$6,000 per mile. Said that in Dayton, O., they used conduit for part of the distance and overhead wire for part.

Mr. LEWIS asked as to the cost of maintenance of motors.

Mr. VAN DEPOELE said that it was no more expensive than the maintenance of any class of machinery; that the large parts were mostly stationary, were made of soft iron; that the depreciation would not exceed, in his judgment, two per cent per annum; said that the largest part of the wear came on the gearing; said that he saw no reason why a good motor would not last fifty or sixty years.

Mr. CLEGG asked about the combination of overhead wire and conduit.

Mr. VAN DEPOELE said that they had none running but soon would have in Dayton. Said that the apparatus for changing from the overhead wire to the conduit conductor was entirely automatic; required no attention on the part of the driver. In reply to a question he said he regarded the conduit as entirely practicable, that it afforded even better facility for insulation than an overhead wire; that they had used it in Toronto with high pressure on a model road that had been running every year for the past three or four years.

Mr. CLEGG asked as to the depth of an underground conduit.

Mr. VAN DEPOELE said 9 in. from the cars to the top of the slot, there being a

slight slope from each rail to the center of the track.

Mr. LITTELL asked as to the effect of the motor on a watch.

Mr. VAN DEPOELE said that for their protection either they should have anti-magnetic shields or the electrical apparatus should be shielded.

Mr. CLEGG asked as to the effect of horse cars running over the conduit.

Mr. VAN DEPOELE said there would be no trouble with two-horse cars but with one-horse cars of course it would be necessary to drive on one side of the conduit. In reply to a question as to dirt and snow on the conduit, Mr. Van Depoele said of course we are obliged to provide for that and severe storms; must of course keep the water out of the conduit by cement, etc.

Mr. CRONYN, of London, asked as to the steepest grade that could be made.

Mr. VAN DEPOELE said that at Appleton they were running at ten per cent and around a curve of 60 ft. radius; that their 15 H. P. motor hauled a 12 ft. car, but that such grades should not in practice be undertaken; practically he was able to surmount from six to eight per cent, using sand on curves, grades, etc., and that eight, nine and ten per cent grades could be counted.

Mr. LEWIS, of Brooklyn, asked if, under trying circumstances, heavy load and steep grade, the motors would not burn out.

Mr. VAN DEPOELE said they would not; that arrangements must be made for a maximum load.

Mr. CRONYN asked whether one or two motors would be recommended.

Mr. VAN DEPOELE preferred one motor, as it could be placed on the platform in sight of the driver and there be kept clean. They used a raw-hide pinion on a large cog gear about one to four, for counter shaft to first axle; said that on most lines one axle was sufficient; in cases where it was not, linked belt was used between the forward and rear axle; said that in ordinary cases as good work could be done with one axle as two, owing to slight differences that were apt to exist in the size of wheels on the two ends of the axle.

Mr. CHERRY, of Cincinnati, asked what would occur if the conductor was crossed.

Mr. VAN DEPOELE said that where underground wires were used, and a telephone, for instance, crossed his main conductor, it caused a pretty general shake-up at the call box of the telephone.

Mr. WOODWORTH, of Rochester, asked about noise.

Mr. VAN DEPOELE said that no noise was necessary; that on their first cars they used ordinary gearing and experienced some difficulty in this direction; that noise was usually objectionable, excepting to Mr. Harriman, who liked it to notify passengers of the coming of the car.

Mr. LEWIS, of Brooklyn, inquired as to the result of ice on overhead wires.

Mr. VAN DEPOELE said that under ordinary circumstances the connection would not be broken by ice on the wire; that he

had watched this in Scranton, where there was considerable ice on the wire, and that the trolley would make its connection and that the ice would be broken with a small flash; that they could run through ice unless the thickness be great.

Mr. CRONYN asked whether electricity and the cable could be combined, conveying power from a distance to a cable power building, and then run the cable.

Mr. VAN DEPOELE said that this was entirely practicable; that an electric man would not recommend a cable, but that in cases where power cost little or nothing it could be without difficulty transmitted to a cable station for the purpose of ascending grades too steep to be overcome by mere wheel traction.

Mr. E. G. BAGNALL, of St. Louis, asked what size of leads would be used to run 25 cars.

Mr. VAN DEPOELE. Three-eighths copper wire on each track; that the size of the lead was double nearest the power house, where most cars would be run.

Mr. BAGNALL. What current is used?

Mr. VAN DEPOELE. Ten amperes.

Mr. BAGNALL. What electro motive force?

Mr. VAN DEPOELE. Five hundred volts. In reply to a question he said a car could run with the same ease in either direction.

Mr. SMITH, of Minneapolis, asked what Mr. Van Depoele would recommend where overhead wires could not be used—conduit or storage battery?

Mr. VAN DEPOELE said that it was a question of cost to equip and run by storage batteries on the one side and the expense of a conduit and maintenance on the other; that the conduit was entirely practicable.

Mr. A. G. CLARK, of Cincinnati, asked that Mr. Ries, of Baltimore, might be allowed to read a paper.

Mr. RICHARDS, of Boston, suggested that this and such other papers as might come up be deferred until the afternoon session, which Mr. Littell agreed to.

Mr. LITTELL moved to appoint a committee to nominate officers for the ensuing meeting and to select a place for the next annual meeting.

Mr. C. A. RICHARDS then offered a motion to so amend the By-laws as to allow manufacturers and dealers in railway supplies to become associate members of the Association on payment of the regular initiation fee and annual dues, but to have no voice in the meeting except upon general consent.

On motion referred to the Executive Committee.

Mr. PATRICK, of Pittsburgh, moved that the Secretary be instructed to edit and compile all the legal decisions that had been rendered in the United States and Canada affecting street railroads, this either at the expense of the Association or at the individual expense of subscribers. He said that in nearly every session of every court one or more cases were decided that would be of interest to other roads;

that rulings and decisions were very different in similar cases.

Mr. SMITH, of Milwaukee, thought that it was hardly within the province of the Association to undertake such a work; thought that the work of preparing and editing such a work would be very great.

Mr. WYMAN thought that the work would be very cumbersome, to say the least; he spoke of the digests received being those of typical cases, and with the works in extant in addition to these were sufficient.

Mr. PATRICK thought that as hardly two judges ruled alike the numerous decisions would be very valuable as aids to the company.

Mr. SMITH thought the preparation of the work belonged to a lawyer, and that only a lawyer would be competent to do it; said that it was juries and not judges usually that gave unheard-of and unreasonable decisions, and that no amount of law books would change this; that nine out of ten cases were decided by juries and were questions of fact rather than of law. He gave an instance in which a woman sued for damages for an injury received in getting off a car, and while three of the eight passengers swore that she did not ring the bell and the other five corroborated it or gave no testimony, a verdict of \$5,000 was given on her own sole testimony.

Mr. WYMAN spoke of a work published on Nassau street, every month, giving a digest of the decisions rendered throughout the United States affecting corporate institutions; that the work cost \$5 per year.

Mr. FRAYSER spoke of the work of the Secretary in sending out decisions, etc., as being very satisfactory. Mr. Frayser stated that from being counsellor of a road he became part owner and President. (Laughter.) Said that an attorney ought to know good property when he saw it.

The Secretary stated that every opinion that had been forwarded him had been printed and sent out; that he had sent out about twelve; he urged various members to give more attention to the matter and to send every decision to him.

Mr. HASBROUCK moved to refer to the Executive Committee. Carried.

The President then announced the Committee on Nominations: Littell, Richards, Walsh, Cleminshaw, Watson, A. Everett, Winfield Smith.

Messrs. Hendry of Detroit and Clapp of Washington then each invited the Association to meet in his respective cities. Mr. Littell in behalf of Col. Lowry invited the Association to Minneapolis. Mr. Clapp gave, as some of the reasons why the Association should come to Washington, that they had a body of men meeting in that city once a year called the American Congress, in comparison with which the present body would not suffer; second, our city was once a city of distances, which distances have largely been annihilated by the street railroads, and that it is now a city of beauties; third, by meeting there the Association would be in a measure nation-

alized; Washington was the center of the earth. Mr. Hendry referred to Detroit as a central western point.

The Secretary then read, at the request of Mr. Kerper, of Cincinnati, the latter's communication to the STREET RAILWAY JOURNAL concerning the cable accident in that city. This will be found under the head of Correspondence.

Convention then adjourned.

THURSDAY AFTERNOON'S SESSION.

A telegram was read by the Secretary from Superintendent DeWitt C. Cregier, of the Chicago West Division road, as follows:—"We send congratulations and best wishes for the long life and success of the men whose skill and energy contribute to the comfort and convenience of millions of people; 'fare five cents.'"

Mr. RIES, of Baltimore, then read a paper on "Electrically Increasing Traction," which is given in substance on page 766 of the September number of the STREET RAILWAY JOURNAL.

WILLIAM RICHARDSON, of Brooklyn, referring to Mr. Ries' paper, asked where 10 or 15 per cent grades could be found.

Boston, Albany and Providence were mentioned.

Mr. CHERRY, of Cincinnati, asked whether this electrical device for increasing traction would not make it necessary to use an increased amount of power to haul the car.

Mr. RIES spoke of the advantages of using the appliance with grades between 6 and 10 per cent, especially when the track was not in good order, and also of the advantage of being able to thus reduce the weight, in the case of independent motors, 50 per cent.

Mr. CLARK, of Cincinnati, referred to the grades on the electrical road in Baltimore being 9 per cent.

Mr. RIES stated that the grades on the Baltimore road ran as high as 15 per cent.

WILLIAM RICHARDSON then moved to invite the representative of the Bentley-Knight company to address the meeting.

Mr. BLACKWELL, of that company, then came forward. He stated that that company hoped to have running within thirty or at the outside sixty days, a road on the Observatory Hill route in Allegheny City, which was guaranteed to do certain work. He also referred to the Fulton street, New York, road, now in the course of construction, a part of which they hoped to have in operation this year.

WILLIAM RICHARDSON asked the speaker to give proof that fifty cars could be run economically on five miles of track by electricity.

Mr. BLACKWELL said that in this matter he could only reason from analogy; the case was analogous to electric lighting, and that judging from this there would be no difficulty. It was simply a question of drawing from 3 to 10 to 15 H. P. from a given point of the conductor, instead of in the case of running three-fourths of one H. P., or less. In reply to a question he stated that they guaranteed to deliver 50 per cent of the power of the engine to the car; that is, a 50 H. P. engine would de-

liver 25 per cent H. P. to the car. Mr. Blackwell also spoke of the road now running on their system in Woonsocket. He gave as the grades of the Allegheny City road (Observatory Hill) 5 to 9½ per cent, in the four miles of road which they hoped to have running within thirty or sixty days. In reply to a question, he stated that while the hill horse was unromantic, it was better to use one than to equip the whole road with sufficient power to mount a single slight grade. He stated that the matter of furnishing electrical appliances was largely a question of patents, which would in time be tested. He spoke very decidedly against the storage battery; said that any one could run an overhead wire road; that their specialty was heavy city traffic with the conduit system; said that a good conduit could not be constructed for less than from \$20,000 to \$25,000 per mile; that they believed in all cases in having a whole metal connection; that overhead wire could be put up for \$1,500 to \$2,500 per mile, but in cases like the Fulton street road the conduit would cost from \$25,000 to \$30,000, on account of encountering manholes, etc.; that a conduit costing less than that was not worth laying down. Referring again to the storage battery, he said that, with all that had been said on the subject, not one was in operation in the world, unless prompted by other motives than its commercial advantages—either an exhibition affair or something of that sort.

Mr. MANSFIELD, of the Thomson-Houston Co., referring to a question as to whether the Woonsocket road was running, stated that he had been there, and that it was running to the satisfaction of its proprietors.

The Committee on Nominations then reported, as nominees for officers for the ensuing year, the following:—

Charles B. Holmes, Chicago, President; Julius E. Rugg, Boston, First Vice President; R. Dudley Frayser, Memphis, Second Vice President; Charles B. Clegg, Dayton, O., Third Vice President; William J. Richardson, Brooklyn, N. Y., Secretary and Treasurer; Thomas W. Ackley, Philadelphia, Winfield Smith, Milwaukee, Daniel F. Lewis, Brooklyn, Charles Green, St. Louis, E. J. Moshér, Augusta, Me., Executive Committee.

They recommended, as the place for holding the next meeting, Washington, D. C.

Mr. GREEN, of St. Louis, speaking to a motion to adopt the report of the nominating committee, objected strongly to always voting aye on all questions before the meeting; spoke at some length on the lack of independence that seems to prevail. His remarks, and a reference by him to the fact that the motion to appoint the nominating committee was not regularly put, caused some little confusion.

Mr. CLEMINSHAW, of Troy, referring to Mr. Green's insinuation that the nominating committee fixed the whole matter, spoke in defense of the nominating committee.

Mr. A. G. Clark, of Cincinnati, was nominated by Mr. Green, but withdrew his

name. Some discussion then ensued, which not being of general interest we omit. The election was finally proceeded with, Messrs. Clark and Green being appointed tellers, and the ticket as proposed was declared unanimously elected.

Mr. HURT, of Washington, moved to increase the salary of the Secretary to \$1,500. Carried without debate.

Mr. GREEN then proposed a vote of thanks to the President and Secretary for the able manner in which they had discharged their duties. Question put by William Richardson. Carried.

On motion of Mr. Woodworth, a committee of two was appointed to escort the First Vice President to the chair, Mr. Holmes, the President elect, being absent. Messrs. Woodworth and Green were appointed such committee.

The Convention adjourned to meet in Washington the third Wednesday in October next.

The Banquet.

On Thursday evening, the 20th ult., the Board of Presidents of the Philadelphia passenger railways gave a banquet to the American Street Railway Association at the Union League, at which about two hundred people were present.

The bill of fare was as follows:—

Blue Points.	Château Sauterne.
Green Turtle à la Royal.	A. A. Amontillado.
Bolted Salmon, Oyster Crab Sauce.	
Parisienne Potatoes.	Cucumbers.
Liebfraumilch.	
RELEVÉS.	
Filet of Beef and Fresh Truffles.	
Green Peppers Farcie.	String Beans.
Pommery Sec.	
Roman Punch.	
ENTREES.	
Terrapin.	Saratoga Chips.
Veuve Cliquot.	
ROTI.	
Teal Duck and Currant Jelly.	Chambertin.
Celery Salad.	
Roquefort.	Brie.
Cream.	
Tomatoes, Mayonnaise.	
ENTREMETS.	
Ice Cream à la Pompadour.	
Assorted Fruit.	Roasted Almonds.
Coffee.	Cognac.
Cigars.	Chartreuse.

About 9.30 the President of the Local Presidents' Association, Mr. Thomas Ackley, called to order, and announced the following

TOASTS:

"Our Guests." May their shadows never grow less. A cordial welcome to them all to the City of Brotherly Love. Responded to by Charles F. Warwick, City Solicitor.

"The People's Servant—The Street Railway Manager." "I serve," the kingly motto, is his by right, because of his hard work in the service of the public. Responded to by George W. Bates, of Wilmington, Del.

"Our Faithful Employees." Men who possess opinions and a will; men of honor; men who will not steal. In our dealings with them may we ever keep before us the motto, "Put yourself in his place." Responded to by William J. Richardson, of Brooklyn.

"The Press." The pen is mightier than the sword. The mightiest moral factor influencing the nation's destiny. It is of vital importance that the pen be in the hands of an honest man. Responded to by Col. A. J. McClure.

"The American Street Railway Association." May the bonds of friendship here formed never be broken. Responded to by Col. A. L. Snowden.

"Our Legal Advisers." "The man who has himself for a lawyer has a fool for a client. Street railroad litigation is a rare field for a lawyer with brains." Responded to by John L. Lawson, of Philadelphia.

"Our Patrons." Responded to by Daniel Dougherty, of Philadelphia.

"Our Homes." Responded to by C. A. Richards, of Boston.

"Our Absent Friends." Responded to by William V. McKean, of Philadelphia.

Ohio State Tramway Association.

At the sixth annual meeting of the Ohio State Tramway Association, to be held in Springfield, Wednesday, Nov. 16, the following papers are expected to be read:—

1. Purchasing and Disposition of Horses, including their Relative Value with Mules. —John Harris, Cincinnati.

2. Detection and Punishment of Dishonest Employees.—J. B. Hanna, Cleveland.

3. Present and Needed Legislation for Street Railroads in Ohio.—A. A. Thomas, Dayton.

4. Rules, Discipline, Uniforms, etc.—A. D. Rodgers, Columbus.

5. Eccentricities of the Members of the O. S. T. A.—George B. Kerper, Cincinnati.

New Publications.

CAR TRACK FRICTION APPLIANCE Co., Boston. Sand-box circular.

J. G. BRILL Co., Philadelphia. Catalogue of seventy-three pages describing and illustrating street cars.

CHADBOURNE & HASTINGS, agents for the Sprague Electric Co., Philadelphia. Pamphlet concerning the Sprague electric system.

JOHN N. REYNOLDS, New York. National Car Builders' Supplement, being a conveniently arranged book—practically a collection of circulars of manufacturers of and dealers in railway appliances. Also contains a directory of street railways, and is the oldest publication of the kind in this country.

If you want to buy or sell street railway property, use our Special Notice column.

As we go to press we learn that an important decision has been rendered in the case pending between the Railway Register Manufacturing Co. and the Third Avenue Railroad Co., practically the Lewis & Fowler Manufacturing Co., in favor of the latter.

The Ries "Combination" Conduit for Electric Street Railways.

We illustrate a new electric railway conduit* which is especially adapted to the requirements of electric street railways in large cities.

This conduit embodies a number of novel features, and bears evidence of having received careful mechanical treatment in its design and construction. One of the peculiarities of this form of conduit is the provision made for carrying and distributing electric wires, cables and other con-

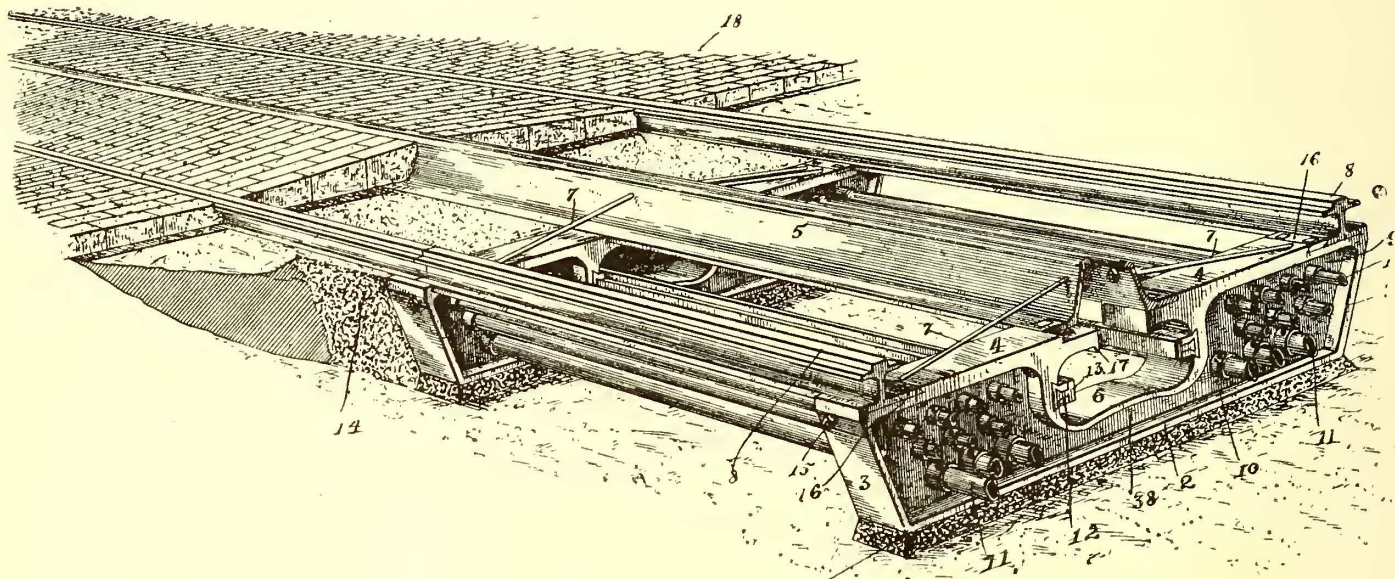
ductors to the cables and grips) that the conduit may be utilized simultaneously by both systems. This construction is of importance where an electric railway is required to turn into a street already occupied by a cable conduit.

Referring to Fig. 1, it will be seen that the supporting brackets are placed in a shallow trench at intervals of 4 ft. apart, and rest upon cross-ties of concrete in order to insure a solid foundation. These brackets have a flanged central spring, 6, forming the conduit channel, and on their upper surface are recessed for the reception

vided with undercut recesses that serve to hold insulators 12, which are secured in place as the construction of the conduit progresses. Within these insulators the supply conductors 13 are afterwards inserted, these conductors being perfectly free to expand and contract by reason of the "slip-joint" support thus formed, while at the same time sufficiently rigid to bear the pressure of the current collecting wheels that travel in a horizontal position between the two conductors.

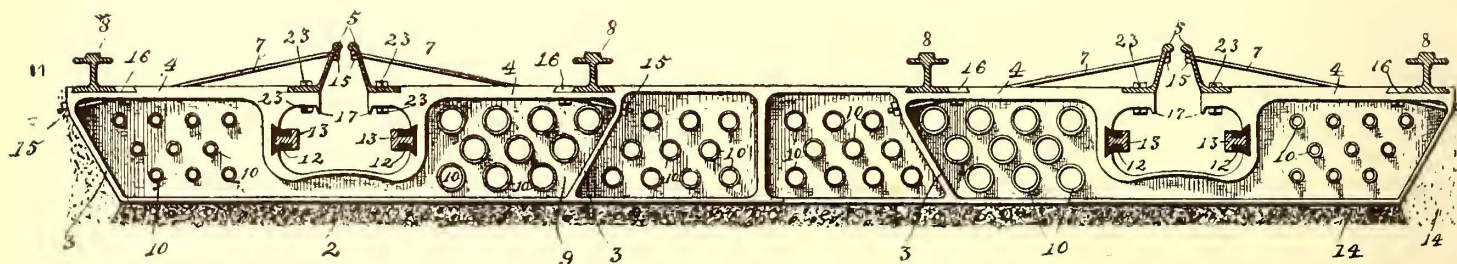
The conduit channel is provided with drainage outlets at proper intervals, and

Fig. 1.



PERSPECTIVE VIEW OF THE RIES CABLE CONDUIT.

Fig. 2.



BRACKET FOR A DOUBLE TRACK RAILWAY.

ductors, the space at both sides of the conduit proper being utilized for this purpose.

Fig. 1 is a perspective view of the conduit, partially exposed to show the construction and arrangement. Fig. 2 is a form of bracket for a double track railway, cast in a single piece, and having flanged openings for the reception of wire ducts, pneumatic tubes, etc. This view also shows the conduit channel with its contained supply conductors, and the arrangement of the track and slot rails. Fig. 3 shows an ordinary cable-railway conduit, provided with electric railway conductors, arranged in such a manner (with respect

of the track and slot rails, respectively, as shown. The track rails are preferably of the girder type, and are self supporting between the brackets, and they are removably secured in place by locking plate 16, so as to permit of renewal without disturbing the conduit structure. The width of the conduit slot, which in this system is one-half of an inch, is regulable by means of the adjustable tie bolts 7, in the usual manner. The construction is such, however, that no perceptible variation in the width of the slot, or in its distance from the rails, is possible, the entire conduit being as firmly and solidly united as if it were one single piece.

The walls of the conduit opening are provided with undercut recesses that serve to hold insulators 12, which are secured in place as the construction of the conduit progresses. Within these insulators the supply conductors 13 are afterwards inserted, these conductors being perfectly free to expand and contract by reason of the "slip-joint" support thus formed, while at the same time sufficiently rigid to bear the pressure of the current collecting wheels that travel in a horizontal position between the two conductors.

It will be noticed that the conduit brackets are formed with a series of flanged openings 10, at both sides of the conduit channel. These openings serve as a support for paper tubes or ducts, that are prepared in a special manner and impregnated with asphaltum to render them moisture and gas proof. These tubes extend from the center of one bracket to the center of the next, so as to form practically continuous tubes, and are hermetically sealed with liquid asphalt poured around a joint of special construction formed upon their

*Elias E. Ries, Baltimore, Md.

The walls of the conduit opening are provided with undercut recesses that serve to hold insulators 12, which are secured in place as the construction of the conduit progresses.

ends. When the tubes between two or more brackets are in place, the space between the brackets and around the conduit channel is filled with a suitable cement or concrete, which securely embeds and protects the tubes and serves as a support for the paving blocks.

At intervals of one or two blocks, man-holes are provided for gaining access to the ducts or tubes, and for making connection between the conductors or wires carried in the main conduit and those of branch or distributing conduits at street intersections.

The interior of the paper ducts is perfectly smooth, and the additional expense for providing and laying them is comparatively slight, a fact that especially commends them to localities where the burying of overhead wires is receiving consideration.

The depth of conduit channel necessary is but 6 in., and the entire depth of conduit shown in Fig. 1 and 2, measured from the street surface, does not exceed 18 in. It

are geared to the car axle by raw-hide gears, made by Pratt & Whitney. The motors are beautifully boxed and are dust and water tight, with ventilating apertures covered with dust screens. The top of the motor is provided with a magnetic shield of soft iron, which prevents any lines of magnetic force entering the car to affect the watches of the passengers.

The commutator opens on one side of the car, to admit of oiling and changing brushes. There are no resistance coils needed where a constant current is used, and the current is allowed to pass through the motor at all times. The stopping, starting, reversing and speeding is all accomplished by rocking the brushes around the commutator. These motions can be controlled from either end of the car by means of a simple lever handle placed on top of an ordinary brake staff, which is fastened outside of the dash board of the car. The ordinary brakes of the street car are still retained in service, although seldom used, as the car can be easily handled by means of the motor.

These motors have been constructed by the Brush Electric Co., of Cleveland, O., with special care and reference to the street car service, and return 80 per cent of the horse power used, at the driving wheels of the car. They do not heat or spark at the commutator, but pull their heavy cars, which are 27 ft. long and carry 120 passengers, with still another coach attached, up the steep grades with perfect ease.

The propulsion of street cars by electricity, by the Series or constant current system, it is claimed, is both practical and economical. In operating electric motors by means of a constant current, small quantity is necessary and the entire current passes through each motor in succession, just as the current passes from a dynamo through a large number of arc lights and the many miles of wire, or as the current from a battery passes through any number of telegraph instruments and hundreds of miles of wire.

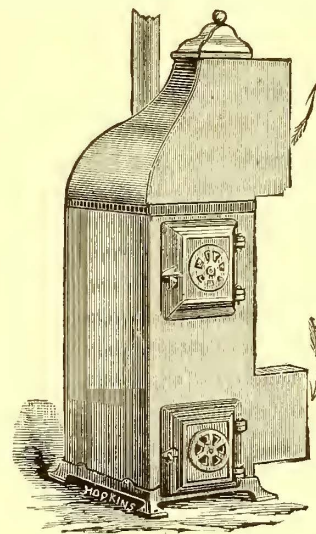
This method of transmitting power by electricity has met with success in every instance, and the proprietors claim that it is to this that street railway men must look for the solution of the electrical railway problem; that with the Series system of transmitting power by electricity as high as from 65 to 80 per cent of the power of the steam engine can be delivered or regained at the driving wheels of the cars. The more cars used upon such a system the more economically can the road be operated, and it meets the demand for a method by which few or many cars can be used as the traffic of the road varies.

This system can be applied to existing lines operating any number of cars, where

rapid transit is required and heavy traffic met, and the line can be equipped with overhead wires at a very slight cost per mile; or the system can be applied as a conduit system, where the overhead wires are not allowed. It is simple in all its details, and promises to meet perfectly all the demands for street locomotion.

The Root Car Heater.

This heater*, shown in the cut, stands on the front of the car and discharges its smoke and products of combustion through a 3 in. vertical pipe that passes up through the roof. It consists of an air-tight fire-pot, surrounded by an air space through which the air of the car circulates, cold air entering at the bottom, and hot air passing out at the top. The hot and cold air registers are indicated by arrows. The heater occupies a floor space only 14 in. long and 10½ in. wide, and, as it is placed on the platform, it does not lessen either



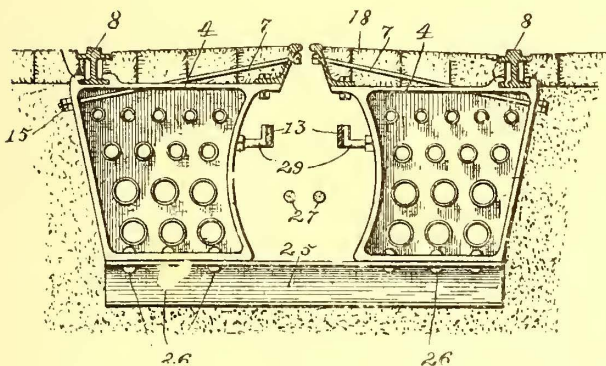
the sitting or standing capacity of the car.

*Toledo Car Heater Co., Water and Cherry sts., Toledo, O.

A Car Horse's Soliloquy.

By night and day
I go my way,
Patiently bearing my lot;
With iron shod feet,
Pacing the street,
Swinging the same old trot.
Harnessed for life,
My path of strife
Is narrow and long and straight;
Through Broadway's throng
I amble along
Swinging the same old gait.
I am not proud,
Although a crowd
I generally manage to draw;
The red-headed girl,
The country churl,
And the learned man of law.
The English peer,
The bank cashier,
And the man who broke the bank;
The political chief,
The uncaught thief,
The messenger boy and the crank.
Compare my fate,
With this human freight,
Steeped in humanity's ills:
I'm a horse, it is true,
But I've nothing to do
With politics, whiskey or bills.

Fig. 3



ORDINARY CABLE RAILWAY CONDUIT.

will be apparent that the wire ducts are not essential to the conduit, but may be omitted in localities where they are not required.

This system provides for the operation of both electric and cable railways from the same conduit, as also the conversion of a cable into an electric railway.

S. H. Short's Electric Road at Columbus, O.

The new Short-Nesmith system* of Overhead Series Electrical Railway was for the first time put into operation a few days since on one of the lines of the Columbus Consolidated Street Railway Co., at Columbus, O., and was operated with signal success. On this line there are four ½ in. copper wires, supported above the tracks upon cables which cross the street and are attached to poles at each end. Each pair of wires is 7 in. apart and so supported that four-wheeled trolleys may run along upon them. Each trolley has wires passing down to the roof of the car, by which the current is conveyed to the motor placed beneath the floor of the car. The motors

*U. S. Electric Co., Denver, Col.

STREET RAILWAY NEWS.

Alameda, Cal.

ALAMEDA, OAKLAND & PIEDMONT R. R. Co. Theodore Meetz and associates, who are interested in this road, have a franchise for a street railway on Park street, but ultimately they are likely to consolidate with the above road. The proposed road will have about two miles of track, probably of 3 ft. gauge, part 20 and part 35 lb. rail, 3 or 4 cars for the present, more later, animal traction for the present, perhaps electricity later. The new company has a capital stock of \$100,000. Work will be commenced within six months and completed within a year.

Albany, N. Y.

ALBANY RY.'s annual report shows receipts of \$158,761.26, and expenses of \$131,821.43, including conductors and drivers, \$38,207.32; removal of snow and ice, \$5,052.20. The dividend was \$14,220.

Allegheny, Pa.

OBSERVATORY HILL PASS. RY. Co. expect to complete their new Bentley-Knight electric railway within a month.

Americus, Ga.

A PERMIT to build a street railroad is asked for by Montgomery parties.

Anniston, Ala.

A DUMMY ROAD is to be built by C. H. Canfield and associates.

ANOTHER DUMMY ROAD will be built by C. H. Williams and associates.

Ansonia, Conn.

DERBY HORSE RY. Co. will have their Van Depoele electric street railway in operation by Nov. 1.

Appleton, Wis.

APPLETON ELECTRIC ST. RY. Co. report continued success. The current is generated by water power, and supplied through a traveling carriage running on an overhead conductor. It is now proposed, at some increase of expense, to dispense with the latter.

Asheville, N. C.

ASHEVILLE ST. RY. Co. will extend their line.

Atlanta, Ga.

AN ELECTRIC RAILWAY is projected here. ATLANTA & WEST END ST. R. R. Co. The bill to allow this company to extend its line has become a law.

ATLANTA CITY & SUBURBAN ST. RY. Co. has been incorporated by L. J. Hill, F. M. Coker, P. Calhoun, W. M. Pendleton and others, with a capital stock of \$25,000. They will run a dummy line along the north side of the Georgia Railroad through Elgewood and Kirkwood to Decatur, six miles distant, thence through Decatur to a fine mineral spring one mile south of Decatur, and from there back to Atlanta on the south side of the Georgia Railroad, forming a U.

Attleboro, Mass.

AN ELECTRIC RAILWAY is contemplated, to run from the railroad station through North Attleboro to Plainville, a distance of about six miles. The Sprague system will probably be adopted.

Auburn, Ala.

A DUMMY RAILROAD is projected here.

Baltimore, Md.

BALTIMORE CITY PASS. RY. Co. will double track their Hall Springs line from Fayette and Aisquith streets to Boundary avenue.

BALTIMORE UNION PASS. RY. Co. has been authorized to change its location on Dolphin and Townsend streets, giving them a straight run on more level ground.

Battle Creek, Mich.

BATTLE CREEK ST. RY. Co. has 6 miles of track, 10 cars and 20 horses. J. W. Fletcher is now Vice President, Lucius Clark Secretary, and P. P. Judson Superintendent.

Bay City, Mich.

WEST BAY CITY ST. RY. Co. has been organized, with a capital stock of \$30,000, of which \$10,000 is paid in. S. O. Fisher is President, and Dr. W. E. Magill Secretary and Treasurer. A franchise has been granted, and work will begin at once on the city line; and next year the road will be laid to Salzburg. Electricity will probably be used.

Bessemer, Ala.

ANOTHER STREET RAILWAY is projected here.

BESSEMER DUMMY LINE Co. will connect Birmingham, Bessemer and the suburbs; is now building, and will be opened about Dec. 1. Capital stock, \$250,000. President, W. P. Pinchard; Secretary and Treasurer, Morris Adler; Superintendent, B. B. Gordon. Will have 3 motors at first, and two trains of 2 coaches each. Will have 14 miles of track, with 40 lb. steel rail.

Binghanton, N. Y.

WEST SIDE ST. RY. has been incorporated by James E. Shafley and others, with a capital stock of \$25,000.

COURT ST. & EAST END R. R. Co. are now building and will open their road about Dec. 1. They will have 2½ miles of track, of 4 ft. 8½ in. gauge, with 45 lb. flat and 35 lb. T rail, 4 cars, 10 to 15 horses.

Birmingham, Ala.

WALKER LAND Co. will soon build their dummy line, previously reported.

BIRMINGHAM & MILNER SPRINGS ST. RY. has increased their capital stock \$50,000.

BIRMINGHAM UNION RY. Co. are building a new blacksmith shop.

Bloomington, Ill.

BLOOMINGTON & NORMAL HORSE RY. Co. increases to 5 miles of track, 37 and 45 lb. rail, 19 cars and 90 mules. The officers are: President, J. J. Patterson; Secretary and Treasurer, W. W. Irvine; Superintendent, John W. Law.

Blount Springs, Ala.

BLOUNT SPRINGS Co. will build a dummy railroad.

Blountsville, Ala.

BLOUNTSSVILLE LAND Co. has been chartered, to build a dummy line to Bangor, 12½ miles, valley all the way. Capital, \$100,000. Dr. F. N. Hudson is President, A. D. Howell Secretary, and Green J. McCoy Treasurer.

Boston, Mass.

WEST END ST. RY. Co. The latest programme is for this company to take possession of all the Boston street railroads Nov.

1. The electric car built for this company by the John Stephenson Co. made its first trial trip Oct. 8. The car was run at various speeds over the tracks of the Cambridge Railroad, a distance of about eight miles. The Sprague motor and Julien storage batteries, together with all the apparatus constituting the electrical equipment of the car, worked smoothly and satisfactorily, and the car was stopped and started on the curves and grades along the route without difficulty. During the trial trips in New York the car ran at the rate of 14 miles an hour with ease, and is capable of running 40 miles with its force of batteries. In exterior appearance it differs from an ordinary street car only in its higher elevation from the street. It weighs about 5,000 lbs. A second car, to be constructed, will have improvements on the first car. The Cambridge Railroad Co. has received permission from the Boston Aldermen to run electric cars in the city, provided storage batteries are used; and the Newton Aldermen have given them permission to run within the limits of that city. The West End Land Co., of which the street railway is an adjunct, owns half the frontage on Beacon street from the Back Bay Park to Chestnut Hill Reservoir, including what will be the finest residence section of the city in the near future. The land company is now widening the street to 160 ft., a work that will take two years. Over 100,000 cubic yards of the whole 160,000 cubic yards of earth to be moved, have already been excavated and filled. About 200 men and 65 horses are employed on the grading work, the Boston & Albany Railroad doing considerable of the filling by gravel trains. This avenue, when completed, will compare favorably with any of the great boulevards of the world, such as the Berlin Unter den Linden, the Ringstrasse, of Vienna, or the Avenue of the Bois de Boulogne, of Paris. The street railway tracks will occupy the middle portion for a space 20 ft. wide. On each side of this is a strip of turf, 5 ft. wide, in which are planted rows of trees. On the left of this, looking from the Boston end, there appears successively a 20 ft. bridle way, a 50 ft. drive way, another similar turf strip with row of trees, and 10 ft. walk. On the right of the space reserved for the railway tracks is a turf strip, a 30 ft. driveway, turf strip with row of trees, and a 10 ft. walk. Earnings of the Cambridge and Charles River roads show a marked increase since their consolidation.

SUBURBAN ST. RY. Co. The hearing before the Railroad Commissioners for authority to increase the capital of this company from \$50,000 to \$150,000 developed no opposition. It was stated in behalf of the company that the increase was for the purpose of constructing and equipping about five miles of road, single track, in locations already granted in Boston and Brookline, to be connected and to be operated in conjunction with the West End Street Railway. The tracks would be laid in the same manner and with the same

rail as those of the latter road, and the estimated cost would be the same, \$20,000 per mile. For equipment \$10,000 per mile would be needed, making \$150,000 necessary for the five miles, \$50,000 of which had been paid in.

GLANDERS. Dr. Winchester, the Cattle Commissioner's veterinary, says that 22 of the alleged infected Cambridge Railroad horses have the glanders of the latent form. The others have been released from the stable. Drs. Lyman, Harrison and Bryden, three of the State's best horse doctors, say the disease does not exist among the animals.

Brenham, Tex.

BRENIAM ST. R. R. Co. will build new car sheds and stables.

Brooklyn, N. Y.

BROOKLYN CITY R. R. Co. has obtained the consent of two-thirds of the property owners on Fulton and Flatbush avenues to a change of motive power. They will now wait and see if the receipts fall off materially when the Kings County Elevated Railroad is in running order, before proceeding any further. The annual report shows gross earnings \$2,431,849.31; operating expenses, \$1,881,189.11. An increase in capital stock from \$2,000,000 to \$3,200,000 is reported as having been made Aug. 1. They carried 50,700,000 passengers during the year, against 47,400,000.

CROSTOWN R. R. Co. has secured the right of way for most of its line from Manhattan avenue to the Bridge.

CONEY ISLAND & BROOKLYN R. R. Co., it is stated, will reconstruct its roadbed before next season, and substitute electricity for horse power.

ATLANTIC AVE. R. R. Co. The courts have decided in favor of the Union Elevated Railroad in the injunction cases, and the work of construction is going forward steadily.

Buffalo, N. Y.

ELECTRIC RAILWAY. The movement in favor of an electric road along Elmwood avenue is growing, and the investigations made into the subject of electric roads in other parts of the country go to confirm the intentions of the projectors.

QUEEN CITY ST. RY Co., whose organization we recently reported, has some idea of building a complete new system of street railroads, and adopting cable or electric traction.

Burlington, Ia.

UNION ST. RY. Co. increases since its last report from 8½ to 10 miles of track, from 20 cars to 25, and from 80 horses to 90.

Butte, Mont. T.

BUTTE ST. R. R. Co. The City Council rejected this company's application for the privilege of running a noiseless motor for a year. Horse power is thought to be out of the question in this city, on account of the steep grades. The company proposed to lay their track out to Burlington and Meaderville and to spend \$8,000 for two motors. Should the Council refuse to reconsider its action, the company will at once order mules in St. Louis, and use

that form of power for the present between Butte and South Butte, which is all they can operate by this means. Under the peculiar topographical conditions of their town, they are not ready to venture yet upon the adoption of an electric or cable system, though the former has a fair chance of being the ultimate method. Two miles of the company's road are now completed, and they are pushing construction on the remainder. They will have 15 cars, 3 motors, 30 horses, 30 lb. rail, and 10 miles of track.

Carbondale, Pa.

CARBONDALE & JERMYN ELECTRIC ST. RY. Work has begun on this new road, and it is expected that it will be opened about Dec. 1. They will have 5 miles of track, of standard gauge, with 25 lb. T and 27 lb. flat rail, 6 cars, Sprague motors. J. W. Aitken is President, M. Moses Vice President, and J. E. Burr Secretary and Treasurer. Capital stock, \$50,000. The company has contracted with Chadbourne & Hastings, of Philadelphia, agents for the Sprague Electric Railway & Motor Co., to equip the road with the overhead system.

Charleston, S. C.

KING ST. & CROSTOWN RY. Co., a new company, will soon begin work on their road. F. L. M. Hugh is interested.

THE KING STREET EXTENSION of the street car system will have double tracks, and will run to the Battery.

Chattanooga, Tenn.

CHATTANOOGA ST. R. R. Co. are making considerable extensions.

CREST RAILWAY Co. is completed and in operation. They have a road along the celebrated Mission ridge, with the option of using electric motors. D. C. McMillin, J. P. McMillin, R. W. Price, C. J. Dunlap and W. H. Converse are interested.

CHATTANOOGA ELECTRIC ST. R. R. Co. has been incorporated.

CHATTANOOGA & SUBURBAN ST. RY. Co. has been incorporated by J. D. Lindsay and others.

Chicago, Ill.

NORTH CHICAGO CITY R. R. Co. If the Van Depoele line in Lake View from Diversy street north 6 miles proves a success, it is believed that President Yerkes will adopt the system on other lines. The Van Depoele company agrees to go underground in a year.

CHICAGO CITY RY. Co. The Western Electric Co. has closed a contract for a 20-light arc plant for this company's new power station at Fifty-fifth street and Cottage Grove avenue. In addition to the arc lights, several individual Little-McDonald cut-outs with incandescent lamps will be placed. The company are hauling material to continue the Archer avenue line from its present terminus on Western avenue along Archer avenue to Thirty-eighth street, to Kedzie avenue, a distance of one mile into the town of Cicero.

OUR CHICAGO LETTER.

The North Chicago City Railway Co. hope to have their new cable line in operation Dec. 1. Track through the tunnel is

laid, and the concrete nearly finished. Matters are considerably delayed, I am told, on account of the slowness with which the City Council sees fit to grant a franchise along Washington instead of Randolph street, as originally intended. H. A. Stevens takes the place of Mr. Wilson as Engineer. Mr. Wilson has gone to Pittsburgh.

The Chicago City Railway Co. deserve great credit for the dispatch with which they have pushed the construction of their new cable lines this season. These lines will soon be in operation, about which I shall probably have more to say in my next. This company are now building 100 new cars. These will be equipped with the latest improved, and I may say best, Vose Graduated Spring. Mr. Williams, the representative of the Vose spring, tells me that he is pushed with orders, and that this spring is not only becoming universally popular, but bids fair to become the only spring for street railways. In addition to equipping those of the City Railway Co., the Pullman people are equipping a large number of their new trucks for cable roads with this spring and the Bemis box.

The Pullman people are very busy with street car construction, now having under way 30 of their combination cars. They have just delivered 10 cars to the Metropolitan road, Kansas City, also 15 for the St. Paul City Railway. The cars now under construction for the Jamaica & Brooklyn electric road are nearly completed, and are guaranteed to be as fine street railway cars as have ever been built. The Van Depoele Co. have the road nearly ready for the cars. These cars will be equipped with Cline's heater and use Cline's patent aromatic carbonic composition fuel.

The Van Depoele Co. have the 150 H. P. electric generator and electric motor completed for the Omaha Motor Railway Co., of Omaha. The cars, which are being built by the Pullman Co., are well under way. The railway company have been greatly delayed on account of not receiving their rail in time. I noticed a large electric motor in their shop which has been constructed for the Derby Horse Railway Co., of Ansonia and Derby, Conn. It is waiting to be put on the electric locomotive now being built at the Pullman Car Works. It is claimed by the Van Depoele people that this is the largest electric motor that has ever been built in this country, if not in the world. The cars, which are composed of both passenger and freight, have been built by the Brill Co. of Philadelphia. The railroad company intend not only to carry passengers between Birmingham and Derby and Ansonia, but also to carry all the freight from the Naugatuck Steamboat Co.'s docks at Derby, and to distribute it by branch tracks to all the manufacturing works of Ansonia, including the Electrical Supply Co., the Ansonia Brass and Copper Co. and others. The grade is quite heavy, being as high as 7 per cent in some places. The Van Depoele people think the adoption of their system by the oldest electrical manufac

turing concerns in the United States, after a careful investigation of all their roads, is quite a card for them. The St. Paul & Minneapolis Rapid Transit Railway Co. will probably build an elevated road between St. Paul and Minneapolis, equipping it with motors of their manufacture. This road will probably not be commenced before spring. The White Line road, at Dayton, O., has commenced to lay track, and has given orders to the Van Depoele Co. to go ahead with the electrical part as fast as possible.

The Empire Warehouse Co. report the outlook very promising for the coming year. Mr. J. W. Dickinson, the Secretary, has just returned from an extended trip through the West to Topeka, Lincoln, Omaha, etc.

We recently received a call from Mr. William M. Hewitt, one of the pioneers of the West in contracting and building street railways, and who is now located at Muscatine, Ia. He has just completed 6 miles of standard gauge electric motor road at Omaha, also 2½ miles narrow gauge horse railroad at Superior, Wis., and 1½ miles at St. Cloud, Minn. Mr. Hewitt has had some eighteen years' experience in work of this kind, and announces himself in readiness to make contracts for the coming season for horse, motor or electric railroads and equipment of same. P.

Cincinnati, O.

VINE ST. RY. CO. The power plant will have a chimney 130 ft. high, with 400 H. P. Lane & Bodley engines.

CINCINNATI ST. RY. CO. has begun running cars on its Fairmount and Cumminsville extensions.

Chillicothe, Ill.

CHILLICOTHE ST. RY. CO. will probably not begin work on their line till spring, but anticipate completing it in a short time, when they do start, as there are no steep grades and track laying will be easy, since they have no street pavements at present. They have a capital stock of \$40,000, and the officers are: President, L. S. Hoyt; Secretary and Treasurer, R. H. Truitt. They will have 1½ miles of track, probably of 4 ft. 8½ in. gauge and probably laid with light flat rail. Will use animal traction.

Cleveland, O.

ST. CLAIR ST. RY. CO. Charles Hathaway, Jr., is Treasurer and General Manager of this company.

BOWLER & Co. have erected a new foundry to be devoted wholly to the production of car wheels, having a capacity of 350 per day. It is 140×200 ft. in size, located on the N. Y., P & O. R. R., with a large platform on the level of the car, also on the level of the charging doors of the cupola. It is fitted with traveling carriages and trains run by steam, and every modern appliance for economy.

Clifton, Ala.

DUMMY LINE. The cars have commenced running on this line. Clifton is near Birmingham.

Clinton, Mo.

AN ELECTRIC RAILWAY is contemplated,

Columbus, O.

ELECTRIC RAILWAY. It is expected that, when the road is completed, the cars will be run at the rate of about ten miles an hour.

Crawfordsville, Ind.

BIDS WANTED. W. H. Webster, City Clerk, writes that the privilege of the streets will be granted to the party or company making the most advantageous bid, using either horse, electric or cable traction.

Cropwell, Ala.

NEW ROAD. E. P. Chandler and G. W. Sides will build a tram road from Cropwell to Jug Town.

Dallas, Tex.

DALLAS ELECTRIC RAILWAY & LIGHT CO. has been organized, with an authorized capital of \$20,000, of which \$10,000 is paid in. Besides building and operating the ¼ mile Daft road inside the exposition grounds, of which we spoke last month, the company will be prepared to build other electric railways.

DALLAS & OAK CLIFF RY. CO. will perhaps build another road, to connect with their Oak Cliff line, but their plans for this connection are not yet in shape. They expected to open their main line Oct. 20. This is an elevated railway to the new suburb of Oak Cliff. The officers are as we gave them in our last report of this company, except that W. J. Storms is now Secretary.

Danbury, Conn.

DANBURY & BETHEL ST. RY. CO. has chosen the following new Board of Officers: President, Gen. D. D. Wylie; Vice President, S. C. Holley; Secretary and Treasurer, J. B. McGeorge; Superintendent, William Foster. They have increased in the past two months from 4½ to 5 miles of track, from 6 cars to 12, and from 25 horses to 85.

Danville, Va.

DANVILLE ST. CAR CO., who opened their road Aug. 15, have now 1.6 miles of track, laid to 4 ft. 8½ in. gauge, with 38 lb. rail, and are running 7 cars, with 30 mules. The company has a capital stock of \$30,000, and the officers are: President, T. B. Fitzgerald; Secretary and Treasurer, P. R. Jones; Superintendent, N. W. Bulkley.

Davenport, Ia.

WEST SECOND ST. RY. CO. has been incorporated, with a capital stock of \$15,000.

Dayton, O.

WHITE LINE ST. R. R. CO. is now laying track, and the road will be opened by Dec. 15. It will have 13 Van Depoele motors, of 15 H. P. each, 19 cars, 4 1-6 miles of track, with 38 lb. Johnston rail.

Dayton, Tenn.

A COMPANY has been chartered here by W. G. Allen and others to build a street railway.

Deaver, Col.

THE ELECTRIC RAILROAD to the Colfax avenue suburb is not running at present. Repairs are in progress, however, which it is expected will obviate the difficulties formerly experienced.

NEW CABLE ROAD. George W. Bowman

will begin work on a system of cable roads at an early date. The company, which is called the Denver & Boulevards Cable Railway Co., has acquired the franchise secured by California parties and the franchise for the cable line on the Boulevard. E. W. Lowrey, W. A. H. Loveland and others are associated with Mr. Bowman.

Detroit, Mich.

EAST DETROIT & GROSSE POINTE RY. CO. The cars for this new electric road have been completed by the Pullman Palace Car Co., and the road is about ready to begin operations. They will have 10 miles of track and 10 cars.

HIGHLAND PARK RY. CO. On a recent trip, with 50 members of the Board of Trade as passengers, the car "Faraday," which has been in regular service on this electric road for some time, traveled continuously at the rate of 35 miles an hour. Of course such a rate of speed would not be desirable in cities, but the road in question runs out into the suburbs.

DETROIT CITY RY. CO. For some time the officers of the company have had strong suspicions that the receipts from their Congress and Baker street line were not as large as they should be. An investigation led to the belief that the company was being defrauded by a combination of conductors and drivers; and 26 of them were discharged Oct. 1, and their places taken by men detailed from the other lines. In the evening two of the new men were attacked and a car pulled off the turntable and another one ditched.

Dodge City, Kan.

DODGE CITY & SO. DODGE ST. RY. CO. has been incorporated by James H. Crawford and others, with a capital stock of \$20,000.

Easton, Pa.

LAFAYETTE TRACTION CO. Work has begun on this new road, and it is believed that it will be opened by Nov. 15. The road will be operated by the Daft electric system. The company has a capital stock of \$12,000, and its officers are as follows: President, J. Marshall Young; Secretary and Treasurer, D. W. Nevin. They will have about a mile of track, of 5 ft. 2½ in. gauge, 30 and 56 lb. rail and will have 2 cars. Capital stock, \$12,000.

East Saginaw, Mich.

EAST SAGINAW ST. R. R. CO. has changed its name to Saginaw Union Street Railway Co. It is expected that the extension to Saginaw City will be opened by Nov. 15. An act has been passed by the Legislature uniting East Saginaw and Saginaw City, so that the company's address hereafter will be Saginaw, Mich. Eleven new cars are being built for the company.

Elsinore, Cal.

ELSINORE LAKE SHORE ELECTRIC RY. Work was to have begun in October, and a portion of the road opened by Dec. 1. They contemplate a total length of track of 30 miles, of 4 ft. 8½ in. gauge, probably 30 lb. rail, about 12 cars, electric motors. The company has a capital stock of \$900,-

000, and its officers are: President, D. Gilbert Dexter; Vice President, Charles S. Gilbert; Secretary, Howard L. Couard.

Elgin, Ill.

ELGIN CITY RY., of which B. C. Payne is owner, will have 2½ miles more of track by early spring, and 4 cars and 18 horses more. He has increased since his last report from 2½ to 3 miles of track, from 4 cars to 6, and from 18 horses to 19.

Fernandina, Fla.

A PERMIT to build a street railroad is asked for by Gideon Palmer and associates.

Findlay, O.

FINDLAY ST. RY. CO., a new enterprise, will have 4 miles of track, of 4 ft. 8½ in. gauge, 25 lb. T rail, 8 cars, 48 horses.

Fort Meade, Fla.

FORT MEADE ST. CAR CO. expect to add ½ mile of track this winter. They have now 4½ miles. C. C. Wilson is now President and A. H. Thompson Secretary.

Fort Smith, Ark.

FORT SMITH ST. RY. CO. will build 5 miles of new track in 1888.

INFORMATION as to dummy engines burning petroleum is asked for by W. M. Fishback.

Fort Payne, Ala.

FORT PAYNE LAND & IMP'T CO. The project of a dummy railroad has not assumed definite shape yet.

Fort Wayne, Ind.

RIVERSIDE ST. RY. CO. have opened their new line. It is 8,000 ft. long, of 4 ft. 8½ in. gauge, 20 lb. T rail, 4 cars, 12 horses. They have a capital stock of \$15,000, and the officers are: President, Edwin Evans; Secretary, H. C. Hanna; Treasurer, William H. Carnahan.

Gadsden, Ala.

GADSDEN LAND & IMP'T CO. think they will begin work on their new dummy road next spring, and open it in the summer. They will have 5 cars. The railroad company will have a capital stock of \$50,000.

Galveston, Tex.

GALVESTON CITY R. R. CO. Leading stockholders of this company obtained control of the Gulf City St. Ry. & Real Estate Co. Oct. 6. The latter run the only other street railway in Galveston. It is stated that neither road has been a paying investment. For the present, separate organizations will be kept up. The active competition between these two companies of late has resulted in the construction of a number of long and profitless lines of road. The result has been that Galveston has at present under operation about forty miles of street railway, more in proportion to her population, it is stated, than any other city in the United States. The present arrangement will permit the lopping off of a quantity of dead weight, though this can not be accomplished at once. The plan will be to convert into belt systems the various parallel lines now operated by the two roads separately, and thus do the same service with about half the number of cars required under the switch and turnout system. It will take some time to bring about this change, as the two roads are of different gauges, the

Gulf City lines being narrower, and a reconstruction of track and the running gear of all the Gulf City cars will be necessary before the consolidated system can be thoroughly and systematically regulated. It is stated that the Galveston City company will run their cars by electricity as soon as a permit can be secured.

Genda Springs, Kan.

THE STREET RAILWAY project hangs fire, and it is now thought that the road will not be built for two years.

Glens Falls, N. Y.

GLENS FALLS, SANDY HILL & FORT EDWARD ST. R. R. CO., which has not hitherto been reported in full in our Directory, has 7¾ miles of track, laid to 3 ft. 6 in. gauge, 25 lb. rail, 8 cars and 25 horses. President, H. Crandall; Secretary and Treasurer, B. B. Fowler; Superintendent, M. J. Byrne.

Grand Island, Neb.

GRAND ISLAND ST. RY. increases to 5 miles of track, with 20 and 35 lb. rail, 9 2-horse cars and 40 horses.

Greenville, Miss.

DEATON & SKINNER will probably build.

Greenville, Tex.

TWO NEW COMPANIES have received permits.

Harrisburg, Pa.

EAST HARRISBURG PASS. RY. CO. has now 4½ miles of track, 12 cars and 14 horses. David Fleming, Jr., is the present Secretary.

Hastings, Neb.

HASTINGS IMP'T CO. In the case between this company and the Citizens' Street Railway Co., for the right of way on Second street, the court has decided against the former.

Helena, Ark.

CITIZENS' ST. RY. CO. will begin building their road at once.

Henderson, Ky.

HENDERSON ST. RY. CO. opened a little over 2 miles of their line Oct. 6. They contemplate a total length of 6 miles. The road is of 4 ft. 8½ in. gauge, with 20 lb. steel rail. They have at present 2 cars and 28 mules. The company has an authorized capital of \$100,000, and the officers are: President, David Banks, Jr.; General Manager, E. G. Sebree, Jr.; Superintendent, John W. O'Brien.

Hot Springs, Ark.

A TRAM ROAD to Gillen's White Sulphur Springs is projected by J. L. Goodbar.

Houston, Tex.

A COMPANY with a capital stock of \$125,000 has been formed, it is stated, to build a street railroad.

Huntsville, Ala.

HUNTSVILLE & MONTE SANO R. R. CO. will not begin work on their new road for three or four months. Capital stock, \$100,000. They will have about five miles of track. Among the incorporators are George M. Harris, William P. Newman and John L. Rison.

Jacksonville, Fla.

JACKSONVILLE ST. R. R. CO. have let contracts for the extension of their road. Since their last report they have increased

from 8 to 9 miles of track, from 22 cars to 28, and from 93 mules to 105.

JACKSONVILLE, SUBURBAN & REAL ESTATE Co. Among the incorporators are Henry A. L'Engle, C. F. Adams and W. A. Bisbee.

Jamaica, N. Y.

JAMAICA & BROOKLYN R. R. CO. The work of changing this line to an electric road, using the Van Depoeles system, is going forward actively. The wires were up as far as Richmond Hill, Oct. 15.

Jersey City, N. J.

JERSEY CITY & BERGEN R. R. CO. has introduced an innovation that will be appreciated by city authorities. Having started the repaving of its tracks through Gregory street, it found that the street on each side needed repaving badly, so the company set to work and repaved the street from curb to curb.

Johnstown, Pa.

JOHNSON STEEL STREET RAIL CO. will erect new iron works to accommodate its increasing business.

Kansas City, Mo.

KANSAS CITY & SUBURBAN R. R. CO. has been granted a franchise for the portion of the line on Second street.

CABLE ROADS. By the end of the present year 28 miles of cable road will be in operation in this city, and 21 miles, at least, will be built in 1888. This is to make Kansas City the second city in the world in cable road mileage, San Francisco leading, with 52 miles.

WALDO PARK RY. CO. has a charter to build from the Missouri river, on the north side of Kansas City, to Waldo Park race track, 6 miles south of the city, thence 1¼ miles to the boundary line between Kansas and Missouri. It has a 3½ years' lease of the portion of the Kansas City & Southeastern R. R. that runs from Westport to Waldo Park. It connects with this road by means of horse cars from Kansas City. After Dec. 1, the Grand avenue cable line makes a direct connection with them. They are also building and will soon finish a link of 4½ miles between the Kansas City & Southern and the Kansas City & Southeastern, which run east of the race track. The Waldo Park Ry. Co. is already operating 10 miles of track. They contemplate a total length of 32 miles. Gauge, 4 ft. 8½ in. On the main line they have 50 lb. rail, and on the branches 40 and 50 lb. They will have 20 cars and 6 steam motors. The company has a capital stock of \$100,000, and will soon increase to \$200,000. The officers are: President, John A. McDonald; Vice President, H. M. Meriwether; Secretary and General Manager, E. F. Hill; Treasurer, William M. Sloan.

GRAND AVE. RY. CO. The work of widening Prospect avenue from 60 to 80 ft., from Fifteenth street to the southern city limits, is going forward. This company will build a branch horse car line along the whole length of the street. This company's Fifteenth street cable line has been opened for traffic, and the Westport line will be opened by Dec. 1. They report 6½

miles of double track cable road, 58½ lb. rail, 50 cars. Authority has been granted for an extension to Independence, under the name of the Centropolis, Blue Valley & Independence Railway Co.

METROPOLITAN CABLE RY. Co. is earning a net income of \$180,000 per year on \$3,000,000 of stock and bonded debt.

INDEPENDENCE DUMMY LINE has been opened.

KANSAS CITY & ROSEDALE ST. RY. Co. This line, which is operated by the Metropolitan St. Ry. Co., extends from Nineteenth and Main streets, in Kansas City, to the southwestern limits of Rosedale, Kan., a distance of 3.696 miles.

Keypoint, N. J.

KEYPORT & MATAWAN ST. RY. Co. The new street railroad between Keypoint and Matawan was opened Oct. 3. The stores in both towns were closed, houses decorated, and there was a procession and addresses.

Kingman, Kan.

KINGMAN CITY ST. RY. Co. opened their 8 mile line Oct. 1.

Knoxville, Tenn.

WEST END ST. RY. Co. The work of construction is going on steadily.

Lafayette, Ind.

LAFAYETTE ST. RY. will use electricity on their main line. They have not yet decided upon the system, but will do so at once. They will add 2½ miles of extensions; have just received some 52 lb. Johnson steel rail. It is thought the extension will be in operation in November.

Lancaster, Pa.

LANCASTER & MILLERSVILLE R. R. has 5½ miles of street railway track.

Laredo, Tex.

INTERNATIONAL BRIDGE & TRAMWAY Co. is building its new street railway.

La Salle, Ill.

LA SALLE ST. R. R. Co. F. W. Matthiessen is President.

Lawrence, Mass.

MERRIMACK VALLEY HORSE R. R. Co. increases from 6½ to 8.45 miles of track, from 22 cars to 27, and 87 horses to 106.

Leavenworth, Kan.

LEAVENWORTH & SUBURBAN RY. Co. increases to 23 horses and 32 mules. W. F. Putnam is now President. Important changes in location are contemplated.

Lisbon, Dak.

LISBON ST. RY. Co. was incorporated, but the road has never been constructed.

Little Rock, Ark.

LITTLE ROCK & CITIZENS' RY. Cos. R. D. Apperson is Superintendent and Cashier.

Lincoln, Neb.

LINCOLN CABLE RY. Co. will begin work at once, and expect to open their road early in the spring. They will have 2½ miles of double track, standard gauge, 56 lb. rail, 10 cars, with storage batteries and motors. The company has a capital stock of \$500,000, and the officers are: President, J. H. Ames; Vice President, Charles Carpenter; Secretary, Lewis Coon; Treasurer, J. H. McMurtry.

Livermore, Cal.

A CHARTER has been granted to J. W. Seligman, of New York city, and others, to construct a system of street railways at this place, to be operated by steam or otherwise.

London, England.

THE ELIESON electric motors on the road of the North Metropolitan company, show for the last six weeks' running an average weekly mileage per car of 490 miles, 3,325 passengers per car, and 475 passengers daily. The motors are said by experts to be working most satisfactorily.

Los Angeles, Cal.

PACIFIC ELECTRIC R. R. Co. has been incorporated by J. H. Book and others, with a capital stock of \$250,000. Mr. Book is now in the East investigating the different electric systems. He is inclined to favor storage batteries.

A FRANCHISE for running an electric road by storage batteries from the Santa Fe depot to the western limits of the city, has been granted to J. H. Moon and others.

BROOKLYN HEIGHTS RY. Co. will begin work on their new line about Nov. 1, and the road will be opened, it is thought, about March 1. They will have 6½ miles of track, of 4 ft. 2 in. gauge, 16 lb. rail, about 15 cars, horses for one year, then electricity. They have a capital stock of \$300,000, and the officers are: President, Clarence J. Richards; Vice President, Charles M. Baker; Secretary, Carl F. Von Brunck; Treasurer, Edward Records. The road is to run along Griffin avenue to East Los Angeles to connect with the proposed dummy line to Garvanzo and Pasadena.

Lynchburg, Va.

LYNCHBURG ST. RY. Co. has now 4 miles of track, laid with 20 lb. T and 26 lb. tram rail, with 7 cars and 40 horses.

Lyons, Ia.

CLINTON & LYONS HORSE RY. Co. has 7 miles of track, 18 cars and 40 horses.

Madison, Wis.

MADISON ST. RY., we are advised under date of Oct. 19, will be discontinued after Nov. 15. The plant has not been paying, and it has been a matter of impossibility to induce the Common Council to modify certain points in the franchise, hence the taking off of the cars and taking up the track.

Memphis, Tenn.

EAST END RY. Co. and Memphis, Greenwood & Prospect Park Co. have consolidated. They have yet several miles of track to lay and a number of engines and cars to purchase, as well as rails, cross ties and stone for paving. Both roads are dummy lines. B. M. Stratton is Vice President of the East End Ry. Co.

JACKSON MOUND PARK R. R. Co. now think they will begin work on their road in April and open it in June. They will have 5 miles of track, of 4 ft. gauge, 30 lb. rail, 12 cars. Holmes Cummins is President, and Sol Coleman is General Manager.

Milwaukee, Wis.

MILWAUKEE ELECTRIC R. R. Co. will use the Van Depoele system.

MILWAUKEE & WAUWATOSA CABLE RY. Co. have changed the location asked for. They now propose to run from the extreme western end of North avenue to Grand avenue. Then they plan to build a horse car line from Fourth and Wells street to South Water and Lake streets. There the cable line will begin again and run to the city limits at Twenty-second avenue. A spur track is provided from Milwaukee and Michigan streets to the Northwestern depot.

Minneapolis, Minn.

MINNEAPOLIS ST. RY. Co. ask permission to build from the Mississippi river at Franklin avenue to Hennepin avenue.

Mount Vernon, N. Y.

MT. VERNON & EAST CHESTER R. R. Co. A syndicate has purchased this road, and will extend it to Yonkers.

Nashville, Tenn.

MCGAVOCK & MT. VERNON HORSE R. R. Co. has increased since March to 14½ miles of track, from 25 cars to 49, and from 140 mules to 217. This company will erect brick buildings, to accommodate 90 cars and 350 mules, with all the latest improvements, at a cost of \$22,000.

NASHVILLE & EDGEFIELD R. R. Co. has now 6 miles of track and uses 110 mules.

THE DUMMY RAILROAD. Eight miles are completed, and will be opened at once, with 5 cars. The motors are furnished by the Baldwin Locomotive Works.

Natchitoches, La.

NATCHITOCHEES ST. RY. Co., a newly organized company, ask for estimates of cost to equip 1 and 2 miles of street railway. They intend running both passenger and freight cars. Phanor Brazeale is President of the company.

Newburyport, Mass.

PLUM ISLAND ST. RY. Co. increases from 20 horses to 25. In addition to the officers previously reported, Charles H. Brown is President and A. G. Reynolds Clerk.

BLACK ROCKS & SALISBURY BEACH ST. RY. Co. The extension to Hampton River next spring will be 4 miles long. The officers of the company are: President, Harvey N. Shepard; General Manager, E. P. Shaw; Secretary and Treasurer, George Tilton.

EVANS & PATRIQUIN, the new car builders here, have already constructed quite a number of cars and have some now under way; among them six for Woonsocket, a number for Portland, Lewiston and Plum Island. The gentlemen composing the firm are both good mechanics, have good facilities for wood work, unlimited room, and would seem to start with fair prospects for success. They have recently erected a new building, and probably will construct another soon.

Niagara Falls, Can.

NIAGARA FALLS, WESLEY PARK & CLIFTON TRAMWAY Co. has 4 miles of track, 10 cars and 31 horses.

New York, N. Y.

NORTH & EAST RIVERS RY. Co., which has laid double tracks on Fulton street, has secured permission from Arthur Leary, President of the Bleeker street line, to relay

the tracks of the latter company on Fulton street. When this is done the electric conduit, on the Bentley-Knight system, which is in process of construction at Pittsburgh, will be put in place, the Board of Electrical Control having granted the company the necessary permission. The stationary engines and boilers are ready and awaiting shipment from Providence. The J. G. Brill Co., of Philadelphia, have notified the company that the 20 cars they ordered some time ago are almost ready. The Eighth Avenue R. R. Co. and the Belt Line Co. have given the electric company the right to run the cars over their tracks on Fulton and West streets. Work has been delayed by the fact that the company has been obliged to do all its work in the night and restore the condition of the street before morning.

NEW YORK CABLE R. R. Co. elected the following officers Oct. 17: President, W. S. Williams; Vice President, J. B. Shaw; Secretary, Abraham L. Earle; Treasurer, Thomas W. Evans.

FORTY SECOND ST. & GRAND ST. FERRY R. R. Co. has now 59 cars and 480 horses.

CENTRAL PARK, NORTH & EAST RIVER R. R. Co. has put on a number of new cars to take the place of some of the odds and ends borrowed from other roads, which it has had to use since all its own cars were burned in the recent destruction of its stables. The new cars are painted Broadway yellow, and have big windows, giddy stained glass in the upper story, a looking glass reflector for the chandelier lamp in the center, and other modern improvements.

BROADWAY & SEVENTH AVE. R. R. Co. The General Term of the Supreme Court has decided that the act annulling the charter of the Broadway Surface R. R. Co. was constitutional.

THIRD AVE. R. R. Co. A special meeting of the stockholders has been called for Oct. 31 to vote upon a proposed consolidated mortgage of the company's property and franchises, to secure an issue of new bonds for retiring outstanding issues, the proceeds to be used in building a cable railway and for other purposes. One of the directors says that they have thoroughly examined into the cable systems in operation in Chicago and San Francisco, and are convinced that the change would be for the best interests of the company. Work will be commenced as soon as the necessary authority is given by the stockholders.

EDWARD BEADLE is filling among others a large order for the Pullman Co.; one for Jones' Sons for car mats, and an order for Pugh & Russell. He is running his shops till 9 P. M., to keep up with orders.

Norfolk, Va.

NORFOLK CITY R. R. Co. has completed its extension to the end of York street, and will build to Brambleton.

Omaha, Neb.

CABLE TRAMWAY Co. expect to open their road in November.

Ontario, Cal.

ONTARIO & SAN ANTONIO HEIGHTS RY.

will open their road about Dec. 1. It is an electric road, built on the Safety Electric Railway & Power Co.'s system (underground conductor), with 4 cars and 3 motors.

Philadelphia, Pa.

PHILADELPHIA TRACTION Co. will build a cable line on Seventh and Ninth streets this fall.

THE J. G. BRILL Co. have received a letter from a party in South America to whom they shipped a large order of 200 cars, in which the writer states, "The cars shipped by the steamer Aladdin are in our possession, and we have to pass the highest praise upon your sleeping cars. They are truly masterpieces. They do honor to your house and to our road." They have given a further order to the Brill Co.

CHADBOURNE & HASTINGS, the agents of the Sprague Electric Railway & Motor Co., who have their head office in this city, feel very sanguine over the present prospects for their system. Their road at Wilmington, Del., is nearly completed; the road at Richmond, which will be the most extensive electric road in the world, is just finished, and they have contracted for roads in Wilkesbarre and Carbondale, Pa. It is very generally acknowledged that electricity as a means of locomotion is even now more economical than horse power, and the obvious advantages which it possesses in other respects are unanimously conceded. The "rough and ready" applications of electricity as a motive power, which have heretofore been attempted, with more or less success, in comparison with that degree of efficiency which has been attained by the Sprague system, remind one forcibly of the difference between the primitive steam engine and the triple expansion "agent" of the present day. The numerous letters and requests for estimates for the equipment of railroads from all parts of the country are particularly significant, and show that the interest is not local but widespread, and that a revolution in the system of street railways is near at hand.

Pittsburgh, Pa.

THE NEW SQUIRREL HILL ROAD will reach town over the line of the Traction company.

Pomeroy, O.

POMEROY, MIDDLEPORT & SYRACUSE ST. RY. Co. will begin work in about 90 days. The franchise is considered a very valuable one.

Portland, Ore.

PORTLAND CABLE RY. Co. are now building, and will finish about three miles this year.

Portsmouth, Va.

PORTSMOUTH ST. RY. Co., at a meeting at 45 Broadway, New York, elected the following officers: President, E. E. Gedney; Vice President, William H. Stewart; Secretary, E. Z. Pennfield; Treasurer, Thornton N. Motley; Superintendent, J. E. Hudson. Eighty men are at work, and the road must be completed and equipped by Dec. 15. They will have 35 lb. side bearing rail and 6 horses. Will change

in a few months from horses to electricity.

Pratt, Kan.

CITY RY. Co. expected to complete their road, of 1½ miles, with 6 cars and 12 horses, by Oct. 15.

Providence, R. I.

THE LONGSTREET RAIL has been adopted in Philadelphia, and is being laid in St. Paul and Lowell.

PROVIDENCE CABLE TRAMWAY Co. ask for authority to construct a new line.

Rome, Ga.

ROME ST. R. R. Co. have nearly completed their 7 mile road.

San Antonio, Tex.

WEST END ST. R. R. Co. will build 6 miles of road soon.

San Francisco, Cal.

POWELL ST. RY. Co. will probably open their new cable line early in 1888.

Santa Barbara, Cal.

CITIZENS' RY. Co. has been incorporated by G. H. Bonebrake and others, with a capital stock of \$50,000.

SANTA BARBARA ST. RY. Co. has been incorporated by A. Cross and others, with a capital stock of \$50,000.

Sault Ste. Marie, Mich.

SAULT STE. MARIE ST. RY. Co. has been incorporated by Edward M. Lacy and others, with a capital stock of \$25,000. They contemplate using electricity, will begin work next spring, and will have about 6 miles of track.

Springfield, Mass.

SPRINGFIELD ST. RY. Co. has secured control of the new road at Chicopee.

Staunton, Va.

A PROPOSITION to build a street railway here has been made by M. Leiterman and A. D. Payne, of Charlottesville, Va. J. Thompson Brown, of Richmond, will also make a proposition.

St. Catharine's, Ont.

ST. CATHARINE'S, MERRITTON & THOROLD ST. RY. Co. has successfully opened its new electric road, on the Van Depoele system.

Stillwater, Minn.

UNION DEPOT ST. RY. & TRANSFER Co. E. D. Buffington is now Receiver, in place of George M. Brush.

St. Louis, Mo.

BADEN & ST. LOUIS R. R. Co. state that they expect to put on some motor for more rapid transit.

OUR ST. LOUIS LETTER.

A delegation of street railroad men, including John Scullin, President of the Union Depot Line, Christian Peper, President of the Broadway Line, and Robert Bagnall, Electrician of the Lindell Railway, have left for Philadelphia to attend the convention of street railroad men, whilst William Henry, Secretary of the Missouri Railway Co., is already there. We trust they will be able to thoroughly satisfy themselves as to the best motor, cable or electricity, to adopt for their roads; as the people here have so long been promised by the Broadway and the other lines, a change from slow horse power, to quick cable or electric power, that they are getting somewhat tired of

waiting. The natural result is, that the Tucker Elevated Railroad and other schemes for street railway franchises are knocking at the door of the Council for charters.

The Franklin avenue cable road expects to be in complete operation by Nov. 1. The Olive street cable is not half completed. Rain has delayed the work ten days, and there is such an amount of cable road construction, there is a scarcity of laborers. The Western cable road was started again last Tuesday, after eight days cessation on account of a series of mishaps that seldom befall a railroad. They have repaired and put in two new shafts in place of old, and are now using a new cable, besides have ordered a second cable to be in readiness in case the one in use breaks. It looks as if the road was poorly constructed at first, and no doubt the stockholders of the new cable roads feel confident that the large investments they are making in the California system will be cheap in the end, although the first cost looks very large.

Can't you send us a brainy, wealthy individual or corporation, who will consolidate all these various roads under one management, the same as has been done in Boston? Whilst there might not be millions in it for a few years, in time it would produce most desirable results for both investors and the public.

I. B. G.

St. Paul, Minn.

THE CABLE ROAD. Six hundred men are engaged in the work of construction.

Superior, Wis.

DOUGLAS ST. RY. CO. W. M. Hewitt, of Muscatine, Ia., has completed the construction of this 2½ mile road.

Tacoma, Wash. T.

ELECTRICITY as a motive power is now considered favorably by the projectors of the new street railway here.

Tuskaloosa, Ala.

TUSKALOOSA & LAKE LORRAINE ST. RY. Co. increases from 5 cars to 8 and from 20 mules to 32. They anticipate putting a dummy engine on a 3 mile stretch of their track, using horse cars on the remaining 1½ miles, which is through the thickly settled part of the city. James H. Fitts is President of the company, and Samuel F. Alston Secretary and Treasurer.

Watertown, N. Y.

WATERTOWN ST. RY. Co. has been incorporated by A. D. Remington and others, with a capital stock of \$40,000.

Wheeling, W. Va.

WHEELING RY. Co.'s electric road, Van Depoele system, will be opened about Dec. 15.

Wilkesbarre, Pa.

WILKESBARRE & SUBURBAN ST. RY. Co. have begun work on their road. They will put down 3½ miles of track. The road will be operated by electricity, and they have just closed a contract with Chadbourne & Hastings, agents for the Sprague Electric Railway & Motor Co., to equip their line with the overhead system. Two cars will be started at once, and they will

put in a steam plant and dynamo capacity sufficient to operate several more.

Wilmington, Del.

WILMINGTON CITY RY. Co. The contract for poles, wires, etc., and starting up the electric railway extension of this road has been awarded to T. William Harris & Co., of New York. The Sprague system will be used.

Winchester, Ky.

A FRANCHISE has been granted to T. G. Stuart & Co.; and work will be commenced this year.

Woonsocket, R. I.

ELECTRIC TESTS. The Woonsocket Reporter states that a very successful test of the workings of the Bentley-Knight system on this new road was made recently. The car ran with the greatest ease, passing around curves without trouble, and at one time attaining a speed of 20 miles an hour.

Worcester, Mass.

WORCESTER STEEL WORKS have made a contract with R. T. White to furnish all materials, rails, chairs, sleepers, etc., for laying his Acme Steel Railway.

WORCESTER CONSOLIDATED ST. RY. Co. has 16 miles of track.

Yankton, Dak.

THE COMPANY that was incorporated has decided not to build this year.

Yonkers, N. Y.

YONKERS R. R. Co. expect to complete another 1½ miles this fall and double track their main road. Have built a large extension to their stable.

Spur Gearing for Electric Street Cars.

EDITORS STREET RAILWAY JOURNAL:—

At a meeting of the American Institute of Electrical Engineers, held Sept. 20, Mr. Anthony Reckenzaun, in an address on the subject of "Electric Street Cars, with Special Reference to Methods of Gearing," referred to the experiments which are going on at Mr. William Wharton, Jr.'s, establishment in Philadelphia, and makes the following statement:—

There we used a set of spur-gearing, which was supplied by the Sprague company. In this case the motor shaft, which runs at from 500 to 600 revolutions a minute, carries two steel pinions, one at each end of the shaft, and these pinions gear direct into two cast-iron spur-wheels upon the driving axle without any intermediate wheels. The motor is partly suspended on the axle and partly on the body of the car. We have run several hundred miles with this car under all conditions of load, gradients and weather, on some of the roughest tracks in Philadelphia, but up to this moment not a single hitch has occurred. The gear is perfectly noiseless, it is efficient and strong, and I see comparatively little indication of wear. The teeth are beautifully shaped, therefore somewhat expensive; but if they last long enough and if they do not rattle when partially worn, this expense can be ignored. This car contains, besides its usual weight, about 3,200 lbs. of storage batteries. It has to mount grades of 5 per cent and run on curves of 35 and 25 ft. radius, which means very hard work.

I wish to correct an impression which one would gather from these remarks of Mr. Reckenzaun, and which hardly do justice to the method of mounting which is there used. The suggestion that the gears are necessarily expensive because of the

beautiful shape of the teeth is incorrect; the shape of the teeth has absolutely nothing whatever to do with the expense of the gears as we make them, for they are no more expensive than any other form of tooth in cut gears.

There are several reasons other than the shape which make these gears so noiseless. The motor, in the first place, is hung upon the driving axle at two widely distant points, and is supported in the center of the other side by a double-compression spring. In this manner absolute parallelism is maintained between the driving and the driven axle in all planes, no matter what the movement of the axle. There is no twisting or tendency to twist on the face of the gears and pinions; the thrust at all times is absolutely in the plane of the gears and pinions, and these are always parallel. The bearings of the armature are very close to the pinions, so that there is no spring whatever in this shaft. One pinion is set about half a tooth ahead of the other. One of the main gears is fixed; the other is adjustable, so that there is no interference in the thrust of the pinions, and a much more perfect simultaneous meshing of the gear is obtained than would be possible where dependence upon the cutting of the splines is necessary for the adjustment.

Two or three teeth on each pinion are always engaged. The proportions of the pinions are such that the armature has to make as many revolutions as there are teeth in the large gear before the same teeth in the gears and pinions engage with each other, and, finally, by reason of the method of supporting, there is always a spring touch, so to speak, of the pinions upon the gears. No matter how sudden a strain is brought upon the motor, it always yields more or less in a direction concentric to the axle of the car, so as to relieve the teeth from all shock. The wear of the gears must be absolutely the same. It is simply impossible for rattling to take place on these gears even if they were worn down one-half of their present thickness, and this wear, where the gears are properly protected by screens, will be very light.

The method of mounting and the general plan of using these gears has far more to do with their noiselessness and efficient operation than the shape of the teeth, although this shape, being of the involute character, is such that they will mesh perfectly even where there is some change in the distance between the centers of the axles. If it were not for the method of mounting it would be impossible to run this kind of gearing, as has been frequently done, with variable strains at a speed as high as twelve hundred feet per minute. At no time, under the severest strains it is possible to put on gears of this character, have they ever shown any signs of weakness or undue wear, and in comparison with fixed gear this method of mounting must necessarily be the more satisfactory.

F. J. SPRAGUE.

New York.

BUSINESS NOTES.

THE BRILL COMPANY report among recent orders 30 cars for the Missouri Pacific Railway; horse cars for Hong Kong and Jeddo; also cars for Rome, Ga.; Nashville, Tenn.; Hartford, Conn.; New York, N. Y.; New Haven, Conn.; Pittsburgh, Pa.; Lansing, Mich.; Newark, O.; and a large lot for California.

THE BEMIS CAR BOX CO., Springfield, Mass., have offices at 20 Platt st., New York, and at 426 Insurance Exchange, Chicago. Among the roads using this box are Grand Avenue Railway Co. and Metropolitan Street Railway, Kansas City, Mo., East Cleveland Street Railroad, Cleveland, O., and Sixth Avenue Railroad Co., New York City.

EDITORS STREET RAILWAY JOURNAL—

I have invented a divided car-axle, No. 352,411, issued Nov. 9, 1885. A car with my invention was placed upon the East Cleveland R. R. Co.'s lines Aug. 16, 1887, and I have letters from officers of the road saying that it works nicely. Mr. Duty, the Superintendent, writes under date of Aug. 22 that it lessens the draught upon curves at least one-half.

D. W. C. JAMES.

SPECIAL NOTICES.

TO RAILWAY OFFICIALS.

SELLING ON COMMISSION.

In order to make known the value of the STREET RAILWAY JOURNAL as a medium of communication between the buyer and seller of street railway property or services, we will insert advertisements of property "Wanted" or "For Sale," "Position" or "Help Wanted" free of charge, unless sale or purchase is effected. In case sale or purchase is effected the price to be paid for the advertisement will be five per cent of the amount of the transaction brought about by the advertisement.

DESCRIPTION SHOULD BE SENT US Of property advertised on commission.

In case of Position Wanted, names of references, salary expected, experience and other particulars should be given.

REGULAR CASH RATES.

When not inserted on commission, Wants, For Sale, etc., are charged at the rate of ten cents per line, about eight words to a line. Street Railway Companies, or their Officers, may send advertisements to be billed and paid for after insertion.

WHEN SENDING

Please state whether ad. is to be paid for at regular rates or on commission. If more convenient for advertiser the advertisement will be written at this office, full particulars being sent to us. Unless parties are known to us or appear in some of our directories, cash should accompany ad.

WANTED.—Three or four good second-hand street cars, 16 foot preferred. Also, good second-hand 25 lb. T rails. Address H, JOURNAL Office.

FOR SALE.—A full-sized Andrews Improved Snow Plow and Sweeper. Been used only six times. Would exchange for open cars in good condition. WATERBURY HORSE R. R. Co., Waterbury, Conn. 14

FOR SALE CHEAP, on account of discontinuance of road, eight cars. Four nearly as good as new. One of them only run two months. Address for full particulars, Madison Street Railway, care STREET RAILWAY JOURNAL, 113 Liberty st., New York.

WANTED.—A man who thoroughly understands the putting up of wood work for street cars. Will give competent man steady employment and good wages or an interest in that branch of my business. I am from New York but this is a much finer and more healthy country. Address SOUTHERN CAR BUILDER, care STREET RAILWAY JOURNAL, 113 Liberty st., New York.

FOR SALE.—The controlling interest in a horse road now in operation in a city of over 20,000 population, within a few hours of New York. This is an opportunity seldom offered to a practical party and will be sold at a price that will show a large profit in near future, as present owner contemplates going abroad. Address S., care STREET RAILWAY JOURNAL, 113 Liberty st., New York.

WANTED.—A position as General Manager on a new or old established Street Railway by thoroughly practical man. Location no object; and willing to work for a small salary. Can give the best of New York City references. Parties wanting a man who is able to look sharp after the interest of the company, will please address J. L. D., care of STREET RAILWAY JOURNAL, 113 Liberty street, New York.

FOR SALE.—A first-class Street Railway line in a thriving city in Indiana. Four miles of track mostly paved with cobble, 9 cars, 46 animals, good barn and car house. Franchise very valuable, being in perpetuity over all streets in the city. Profitable extensions can be made. Road in good condition and doing good paying business. Address "OWNER," care STREET RAILWAY JOURNAL, 113 Liberty street, New York.

WANTED.—By a party having held different responsible positions in the business for the past six years, a position as Superintendent of the construction or operation of a street railway. Can furnish best of references from former employers. Is soon to take a trip to California and would like to confer on the way with any directors needing such a man. Address for full particulars, "Eastern," care STREET RAILWAY JOURNAL, 113 Liberty st., New York.

FOR SALE at a bargain. Franchise for a street railroad in a rapidly growing city of 3,000 inhabitants on the Atchison, Topeka and Santa Fe R. R. City has a good system of water works, electric lights, etc. As to price, map of the city, copy of franchise, inquiry may be made at the STREET RAILWAY JOURNAL office, or letter may be addressed to WESTERN OWNER, care STREET RAILWAY JOURNAL, 113 Liberty st., New York.

WANTED.—Benton Portable Registers in exchange for Lewis and Fowler Stationary Registers. Our road is a single track line on which five cars are run, attended to by three conductors. Continual change of conductors makes it difficult to keep accounts strict with stationary registers. We would exchange the five stationary in first-class order for eight Benton portables, each delivering his register to the other. Address MEXICAN STREET RAILWAY, care of STREET RAILWAY JOURNAL, 113 Liberty st., New York.

STREET RAILWAY STOCK QUOTATIONS.

PROVIDENCE STOCKS.—Corrected by CHACE & BUTTS, Bankers, Providence, R. I.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Union R. R. Co., Prov.....	100	\$1,500,000	Q.—J.		July, 1887.	197	200
Pawtucket St. Ry. Co.....	100	270,000	New.	New.		105	107½

NEW HAVEN STOCKS.—Corrected by H. C. WARREN & Co., Bankers & Brokers, New Haven, Conn.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Fair Haven & Westville R. R. Co....	25	\$300,000	J. & J.	4	January, 1887	136	
State Street Horse R. R. Co.....	25	23,000	J. & J.	3	January, 1887	100	
" Bonds		12, 00	J. & J.	7		110	
New Haven & West Haven R. R. Co.	25				12	
New Haven & Westville H. R. Co..							
Whitney Ave. Ry. Co.....	50	25,000				7	
Bridgeport Horse R. R. Co.....	100	140,000					
" Bonds.....	1,000	50,000		6			

PHILADELPHIA STOCKS.—Corrected by ROBERT GLENDINNING & Co., 303 Chestnut st., Philadelphia.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Citizens	50	\$500,000	Q.—J.				
Continental.....	50	1,000,000	J. & J.				122½
Frankford & Southwark	50	750,000	Q.—J.				275
Germantown	50	1,500,000	Q.—J.			94½	95
Green & Coates.....	50	500,000	Q.—J.				116
Hestonville	50	2,050,000				22	26
Lombard & South.....	25	500,000					9½
People's.....	25	1,500,000					34
Philadelphia City.....	50	1,000,000	J. & J.			141	145
Philadelphia & Gray's Ferry.....	50	617,500	J. & J.				89
Philadelphia Traction.....	50	5,000,000				62	64
Ridge Avenue.....	50	750,000	Q.—J.				
Second & Third.....	50	1,060,200	Q.—J.			155	
Seventeenth & Nineteenth.....	50	500,000	J. & J.				
Thirteenth & Fifteenth.....	50	1,000,000	J. & J.			140	145
Union.....	50	1,250,000	J. & J.			170	
West Philadelphia.....	50	750,000	J. & J.			170	180

ST. LOUIS STOCKS.—Corrected by JAMES CAMPBELL, Banker & Broker, 307 Pine st., St. Louis, Mo.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
STOCKS.							
Benton-Bellefontaine.....	100	\$400,000	Jan.	1½		95	100
Cass Ave. & Fair Grounds.....	50	300,000				80	
Citizens'	100	1,000,000	Apr. '76	1¼		65	70
Forest Park & Laclede.....	100	100,000				100	
Jefferson Avenue.....	100	112,000				100	110
Lindell	100	600,000	Oct.	2		105	175
Missouri.....	100	600,000	Oct.	2		170	
Mound City	100	125,000				103	107
Northern Central.....	100	200,000					
People's.....	50	300,000	June	2		40	42½
St. Louis.....	100	900, 00	May	2		50	55
Tower Grove.....	50	300,000	Jan.	.50			9
Union.....	50	600,000				13	15
Union Depot	100	400,000				75	80
St. Louis Cable.....	100	1,000,000					
BONDS.							
Benton-Bellefontaine.....	1,000	\$50,000	A. & O.	6	1880	102	
Cass Avenue.....	1,000	2 0,000	F. & A.	6	1886	102	103
Citizens'	1,000	200,000	J. & J.	6	1882	100	101
Citizens' Cable.....	1,000	1,500,000	J. & J.	6		103	106
Lindell	1,000	87,500	F. & A.	7	1879	102	105
Mound City.....	1,000	125,000	J. & J.	6	1884	102	103
Missouri Cable.....	1,000	500,000	M. & S.	6		102	105
People's 1st mort.....	1,000	125,000	J. & D.	6	1882	103	105
2d mort.....	1,000	75,000	M. & N.	7	1886	104	105
Northern Central.....	1,000	200,000	J. & J.	6	1884	102	103
St. Louis Cable.....	1,000	600,000	M. & N.	6	1884	105	107
Union.....	1,000	150,000	M. & N.	6	1885	102	103
Union Depot.....	1,000	350,000	A. & O.	6	1886	102	102½

STREET RAILWAY STOCKS.—Continued.

BOSTON STOCKS.—Corrected by R. L. DAY & Co. 51 State st., Members of Boston Stock Exchange.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Metropolitan.....	50	\$2,000,000	J. & J.	10	July, 1887	97	100
South Boston.....	50	750,000	J. & J.		July, 1886	97	100
Boston Consolidated.....	100	1,700,000	J. & J.	8	July, 1887	138	142
Cambridge.....	100	1,950,000	J. & J.	5		116	118½
West End Pref.....	50	6,650,000	J. & J.	8	January, 1887	78	85

NEW YORK STOCKS.—Corrected by H. L. GRANT, 145 Broadway, New York.

Company..	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Bleecker St. & Fulton Ferry.....	100	\$900,000	J. & J.	¾	January, 1887	28	31
1st mort.....	1,000	700,000	J. & J.	7	July, 1900	114	116
Broadway & Seventh Avenue.....	100	2,100,000	Q.—J.	2	January, 1886		180
1st mort.....	1,000	1,500,000	J. & D.	5	June, 1904	100	103
2d mort.....	1,000	500,000	J. & J.	5	July, 1914	103	105
Broadway Surface Guaranteed.....	1,000	1,500,000	J. & J.	5	July, 1924		91
Additional.....	1,000	1,000,000	J. & J.	5	July, 1905		130
Brooklyn City—Stock.....	10	2,000,000	Q.—F.	2	May, 1887	124	130
1st mort.....	1,000	800,000	J. & J.	5	January, 1902	106	110
Brooklyn Crosstown.....	100	200,000	A. & O.	4	April, 1887	160	165
1st mort bonds.....	1,000	400,000	J. & J.	7	July, 1888	105	109
Central Park, North & East River Con. mort. bonds.....	100	1,800,000	Q.—J.	2	January, 1887	75	81
Christopher & Tenth.....	100	1,200,000	F. & D.	7	December, 1902	120	121
Bonds.....	1,000	650,000	J. & D.	1½	August, 1887	120	125
Central Crosstown.....	100	250,000	A. & O.	7	October, 1898	110	114
1st mort.....	1,000	600,000	Q.—F.	1½	July, 1887	155	160
Dry Dock, East B'way & Battery....	100	250,000	M. & N.	2	November, 1922	118	125
1st mort. consol.....	500	1,200,000	Q.—F.	6	August, 1887	142	147
Scrp.....	100	1,900,000	F. & D.	7	June, 1893	108½	111
42d & Grand St. Ferry.....	100	1,200,000	F. & A.	6	August, 1914	104	106
1st mort.....	1,000	748,000	Q.—F.	3	August, 1887	200	210
2d mort.....	1,000	236,000	A. & O.	7	April, 1893	110	112
42d St., Manhattan & St. Nich. Av. 1st mort.....	100	2,500,000				38	42
2d mort. in bonds.....	1,000	1,200,000	M & S.	5	1910	108	110
Eighth Avenue—Stock.....	100	1,600,000	J. & J.	6	1915	60	63
Scrp.....	100	1,000,000	Q.—J.	2	July, 1887	155	160
Houston, West St. & Pavonia Ferry 1st mort.....	500	1,000,000	F. & A.	6	August, 1914	105	110
2d mort.....	100	250,000	Q.—F.	2	August, 1885	150	160
3d mort.....	100	500,000	J. & J.	7	July, 1894	110	111
Consol.....	1,000	1,862,000	J. & J.	5	January, 1887	118	121
Sixth Avenue.....	100	550,000	M. & N.	5	November, 1909	104	106
1st mort.....	1,000	1,050,000	M. & N.	7	November, 1887	101	103
Third Avenue—Stock.....	100	500,000	M. & S.	3	August, 1887	175	180
1st mort.....	1,000	500,000	J. & J.	7	July, 1890	110	112
23d St.—Stock.....	100	2,000,000	Q.—F.	3	August, 1887	210	225
1st mort.....	1,000	2,000,000	J. & J.	7	January, 1890	110	112
Ninth Avenue.....	100	600,000	F. & A.	5	August, 1887	224	230
Chicago City Railway.....	100	250,000	M. & N.	7	May, 1893	110	113
		800,000		3	September, 1885	107	112
						299	325

EXPERIENCED and thoroughly practical St. R. R. man, competent to fill any or all of the following positions: Superintendent, Secretary, Purchasing Agent, Auditor and Accountant, desires a change; location no object. Present position combines the duties of Superintendent, Secretary, Auditor and Accountant. Would prefer position as General Manager or Superintendent to take hold of large failure, entire charge of operating a medium sized road or to look after the interests of a syndicate controlling several small roads.

Remuneration can be based on results obtained. This is a good opportunity to secure a first-class reliable man on easy terms, expectations small. Correspondence or an interview is solicited. Address, "Expert," Box 17, No. 1,692 Broadway, New York City.

Wanted, STREET RAILWAY JOURNAL, For August, 1886.

We will credit three months, fifty cents, on subscription, for copies of that date received here before July 10. Send to
STREET RAILWAY JOURNAL,
113 Liberty Street, New York.

Steel Rails.

COMPLETE OUTFIT FOR
LOGGING, MINING, PLANTATION
—AND—
STREET RAIL & TRAM ROADS.
Light sections Rails & Spikes in stock.
Locomotives, Motors, Cars, etc.,
NEW & SECOND HAND.

HUMPHREYS & SAYCE,
No. 1 Broadway, New York.

The Bemis Car Box Company

Refer to the following companies in addition to those on page 1008:

Grand Ave. Ry. Co., Metropolitan St. Ry., Kansas City;
East Cleveland St. R.R., Cleveland; 6th Ave. R.R., New York.

THE BEMIS CAR BOX COMPANY,

SPRINGFIELD, MASS.; 18 & 20 Platt St., NEW YORK;
426 Insurance Exchange, CHICAGO, ILL.

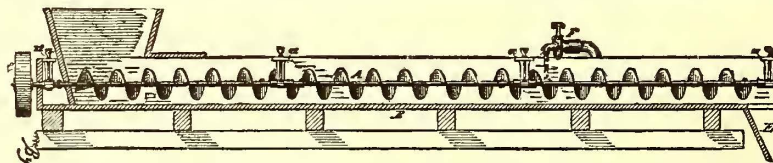
CAMBRIA STEEL Street Rails

Address,

CAMBRIA IRON CO.,
218 SO. FOURTH ST., PHILADELPHIA, PA.

The Caldwell Patent Concrete & Mortar Mixer.

The Concrete Mixers built for the Chicago City Railway Company driven by a steam engine and revolving in a trough, into which the ingredients are thrown, and a stream of water run. The mixture is delivered at the farther end ready for use. During the past season the City Railway with one of these machines mixed and concreted 920 feet of track in ten hours; and the average capacity of the machine was 850 feet per day. The



INDISPENSABLE TO CABLE RAILWAY CONSTRUCTION.

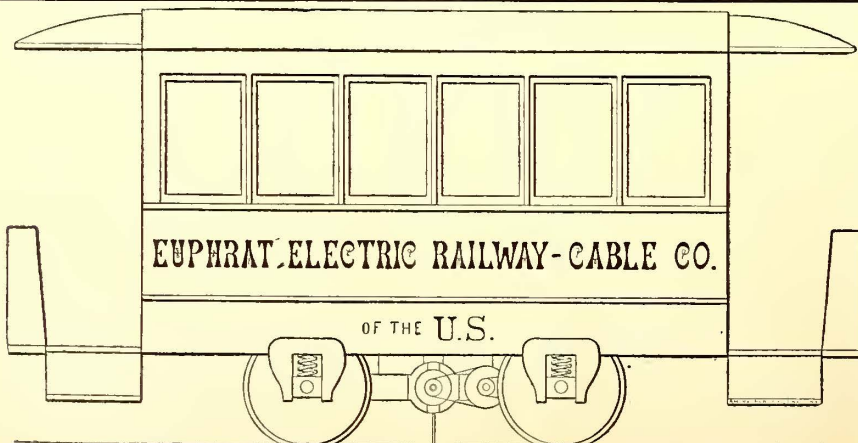
Mixes Better and Quicker than by any known Process. Mixes consist of spiral steel screws 12 in. diameter and 56 feet long, driving engine and mixing machine are carried on trucks which run on the completed track and follow as fast as concreted. These machines have also been used in building bridge foundations and mixing mortar for some of the largest buildings in the city. Gen'l Sooy Smith and Gen'l Fitzsimons have both used them in their work. Also St. Louis Cable & other roads.

Inventor and Manufacturer, Mill and Grain Elevator Supplies, etc.

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H. W. CALDWELL,

131 & 133 W. WASHINGTON STREET, CHICAGO, ILL.



Euphrat Electric Ry.-Cable,

A Sub-Surface System for
STREET RAILWAYS.

No Overhead Wires. No Storage Batteries. Adaptable to any Good Motor and to Ordinary Street Cars.

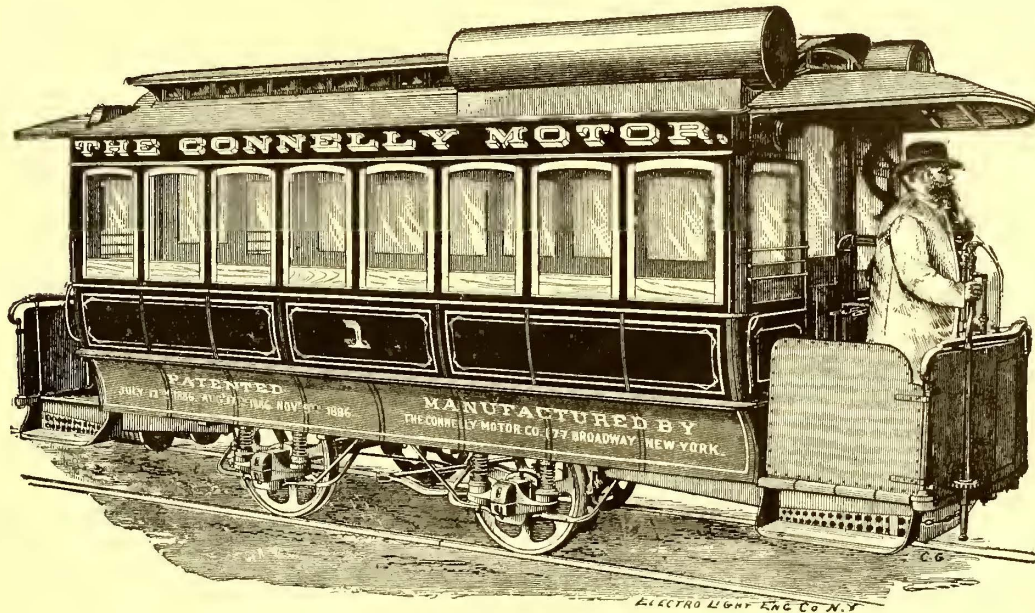
The only practicable way yet discovered for supplying to a traveling Motor a direct and unbroken current of electricity from an insulated underground conductor.

Circulars will be sent and information furnished on application to

A. L. EARLE or F. EUPHRAT,
137 BROADWAY, Room 15, NEW YORK.

THE CONNELLY MOTOR.

PATENTED.



No Fire! No Smoke! No Dust! No Ashes! No Fireman! No Engineer!
Complete within Itself! Generates its own Power! Perfectly Independent! Can run on any Track!
No Cables, "grips" or expensive conduits.
No "Central Station" for generating power.
No loss of power in transmission.
No dangerous Electric currents.
No tearing up of streets for repairs.
No suspension of traffic for repairs.

The Connelly Gas Motor generates its own gas from Naphtha; carries a supply for a day's run, and consumes but **ONE GALLON PER HOUR.**

It excels all other motors in **ECONOMY** and **CONTROLLABILITY**, and stands alone in its **INDIVIDUALITY.**

The daily expense of operating a road with these motors **IS IN EXACT PROPORTION TO THE NUMBER OF MOTORS IN USE**, which cannot be said of any Cable or Electric system.

The cost of equipping a road with them is about **ONE-HALF** the cost of any Electric system, and less than **ONE-FOURTH** the cost of any Cable system.

The cost of operating, including Fuel, Lubrication, Care, Repairs and Royalties, will not exceed **\$2.00** per day, being about **HALF** the cost by Cable or Electricity.

Any road can adopt these motors without making any change in their system, without interruption to their business, and without risking any investment in special plant, as a few motors can be put into use along with the Horse-cars, and the number gradually increased.

All companies desiring to abandon the use of horses should examine fully into the merits and peculiar advantages of our system, before making any contracts, as it is the only system that can be applied with equal economy on both large and small roads.

All parties interested in street or suburban roads are requested to correspond with us-

THE CONNELLY MOTOR CO., 177 BROADWAY, NEW YORK CITY.

The Julien Electric Company.

OFFICE, 120 BROADWAY, N. Y

FACTORY, CAMDEN, N. J.

Electric Street Cars on Secondary Battery Principle.

EDMOND JULIEN, Engineer, of Brussels, Belgium, is the inventor both of the Traction System and Secondary Battery System of this company. The present car is the result of six years of unceasing experiments, carried on at his works in Brussels and on the streets of that city, at great cost.

The leading principle of Mr. Julien's System has been the application of an Electric Motor and Batteries to the present existing rolling stock of street railways, and to construct a car so simple in its management that the drivers and conductors at present in charge of horse cars may take to the new service as easily as to the old. Mr. Julien, after running an Electric Car on the Rue de la Loi in Brussels, during the years 1884 and 1885, and ascending a grade of 5 per cent on that street, put his car in service at the Autwerp International Exhibition of Mechanical Traction in May, 1885, and ran it daily a distance of 57 miles, sometimes drawing an ordinary street car, both cars filled with passengers, and in competition with steam and compressed air motors; and the jury, consisting of eminent Engineers from England, Germany, France and Belgium, awarded Mr. Julien the First Prize and Diploma of Honor for the best System of Mechanical Traction for street cars.

At the end of this Exhibition, Mr. Julien placed two cars on the streets of Hamburg, and afterwards added a third. Those cars have now been running since February, 1886. They each make 69 miles a day and in one place over a 4 per cent grade, carrying passengers; and, although the municipal requirements of Hamburg were very exacting, yet the Electric car has so satisfactorily met them, that it has been adopted in that city. Readers are requested to write to Hamburg to satisfy themselves. The batteries used upon these cars were examined by the municipal officers two months ago, and were found in as perfect condition as when they were first put in the cars.

In April, 1886, Mr. Julien closed a contract with all the Brussels street railways, whereby they have agreed to adopt his System and to put 107 cars in use in Brussels. They are now ready to put three lines of Mr. Julien's system in service, if they have not already done so. The street railways at Rio Janeiro have also adopted Mr. Julien's system.

Last June, Mr. Julien placed two of his cars in service on the Champs Elysees under the supervision of ten members of the International Society of Electricians of France, M. Foutaine at the head. They did service between the Place de la Concorde and the Palais de l'Industrie during the entire summer, and, at the end of the Exhibition, were awarded a first prize and Diploma of Honor. Mr. Julien's Batteries were also put in competition there with those of Faure and Plante under the supervision of Mr. Hospitalier, an eminent Electrician; and Mr. Julien was awarded the first prize and a Diploma of Honor. The Faure and Plante batteries received a third prize and silver medal. Mr. Julien's car, which is now exhibited on Eighth Avenue, New York City, is working its way into favor and has been so adapted to the new conditions arising from sharp curves and an irregular track, as to travel easily at a rate of eight and one-half (8½) miles an hour and carrying a full load.

COST.

The cost of Installation of Mr. Julien's System is about the same as that of horse system. It is, in all probability, less; and, once installed, the expense of maintaining it is, of course, much less. In Brussels, this expense has been found, after an examination, covering a period of nearly a year, by a committee of Street Car men, to be a little over Three Dollars (\$3.00) a day for each car. In this country, the expense will not exceed Four Dollars (\$4.00) per day. From our observations on the Eighth Avenue line, it will be less than that on that line, owing to the favorable nature of the grades. The cost of horse traction is deemed to be at least Seven Dollars (\$7.00) a day. We speak, of course, of two-horse cars.

The manipulation of the System is far easier than that of the horse system. Each car will require about three horse power in the way of steam engine, so that a road maintaining, say, 40 cars, would require three 60 horse power engines, one engine being in reserve. The dynamic power required is the same. Each car will require about three tons of battery; this will enable the car to be run about 80 miles a day with but one change of battery. It requires

about eight hours to charge each battery. The three tons will be divided into two batteries, one being charged while the other is being used on the car. The batteries are ranged on either side of the car on benches; when the car comes in from service and its batteries are exhausted, it is run up between empty benches, which are on a level with the panels of the car, the panels are let down and the batteries are easily drawn out on greased rods. Adjoining the empty benches are the benches with the charged batteries, which take the place of the discharged ones.

Mr. Julien's batteries being made on a new principle—that is, *inoxidizable support plates*—are found to have an unlimited life and to be capable of being run up to a very high intensity without any injurious effect. In heavy grades, and going around curves, the current may be run up to 70 amperes without any fear of injury to the battery. As all Electricians know, Mr. Julien's is the only battery that can pretend to stand so high an intensity. Yet it may be seen every day on the Eighth Avenue road. The motor required for a large car will vary, according to the grades of the road, from 7 to 10 horse power. We do not consider it economical to overcome long grades of more than 5 per cent, though of course the car may be made to overcome much higher grades than this, especially for short distances. Curves should be at least 40 feet radius, although, on the Eighth Avenue road, we are compelled to run around curves of only 29 feet radius; yet there is an element of danger to the gearing of the car in so short a curve.

Next to Mr. Julien's motor, which is especially adapted, by its simplicity, for use on a Street Car, the Electrical Regulator is worthy of admiration. It is placed at either end of the car and controls so effectively and so methodically the application of power that an ordinary driver may learn the use of it with entire success in less than a few hours. Of course, railroads using this Company's cars will be enabled to light their stables with the Secondary battery employed in the service; the cars are, of course, lighted from the same batteries. One company now adopting Mr. Julien's System are undertaking to light the streets along which the cars will run from their stables, thereby reducing the cost of their installation by getting a profit from the City.

Wm. E. Horwill, Supt. Walter G. Howey. Office 394 Kent ave.

Grand Street, Prospect Park & Flatbush R.R. Co. 8½ m, 4-8½ g, 50 lb c-r, 75 2-h c, 245 h. Pres. Thos. Clark, Jr., Sec. & Treas. Chas. Cretdels, Supt., Pur. Agt. & Supt. Car Reps. John L. Helms. Leased to Brooklyn City & Newtown R.R. Co. Office, Franklin ave. & Prospect place.

Greenpoint & Lorimer St. R. R. Co. 5½ m, 4-8½ g, 50 lb r, 36 c, 183 h. Pres. Geo. W. Van Allen, Sec. Wm. B. Walt, Treas. C. B. Cottrell, Supt. Chas. E. Harris. Office, cor. Nostrand and Park aves.

New Williamsburgh & Flatbush R. R. Co. 17½ m, 4-8½ g, 47-50 lb r, 78 c, 299 h. Pres. Geo. W. Van Allen, 54 Ann st., New York, Sec. W. B. Walt, 34th st. & 9th ave., New York, Treas. C. B. Cottrell, 8 Spruce st., N. Y. City, Supt. Chas. E. Harris, Nostrand & Park aves., Brooklyn.

Prospect Park & Flatbush R. R. Co. 3 m, 4-8½ g, 34 lb r, 4 c, 16 h. Pres. John G. Jenkins, Sec. & Supt. W. G. Howey, Treas. Theo. F. Jackson. Offices 45 Broadway.

South Brooklyn Central R.R. Co. 8½ m, 4-8½ g, 60 lb r, 42 c, 193 h. Pres. Wm. Richardson, Sec. Wm. J. Richardson, Treas. N. H. Frost, Asst. Treas. Jas. S. Suydam, Offices, Atlantic & 31 aves.

Van Brunt St. & Erie Basin R.R. Co. 3 m, 4-8½ g, 45 lb r, 7 c, 26 h. Pres. & Supt. John Cunningham, Sec. & Treas. Edmund Terry. Offices, 264 Van Brunt st.

BRUNSWICK, GA.—Brunswick St. R. R. Co. 4½ m, 4-8½ g, 38 lb steel r, 6 c, 25 h. Pres. C. P. Good-year, Sec. & Gen. Man. U. Dart, Treas. W. E. Kay. Office, Newcastle st.

BUFFALO, ILL.—See Mechanics Building, Ill.

BUFFALO, N. Y.—Buffalo St. R.R. Co. 15½ m, 4-8½ g, 60 lb r, 109 c, 615 h. Pres. Henry M. Watson, V. Pres. P. Pratt, Sec. S. S. Spaulding, Treas. W. H. Watson, Supt. Edward Edwards, Engr. Marsden Davey. Office, 846 Main st.

Buffalo East Side St. Ry. Co. 32 m, 4-8½ g, 42 & 50 lb c-b-r, 59 c, 301 h. Pres. S. S. Spaulding, V. Pres. Joseph Churchyard, Sec. H. M. Watson, Treas. W. H. Watson, Supt. Edward Edwards, Engr. Marsden Davey. Office 346 Main st.

BURLINGTON, IA.—Burlington St. R.R. Co. 3½ m, 4-8½ g, 16-22 lb r, 9 c, 23 h, 10 mu. Pres. & owner, John Patterson, Sec., Treas. & Man. C. T. Patterson. Office, 1401 Summer st.

Union St. Ry. Co. 8½ m, 4-8½ g, various r, 20 c, 80 h. Pres. Geo. A. Duncan, Sec., Treas. & Supt. F. G. Jones.

BURLINGTON, VT.—Winooski & Burlington St. Ry. Co. 3½ m, 4-8 g, 25 lb r, 8 c, 30 h. Pres. U. A. Woodbury, V. Pres. F. C. Kennedy, Supt. K. B. Walker, Treas. L. E. Woodhouse, Clerk, G. W. Wales. Office, 167 Bank st.

CAIRO, ILL.—Cairo St. Ry. Co. 3 m, 3-6 g, 25 lb r, 5 c, 12 h. Pres. J. A. Goldstine, V-Pres. C. V. Neff, Supt. & Treas. Thos. Lewis, Sec. H. Schulze.

CALLOPE, IA.—Callorpe & Hawarden St. R. R. Co. Gen. Man. E. E. Carpenter.

CAMBRIDGE, MASS.—Cambridge R.R. Co. 55½ m, 4-8½ g, 45 lb T and tram r, 237 2-h c, 1,646 h. Pres. Prentiss Cummings, Treas. & Clerk Franklin Perrin, Exec. Com. L. M. Spelman, P. Cummings, O. S. Brown, Clerk of Directors, O. S. Brown, Supt. Wm. A. Bancroft, Pur. Agt. & Supt. Car Reps. A. K. Sweet.

CAMDEN, N. J.—Camden & Atlantic St. Ry. 8½ m, 6-1 g, 35-47 lb tram r, 18 c, 100 mu. Pres. Wm. L. Elkins, V. Pres. Wm. G. Sewell, Sec. D. M. Zimmerman, Treas. W. Taylor, Supt. Wm. N. Bannard.

Camden Horse R.R. Co. 9 m, 5-1 g, 35-52 lb r, 26 c, 87 h. Pres. Thos. A. Wilson, Sec. Wilbur F. Rose, Treas. & Supt. John Hood.

CANTON, O.—Canton St. Ry. Co. 4½ m, 4 g, 28 lb r, 11 c, 59 h. Pres. & Treas. E. Cook, Sec. John F. Clark, Supt. O. L. Stanton. Office, 4 E. 7th st. a

CAPE MAY, N. J.—Cape May & Schellenger's Landing R. R. Co. 3 m, 5-2 g, 45 lb r, 4 1-h 2-h c, 50 h. Pres. Wm. Wharton, Jr., Sec. & Treas. Wm. Seifridge, Supt. Jas. Leaming.

CARTHAGE, MO.—Carthage Horse Ry. Co. 3½ m, 3-6 g, 20 lb T r, 3 2-h c, 16 mu. Pres. & Pur. Agt. J. W. Ground, Sec. Nellie Ground, Treas. & Supt. A. J. Ground. Office, 19 S. Main st.

CEDAR RAPIDS, IA.—Cedar Rapids & Marion Ry. 13½ m, 4-8½ g, 28-30-35 lb r, 20 c, 44 h. Pres. W. Greene, V-Pres. A. J. McKean, Sec. N. B. Con-signy, Treas. G. Greene, Supt. Wm. Elsom. Office, 11 N. Second st.

CENTERVILLE, IA.—People's St. Ry. Co. 1½ m, 3-6 g, 20 & 27 lb r, 3 1-h c, 8 mu. Pres. Wm. Bradley, Sec. H. A. Russell.

CHAMPLAIN, ILL.—Champaign St. R. R. Co. Pres. J. L. Ray.

Urbana & Champaign St. R.R. Co. (See Urbana.)

CHARLESTON, CAN.

CHARLESTON, S. C.—Charleston City Ry. Co. 9 m, 4-8½ g, 38 lb r, 32 c, 110 h, 1 mu. Pres. Jno. S. Riggs, Sec. and Treas. Evan Edwards, Asst. Treas. Frank Whilden, Supt. Jno. Mohlenhoff. Office 2 Broad st.

Enterprise R.R. Co. 15 m, 5 g, 42 lb r, 29 pass. c, 10 freight c, 95 h. Pres. A. F. Ravenel, Sec. & Treas. W. E. Hayne, Supt. T. W. Passafalgue.

Middle Street Sullivant Island Ry. Co. 2½ m, 4-8½ g, 20 lb T r, 7 c, 14 mu. Pres. B. Cullaghan, Sec. & Treas. Frank F. Whilden, Supt. B. Backley. Office 2 Broad st.

CHARLOTTE, N. C.—Charlotte St. Ry. Co. 3½ m, 4-8½ g, 16 lb r, 4 c, 26 mu. Pres. W. J. Rushton, Sec., Treas. & Gen. Man. E. K. Osborne, Supt. F. W. Dixon.

CHARLOTTESVILLE, VA.—Charlottesville & University St. Ry. Co. 1½ m, 4-8½ g, 16 lb T r, 3 1-h c, 10 h. Pres. R. P. Valentine, Sec. C. P. Benson, Supt. H. D. Porter.

CHATTANOOGA, TENN.—Chattanooga St. R. R. Co. 12 m, 4-8½ g, 25-45 lb r, 26 c, 124 mu. Pres. and Treas. J. H. Warner, Sec. C. R. Gaskill, Supt. Geo. J. Stubbfield.

CHESTER, PA.—Chester St. Ry. Co. 9½ m, 5-2½ g, 47 lb r, 18 c, 40 h, 40 mu. Pres. E. Mitchell Cornell, Sec. Wm. S. B'akeley, Treas. Sam'l H. Seeds. Office, 1,300 Edgmont ave.

CHETOPA, KAN.—Chetopa St. Car Co. 4 m, 3-6 g, glider R, 3 1-h 6 2-h c, 20 h, 10 mu. Pres. V. S. Roy, Sec. D. Richards, Treas. K. H. Peters, Supt. P. D. Jeffries, Pur. Agt. K. S. Anderson, Supt. Car Reps. W. H. Alden. P. O. Box 75.

CHICAGO, ILL.—Chicago City Ry. Co. 102 m, of which 26½ m cable, 4-8½ g, 45, 65 & 75 lb r, 50 2-h c, 232 cable c, 1,700 h, 5,000 H. P. engines. Pres., Supt. & Pur. Agt. C. B. Homes, V. Pres. S. B. Cobb, Sec. Henry H. Windsor, Treas. T. C. Pennington, Master Car Builder Jas. B. Wright, Track Master C. J. Luck. Office, 2,020 State st.

Chicago Pass. Ry. Co. 21 m, 52 lb r, 60 c, 500 h. Pres. Harvey T. Weeks, Supt. Austin J. Doyle.

Chicago West Division Ry. Co. 93 m, 4-8½ g, 43 lb r, 900 c, 4,300 h. Pres. J. R. Jones, V. Pres. B. H. Campbell, Sec. & Treas. Geo. L. Webb, Supt. De Witt C. Cregier. Office of Pres., 59 State st.; Supt., 511 Randolph st.

North Chicago City R.R. Co. 45 m, 4-8½ g, 45 lb r, 375 c, 1,800 h. Pres. Chas. T. Yerkes, Treas. Illram Crawford, Supt. Fred L. Thredy, Purch. Agt. John M. Roach, Master Mechanic J. Millar, Car Builder H. N. E. Cottler. Office, 441 N. Clark st.

CHILLICOTHE, O.—Chillicothe St. R.R. Co. 2 m, 3 g, 16 lb r, 7 c, 20 mu. Pres. E. P. Safford, Sec. A. E. Wemts, Treas. William Poland, Supt. E. H. McMartin.

CINCINNATI, O.—Cincinnati Inclined Plane Ry. Co. 6½ m, 5-2½ g, 43 lb r, 25 c, 140 h. Pres. Geo. A. Smith, Sec. & Supt. James M. Doherty, Tr. J. S. Hill.

Cincinnati St. Ry. Co. 100 m, 5-2 g, 42-52 lb r, 275 c, 2,000 h. Pres. Jno. Kilgour, Treas. R. A. Duntap, Sec. & Auditor, Jas. A. Collins, Supt. Jno. Harris, Pur. Agt. B. F. Haughton. Office second floor of Apollo Building.

Columbia & Cincinnati St. R.R. Co. 3½ m, 3 g, 40 lb r, 6 c, 3 dummy v. Pres. & Auditor C. H. Kilgour, V. Pres. John Kilgour, Treas. & Sec. A. H. Meler, Mt. Lookout, O. Office Station C.

Mt. Adams & Eden Park Inclined R.R. Co. 7 m, & 8 m cable, 5-2½ g, 42 lb r, 20 c, 40 cable c, 175 h. Pres. G. B. Kerper, Sec. J. R. Murdoch, Supt. R. P. Alley. Office, head of Mt. Adams incline.

Mt. Auburn Cable Ry. Co. 8 m, cable, 5-2 g, 52 lb glider r, 20 c, 2,350 H. P. engines. Pres. Henry Martin, Sec. W. F. Irwin, Treas. John H. Martin. Office Highland ave. & Saunders st.

Price Hill Inclined Plane R.R. Co. 8-13 m, 5-6 g, 60 lb r, 4 c. Pres. M. W. Oliver, Gen. Man. Rees E. Mc Duffie, Sec. & Treas. Geo. T. McDuffie. Office, Price Hill.

So. Covington & Cincinnati. (See Covington, Ky.)

CLARKSVILLE, TENN.—Clarksville St. Ry. Co. 2 m, 4-8 g, 16 lb T-r, 9 c, 16 mu. Pres. John F. Shelton, Sec. & Treas. John W. Faxon. Capital, \$6,250. Office, Farmers' & Merchants' Nat. Bank.

CLAY CENTER, KAN.—Clay Center City Ry. Co. 5 m, 4-8½ g, 24 lb r, 4 c, motors. Capital, 10,000. Pres. G. M. Stratton, V. Pres. J. M. Frank, Sec. & Treas. Wm. Sharpe.

CLEVELAND, O.—Brooklyn St. R.R. Co. 12½ m, 4-8½ g, 52 lb r, 70 c, 403 h. Pres. Tom L. Johnson, V. Pres. A. J. Moxham, Sec. J. B. Hoegen, Treas. John McConnell, Supt. A. L. Johnson. Office 1,301 Pearl st.

Broadway & Newburg St. R.R. Co. 11.4 m, 4-8½ g, 43 lb r, 36 c, 250 h. Pres. Joseph Stanley, V. Pres. H. E. Andrews, Sec. & Treas. E. Fowler, Supt. J. J. Stanley. Office 1373 Broadway.

East Cleveland R. R. Co. 20½ m, 4-8½ g, 45 lb steel r, 115 c, 550 h. Pres. A. Everett, V. Pres. Chas. Wason, Sec. & Treas. H. A. Everett, Supt. E. Duty. Offices, 1154 Euclid ave.

Superior St. R.R. Co. 15 m, 4-8½ g, 45 lb r, 46 c, 265 h. Pres. Frank De H. Robinson, V. Pres. John Koch, Sec. J. H. Robinson, Treas. & Supt. M. S. Robinson, Jr.

South Side St. Ry. Co. 5 m, 3 g, 25 & 27 lb tram r, 8 2-h c, 26 h, 45 mu. Pres. Tom L. Johnson, Sec. & Treas. J. B. Hoegen, Supt. Jebson Holemam. Office, 1301 Pearl st.

St. Clair Street Ry. Co. 9 m, 4-8½ g, 40 lb steel r, 6 one-h. & 24 two-h c, 105 h. Pres. Chas. Hathaway, V. Pres. S. S. Lyon, Sec. A. G. Hathaway, Treas. & Gen. Man. C. Hathaway, Jr. Office, 515 St. Clair st. a

Woodland Avenue & West Side St. R.R. Co. 40 m, 4-8½ g, 43-45 lb r, 140 c, 630 h. Pres. M. A. Hanna, V. Pres. C. F. Emery, Sec. & Pur. Agt. J. B. Hanna, Gen. Supt. George G. Mulhern. Office, cor. Pearl and Detroit sts.

CLINTON, IA.—Lyons & Clinton Horse R.R. Co. (See Lyons.)

COLUMBIA, S. C.—Columbia St. Ry. 4½ m, 4-8½ g, 30 lb r, 6 c, 24 h, 3 mu. Pres. E. M. Cole, Sec. Edw. Benedict, Treas. W. de L. Benedict, all of 32 Liberty st., New York. Capital, \$50,000.

COLUMBUS, GA.—Columbus St. Ry. Co. 3 m, 4-8½ g, 16 lb T r, 9 2-h c, 7 h, 27 mu. Pres. & Pur. Agt. B. T. Hatcher, Sec. & Treas. F. C. Weisiger, Supt. J. B. Weisiger.

COLUMBUS, O.—Columbus Consolidated St. R.R. Co. 25 m, 5-2 g, 35-52 lb r, 97 c, 383 h. Pres. A. D. Rodgers, V. Pres. H. T. Chittenden, Sec. & Treas. E. K. Stewart, Supt. J. H. Atcherson.

Glenwood & Greenlawn St. R.R. Co. 4½ m, 3-6 g, 24 lb r, s c, 25 h. Pres. A. D. Rodgers, V. Pres. B. S. Brown, Sec. R. R. Rickly, Treas. S. S. Rickly, Supt. Jonas Wilcox. Office 9 S. High st.

CONCORD, N. H.—Concord Horse R.R. Co. 7½ m, 3 g, 34 lb r, 9 c, 15 h, 2 steam motors. Pres. & Supt. Moses Humphrey, Treas. H. J. Crippin, Clerk E. C. Hoag.

CORNWALL, ONT.—Cornwall St. Ry. Co. 3 m, 4-8½ g, 10 lb T r, 4 c, 2 steam motors. Pres. Chas. D. Haines, Sec. & Treas. A. G. Haines.

CORTLAND, N. Y.—Cortland & Homer Horse R.R. Co. 4 m, 4-8½ g, 25-30 lb r, 6 c, 16 h. Pres. Chas. H. Garrison, Troy, N. Y. V. Pres. E. A. Fish, Cortland, Sec. & Treas. S. E. Welch, Cortland, Office 33 N. Main st.

COTTONWOOD FALLS, KAN.—Consolidated St. Ry. Co. 2 m, 3 g, 30 lb steel T r, 2 1-h 2-h c, 5 mu. Pres. E. A. Heidebrand, Sec. & Pur. Agt. W. P. Martin, Treas. J. M. Tuttle, Supt. W. H. Hulsinger. 9

COUNCIL BLUFFS, IA.—Council Bluffs St. Ry. Co. 5 m, 4-8½ g, 27 lb r, 10 c, 32 h. Pres. S. R. Callaway,

Sec. & Treas. Geo. R. Hall, Supt. Wm. H. Burns. Office, 56-6 First ave.

Lake Manawa Ry. Co. 4½ m, 4-8½ g, 25 lb steel r, 10 c, steam motors. Pres. & Treas. J. K. Graves, Sec., Gen. Man. & Pur. Agt. W. S. Couch. Capital, \$50,000.

COUNCIL GROVE, KAN.—Council Grove St. Ry. Co.

COVINGTON, KY.—So. Covington & Cincinnati St. Ry. Co. 23½ m, 5-2½ g, 45 lb r, 61 c, 370 h. Pres. E. F. Abbott, Sec. J. C. Benton, Treas. G. M. Abbott. 9

DALLAS, TEX.—Dallas Consolidated St. Ry. Co. 16 m, 4-8½ g, 30 lb r, 40 c, 130 mu. Pres. J. E. Henderson, Sec. W. C. Connor, Treas. Royal A. Ferris.

DANBURY, CONN.—Danbury St. R. R. Co. 4 m, 3-6 g, 25 lb T r, 7 1-h c, 30 h. Pres. John D. Haines, Sec. & Treas. Charles D. Haines, Supt. & Pur. Agt. A. G. Haines.

Danbury & Bethel St. Ry. Co. 5 m, 4-8½ g, 25 lb T r, 12 c, 85 h. Pres. D. D. Wylie, V. Pres. S. C. Holley, Sec. & Tr. J. B. McGeorge, Supt. Wm. Foster. 11

DANVILLE, ILL.—Citizens' St. Ry. Co. 5 m, 4 g, 20 lb r, 8 c, 42 mu. Pres. Wm. P. Cannon, V. Pres. A. C. Daniel, Sec. & Treas. Adam R. Samuel. Office, 146 Vermilion st.

DAVENPORT, IA.—Davenport Central St. Ry. Co. 3 m, 4-8½ g, 20 lb r, 14 c, 24 h, 15 mu. Pres. Whit. M. Grant, V. Pres. W. L. Allen, Treas. J. B. Fidler, Sec. O. S. McNeil, Supt. J. W. Howard.

Davenport City Ry. Co. 3½ m, 4-8½ g, 27 lb r, 14 c, 46 h. Pres. C. S. Watkins, Sec. and Treas. S. D. Bawden, Supt. & Pur. Agt. H. Schmitzger.

DAYTON, KY.—Newport & Dayton St. Ry. Co. 2 m, 5-2½ g, 44 lb r, 9 c, 36 h. Pres. & Supt. W. W. Bean.

DAYTON, O.—Dayton St. R.R. Co. 7½ m, 4-8½ g, 44 lb r, 25 c, 61 h, 40 mu. Pres. C. J. Ferneling, V. Pres. G. W. Rogers, Sec. C. A. Craighead, Supt. A. W. Anderson. Office, W. 3d st.

Fifth St. R. R. Co. 7 m, 4-8½ g, 45 lb r, 18 c, 58 h. Pres. A. A. Thomas, Sec. D. B. Corwin, Treas. R. I. Cummin, Supt. J. M. B. Lewis. Office, 7 E. 3d st. a

Oakwood St. Ry. Co. 6 m, 4-8½ g, 38 lb r, 14 c, 25 h, 23 mu. Pres. Charles B. Clegg, Sec. H. V. Perrine.

Wayne & Fifth St. R. R. Co. 4½ m, 4-8½ g, 38 lb r, 10 c, 35 h. Pres. Geo. W. Shaw, Sec. & Treas. Eugene Watchet, Supt. N. Routzahn. Office, 29 Wayncst.

DECATUR, ILL.—Decatur & North Park St. Ry. Co. Atty. Geo. Brown.

Citizens' Street R.R. Co. 2 m, 4-8½ g, 20 lb T r, 9 c, 45 h & mu. Pres. D. S. Shellabarger, Sec. W. L. Shellabarger, Treas. & Gen. Man. W. L. Ferguson. a

DENISON, TEX.—Denison St. Ry. Co. 3½ m, 3-6 g, 16 lb r, 7 c, 25 mu. Pres. C. A. Walterhouse, Supt. J. J. Campbell.

DENVER, COL.—Denver City Ry. Co. 30 m, 3-6 g, 21 lb r, 80 c, 450 h. Pres. Geo. H. Holt, 10 Wall st., New York City, Sec. G. D. L'huillier, 11 Wall st., New York City, Treas. & Man. G. E. Randolph. Office, 10 Wall st., New York.

Colfax Ave. Ry. Co. 3 m, 4-8½ g, 27 lb r, 2 1-h c, 6 h. Pres. T. S. Hayden, Sec. & Pur. Agt. H. P. Chamberlain, Treas. D. Fletcher, Supt. J. Flannery. Office, 1,664 Lawrence st.

Denver Tramway Co. 4 m, 3-6 g, 16-18 lb r, 10 c. Run by electricity. Conduit; Short-Nesmith Series system. Pres. Rodney Curtis, V. Pres. John J. Riechman, Sec. Wm. G. Evans.

DES MOINES, IA.—Des Moines St. R. R. Co. 12 m, 3 g, 25-30-38-52 lb r, 24 c, 140 h. Pres. W. McCall, V-Pres. C. W. Rogg, Sec. F. A. Sherman, Treas. G. B. Hippee.

Capital City St. Ry. Co. 7 m, 4-8½ g, 45 lb r, 6 c, 32 h. G. Van Ginkel, Sec. H. E. Teachout, Treas. J. Weber. Office, cor. E. 5th & Locust sts.

Des Moines & Sevastopol St. Ry. Co. (See Sevastopol, Ia.)

DETROIT, MICH.—Fort Wayne & Elmwood Ry. Co. 9.1 m, 4-8½ g, 45 lb r, 41 c, 270 h. Pres. H. B. Brown, V. Pres. Edward Kanter, Sec. N. W. Goodwin, Treas. E. S. Heineman, Supt. Geo. S. Hazard. Office, 129 Griswold st.

Detroit Electric Ry. Co. 2 m, 30 lb r, 4 c, elec. motors. Van Depoele system; overhead conductor. Pres. H. M. Campbell, Sec. Bethune Duffield. Offices, 23 & 24 Campau Bldg.

Detroit City Ry. 35 m, 4-8½ g, 40-43½ lb r, 130 c, 1,150 h. Includes Jefferson Ave. line, Woodward Ave. line, Michigan Ave. line, Gratiot Ave. line, Brush St. line, Cass Ave. line, Congress & Baker line, Trumbull ave. line. Pres. Sidney D. Miller, Treas. George Hendrie, Sec. James Heugh, M. M. John Willis, Office, 12 Larned st. W.

Grand River St. Ry. Co. 4½ m, 4-8½ g, 45 lb r, 15 c, 160 h. Pres. & Treas. Jos. Dalley, Sec. J. W. Dalley, Supt. C. M. Dalley.

Highland Park Ry. Co. 3 m, 4-8½ g, 42 lb r for ½ m in city limits, outside 35 lb T r, 4 c, electric motors. Overhead conductors. Pres. and Treas. Frank E. Snow, Sec. F. Woodrauf. Capital, \$50,000. Office, 92 Griswold st.

DIGHTON, KAN.—Western Kansas St. Ry. & Transfer Co. 1 m, 4-8½ g, 1 1-h c, 1 h. Pres. V. H. Grinstead, Sec. H. A. Wishard, Treas. C. B. Frazer. 9

DOVER, N. H.—Dover Horse R.R. Co. 5 m, 3 g, 30 lb r, 4 c, 14 h. Pres. Chas. H. Sawyer, Treas. Harrison Haley.

DUBUQUE, IA.—Dubuque St. R.R. 7 m, 4-8½ g, 52 lb r, 23 c, 60 h. Pres. J. A. Rhomborg, Sec. & Treas. B. E. Linehan, Supt. J. J. Linehan. Office, 21st st. & Coulier ave.

DULUTH, MINN.—Duluth St. Ry. Co. 5½ m, 3-6 g, 35-45 lb r, 18 c, 91 mu. Pres. Sam'l Hill, V. Pres. T. P. Wilson, Sec. & Treas. A. S. Chase, Supt. T. W. Hoopes.

DURHAM, N. C.—Durham St. Ry. Co. 2 m, 4-9 g, 16 lb T r, 2 1-h c, 6 h. Pres. W. T. Blackwell, Sec., Treas. & Supt. R. D. Blackwell.

EAST SAGINAW, MICH.—East Saginaw St. Ry. 8 m, 4-8½ g, 30 and 40 lb r, 23 c, 70 h. Pres. Walter A. Jones, Acting Sec. C. A. Bartlett, Supt. A. Bartlett.

EAST ST. LOUIS, ILL.—East St. Louis St. R.R. Co.

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H. H. LITTELL, Louisville, Ky.

EASTON, PA.—Easton, So. Easton & West End Pass. Ry. Co. 4 m, 5-2 1/2 g, 45 lb r, 11 1-h c, 48 h. Pres. H. A. Sage, Sec. & Treas. H. W. Cooley, Supt. Murray Swain.

EAU CLAIRE, WIS.—Eau Claire St. Ry. Co. 5 m, 4-8 1/2 g, 27 lb, 42 lb center bearing steel, and 60 lb grooved steel r, on all curves, 16 c, 80 h. Pres. A. G. Bradstreet, New York, V. Pres. Geo. B. Shaw, Eau Claire, Sec. & Treas. Weston Lewis, Gardiner, Me.

ELGIN, ILL.—Elgin City Ry. 2 1/2 m, 4-8 1/2 g, 25 lb r, 4 c, 18 h. Pres., Sec., Treas. Supt. & Owner, B. C. Payne.

ELIZABETH, N. J.—Elizabeth & Newark Horse R. R. Co. 14 m, 5-2 1/2 g, 4-10 1/2 g, 30 lb r, 24 c, 74 h. Pres. & Treas. Jacob Davis, Sec. & Supt. John P. Pritchard, 6 Elizabeth St. Ry. Co. Pres. & Supt. Amos Clark, Sec. & Treas. John P. Earl.

ELKHART, IND.—Citizens' Ry. Co. 6 1/2 m, 4-8 1/2 g, 20 & 30 lb r, 9 c, 25 lb. Pres. F. W. Miller, V. Pres. J. W. Ellis, Sec. C. W. Fish, Treas. J. A. Cook, Man. Director, Jas. Kavanagh.

ELMIRA, N. Y.—Elmira & Horseheads Ry. Co. 10 m, 4-8 1/2 g, 25-30-40 lb r, 18 c, 34 h. Pres. & Treas. George M. Diven, V. Pres. Geo. W. Hoffman, Sec. Wm. S. Kershner, Acting Supt. B. F. Jennings. Office, 212 E. Water st.

EL PASO, TEX.—El Paso St. Ry. Co. 6 m, 4-8 1/2 g, 30-40 lb r, 18 c, 40 mu. Pres. J. F. Crosby, V. Pres. B. H. Davis, Treas. C. R. Morehead, Sec. & Supt. G. N. Marshall. Office, 175 Seventh st.

EMPORIA, KAN.—Emporia City Ry. Co. 3 1/2 m, (g, 20 lb r, 8 c, 24 h. Pres. Van R. Holmes, Treas. F. Crowe, Sec. & Man. J. D. Holden.

ENTERPRISE, MISS.—Enterprise St. Ry. Co. 1 1/2 m, 3-6 g, 24 lb r, 2 c, 6 h. Pres. John Kampe, V. Pres. E. B. Gaston, Sec. & Treas. J. W. Gaston.

ERIE, PA.—Erie City Passenger Ry. Co. 8 1/2 m, 4-8 1/2 g, 30, 40 & 45 lb r, 20 c, 85 h. Pres. W. W. Reed, Treas. Wm. Spencer, Sec. J. L. Sternberg, Supt. Jacob Borst. Office, cor 2d & State sts.

EVANSVILLE, IND.—Evansville St. Ry. Co. 12 m, 4-8 g, 27 lb r, 32 c, 200 mu. Pres. John Gilbert, Sec. & Treas. W. S. Gilbert, Supt. T. J. Gist. Office, cor. First and Main sts.

FALL RIVER, MASS.—Globe St. Ry. Co. 16 m, 4-8 1/2 g, 30-35-47 lb r, 61 c, 230 h. Pres. Frank S. Stevens, Treas. F. W. Brighton, Sec. M. G. B. Swift, Supt. John H. Bowker, Jr. Office, 182 N. Main st.

FAIR ROCKAWAY, N. Y.—Village Ry. Co. 1 m, 4-8 1/2 g, 47 lb r, 5 c, 10 h. Pres. C. A. Cheever, Treas. D. L. Haght, Sec. J. S. Auerbach, Supt. Rufus Martin. Office, 13 Park row, New York.

FITCHBURG, MASS.—Fitchburg St. Ry. Co. 3 1/2 m, 4-8 1/2 g, 35 lb r, 9 c, 35 h. Pres. H. A. Willis, V. Pres. H. I. Wallace, Treas. B. F. Wallis, Sec. H. C. Hartwell, Supt. & Pur. Agt. Wesley W. Sargent. Office of Pres. 131 Main st., Supt., 41 River st.

FORT MEADE, FLA.—Fort Meade St. Car Co. 2 1/2 m, 3 g, 25 lb r, 2 1-h c, 2 mu. Pres. J. A. Edwards, Sec. C. C. Wilson, Treas. J. G. Carter, Supt. G. Darbishire.

FORT SCOTT, KAN.—Bourbon County St. R. R. Co. 7 m, 4 g, 16 lb r, 5 c, 22 h. Pres. J. D. Hill, Sec. C. O. French, Treas. J. H. Richards, Supt. E. Strong.

FORT SMITH, ARK.—Fort Smith St. Ry. Co. 4 1/2 m, 3-6 g, 30 & 45 lb r, 20 c, 18 1-h c, 56 mu. Pres. Saml M. Loud, Sec. & Treas. Geo. T. Sparks, Supt. W. A. Evers.

FORT WAYNE, IND.—Citizens' St. R. R. Co. 7 m, 4 g, 28 & 30 lb r, 1 1-h, 11 2-h c, 41 h. Pres. J. H. Bass, Sec. Jas. M. Barrett, Treas. C. F. W. Scamman, Recvler S. C. Lumbard.

FORT WORTH, TEX.—Fort Worth St. Ry. Co. 7 1/2 m, 4 g, 25-38 lb r, 16 c, 89 mu. Pres. K. M. Vandandy, Treas. W. A. Huffman, Supt. J. T. Payne.

FRANKFORD, N. Y.—Frankfort & Ilion Street Ry. Co. 2 1/2 m, 5 g, 5 c, 5 h. Pres. A. C. McGowan, Frankfort, Sec. & Treas. John A. Giblin, Ilion, Supt. Fredk. Gates, Frankfort.

FREDONIA, N. Y.—Dunkirk & Fredonia R.R. Co. 3 1/2 m, 4-10 g, 25 lb r, 5 c, 9 h. Pres. W. McKinstry, Sec. & Treas. M. M. Fenner, Supt. Z. Elmer Wheelock.

FREEPORT, ILL.—Freeport St. Ry. Co. 4 1/2 m, 4-8 1/2 g, 8 c, 48 h. Pres. Jacob Krohn, V. Pres. F. C. Platt, Sec. W. G. Barnes, Treas. John B. Taylor, Supt. H. T. Warner.

FULTON, N. Y.—Fulton & Oswego Falls St. Ry. Co. 6 000 ft, 4 8 1/2 g, Gibbon's metallic stringer and r, 4 c, 8 h. Pres. Joseph Walker, Jr., V. Pres. N. N. Stranahan, Sec. & Treas. Chas. Lyman, Capital, \$15,000. Office, 15 Broad st., New York.

GAINESVILLE, FLA.—Gainesville City & Suburban Ry. Co. 7 1/2 m, 4-8 1/2 g, 20 lb r, 5 c, 40 mu. Pres. Wm. H. Robertson, Treas. Jas. D. Matheson, Supt. & Pur. Agt. R. L. Robb.

GAINESVILLE, TEX.—Gainesville St. Ry. Co. 3 m, 3-8 g, 16 to 20 lb r, 4c, 2h, 21mu. Pres. Sam. Lazarus, V. Pres. L. Dryfoos, Sec. & Treas. Zac. Farmer.

GAINESVILLE, GA.—Gainesville & Hall Co. St. R. R. Co. 2 1/2 m, 4-8 1/2 g, 20 lb crescent r, 3 pass, 2 freight c, 8 mu. Pres. Jas. R. Barnes, Sec. C. W. Du Pre, Treas. & Pur. Agt. Robt. E. Green.

GALESBURG, ILL.—College City St. Ry. Co. 5 1/2 m, 4-8 1/2 g, 18-30 lb r, 9 c, 24 h. Pres. L. W. Sanborn, V. Pres. A. S. Hoover, Sec. & Supt. Geo. W. Delaney, Treas. J. K. Mitchell.

GALVESTON, TEX.—Galveston City R. R. Co. 25 m, 4-8 1/2 g, 30 lb r, 79 c, 218 mu. Pres. Wm. H. Sinclair, Sec. & Treas. F. J. DeMerritt, Supt. M. J. Keenan. Office, cor. Twenty-first & 1 sts.

GARDEN CITY, KAN.—Garden St. Ry. Co. 4 GLENS FALLS, N. Y.—Glens Falls, Sandy Hill & Fort Edward St. R. R. Co. 7 1/2 m, 3-6 g, 25 lb r, 8 c, 25 h. Pres. Henry Crandall, Sec. & Treas. B. B. Fowler, Supt. M. J. Byrne.

GLOUCESTER, MASS.—Gloucester City R. R. Co. 4 m, 4-8 g, 35 lb r, 10 c, 90 h. Pres. Morris C. Fletcher, V. Pres. Walter A. Jones, Sec. D. G. Pearson, Treas. F. W. Homans. Office, Railroad ave.

Sec. D. S. Presson, Treas. F. W. Homans, Supt. W. A. Strongman. Office, Railroad ave.

GRAND ISLAND, NEB.—Grand Island St. Ry. Co. 4 m, 4-6 g, 20 lb steel T r, 5 2-h 1-h c, 32 h. Pres. A. H. Baker, V. Pres. H. A. Koentig, Sec., Pur. Agt. & Supt. O. B. Thompson, Treas. Wm. A. Hagg, 9

GRAND RAPIDS, MICH.—Street Ry. Co. of Grand Rapids, Mich. 1 1/2 m, 4-8 1/2 g, 25, 35 & 40 lb r, 61 c, 240 h. Pres. W. J. Hayes, Cleveland, O., V. Pres. L. H. Wither, Grand Rapids, Treas. C. G. Swensberg, Grand Rapids, Sec. L. M. Weston, Grand Rapids, Supt. A. Bevier, Grand Rapids. Office, cor. Pearl & Canal sts.

GRATIOT, MICH.—Gratiot Elec. Ry. Co. 1 1/2 m, 16 lb steel r, 1 motor c, 1 summer c, Van Depoele overhead system. Pres. Wm. F. Botsford, V. Pres. John F. Talbot, Sec. J. H. Talbot, Treas. Chas. A. Ward. Capital, \$25,000.

GREENBUSH, N. Y.—North & East Greenbush St. Ry. Co. 1 1/2 m, 4-8 1/2 g, 4 c, 12 h. Pres. & Treas. A. Bleekerbanks, Supt. J. Gascolgne.

GREEN CASTLE, IND.—Green Castle City St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 23 lb r, 3 c, 14 h. Pres. & Supt. Dudley Rogers, Sec. James S. Nutt, Treas. Ralph Rogers, Gen. Man. E. W. Rogers. Office, 16 S. Jackson st.

GREENVILLE, S. C.—St. Ry. Co. of the City of Greenville. 2 1/2 m, 5 g, 16 lb r, 7 c, 34 mu. Pres. T. C. Gowen, Sec. G. G. Wells, Supt. P. H. Relly. Props. & Owners, Gowen & Relly.

HALIFAX, N. S.—Halifax St. Ry. Co. (Lim.) 7 m, 4-8 1/2 g, 45-60 lb r, 15 c, 65 h. Pres. John R. Bothwell, V. Pres. & Treas. John F. Zeblye, Sec. H. B. Zeblye, Supt. J. C. McDonald. Offices, Room 39, Drexel Building, New York, and Halifax, N. S.

HAMILTON, O.—Hamilton St. Ry. Co. 4 m, 3 g, 25 lb r, 11 c, 15 h. Pres. James S. Giffin, Sec. D. V. Parrish, Treas. H. L. Morey. Office, Bechtel Block.

HANNBAL, MO.—Hannibal St. Ry. Co. 2 m, 4-8 1/2 g, 36 lb r, 6 c, 22 h. Pres. & Supt. M. Doyle, Sec. & Treas. James O'Hern. Office, 300 Market st.

HARRISBURG, PA.—Harrisburg City Passenger Ry. Co. 6 m, 5-2 1/2 g, 42-47-50 lb r, 26 c, 72 h. Pres. H. A. Kelker, Sec. John T. Ensminger, Treas. R. F. Kelker Capital, \$100,000. Office, 27 South 2d st. e East Harrisburg Pass. Ry. Co. 1.2 m, 5-2 1/2 g, 33 & 52 lb steel glider r, 4 1-h c, 14 h. Pres. W. J. Calder, S. c. F. R. Leib, Treas. T. D. Greenwaldt, Supt. Jacob Shaffer.

HARTFORD, CONN.—Hartford & Wethersfield Horse R. R. Co. 12 m, 4-8 1/2 g, 45 lb r, 53 c, 259 h. Pres. E. S. Goodrich, Sec. Danl R. Howe.

HARTLAND, KAN.—Hartland St. Ry. Co. 3-6 g, 20 lb T r, 2 1-h 2-h c. Pres. & Pur. Agt. E. S. Snow, Sec. Geo. Stallard, Treas. J. T. Kirtland, Supt. W. S. Handy.

HASTINGS, NEB.—Hastings Improvement Co. 15 m, 4-8 1/2 g, 16 c, 60 h & mu. Pres. Jas. B. Harwell, V. Pres. J. J. Wemple, Sec. Charles D. Hartwell, Treas. H. Bostwick, Supt. J. A. Kraft.

HAVERHILL, MASS.—Haverhill & Groveland St. Ry. Co. 13 1/2 m, 4-4 1/2 g, 30-35 lb r, 38 c, 110 h. Pres. Jackson B. Sweet, Clerk & Treas. John A. Colby. Office 3 Water st.

HELENA, M. T.—Helena St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 28 lb r, 5 2-h c, 17 h. Pres. C. W. Cannon, V. Pres. J. B. Whitson, Sec. & Treas. L. A. Walker, Supt. J. A. Strong.

HERKIMER, N. Y.—Herkimer & Mohawk St. Ry. Co. 1 1/2 m, 4-8 1/2 g, 25 lb r, 3c, 6 h. Pres. J. M. Ausman, V. Pres. Aaron Harter, Sec. Henry McNeal, Treas. H. D. Alexander.

HIOBOK, N. J.—North Hudson County Ry. Co. 25 m, 4-7 g, 50-60 lb r, 116 c, 635 h. Pres. John H. Bonn, Sec. F. J. Mallory, Treas. Fredk. Michel, Supt. Nicholas Goetz.

HOLYOKE, MASS.—Holyoke St. Ry. Co. 3 1/2 m, 4-8 1/2 g, 35 lb r, 15 c, 55 h. Pres. Wm. A. Chase, Treas. C. Fayette Smith, Supt. H. M. Smith.

HOT SPRINGS, ARK.—Hot Springs R.R. Co. 3 m, 4 g, 25 lb r, 11 c, 30 h. Pres. S. W. Fordyce, Sec. C. E. Maurice, Supt. J. L. Butterfield.

HOUSTON, TEX.—Houston City St. Ry. Co. 14 m, 4-8 1/2 g, 20-30-40 lb r, 40 c, 118 mu. Pres. Wm. H. Sinclair, Galveston, V. Pres. & Gen. Man. H. F. MacGregor, Houston, Supt. Henry Freund, Houston, Sec. & Treas. E. H. Bailey, Houston. Office, 99 Travis st.

HUTCHINSON, KAN.—Hutchinson St. Ry. Co. 6 m, 4-6 g, 30 lb r, 12 c, 43 h. Pres. A. L. Fornha, V. Pres. J. W. Severance, Sec. & Treas. Fred. A. Forsha, Supt. A. G. Statts. Office, 5 North Main st.

ILION, N. Y.—Frankfort & Ilion St. R. R. Co. 2 1/2 m, 5 g, 25 lb r, 5 c, 5 h. Pres. A. C. McGowan, V. Pres. P. S. Skiff, Sec. & Treas. John A. Giblin, Supt. J. J. Hannah.

INDEPENDENCE, MO.—Kansas City, Independence & Park Dummy Line.

INDIANAPOLIS, IND.—Citizens' St. Ry. Co. 25 m, 4-8 1/2 g, 33-38-45-50 lb r, 70 c, 550 mu. Pres. A. W. Johnson, Indianapolis, Treas. Tom L. Johnson, Cleveland, O. Sec. A. A. Anderson, Indianapolis, Man. W. T. Steele, Indianapolis. Office 80 W. Louisiana st.

ITHACA, N. Y.—Ithaca St. Ry. Co. 3 m, 4-8 1/2 g, 30 lb T r, 6 c, Daft elec. motors. Pres. Chas. D. Haines, V. Pres. A. G. Haines, Sec. & Treas. S. D. Lake. Office, 45 Bdy., New York.

JACKSON, MICH.—Jackson City Ry. Co. 4 m, 3 6 g, 28 lb r, 11 c, 40 h. Pres. Hiram H. Smith, Treas. Samuel Hopewell, Gen. Supt. Henry H. Smith.

JACKSON, MISS.—Jackson City R. R. Co. 1 1/2 m, 5 g, 25 lb r, 4 c, 18 mu. Pres. S. B. Hubbard, V. Pres. J. M. Schumacher, Treas. J. C. Greely; Sec. & Man. H. S. Ivy.

JACKSONVILLE, ILL.—Jacksonville Ry. Co. 4 1/2 m, 4-8 1/2 g, 30 lb r, 16 c, 30 h. Pres. Wm. S. Hook, Sec. T. J. Hook, Treas. Marcus Hook, Supt. B. F. Sibert.

JAMAICA, N. Y.—Jamaica & Brooklyn R.R. Co. 10 m, 4-8 1/2 g, 56-60 lb r, 29 c, 56 h. Pres. Aaron A. Degrauw, Sec. Martin J. Durea, Treas. Morris Fosdick. Supt. Wm. M. Scott.

JAMESTOWN, N. Y.—Jamestown St. Ry. Co. 4.34 m, 4-8 1/2 g, 30-42 lb r, 13 c, 40 h. Pres. Jas. B. Ross, V. Pres. L. B. Warner, Sec. F. E. Gifford, Treas. A. N. Broadhead, Supt. G. E. Maltby.

JANESVILLE, WIS.—Janesville St. Ry. Co. Pres. Stephen G. Clarke, Chicago.

JERSEY CITY, N. J.—Jersey City & Bergen R. R. Co. 28 m, 4-10 g, 47-60 lb r, 80 c, 630 h. Pres. Chas. B. Thurston, V. Pres. Wm. Keeney, Treas. C. B. Place, Sec. Warren E. Dennis, Supt. Thos. M. Sayre, Engr. E. F. Brooks.

JOHNSTOWN, N. Y.—Johnstown, Gloversville & Kingsboro Horse R. R. Co. 4 m, 4-8 1/2 g, 26 lb r, 6 c, 18 h. Pres. James Younglove, V. Pres. R. Fancher, Sec. & Treas. J. McLaren, Supt. Henry Slotter.

JOHNSTOWN, PA.—Johnstown Pass. Ry. Co. 7 1/2 m, 5-3 g, 41-43 lb r, 15 c, 74 h. Pres. James McMillen, Sec. B. L. Yeagley, Treas. W. H. Rosensteel, Jr. f

JOLIET, ILL.—Joliet City Ry. Co. 3 1/2 m, 4-8 1/2 g, 38 lb r, 16 c, 30 h. & mu. Prop. J. A. Henry, Supt. A. Bischman, Treas. J. Huisizer.

JOPLIN, MO.—6in, 4 g, 15, 21 & 27 lb T and tram r, 4 2-h c, 26 mu. Pres. J. B. sergeant, Sec., Treas., Supt. & Pur. Agt. Clark Craycraft.

KALAMAZOO, MICH.—Kalamazoo St. Ry. Co. 8 1-6 in, 4-8 g, 35 lb r, 30 c, 50 h. Pres. E. M. Irish, V. Pres. Dr. Chase, Man. J. W. Bounton, Sec. & Treas. Arthur Ellithorp, Auditor, Wm. Shakespeare, Office, 128 Main st.

KANSAS CITY, MO.—Kansas City Cable Ry. Co. 12 m, 4-8 1/2 g, 45-56 lb r, 26 grtp c, 39 pass. c, Pres. Wm. J. Smith, V. Pres. Philip A. Chase, Sec. W. H. Lucas, Cht. Eng. Cliff Wise, Supt. F. A. Tucker, Office, S. E. cor. Niuth & Washington sts. e Corrigan Consolidated St. Ry. Co. 20 m, 4-1 g, 30 lb r, 80 c, 350 h. Pres. Bernard Corrigan, Gen. Mau. Thos. Corrigan, Sec. Jas. T. Kelley. Operated by Metropolitan St. Ry. Co.

KANSAS CITY, MO.—Kansas City Electric Ry. Co. 2 m, 4-8 1/2 g, 70 lb glider r, 4 motor c (Henry system). Pres. W. W. Kendall, V. Pres. Hugh L. McElroy, Sec. & Treas. Warren Watson, Supt. John C. Henry. Office, 1139 E. 5th st. Capital, \$10,000.

KANSAS CITY, MO.—Kansas City Electric Ry. Co. Operated by the Metropolitan St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 42 lb steel r, 8 2-h c, 60 mu. Pres. C. T. Morse, Sec. R. J. McCarty, Supt. E. J. Lawless, Pur. Agt. T. M. Pitkin.

KANSAS CITY, MO.—Kansas City Electric Ry. Co. 25 m, 4-8 1/2 g, 56 lb r, 126 c, 475 h. Pres. C. F. Morse, V. Pres. Geo. H. Nettleton, Sec. & Auditor R. J. McCarty, Treas. A. W. Armour, Supt. E. J. Lawless, Engineers. Knight & Boutcon.

KANSAS CITY, MO.—Waldo Park Dummy Line. Mr. Hill is lessee. 10

KEOKUK, IA.—Keokuk St. Ry. Co. 4 m, 4-8 1/2 g, 27 lb steel r, 12 c, 40h. Pres. Jas. H. Anderson, Sec. Wm. E. Anderson.

KINGSTON, ONT., CAN.—Kingston St. R.R. Co. 3 1/2 m, 3-6 g, 9 lb r, 10 c, 36 h. Pres. Robert Carson, Sec. & Treas. F. Sargent, Man. William Wilson.

KNOXVILLE, TENN.—Knoxville St. R. R. Co. 3 m, 4-8 1/2 g, 25 lb r, 5 c, 33 h. Pres. John S. Van Gilder, Treas. & Man. T. L. Beaman. Office, 336 Broad st.

KNOXVILLE, TENN.—Mabry Bell Ave. & Hardee St. Ry. Co. 4 m, 4 8 1/2 g, 22 lb r, 4 c, 27 h. Pres. John S. Van Gilder, Man. & Treas. T. L. Beaman. Office, 336 Broad st.

KNOXVILLE, TENN.—Market Sq. St. Ry. Co. 2 m, 4-8 1/2 g, 22 lb r, 4 c, 19 h. Pres. John S. Van Gilder, Sec. W. I. Henderson, Treas. W. H. Simmonds, Supt. L. O. Rogers. Office, 143 Gay st.

LACONIA, N. H.—Laconia & Lake Village Horse R. R. 2 1/2 m, 3 g, 34 lb r, 5 c, 20 h. Pres. A. G. Folsom, Sec. J. P. Hutchingson, Treas. Edmund Little, Man. Bela S. Kenniston.

LA CROSSE, WIS.—La Crosse City Ry. Co. 5 1/2 m, 4-8 g, 40 lb r, 15 c, 70 h. Pres. B. E. Edwards, V. Pres. Geo. F. Gund, Treas. Fred Tillman, Sec. Jas. T. Daggett, Supt. (North Division), Peter Valier, Supt. (South Division), Geo. F. Smith. Office 222 Main st.

LAFAYETTE, IND.—Lafayette St. Ry. 2 1/2 m, 4-8 1/2 g, 35 & 46 lb r, 5 c, 30 h. Pres. G. E. C. Johnson, Sec. T. J. Levering.

LAMPASAS SPRINGS, TEX.—Lampasas Springs St. R. R. Co. 3 m, 4-8 1/2 g, 6 c, 18 h. Sec. & Treas. W. H. Little. Office, Elm st.

LANCASTER, PA.—Lancaster & Millersville St. Ry. Co.—m, 4-8 1/2 g, 30 lb r, 4 c, 14 h. Pres. J. C. Hager, V. Pres. H. S. Shirk, Sec. & Treas. Chas. Dennes. b Lancaster City St. Ry. Co. 1 1/2 m, 5-2 g, 38 lb r, 6c, 4 h. Pres. W. D. Sprecher, Treas. J. H. Baumgardner, Sec. Thos. B. Cochran, Man. J. B. Long. Gen. Ofie, 129 North Queen st.

LANSING, MICH.—Lansing City Ry. Co. 3 m, 4-8 1/2 g, 30 lb steel r, 5 c, 24 h. Pres. Stephen G. Clarke, Chicago, V. Pres. & Treas. Harry M. Clarke, Lansing, Sec. John P. Altgeld, Supt. Byron E. Clarke, Lansing.

LARCHMONT, N. Y.—Larchmont Manor Co. 1 1/2 m, 4-8 g, 25 lb r, 2 c, 10 h. Pres. C. H. Murray, Treas. T. H. French, 38 East Fourteenth st. N. Y. City.

LARNED, KAN.—Larned St. Ry. Co. 2 1/2 m, 3-9 g, flat r, 2-2-h c, 4 mu. Pres., Supt. & Pur. Agt. D. H. Scott, Sec. G. H. Miye, Treas. Wm. Scott.

LA SALLE, ILL.—La Salle St. R. R. Co. 1 1/2 m. Sec. G. Weerts.

LAWRENCE, KAN.—Lawrence Transportation Co. 5 1/2 m, 4-1 g, 38 lb r, 8 c, 38 h. 6 mu. Pres. H. Tisdale, Sec. W. N. Bangs, Supt. Geo. Fricker.

LAWRENCE, MASS.—Merrimack Valley Horse R.R. Co. 6 1/2 m, 4-8 1/2 g, 48 lb r, 22 c, 87 h. Pres. Wm. A. Russell, Clerk & Treas. James H. Eaton, Supt. A. N. Kimball.

LEAVENWORTH, KAN.—Leavenworth & Sub-

JOS. A. SLEEPER, Pres.
W. A. STILES, Secy. and Treas.

CHAS. J. VAN DEPOELE, Electrician.
AARON K. STILES, Manager.

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CHICAGO, ILL., U. S. A.

urban Ry. Co. 5 m, 4-8 1/2 g, 22 lb r, 12 2-h c, 22 1/2, 32 mu. Pres. W. F. Putnam, Sec., Treas. & Supt. Geo. A. Baker. c

LEWISTON, ME.—Lewiston & Auburn Horse R. R. Co. 10 m, 4-8 1/2 g, 32 lb r, 20 c, 60 h. Pres. Frank W. Dana, Clerk & Treas. C. C. Corbett, Supt. J. E. Fairbanks. k

LEXINGTON, KY.—Lexington City Ry. Co. 8 1/2 m, 4-10 g, 16 & 20 lb r, 23 c, 111 h. Pres. & Treas. R. B. Metcalf, Sec. B. P. Carpenter, Supt. & Pur. Agt. W. W. Monroe. a

LEXINGTON, MO.—Lexington St. Ry. Co. 1 1/2 m, 4-4 g, 30 lb r, 2 c, 8 h. Supt. John C. Young. Office, 124 Main st. 4

LIMA, O.—Lima St. Ry., Motor & Power Co. Electric, Van Depoelle system; overhead conductor. 4 m completed, 10 m contemplated, 4-8 1/2 g, 40 lb Johnson steel r, 7 c, 7 motors. Pres. B. C. Faurot, Sec. & Treas. F. L. Langan. Capital, paid in, \$50,000. a

LINCOLN, NEB.—Lincoln St. Ry. Co. 12 m, 4-8 1/2 g, 20 lb steel r, 24 c, 150 h. and mu. Pres. J. W. Deeweese, V. Pres. John R. Clark, Sec. & Treas. C. J. Ernst, Supt. Wm. R. Carter. b
Lincoln Rapid Transit Co. 7 m, 4-8 1/2 g, 25 & 35 lb girder r, 8 2-h c, steam motors. Pres. John Fitzgerald, Sec. J. R. Webster, Treas. Sam'l McClay, Supt. Jas. P. Walton. 9

LITTLE ROCK, ARK.—Citizens' & Little Rock Ry. Cos. 12 m, 4-10 g, 25, 36 & 45 lb r, 30 c, 200 mu. Pres. Jas. R. Miller, Sec. & Treas. Allan Johnson, Cashier & Supt. R. D. Apperson. Office, cor. Markham & Spring sts. d

LOCKPORT, N. Y.—Lockport St. R. R. Co. 3 1/2 m, 4-8 1/2 g, 42 lb r, 8 c, 33 h. Pres. & Treas. John Hodge, Sec. W. T. Ransom, Atty. E. M. Ashley. Office, 19 & 20 Hodge Opera House Bldg. 4

LOGANSPORT, IND.—Logansport Ry. Co. 4 m, 4g, 30 lb r, 9 c, 46 mu. Pres. Frank G. Jaques, Sec. M. Jaques, Supt. Wm. P. Jaques. Office, Urbana, Ill. k

LONDON, CAN.—London St. Ry. Co. 6 m, 4-8 1/2 g, 30 lb r, 12 c, 40 h. Pres. V. Cronyn, Sec. Jas. H. Flock, Treas. Chas. Currie, Supt. Henry I. Smith. Office, Richmond st. a

LONG ISLAND CITY, N. Y.—Steinway & Hunter's Point R. R. Co. 30 m, 4-8 1/2 g, 47 lb r, 90 c, 300 h. Pres. G. A. Steinway, Steinway Hall, N. Y. City. V. Pres. & Man. Henry A. Cassebeer, Jr., Steinway P. O., Long Island City, N. Y. Sec. & Treas. Chas. F. Trebbar, Steinway Hall, N. Y. City. Supt. W. H. Delahanty. Offices Steinway Hall, N. Y. d
Long Island City & Newtown Ry. Co. 4 1/2 m, 4-8 1/2 g, 45-55 lb r, 25 c, 60 h. Pres. Isaac Buchanan, N. Y. City. Sec. Geo. S. Crawford, Brooklyn, N. Y. Treas. Patrick J. Gleason, Supt. Michael Conway. Offices 112 Front st. f
Riker Ave. & Sandford's Point R. R. Co. 2 1/2 m, 4-8 1/2 g, 47 lb r, h this year, electricity thereafter, operated under lease by Steinway & Hunter's Point R. R. Co. Pres. J. H. Hempstead, Sec. & Treas. Oscar R. Steins. Capital, \$20,000. N. Y. Office, 107 E. 14th st. d

LONGVIEW, TEX.—Longview & Junction St. Ry. Co. 3 m, 3-6 g, 16 lb r, 2 c, 4 h. Pres. F. T. Rembert, Sec. R. B. Levy, Treas. F. S. Whaley, Supt. C. W. Booth. b

LOS ANGELES, CAL.—Central & Boyle Heights Co. 6 1/2 m, 3-6 g, 26 c, 110 h. Pres. E. F. Spence, Gen. Man. J. P. Crank, Sec. Fred Harkness, Supt. W. Hawks. c
Los Angeles Cable Ry. Co. 29 m, 3-6 & 4-8 g, 16 & 20 lb r, 57 c, 314 h. Gen. Man. Chas. Forman. Office, 133 N. Main st. 9
Los Angeles Electric Ry. Co. 5 m, 4-8 g, 4 c, Daft system, overhead wires. Pres. Geo. H. Bonebrake, Sec. & Man. C. H. Howland, Constructing Engr. A. H. Hayward. h
Main St. & Agricultural Park Co. 8 m, 3-6 g, 15 c, 60 h. Pres. W. J. Broderick, Sec. A. C. Taylor, Supt. E. M. Loricke. 6
Second St. Cable Ry. Co. 1 1/2 m cable & 1 1/2 m steam-motor extension, 3-6 g, 8 c, 6 grip c, 2 motors. Pres. & Treas. Jas. McLoughlin, Sec. & Supt. H. W. Davis, Asst. Supt. & Master Mechanic E. H. Hutchinson. 6
Temple St. Cable Ry. Co. 1 1/2 m, 3-6 g, 6 c, 6 grip c. Pres. P. Beaudry, Sec. & Man. F. W. Woods, Supt. J. Fowler. 6

LOUISVILLE, KY.—Kentucky St. R. R. Co. 5 m, 5 g, 52 lb r, 22 c—h. Pres. T. J. Minary, Sec. T. C. Donigan. 6
Central Pass. R. R. Co. 51 m, 5 g, 52 lb r, 156 c, 800 h, Pres. B. du Pont, V. Pres. & Man. T. J. Minary, Sec. T. C. Donigan. Office, 18th & Walnut Sts. 6
Crescent Hill R. R. Co. 3 m. Leased and operated by Central Pass. R. R. Co. 6

Louisville City Ry. Co. 65 m, 5 g, 40 to 58 lb r, 230 c, 1,400 mu. Pres. Maj. Alexander Henry Davis, Syracuse, N. Y., V. Pres. St. John Boyle, Sec. & Treas. R. A. Watts, Supt. H. H. Littell. Office, 13th and Main sts. c

LOWELL, MASS.—Lowell Horse R. R. Co. 12 m, 4-8 1/2 g, 28-33-45 lb r, 43 c, 160 h. Pres. Wm. E. Livingston, Gen. Man. J. A. Chase. c
Lowell & Dracut St. Ry. Co. 9 m, 4-8 1/2 g, 35 lb iron and 1 1/2 m Longstreet r, 16 c, 120 h. Pres. Aug. Fels, Treas. Walter M. Sawyer, Supt. John F. Murphy. 8

LYNCHBURG, VA.—Lynchburg St. Ry. Co. 4 m, 5-1 g, 20 lb T & 26 lb tram r, 7 c, 40 h. Pres. & Sec. & Treas. Stephen Adams. h

LYONS, IA.—Clinton & Lyons Horse Ry. Co. 7 m, 3-8 g, 18-30 lb r, 18 c, 40 h. Pres. D. Joyce, Sec. W. T. Joyce, Supt. Frank Crasper. f

MACON, GA.—Macon City & Suburban St. R. R. Co. 12 m, 5 g, 20 lb T r, 26 c, 100 mu. Pres. John S. Bransford, Nashville, Tenn., Sec. and Supt. Jno. T. Voss. 7

MADISON, IND.—Madison St. Ry. Co. 2 1/2 m, 4 g, 15 lb r, 7 c, 4 h, 11 mu. Pres. & Supt. Jacob Wendel, V. Pres. & Treas. Peter F. Robinus, Sec. John K. Weyer. Office, 1026 Walnut st. a

MADISON, WIS.—Madison St. Ry. Co. 2 1/2 m, 4 g, 23 lb r, 8 c, 28 mu. Pres. D. K. Tenney, Sec. & Treas. B. W. Jones, Supt. A. R. Kentzler. Office, Williamson st. 4

MANCHESTER, N. H.—Manchester Horse R. R. 7 m, 3 g, 27-34 lb r, 14 c, 60 h. Pres. S. N. Bell, Treas. G. F. Smyth, Clerk J. A. Weston, Supt. A. Q. Gage. Office Depot st. e

MANKATO, MINN.—Mankato St. Ry. Co. 2 1/2 m, 3-6 g, 27 lb steel r, 4 c, 12 h. Pres. & Man. W. M. Farr, Sec. and Treas. John C. Noe, Capital, \$50,000; office, 313 So Front street. f

MANSFIELD, O.—Mansfield Elec. St. Ry. Co. 4 1/2 m, 4-8 1/2 g, 43 lb s-b r, 10 c, 15 H. P. each, Daft system. Pres. Edward Oothout, New York, V. Pres. Huntington Brown, Sec. C. E. McBride, Treas. M. Van Rensselaer, New York, Engr. Knight Nettel, Supt. W. G. Root. Capital, \$75,000. f

MARSHALTON, IA.—Marshalltown St. Ry. Co. 3 m, 4 g, 25 lb r, 7 c, 20 h. Pres. B. T. Frederick, Sec. C. C. Gilman, Man. & Treas. A. E. Shorthill. f

MARYSVILLE, CAL.—Clity Pass. R. R. Co. MAXVILL, KY.—Maxville St. R. R. & Transfer Co. 3 1/2 m, 20 lb r, 4-8 1/2 g, 7 c, 32 mu. Pres. L. W. Robertson, Sec., Treas. & Supt. W. S. Frank. Office, Court st. d

MCPHERSON, KAN.—McPherson St. Ry. Co. 3 1/2 m, 3-8 g, 20 lb T r, 3 2-h c, 12 mu. Pres. A. A. Irvin, Sec. Scott Buker, Treas. C. Aug. Heggeland, Pur. Agt. M. D. Herrington, Supt. Benj. Hunt. 9

MECHANICSBURG, ILL.—Mechanicsburg & Buffalo Ry. Co. 7 1/2 m, 3-10 g, 16 & 20 lb r, 3 c, 4 mu. Pres. J. B. Hunter, V. Pres. H. Thompson, Sec. J. T. Fullenwider, Treas. A. T. Thompson. b

MEMPHIS, TENN.—Memphis City R. R. Co. 18 m, 5 g, 38-40 lb r, 80 c, 320 h. Pres. R. Dudley Frayser, V. Pres. & Gen. Man. Thos. Barrett, Sec. James Frost, Treas. S. P. Read, Jr., Supt. W. F. Shippey. Office 47 1/2 Main st. f

Citizens' St. R. R. Co. 40 m, 4-8 1/2 & 5 g, 38 lb girder & 45 lb tram r, 140 2-h c, 604 mu. Pres. Napoleon Hill, V. Pres. & Gen. Man. Thos. Barrett, Sec. R. Dudley Frayser, Treas. S. P. Read, Jr. g

East End Ry. Co. 6 m, 4-8 1/2 g, 35 lb steel r, 6 c, 2 dummy engines. Pres. W. M. Sneed, V. Pres. B. M. Stratton, Sec. & Treas. J. W. Falls. Office, 310 2d St. 11

Memphis & Prospect Park R. R. 5 m, 4-8 1/2 g, 4 c, steam dummy. Pres. T. J. Latham, V. Pres. J. A. Van Hoese, Sec. & Treas. T. A. Lamb. Capital, \$100,000. c

Union R. R. Co. 14 m, 38 c, 200 h and mu. MERIDEN, CONN.—Meriden Horse R. R. Co. 5 m, 4-8 g, 35 lb r, 15 c, 100 h. Pres. Geo. L. Curtis, Sec. & Treas. Chas. L. Rockwell, Supt. Dan'l Barker. 6

MERIDIAN, MISS.—Meridian St. Ry. Co. 2 1/2 m, 4-8 g, 16 lb r, 5 c, 20 mu, Pres. Geo. S. Covert, V. Pres. and Sup. J. L. Handley, Sec. R. M. Houston, Treas. J. A. Kelly. d

MICHIGAN CITY, IND.—Citizens' St. Ry. Co. 4 m, 4-8 1/2 g, 30 lb r, 4 c, 15 h. Pres. Wm. G. Knight, V. Pres. John Lyons, Sec. Jacob Henderson, Treas. Jerry H. Knight. Office West Washington st., South Bend, Ind. 1

MIDDLETOWN, CONN.—Middletown Horse R. R. Co. 2 m, 36 lb r, 6 c, 30 h. Pres. John M. Douglas, Sec. & Treas. J. K. Guy, Supt. Walter Baldwin. Office 166 Main st. a

MIDDLETOWN, O.—Middletown & Madison St. R. R. Co. 2 m, 4-8 1/2 g, r, 4 c, 8 h. Pres. C. F. Gunckel, Sec. and Treas. E. W. Gunckel, Supt. T. C. Reed. 11

MILLERSVILLE, PA.—Lancaster & Millersville St. R. R. Co. (See Lancaster, Pa.) MILLWAUKEE, WIS.—Cream City R. R. Co. 317 m, 4-8 1/2 g, 38 & 52 lb girder r, 27 lb tram r, 80 c, 119 mu. Pres. Winfield Smith, V. Pres. Christian Preusser, Treas. Ferdinand Kuehn, Sec. Wm. Damkoehler, Gen. Man. D. Atwood, Supt. H. J. C. Berg. Office, 440 E. Water st. b

Milwaukee City Ry. Co. 30 m, 4-8 1/2 g, 45 lb r, 81 c, 513 h. Pres. Peter McGeech, Sec. & Treas. Geo. O. Wheatcroft. Office 209 West Water st. a

West Side St. Ry. Co. Pres. Washington Becker Sec. Thos. J. Durkin, Supt. A. McNaughton. 4

MINNEAPOLIS, MINN.—Minneapolis St. Ry. Co. 62 m, 3-6 g, 27-35-45 lb r, 186 c, 876 h, 230 mu. Pres. Thos. Lowry, V. Pres. C. Morrison, Sec. & Gen. Man. C. G. Goodrich, Treas. M. B. Koon, Supt. D. W. Sharpe, Engr. E. T. Abbott. Office, 300 3rd ave. N. g

MOBILE, ALA.—Mobile St. Ry. Co. 23 m, 5-2 1/2 g, 35-60 lb T & tram r, 74 c, 4 freight c, 230 mu & h. Pres. W. M. Duncan, V. Pres. Gaylord, B. Clark, Sec. & Gen. Man. R. K. Warren. 9

Mobile & Spring Hill R. R. Co. 8 m, 5-2 1/2 g, 35 lb r, 15 c, 35 h, 1 dummy. Pres. Daniel McNeill, Sec. & Treas. C. F. Sheldon, Man. F. Ingate. b

MOHAWK, N. Y.—Mohawk & Hill R. R. Co. 1 1/2 m, 4-8 1/2 g, 30 lb r, 4 c (contract for motive power). Pres. O. W. Bronson, V. Pres. C. W. Carpenter, Sec. H. D. Alexander, Treas. R. M. Devendorf, Supt. O. W. Bronson. f

MOLINE, ILL.—Moline & Rock Island St. Car Co. 5 m, 4-8 1/2 g, 20 lb crescent tram & T r, 13 1-h, 2 2-h c, 44 h. Pres. Jonathan Huntoon, Moline, Sec. & Treas. J. M. Buford, Rock Island. 6

Moline Central St. Ry. Co. 1 1/2 m, 4-8 1/2 g, 1 m tram 1/2 m T r, 3 c, 10 h. Pres. P. H. Wessel, V. Pres. M. Y. Cady, Sec. W. R. Moore, Treas. C. F. Hemenway. 1

Union St. Ry. Co. 5.4 m, 4-8 1/2 g, 38 lb Johnson girder r for 1 1/2 m and 42 lb tram r for balance, 6 1-h 2 2-h c, 16 h, 12 mu, 2 steam motors. Pres. Eugene Lewis, Moline, V. Pres. W. H. Decker, Davenport, Ia.; Sec. & Treas. G. Watson French, Davenport, Ia., Supt. Jas. Cazatt, Moline. 10

MONTGOMERY, ALA.—Capital City Electric Ry. 11 m, 4 g, 42 lb r, 20 c. Electric motors; Van Depoelle system; overhead conductor. Pres. E. B. Joseph, Gen. Man. J. A. Gaboury, Treas. Thos. E. Hannon. 6

MONTREAL, CAN.—Montreal St. Ry. Co. 30 m, 4-8 1/2 g, 80 c, 80 sleighs, 40 buses, 700 h. Pres. Jesse Joseph, V. Pres. Alex. Murray, Sec. & Man. Ed. Lusher, Supt. T. H. Robillard. 3

MOULTRIEVILLE, S. C.—Middle St. & Sullivan's Landing Ry. 2 1/2 m, 4-8 1/2 g, 20 lb r, 7 c, 4 h. Pres. B. Callahan, Treas. B. Buckley. 1

MOUNT VERNON, N. Y.—Mount Vernon & East Chester R. R. Co. 5 1/2 m, 7 c, 13 h. Sold to Leopold Wertheimer of New York, late Sec. of co. Treas. Louis Wertheimer. 10

MUSCATINE, IA.—Muscatine City Ry. Co. 3 1/2 m, 3-6 g, 20 lb T r, 7 c, 34 h. & mu. Pres. Peter Musser, V. Pres. W. Hoffman, Sec. T. R. Fitzgerald, Treas. S. M. Hughes. k

MUSKOGON, MICH.—Muskegon Ry. Co. 4 1/2 m,

1-6 g, 20 lb r, 8 c, 17 h, 9 mu. Pres. F. A. Nims, V. Pres. Chas. Merriam, Boston, Mass., Sec. Thomas Munroe, Treas. G. R. Sherman, Supt. Wm. McLaughlin. d

NASHUA, N. H.—Nashua St. Ry. Co. 2 m, 3 g, 35 lb r, 6 c, 24 h. Pres. John A. Spalding, Clerk, R. D. Barnes, Treas. Ira F. Harris, Supt. Q. A. Woodward. e

NASHVILLE, TENN.—Nashville & Edgefield R. R. Co. Fotherland Street Railway Co. North Edgefield & Nashville St. R. R. Co., one management. 6 m, 5 g, 16-20-38 lb r, 18 c, 110 mu. Pres. Jas. H. Yarbrough, Sec. & Treas. H. B. Stubblefield, Supt. Thos. R. Donahue. 1

McGavock & Mt. Vernon Horse R. R. Co. 1 1/2 m, 5 g, 16-20-32-38 lb r, 49 c, 217 mu. Pres. John P. White, V. Pres. Sec. & Treas. H. B. Stubblefield, Supt. & Pur. Agt. Daingerfield Deaderick. j

South Nashville St. R. R. Co. 4 1/2 m, 5 g, 16-20-30 lb r, 10 c, 70 h. Pres. Wm. M. Duncan, Sec. & Treas. & Supt. C. L. Fuller. Office cor. Franklin and Cherry sts. i

NATCHEZ, MISS.—Natchez St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 18 & 45 lb r, 4 c, 10 h, 6 mu. Owner, Thos. Reber. 11

NATICK, MASS.—Natick & Cohitate St. Ry. Co. 3 m, 4-8 1/2 g, 35 lb r, 7 c, 19 h. Pres. Harrison Harwood, Supt. Geo. F. Keepe, Clerk Frank Hays. e

NEW ALBANY, IND.—New Albany Ry. Co. 6 1/2 m, 4-11 g, 25 lb r, 14 c, 55 h. Pres. Geo. T. Vance, Treas. Letitia V. Vredenburg, Supt. & Pur. Agt. Wm. L. Timberlake. Office cor. Vincennes and Spring sts. j

NEWARK, N. J.—Essex Pass. Ry. Co. 50 m, 5-2 1/2 g, 47 lb r, 133 c, 797 h. Pres. S. S. Battin, Sec. Fred T. Klrk, Supt. H. F. Totten. Paymaster, W. L. Mulford. Office, 786 Broad st. d

Newark & Irvington St. Ry. Co. 7 m, 5-2 1/2 g, 47 lb r, 32 c, 165 h. Pres. S. S. Battin, Sec. W. L. Mulford, Supt. H. F. Totten. Office 786 Broad st. d

Newark & So. Orange, Ferry St. & Hamburg Place R. R. Co. 15 m, 5-2 1/2 g, 45 lb r, 49 c, 300 h. Pres. John Radel, Sec. Andrew Radel, Treas. Joseph Critiqu. Office, cor. So. Orange ave. & So. 19th st. f

NEWARK, O.—Newark City Ry. Co. 5 m, 4-8 1/2 g, 35 lb r, 6 c, 24 h. Pres. Stephen G. Clarke, V. Pres. & Supt. Byron E. Clarke, Sec. John W. Lanehart, Treas. Harry M. Clarke. Office, 239 W. Main st. 1

NEW BEDFORD, MASS.—Union St. Ry. Co. 18 m, 4-8 1/2 g, 35, 45 & 50 lb tram, 45 lb steel & 38 lb girder r, 84 2-h c, 290 h. Pres. Sam'l C. Hart, Treas. A. G. Pierce, Clerk Abbott P. Smith, Auditor Geo. R. Phillips, Supt. Stables Chas. E. Cook, Supt. Transportation Wm. H. Allen. Capital, \$266,000. j

NEW BRITAIN, CONN.—New Britain Tramway Co. 3 1/2 m, 4-8 1/2 g, 35 lb r, 4 c. Pres. Alston Gerry, Treas. Jos. A. Flynn, both of New York City. 5

NEW BRUNSWICK, N. J.—New Brunswick City R. R. Co. 4 m, 4-8 1/2 g, 40 lb r, 5 c, 20 h. Pres. F. M. Delano, Treas. Carroll Sprigg. 1

NEWBURGH, N. Y.—Newburgh St. Ry. Co. 2 1/2 m, 4-8 g, 40 lb r, 11 c, 60 h. Pres. Rowland F. Hill, V. Pres. Sidney W. Hopkins, Sec. & Treas. Wm. Moores, Gen. Man. H. Ives Smith. President's office, 3 Broad st., New York. b

NEWBURYPORT, MASS.—Newburyport & Amesbury Horse R. R. Co. 6 1-3 m, 4-8 1/2 g, 35 lb r, 18 c, 50 h. Pres. Chas. Odell, Sec. G. H. Stevens, Treas. A. G. Reynolds, Supt. W. B. Ferguson. 5

Black Rocks & Salisbury Beach St. Ry. Co. Dummy road. 2 m, 4-8 1/2 g, 25 lb T r, 6 c, 1 dummy engine. Clerk Geo. Tilton. f

Plum Island St. Ry. Co. 5 m, 4-8 1/2 g, 35 & 40 lb r, 10 c, 25 h. Pres. Chas. Odell, Salem, Clerk Chas. H. Brown, Treas. A. G. Reynolds, Supt. W. B. Ferguson. Capital, \$40,000. i

NEW HAVEN, CONN.—Fair Haven & Westville R. R. Co. 10 m, 4-8 1/2 g, 50 lb r, 28 c, 207 h. Pres. H. B. Ives, Sec. & Treas. L. Candee, Supt. Walter A. Graham. Office 736 Chapel st. a

New Haven & Centreville Horse R. R. Co. 2 1/2 m, 4-8 1/2 g, 42 lb r, 8 c, 42 h. Trustee Cornelius Pierpont. Office, 1 Broadway. 6

New Haven & West Haven Horse R. R. Co. (See West Haven). State Street Horse R. R. Co. 2 1/2 m, 4-8 1/2 g, 43 lb r, 6 c, 40 h. Pres. C. A. Warren, Sec. & Treas. J. E. Emery. Office 16 Exchange Bldg. d

Whitney Ave. Ry. Co. 2 1/2 m, 4-8 1/2 g, 25 lb r, 3 c, 20 h. Pres. Geo. H. Watrous, Sec. George D. Watrous, Treas. Eli Whitney, jr., Leased to State St. Horse R. R. Co. a

NEW ORLEANS, LA.—Canal & Claiborne Sts. R. R. Co. 13 m, 5-2 1/2 g, 37 lb r, 40 c, 200 h. Pres. E. J. Hart, Sec. & Supt. Jos. H. DeGrange. 6

Algiers & Gretna Ity. Co. 3.1 m, 3 g, 50 lb T r, 3 1-h c, 17 h. Pres. J. E. Auvaray, Sec. Wm. Bogel, Supt. John Reaney. Office, 382 St. Charles st. b

Crescent City R. R. Co. 26 m, 5-2 1/2 g, 35-45 lb r, 90 c, 400 h. Pres. W. J. Behan, Sec. & Treas. J. R. Juden, Supt. A. V. Smith. 9

Orleans R. R. Co. 9 1/2 m, 5-2 1/2 g, 35 lb r, 32 c, 155 h. & mu. Pres. & Supt. H. Larque, Sec. & Treas. P. Cougot. Office, cor. White & Laharpe sts. b

St. Charles St. R. R. Co. 15 m, 5-2 1/2 g, 35-40 lb r, 61 c, 260 mu. Pres. & Supt. Alden McEellan, Sec. V. Riviere. Operates 3 lines. Office cor. Carondelet & 8th sts. a

New Orleans & Carrollton R. R. Co. 8 m, 4-8 1/2 g, 40-45 lb r, 65 c, 200 h, 19 engines. Pres. Jos. Hernandez, Sec. Walter V. Crouch, Supt. Chris. V. Halle. a

New Orleans City & Lake R. R. Co. 60 m, 5-2 1/2 g, 48 lb r, 170 st. c, 40 coaches, 7 locomotives, 800 mu. Pres. J. A. Walker, Sec. W. E. Leverich, Supt. F. Wintz. Office, 102 Canal st. 6

NEWPORT, KY.—Newport St. R. R. Co. NEW ROCHELLE, N. Y.—New Rochelle & Pelham R. R. Co. 10 m, 4-8 1/2 g, 42 lb r, 8 c, 30 h. Pres. W. R. Bergholz, Sec. Eugene Durbin, Treas. Thos. E. Crimmins. 1

NEWTON, KAN.—Newton City St. Ry. Co. Pres. Allen Moore, V. Pres. John A. Randall, Sec. W. G. Oldfield, Treas. J. M. Ragsdale. 6 m, 3-6 g, 20 lb steel r, 8 c, 24 mu. Capital, \$60,000. 7

NEW YORK, N.Y.—Ninth Ave. R. R. Co. 16 m, 4-8 1/2 g, 50 lb r, 50 c, 500 h. Pres. Geo. Law, Sec. & Treas. James Affleck, Supt. Lewis P. Foulk. Offices, Ninth Ave., cor. 54th st. a
Broadway & Seventh Ave. R. R. Co. 16 m, 4-8 1/2 g, 47-60 lb r, 227 c, 2240 h. Pres. Henry Thompson, Sec.

E. H. Johnson, Prest. F. J. Sprague, V. Prest. & Gen. Man. A. S. Beves, Sec. & Treas. H. McL. Harding, Gen. Agt.

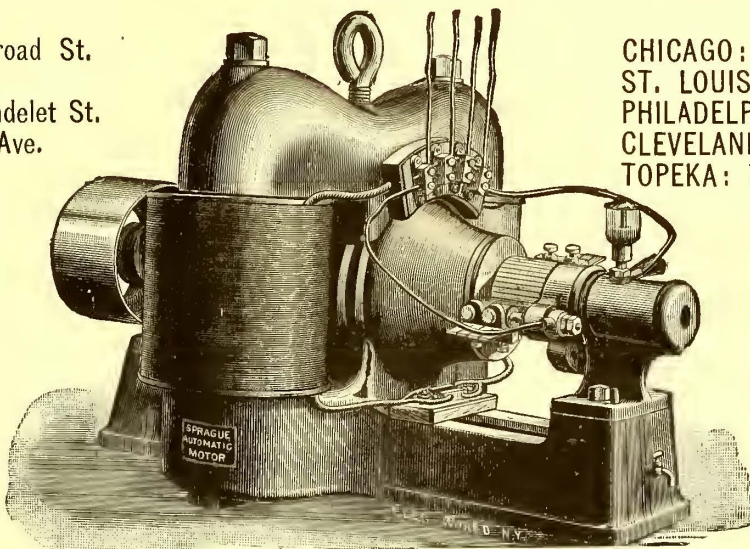
THE SPRAGUE ELECTRIC RAILWAY & MOTOR CO.

OFFICES:

NEW YORK: 16 & 18 Broad St.
BOSTON: 55 Oliver St.
NEW ORLEANS: 20 Carondelet St.
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This is the only company in the United States devoting its entire energies to the various questions involved in the transmission of power, and it is putting into practical use more motors of and over one-half horse power than all other companies combined.

This company, having now perfected a Street Rail-

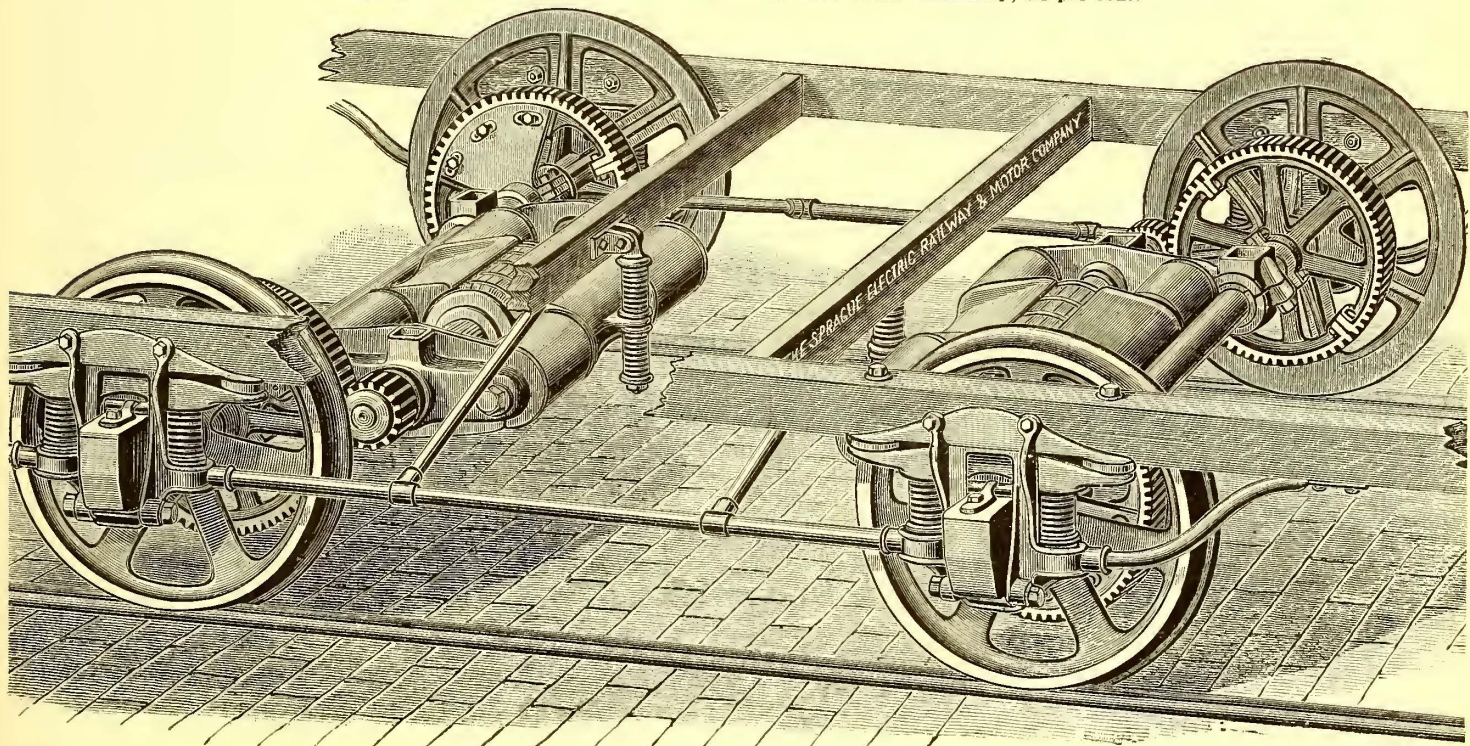


Sprague Automatic Motor.—15 Horse Power. 220 Volts. Efficiency, 91 per cent.

OFFICES:

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way System in all its details, is prepared under suitable guarantees of successful operation, to take contracts for equipping new roads with all the appliances, both electrical and mechanical, for operating street railroads, and also for equipping roads now in operation.



Street Car Truck Showing Motors.

CHARACTERISTICS OF RAILWAY MOTORS.

Lightest weight consistent with Highest Efficiency.
Simple, Compact in Construction.
Non-Liability to get out of order.
No Skilled Labor.

Strong enough to do the work under all conditions.
Simplicity and ease of operation.
Commutator wear Reduced to a Minimum.

DETAILS OF SYSTEM.

Generators of Highest Efficiency and Reliability.
Systems of Conducting Current to the Cars with the Impossibility of an Accident at any Point of the Line Interfering with the Operation of the Remainder of the Road.
Motors Flexibly Suspended from the Axles to insure Perfection of Running.
Greatly Increased Traction by the Application of Motors to each Axle with Independent Driving.
Greatest Return for Given Amount of Coal Burned.

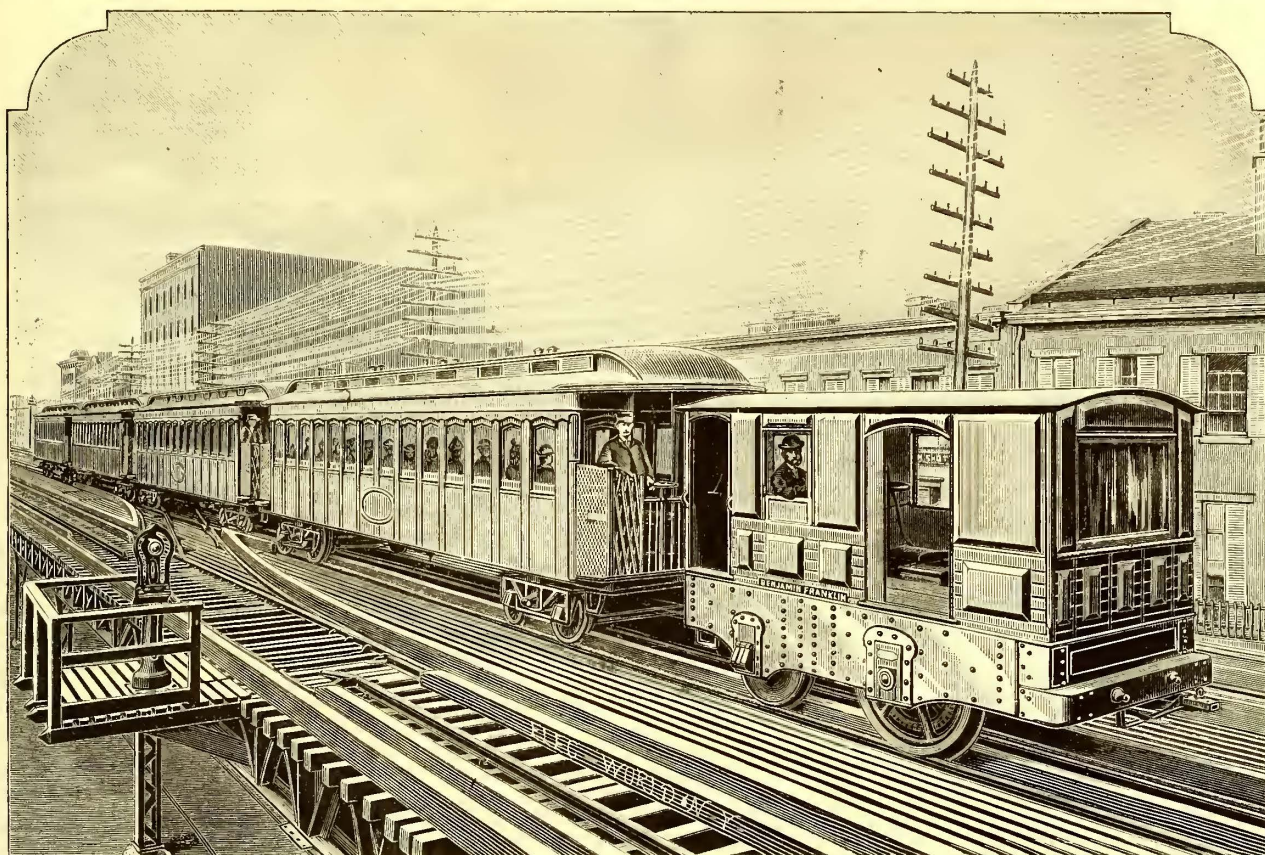
Entire Freedom from Disagreeable Noises by means of Split-Gears and Spring Suspension.
Absence of all Ropes, Belts, Sprocket-Wheels and Chains.
No Useful Room in the Car taken up by the Motor.
No Changes in Truck.
No Complicated Nest of Gearing.
Use of Single Sets of Brushes for both Directions of Driving.
Storage Battery or Overhead System.

& Treas. Thos. F. Ryan, Supt. Henry A. Newell. Office 761 Seventh ave. f
 Central Crosstown R.R. Co. 5.22 m, 4-8½ g, 52 lb r, 45 c, 241 h. Pres. Geo. S. Hart, V. Pres. A. Cammack, Sec. Milton I. Masson, Treas. E. Burton Hart. Office, 365 Ave. A. g
 Central Park, North & East River R.R. Co. 26 m, 4-8½ g, 60 lb r, 162 c, 1,200 h. Pres. G. H. Scribner, V. Pres. C. D. Wyman, Sec. H. Scribner. Treas. J. L. Valentine, Supt. W. N. A. Harris. Office, Tenth Ave., 53d & 54th st. j
 Chambers St. & Grand St. Ferry R. R. Pres. H. Thompson.
 Christopher & Tenth St. R.R. Co. 5 m, 4-8 g, 45 lb r, 47 c, 290 h. Pres. Jacob Sharp, Treas. W. T. Hatch, Sec. & Supt. G. W. Lynch. Office, 168 Christopher st. f
 Dry Dock, East Broadway & Battery R.R. Co. 18½ m, 4-8 g, 60 lb r, 185 c, 1,102 h. Pres. William White, Sec. & Treas. Richard Kelly, Auditor E. T. Landon, Supt. Fred F. White. Offices, 605 Grand st. a
 Eighth Ave. R.R. Co. 20 m, 4-8½ g, 60 lb r, 112 c, 1,155 h. Pres. Geo. Law, Sec. & Treas. James Affleck, Supt. H. B. Wilson. Office, Eighth Ave. & 50th st. 4
 Forty-second Street & Grand Street Ferry R.R. Co. 10½ m, 8-4 g, 64 lb r, 59 c, 480 h. Pres. Chas. Curtiss, Sec. & Treas. E. S. Allen, Supt. John M. Calhoun. Office, 653 W. 42d st. h
 Forty-second St., Manhattanville and St. Nicholas Avenue Ry. Co. 18 m, 4-8½ g, 60 lb r, 105 c, 650 h. Pres. John S. Foster, Sec. C. F. Naething, Treas. Arthur Leary. Office, 118 E. 42 st. a
 Harlem Bridge, Morrisania & Fordham Ry. Co. 16.37 m, 4-8½ g, 45-60 lb r, 65 c, 316 h. Pres. and Supt., H. Spratley, V. Pres. Wm. Remsen, Sec. & Treas. Wm. Cauldwell. Office, Third ave., near 170 st. f
 Houston, West Street & Pavonia Ferry R.R. Co. 12.3 m, 4-8½ g, 60 lb r, 50 c, 340 h. Pres. Henry Thompson, Sec. & Treas. Daniel B. Hasbrouck, Supt. H. W. Edes. Office 415 E. 10 st. f
 Jerome Park R.R. 1-2-3 m, 4-8½ g, 50-56 lb r. Pres. Leonard W. Jerome, Sec. Fred A. Lovcraft, Treas. Theodore Moss. Office, cor. 5th. ave. & 22d st. 6
 New York City St. Ry. Co. 10 m, (not in operation). Pres. Loomis L. White, Sec. W. L. McCorkle, Treas. Wm. L. Skidmore.
 New York & Harlem R. R. Co. 18½ m, 4-8½ g, 60-75 lb r, 172 c, 1,500 h. Pres. C. Vanderbilt, V. Pres. C. C. Clarke, Sec. & Treas. Ed. V. W. Rossiter, Supt. Alfred Skitt, Pur. Agt. Chas. Reed. Office, Grand Central Depot. e
 Sixth Ave. R.R. Co. 9½ m, 4-8½ g, 60 lb r, 109 c, 1,250 h. Pres. Frank Curtiss, Sec. and Treas. Henry S. Moore, Supt. Edw. E. Moore. Office, 758 6th ave. 2
 South Ferry Ry. Co. 1½ m, 4-8 g, 60 lb r, 6 box 4 open c, 32 h. Pres. Henry Hart, Sec. & Treas. Albert I. Elias, Supt. Chas. H. Meeks. Office, 20 Whitehall st. b
 Second Ave. R.R. Co. 28 m, 4-8½ g, 60 lb r, 315 cars, 1750 h. Pres. W. S. Thorn, V. Pres. J. Wadsworth, Sec. & Treas. J. B. Underhill. Office Second ave. cor. 96th st. 6
 Third Ave. R. R. Co. 23½ m, 4-8½ g, 60 lb r, 360 c, 2190 h. Pres. Lewis Lyon, 739 Madison ave., Sec. Alfred Lazarus, 436 W. 61st st., Treas. John Beaver, 211 E. 112th st., Supt. John H. Robertson, 307 E. 65th st., Eng. Wm. H. Palme. Office, 1,115 Third ave. e
 Twenty-third St. Ry. Co. 14 m, 4-8 g, 54 lb r, 122 c, 770 h. Pres. Arthur Leary, V. Pres. George N. Curtis, Sec. Thos. H. McLean, Treas. Walter T. Hatch. Office, 621 West 23d st. i
NIAGARA FALLS, N. Y.—Niagara Falls & Suspension Bridge Ry. Co. 2½ m, 4-8½ g, 38 lb r, 34 c, 50 h. Pres. Benj. Flagler, V. Pres. H. Nielson, Sec. W. J. Mackay, Man. & Treas. A. Schoellkopf. i
NIAGARA FALLS, CAN.—Niagara Falls, Wesley Park & Clifton Tramway Co. 4 m, 4-8 g, 30 & 45 lb r, 10 c, 31 h. Pres. J. H. Mooney, Sec. John H. Bache, Treas. John N. Hayward, Supt. J. H. Bache. h
NORFOLK, VA.—Norfolk City R. R. Co. 3½ m, 5-2 g, 43 lb r, 20 c, 67 h. Pres. John B. Whitehead, Sec. & Treas. H. C. Whitehead, Supt. E. W. Savage. b
NORRISTOWN, PA.—Citizens' Pass. Ry. Co. 4m, 5-2 g, 47 lb r, 8 c, 50 h. Capital, \$80,000. Pres. Geo. D. Bolton, Sec. Geo. R. Kite, Treas. Geo. Shannon, Supt. D. B. Hartranft. a
 Norristown Pass. Ry. Co. 1½ m, 5-2½ g, 45 lb r, 2 1-h 2-h c, 12 h. Pres. H. M. Lutz, Sec. Eugene D. Egbert, Treas. & Supt. Norman Egbert. 10
NORTH ADAMS, MASS.—Hoosac Valley St. Ry. Co. 6 m, 4-8½ g, 40 lb r, 8 c, 31 h, 2 steam motors. Pres. Wm. B. Baldwin, V. Pres. L. W. Cronkrite, Sec. S. Proctor Thayer, Treas. Chas. T. Beach. e
NORTHAMPTON, MASS.—Northampton St. Ry. Co. 3½ m, 4-8½ g, 32 lb r, 9 c, 35 h. Pres. Oscar Edwards, Sec. M. H. Spaulding, Treas. & Sup. E. C. Clark. l
NORWALK, CONN.—Norwalk Horse R. R. Co. 1½ m, 4-8 g, 40 lb r, 7 c, 21 h. Pres., Supt. & Treas. James W. Hyatt, Sec. Edwin G. Hoyt. j
NORWICH, CONN.—Norwich Horse R. R. Co. 6 m, 4-8 g, 20 lb r, 12 2-h c, 39 h. Pres. Thos. Cunningham, Sec., Treas., Supt. & Pur. Agt. T. West. 9
OAKLAND, CAL.—Alameda, Oakland & Piedmont R. R. 4 m. Pres. & Pur. Agt. Theo. Meetz, Sec. R. Mohr, Treas. W. Blair, Supt. L. Koehnig, Berkeley Villa R. R. Co. Props. Berryman & Chaffet.
 Broadway & Piedmont R.R. Co. 3 m, 5 g, 30 lb r, 18 c, 46 h. Pres. Walter Blair, Sec. Montgomery Howe. 9
 Brooklyn & Fruit Vale R. R. 2½ m, 5 c, 18 h. Pres. E. C. Sessions, Sec. W. H. Gill. 2
 Fourteenth St. R.R. Co. 8 m, 5 g, 25-40 lb r, 10 c, 46 h. Pres. & Supt. Walter Blair, Sec. P. J. Van Lobez, Office, 524 14th st. j
 Oakland R. R. Co. 8 m, 3 g, 60 lb r, 9 c, 83 h. Pres. Jas. G. Fair, Sec. Chas. S. Neal, Supt. Geo. Y. Loring. Office, 21st & Jones sts. 5
 Oakland, Brooklyn & Fruit Vale R. R. Co. 2½ m, 6 g, 35 lb r, 4 c, 25 h. Pres. H. Tubbs, Sec. W. C. Mason, Supt. J. Dixon, Pur. Agt. Geo. H. Mason. Office, 301 Central ave. a
 Oakland Cable Ry. Co. 5 m, 3 g, 40 lb. iron r, 10 c. Pres. Jas. G. Fair, Sec. & Treas. Chas. S. Neal, Supt. Geo. Y. Loring. Office, 21st & Jones sts. 5
OGDEN CITY, UTAH.—Ogden City Ry. Co. 3 m, 4-8½ g, 20 lb r, 4 c, 30 h. Pres. L. W. Shurtliff,

V. P. & Supt. O. P. Arnold, Sec. & Treas. H. S. Young. a
OGDENSBURG, N. Y.—Ogdensburg St. Ry. Co. 5m, 4-8½ g, 25 lb r, 6 c, 22 h. Pres. W. H. Daniels, Sec. E. A. Newell, Treas. A. E. Smith. b
OLEAN, N. Y.—Olean St. Ry. Co. 1.34 m, 3-6 g, 25 lb r, 3 c, 7 h. Pres. & Supt. John Fobes, V. Pres. C. S. Carey, Sec. & Treas. M. W. Barse. i
OMAHA, NEB.—Omaha Horse Ry. Co. 22 m, 4-8½ g, 30, 35 & 45 lb r, 62 c, 470 h. Pres. Frank Murphy, V. Pres. Guy C. Barton, Sec. J. E. Wilber, Treas. W. W. Marsh, Supt. W. A. Smith. Office 1504 Farnam st. e
 Cable Tramway Co. of Omaha, 4 m, 4-8 1-2 g, 58½ lb r, 10 c, each with grip; operated by cable. Pres. S. R. Johnson, V. Pres. L. B. Williams, Sec. and Treas. C. E. Yost, Chief Engineer Robert Gillham. Capital stock, \$300,000. General office, 130 South 13th st. a
 Omaha Southwestern St. Ry. Co. 2½ m, 4-8½ g, 25 lb No. 1 steel r, 30 c, motors. Pres. Henry Mueller, V. Pres. C. R. Woolley, Sec. Sam'l J. Howell, Treas. C. F. Harrison. Office, 217 S. 14th st. c
ONEIDA VILLAGE, N. Y.—Oneida Ry. Co. 2 m, 4-8 g, 47 lb r, 3 c, 7 h. Pres. W. A. Stone, Sec. & Treas. W. E. Northrup, Supt. Chas. Bonta. j
ORANGE, N. J.—Orange Crosstown and Orange Valley St. Ry. Co. 2½ m, 5-2 g, 35 lb Johnson girder rail, 81-h, 2-3-h c, 38 h. Pres. Francis M. Eppley, of Orange, Sec. Thos. Marsh, Treas. Edw. A. Pearson. Capital stock, \$20,000; bonds, \$20,000. h
ORLANDO, FLA.—Orlando St. Ry. Co. 2 m, 4-8½ g, 30 lb r, 3 c, 8 mu. Pres. T. J. Shine, V. Pres. N. L. Mills, Sec. & Treas. J. D. Beggs. Capital, \$50,000. a
OSHKOSH, WIS.—Oshkosh St. R. R. Co. 3½ m, 4-8½ g, 27 lb r, 10 c, 40 h. Pres. Leander Choate, V. Pres. J. H. Jenkins, Sec. & Treas. J. Y. Hull, Sup. L. F. Thompson. g
OSWEGO, N. Y.—Oswego St. Ry. Co. 2½ m, 4-8½ g, 45 lb r, 5 c, 25 h. Pres. R. J. Oliphant, V. Pres. II. D. McCaffrey, Sec. & Treas. Albert Himes, Supt. Wm. S. Turner. Office, West Bridge, near Third ave. d
OTTAWA, KAN.—Ottawa St. Ry. Co. 2 m, 4-8½ g, 20 & 30 lb T and girder r, 1-1-h 3-2-h c, 16 mu. Pres. John P. Harris, Sec. & Treas. Peter Shiras, Supt. David Miller. 10
OTTAWA, ONT.—Ottawa City Passenger Ry. Co. 5 m, 4-8 g, 30 lb r, 9 c, 40 h. Pres. Thomas C. Keeler, V. Pres. R. Blackburn, Sec. James D. Fraser. i
OTTUMWA, IA.—Ottumwa St. R. R. Co. 2 m, 3-6 g, 27 lb r, 4 c, 2 h, 14 mu. Pres. J. M. Hedrick, Sec. & Treas. H. L. Hedrick, Supt. C. M. Hedrick. Mineral Springs Ry. Co. 1 m, 3-6 g, 16 lb r, 1 c, 4 mu, Owner, L. E. Gray. 8
OWENSBORO, KY.
PADUCAH, KY.—Paducah St. Ry. Co. 5½ m, 4-8 g, 30 lb flat r, 9 1-h c, 26 mu. Pres. C. Delafield, Sec. Henry H. Houston, Treas. J. C. Thompson. Office, 110 S. 3d st. 9
PARIS, TEX.—Paris Ry. Co. 2½ m, 4-8½ g, 22 lb T, 3 pass, 4 ft c, 11 mu. Pres. D. F. Latimer, Sec. & Supt. C. G. Cavinness, Treas. W. D. Latimer. Capital, \$50,000. a
PATERSON, N. J.—Paterson & Passaic R.R. Co. 7 m, 4-10½ g, 33 lb r, 16 c, 30 h. Pres. John N. Terhune, Sec. E. S. Brown, Treas. John J. Brown, Man. & Supt. Ambrose T. King, Asst. Supt. Townsend Rider. Office, First National Bank Bldg. e
 Paterson City Ry. Co. 8½ m, 4-8½ g, 35 lb r, 10 c, 40 h. Pres. Garret Platten, Treas. & Man. H. Romalne, Sec. Albert A. Wilcox, Supt. M. Pettigrew. Office 27 Broadway. a
PAWTUCKET, R. I.—Pawtucket St. Ry. Co. 8 m, 54 lb r, 4 g, 24 c, 124 h. Pres. A. B. Chase, V. Pres. & Gen'l Man. D. F. Longstreet, Treas. E. N. Littlefield, Engr. Geo. C. Tingley. Office Broad st. k
PELHAM, N. Y.—Pelham Park R. R. Co. 1½ m, 3-6 g, 30-57 lb T and s-b r, 4 1-h c, 9 h. Pres. W. R. Lambertson, V. Pres. & Supt. Henry D. Carey, Sec. & Treas. E. N. Anable. Office, 16 Exchange place, New York. f
PENSACOLA, FLA.—Pensacola St. Car Co. 3 m, 4-8½ g, 30 lb r, 10 c, 33 mu. Pres. A. V. Clubbs, Sec. W. A. Blount, Treas. Thos. C. Watson. Capital, \$100,000. Office, 100 E. Government st. c
PEORIA, ILL.—Central City Horse Ry. Co. 10 m, 4-8 g, 40 & 60 lb r, 40 c, 90 h. Pres. & Gen. Man. H. R. Woodward, Sec. & Treas. E. Callender, Supt. John Strong. Office 2011 N. Adams st. f
 Central Horse & Cable R. R. Co. 3 m, 4-8½ g, 30 & 40 lb r, 9 c, 22 h. Pres. & Gen. Man. H. R. Woodward, Sec. Jos. Elder, Treas. E. Callender, Supt. John Strong. Office, 2011 N. Adams st. f
 East Bluff Peoria Horse Ry. Co. 1 m, 4-8½ g, 30-40 lb r, 4 c, 24 h. Pres. N. Giles, Sec. R. R. Bourland, Treas. M. E. Culver. Capital, \$11,000. 4
 Fort Clark Horse Ry. Co. 8 m, 4-8½ g, 20-38 lb r, 32 c, 80 mu. Pres. J. H. Hall, Sec. H. W. Wells, Treas. H. Detweiler, Supt. J. H. Hall. Office, 1,600 Perry st. i
 Peoria Horse Ry. Co. 6 m, 4-8 g, 40-60 lb r, 14 c 60 h & mu. Pres. & Gen. Man. H. R. Woodward, Sec. & Treas. E. Callender, Supt. John Strong. j
PETERSBURG, VA.—Petersburg St. Ry. 3½ m, 4-8½ g, 42 & 47 lb r, 9 c, 2 h, 35 mu. George Beadle, Prop. 7
PHILADELPHIA, PA.—Citizens' Pass. Ry. Co. 10½ m, 5-2 g, 45-47 lb r, 86 c, 470 h. Pres. John McCarthy, Sec. & Treas. J. Q. Adams, Sup. H. C. Keen, Office, n w cor. 12th and Susquehanna ave. Capital, \$192,500. a
 Empire Pass. Ry. Co. 8½ m, 5-2 g, 45 lb r, 32 c, 250 h. Pres. James McManes, Sec. and Treas. Johu I. Adams. Office, n w cor. 12th st. and Susquehanna av. a
 Frankford & Southwark Phila. City Pass. R.R. Co. 18.10 m, 5-2 g, 47 lb r, 100 c, 8 dummies, 650 h. Pres. John Noblit, Sec. Thos. S. Harris, Treas. R. C. Brewster, Supt. T. E. Cox. Capital, \$750,000. Office, 2501 Kensington ave. a
 Germantown Pass. Ry. Co. 29½ m, 5-2 g, 47 lb r, Cars and horses, leased. Pres. Craig D. Ritchie, Sec. & Treas. Lewis S. Renshaw. Office, 1,001 Chestnut st. f
 Green & Coates R. R. Co. (Leased to People's Pass. Ry. Co.) Office, 8th & Dauphin sts. 8
 Hestonville, Mantua & Fairmount Pass. R.R. Co. 20

m, 5-4½ g, 45 lb r, 60 c, 500 h. Pres. Chas. H. Laffer ty, Sec. & Treas. W. C. Foster. Office, 4,300 Lancaster ave. a
 Lombard & South Sts. Pass. Ry. Co. 10 m, 5-2 g, 43 lb r, 51 c, 276 h. Pres. John B. Parsons, Sec. & Treas. Thos. C. Barr, Supt. J. H. Fresh. Office, 25th & South sts. k
 Manayunk & Roxborough Incline Plane & Ry. Co. 5½ m, 5-2½ g, 45 lb r, 8 c, 33 h. Pres. C. J. Walton, Sec. W. H. Lewis, Treas. C. J. McGlinchey, Supt. A. Tibben. 9
 People's Pass. Ry. Co. 45 m, 5-2 g, 47 lb r, 174 c, 1153 h. Pres. John B. Parsons, Asst. to Pres. Thos. C. Barr, Sec. & Treas. David C. Golden, Supt. Chas. S. Whiting. Office, 8th & Dauphin sts. a
 Philadelphia City Pass. Ry. Co. 12.417 m, 5-2½ g, 47 & 78 lb r, 132 c, 708 h. Pres. Wm. W. Colket, Sec. & Treas. T. W. Pennypacker. (Leased to W. Phila. Pass. Ry. Co.) Office, 202 Walnut place. a
 Philadelphia Traction Co. 109 m, 5-2½ g, 47 lb r, 594 c, 2608 h. Pres. W. H. Kemble, V. Pres. P. A. B. Widener & W. L. Elkins, Sec. & Treas. D. W. Dickson, Engr. A. D. Whitton. Office, n w cor. 41st and Haverford sts. i
 Philadelphia & Darby Ry. Co. 6½ m, 5-2½ g, 42 lb r, road leased. Pres. C. L. Borie, Sec. and Treas. Wm. W. Colket. Office, 202 Walnut pl. Leased to Phila. City Pass. Ry. Co. a
 Philadelphia & Gray's Ferry Pass. R.R. Co. 101-3 m, 40 c, 200 h. Pres. Matthew Brooks, Treas. J. C. Dawes, Sec. J. Crawford, Supt. Patrick Lovett. Office, 36th st. and Gray's Ferry Rd. 6
 Ridge Ave. Pass. Ry. Co. 15 m, 5 g, 47 lb r, 60 c, 350 h. Pres. E. B. Edwards, Treas. Wm. S. Blight, Supt. Wm. Myers. a
 Second & Third St. Pass. Ry. Co. 37 m, 5-2½ g, 43 to 55 lb r, 116 c, 675 h. Pres. Alexander M. Fox, Treas. William F. Miller, Sec. Charles D. Matlack, Supt. D. W. Stephens. Office, 2,653 Frankford ave. a
 Seventeenth & Nineteenth Sts. Pass. Ry. Co. 7½ m. Pres. Matthew S. Quay, Sec. & Treas. John B. Peddie. (Leased to Philada. Traction Co.)
 Thirteenth & Fifteenth Sts. Pass. Ry. Co. 14 m, 5-2 g, 47 lb r, 43 c, 52 h. Pres. Thos. W. Ackley, Sec. & Treas. Alex. Rennick, Supt. Wm. F. Cooper. Office, 15th & Cumberland sts. a
 Union Pass. Ry. Co. 70 m, 348 c, 1,724 h. Pres. Wm. H. Kemble, Sec. & Treas. John B. Peddie, Supt. Jacob C. Petty. (Leased to Phila. Traction Co.)
 West Philadelphia Pass. Ry. Co. 18½ m, 5-2½ g, 47 lb r, 122 c, 112 h. Pres. Peter A. B. Widener, Sec. & Treas. D. W. Dickson, Supt. Jas. T. Gorman. Office, cor. Haverford & 41st sts. (Leased by the Phila. Traction Co.) 5
PHILLIPSBURGH, N. J.—Phillipsburgh Horse Car R. R. Co. 2½ m, 4-8 g, 35 lb r, 4 c, 13 h. Pres. Daniel Runkle, Sec. & Treas. James W. Long. a
PINE BLUFF, ARK.—Citizens' St. Ry. Co. 2½ m, 4-8 g, 34 lb T, 8 c, 50 mu. Pres. John M. Taylor, V. Pres. & Supt. H. P. Bradford, Sec. John O'Connell, Treas. H. H. Hunn. Capital, \$30,000. 9
PITTSBURGH, PA.—Central Pass. R.R. Co. 6 m, 5-2½ g, 45 lb r, 16 c, 100 h. Pres. Geo. I. Whitney, Sec. & Treas. F. L. Stephenson, Supt. R. G. Heiron. 4
 Citizens' Traction Co. 16½ m, 5-2½ g, 47 lb r, 52 c, 337 h. Pres. Jno. G. Holmes, Sec. C. M. Gormly, Treas. N. Holmes, Supt. Murray A. Verner. Capital, \$2,500,000. Office, 739 Penn ave. 11
 Federal St. & Pleasant Valley Ry. Co. 6 m, 5-2½ g, 45-47 lb r, 22 c, 168 h. Pres. Wm. McCreery, Sec. R. F. Ramsey, Treas. James Boyle, Supt. Wm. J. Crozier, Allegheny City. Office, 129 Taggart st., Allegheny City. a
 People's Park Pass. Ry. Co. 2 m, 5-2½ g, 45 lb r, 10 c, 80 h. Pres. Wm. McCreery, Sec. R. F. Ramsey, Treas. James Boyle, Supt. Wm. J. Crozier, Allegheny City. Office, 129 Taggart st., Allegheny City. a
 Pittsburgh & Manchester Pass. Ry. Co. 10 m, 5-2½ g, 46 lb r, 44 c, 278 h. Pres. Chas. Atwell, Sec. & Treas. Chas. Seibert, Supt. James C. Cotton. Office, Market & Liberty sts. a
 Pittsburgh, Oakland & East Liberty Pass. Ry. Co. 11 m, 5-4½ g, 47 lb r, 22 c, 162 h. Pres. Thos. S. Bigelow, Gen. Man. G. W. Elkins, Sec. John G. Traggard, Treas. A. W. Mellon, Supt. H. M. Cherry. Being converted into a cable road under name of Pittsburgh Traction Co., which see, among New Roads. e
 Pittsburgh Union Pass. R.R. Co. 10 m, 5-2½ g, 46 lb r, 29 c, 150 h. Pres. Chas. Atwell, Sec. Chas. Seibert, Treas. J. J. Donnell, Supt. James C. Cotton. a
 Pittsburgh & Birmingham Pass. R. R. Co. 7 m, 5-2½ g, 45-47 lb r, 20 c, 177 h. Pres. W. W. Patrick, Sec. C. B. Agnew, Treas. John G. Holmes. e
 Pittsburgh & West End Pass. Ry. Co. 7 m, 5-2½ g, 40 lb r, 14 c, 74 h. Pres. & Treas. John C. Rely, Sec. Thomas S. Bigelow, Supt. William J. Burns. Office, Wabash ave. a
 Second Avenue Pass. Ry. Co. 5 m, 5-2 g, 47 lb r, 8 c, 40 h. Pres. Geo. Fawcett, Sec. Jas. F. Fawcett, Treas. W. J. Fawcett. Office, 2d ave. e
 South Side Pass. R.R. Co. 5m, 5-2½ g, 45 lb r, 12 c, (only 6 in use), 40 h. Pres. D. Z. Brickell, Clerk J. A. Curry, Treas. W. T. Wallace, Supt. W. M. Rosborough. Office, 2,136 Sarah st. e
 Transverse Pass. Ry. Co. 6½ m, 5-2 g, 52 lb r, 39 c, 243 h. Pres. C. L. Magee, V. Pres. C. F. Klopfer, Sec. & Treas. Wm. R. Ford, Supt. Miller Elliot. e
PITTSFIELD, MASS.—Pittsfield St. Ry. Co. 3½ m, 4-8 g, 30 c, 40 h. Pres. Jos. Tucker, Sec. T. Allen, Treas. T. A. Oman, Supt. C. P. Upson. 8
PITTSSTON, PA.—Pittston St. Car Co. 1½ m, 5-2g, 42 lb r, 2 c, 6 h. Pres. Isaac Everitt, Sec. Eug. W. Mulligan, Treas. M. W. Morris. e
PORT HURON, MICH.—Port Huron Electric Ry. Co. 2½ m, 4-8 g, 27 lb r, 8 c, (3 being motor c), 11 h. Van Depoelle system; overhead conductor. Pres. Wm. F. Botsford, V. Pres. John F. Talbot, Treas. Chas. A. Ward, Jr. Office, 306 Huron ave. h
 Port Huron St. Ry. Co. 6½ m, 4-8 g, 7 c, 22 h. Pres. J. P. Sanborn, Sec., Treas. & Man. J. R. Washtell. 7
PORTLAND, ME.—Ocean St. R.R. Co. Operated by Portland R. R. Co. 12
 Portland R.R. Co. 9½ m, 4-8½ g, 35-45 lb r, 36 c, 167 h. Pres. H. J. Libby, Treas. & Gen. Man. E. A. Newman. Office, 484 Congress st. 4

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PORTLAND, ORE.—Portland St. Ry. Co. 2 m, 3-6 g, 25-42 lb r, 11 c, 40 h. Pres. Jos. Holladay, Sec. & Supt. C. K. Harbaugh. Office, 104 Fourth st. k
Multnomah St. Ry. Co. 2½ m, 3-6 g, 30 lb r, 19 c, 65 h. Pres. A. N. King, Sec. E. A. King, Supt. W. J. Matchette. Office, 394 Washington st. b
Transcontinental St. Ry. Co. 10 m, 3-6 g, 25-38 lb r, 24 c, 100 h. Pres. & Gen. Man. Tyler Woodward, Sec. D. W. Wakefield. Office, 145 G st. b
PORTSMOUTH, O.—Fortsouth St. R. R. Co. 2 m, 3-6 g, 18 lb r, 4 c, 10 h. Pres. James Skelton, Treas. Sec. & Supt. Enos Reed. a
POTTSVILLE, PA.—People's Ry. Co. 4½ m, 4-8½ g, 45 to 60 lb r, 16 c, 54 h. Pres. T. A. Reilly, Sec. & Supt. Wm. D. Pollard. 9
POUGHKEEPSIE, N. Y.—City R. R. Co. 4 m, 4-8½ g, 35-42 lb r, 11 c, 39 h. Pres. Geo. B. Adrance, V. Pres. & Treas. Hudson Taylor, Sec. A. B. Smith, Supt. C. M. Davis. Office 491 Main st. f
PROVIDENCE, R. I.—Union R.R. Co. 53.8 m, 4-8 g, 47-54 lb r, 27 c, 1,400 h. Pres. Jesse Metcalf, V. Pres. & Gen. Man. D. F. Longstreet. Sec. and Treas. C. A. Babcock, Auditor B. A. Jackson, Engr. Geo. C. Tingley. Office, Market sq. k
PUEBLO, COL.—Pueblo St. Ry. Co. 5 m, 3 g, 22 lb iron r, 8 c, 28 h. Pres. J. B. Osman, V. Pres. J. K. Moore, Sec. & Supt. J. T. Clark, Treas. J. N. Carlisle. 5
QUEBEC, CAN.—Quebec St. Ry. Co. 3 m, 4-8½ g, 45 lb r, 9 c, 46 h. Pres. Chas. St. Michel, Quebec, V. Pres. G. R. Renfrew, Quebec, Sec., Treas. & Supt. Samuel Moore. b
St. John St. Ry. Co. Ltd. 1½ m, 4-8½ g, 35 lb r, 4 c, 23 h. Runs 4 buses out 4 m. from city limits, Pres. Jos. W. Henry, V. Pres. A. Robertson, Sec. & Man. W. W. Martin. b
QUINCY, ILL.—Quincy Horse Ry. & Carrying Co. 6 m, 5 g, 71 lb r, 21 c, 118 mu. Pres. Lorenzo Bull. V. Pres. C. H. Bull, Sec. & Treas. E. J. Parker, Supt. E. K. Stone. a
RACINE, WIS.—Belle City St. Ry. Co. 4 m, 4 g, 32 lb r, 9 c, 40 h. Pres. Geo. B. Hathaway, Sec. & Treas. J. E. Dodge. Office, 716 Park ave. d
RALEIGH, N. C.—Raleigh St. Ry. Co. 5 m, 4-8½ g, 16 T steel r, 6 c, 36 mu. Pres. V. E. Turner, Sec. & Treas. R. T. Gray, Atty. F. H. Busbee. Capital stock, \$25,000. 6
RAPID CITY, DAK.—Rapid City St. Ry. Co. 1½ m, 4 g, lb r, 2 c, 4 h. Pres. Fred. T. Evans, Sec. & Treas. G. Schnasse. a
READING, PA.—Reading City Pass. Ry. Co. 4 m, 5-2½ g, 47, 50 & 52 lb r, 30 c, 125 h. Pres. B. F. Owen, V. Pres. Jas. L. Douglas, Sec. & Treas. H. A. Muhlenberg, Supt. J. A. Riggs. Office, 537 S. 6th st. a
Perklimen Ave. Pass. Ry. Co. 4½ m, 5-2½ g, 38-45 b r, 18 c, 75 h. Pres. Chas. Bretniser, Sec. & Treas. Isaac Hlester, Supt. John B. Houp. Office, Perklimen ave. & 19th st. e
RED OAK, IA.—Red Oak St. R.R. Co. 1½ m, 4-2½ g, 20 lb r, 2 c, 4 h. Pres. John Hayes, V. Pres. Edw. Hayes, Sec. F. M. Byrkit, Treas. & Supt. Marcus Bonham. a and g
RICHMOND, IND.—Richmond City R. R. Co. 4m, 3 g, 20 lb r, 13c, 40h. Pres. J. C. Shaffer, V. Pres. J. F. Miller, Sec. & Treas. H. I. Miller. e
RICHMOND, VA.—Richmond City Ry. Co. 7½ m, 4-8½ g, 30-40 lb r, 42 c, 185 h. Pres. J. L. Schoolcraft, Treas. Walter Kidd, Man. C. M. Bolton, Supt. Charles Selden. a
Richmond & Manchester Ry. Co. 3½ m, 4-8½ g, 38 lb r, 5 c, 26 h. Pres. J. E. Taylor, V. Pres. J. Bryan, Sec. & Treas. Jackson Brandt, Supt. B. R. Selden. a
Richmond Union Pass. Ry. Co. 13 m, 4-8½ g, 45 lb r, 40 c, Sprague elec. motors, 2 on each c. Pres. J. R. Thompson Brown, Sec. & Treas. John F. Barry. Capital, \$500,000. Office, 1,103 Bank st. e
ROCHESTER, N. Y.—Rochester City & Brighton R.R. Co. 37 m, 4-8½ g, 30-45-57 lb r, 170 c, 682 h. Pres. Patrick Barry, Sec. C. C. Woodworth, Treas. C. B. Woodworth, Supt. Thomas J. Brower. e
Citizens' St. Ry. Co. Pres. Wm. H. Jones, Sec. & Treas. J. E. Pierpont, Supt. S. A. Green. c
ROCKFORD, ILL.—Rockford St. Ry. Co. 6-1-3 m, 4-8½ g, 30-40 lb r, 13 c, 54 h, 26 mu. Pres. Anthony Haines, Sec. H. H. Robinson, Treas. N. E. Lyman, Supt. Fred. Haines. c
ROCK ISLAND, ILL.—Rock Island & Milan St. Ry. Co. 12 m, 4-8½ g, 20, 30 & 40 lb r, 8 pass c, 8 ft c, 7 h, 2 motors. Pres. & Supt. Bailey Davncourt, Sec. E. C. Hurst, Treas. J. F. Robinson. a
ROME, GA.—Rome St. Ry. Co. 1½ m, 4-8½ g, 20 lb T, 1-1 h 3-2-h c. Pres. J. W. Rounsaville, Sec. J. L. Bass, Treas. J. F. Howell, Supt. & Pur. Agt. F. C. Hand. 6
ROME, N. Y.—Rome City St. Ry. Co. 6½ m, 4-8½ g, 38½ lb r, 14 c, 75 h. Pres. Rowland F. Hill, 3 Broad st., New York; Sec. & Treas. Wm. Moores, New York; Supt. Wm. P. Rayland, 115 John st., Rome. 11
RONDOT, N. Y.—Kingston City R. R. 2.78 m, 4-8½ g, 40 lb r, 8 c, 40 h. Pres. James G. Lindsey, V. Pres. S. D. Coykendall, Sec. & Treas. Peter E. Schoonmaker, Auditor, Oscar L. Eastman, Gen. Man. Geo. Coykendall. j
RUTLAND, VT.—Rutland St. Ry. Co. 8 m, 4-8½ g, 20 lb r, 8 c, 30 h. Pres. John N. Woodfin, Treas. A. H. Tuttle, Supt. M. McKeogh. Office, 77½ Center st. g
SACRAMENTO, CAL.—Sacramento City Ry. Co. 121-horse and 10 2-horse c, 60 h. Prop. R. S. Carey, Supt. Geo. W. Carey. j
SAGINAW, MICH.—City of Saginaw St. R. R. Co. 2½ m, 4-8½ g, 42 lb r, 14 c, 50 h. Pres. David H. Jerome, V. Pres. Geo. F. Williams, Sec. & Treas. Geo. L. Burrows, Supt. Fred G. Benjamin. Office, 311 Court st. 5
SALEM, MASS.—Naumkeag St. Ry. Co. 2½ m, 4-8½ g, 35-45 lb tram & T r, 55 box 49 open c, 360 h. Pres. Chas. Odell, Treas. Henry Wheatland. Office, 233 Essex st. 9
SALINA, KAN.—Salina Ry. Co. 2½ m, 3-6 g, 20 lb T r, 3-2-h c, 18 mu. Pres. M. D. Herrington, Sec. A. L. Dodge, Treas. M. D. Teague, Supt. C. F. Hilton. 9
SALINA, N. Y.—Woodlawn and Butternut St. Ry. Co. a
SALT LAKE CITY, UTAH.—Salt Lake City R.R. Co. 13 m, 4-8½ g, 20 lb r, 16 c, 106 mu. Pres. John Taylor, Sec. David McKenzie, Treas. James Jack, Supt. Orson P. Arnold. d

SAN ANTONIO, TEX.—San Antonio St. Ry. Co. 18 m, 4 g, 38 lb r, 40 c, 150 mu. Pres. A. Belknap, San Antonio, V. Pres. F. W. Pickard, N. Y. City, Treas. J. Withers, San Antonio, Sec. E. R. Norton, Supt. John Robb. 1
Prospect Hill St. R.R. Co. 1¼ m, 1 c, 2 h. Pres. Sam. Maverick, V. Pres. & Gen. Man. P. J. Moss, Sec. Leonardo Garza, Treas. L. Wm. Menger. d
SAN BERNARDINO, CAL.—Motor road to Colton, owned by Mr. Button. 9
SANDUSKY, O.—Sandusky St. Ry. Co. 4 m, 4-8½ g, 32 lb r, 7 c, 28 h. Pres. Chas. V. Olds, Sec. & Treas. A. C. Moss, Supt. Clark Rude. a
SAN FRANCISCO, CAL.—California Street Cable R. R. Co. 7 m, 3-6 g, 34 lb r, 27 c, 25 dummies, 4 h. Pres. Chas. Mayne, V. Pres. Roht. Watt, Sec. T. W. Hinshman, Treas. A. Borel, Supt. J. W. Harris. Office, 1435 California st. g
Central R. R. Co. 12 m, 5 g, 45 lb r, 31 2-h & 26 1-h c, 293 h. Pres. Chas. F. Crocker, V. Pres. T. Hopkins, Sec. & Gen. Man. J. L. Willcutt, Treas. N. T. Smith, Supt. J. R. Clark. Office, 4th & Townsend sts. g
City R.R. Co. 11 m, 5 g, 45 lb r, 51 1-h 16 2-h c, 289 h. Pres. Leland Stanford, V. Pres. Chas. F. Crocker, Sec. & Gen. Man. J. L. Willcutt, Treas. N. T. Smith, Supt. H. L. Gude. Office, 4th & Townsend sts. 7
Clay St. Hill R. R. Co. 2 m, 3-6 g, 30 lb r, 11 c, 12 dummy cars. Pres. Joseph Britton, V. Pres. Chas. Mayne, Treas. Henry L. Davis, Sec. Chas. F. Campbell. Office, s w cor. Clay & Leavenworth sts. h
Geary St., Park & Ocean R.R. Co. 8 m, (5 m cable, 3 m steam) 5 g, 45 lb r, 30 c, 26 dummies, 4 motors. Pres. Chas. F. Crocker, V. Pres. Timothy Hopkins, Sec. & Gen. Man. J. L. Willcutt, Treas. N. T. Smith, Supt. Johnson Reynolds. Office, 4th & Townsend sts. g
Market St. Cable Ry. Co. 25 m, 4-8½ g, 37-38 lb r, 35 cable c, 25 h c, 86 h. Pres. Leland Stanford, V. Pres. Chas. F. Crocker, Treas. N. T. Smith, Sec. & Gen. Man. J. L. Willcutt, Supt. A. W. Barron. Office, 4th & Townsend sts. d
North Beach & Mission R. R. Co. 16 m, 5 g, 45 lb r, 50 two h. c, and 14 one h. c, 400 h. Pres. Albert Meyer, Sec. H. W. Hathorne, Treas. Wm. Alvord, Supt. M. Skelly. Office, 4th & Louisa sts. h
Ocean Beach Ry. Co. (operated by Market St. Cable Ry. Co.) 2 m, 4-8 g, g. Pres. Leland Stanford, V. Pres. Chas. F. Crocker, Treas. N. T. Smith, Sec. J. L. Willcutt. Office, 4th & Townsend sts. d
Omnibus R. R. & Cable Co. 18 m, 5 g, 40-45 lb r, 60 c, 400 h. Pres. Gustav Sutro, V. Pres. D. Skein, Sec. G. Ruegg, Supt. M. M. Martin. Office 727 Howard st. Will soon change to cable. g
Park & Ocean R. R. Co. 8 m, 35 and 40 lb r, 4-8½ g, 7 dummy engines, 16 pass. c, 6 flat and section 6. Pres. Chas. F. Crocker, V. Pres. Timothy Hopkins, Treas. N. T. Smith, Sec. J. L. Willcutt. Office, 4th & Townsend sts. Operated by Market St. Cable Ry. Co. d
Potrero & Bay View R. R. Co. 3 m, 5 g, 35 lb r, 10 1-h 10 2-h c, 43 h. Pres. Leland Stanford, V. Pres. Chas. Crocker, Treas. N. T. Smith, Sec. & Gen. Man. J. L. Willcutt, Supt. H. O. Rogers. Office, 4th & Townsend sts. d
Sutter St. R. R. Co. 14 m, 4-11 g, 45 lb r, 50 c, 185 h. Pres. R. F. Morrow, Sec. A. K. Stevens, Treas. M. Schmitt. Office, cor. Sutter & Polk sts. f
Telegraph Hill R.R. Co. 1,560 ft, 4-8½ g, 45 lb r, 2 c, — h. Pres. Gustave Sutro, V. Pres. C. Kohler, Sec. & Supt. Chas. J. Werner. Suspended operations. Cable taken up and stored away. e
SAN JOSE, CAL.—San Jose & Santa Clara R.R. Co. 8½ m, 4-8 and 3 g wide g, 40 lb r, narrow g, 20 lb r, 25 c, 75 h. Pres. S. A. Bishop, V. Pres. W. S. McMurtry, Treas. Jacob Rich, Sec. E. M. Rosenthal, Man. Wm. Flitts. Office, 20 W. Santa Clara st. n
First St. R. R. 4½ m, 3 g, 20 lb r, 6 c, 30 h. Jacob Rich, Sole Owner; Sec. E. M. Rosenthal. Office, 20 Santa Clara st. 12
First St. & San Pedro St. Depot R. R. Co. Pres. Frank C. Bethel. c
North Side Horse R.R. Co. 2½ m, 3 g, 16 lb r, 3 c, 10 h. Pres. & Man. Jacob Rich, Sec. E. M. Rosenthal, Treas. S. A. Bishop. f
Willow Glen R.R. 7½ m, 3 g, 20 lb r, 8 c, 30 h. Sole owner Jacob Rich, Sec. E. M. Rosenthal. Office 20 W. Santa Clara st. k
SANTA BARBARA, CAL.—Santa Barbara St. R.R. Co. 22-5 m, 3-6 g, 3 c, 12 mu. Pres. A. F. McPhail. Office, State st. 5
SANTA ROSA, CAL.—Santa Rosa St. Ry. Co. 1½ m, 3 g, 32 lb tram r, 2 1-h 2-2-h c, 6 h. Pres. & Treas. M. L. McDonald, Sec., Supt. and Pur. Agt. J. B. Reed. 9
SARNIA, CAN.—Sarnia St. Ry. Co. 5m, 4-8 g, 32 lb r, 2 c, 9 h. Pres. J. F. Lester, Sec. & Treas. Thos. Symington, Supt. Henry W. Mills. Office, Canadian Block. e
SAUGATUCK, CONN.—Westport & Saugatuck Horse R.R. Co. (See Westport, Conn.)
SAVANNAH, GA.—City & Suburban R. R. 12½ m steam line, 6 m street line, 5 g, 35, 38 & 42 lb r, 40 street c, 12 steam c, 130 h, 3 engines. Pres. J. H. Johnston, Sec. A. L. Hartridge, Treas. E. Schmidt. 1
Coast Line R.R. Co. 7 m, 5 g, 35 lb r, 17 c, engine, 35 h, 5 m suburban line 35 lb T r steam. Pres. Geo. Parsons, New York, Sec. Treas. & Gen. Man. R. E. Cobb, Savannah. Office, Bolton st. c
SCHENECTADY, N.Y.—Schenectady St. Ry. Co. 2 m, 4-8½ g, 40 lb steel girder r, 5 c, 28 h. Pres. A. R. Chisolm, New York Sec. L. M. Fulton, Treas. & Gen. Man. Alfred Ely, 29 Nassau st., New York, Supt. & Pur. Agt. D. G. Christie, Schenectady. 10
SCRANTON, PA.—People's St. Ry. Co. of Luzerne Co. 10 m, 4-8½ g, 25-40-52 lb r, 20 c, 90 h. Pres. Wm. Matthews, Sec. & Treas. Horace E. Hayd, Supt. F. Pearce. k
Scranton Suburban Ry. Co. 4½ m, 4-8½ g, 52 lb flat & 42 lb T r, 5 c, operated by electricity. Van Depoele system; overhead conductor; two 180 H. P. engines. Pres. Edward B. Sturges, Treas. T. F. Torrey, Sec. Geo. Sanderson, Supt. John Lathrope. 6
SEARCY, ARK.—Searcy & West Point R.R. Co. 8 m, 4-8 g, 20 lb r, 7 c, 8 mu. Pres. A. W. Yarnell Sec. W. H. Lightie, Treas. Jasper Hicks. c
SEATTLE, W. T.—Seattle St. Ry. Co. 4½ m, 4-8½ g, 25 & 30 lb T steel r for 2½ m, 35 lb flat steel

r for 2 m, 7 c, 24 h. Pres. & Gen. Man. F. H. Osgood, Sec. Geo. Kinnear. a
SEDALIA, MO.—Sedalia St. Ry. Co. 2½ m, 4-10 g, 22 lb r 6 c 25 h. Pres. Joseph D. Sicher, V. Pres. Louis Deutsch, Treas. F. H. Guenther, Sec. Chas. S. Conrad. 7
SELMA, ALA.—Selma St. R.R. Co. 2½ m, 5 g, 20 lb r, 7 c, 7 h. Pres. H. L. McKee, Sec. J. F. Brown. 9
SEVASTOPOL, IA.—Des Moines & Sevastopol St. Ry. Co. 2 m, 4 g, 20 lb r, 3 c, 10 h. Pres. G. Van Ginkel, Sec. C. G. Van Ginkel, Treas. & Man. John Weber. a
SHERMAN, TEX.—Sherman City R. R. Co. 4 m, 5 g, 20 lb r, 9 c, 54 mu. Pres. C. W. Batsell, Treas. J. M. Batsell, Sec. C. W. Batsell, Jr. d
SHREVEPORT, LA.—Shreveport City R.R. Co. 1½ m, 4-4 g, 46 lb r, 6 c, 14 h. Pres. Peter Youree. 9
SILVER CLIFF, COL.—Silver Cliff St. R.R. Co. a
SIOUX CITY, IA.—Sioux City St. Ry. Co. 8 m, 4 g, 30 lb r, 16 c, 125 h. Pres. Fred. T. Evans, V. Pres. D. A. Magee, Sec. & Treas. F. T. Evans, Jr. a
Sioux City & Highland Park Ry. Co. 5 m, 4-8½ g, 35 lb r, 13 c, 2 dummy engines. Pres. W. W. Byam, Sec. F. B. Hutchins, Treas. W. C. Hutchins Supt. S. B. Jackson. c
SOUTH BEND, IND.—South Bend St. Ry. 7 m, 4-8½ g, 30 lb r, 16 c, 56 h. Pres. Jacob Woolvorton, Treas. & Gen. Man. Lucius Clark, Sec. W. G. George, Supt. Will Miller. a
South Bend & Mishawaka St. Ry. Co. 10 m, 4-8½ g, T and s-b r, 13 2-h c, 44 h. Pres. J. W. Boynton, Sec. & Treas. E. W. Ellithorp, Mishawaka, Ind. a
SOUTH CHICAGO, ILL.—South Chicago City Ry. Co. 6 m (of which 3 m are 40 lb Johnson girder r, 1½ m 35 lb tram & ½ m T r), 7 c, 37 h. Pres. Douglass S. Taylor, Sec. & Supt. Andrew Krimbill, Treas. C. O. Pomeroy. Office, 46 Calumet Bldg., Chicago. e
SPRINGFIELD, ILL.—Citizens' St. R. R. Co. 8½ m, 3-6 g, 20 & 36 lb r, 31 c, 100 mu. Pres. J. H. Schuck, Sec. Chas. Herrman, Treas. Frank Reisch. Office Washington st. 5
Springfield City Ry. Co. 7 m, 4-8½ g, 30-45 lb r, 10 open & 10 box c, 85 mu. & h. Pres. A. L. Ide, V. Pres. Geo. H. Black, Treas. Wm. Ridgeley, Sec. Geo. Brinkerhoff, Supt. Irwin Johnson. Office, Monroe st., bet. 4th & 5th. d
SPRINGFIELD, MASS.—Springfield St. Ry. Co. 9½ m, 4-8½ g, 35 lb r, 40 c, 170 h. Pres. John Olmsted, Auditor L. E. Ladd, Clerk Gideon Wells. Treas. A. E. Smith, Supt. F. E. King. Office, 1 Main st. a
SPRINGFIELD, MO.—Citizens' Ry. Co. of Springfield and No. Springfield, 7 m, 4-8½ g, 33-40 lb r, 15 c, 25 h, 48 mu. Pres. R. C. Kerens, V. Pres. B. F. Hoebart, Sec. and Treas. A. M. Longwell, Supt. F. B. Smith, Ex-Com. H. F. Denton, L. H. Murray, C. B. McAfee. Office, North Springfield. 3
SPRINGFIELD, O.—Citizens' St. R. R. Co. 11½ m, 4 g, 30 lb r, 30 c, 145 h. Pres. D. W. Stroud, V. Pres. H. S. Bushnell, Treas. Ross Mitchell, Sec. F. S. Penfield. a
STAFFORD, KAN.—Stafford St. Ry. Co. 1m, T r, 3-2-h c, 12 h. Pres. Supt. and Pur. Agt. John Clynne, Sec. J. H. Cothness, Treas. Frank Cox. c
STAMFORD, CONN.—Stamford Horse R. R. Co. 5½ m, 4-8½ g, 10 c, 40 h. Pres. Wm. R. Fosdick, Supt. Wm. H. Hay. 10
STATEN ISLAND, N.Y.—Staten Island Shore Ry. 9 m, 4-8½ g, 25 lb T r, 10 c, 40 h. Supt. Thos. Moore. Office, Tompkinsville. 8
ST. CATHARINE'S, ONT.—St. Catharine's, Merri- ton & Thorold St. Ry. Co. 6 m, 4-8½ g, 30 lb r, 12 c, Van Depoele elec. system, 16 motors. Pres. E. A. Smyth, Sec. A. P. Friesman, Supt. E. A. Smyth, Electrician Walter Bradley. Capital, \$50,000. b
ST. CLOUD, MINN.—St. Cloud St. Ry. Co. 3 m, 4-2 g, 30 lb flat r, 5 1-h c, 12 h. Pres. C. P. McClure, Sec. F. Folman, Treas. A. G. Whitner. 6
STERLING, ILL.—Rock River St. Ry. Co. 4 m, 4-8½ g, 20 lb T r, 8 1-h c, 45 h. Pres. Chas. D. Haines, Treas. A. G. Haines. c
STILLWATER, MINN.—Union Depot St. Ry. & Transfer Co. 7 m, 4-8½ g, 55 lb r. Receiver E. D. Buffington. 10
STILLWATER, N. Y.—Stillwater & Mechanicsville St. Ry. Co. 4½ m, 4-8½ g, 25-30 lb r, 4 c, 6 h. Pres. W. L. Denison, V. Pres. Lyman Smith, Gen. Supt. Peter Van Veghten, Sec. & Treas. Edw. I. Wood. k
ST. JOHN, N. B.—St. John St. Ry. Co. 7 m, 4-8½ g, 45-60 lb r, 15 c, 65 h. Pres. John R. Bothwell, Treas. John F. Zebly. Office Room 39 Drexel Bldg., New York, and St. John, N. B.
ST. JOSEPH, MICH.—St. Joseph & Benton Harbor St. Ry. Co. 1½ m, 4-8 g, 30 lb r, 3-2-h c, 22 h, 4 mu. Pres. & Supt. M. C. Burnes, Sec. & Treas. W. Bullinger. 9
ST. JOSEPH, MO.—Citizens' Ry. Co. 3 m, 4-8½ g, 28, 38 & 52 lb r, 14 c, 60 h. Pres. C. C. Burnes, Sec. & Man. Jos. A. Corby, Treas. S. A. Walker. Office, 511 Francis st. c
Frederick Ave. Ry. Co. 3½ m, 4-8½ g, 42 lb r, 10 c, 70 h & mu. Pres. D. D. Burnes, Sec. & Gen. Man. J. A. Corby, Treas. S. A. Walker. Office, 511 Francis st. d
Union Ry. Co. 9½ m, including 1 m elec., overhead wire. Sprague system. 4-8½ g, 20, 30, 35 & 52 lb r, 32 c, 110 h. Pres. Seymour Jenkins, Sec. & Treas. A. Steinacker, Supt. Chas. Wilson. Office, Highland & St. Joseph aves. c
ST. LOUIS, MO.—Baden & St. Louis R.R. Co. 3½ m, 4-9½ g, average 28 lb r, 10 c, 23 h. Pres. George S. Case, V. Pres. William Z. Coleman, Supt. H. Nelson. Office, Broadway, near Baden ave. c
Benton-Bellerfontaine Ry. Co. 8m, 4-10 g, 52 lb r, 57 c, 234 h. Pres. Chas. Parsons, Sec. & Treas. Robert McCulloch. Office, 4238 N. 20th st. d
Cass Avenue & Fair Ground Ry. Co. 8½ m, 4-9½ g, 69 lb r, 34 c, 278 h. Pres. Julius S. Walsh, V. Pres. & Treas. Jas. Campbell, Sec. Patk. Gorry, Supt. M. J. Moran, Engr. Jas. Boland. Office, 2,900 Cass ave. c
Citizens' R. R. Co. 21 m, 4-9½ g, 69 lb r, 80 combination, 40 grip, 60 open c, 225 h, 200 mu. Pres. J. Ius S. Walsh, V. Pres. J. P. Helfenstein, Supt. Chas. J. Luckner. Office, Easton ave., Three-mile House. c
Forest Park, Laclede & Fourth St. Ry. Co. 5½ m, 4-10 g, 44 lb r, 20 c, 190 h. Pres. C. H. Turner. Sec. & Treas. Wm. D. Henry. Office, 1,827 Market st.

THE SHORT & NESMITH S E R I E S ELECTRICAL RAILWAY SYSTEM

OF THE

United States Electric Company,
DENVER, COLORADO, U.S.A.

This Series System of Electrical Railway solves the problem of electrical traction. It has no disagreeable features. No unsightly poles on the street; there being but one wire in the track way, no shocking can occur. The simplicity and practical construction of the system, and the fact that it is the only one on which a large number of cars can be operated, makes it the system which will immediately come into general use.

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Bentley-Knight Electric Railway Co.,

115 Broadway, New York.

CONTRACTORS FOR THE CONSTRUCTION OF CITY STREET RAILWAYS AND SUBURBAN
TRAMWAYS USING EITHER UNDERGROUND, SURFACE OR ELEVATED CONDUCTORS.

Estimates furnished on application.

N. B.—The Bentley-Knight Electric Railway Company absolutely controls all efficient and economic methods of operating electrically equipped cars by means of conductors contained in and protected by sub-surface conduits. Entering the field long in advance of all others, it first encountered the many difficulties which had to be met and overcome; and the many patents now owned and controlled by it, effectually cover each and every detail (both mechanical and electrical) necessary to the successful construction and operation of an electric railway in a city street.

Jefferson Ave. Ry. Co. 5 m, 4-9 g, 56 lb r, 21 c. Pres. John Scullin, V. Pres. Frank Carter, Sec. Jas. H. Roach, Treas. Clement M. Seaman. Office, Jefferson ave. & La Salle st.

Lindell Ry. Co. 1 1/2 m, 4-10 g, 45 lb r, 75 c, 407 h. Pres. John H. Maxon, Sec. & Treas. Geo. W. Baumhoff. Office, 2207 Washington ave. c

Missouri R.R. Co. 1 1/2 m, 4-10 g, 44 lb r, 50 c, 488 h. Pres. P. C. Maffit, Sec. Wm. D. Henry, Supt. James F. Davidson. Office, 1827 Market st. e

Mound City Ry. Co. Pres. John Scullin, V. Pres. Frank Carter, Sec. Jas. H. Roach, Treas. C. M. Seaman, Supt. Jas. Scullin. Office, 2,500A St. Louis ave. f

Northern Central Ry. Co. 10 1/2 m, 4-9 1/2 g, 50 lb r, 60 c, 280 h. Pres. Julius S. Walsh, Sec. & Treas. Chas. K. Dickson, Supt. John Mahoney, Foreman Wm. Hanntgan, Cash. T. C. Callahan. Office, 2,401 Spring av. People's R. R. 8 m, 4-10 g, 44 lb steel r, 63 2-h c, 314 h. Pres. Chas. Green, Sec. & Treas. Jos. Perry, Supt. Patrick Shea. Office, 1,810 Park ave. 11

Southern Ry. Co. 7 1/2 m, 4-10 g, 35-52 lb r, 54 c, 279 h. Pres. W. L. Johnson, Sec. Joe S. Minary, Supt. Jas. F. Uhl. Office, 4,041 So. Broadway. a

St. Louis R.R. Co. 11 m, 4-10 g, 38-44 lb r, 58 c, 375 h. Pres. C. Pepper, Sec. & Treas. R. B. Jennings, Supt. Chas. Ischer. Office, 3,710 N. Broadway. c

St. Louis Cable & Western Ry. Co. 6 m, 4-10 1/2 g, 40 lb r, 88 c. Pres. Dwight Tredway, Auditor & Man. A. de Figueiredo, Supt. S. M. Sparklin. Office, Franklin & Channing aves. c

Tower Grove & Lafayette Ry. Co. 4-10 g, 44 lb r, 20 c, 96 h. Pres. Chas. Green, Sec. & Treas. Joseph Perry, Supt. Patrick Shea. Office, 1,810 Park ave. 11

Union Depot R.R. Co. 16 m, 4-10 g, 45 lb r, 72 c, 375 h. Pres. John Scullin, V. Pres. & Treas. C. M. Seaman, Sec. Jas. H. Roach, Supt. Jas. Scullin, Engr. Wm. Jens. Office, Gravois & Jefferson aves. 7

Union Ry. Co. 8 m, 4-10 g, 52 lb r, 40 open & 40 box c, 80 h, 230 mu. Pres. Julius S. Walsh, V. Pres. J. P. Helfenstein, Sec. & Treas. C. N. Duffy, Supt. Michael Moran. Office, 3,623 Kossuth ave. c

STONEHAM, MASS.—East Middlesex St. R. Co. 5 m, 4-8 1/2 g, 32-35 lb T & girder r, 11 2-h c, 39 h. Pres. A. F. Breed, Treas. F. H. Monks, Supt. G. F. Jones. Office, 35 Congress st., Boston.

ST. PAUL, MINN.—St. Paul City Ry. Co. 52 m, 4-8 1/2 g, 45-52 lb r, 128 c, 650 h, & mu. Pres. Thos. Lowry V. Pres. C. G. Goodrich, Sec. A. Z. Levering, Treas. W. R. Merrill, Supt. A. L. Scott, Auditor & Cashier G. C. Eddings. Office, cor. Oak, Forbes and Ramsey sts. a

STROUDSBURG, PA.—Stroudsburg Passenger Ry. Co. 1 1/2 m, 4-8 1/2 g, 28-30 lb r, 3 c, 10 h. Pres. & Treas. J. Lantz, Sec. Jacob Houser. 4

ST. THOMAS, CAN.—St. Thomas St. R. R. Co. 1 1/2 m, 3-6 g, 30 lb r, 5 c, 9 h. Pres. Jos. Griffin, Sec. & Treas. Geo. Wegg. f

SUPERIOR, WIS.—2 1/2 m. Pres. Harry D. Moot, St. Paul. 11

SYRACUSE, N. Y.—Syracuse & Onondaga R.R. Co. 2 3-5 m, 4-8 1/2 g, 28-47 lb r, 10 c, 30 h. Pres. Peter Burns, V. Pres. Chas. P. Clark, Sec. & Treas. Lyman C. Smith, Supt. W. B. Thompson. Office, 165 So. Clinton st. j

Central City Ry. Co. 2 1/2 m, 4-8 1/2 g, 47 lb r, 14 c, 48 h. Pres. Daniel Pratt, V. Pres. Jonathan C. Chase, Sec. & Treas. James Barnes, Supt. & Pur. Agt. George Crampton. 4 Syracuse Savings Bank Building. a

Fifth Ward R.R. Co. 2 1/2 m, 4-8 1/2 g, 35-56 lb r, 8 c, 30 h. Pres. P. B. Brayton, V. Pres. John D. Grey, Sec. & Treas. O. C. Potter, Supt. Hugh Purnell. Office W. Washington st. 10

Genesee & Water St. R.R. Co. and Fourth Ward R.R. Co. 4 m, 4-8 1/2 g, 35 & 47 lb r, 10 c, 47 h. Pres. Robt. G. Wynkoop, Sec. & Treas. Geo. J. Gardner, Supt. W. J. Hart. Office, Onondaga Savings Bank Building. j

New Brighton & Onondaga Valley R.R. Co. 1 1/2 m, 4-8 g, 16-35 lb r, 2 c, 6 h, 1 dummy. Pres. Matthias Britton, Sec. T. W. Meacham, Treas. J. H. Anderson, Supt. Arthur G. Markham. Office, 58 W. Railroad st.

Seventh Ward Ry. Co. 2 m, 4-8 1/2 g, 47 lb s-b r, 6 1-h c, 25 h. Pres. Sec. & Treas. Edw. F. Rice, Supt. F. Purnell. Office, 3 Hendrick's Block, Fayette st.

Syracuse & Geddes Ry. Co. 2 1/2 m, 4 8 g, 30-45 lb r, 8 c, 35 h. Pres. R. Nelson Gere, Sec. & Treas. Rasselas A. Bonta, Supt. Wm. J. Hart. Gen. offices, 1 Onondaga Co. Savings Bank Building. a

TAMPA, FLA.—Tampa St. Ry. Co. 2 1/2 m, 3-3 g, 25 lb r, 7 c, 2 dummies. Pres. C. A. Martinez Ybor, Sec. & Treas. G. T. Chamberlain, Supt. C. E. Parcell. e

TAUNTON, MASS.—Taunton St. Ry. Co. 4 m, 4-8 1/2 g, 14 c, 45 h. Pres. Wm. C. Lovering, Treas. Henry M. Lovering, Clerk, Orville A. Barker, Supt. Geo. C. Morse. j

TERRE HAUTE, IND.—Terre Haute St. Ry. Co. 10 m, 4-8 1/2 g, 38 lb r, 18 c, 1 h, 81 mules. Pres. Jos. Collett, V. Pres. D. W. Mimshal, Sec. J. R. Paddock, Treas. W. R. McKeen, Supt. Jos. G. Elder. Office, 101 N. Ninth st. c

TEXARKANA, ARK.—Texarkana St. Ry. Co. 3 m, 3 g, 16 & 24 lb r, 6 c, 10 h. Pres. C. E. Mitchell, Sec. & Treas. Thos. Orr, Supt. B. M. Foreman. e

TOLEDO, OHIO.—Toledo Consolidated St. Ry. Co. 21 m, 4-8 1/2 g, 42 lb r, 50 c, 255 h. Pres. & Treas. J. E. Bailey, Sec. A. E. Lang. Supt. John Gilmartin. a

Central Passenger R.R. Co. 9 m, 3 g, 27 lb r, 17 c, 80 h. Pres. F. E. Seagrave, Sec. C. F. Parkis, Treas. A. R. Seagrave, Supt. Joseph Murphy. a

Metropolitan St. R.R. Co. 10 m, 3 g, 28-35 lb r, 30 c, 115 h. Pres. & Sec. Jno. J. Shipherd, Treas. H. E. Wells, Supt. & Gen. Man. T. F. Shipherd. Office, Cherry st., near Bancroft. 6

TOPEKA, KAN.—Topeka City Ry. Co. 10 1/2 m, 4 g, 28 & 38 lb r, 27 c, 55 h, 64 mu. Pres. Joab Mulvane, V. Pres. D. W. Stormont, Sec. & Treas. E. Wilder, Supt. Jesse Shaw. Office, 116 W. 10th ave. b

West Side Circle Ry. Co. 5 m, 4-8 1/2 g, 33 lb r, 6 c, 3 steam motors. Pres. Thos. A. Osborn, Sec. R. H. Delahay, Treas. P. I. Bonebrake. Capital, \$50,000. Office, 621 Kansas ave. 10

Topeka Rapid Transit Ry. Co. 10 m, 4-8 1/2 g, 35 & 38 lb r, 24 c, 12 Baldwin steam motors. Pres. John

Francis, Sec. J. B. Bartholomew, Treas. John Norton, Supt. J. F. Gwin. Capital, \$250,000. Office, 621 Kansas avenue. b 10

TORONTO, CAN.—Toronto St. Ry. Co. 60 m, 4-10 g, 30 lb r, 180 c, 850 h. Pres. Frank Smith, Sec. James Gunn, Supt. John J. Franklin. Offices, 94 & 96 King st., east. j

TRENTON, N. J.—Trenton Horse R. R. Co. 5 m, 5-2 g, 45 lb r, 12 c, 54 h. Pres. Gen. Lewis Perrine, Sec. & Treas. Lewis Perrine, Jr., Supt. Thomas S. Morris. Office, Clinton & Greenwood aves. f

City Ry. Co. 10 m, 5-2 1/2 g, 35 lb r, 24 c, 108 h. Pres. Adam Exton, V. Pres. W. H. Skirm, Sec. H. B. Howell, Treas. & Mang. Director Chas. Y. Bamford. Office, 264 Clinton ave. a

TRINIDAD, COL.—Trinidad St. Ry. Co. 1 1/2 m, 3-2 g, 14 lb r, 2 c, 8 mu. Pres. S. H. Jaffa, Treas. T. B. Collier, Sec. R. L. Wootton, Supt. R. L. Pearson. c

TROY, N. Y.—Troy & Albion Horse R. R. Co. 3.33 m, 4-8 1/2 g, 35-45 lb r, 10 c, 41 h. Pres. Thos. A. Knickerbocker, Sec. & Treas. Theo. E. Haslehurst, Supt. W. R. Bean. Office, 11 First st. a

Troy & Lansingburgh R.R. Co. 2 1/2 m, 4-8 1/2 g, 45 lb r, 95 c, 420 h. Pres. Charles Cleminshaw, V. Pres. Jos. B. Carr, Sec. & Treas. Joseph J. Hagen, Asst. Supts. L. C. Brown and C. H. Smith. Office, 205 River st. a

TUSKALOOSA, ALA.—Tuskaloosa & Lake Lorraine St. Ry. Co. 4 1/2 m, 4-8 1/2 g, 23 lb steel r, 8 c, 32 h. Pres. Jas. H. Fitts, Man., Sec. & Treas. S. F. Alston. 10

URBANA, ILL.—Urbana & Champaign St. Ry. Co. 2 m, 4-8 1/2 g, 33 lb r, 4 c, 20 h. Pres. & Supt. Wm. Park, Sec. & Treas. Frank G. Jaques. 11

UTICA, N. Y.—Utica, Clinton & Binghamton St. R. R. Pres. Jay J. Scollard, Sec. & Treas. Robt. S. Williams. Leased to and operated by Utica Belt Line St. R. R. Co. a

Onelda St. R. R. Co. 1 1/2 m, (2 1/2 m more building), 4-8 1/2 g, 30 lb center bearing r, 3 c, 8 h. Pres. Henry Ney, V. Pres. Daniel L. Jones, Jr., Sec. Frank J. Creek, Treas. Wm. C. Willcox. Capital, \$40,000. Office, 71 Genesee st. b

Utica & Mohawk R.R. Co. 3 1/2 m, 4-8 g, 47 lb r, 9 c, 16 h. Pres. Jas. F. Mann, V. Pres. R. W. Sherman, Sec. Wm. E. Lewis, Treas. Geo. D. Dimon. Office, 26 Mann Bldg. a

Utica Belt Line St. R. R. Co. 20m, 4-8 1/2 g, 32 c, 97 h, Pres. J. Mather, V. Pres. J. W. Boyley, Treas. Chas. W. Mather. 4

VALEJO, CAL.—Valejo St. Ry. Co. Pres. E. J. Wilson, Sec. S. G. Hilborn. b

VICKSBURG, MISS.—Vicksburg St. Ry. Co. Hill City R.R. Co. c

VINCENNES, IND.—Vincennes St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 36 lb r, 4 c, 24 h. Pres. & Treas. Fredk. Graeter, Sec. Geo. W. Graeter. Office, Fair Ground ave. 4

WACO, TEX.—Waco St. Ry. Co. 8 m, 4-8 1/2 g, 18, 20 & 25 lb r, 15 c, 55 mu. Pres. E. Rotan, Sec. & Treas. W. R. Kellum, Supt. J. W. Sedberry. j

WALTHAM, MASS.—Waltham & Newton St. Ry. Co. 3.4 m, 3-8 1/2 g, 36 & 42 lb r, 8 c, 20 h. Pres. R. E. Robbins, Treas. & Supt. Henry Bond. j

WASHINGTON, D. C.—Capital, No. O. St. & So. Washington R.R. 13 1/2 m, 4-8 g, 35 lb r, 45 c, 176 h. Pres. C. White, Sec. & Treas. W. E. Boughton, Supt. Andrew Glass. 6

Anacostia & Potomac River Ry. Co. 3 m, 4-8 g, 37 lb r, 12 c, 30 h. Pres. & Supt. H. A. Griswold, Sec. & Treas. J. B. Pitcher. Office, Anacostia, D. C. g

Columbia R.R. Co. 5 m, 4-8 g, 18 lb crescent r, 24 1-h c, 73 h. Pres. H. A. Willard, Sec. & Treas. Wm. H. Claggett, Supt. Elbert Claggett. Office, 15th st. and Boundary N. E. 4

Metropolitan R. R. Co. 19.44 m, 4-8 1/2 g, 38 lb r, 113 c, 460 h. Pres. George W. Pearson, V. Pres. A. A. Wilson, Sec. & Treas. Wm. J. Wilson, Supt. L. W. Emmart. Office 2411 P st., N. W. g

Washington & Georgetown R.R. Co. 20 m, 4-8 1/2 g, 42 lb r, 173 c, 880 h. Pres. H. Hurt, Sec. & Treas. C. M. Koonen, Gen. Supt. C. C. Saller. a

WATERBURY, CONN.—Waterbury Horse R. R. Co. 5 1/2 m, 4-8 1/2 g, 40 lb r, 13 c, 100 h. Pres. D. S. Plume, Sec. C. K. Baldwin, Treas. E. T. Turner, Supt. E. A. Bradley. Office, 4 Bank st. g

WATERFORD, N. Y.—Waterford & Cohoes R.R. Co. 2 m, 4-8 g, 45 lb r. Pres. Thos. Breslin, Sec. & Treas. O. C. Ormsby. (Leased by the Troy & Lansingburgh R.R. Co.) 11

WATERLOO, IA.—Waterloo St. Ry. Co. 2 m, 3 g, 20 lb r, 2 c, 1 baggage wagon, 9 h. Pres. W. H. Hartman, V. Pres. & Supt. J. A. Foye, Sec. & Treas. T. N. Kellogg. 2

WATERLOO, N. Y.—Seneca Falls & Waterloo R. R. Co. 5 m, 4-8 1/2 g, 40 lb r, 4 c, 2 dummies. Pres. S. R. Welles, V. Pres. A. H. Terwilliger, Sec. & Treas. A. G. Mercer. Supt. Albert Jewett. 5

WELLINGTON, KAN.—Citizens' St. Ry. Co. 3 m, 4-8 1/2 g, 16 lb T r, 5 2-h c, 6 h, 14 mu. Pres. J. G. Woods, Sec. & Supt. D. A. Espy, Treas. J. D. Alexander, Pur. Agt. D. P. Alexander. a

WEST HAVEN, CONN.—New Haven & West Haven Horse R.R. Co. 7 m, 4-8 g, 50 to 60 lb steel r, 24 c, 115 h. Pres. Geo. R. Kelsey, Sec. Sam'l L. Smith, Treas., Supt. & Gen. Man. W. W. Ward. a

WESTPORT, CONN.—Westport & Saugatuck Horse R. R. Co. 1 1/2 m, 4-8 1/2 g, 40 lb r, 4 c, 6 h. Pres. A. S. Hurlbutt, Sec. and Treas. B. L. Woodworth, Supt. E. S. Downes. c

WHEELING, W. VA.—Citizens' Ry. Co. 10 m, 5-2 g, 45 lb r, 16 c, 60 h. Pres. Dr. Geo. B. Caldwell, S. C. Frank P. Hall, Supt. Michael Loitus. a

Wheeling & Elm Grove R.R. 7 m, 4-8 1/2 g, 30 lb r, 12 c, 4 Baldwin Motors. Pres. J. D. DuBois, Sec. E. J. Ritter, Supt. C. Hirsch. Office, 16th st. a

WICHITA, KAN.—Wichita City Ry. Co. 18 m, 3-6 g, 20 & 25 lb r, 50 c, 300 h & mu. Pres. G. L. Rouse, V. Pres. B. H. Campbell, Sec. & Man. G. M. Dickson, Treas. J. O. Davidson. Office, 121 N. Market st. k

Riverside & Suburban R. R. Co. 5 m, 6-8 g, 45 lb r, 6 c, 8 h, 1 steam motor. Pres. & Treas. J. O. Davidson. Sec. W. E. Stanley. Office, 100 Douglas ave. a

WILKESBARRE, PA.—Wilkesbarre & Kingston Pass. R.R. 3 m, 5-2 g, 30-45 lb r, 10 c, 22 h. Pres. & Man. Wm. J. Harvey, Sec. & Treas. A. J. Davis. a

Coalville Passenger R.R. Co. 2 1/2 m, 4-8 1/2 g, 20-34 lb r, 3 c, 12 h. Pres. Geo. W. Kirkendall, Supt. A. S. Orr,

Sec and Treas Geo. Loveland. Capital, \$62,675. a

WILLIAMSPORT, PA.—Williamsport Pass. Ry. Co. 3 1/2 m, 4-8 1/2 g, 36 lb center bearing r, 7 one h c, 26 h. Pres. Robt. P. Allen, V. Pres. Henry C. Parsons, Sec. R. J. C. Walker, Treas. and Gen. Man. S. A. Filbert. Office, 907 W. 4th st. a and j

WILMINGTON, DEL.—Front & Union St. Pass. Ry. Co. 1 1/2 m, 5-2 g, — lb r, 7 c, 22 mu. Pres. Geo. W. Bush, Supt. Sam'l A. Price, Treas. E. T. Taylor. Office, Front & Union sts. e

Wilmington City Ry. Co. 6 1/2 m, 5-2 g, 47 lb r, 23 c, 81 h. Pres. W. Canby, Sec. & Treas. John F. Miller, Supt. Wm. H. Burnett. Office, Delaware ave. & Dupont st. f

WINDSOR, CAN.—Sandwich & Windsor Passenger R.R. Co. Pres. Henry Kennedy. 12

Windsor Electric St. Ry. Co. 1 1/2 m, 1 motor, 2 cars. Van Depoele system; overhead conductor. Pres. W. M. Boomer, Sec. & Treas. A. H. Joseph. Office, 19 Sandwich st., W. 5

WINFIELD, KAN.—Union St. R. R. Co. 4 1/2 m, 20 lb r, 7 c, 14 h. Pres. Wm. Matthewson, Sec. R. M. Pratt, Treas. Thos. J. Eaton. c

WINNIPEG, MANITOBA, CAN.—The Winnipeg St. Ry. Co. 5 m, half single, half double, 4-8 1/2 g, 35 lb r, 15 c, 15 sleighs, 100 h. Pres. Jas. Austin, Sec. & Mangr. Albert W. Austin, Supt. Geo. A. Young. 2

WINONA, MINN.—Winona City Ry. Co. 4 m, 3-6 g, 27 lb r, 10 c, 37 h. Pres. B. H. Langley, Sec. & Treas. C. H. Portee, Supt. L. Marion. Office, 119 Center st. f

WOBURN, MASS.—No. Woburn St. R.R. Co. 4.82 m, 4-8 1/2 g, 35 lb flat r & 42 lb T r, 6 open & 7 box c, 29 h. Pres. Amos F. Breed, Treas. Frank H. Monks, Supt. Gilman F. Jones. Office, 85 Congress st., Boston. Consolidated with East Middlesex St. Ry. Co. Same officers. k

WOONSOCKET, R. I.—Woonsocket St. Ry. Co. 7 m, 4-8 1/2 g, 30 & 50 lb r, 20 c. Elec. power. Pres. Horace A. Jenckes, Sec. Willard Kent, Treas. Franco G. Jilison. Capital, \$100,000. 9

WORCESTER, MASS.—Worcester Consolidated St. Ry. Co. 16 m, 4-8 1/2 g, 35 lb flat r, 57 2-h c, 280 h. Pres. Chas. B. Pratt, Sec. & Treas. H. S. Seeley, Supt. J. N. Akarman. Office, 15 Market st. k

WYMORE, NEB.—Wymore and Blue Springs Ry Co. 3 1/2 m, 3-6 g, 4 c, 10 h. Pres. J. H. Reynolds, V. Pres. Ben Reynolds, Sec. & Treas. E. P. Reynolds, Jr., Supt. A. N. Bradfield. 3

YONKERS, N. Y.—Yonkers R. R. Co. 5 m, 4-8 1/2 g, 42-48 lb r, 10 c, 70 h. Pres. D. N. Stanton, Sec. John F. Brennan, Treas. D. Perry Stanton. Office, 83 Main st. a

YORK, PA.—York St. Ry. Co. 1 1/2 m, 4-8 1/2 g, 38 lb r, 6 c, 11 h. Pres. W. H. Lannius, Sec. D. K. Trimmer, Treas. C. S. Weiser. Authorized capital, \$50,000. a

YOUNGSTOWN, O.—Youngstown St. R.R. Co. 2 1/2 m, 3 g, 24 & 27 lb r, 6 c, 18 h. Pres. John R. Davis, Sec. & Treas. Alfred Smith. a

ZANESVILLE, O.—Zanesville & McIntire St. Ry. Co. 3 m, 3-6 g, 38 lb r, 12 c, 51 h & mu. Pres. F. M. Townsend, Sec. W. C. Townsend, Treas. O. H. Townsend. a

CABLE RAILWAYS.

BINGHAMTON, N. Y.—Washington St. & State Asylum R. R. Co.

CHICAGO, ILL.—Chicago City Ry. Co. CINCINNATI, O.—Mt. Adams & Eden Park Inclined R. R. Co. Mt. Auburn Cable Ry. Co. Price Hill Inclined Plane R. R. Co.

HOBOKEN, N. J.—No Hudson Co. Ry. Co. Elevated. KANSAS CITY, MO.—Kansas City Cable Ry. Co. Corrigan Consolidated St. Ry. Co. Grand Ave. Ry. Co.

LOS ANGELES, CAL.—Second St. Cable Ry. Co. Los Angeles Cable Ry. Co. Temple St. Cable Ry. Co. NEW YORK, N. Y.—Third Ave. R. R. Co. Line on Tenth ave.

OAKLAND, CAL.—Oakland Cable Ry. Co. OMAHA, NEB.—Cable Tramway Co. of Omaha. PEORIA, ILL.—Central Horse & Cable R. R. Co. PHILADELPHIA, PA.—Phila. Traction Co. SAN FRANCISCO, CAL.—California St. Cable R. R. Co.

Clay St. Hill R. R. Co. Geary St. Park & Ocean R. R. Co. Market St. Cable Ry. Co. Omnibus R. R. & Cable Co. Sutter St. R. R. Co. Telegraph Hill R. R.

ST. LOUIS, MO.—St. Louis Cable & Western Ry Co. BINGHAMTON, N. Y.—Washington St. & State Asylum R. R. Co.

DENVER, COL.—Denver Tramway Co. DETROIT, MICH.—Detroit Electric Ry. Co. Highland Park Ry. Co. GRATIOT, MICH.—Gratiot Electric Ry. Co. ITHACA, N. Y.—Ithaca St. Ry. Co.

KANSAS CITY, MO.—Kansas City Electric Ry. Line, O.—Lima St. Ry., Motor & Power Co. LOS ANGELES, CAL.—Los Angeles Electric Ry. Co.

MANSFIELD, O.—Mansfield Elec. St. Ry. Co. MONTGOMERY, ALA.—Capital City Electric Ry. PORT HURON, MICH.—Port Huron Electric Ry. Co.

RICHMOND, VA.—Richmond Union Pass. Ry. Co.

ELECTRIC RAILWAYS.

APPLETON, WIS.—Appleton Electric St. Ry. CO. ASBURY PARK, N. J.—Seashore Electric Ry. Co.

BALTIMORE, MD.—Baltimore Union Pass. Railway Co. BELLEVUE, PA. BINGHAMTON, N. Y.—Washington St. & State Asylum R. R. Co.

DENVER, COL.—Denver Tramway Co. DETROIT, MICH.—Detroit Electric Ry. Co. Highland Park Ry. Co. GRATIOT, MICH.—Gratiot Electric Ry. Co. ITHACA, N. Y.—Ithaca St. Ry. Co.

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RICHMOND, VA.—Richmond Union Pass. Ry. Co.

GEORGE WESTINGHOUSE, Jr., President. THOMAS B. KERR, Vice President and Secretary. JOHN CALDWELL, Treasurer.

THE OVERHEAD CONDUCTOR ELECTRIC RAILWAY COMPANY, OF PITTSBURGH, PENN.

The Patents of JOSEPH R. FINNEY, No. 231,552, Aug. 24, 1880, reissued Nov. 2, 1882; No. 270,186, of Jan. 2, 1883; and No. 285,353, of Sept. 18, 1883, owned and controlled by this Company, COVER EVERY FORM OF APPARATUS for supplying electricity to electric machinery upon moving vehicles, making use of TRAVELERS or ROLLING CONTACTS running upon OVERHEAD CONDUCTORS.

This Company owns and controls OTHER INVENTIONS of IMPORTANCE in Electric Railway Appliances.

IT COSTS { **TEN CENTS** per car-mile for **HORSE POWER**, for street railway service,
Two-thirds as much to run with **Electric Accumulators**,
Only **One-third** as much to run with **Overhead Conductors**.

THE OVERHEAD CONDUCTOR IS COMPARATIVELY INEXPENSIVE.

It Is Quickly Erected. It Is Not Necessarily Unsightly. It Does Not Waste Electric Energy. It Does Not Easily Get Out of Order.

Of the **Fifteen** Electric Street Railways, in successful operation in this country, in August, 1887, **Thirteen** are using the **Overhead Conductor**, and many others are under construction.

This Company is now prepared to license RAILWAY COMPANIES, CONTRACTORS, and others desiring to use its patented inventions upon OLD or NEW ROADS upon reasonable terms.

NOTICE is hereby given, that makers, sellers and users of infringing apparatus will be proceeded against. Information furnished upon application. Address all communications to

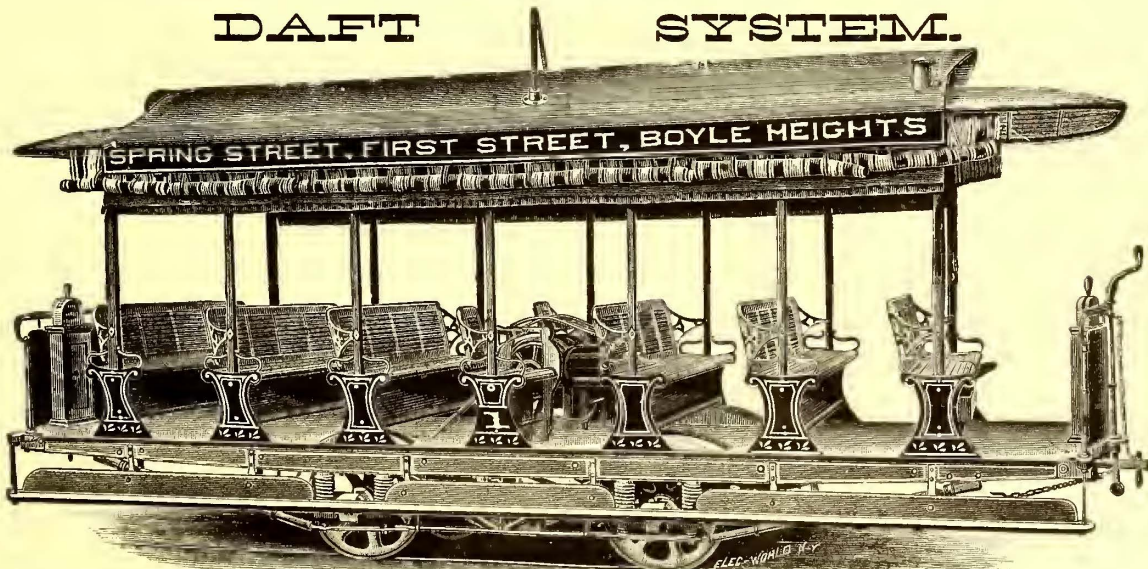
THOMAS B. KERR, Vice President and Secretary, Pittsburgh, Pa.

SAFETY ELECTRIC RAILWAY & POWER COMPANY.

Electric Railway Motors, Separate, or Attached Directly to Street or other Cars.

ELECTRIC LIGHT AND POWER MACHINES. ELECTRICAL CONDUCTORS.

DAFT SYSTEM.



We are prepared to equip railways with our electric system and supply Power and Light machines at the shortest notice. The **ONLY** street railway in practical and economical operation by electricity in America is run by our system. We guarantee the successful operation of our system. Heaviest grades no obstacle. We are now building, in the city of Pittsburg, a road which will cost \$120,000. This road has a 14 per cent grade, and has overhead and underground conductors, and five motors. The cost of electric power per car per day on the Baltimore road, operating our system, is \$4.00. Fifty or more cars could be run at an average of \$1.80 per day. The grade on this road is 350 feet per mile. Average speed, eight miles per hour. By horse power the speed was only four miles per hour, and the cost under the old system was \$6.50 per car per day. **SEND FOR ESTIMATES.** On receipt of full particulars of your road, or of power wanted, we will send you exact estimates for equipping and operating it by our system. **SEND FOR CIRCULARS.**

Office, 41 and 43 Wall Street, New York.

Factory, Greenville, N. J.

SCRANTON, PA.—Scranton Suburban Ry. Co. **ST. CATHARINE'S, CAN.**—St. Catharine's, Merritt & Thorold St. Ry. Co.
WICHITA, KAN.—Iverson & Suburban R. R. Co.
WINDSOR, CAN.—Windsor Electric St. Ry. Co.
WOONSOCKET, R. I.—Woonsocket St. Ry. Co.

NEW ROADS.

ALAMEDA, CAL.—Theo. Meetz and associates have a franchise; will likely consolidate with Alameda, Oakland & Piedmont R. R. Co. 2 m, prob. 3 g, 20 & 35 lb r, 3 or 4 c, h traction for the present, later perhaps elec. Will begin work within six months and finish within a year. Capital, \$100,000. 1 11
ALBANY, GA.—Albany St. Ry. Co. J. G. Stephens is interested. 9
ALLEGHENY, PA.—Observatory Hill Pass. Ry. Co. 4 m, 5-2 g, 54 lb r, 4 c, elec. motors, Bentley-Knight system, 3 m overhead conductor and 1 m conduit in city streets. Capital, \$125,000. Work now under way. Expect to open about Dec. 1. Pres. Oliver P. Scaife, Sec. Arthur Kennedy, Treas. Jas. B. Scott, all of Pittsburgh. a 11
 Allegheny Rapid Transit Co. From Northside bridge to California avenue. 6
 Nunnery Hill Incline Plane Ry. Co. 1,200 ft., 5 g, 2 c, using wire rope and drum. Pres. Oliver P. Scaife, Capital, \$60,000. Will be opened soon. 8
ALTON, ILL.—Alton Imp't Ass'n. To operate h. or cable rys. Pres. C. W. Minor, V. Pres. H. Watson, Sec. & Treas. H. R. Phinney. Capital, \$25,000. 10
AMERICUS, GA.—Montgomery parties ask for a permit to build. 11
ANNISTON, ALA.—Anniston St. Ry. Co. Work will begin at once. Pres. John W. Noble, Sec. & Treas. Wm. A. Davis. 9
 C. H. Cannell and others will build a dummy road 11
 C. H. Williams and others will build a dummy road 11
 W. B. Kearney and others of Birmingham ask for permission to build a dummy road. 9
ANSONIA, CONN.—Derby Horse Ry. Co. 3½ m, standard g, 46 lb r, 4 pass. 8 ft. c, 5 motors, Van Depoele system. Capital, \$40,000 paid in; will increase to \$50,000 or \$60,000. Began work May 2; will be in operation 11 Nov. Pres. John B. Wallace, V. Pres. H. Holton Wood, Sec. & Treas. Wm. J. Clark, Birmingham, Supt. Jas. D. Kennedy. Office, 50 Main st. d 11
ASHEVILLE, N. C.—Asheville Imp't & St. R. R. Co. C. M. McLeod is interested. 7
 Ohio parties talk of building a st. ry. 9
ASHLAND, KAN.—Ashland St. Ry. Co. Incorp'd by Jas. P. Weeks, Frank B. Brooks and others. Capital, \$5,000. 8
ASHLAND, WIS.—Ashland St. Ry. Co. 3 m, 4-8½ g, 35 lb r, 5 c, about 20 h. Road will be opened soon. Pres. Edwin Ellis, Sec. W. M. Tomkins, Treas. Thos. Bardon, Supt. G. H. Hopper. Capital, \$50,000. h 9
ATCHISON, KAN.—Atchison Rapid Transit St. & Road Ry. Co. Mechanical traction. John Price, J. W. Parker and others incorporators. Capital, \$600,000. 5
ATHENS, TENN.—Athens Mineral Land & Imp't Co. are ready to receive bids for a new railroad which they will build. 5
ATHENS, GA.—J. H. Dorsey will prob. build a line here. 8
ATLANTA, GA.—Harry Hill is organizing a scheme for a belt st. ry. 5
 Atlanta & Edgewood St. R. R. Co. 2 m, 2 steam Elec. ry. projected. 11
 Atlanta City and Suburban St. Ry. Co. Incorp'd by L. J. Hill and others. 13 m, to Decatur, dummy line. Capital, \$25,000. 11
 E. C. Peters will build a dummy line. 7
 East Atlanta Land Co. will build a dummy line. 7
ATTLEBORO, MASS.—Elec. ry., Sprague system, to run from Attleboro to North Attleboro through Plainville, 6 m. 11
AUBURN, ALA.—Dummy rr. 11
BALTIMORE, MD.—Baltimore, Brooklyn & Cedar Hill Ry. Co. 10 m, 5-2 g, 30 lb steel T r, 25 c, 50 h. Partly finished and road will be opened in Jan. Will run from Baltimore to Cedar Hill Cemetery, in Anne Arundel co., via Light st. bridge and the town of Brooklyn. Capital, \$50,000 and \$50,000 1st mortgage bonds. Office, 305 St. Paul st. Pres. C. Orrick Swann, Sec. N. W. Paynter, Treas. Levi Condon, Supt. I. M. Thompson. a 10
 Baltimore & Sparrow's Point Ry. Co. has been incorp'd by Geo. Small, Fredk. W. Wood and Nicholas P. Bond. 9
BANGOR, ME.—Electric ry. 5
BAYONNE, N. J.—Elec. ry. talked of. 7
BELOIT, KAN.—Beloit City St. Ry. Co. Will begin work in spring, and finish road before close of year. 2 m. Pres. D. W. Soper, Sec. F. T. Burnham, Treas. M. S. Atwood. Capital, 75,000. d 9
BESSEMER, ALA.—Birmingham & Bessemer dummy line. J. W. Worthington & Co. have contract. 6 m, 4-8½ g, 40 lb r, steam power. Pres. W. P. Pinkard, Sec. & Treas. Morris Adler. 9
 Another st. ry. is projected. 11
 Bessemer Dummy Line Co. Incorp'd by E. A. Burke and others. Capital, \$250,000. 10
BIDDEFORD, ME.—Biddeford & Saco Horse R. R. To be operated by animal, electric or cable power. Pres. Stephen F. Shaw, Sec. Chas. H. Prescott, Treas. Chas. A. Moody. 9
BINGHAMTON, N. Y.—Court St. & East End R. R. Co. Now building; will be opened about Dec. 1. 2½ m, 4-8½ g, 45 lb flat and 35 lb T r, 4 c, 10 to 15 h. Pres. Chas. M. Stone, Sec. & Treas. Wm. G. Phelps. Capital, \$20,000. j 11
 West Side St. Ry. Incorp'd by Jas. E. Shafley and others. Capital, \$25,000. 11
 Washington St. & Spring Forest Cemetery Ry. Co. To be built in the spring, out Clinton st. toward the Ashery. 9

BIRMINGHAM, ALA.—Birmingham & Jones Valley St. R. R. 6 m, 45 lb, steel r. Hefflin & Knox received proposals.
 Smith & Eastman have made surveys for electric road to run 3 m from the city to their real estate near North Birmingham. 4
 Western Valley St. Ry. Co. 4 m, 4-8½ g, 24 lb r, 6 c, 20 mu; but will likely change motive power ultimately. Work to be commenced at once. Capital, \$50,000. Pres. J. C. Westbrook, V. Pres. W. E. Berry, Gen. Man. S. Torrey. 5
 Walker Land Co. will soon build a dummy line. 11
BLOUNT SPRINGS, ALA.—Blount Springs Co. will build a dummy rr. 11
BLOUNTSVILLE, ALA.—Blountsville Land Co. will build a dummy line to Bangor, 12½ m. Pres. Dr. F. N. Hudson, Sec. A. D. Howell, Treas. Green J. McCoy. Capital, \$100,000. 11
BOSTON, MASS.—West End St. Ry. Co. H. M. Whitney, Asa P. Potter, Eben D. Jordan and others incorporators. 8 to 15 m, 4-8½ g, 90 to 100 lb imported girder r with grooved head. Pres. H. M. Whitney, Treas. G. D. Braman, Clerk Elmer D. Howe. Hope to use electricity as motive power. Will lay 10 or 12 miles of track this year.
 Suburban St. Ry. Co., proposes to lay tracks through Park, Beacon, Arlington and Marlboro streets to West Chester Park. 5 m, 4-8½ g. Pres. Henry M. Whitney, Sec. & Treas. G. D. Braman. Capital, \$50,000. Office, Equitable Building. b
BRIDGETON, N. J.—Elec. ry. will be built here. 1-1.3 m, and if successful as much more will be built. Oberlin Smith is interested. 8
BRISTOL, VA.—Bristol-Goodson St. Ry. Co. has been incorporated. W. E. Chamberlain is interested. 10
BROCKTON, MASS.—New co. projected in eastern part of city.
BROOKLYN, N. Y.—Annex St. Ry. Co., in progress, to be completed soon. Pres. F. M. Delano, New York, V. Pres. H. H. Adams, Brooklyn. Treas. Philip Richardson, New York. Office, 204 Montague st., Brooklyn, N. Y. 1
 Brooklyn & suburban St. Ry. Co. To run from Bedford ave. through Flatbush to Flatlands, with a branch to the Cemetery of the Holy Cross. Will use either horse or cable power. Geo. Malcom, Wm. Ziegler, Wm. J. Gaynor, Henry H. Adams, Jas. Ryan, Peter Sutter and Park McConna, Directors. Paid-up capital, \$100,000. 4
 Union Ry. Co. of the City of Brooklyn.
 Brooklyn Heights Ry. Co. Capital, \$150,000. To build along Montague street from Court street to Wall Street Ferry. Will use electricity. Pres. S. B. Cliftenden, V. Pres. John Jay Pierrepont, Sec. Geo. W. Chauncey, Treas. Michael Chauncey. ½ m, 4 g, about 50 lb r, 6 c. 7
 Capitalists interested in Calvary Cemetery road are building from Ash street to Park avenue. Pres. Jas. B. McKewen, Sec. Michael Just, Treas. John R. Connor, Man. D. W. Sullivan. 6
 Franklin Ave. R. R. Incorporated May 21. To run from Grand and Second sts., in the Eastern District, via Second st., Wylie ave., Franklin ave., and Malbone st., to Flatbush ave., in the town of Flatbush. Capital, \$100,000. Wm. A. Wheelock and Walter R. Gorman of New York, and Thos. D. Jordan of Jersey City, are among the directors. 7
BRUNSWICK, GA.
BUFFALO, N. Y.—Buffalo West Side St. Ry. Co. Capital, \$50,000. To build to the Park via Elmwood ave., paying the city 26 per cent of gross receipts. Composed of same parties who control Buffalo East Side Ry. Co. 9
 An elec. ry. is projected along Elmwood ave. 11
 Queen City St. Ry. Co. Capital, \$100,000. Pres. Geo. V. Forman, Olean, V. Pres. H. L. Taylor, Buffalo, Sec. Chas. M. Howe, Buffalo, Treas. W. W. Welch, Gowanda. Did not secure franchise they were organized to build for, and may never secure it; but propose a complete new system of street rrs., with cable or elec. traction. 11
BUTTE, MONT. T.—Butte St. Ry. Co. Will use mules for the present between Butte and So. Butte, but are likely ultimately to have noiseless motors or elec., and connect with Burlington, Meaderville and Centerville. Pres. Willard Bennett, Sec. E. E. Congdon, Treas. W. A. Clark. 11
CALERIA, ALA.—So. Calera Land & Imp't Co. Work in progress, and road will be opened about Nov. 1. 2½ m, standard g, 40 lb steel r, a dummy engine. Capital, \$150,000. Office, Calera. b 8
CANANDAIGUA, N. Y.—Canandaigua St. R. R. Co. Will be built soon. Pres. Frank O. Chamberlain, Sec. Chas. F. Milliken, Treas. Alfred Denbow, Supt. Chas. L. Sackett. 9
CARBONDALE, PA.—Carbondale & Jermy Elec. St. Ry. 5 m, 4-8½ g, 25 lb T & 57 lb flat r, Sprague elec. motors; overhead system. Work begun in July; will be opened about Dec. 1. Capital, \$50,000. Pres. John W. Aitken, V. Pres. M. Moses, Sec. & Treas. J. E. Burr. a 11
CHARLESTON, S. C.—King St. & Crosstown Ry. Co. Will begin work soon. F. L. M. Hugh is interested. 11
CHARLESTON, W. VA.—Glenwood Co. will lay out a town near the city and ultimately construct a road 1½ m long. This is a land co. Supt. Benj. Brown. Capital, \$55,400. 8
CHATTANOOGA, TENN.—North Side St. R. R. Co. Incorporators, G. Lindenthal, C. C. Anderson and others. 10
 An elec. ry. is likely to be built. 11
 Tennessee River & Walden's Ridge R. R. Co. Dummy line from Hill City to Walden's Ridge. S. J. A. Frazier, John C. Griffin and others incorporators. 8
 City St. Ry. Co. has been organized by John T. Williamson and others. 6
CHEYENNE, WY. T.—Cheyenne St. Ry. Co. Will build 1½ m by Dec. 1. Supt. —Flanigan. 9
CHICAGO, ILL.—The Crosstown Pass. Ry. Co. of Chicago, 30 m, 4-8½ g, 45 lb r, 75 c, 500 to 800 h. Pres. John J. Curran, Treas. Geo. P. Bunker, Sec. & Pur. Agt. Elias Curran. Capital stock, \$1,000,000. Gen. office, room 18, No. 164 Washington st. Time of commencement of work undecided. 1

Lakeside City St. Ry. Co. To operate h. or dummy roads in Chicago and its suburbs. Incorporators, Sam'l P. McConnell, C. H. Merrill and Theo. P. Elliott. Capital, \$250,000. 5
 Union Pass. Ry. Co. Incorp'd by James C. Page, Volna P. Sherwin and others. Capital, \$1,000,000. Horse, cable, elec. or steam. 9
CHICOPEE, MASS.—Chicopee St. Ry. Co. Franchise secured. Capital, \$25,000. Work to begin soon. Line to extend from Chicopee Falls through Chicopee Center to the point where the boundary line between Chicopee and Springfield crosses the River road. About 4 m, 4-8½ g, not less than 35 lb r. Pres. Olmsted, of Springfield St. Ry. Co., has stock controlling interest. Ex-Gov. Robinson is a stockholder. Will build in spring. Ultimately will prob. be consolidated with the Springfield system. 11
CHILLICOTHE, ILL.—Chillicothe St. Ry. Co. 1½ m, prob. 4-8½ g, light flat r, animal power. Pres. L. S. Hoyt, Sec. & Treas. R. H. Truitt. Capital, \$40,000. Will begin work in spring. 11
CINCINNATI, O.—Cincinnati, Burnet Woods, Clifton & Cumminsville St. R. R. Co. Incorporated by Thos. Morrison and others. Capital, \$500,000. 8
CLEVELAND, O.—Garden St. Ry. Co. Incorp'd by Thos. B. McKearney and others. Capital, \$250,000. 10
CLINTON, MO.—Elec. ry. projected. 11
COLUMBIA, TENN.—Columbia St. Ry. Co. 6 m, 4-8½ g, 4 c, 8 mu. Will be opened by Nov. 1. Capital, \$100,000. Pres. J. T. Crank, Sec. & Gen. Man. J. H. Dew, Treas. E. C. McDowell. d 10
COLUMBUS, MISS.—City R. R. Co. Capital, \$20,000. Pres. R. W. Banks, Sec. & Treas. E. T. Sykes. Will build at once. 6
COLUMBUS, O.—Third & Schuller St. R. R. Co. Franchise granted by City Council June 6. Cars must be running within 2 years. 3½ m, 5-2 g. May use electricity. Capital, \$75,000. Work will begin as soon as stocks taken. Pres. P. E. Blesch, V. Pres. H. Mithoff, Sec. C. Herman, Treas. J. A. Kremer. d 7
CORSICANA, TEX.—Co. formed, and has contracted for mat'l. 10
COVINGTON, GA.—W. C. Clark & Co. Incorporators and owners. 1 m, 20 or 30 lb r, 2 pass. c, 2 flat c, pass. cars for 1 h, 6 to 8 mu. or h. 2
CRAWFORDSVILLE, IND.—City asks for bids for franchise, using any power. W. H. Webster will give information. 11
CROOKSTON, MINN.—Crookston St. Ry. Co. Capital, \$100,000. Line to be built next year. Pres. Chas. E. Sawyer, Sec. John Cromb, Treas. A. D. Stephens. 8
CROPWELL, ALA.—E. P. Chandler and G. W. Sides will build from Cropwell to Jug Town. 11
DALTON, GA.—Dalton St. Ry. Co. Bids invited for iron, cars, etc. T. R. Jones, Secretary of Board of Directors.
DALLAS, TEX.—Dallas & Oak Cliff Ry. Co. 3½ m, 4-8 g, 35 lb r, 5 c, 2 motors, operated by steam. Road to be opened Oct. 20. Capital, \$400,000. Pres. T. L. Marsalis, V. Pres. Thos. Field, Sec. W. J. Storms, Treas. J. T. Elliott. e 11
DAVENPORT, IA.—Bridge, Second St. & Northwestern St. Ry. Co. Work to begin very soon. 2½ m, 4-8½ g, 38 lb r, 6 c. Either elec. or animal power, 40 h if latter. Pres. H. F. Petersen, V. Pres. F. H. Hancock, Sec. Joseph Ochs, Treas. G. M. Schriede, Capital, \$25,000, to be increased to \$100,000. e 9
 Davenport & Rock Island St. Ry. Co. 50 lb r, 4-8½ g. Pres. Chas. H. Deere, Moline, Ill.; Sec. E. Carl. Davenport, Treas. Morris Rosenfield, Rock Island. 7
DAYTON, O.—White Line St. Ry. Co. 8½ m, elec., now building, 4-8 g, 38 lb r, 16 c, 13 motors, Van Depoele system. Pres. John A. McMahon, Sec. Chas. D. Iddings, Treas. Michael A. Nippen, Pur. Agt. Jos. C. Lewis. Work began Aug. 1; road will be opened Nov. 1. Capital, \$300,000. e 9
DAYTON, TENN.—Co. chartered by W. G. Allen and others. 11
DECATUR, ALA.—Decatur St. Ry. Co. Work to begin at once, mat'l having been bought. Pres. W. G. Wharton, Sec. S. D. Wharton, both of Montgomery. 9
 Decatur & Trinity Belt Line R. R. Co. To run from Decatur to a mountain near Trinity. Dummy. Jos. Shackelford is interested. 9
DENVER, COL.—Denver Cable Ry. Co. Capital stock, \$500,000. Work has begun, and the road will be opened Apr. 10, 1888. 6 m, narrow g, 34 lb r, 35 c altogether, but only 12 for first line of 2 m, cable. Two 50 H. P. engines for each line. Offices, 42 & 43 Barth Block. e 9
 Denver & Boulevards Cable Ry. Co. Incorp'd by Ernest W. Lowrey, W. A. H. Loveland, G. W. Bowman and others. Will acquire the franchise secured by California parties and the franchise for the cable line on the Boulevard. Work will begin at once on latter line. 11
 Geo. Wirt Bowman has franchise for h and cable road to Fort Sheridan. Work to begin in Dec. 10
DETROIT, MICH.—East Detroit & Grosse Pointe Ry. Co. 10 m, 4-8½ g, 25 lb steel T r, 10 c. Fisher elec. system. Capital, \$100,000. Pres. C. K. Brandon, Sec. Hibbard Baker, Treas. Frank E. Snow. Began work June 15; expect to open Nov. 1. 8
 Metropolitan Elec. Ry. Co. 9
 Spring wells, Ecorse & Wyandotte R. R. Co. Incorporated by J. B. Molony and others. Capital, \$10,000. 8
DODGE CITY, KAN.—Dodge City & So. Dodge St. Ry. Co. Incorp'd by Jas. H. Crawford and others. Capital, \$20,000. 11
DULUTH, MINN.—Duluth Highland Cable Ry. Co. Propose to build to the hill top unless the old Co. after notice build there. H. W. Bradley and Wm. W. Billson, of Duluth, and J. A. Willard, of Mankato, are interested. Capital, \$200,000. 5
 Park Point St. R. R. Co., prob. name. 6 m, 4-8½ g, h or mu. R. W. Petre is interested. Uncertain when they will organize. 10
EASTON, PA.—Lafayette Traction Co. Elec., Duff system. 1 m, 5-2½ g, 30 & 56 lb r, 2 c. Pres. J. Marshall Young, Sec. & Treas. D. W. Nevin. Capital, \$12,000. a 11

H. A. PEVEAR, President.

S. A. BARTON,

E. I. GARFIELD, Secretary.

C. A. COFFIN, V. Prest. & Treas.

Gen'l Manager.

E. THOMSON, Electrician.

Thomson-Houston Electric Company.

PRINCIPAL OFFICE:

178 Devonshire Street & 33 Federal Street,
Boston, Mass.

Chicago Office: Pullman Building.

ELECTRIC TRAMWAYS.

Our Dynamos and Motors Stand
Pre-eminent.

Highest Economy.

Perfectly Adapted.

Absolutely Reliable.

ESTIMATES FURNISHED UPON APPLICATION FOR THE CONSTRUCTION OF
CITY STREET RAILWAYS AND SUBURBAN TRAMWAYS USING EITHER UNDER-
GROUND, SURFACE OR ELEVATED CONDUCTORS.

EAST PORTLAND, ORE.—Sellwood & Vancouver Ry. Co. Motors. 7
Stark St. Ferry Co. 7

EAST ST. LOUIS, ILL.—East St. Louis Motor Ry. incorporated by H. D. Sexton, Henry O'Hara and Wm. H. Hill. Capital, \$200,000. 6

EL DORADO, KAN.—El Dorado City St. Ry. Co. Now building. Pres. John Fouch, Sec. Robt. H. Hazlett, Treas. F. P. Gillespie. 9

ELIZABETH, N. J.—Henry H. Isham of New York, Fredk. L. Heldritter and others, propose to build a cross-town road from Fourth ave. to the Singer factory and Elizabethport station. 7
Elec. ry. incorp'd and ask for franchise. Ex-Freeholder Oliver, ex-Councilman Reeve and ex-Mayor Green are interested. 8

ELMIRA, N. Y.—Articles of Incorporation signed by J. H. Clark, John Brand, M. H. Arnot, D. C. Robinson and others. Location, Fifth ward. Capital, \$20,000. Will use horses. Hope to complete road very soon. 7

ELSIKORE, CAL.—Lake Shore Elec. Ry. 30 m. 4-8½ g, prob. 30 lb r. prob. 12 c. elec. motors. Work to begin at once, and part of it to be in operation by Dec. 1. Pres. D. Gilbert Dexter, V. Pres. Chas. S. Gilbert, S. C. Howard L. Couard. Capital, \$50,000. g 11

EUFULA, ALA.—City of Eufaula St. Ry. Co. 4 m. 4-8½ g, 20 lb r. 4 regular cars and several excursion flats 12 h. Will commence work very soon, and the road may be opened this year. Pres. E. B. Young, Sec. Geo. McCormick, Treas. Ell Shorter. Capital \$25,000. 4

EUREKA, CAL.—Co. formed to build an elec. ry. 8

FERNANDINA, FLA.—Gideon Palmer and associates a-k for permit. 11

FINDLAY, O.—Findlay St. Ry. Co. 4 m, 4-8½ g, 25 lb r, 8 c, 48 h. 11

FLUSHING, N. Y.—Flushing & College Point R. R. Co. Pres. Jos. Dykes, Sec. Arthur Herrin, Treas. Henry Clement. Have obtained a charter to run a line from Flushing to College Point. Electricity will be used. Will be built in 6 mos. 8

FOND DU LAC, WIS.—Co. organized. 9

FORESTVILLE, GA.—Printup City & Forestville St. R. R. organized. 8

FORT PAYNE, ALA.—Fort Payne Land & Imp't Co. May build dummy or cable road. 11

FORT SMITH, ARK.—Belt Line St. Ry. Co. Has been chartered. 6
W. M. Fishback is interested in a contemplated st. ry. Wants information as to dummy engines burning petroleum. 11

Metropolitan St. Ry. Co. 2 m, 4-10 g, 38 lb r, 10 c, elec. or animal power. Sec. & Treas. Geo. Tilles, Engr. John P. Hely. Will begin work in 30 days. 10
Sulphur Springs Ry. Co. 3½ m, 3-6 g, 38 lb r, 12 c, 25 mu. In progress; will be opened in 60 days. Pres. & Gen. Man. W. J. Johnston, Sec. Edgar Bryant, Treas. W. R. Martin. Capital, \$50,000. e 10

FORT WAYNE, IND.—Fort Wayne St. Ry. Co. Incorp'd by John A. Bass and others. Capital, \$30,000. 10

FORT WORTH, TEX.—North Side St. Ry. Co. chartered by J. P. Smith, John D. Templeton and others. Capital, \$100,000. 2 m. Dummy or cable. To be completed in 8 months. 9

FRAMINGHAM, MASS.—Framingham Union St. Ry. Co. \$60,000 capital. The Haines Bros. & Geo. W. Stetson, of New York, are interested. To be in operation Jan. 1. Sec. Clifford Folger, Treas. Sam'l B. Bird. 10
Framingham Center Ry. Co. Capital, \$25,000. 2½ m, 4-8½ g. 4

FREEPORT, ILL.—Freeport, Dodgeville & Northern Ry. Co. Pres. Jas. I. Neff, Sec. & Treas. B. Moe, Chicago, Ill. 9

FRIEBURG, ME.—Now building. 8

GADSDEN, ALA.—Gadsden Land & Imp't Co. will build a dummy rr. via Bellevue to Black Creek Falls. Expect to begin work next spring, and finish it by next summer. 5 m, standard g, 35 lb r, 4 c, steam motors. Sec. & Treas. M. L. Foster. Capital, \$50,000. 11

GRAND FORKS, DAK.—Secretary of State McCormick, of Bismarck, has secured franchise, and is said to be backed by Duluth and New York capitalists. 6

GRAND ISLAND, NEB.—Grand Island St. Ry. Co. Expect to have 4 m in operation this year. 4-6 g, 20 lb steel T, oak ties, 5 c, 30 h. Will change to elec. when they can get a cheap and practicable system. Capital \$100,000, of which 25 per cent is paid in. Pres. A. H. Baker, V. Pres. H. A. Koenig, Sec. O. B. Thompson, Treas. Wm. A. Haggie. h 7

GRAND RAPIDS, MICH.—Cable St. Ry. Co. incorporated by Robt. Wetherell and others. Capital \$50,000. 8
Valley City St. & Cable Ry. Co. 17 m, of which 1½ m cable and a portion of remainder prob. elec. Ultimately will cable whole system, putting in 2 or 3 m each year. Pres. Wm. P. Innes, Sec. & Treas. Robt. P. Innes. Being built by Continental Construction Co., of Minneapolis. When finished Horace P. Breed will be Pres., W. S. Crosby Sec. & Treas., Sam. B. Tibbitts Vice Pres., and A. W. Eggleston Supt. 10

GREENSBORO, ALA.—Dummy line, to be built by Coleman & Coleman. 8

GREENSBORO, N. C.—J. W. Griffith has rec'd permitt. There is talk of an electric road. 9

GREENVILLE, ALA.—J. T. Perry will build a st. ry. 6

GREENVILLE, TEX.—Greenville St. Ry. Co. organized. Capital, \$50,000. Will be completed in 5 months. 11
Another co. has also received permission to lay tracks; must be completed in 5 months. 11

GREENWICH, CONN.—Greenwich Horse R. R. Co. To run along Putnam and Greenwich aves. and Steamboat road to the steamboat dock, with a branch along Railroad ave. to the N. Y., N. H. & H. station. Capital, \$30,000. Prob. 4 cars. Delano-Richardson syndicate are back of the scheme. 5

HARTLAND, KAN.—Hartland St. Ry. Co. 2 m, narrow g, light r, 2 c, 1 mu. Pres. E. S. Snow,

Sec. & Treas, Logan A. Garten, Supt. W. S. Handy. Capital stock, \$5,000. 3

HASTINGS, NEB.—Citizens' St. Ry. Co. Franchise obtained, similar to that of the Imp't Co., and are contesting the matter in the courts. Pres. R. A. Beatty, Sec. Henry Shedd, Treas. C. L. Jones. 8

HELENA, ARK.—Helena St. R. R. Co. Capital, \$30,000. Pres. Greenfield Quarles, Sec. D. T. Hargraves, Treas. S. H. Horner. 5

HOLDEN, MO.—Franchise granted to Wm. Steele, J. S. Johnson, John T. Bruce, J. N. McDonald and Thos. C. Carter. To run on Oilvest. from 2d to 14th, to Main, to 2d, to starting point. 6

HOPKINSVILLE, KY.—Hopkinsville St. Ry. Co. has been incorporated. Will not begin work before Jan. 9

HOT SPRINGS, ARK.—Road to Gillen's White Sulphur Springs projected by J. L. Goodbar. 11

HOUSTON, TEX.—Co. formed with capital of \$125,000. 11

HUDSON, N. Y.—Edw. J. Hodge bought the franchise at auction, and the road will be built soon. 8

HUNTINGTON, N. Y.—3½ m, from the Long Island R. R. station along the east side of Huntington Harbor. Stockholders, D. Schuberth and R. G. Phelps of New York, Henry S. Brush and others of Huntington. Capital stock, \$35,000, 4-8½ g, 40 lb r, 3 c, 8 h. Prob. build in Oct. 10

HUNTINGTON, W. VA.—J. L. Caldwell will build a st. r. & railway here. 9

HUNTSVILLE, ALA.—Huntsville Belt Line & Monte Sano R. R. Co. 5 m. Backed by No. Ala. Imp't Co. Work to begin in 3 or 4 months. Capital \$100,000. 11

HUFCHINSON, KAN.—Metropolitan St. Ry. Co. Being rapidly pushed to completion. Capital, \$50,000. Directors G. W. Hardy, Jas. H. Peikits, Hiram Constant, J. W. Mulky and A. H. Roblnson. 5

INDIANAPOLIS, IND.—Indianapolis Cable St. R. R. Co. 14½ m cable, 15½ m horse, 4-8½ g, 54 lb r, 70 closed and 20 open c, cable and h & motor traction. Work on cable line to begin in winter, and track laying March 15. Pres. W. W. Dudley, V. Pres. T. A. Morris, Sec. W. R. Holloway, Treas. Oran Perry. Capital, \$1,200,000. Office, 90½ E. Market St. 9

JACKSON, TENN.—Jackson & Suburban St. R. R. Co. 7 m, 4 g, 30 lb r, 4 c for the present, 12 mu. Pres. C. P. Heath, V. Pres. J. H. Duke, Sec. R. B. Crawford, Treas. J. L. Wisdom. Road to be opened about Oct. 1. Capital, \$50,000. Office for present, 212 Kansas st., Sioux City, Ia. e 9

JACKSONVILLE, FLA.—Jacksonville, Suburban & R. Est. R. R. Co. Surveys have been made Henry A. L'Engle, C. F. Adams and others are incorporators. 11

JUNCTION CITY, KAN.—Junction City & Fort Riley St. Ry. Co. 8 m. Horses will be used in the city, and some of her faster motor b-tween Junction City and Fort Riley. Must obtain franchises from city, county and Congress. Expect to have bill through Congress by Feb. 1 for right of way on Fort Riley Reservation. Capital \$50,000. Pres. B. Rockwell, V. Pres. G. E. Harvey, Sec. & Treas. C. G. Thurston. 7

KANSAS CITY, MO.—McGee, E. Seventeenth & Suburban Ry. Co. Dummy. Capital, \$500,000, one-half paid in. B. F. Jones, M. J. Payne and Isaac Whitaker are stockholders. 9
Kansas City & Suburban R. R. Co. has been granted franchise on Second st. 11
Kansas City, Masten Park & Westport R. R. Co. To be completed by Nov. 9. 10
People's Cable Ry. Co. Capital, \$750,000. Chicago capitalists interested. Pres. J. Foster Rhodes, V. Pres. C. F. Dwight, Sec. & Treas. W. P. Rice. Line to be completed this year. 5

Citizens' Cable Ry. Co. organized; capital, \$750,000. First-class road, to extend from Sixth street south on Holmes street to a point ½ m south of southern city limits. T. A. Harris, Bernard and Thos. Corrigan and E. J. Lawless are the principal stockholders. 7

KEENE, N. H.—Keene St. Ry. Co. Pres. Hon. R. F. Batchelder Clerk Chas. H. Henry, Treas. Wm. B. Frink. 9

KINGMAN, KAN.—Kingman St. Ry. Co. In progress. May use elec. 10

KINLEY, KAN.—Kinley St. Ry. & Elec. Lighting Co. Incorp'd by C. A. Read and others. Capital, \$100,000. 10

KNOXVILLE, TENN.—Knoxville & Edgewood Ry. Co. Will build at once, and open this year. 2 to 5 m. Have proposals from other new lines to join them, and it will depend upon which they accept what mode of propulsion, car and rail will be adopted. Pres. Wm. Caswell, V. Pres. E. C. Camp, Sec. Arthur Swan, F. A. Moses, A. N. Jackson and S. R. Rogers also interested. Capital, \$25,000. 5
Fountain Head R. R. Co. Incorp'd by F. A. R. Scott, J. H. Cruze and others to build a dummy rr. 6
Knoxville Belt R. R. Co. 8½ m, 4-8½ g, 60 lb steel r, 4 pass. c, 2 engines. Capital, \$100,000. Will begin work soon, and open in a year. Pres. W. R. Tuttle, Sec. I. W. S. Frierson, Treas. Sam. House. 10

KNOXVILLE, TENN.—Knoxville & Edgewood Ry. Co. Will build dummy line. 9
Magnolia Ave. Dummy Line. In progress. T. S. Frierson is interested. 10
So. Side and Market Sq. R. R. Co. Pres. H. Schubert, Sec. P. Kern. 2 m, 2 c, about 12 h. Road to be completed within a month. Capital, \$20,000. 9
West End St. Car Co. In progress. Jas. D. Cowan is interested. 10

LA GRANGE, GA.—La Grange St. R. R. Co. F. M. Ridley, F. M. Longley and others are interested. Will prob. cost \$20,000. 10

LAKE CITY, FLA.—H. S. Haines, Gen. Man. Sav., Fla. & W. Ry. and all the Plant system in Fla., has right of way. 10

LAKE SIDE, O.—Contracts awarded for elec. ry. 3 m, 2 open c. Prob. use overhead conductors. 7

LEXINGTON, GA.—W. A. Shackelford and others will build a dummy line to Crawford. 8

LINCOLN, NEB.—Elec. motor co. From city to stockyards. Capital, \$100,000. 6
Lincoln Cable Ry. Co. 5 m, 4-8½ g, 56 lb r, 10 c,

storage batteries and motors. Work to begin at once, and to be opened in early spring. Pres. J. H. Ames, V. Pres. Chas. Carpenter, Sec. Lewis Coon, Treas. J. H. McMurtry. Capital, \$500,000. e

Rapid Transit St. Ry. Co. Now building. Will use compressed steam motors at first. 9

So. Lincoln St. Ry. Co. incorporated. To build to Insane Asylum, Penitentiary and other points within 5 miles of city. Capital, \$25,000. J. H. McClay, S. W. Burnham and C. D. Hyatt are among the incorporators. 7

Standard St. R. R. Co. Incorp'd by L. G. Baldwin, M. H. Baldwin and Chas. Pitcher. Capital \$100,000. 8

LISBON, DAK.—Lisbon St. Ry. Co. Incorp'd, but never built. 11

LITCHFIELD, ILL.—J. A. Beverly, H. H. Beach, S. M. Grubbs and B. F. Johnston are the Directors. 9

LIVERMORE, CAL.—Charter granted to J. W. Seligman, of New York, and others. Steam or other motor may be used. 11

LOS ANGELES, CAL.—The American Rapid Transit Co. has been formed here, capital, \$500,000, to build from Pasadena to Monica, under the Enos elevated electric system. 11
Pacific Elec. R. R. Co. Incorp'd by J. H. Book and others. Capital, \$250,000. 11
J. H. Moon and others have franchise for elec. road with storage batteries. 11

Brooklyn Heights Ry. Co. 6½ m, 4-2 g, 16 lb r, about 15 c, h for one year, then elec. Pres. Clarence J. Richards, V. Pres. Chas. M. Baker, Sec. Carl F. Van Brunk, Treas. F. W. Records. Work to begin in Nov. and road to be opened in March prob. Capital, \$300,000. Office, 10 Court st. j 11
S. O. Brown will build a road 6½ m long to Glendale. 5

Los Angeles & Vernon St. Ry. 5 m, 4-8½ g, 20 lb T & 27 lb flat r, 6 c, 12 h, 1 dummy. In progress; will be completed by Dec. 1. Capital, \$50,000. Pres. D. G. Stephens, V. Pres. C. E. Day, Sec. F. A. Gibson, Treas. E. W. Kysor. e 10

Azusa Valley St. R. R. Co. Incorp'd by J. S. Phillips and others. Capital, \$100,000. 8
Los Angeles Cable Ry. Co. 10 m, 3-6 g, 46 lb r, 15 c, cable. Work to begin at once and to be finished in a year. Pres. J. F. Crank, Gen. Man Chas. Forman, Sec. S. P. Jewett, Asst. Sec. R. D. T. Widner. Capital, \$1,500,000. Office, 132 N. main st. 10

LYONS, KAN.—E. A. Deupree, Sam Steiner, C. W. Shumway and others incorporators. 5

MACON, GA.—R. K. Hines and others will build a st. ry. here. 7
Central City St. Ry. Co. has been incorp'd. 9
Macon City & Suburban Ry., Light & Power Co. has been incorp'd. 9 4
Vineville St. R. R. Co. 9

Metropolitan St. R. R. Co. 9

MARBLE FALLS, TEX.—A. R. Johnson and others will build line. 9

MARION, KAN.—Marion St. Ry. Co. Incorp'd by R. C. Cable, C. S. Winslow and others. Capital, \$10,000. 8

MARION, O.—Marion St. R. R. Co. 1 to 4 m. Prob. elec., though may use crude petroleum engines. 8

MARYVILLE, TENN.—Capital, \$5,000. Dr. John P. Blankenship, Rev. P. M. Bartlett, W. T. Parkham and others are interested. 6

MATTOON, ILL.—Mattoon St. Ry. Co. Now building. 5 m, 4-8½ g, steel T r. Pres. J. B. Craig, Sec. Joseph Millington, Treas. Robt. Owens. 9

McKEESPORT, PA.—McKeesport Pass. Ry. Co. Now building. 4 m, 5-2½ g, 35 lb girder r, 4 2-h c, 25 h. Pres. J. C. Smith, Sec. & Treas. E. F. Woods. 9

MCPHERSON, KAN.—Franchise owned by Salina St. Ry. Co. 8

MEMPHIS, TENN.—East End Ry. Co. 20 m, 4-8½ g, 35 lb r, 6 c, to be operated by 3 dummies. Will be running in Oct. Pres. W. M. Sneed, V. Pres. B. M. Stratton, Sec. & Treas. J. W. Falls. Capital, \$200,000. a 9
Jackson Mound Park R. R. Co. Elec. Work to begin in April, and the road to be opened in June. 5 m, 4 g, 30 lb r, 12 c. Pres. Holmes Cummins, Gen. Man. Sot Coleman, Sec. Theo. Krekel. Capital, \$100,000. Office, 41 Madison st. 11

Memphis & Chelsea Ry. Co. Chartered by Thos. F. Duffin, J. H. Smith, W. D. Beard and others. 9

MIDDLEBORO, MASS.—1½ m, perhaps elec. Capital, about \$39,000. Dr. Chas. Copeland, S. B. Ryder and others are interested. 9

MIDDLETOWN, O.—J. H. Stoll & Co., of New York, will build 3 m from Pomeroy to Middletown, O., for both freight and pass. 9

MILFORD, MASS.—Milford & Hopedale St. Ry. Co. 4 m, 4-8 g, heavy r, 6 or 8 c, h. & elec. Are guaranteed about \$60,000 capital. Will begin work in spring. C. W. Shippee is interested. 9

MILWAUKEE, WIS.—Milwaukee Cable Ry. Co. incorporated by Wm. P. McLaren, Geo. W. Mitchell and John A. Hinsey; capital, \$300,000. To build from center of city to western limits. Hope to open in a year. 2½ m, 4-8½ g, about 50 c, cable. Work to begin as soon as ordinance passes. 8
Milwaukee & Wauwatosa Cable Ry. Co. Frank L. Gilson & Judge Frisby are interested. 9
Robt. Nunnemacher, Wm. Sanderson & others ask to build a h or cable ry. along Broadway, Onelda, Wells and other sts. 9
Milwaukee Elec. R. R. Co. ask for franchise on River, E. Water & other sts. Adolph Toellner is leading spirit. Van Depoele system. 10
Dummy line to Whitefish Bay. Road to be completed by Jan. 1. 9

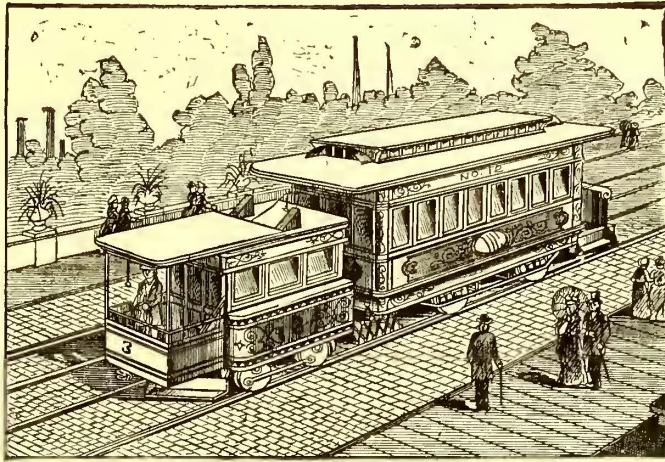
MINNEAPOLIS, MINN.—Minneapolis West Side St. Ry. Co. Incorporators: Randolph Burgess, John T. Byrnes, A. G. Chamberlain, H. J. Mitchell and Matthew Walsh, all of Minneapolis. Capital stock, \$200,000. From Lake Calhoun to Lake street bridge, with a branch to Lakewood cemetery. 7 m, 4-8½ g. Pres. Randolph Burgess, Sec. & Treas. John T. Byrnes, Supt. Albert C. Chamberlain. Office, 112 Hennepin ave. 5

MOBILE, ALA.—Mobile & Dauphin Island R. R. Co. W. W. Ansley & Co. of Birmingham have con-

POLE STREET CAR

Differential Lever Car
Starter, Runner & Brake.

Starts easily, Brakes as certainly and effectively as the air or Steam brake.



Standard No. 3 Motor
Is operated by a
Specially Designed Low Pressure
Condensing Engine
of great power in small space and
having no escapes on the street.

MOTOR SYSTEM.

The system can be operated by compressed air and is so recommended where good all-the-year-round water power can be secured to compress the air. Can be operated by storage battery, electricity or soda, ammonia, and other motive powers.

Warranted to climb hills, start on hills, and when the track is so slippery that the driving wheels will slip round under the motor, we still guarantee the motors starting by a system of ground levers.

WE ARE FULLY SECURED BY PATENTS.

We claim the only motor system capable of starting and going when the tracks are slippery, excepting only the cable motor. Ours is a cheaper outfit.

Correspondence solicited.

Pole Street Car Motor System,

310 Chestnut Street, Philadelphia, Pa.

tract to grade 5 m and to lay track from Mobile to Cedar Point. Grading in progress. 10

MUNCIE, IND.—Muncie City Ry. Co. Incorporated by W. W. Ball and others. Capital, \$100,000. Will perhaps use elec. 8

MURFREESBORO, TENN.—Murfreeseboro St. R. Ry. Co. Capital \$10,000. Incorporators, J. L. McKnight, W. M. Bell and others. 5

NASHVILLE, TENN.—Nashville & West Nashville St. Ry. Co. Has been chartered by S. W. Steel, Volney James, Geo. K. Whitworth, E. T. Noel, L. H. Davis, J. H. Moore and others. Dummy line. Now building. 11

Lake R. R. Co. has been organized by John Lelley, John McEwen and others. 6

North Nashville St. Ry. Co. J. G. Jones, Theo. Seifred, A. W. Willis and others incorporators. 6

Charter for a line leading out the Charlotte pike. 7
Main St. & Gallatin Pike St. R. Ry. Co. 2½ m, 4 8½ g, 38 lb Johnson girder r, 6 c, 45 m. Pres. Thos. L. Dodd, Sec. J. W. Baker, Treas. W. C. Dibrell. Work began in Aug. & road will be opened in Nov. Capital, \$50,000. e 9

E. T. Hotman and others have charter for dummy rr. from Nashville to West Nashville, 3½ m. Will begin active work as soon as right of way is obtained from Nashville City Council. 7

Overland Ry. Co. 8 m, 4-8½ g, 45 lb Johnson steel r, 12 c, 2 steam motors. Work commenced in March, and the road will be opened in Oct. Capital, \$50,000. Pres. O. F. Noel, Sec. & Treas. Jas. E. Caldwell. a 9

NATCHITOCHEES, LA.—Natchitoches St. Ry. Co. 1 or 2 miles. Ask for estimates. To run pass. and freight cars. Pres. Phanor Brazeale. 11

NEWBURGH, N. Y.—Third St. Ry. Co. ½ m, cabl., 4 c. Sec. & Treas. C. L. Waring. Expect to build in spring. Capital, \$40,000. Office, 76 Water st. 9

NEW BRUNSWICK, N. J.—Elec. ry. contemplated. 7

NEW CASTLE, PA.—New Castle St. Ry. Co. Organized, but mode of propulsion not yet determined. About 3 m. Pres. Geo. W. Johnson, V. Pres. L. Rancy, Sec. Chas. S. Wallace. Work to begin this fall. Capital, \$8,000; will increase to \$25,000. a 8

NEW HAVEN, CONN.—Cable road projected by Frank Blake. 7

NEW LONDON, CONN.—New London Horse Ry. Co. John Tebbets, Incorporator.

NEW ORLEANS, LA.—Jas. Sweeney will build new road on Nashville ave. 10

NEWTON, MASS.—Newton St. R. Ry. Co. 6 m, 4-8½ g, 52 lb r, 12 c, 12 h, electric motors. Pres. Horace B. Parker, V. Pres. J. W. Stover, Sec. & Treas. Herbert C. Pratt. Capital stock, \$50,000. Office, Newtonville. Work will commence when Aldermen grant location. 1

NEWPORT, KY.—Co. organized. 8

NEW YORK, N. Y.—North & East Rivers Ry. Co. To run through Fulton and Cortland sts. Bentley-Knight elec. system. Pres. W. W. Laman, Directors A. Hudnut, Ira Perego, David Bangs, Aaron Raymond, J. L. Truman, W. H. McDougal, W. G. Smith, Homer A. Nelson, R. R. Hazard, Robt. W. Blackwell and John T. Fanning, J. W. Childs, contractor for construction of road. Chairman Ex-Com, R. R. Hazard. About completed. Prob. open in Nov. 10

New York Cable R. R. Co. Pres. W. S. Williams, V. Pres. J. B. Shaw, Sec. Abraham L. Earle, Treas. Thos. W. Evans. 11

New York Underground R. R. Co. Pres. Edw. Lauterbach, J. Coleman Drayton is Pres. of New York Underground Construction Co., which has made application to open Lafayette place to operate under the Bentley-Knight system. Col. Rowland R. Hazard is prominent in the enterprise. 4

East & West Ferris R. R. Co. has been incorporated, with capital stock of \$50,000. Chas. W. Hough and others incorporators. 6

Twenty-eighth & Twenty-ninth Sts. R. R. Co. Secured franchise by agreeing to pay city 29.2 per cent of gross receipts for first five years and 31.2 per cent thereafter. Pres. John H. Crane, V. Pres. Edw. P. Beach, Sec. Fredk. A. Bartlett, Treas. John H. Davis. 5 m, 4-8½ g, 47 lb steel s-br, 40 to 50 c, prob. elec. Capital, \$50,000. Office, 183-191 Empire Court. d 10

NIAGARA FALLS, CAN.—Elec. ry. building 10

NORFOLK, NEB.—Norfolk St. Ry. Co. Capital, \$50,000. Pres. J. S. McClary, Sec. H. C. Brown, Treas. A. P. Pligla. 10

OAKLAND, CAL.—Elec. ry. Franch. granted. 8

OBERTIN, KAN.—Obertin St. Ry. Co. Capital, \$50,000. R. A. Marks, Everton Doom and others incorporators. 5

OLATHIE, KAN.—Kansas City & Olathie Investment & Rapid Transit Co. Dummy line to Kansas City. 8

OMAHA, NEB.—Cable line to be built by a Kansas City syndicate. Intended to have 3 m. in operation this fall.

Metropolitan Cable Ry. Co. 4.7 m, 4-8½ g, 56 lb r, 2 c, cable, 10 motors. Pres. F. L. Underwood, V. Pres. N. D. Allen, Sec. R. W. Patrick, Treas. G. A. Joslyn. Work to begin at once and road to be opened Sept. 1, 1888. Capital, \$1,000,000. 9

Omaha & So. Omaha St. Ry. Co. Capital, \$1,000,000. Cable road. Wm. A. Paxton, John E. Creighton and Isaac E. Corydon are among the incorporators. 5

Omaha Motor Ry. Co. Incorporated. Capital, \$500,000, of which \$50,000 to be paid in before commencement of business. Samuel D. Mercer, Clifton E. Mayne and others incorporators. Now laying track. Electricity in city. Van Depeole system: steam outside. 5 m, 4-8½ g, 56 lb girder r, 20 12 H. P. motors & 250 H. P. generators. Pres. Dr. S. D. Mercer, Sec. J. T. Hertzman, Treas. S. S. Curtis. Hope to be in operation in Nov. Office, 12th & Howard sts. 9

Line to asylum and penitentiary. Ex-Gov. Dawes, Senator S. W. Burnham, J. M. Hoffman and others are interested. 6

So. Omaha St. Ry. Co. 5 m, 4 8½ g. Will use h power. Work to begin this fall, and the road to be opened next summer. Capital, \$100,000. To run from Twenty-first street at Armour, along Twenty-first, Wyman, Bellevue to the corporation limits, with a number of branches. Pres. D. Anderson, V. Pres.

C. M. Hunt, Sec. C. C. Van Kuren, Treas. H. C. Bostwick. 6

Omaha Horse Ry. Cable Co. 2½ m, 4-8½ g, 45 lb Johnson girder r, cable power. Capital, \$1,500,000. Work to commence very soon. Pres. Guy C. Barton, V. Pres. S. H. H. Clark, Treas. Frank Murphy. 7

Northwestern St. Ry. Co. have been granted a franchise. 8

Omaha & Council Bluffs Ry. Bridge Co. To be built by March, 1888. 6 m, 4-8½ g, 45 lb T r, 12 c, 4 Baldwin motors. Pres. John T. Stewart, Sec. Geo. T. Wright, Treas. Jos. H. Millard, Supt. & Pur. Agt. Thos. J. Evans. 9

ONTARIO, CAL.—Elec. ry. 8 m, 2 trains of 2 c each. 16 lb T r. Terms asked for. 8

ORANGE, N. J.—Cable rr. up Orange mountain. 9

OTWAGA, ILL.—Ottawa St. Ry. Co. Contracts for construction awarded. Pres. F. A. Sherwood. 9

So. Ottawa & Ottawa St. Ry. Co. Will build as soon as they get franchise. 4½ m, 12 c, h power. Pres. Jas. Milligan, Jr., V. Pres. L. A. Rose, Sec. Fred E. Mays, Treas. L. W. Hess. Capital, \$30,000. e 10

PAINESVILLE, O.—Painesville & Fairport St. Ry. Co. Right of way and charter secured; and co. expects to be in operation by Apr. 1, 1888, using gas or elec. 5 m, 4-8½ g, 30 lb flat r, 3 c, limit power of engines 60 h.

PALATKA, FLA.—Palatka St. Ry. Co. Work begins Nov. 1; to open Jan. 1. 1½ m, narrow g, 20 lb r, 3 c, mu. Treas. W. W. Mitchell, Supt. J. H. Hibbard. Capital, \$10,000. 10

PAOLA, KAN.—Paola St. Ry. Co. Must be completed in 2 years from depots to park. Incorporators, S. D. Condon, J. H. Phillips and E. W. Robinson. 5

PARSONS, KAN.—Parsons St. Ry. Co. Expect to use elec. 8

PASADENA, CAL.—Elec. ry. Draft system. 9

PASSAIC, N. J.—Passaic St. Ry. Co. 3 m, from Garfield to Passaic through Clifton; and if the Paterson Main street road build their line to the race grounds the new co. will also build their line to meet them. 5

PEABODY, KAN.—Peabody St. Ry. Co. Incorporated by W. E. Scott and others, with a capital stock of \$10,000. 7

PEORIA, ILL.—East Bluff Horse R. R. Co. 1½ m, 4-8½ g, 30-40 lb r, 4 c, 24 h. Pres. N. Giles, Sec. R. R. Bouraud, Treas. M. E. Culver. Capital stock, \$11,000. Work in progress. 10

PHILADELPHIA, PA.—Lehigh Ave. Ry. Co. To run up Lehigh avenue from Second street to R dge avenue and directly to East Fairmount Park. Pres. Jos. T. Bunting, Sec. & Treas. J. Mc K. Barron, Directors, Wm. R. Wister, John Wister, Langhorn Wister and Jas. P. Booth. Other large stockholders are Wm. Wharton, Jr. and Wm. L. Elkins. Capital, \$600,000, of which 60,000 is paid lo. Double track the whole length. Will have 6 miles of track. Nearly finished; will be opened this fall. 5-2½ g, 47 lb s-b r. Will use either horses or electricity. Temporary office, 830 Walnut st. 7

PITTSBURGH, PA.—Road to Squirrel Hill. Will prob. be called Eastern Heights R. R. Will intersect Pittsburgh Traction Co.'s cable line and run to the Homewood and Lutheran cemeteries. 3 m, narrow g, either steam or elec. Capital, \$60,000. Sec. Howard Morton, 28 Lewis Bldg. 9

Pittsburgh & Allegheny Traction Co. Charter granted. Composed of same interests as Federal St. & Pleasant Valley Co., the plan being to change this road to elec. or cable, work to begin early next spring. 10

Pittsburgh, East Liberty & Wilkinsburgh Ry. Co. 3 m, 4-8 1-2 g, 52 lb Johnson girder r. Pres. Ed. Jay Allen, Sec. & Treas. W. H. Allen. To use about 5 c and 20 h. Not decided when road will be opened. Capital stock, \$15,000. Present office, 517 Wood st.

Pittsburgh Traction Co. Cable, 11 m, 5-2 g, 66½ lb girder r, 30 c, 3 500 H. P. engines. Pres. Geo. W. Elkins, Sec. Geo. L. McFarlane, Treas. W. McCandless, Engr. Geo. Rice. Office, Room 307, Hamilton Bldg. Market st. to Point Breeze, along Fifth ave. This co. will be successor to Pittsburgh, Oakland & East Liberty Pass. Ry. Co. Will have 4 500 H. P. Corliss engines. Began work Aug. 1; will be opened next year. Capital, \$2,500,000. 10

Pittsburgh & East End R. R. Co. Capital, \$250,000. Incorporators, Wm. L. Chalfort, John Bisset and others. Track laid. 9

Overhead Conductor Elec. Ry. Co. Incorp'd by Geo. Westinghouse and others. Capital, \$300,000. 9

Pittsburgh, Knoxville & St. Clair St. Ry. Co. Elec. ry. Durt system, 5 35 H. P. motors have been completed. 3 m, 5-2½ g, 40 lb tram r. Pres. Thos. Evans, Sec. J. W. Patterson, Treas. Henry Stamm. 9

Brownsville Ave. St. Ry. Co. 8

PLATTSMOUTH, NEB.—Plattsmouth St. Ry. Co. 2 m, 4-8½ g, 35 lb tram r. Pres. S. D. Mercer, Omaha; Sec. & Pur. Agt. L. C. Mercer, Plattsmouth; Treas. O. H. Bailon, Omaha. 9

PLAINFIELD, N. J.—Elec. ry. will prob. be built. 7

PLYMOUTH, MASS.—Plymouth & Kingston St. R. R. Co. 2½ m, 4-8½ g, about 35 lb r, 4 to 6 c, elec., motor on each car. Are waiting for improvements in accumulator system. Capital stock, \$25,000. James D. Thurber and others incorporators. Grant of location has expired but could be renewed. 9

PONTIAC, ILL.—Pontiac Ry. Co. Incorp'd by Reason M. George and others. Capital, \$20,000.

PORTLAND, ORE.—Portland Traction Co. Incorp'd by Van B. DeLashmut and others. Capital, \$500,000. 10

Portland Cable Ry. Co. Their solicitors are at 142 S. 4th st., Philadelphia. 10

PORT CHESTER, N. Y.—Port Chester & Rye Beach St. Ry. Co. 4½ m, 4-8½ g, 20 lb side bearing r, 6 c, 40 h. Work to begin soon; road to be opened Dec. 1. Pres. Chas. D. Haines, V. Pres. Andrew G. Haines, Sec. & Treas. F. H. Skeele. Capital, \$40,000. Office, 46 Broadway, New York, Rooms 4 & 5. a 10

PORTSMOUTH, VA.—Portsmouth St. Ry. Co. To be in operation by Nov. 15. S. T. Dunham, 45 Broadway, New York, has charge of construction; and Rufus Martin & Co. supply cars, etc. 4 m, 4-8½

g, 30 lb T r, 6 c, elec. or h, 25 lf latter. Capital, \$50,000. 10

PLATT, KAN.—City Ry. Co. Incorp'd by Geo. S. Chase, of Topeka, and others. Capital, \$35,000. 10

PRESTON, IA.—2 m. R. T. Shea is interested. 10

PROVIDENCE, R. I.—Providence, Warren & Bristol R. R. Co. will build cable road, ¼ m, from their present terminus to center of city, 4-8½ g. Supt. Waterman Stone. Will begin work in a few months. Col. Paine will have supervision of the work. 8

PUEBLO, COL.—Pueblo & Bessemer St. Ry. Co. G. M. Chilcott, And. McClelland and others are interested. 8

Pueblo, Bessemer, Highland & Mineral Park Circle R. R. ask for right of way.

QUINCY, MASS.—Quincy St. Ry. Co. 4¼ m. H. M. Federhen is interested. Capital, \$40,000. 10

RALEIGH, N. C.—Jas. Graham, who is backed by the Messrs. Pratt, the oil men, has obtained a franchise. 4

RICHFIELD SPRINGS, N. Y.—Richfield Springs & Canadaraque Lake Surface R. R. 1 m. D. C. Hadcock of Syracuse organizer. Capital \$15,500.

RIVERSIDE, CAL.—Riverside & Arlington St. Ry. 12 m, 4-8½ g, 16 lb r. Work to begin this fall. Capital, \$500,000. Pres. Thos. Bakewell, Treas. I. S. Castleman. 9

ROANOKE, VA.—Roanoke St. Ry. Co. Chartered, with capital of \$10,000. Pres. Thos. Lewis, Sec. F. T. Brinkley. 5

ROCHESTER, N. Y.—Rochester Cable R. R. Co. 10 m, 4-8 g, about 30 c, cable traction. Work to begin as soon as franchise is granted, and road to be opened by July 1, 1888. Pres. Valentine Fleckenstein, V. Pres. John W. Harman, Sec. Paris G. Clark, Treas. Geo. W. Archer. Capital, \$1,603,000. Office, 28 Elmwood Bldg. 9

Elec. ry. co. Incorp'd by Henry Brinker, Asa T. Soule and others. Capital, \$75,000. Work has begun. 9

West Side R. R. Co. Incorp'd by C. B. Woodworth and others. Capital, \$50,000. 9

ROCKLAND, MASS.—To connect with No. Abington. 9

ROCKMART, GA.—S. E. Smith is interested. 6

ROCKAWAY, N. Y.—Elec. ry. 9

ROME, GA.—Rome Investment Co. will build dummy line through East Rome. Work to begin soon. 7

SAN JOSE, CAL.—Franchise granted to J. W. Rea, W. P. Dougherty and others for elec. or cable road. Work to begin at once. 10

SANTA BARBARA, CAL.—Citizens' Ry. Co. Incorp'd by G. H. Bonebrake and others. Capital, \$50,000. 10

Santa Barbara St. Ry. Co. Incorp'd by A. Cross and others. Capital, \$50,000. 10

SAULT STE. MARIE, MICH.—Sault Ste. Marie St. Ry. Co. Incorp'd by Edw. M. Lacy and others. Capital, \$25,000.

SAYRE, PA.—Sayre St. Ry. To connect Sayre, Athens, Pa. and Waverly, N. Y. 4 m. Streets now being graded for track. To be built by Sayre Land Co. Pres. Howard Elmer, Treas. Wm. Stevenson. 6

SALT LAKE CITY, U. T.—Elec. Ry. Co. 9

SAN ANTONIO, TEX.—R. Woolley, Jr., of Cincinnati, represents co. formed there to build a st. ry. at San Antonio. 5 or 6 m. 9

West End St. Car Co. Incorp'd by G. W. Russ, J. W. Moon and others. Capital, \$50,000. 9

SAN BERNARDINO, CAL.—Motor line to Harlem Springs. \$20,000 of stock subscribed already. 9

SAN DIEGO, CAL.—San Diego St. Ry. Co. Elec. ry., now building. Henry system. 9 m, 4 40 H. P. motor c. Pres. Dr. Grancher, V. Pres. Juan Francisco. 9

San Diego & Old Town St. Ry. Co. Nearly finished. 4 m, 4-8½ g, 20 & 30 lb r, 4 or more c. elec. or steam. Pres. J. R. Thomas, Sec. G. B. Hensley, Treas. R. A. Thomas. Capital, \$100,000. 10

Elec. ry. to El Canon, 15 m. 9

SAN FRANCISCO, CAL.—Powell St. Ry. Co. 11 m, 3-6 g, 33 lb r, 32 c. Pres. W. J. Adams, V. Pres. Thos. Magee, Treas. H. H. Lynch, Sec. G. H. Waggoner. Capital stock, \$2,000,000. Work in progress. Cable traction. Office, 32 Merchants Exchange. Will be opened soon. 15

J. M. Davies and J. L. Wetmore ask for franchise for elec. or cable road. 9

Columbus Bartlett has franchise for road on Park st., which he assigned to J. A. Woodard. 10

New cable road to beach. Thos. Magee is interested. 9

Telpherage Electric Ry. Co. has been incorporated. Pres. F. M. Speed. Prof. N. S. Keith has charge of engine'r. Experimenting on 19th st. 8

Broadway Cable R. R. Co. Incorp'd by Robt. Sherwood and o'hers. Capital, \$1,000,000. 8

SANTA ROSA, CAL.—T. J. Glary, M. Doyle and A. B. Ware have formed co. with capital of \$25,000, work to begin within next two months. 6

SAVANNAH, GA.—Savannah St. & Rural Reso t Ry. 6 m, 4-8½ g, about 15 c, if possible will use elec. motors. Man. H. P. Smart. Will commence work as soon as city gives its permission. Capital, \$100,000. 9

SCRANTON, PA.—The Nayaug Crosstown R. R. Co. Pres. G. Clark, V. Pres. H. C. Dowd, Sec. T. C. Snow, Treas. B. E. Leonard. Will build 5 m, and probably use electricity. Capital, \$50,000. 2

SHEFFIELD, ALA.—Sheffield St. Ry. Co. 6 m, broad g, medium r, 4 c, 4 dummy engines. Road about finished. Pres. H. B. Tompkins, Sec. Ed. B. Almon, Treas. C. D. Woodson, Supt. W. S. White. Capital, \$50,000. e

SHERMAN, TEX.—H. A. Burnett will build a road this year. 5

SIoux CITY, IA.—E. W. McNeil, Manager Rasmussen cable, will build a road here, 2½ m. 3

Sioux City & Morning Side St. Ry. Co. Incorp'd by W. L. Jay and others. Capital, \$150,000. 10

SIoux FALLS, DAK.—Sioux Falls St. R. R. Co. Company must have 2 m running by Nov. 1 and a mile each year for five years thereafter. Incorporators, L. F. Pettigrew, L. L. Dunning and S. L. Tate, Sioux Falls; Jas. Creighton, Chicago; Elnathan Sawtelle, Evansville, Wis. Capital, \$150,000. 5

SOUTH PITTSBURG, TENN.—So. Pittsburg R. R. Co. chartered by W. M. Duncan, Sam'l Cowan and others. 7

SOUTH ST. PAUL, MINN.—So. St. Paul Rapid Transit Co. 8 m, 40 & 56 lb r, 10 c, elec., 4 motors to each c. Enos Elevated Ry. system, with Daft motors. Work now under way. Will be completed this year. Pres. A. E. Clark, Sec. & Gen. Man. J. H. Lawrence. Capital, \$500,000. Office, German Bank Bldg., St. Paul. 1 9

SPARTANBURG, S. C.—Spartanburg Land & Imp't Co. chartered by John B. Cleveland, S. J. Simpson and others to build a st. rr. among other things. Capital, \$10,000. 9

B. H. Rice asks for franchise. 10

ST. AUGUSTINE, FLA.—Elec. ry. in contemplation. Northern capitalists interested. 8

STAUNTON, VA.—M. Letterman and A. D. Payne, of Charlottesville, have made proposition. 10 J. Thompson Brown, of Richmond, also asks to build. 10

ST. CLOUD, MINN.—St. Cloud Motor Line Co. incorp'd by H. C. Waite, F. E. Searle, C. F. Macdonal and others. Wm. M. Hewitt, of Muscatine, reports 1½ m completed. 11

STERLING, KAN.—H. H. Jackman, of Wichita, will build a street railway here at once. 9

STEUBENVILLE, O.—Haines Bros. propose building a new line here this year. 3

ST. JOSEPH, MO.—Wyatt Park Ry. Co. 5 m, 4 8½ g, cable. Pres. J. M. Huffman, Sec. I. R. Williams. Capital, \$3,000. Being constructed by D. J. Miller, and the Miller system will be adopted. 10

Circle Cable Ry. Co. Work has begun. Franchise is owned by Messrs. Johnson, Lillis and Lucas, of the Citizens' Cable Co., Kansas City. 10

Elec. ry. in No. St. Joseph. Being built. 10

ST. LOUIS, MO.—John Jackson, Julius S. Walsh, J. R. Helfenstein and others are interested in a new road on Grand avenue, to use horse, cable or electric power. 6

St. Louis Cable Ry. Assn. Capital, \$100,000. Julius S. Walsh and others, incorporators. 7

Elec. el. ry. to be built by Henry D. Loughten. 7

So. St. Louis Ry. Co. Pres. W. L. Johnson. Will prob. put in Johnson-Rasmussen cable in spring. 9

ST. PAUL, MINN.—St. Paul Cable Ry. Co. V. Pres. Thos. P. Wilson. Now building. 7

St. Paul & Minneapolis Rapid Transit Co. Incorp'd to build an elevated or surface road between the two cities. Incorporators are P. R. L. Hardenberg and others, of St. Paul, and Wm. W. Huntington and others, of Minneapolis. 10

Metropolitan & Suburban Ry. asks for charter, to use cable or h. One mile must be in operation by Jan. 1, 1888. 8

St. Paul Elec. Ry. Co. Daft system. 9

SUFFOLK, VA.—Suffolk St. R. R. Co. Incorporated. 7

SUMTER, S. C.—Maryland Elec. Motor Mfg. Co., of Baltimore, will build elec. road. 10

SUNBURY, PA.—Sunbury & Northumberland St. Ry. Co. Elec. ry. Pres. H. E. Davis, Sec. L. H. Case, Treas. S. P. Wolvorton.

SYRACUSE, N. Y.—Butternut St. Ry. Co. 2m. To be built this year 2

People's R. R. Co. 5½ m, 4-8½ g, 45 c, 165 h. Work to go forward this fall and road to be opened in April. Pres. J. R. Swan, Utica, V. Pres. Daniel Candee, Syracuse, Sec. S. A. Beardsly, Syracuse. Capital, \$300,000. a 9

Palmyra St. Surface R. R. Co. Pres. John Hadcock, V. Pres. W. A. Beach, Sec. & Treas. I. D. Brewster. 2 m, 4-8½ g, 36 lb r, 4 c, 10 h. Capital, \$30,000. To be built this fall. a 9

Hudson St. Surface R. R. Co. Pres. D. C. Hadcock, V. Pres. W. A. Beach, Sec. & Treas. T. D. Brewster. 2 m, 4-8½ g, 36 lb r, 5 c, 12 h. Capital, \$30,000. To be built this fall. 9

Lyons St. Surface R. R. Co. Pres. Wm. A. Beach, V. Pres. D. C. Hadcock, Sec. & Treas. I. D. Brewster. 2 m, 4-8½ g, 36 lb r, 4 c, 12 h. Capital, \$30,000. To be built this fall. 9

Syracuse R. R. Co. incorp'd by Roger S. Perry and others. Capital, \$100,000. 8

Third Ward Ry. Co. To at once build 3¼ m, to Geddes, franchise having been granted. Pres. Wm. B. Cogswell, Sec. and Treas. W. S. Wales. Daft elec. system, with Sprague truck and bearings. Metallic st. ry. 9

TACOMA, WASH. T.—Allen C. Mason is interested. Will be pushed to an early completion. May use any power but steam, but the co. want this restriction removed, saying they may use a noiseless motor, and elec. is also talked of.

TALLADEGA, ALA.—From city to Spring Lake park. Willis Shaw of Birmingham and W. H. Skaggs of Talladega are among incorporators. Talladega Land & Imp't Co. are interested. 8

TARPON SPRINGS, FLA.—Will prob. he built this winter. 9

TAUNTON, MASS.—Scadding St. Ry. Co. Franchise granted. 3½ m. To build through Cedar street from Main to Grant, thence through School, Purchase, Washington and Bay to Scadding's pond. 10 c, 30 h. Capital, \$60,000. W. W. Swan is interested. Wish to negotiate with parties who would like to take hold of the enterprise. 8

TEXARKANA, ARK.—State Line Ry. Co. Capital, \$25,000. E. A. Warner, Samuel Lemby and others are incorporators. 6

B. B. Harrell will build a new line. 7

TIFFIN, O.—Tiffin St. Ry. Co. has been incorporated. Capital, \$10,000. Perry M. Adams and others, incorporators. May use elec. 6

TOPEKA, KAN.—Sixth Ave. & Deer Creek St. Ry. Co. Incorporators, Gullford Dudley, B. F. Golaen,

W. D. Alexander and others. Steam, electricity or other motive power. To accommodate the east side and to be built at once. 5

Illghland Park Circle Ry. Co. Incorporated, and first 3 m. will be completed by Dec. 1. Steel r, narrow g, dummy engine. Major Hudson is at the head of the enterprise. 5

TUSKALOOSA, ALA.—Tuskaloosa Belt Ry. will be built by Tuskaloosa Coal, Iron and Land Co. Officers of both roads: Pres. W. C. Jemison, V. Pres. B. Friedman, Sec. J. W. Castleman, Treas. Geo. A. Searcy. Work to begin at once. 6½ m, 4-8½ g, 35 lb r, 2 c, 1 steam motor. 8

TYLER, TEX.—A St. Louis party proposes to build a st. ry. here. 8

UNION SPRINGS, ALA.—Union Springs St. Car Co. Sec. T. H. Mabson, Jr. Building. 9

WASHINGTON, GA.—Co. chartered. 10

WASHINGTON, KAN.—Co. organized. 5

WATERTOWN, DAK.—Chas. Joscelyne has received a franchise allowing him the use of any streets he wishes, and to use either horse, steam or electric motors. At least 1 mile must be in operation by May 1, 1888. 5

WAXAHACHIE, TEX.—Waxahachie St. Ry. Co. chartered by Messrs. Dunlap, White and others. Capital, \$25,000. 10

WEATHERFORD, TEX.—Weatherford St. Ry. Co. Will begin building soon. Pres. G. M. Bowie, Sec. Jas. L. Simmons, Treas. C. H. Milliken, Supt. L. M. Bailey.

WESTFIELD, MASS.—Westfield St. Ry. Co. 5 m. Directors Eugene Cole and J. H. Stoll, of New York, owning a majority of stock: Orrin D. Parks, J. H. Bryan and others. 9

WHEELING, W. VA.—Wheeling Ry. Co. Rec'd permit. Capital, \$10,000. N. Roster, J. M. Sweeney and others are interested. Will use electricity, Van Depoele system. 10

WICHITA, KAN.—West End Motor Line Co. Capital, \$100,000. Wm. P. Carey is one of the incorporators. 6

WINCHESTER, KY.—T. G. Stuart & Co. have been granted franchise. 10

WINSTON, N. C.—Winston Elec. Light & Motor Power Co. will build a line. 7

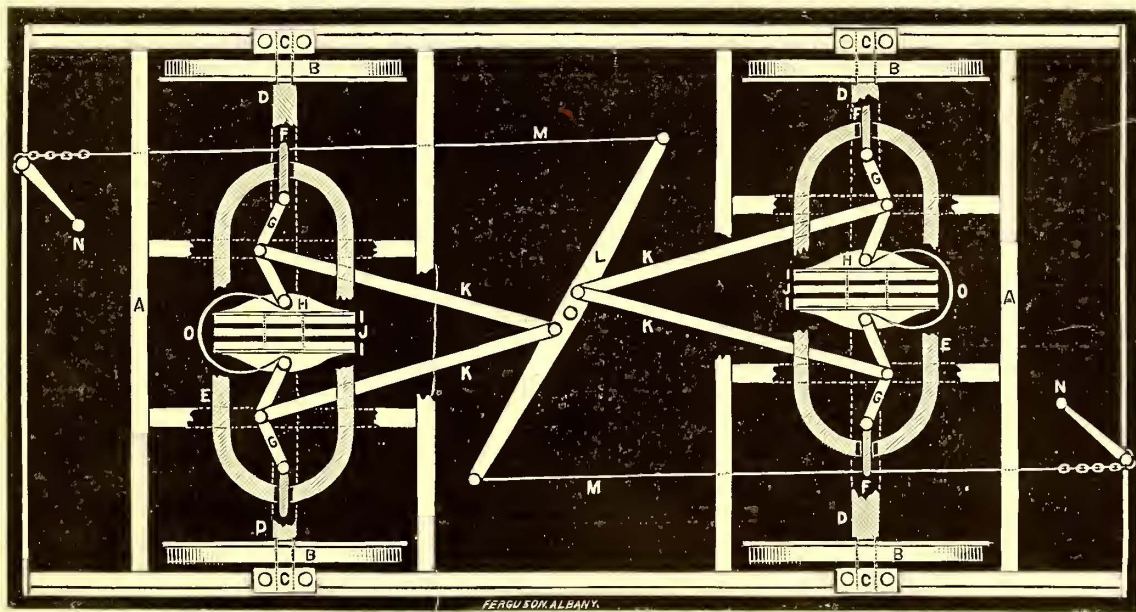
WOOSTER, O.—Elec. ry. 9

WORCESTER, MASS.—Lake Quinsigamond road, 4 m, to be changed from steam to electricity. Daft system. 9

WYANDOTTE, KAN.—Inter-State Consolidated Rapid Transit Ry. Co. 5.6 m, 4-8½ g, 35, 50 and 62 lb c-h and T r, 24 c, motors. Cable, 2½ m, being built. Pres. David M. Edgerton, Sec. D. D. Hoag, Treas. A. A. Calef, New York, Pur. Agt. D. E. Tyler, Supt. T'kos. E. Lewis.

YANKTON, DAK.—Co. Incorp'd, but will not build this year. 10

Messier Car Brake.



A—Car Frame. B—Car Wheels. C—Journals. D—Axles. E—Brake Frame. F—Adjustable holl's. G—Toggle Joints. H—Brake Shoes. I—Wooden Facing of Shoes. J—Brake Wheel or Friction Disk. K—Draw Bars. L—Brake Lever. M—Pulling Rods. N—Standards. O—Spring.

The Brake, working on the third wheel, placed at such a height from the surface of the road, renders it impossible to clog with snow or ice in winter weather; removing the iron shoes from the wheels and saving the expense of new shoes; also the wearing of flat places on the wheels.

The Shoes placed on the Messier Brake are guaranteed for one year.

We will place one Brake on any Horse Railroad in the United States for cost of manufacturing.

Remember the Messier Brake can be made duplicate, so that it can be applied to one or both trucks from either end of the car, without placing any additional weight on the car.

After a thorough test of fourteen weeks on the State street road in Albany (this road having a grade of 10 feet to 100 feet), it was told us that it was the first and only Brake ever applied that would stop a large summer open car with fifty-two passengers without setting the wheels.

Letters of inquiry or any question of information will be gladly answered by addressing the Manager,

W. N. LEWIS, No. 8 State Street, ALBANY, N. Y.

GREENWOOD HORSE SHOE CO.,
S. E. COR. AMERICAN & YORK STS.,
PHILADELPHIA, PA.,

MANUFACTURERS OF THE

GREENWOOD SOLID CALK

PLAIN AND DOUBLE BEVELED

HORSE & MULE SHOES

For Street Railway Use.

STREET RAILWAY COMPANIES CAN HAVE ANY KIND OF SPECIAL SHOE MADE
IN QUANTITIES.

ALL DROP FORGED FROM BEST MATERIAL, IN STEEL OR IRON.

THESE SHOES ARE IN CONSTANT USE ON MANY OF THE LEADING RAILROADS
OF THE COUNTRY.

CORRESPONDENCE SOLICITED.

P. F. GREENWOOD, Manager.

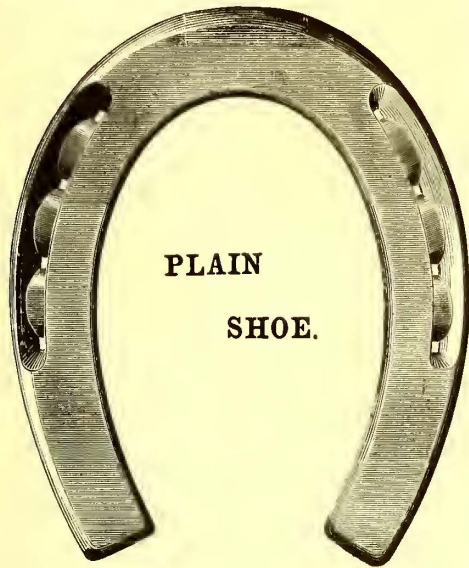
THE BRYDEN FORGED HORSESHOE WORKS, Limited, CATASAUQUA, PENN.,

MANUFACTURERS OF

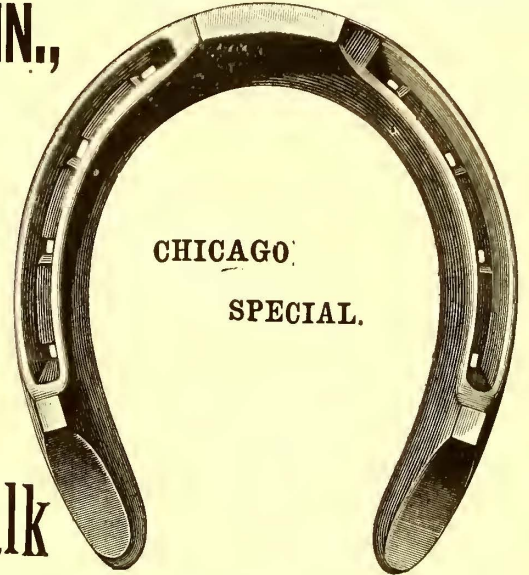
THE BRYDEN

Forged Solid Calk

HORSE AND MULE SHOE.



PLAIN
SHOE.



CHICAGO
SPECIAL.

These shoes are forged into shape under heavy drop hammers, greatly condensing the iron and adding very much to wearing qualities, making it nearly equal to steel in durability.

The distinctive feature of our system of manufacture is, that it produces a *finished* shoe, calked, or plain, ready for attaching to the hoof.

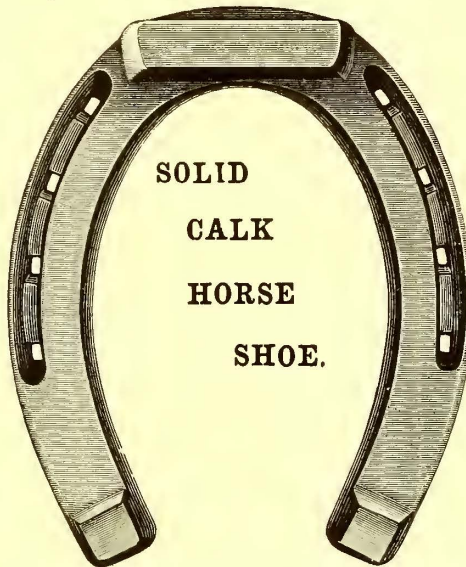
The crease is made low and the nail holes are punched well in and beveled to permit the nailhead to be well driven in, reducing the strain on the nails and insuring a firmly fastened shoe.

The foot bearing of the shoe is level, thus materially aiding in the preservation of the hoof.

It is not necessary to heat the shoe in order to fit it.

There are no welds in the shoe to break, the calks being solid forged up from the web.

OUR CALKED SHOE. A good, strong, reliable shoe to have on hand. The calks will not come off. Always ready to nail on. A handy shoe for the Winter, easily sharpened, and, as the calks will not break, will give as much service as steel. Made in sizes No. 1 to No. 6. Front and hind of steel or iron.

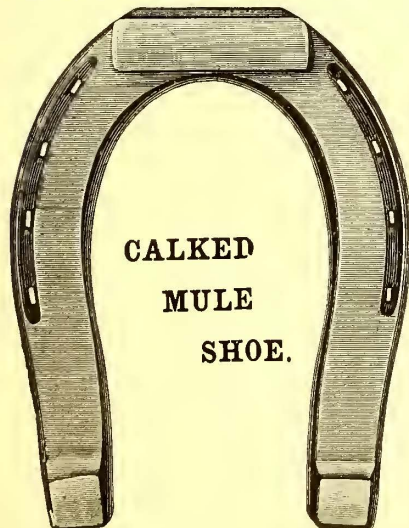


SOLID
CALK
HORSE
SHOE.

The shoes have a good substantial clip drawn up from metal driven outside the regular outlines of the shoe for that purpose. The outer edge of the clip, when drawn up, coinciding with the outlines of the shoe, requires no robbing of the hoof wall to let in the clip.

Among the street railways using our shoes are, the Third Avenue R. R. Co., Eighth Avenue R. R. Co., Broadway & Seventh Avenue R. R. Co. of New York city; Bushwick R. R. Co., Brooklyn City and Newtown R. R. Co. of Brooklyn; Philadelphia Traction Co., Citizen's Passenger R. R. Co., Second & Third Street R. R. Co. of Philadelphia; Metropolitan R. R. Co. of Washington, D. C.; North Chicago R. R. Co., Chicago City R. R. Co., West Division R. R. Co. of Chicago, Ill.; New Orleans City & Lake R. R. Co. of New Orleans, La.

We present illustrations of some of the many designs of shoes manufactured by us.

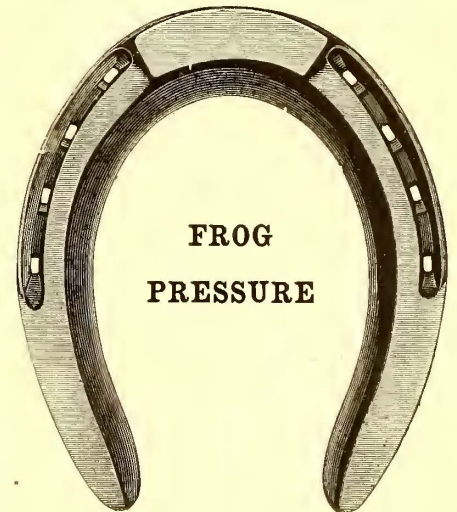


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MULE
SHOE.

OUR FROG PRESSURE SHOE. The advocates of the frog pressure system of horseshoeing have in this shoe the very thing they want. The best shoe made for curing corns or contracted feet. Made in sizes No. 1 to No. 6. Front and hind, iron, or steel.

OUR PLAIN SHOE. "The best railroad shoe made," so says one of the largest consumers of horseshoes in New York city. This shoe is used by the largest street railroads in New York city and Philadelphia. Made in sizes No. 1 to 6. Front and hind.

OUR CHICAGO SPECIAL. Designed to meet the wants of many of our western customers. Extensively used in Chicago, on the principal railroads and for custom work. A light calked shoe for shoeing trotting and driving horses. Made in sizes No. 1 to No 4 of iron or steel.



FROG
PRESSURE

OUR CALKED MULE SHOE. Just the thing for street railway and coal mining work; solid calks. Made in sizes No. 1 to No. 5 in iron or steel.

J. B. WHITE, Manager Sales Department.

DAN'L CRUICE & CO.

Office: 25 Spring st., New York.

Now offers for sale to the public the Reliable Hoof Clasp, which is used as shown in the above cut, for the purpose of closing cracks in horses' feet and holding the hoof firmly together, thus preventing the entrance of water, dirt or sand within the horny shell or wall. It is well understood by horse owners having experience with sand and quarter cracks that they become mischievous only when some foreign substance makes its way beneath the outside crust, which will, if not attended to promptly, cause the horse great pain, and render him useless to his owner. The method now generally practiced for closing hoof cracks is by nailing or riveting, which is both cruel and dangerous. There are many instances on record where tetanus (lock-jaw) has set in as a result of the nailing process.

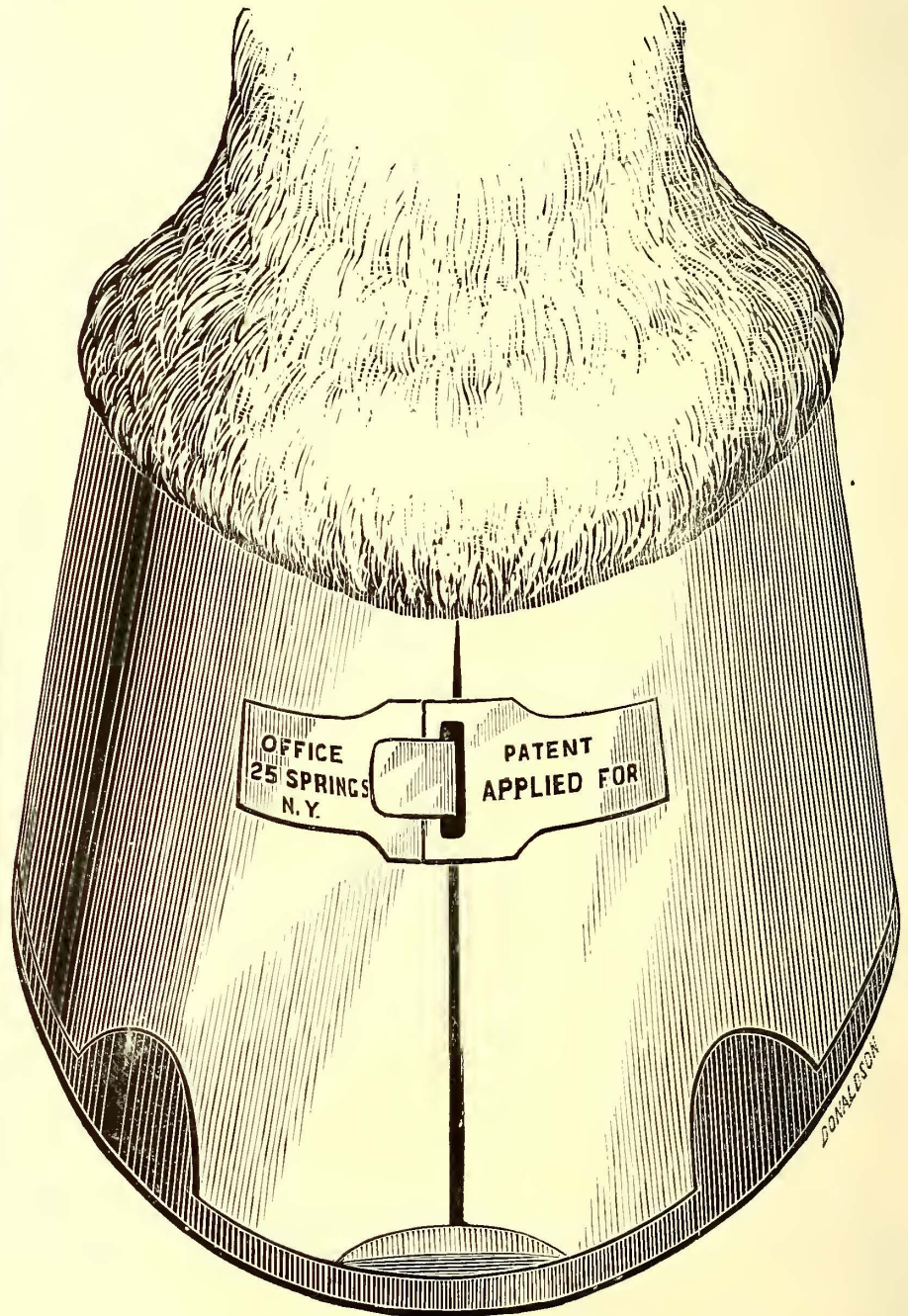
The Reliable Hoof Clasp possesses none of these objections, as there is no hammering required, it being adjusted to the foot by fastening a small vise to both ends of the clasp, allowing the tongue of one side to enter the loop of the other, and by means of a screw the foot is drawn gently together, until the crack is completely closed, and held in that position, by simply pulling the tongue over and laying it flat against the hoof.

It is well to state, in order to obtain the best results from the clasp, that the soreness should be well out of the foot, and the horse shod properly; if the sole of the foot, having crack, is dropped, it will be necessary to put on a wide web shoe, well concaved, with a bar welded across the center in order to protect the sole from concussion. Good cup feet can be shod in the ordinary way. The clasp should not be applied until the shoe is put on, and the clinches laid down. The horse is then ready for work, and will not give any further trouble.

For Street Railroad Companies the Reliable Clasp will be of special value, as they have a great many fine able horses laid up solely on account of cracked feet.

Those desiring to use the Reliable Hoof Clasp can have them forwarded by mail, together with the necessary tools for applying them, by addressing

Dan'l Cruice & Co.,
25 SPRING ST., NEW YORK.



DIRECTIONS FOR APPLYING CLASP.

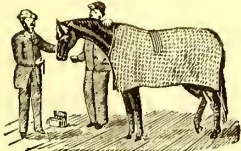
1st. Place gauge across the crack. Strap it on firmly so that it will not shift, then insert burning iron without teeth, placing your hand in a slanting position towards the crack, pressing until the iron comes in contact with gauge, then you are deep enough.

2nd. Place the grips of Clasp into the indentation made by burning iron, inserting at the same time the tongue of one side of the Clasp into the loop of the other, then catch both ends of Clasp in the vise and turn the screw which pushes the tongue through the loop, and at the same time draws both sides of

the hoof together, thus completely closing the crack.

3rd. Pull the tongue of the Clasp well up with pinchers, so that it will lie snugly against the loop, then turn it entirely over so that it will lay flat on the hoof, in order that the horse will not interfere if placed on the inside quarter of the foot. If in time the clasp should become loose apply the vise to both ends, then lift the tongue so that in compressing the vise you push the tongue forward, then lay the tongue back by the aid of the punch in order that it may be brought up snugly to the end of the loop.

Send for Price List.



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ANTI-FEVER MEDICINE.

The Anti-Fever Medicine has now been in use for over 30 years as a specific in all Diseases of an Inflammatory Character in Horses and Cattle. Anti-Fever Medicine is a Certain Cure for Chills and Fever, Sore Throat, Inflammation of Lungs, Coughs, Staggers, Inflammation of the Bowels, Spasmodic Colic, and Pleuro-Pneumonia in Cattle. This valuable Medicine is now used by the Principal Stables in the Country, by the U. S. and American Express Companies, and many of the Street Car Companies. Try one bottle and you will be convinced of its value in your stable. Sold by all Druggists. PRICE \$1 per bottle. Discount to the Trade. Address **Wm. Somerville & Sons, Buffalo Horse Infirmary, 127 Erie st. Buffalo, N.Y.** Mention this paper.

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P. F. Burke, c. F. Dewick & Co.,

Successor to

Manufacturer of

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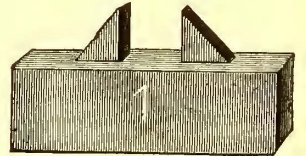


Welding Dies for Sharp, and Horse Shoers' Foot Vises.

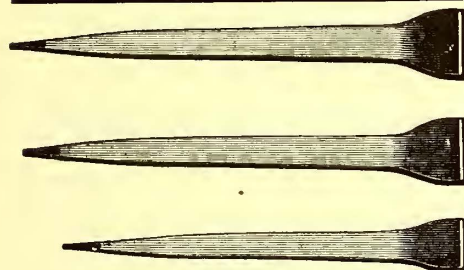
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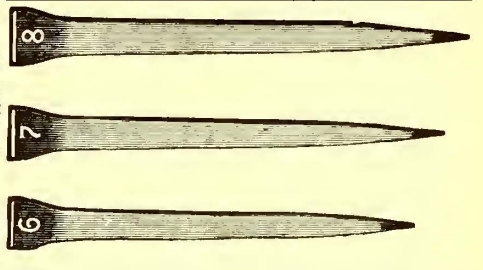
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Manufactured from very best SWEDISH METAL. Will not SPLIT. Are accurately pointed, tough, strong and hold the shoes. Soft enough to clinch readily; stiff enough to drive without bending. All nails uniform and perfect. They are used in thousands of shops with the best of satisfaction, and are especially liked by "floor-men" for their good reliable driving. Made in two patterns, "LARGE HEADS" and "CITY HEADS."

QUALITY GUARANTEED.

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Champion Horse Nail Co., Appleton, Wis.



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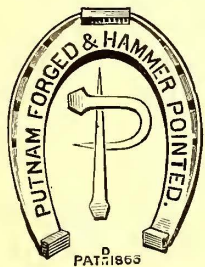


Fig. 1.

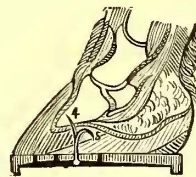
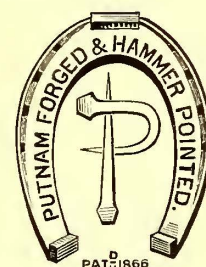


Fig. 2.



Centennial Exhibition.

HORSES' FEET

These drawings show how many horses are made lame and permanently injured by the use of the COLD CUT and SHEARED-POINTED Nails. This process of manufacture produces lamination, causing the iron to form in layers, and when driven into the foot, the horny fibers of which the hoof is composed cause the nail to separate at the point, and one portion passes INTO the foot.

No. 4 represents one of these nails which was driven into the hoof and SLIVERED in driving, one THIN blade passing into the quick or sensitive sole; No. 5 the THICK blade of the nail passed out of the wall of the hoof for clinching. After a few days the horse was returned lame, and upon the removal of the shoe, a nail similar to the above was broken off, leaving the silver in the foot: LOCK-JAW ensued, from which the horse died. Upon dissecting the foot a portion of the nail was found to have penetrated through the coffin bone, as seen in Fig. 2, letter A, thus sacrificing the life of a valuable animal.

It requires but little observation and reflection, one would think, to arrive at the conclusion as to the kind of nails to be used in the horse's foot, whether a mangled piece of iron rendered DANGEROUS by the COLD ROLLING AND SHEARING process, or one made from the rod at a welding heat, where all the fibers remain intact and a perfect ONENESS maintained and being pointed by the hammer, rendering such an accident as slivering utterly impossible.

The foot is the MOST IMPORTANT member of the animal's body, to which the greatest care and attention should be directed: for when it becomes injured or

diseased, no matter how perfect the other parts may be, the horse's services are diminished or altogether lost. Hence the value of a horse depends upon the condition of his feet.

The horse at every step brings an immense power and weight to bear upon the foot. The hoof is a *thing of life* and yields to the pressure. The PUTNAM NAIL being *forged* accommodates itself to the pressure of the hoof. It is far otherwise, however, with stiff rolled and cut nails. They remain rigid and their sheared edges are therefore pressed like sharp knives against the horny fiber. This is what causes the broken and rotten appearance so frequently seen in horses shod with cheap cut nails. Can a horse owner afford to attempt to save a few cents in price of nails and ruin his horse? Surely not, for the old adage is true as ever: "NO FOOT, NO HORSE."

As the remedy lies with the owner of the horse, it is for him to prohibit any cold-rolled or sheared nails being used in his horse's feet.

The only Hot-Forged and Hammer-Pointed Horse-Shoe Nail in the World

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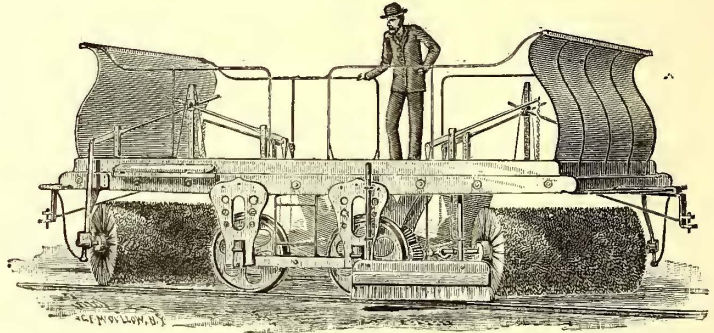
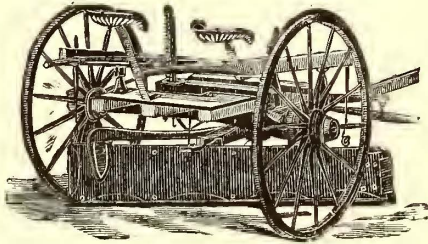
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One-Third the Price of other Plows and Satisfaction Guaranteed.

We are in receipt of letters from prominent railroad men all over the country and print a few to show what they think of them. Parties needing Plows are respectfully referred to any railroad companies using them.

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JOHN H. STUDLEY, JR., ASST. TREAS.
TREMONT ROW COR. PEMBERTON SQUARE,
BOSTON, May 25, 1887.

CHAS. B. ALLYN, ESQ.:
DEAR SIR—In reply to yours of the 21st inst. I would say that during the snow storms of last winter we made use of the "Boss" Snow Plow and with very satisfactory results. It will do the work of very many men in leveling off the snow and keeping the icy ridges down.

Very truly yours,
CHAS. E. POWERS, Pres't.

MILWAUKEE, Wis., Jan. 7, 1887.

THOMAS KANE & Co.:
GENTS—The two "Boss" scrapers purchased from you some two weeks ago are doing very satisfactory work in scraping snow and ice from our tracks and leveling same. We are well pleased with them.

Very respectfully,
PETER McGEOGH,
Pres. Mil. St. Ry. Co.

ST. LOUIS, Jan. 14, 1887.

THOMAS KANE & Co.:
GENTS—Yours of recent date to hand. I have been using the "Walkaway" snow scraper on my roads for the past three weeks. It gives entire satisfaction. It paid for itself in one trip. It is almost a necessity for street railroads.

Very truly yours,
CHAS. GREEN,
Pres. People's Ry. Co.

MINNEAPOLIS, MINN., Feb. 14, 1887.

THOMAS KANE & Co.:
GENTS—I have six of your Walkaway Snow Scrapers on our roads in St. Paul and Minneapolis. We have had a very hard winter, and I have 22 snow plows, and I am pleased to say that your plows have given us the best satisfaction of any.

Respectfully yours,
C. G. GOODRICH,
Sec'y Minneapolis St. Ry. Co.

SOUTH BEND RAILWAY CO.,
SOUTH BEND, IND., Feb. 4, 1887

FLEMING MFG. CO.:
We are perfectly satisfied with the "Boss" purchased of you, as it will do all claimed for it and we consider it the cheapest and best snow plow made for street car purposes.

A. F. SPEENK,
W. F. MILLER, Supt.

ST. LOUIS, Mo., Jan. 15, 1887.
THOMAS KANE & Co.:
GENTS—The Belle Fontaine Ry. Co. is using two of your Boss Snow Scrapers and they give entire satisfaction. It is difficult now to understand how we ever got along without them.

ROBERT McCULLOCH,
Sec'y Belle Fontaine Railway Co.

LANSING, MICH., Jan. 8, 1887.

JAMES A. BELL, ESQ., AGENT FLEMING MFG. CO.,
Dimondale, Mich.:
DEAR SIR—I take pleasure in assuring you that the "Walkaway" Snow Scraper we bought of you has proved a very efficient aid in cleaning our track of snow this winter. We have had no difficulty so far in removing the snow with the scraper and one pair of horses. A specially valuable feature of the machine is the ease with which one can level the snow from the sides of the track, thus preventing it being pushed back on the track by vehicles and avoiding disagreeable controversy. The machine is strong, simple, effective and the best snow fighter of the kind I ever saw.

Yours truly,
H. M. CLARK,
V. Pres. Lansing City Ry. Co.

MERIDEN, CONN., May 23, 1887.

CHAS. B. ALLYN, ESQ.:
DEAR SIR—Yours of the 21st inst. at hand and I will say in regard to the "Boss" Snow Plow that I used it in three very hard snowstorms this year just after we started the R. R. and will say I would take no price for it if I could not get another one. It did all you could ask for it to do.

DANIEL BARKER, Supt.
Meriden H. R. R. Co.

HANNIBAL, Mo., Jan. 4, 1887.

THOMAS KANE & Co.:
GENTS—We are well pleased with the "Boss" Snow Scraper. You gave it the proper name, as it is the Boss. We would not be without it for double what it cost.

JAMES O'HERN, Sec.
Hannibal St. Railway Co.

THE WATERBURY HORSE R. R. CO.,
WATERBURY, CONN., May 23, 1887.

BROOKLYN RAILWAY SUPPLY CO.:
GENTLEMEN—We are very much pleased with the "Boss" snow plow purchased of you. I don't know of anything that will handle a heavy snow equal to it.

Respectfully yours,
E. A. BRADLEY, Supt.

MICHIGAN CITY, IND., Feb. 12, 1887.

SAM JENNINGS, ESQ.:
DEAR SIR—The snow plow we bought from you in my opinion meets all the requirements that it is intended for, and gives good satisfaction. We have used it on our road this winter when the snow was three feet deep on our track, and must say that it did its work admirably.

Yours truly,
JOHN LYONS,
V. Pres. M. C. St. R. R. Co.

PAVONIA HORSE RAILROAD,
J. H. SMALL MAN GER.,
JERSEY CITY, N. J., Feb. 12, 1887.

BROOKLYN RAILWAY SUPPLY CO.:
In reply to yours of 7th inst. I would say that I think the Boss Snow Plow is something that every road that has to fight snow should have. It has given me very great satisfaction this winter.

Yours truly,
J. H. SMALL,
Manager Pavonia H. R. R.

EAU CLAIRE ST. RAILWAY CO.,
EAU CLAIRE, WIS. }

TO THE FLEMING MFG. CO., Fort Wayne, Ind.:
GENTLEMEN—I have used the Boss Snow Scraper purchased of you and I find it giving entire satisfaction. I could not possibly run my cars had it not been for the use of it this winter, and I cheerfully recommend it to any street railway company that may be troubled with snow.

Yours very respectfully,
J. R. HARRIGAN, Supt.

ERIE, PA., Feb. 8, 1887.

FLEMING MFG. CO., Fort Wayne, Ind.:
GENTS—Yours of 2nd inst. is at hand. In reply I would say that the "Boss" Snow Scraper and Track Cleaner is all that you recommended it to be. We have had considerable snow here, and had a good opportunity to give it a trial. It is without a doubt a Boss scraper and cleaner. I can recommend to any one requiring the same.

JACOB BORST, Supt.

JANESVILLE, WIS., Dec. 19, 1886.
GENTS—We have had a good chance to try the Walkaway, and it did all you claim and is the best scraper I have seen work this winter. I like it a great deal better than one that runs on the rail, for we can leave rail in so much better shape than with the V scraper.

Yours truly,
CHAS. ARWOOD, Supt.
Janesville St. Railway Co.

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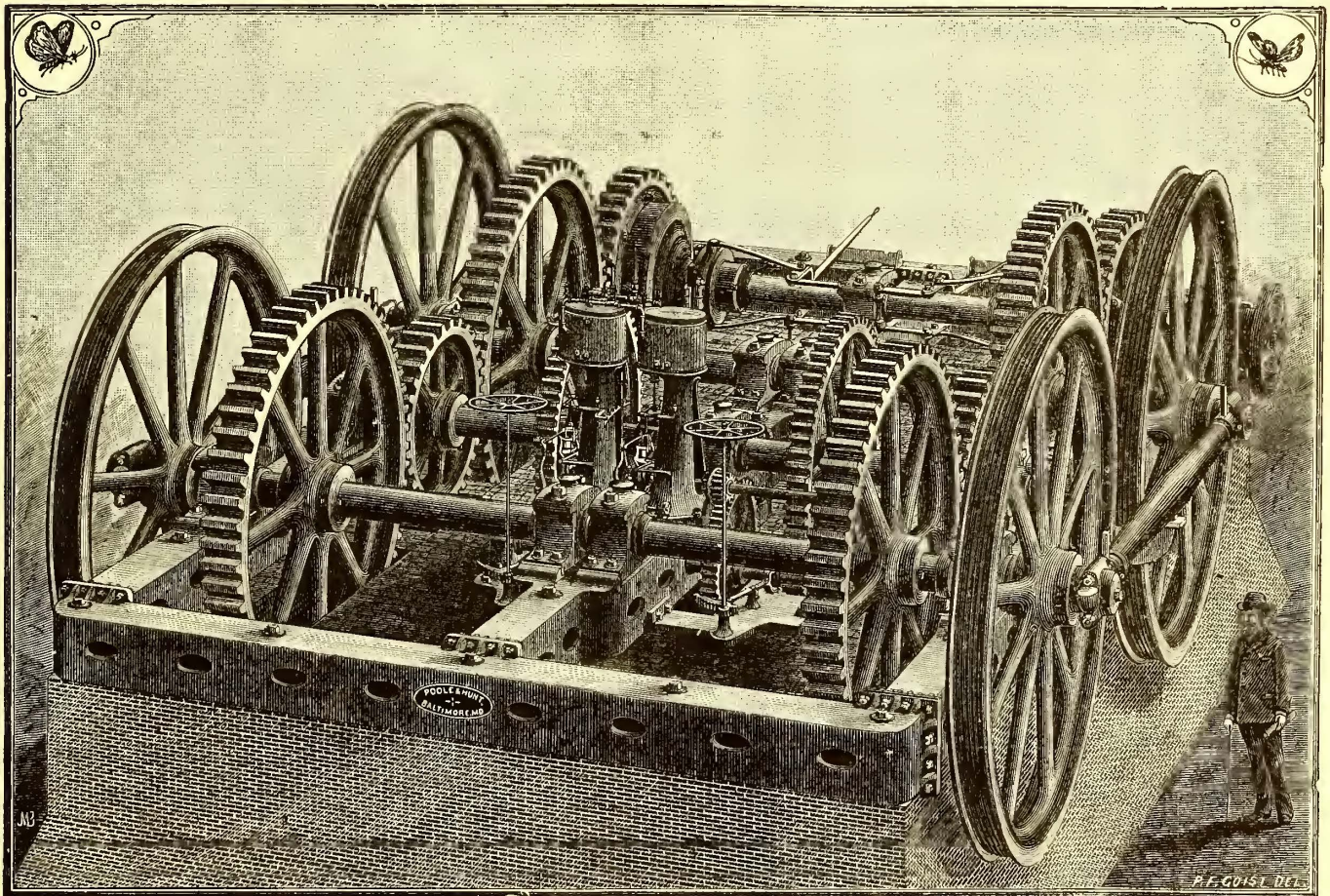
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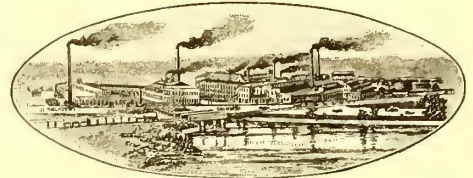
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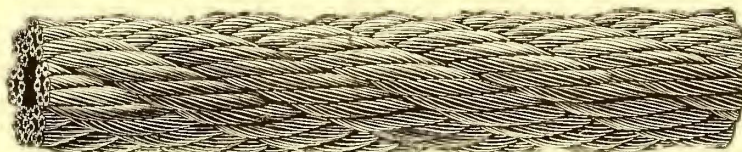
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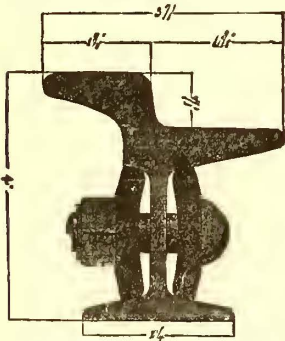
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THE

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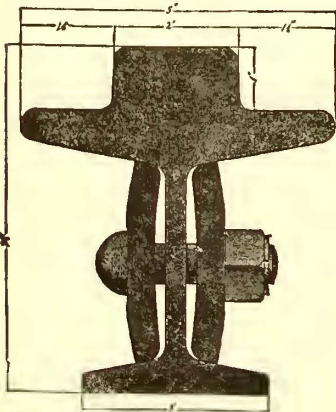
JOHNSTOWN, PA.

Section C. 28, No. 111.



Patented February 20, 1883.

Section E. 76, No. 117.



Patented January 29, 1884.

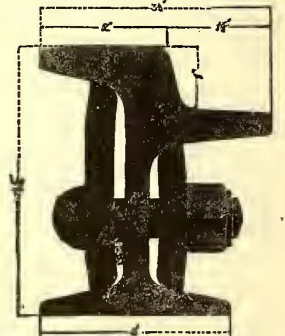
SIDE BEARING GIRDER RAILS

OR

CENTER BEARING GIRDER RAILS.

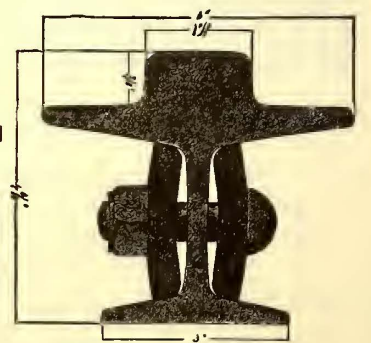
Large Assortment of different Weights and Sections.

Section D. 45, No. 11.



Patented November 27, 1883.

Section G. 58, No. 120.



Patented January 29, 1884.

Rolled Steel Switches, Frogs, Curve Crosses, Etc.

We Furnish Every Detail Wanted in Track Work.

Our customers are guaranteed against all suits for infringements on goods purchased from us and we further undertake to defend the patents covering the details of our Girder System. To those contemplating the use of the Girder System, we offer, FREE OF COST, to survey their routes, and after consultation as to the best and most economical construction, to furnish full and complete estimates of cost of the completed work. Send for Illustrated Catalogues.

STEEL RAILS

PENNSYLVANIA

Standard Sections
Light Sections
Street Rails
Fish Plates,
Frogs, Switches

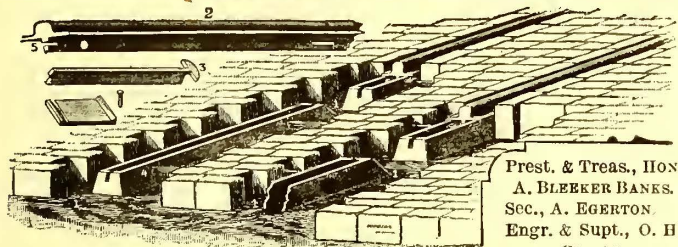
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SALES AGENT

STEEL COMPANY

50 to 80 lbs. per yard.
16 " 45 " " "
30 " 88 " " "
Bolts & Nuts,
and Crossings.

NO. 2 WALL STREET,
NEW YORK, N.Y.

16 lbs. Full Size.



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Sec., A. EGERTON.
Engr. & Supt., O. H.
GIBBON.

The Metallic Street Railway Supply Co.

GIBBON'S PATENT.
ALBANY, NEW YORK.

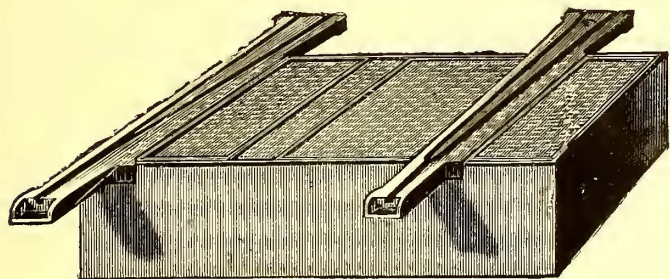
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NEW YORK.



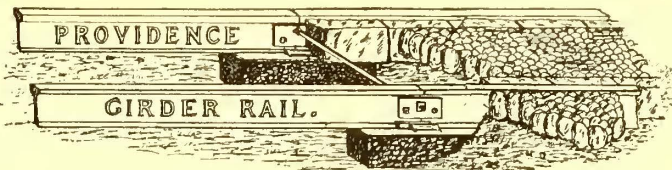
OWNERS AND BUILDERS OF

H. DOUGLASS'

Patent Automatic Switch

FOR STREET RAILROADS.

FRANK H. ANDREWS, Sole Agent, 545 West 33d St., N.Y.

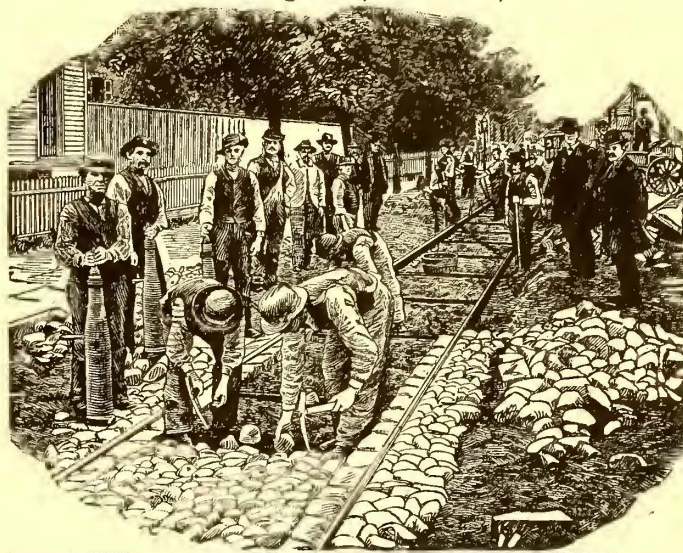


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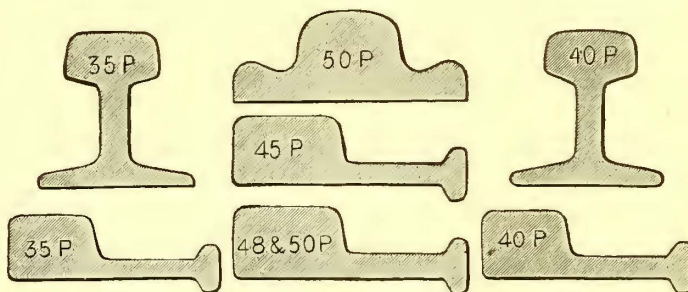
Wm. Wharton, Jr. & Co., Lim., Phila., Pa., General Agents.
Or D. F. Longstreet, Providence, R. I.



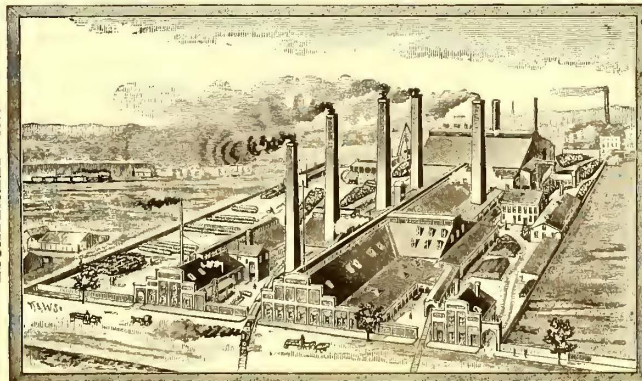
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Bessemer Steel Street Rails.



GEORGE M. RICE, Pres. EDWIN GLEASON, Treas.
SAM'L D. NYE, Man. M. J. P. McCAFFERTY, Sec. W. E. COLLES, Gen. Supt.



ESTABLISHED 1857.

INCORPORATED 1881.

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IMPORTERS OF

ENGLISH & GERMAN PORTLAND CEMENTS

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198 to 210 Market St., - - - Chicago.

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METROPOLITAN STREET RAILWAY CO., " "

GRAND AVE. CABLE LINE RAILWAY CO., " "

OMAHA CABLE TRACTION CO., OMAHA.

The Clark Grooming Machine.

(Patented Dec. 15, 1874; Jan. 9, 1883.)

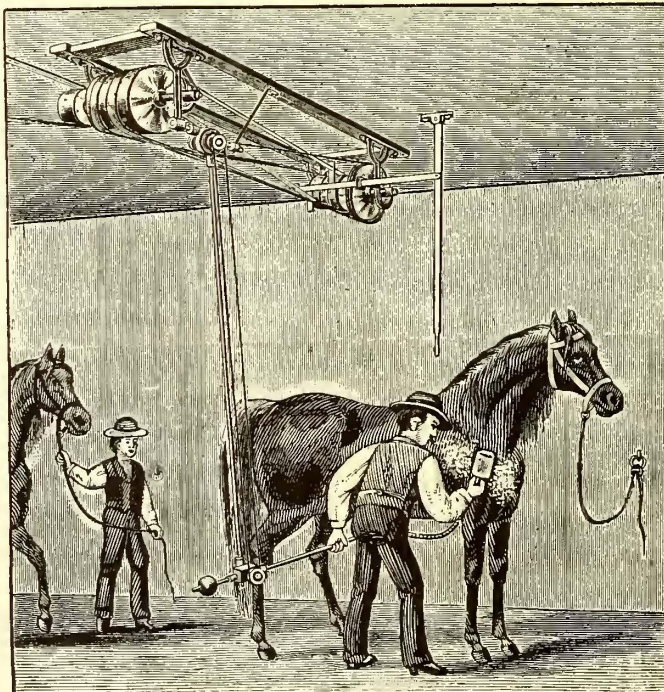
This machine for Grooming may be driven by any known power, and can readily be placed for use in any stable or out building. It can be operated by an ordinary groomer; its work is perfect; its action simple and effective. Stock owners will readily realize the importance of the machine. The perfection and rapidity of its work, and the benefits derived by its use, commend it to those interested in the care and use of all classes of thoroughbred and work stock. The most vicious animal readily submits to its use.

Foul and unhealthy accumulations are instantly and thoroughly eradicated, and the pores of the skin opened to healthy action. It not being possible to slight the work upon the animal, as in hand grooming, the hair becomes oily and glossy, a healthy action to the skin being maintained.

We now offer this Groomer to the public in confidence, knowing it will be found invaluable in its use in all stables, and especially so wherever perfection in stock raising is desired.

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Machine Grooming is found to be less expensive than hand



grooming, saving in food and medicines, and materially increasing the value of the animal.

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Horse railroads save the cost of a double brush machine ten times a year on every one hundred horses.

All large stables will have these machines as soon as they can get them after investigation.

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These machines are much improved, and are now as perfect as can be made. The wearing parts were formerly iron, but are replaced with steel, and are giving perfect satisfaction.

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Keg-Shaped Spring for St. Cars

CAR SEATS AND BACKS.
3-Ply, Plain or Perforated,
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Trial sets furnished. Prices Low.

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WILL SAVE TIME AND MONEY BY DEALING WITH US.

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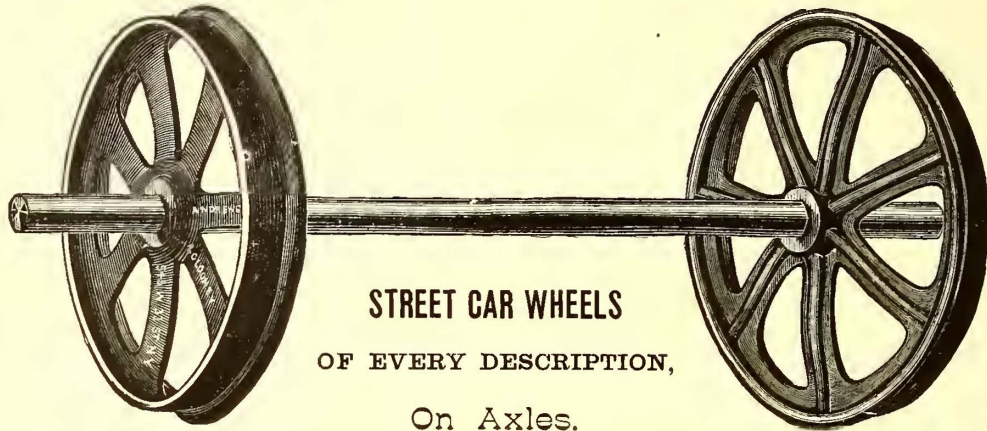
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STREET CAR WHEELS
OF EVERY DESCRIPTION,
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WORKS :

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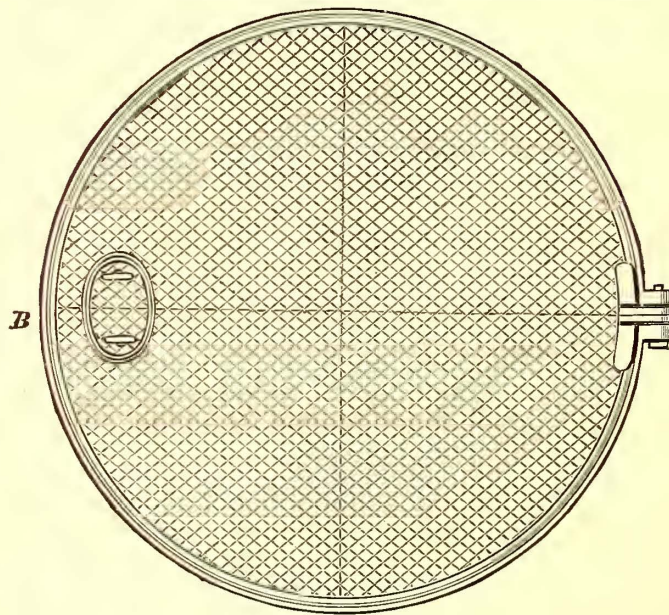
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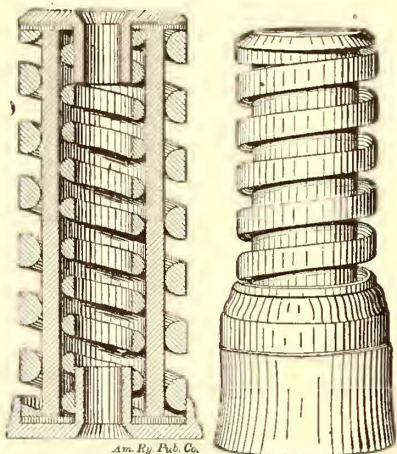
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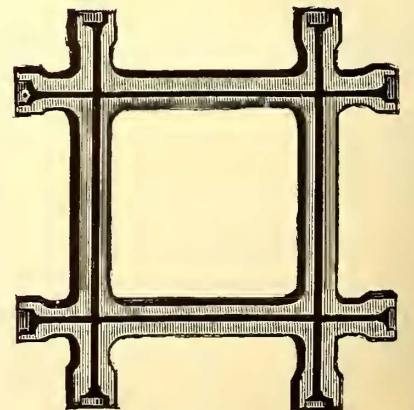
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Improved Springs.



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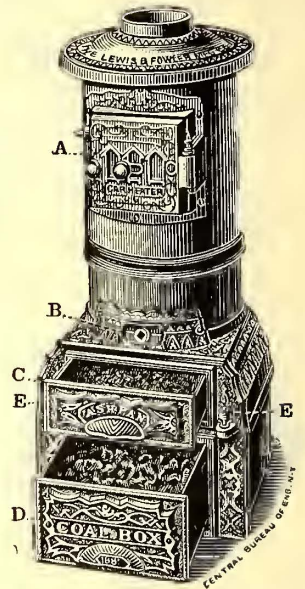
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Patent Improved

STOVE BOX

—AND—

Street Car Heater.

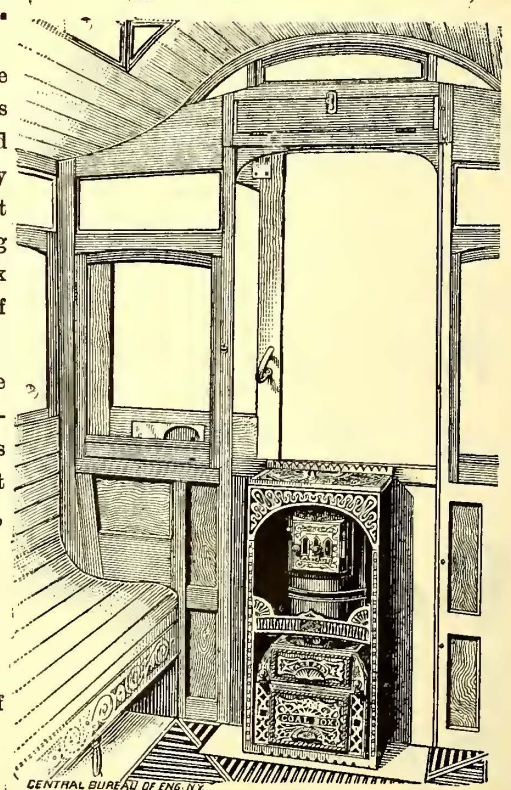
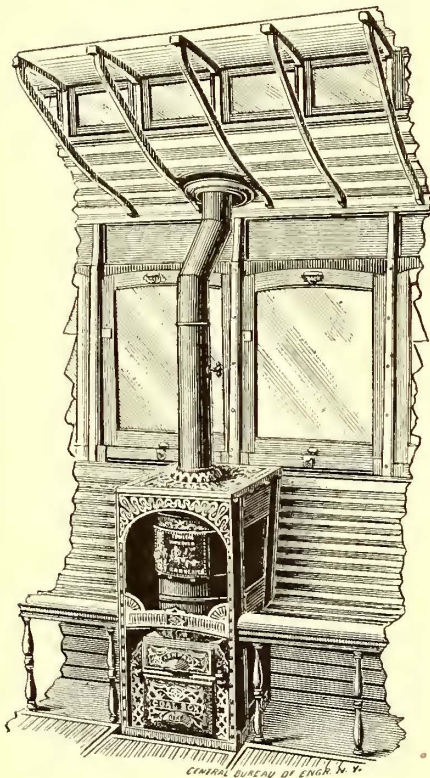


EXPLANATION OF CUTS.

No. 1—Car Heater is designed for one horse or fare box cars, to be fitted as shown in Cut No. 4—when car is operated only from one end. This design does away with the cutting out of seat and does not interfere with seating capacity, projecting only 7 in. into the car. Height of box and stove over all, 2 ft. 10 in. Width of box, 16 in.

No. 2—Car Heater is designed for large car—can be used in small cars when operated from both ends. To be fitted as shown in Cut No. 3. Size of box for Cut No. 2. Width, 16 and 18 in. Height of box, 2 ft. 10 in.

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- D—Coal Box (which holds one hod of coal, shovel and shaker).
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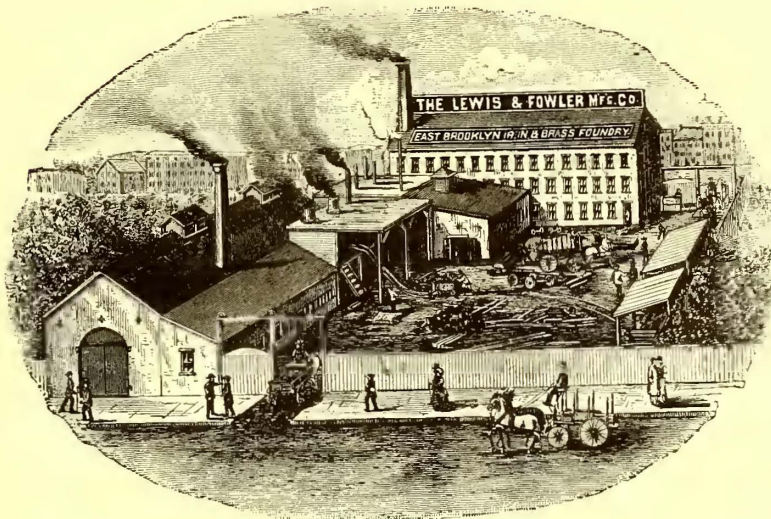
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Walworth St., Brooklyn, N.Y.

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AUTOMATIC SWITCHES

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AND

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This Box is eminently practical, effecting great economy in expenses for labor and in the care of them, and in the use of oil.

It also furnishes a protection against hot boxes, arising from loss of oil, and in the accumulation of dust, dirt, grit, and other foreign substances, thus reducing the liability to loss or accident from these causes to the minimum.

After a careful inspection of this box as made for steam cars it is regarded as admirably adapted as a substitute for the present washer on account of its simplicity and the easy means of applying it.

The remarkable test of this car axle box on the steam roads, which has been in every way satisfactory, has fully demonstrated its adaptability for the street car service.

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ADJUSTABLE CLUTCH AXLE.

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4. Enables horses to do twenty-five per cent more work, by sparing them the hard pull in rounding curves.
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Satisfaction Guaranteed

AT A COST SLIGHTLY ABOVE ORDINARY WHEELS AND AXLES.

We use only the best car wheels, cold rolled steel axles of the finest quality, and our work is second to none in the country.

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Now negotiating with other leading roads.

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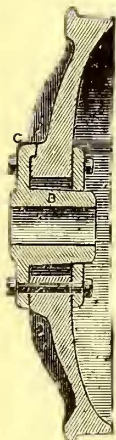
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PECKHAM'S

Patent Elastic Street Car Wheel,

WITH INTERCHANGEABLE WEB, TUBULAR FIBROUS CUSHION AND
INDESTRUCTIBLE CLUTCH JAW HUB.



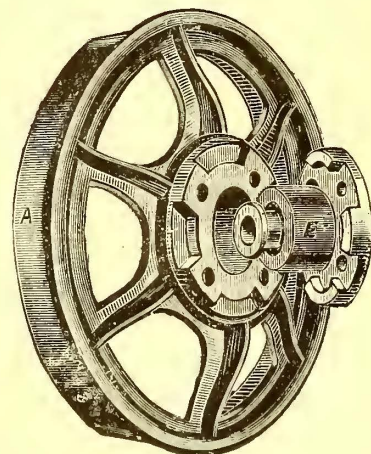
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The only Interchangeable

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No Crystalization of Wheels or Axles.

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No Special Machinery or Skilled Labor Required for Renewals.

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Price Lists, Descriptive Circulars and Blue Prints furnished upon application.

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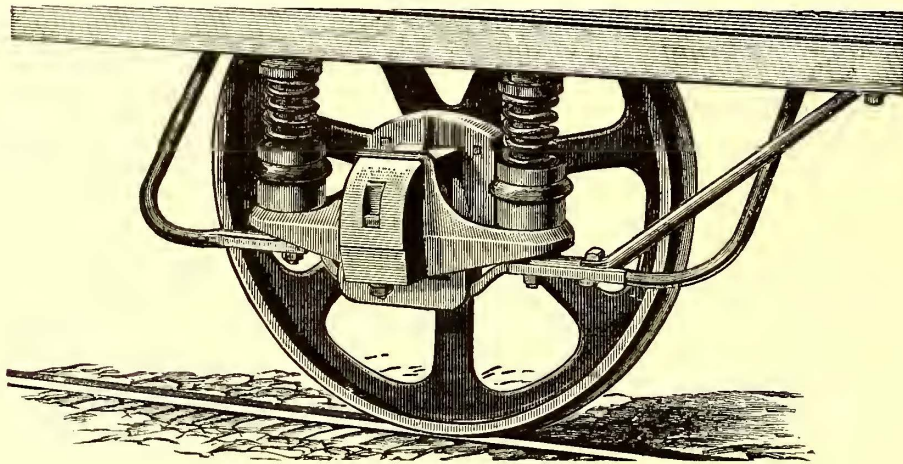
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Light Draft, Easy Riding, Durable, Economical.

Brasses are warranted for 10 years, and Journal for 20 years. Requires oiling or inspection but once in 12 months. Boxes are positively dust proof.



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Pittsburgh & Birmingham Pass. Ry.
 Columbus Consolidated St. Ry.
 Detroit City Ry.
 Louisville City Ry.
 Denver City Ry.
 Milwaukee City Ry.
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 Minneapolis St. Ry.
 St. Paul City Ry.
 Galveston City Ry.
 North Baltimore Pass. Ry.
 Chicago Pass. Ry.
 Brooklyn City R. R.

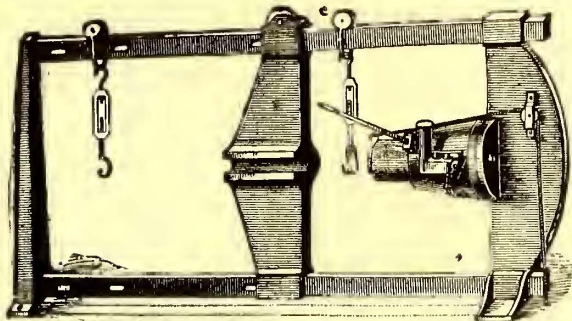
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HAND POWER, LEVER AND HYDRAULIC PRESSES



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 IMPORTERS OF
Sponges & Chamois.

OUR SPECIALTY:
Unbleached, Unlimed & Clean
SPONGES.

The Only exclusively Sponge and Chamois House in the West.
 No. 103 South Fourth Street, Southern Hotel,
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—SUCCESSOR TO—

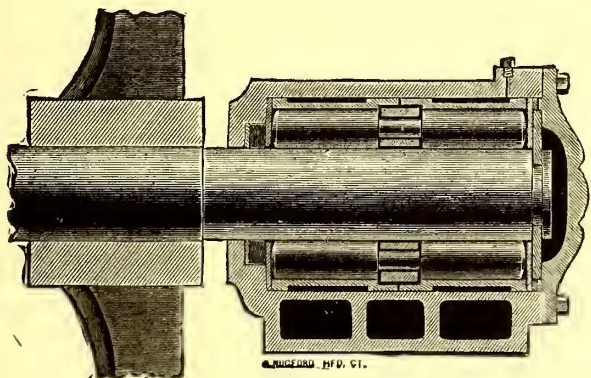
HIGLEY CAR JOURNAL CO., CLEVELAND, O.,

MANUFACTURERS AND DEALERS IN

Street Railway Supplies
 OF EVERY DESCRIPTION.

GEAR SUPPLIES A SPECIALTY.

—The Chaplin Roller Bearing Tramway—
CAR BOX AND GEAR.



LIGHT DRAFT EASY RIDING DURABLE
POSITIVELY DUST PROOF AND OIL TIGHT

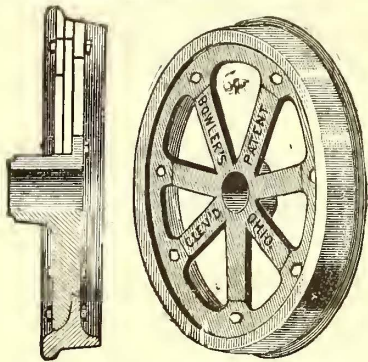
Boxes Hold Sufficient Oil for One Year. No Waste Used
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 Overcomes Friction in Taking a Curve.

SUPERINTENDENT'S OFFICE, HIGHLAND STREET RAILWAY,
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CHAPLIN M'FG CO., MESSRS.—In reply to your note I will say we have had a set of your
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 Respectfully, J. E. Ruoo, Supt.

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Manufacturers of

Car and Locomotive Wheels, either Chilled or Steel Tired; with or without axles. Street Railway Wheels, Turnouts and Turntables. Patent Chilled Face R.R. Frogs. Engine & Heavy Castings a Specialty.



Graded Stable Cutter with Straight or Curved Cover.
Descent 1/2 inch per foot. Pieces 5 feet lengths; short pieces furnished to suit any length. Spouts to connect with sewer.

They control and make N. P. Bowler's Patent Street Railroad Wheel. The tire of this wheel is cast separately from the hub and spokes; the latter is made of soft strong iron, and is perfectly free from strain—therefore can be made much lighter and more durable. The tires and the spokes or center of the wheel are made perfectly interchangeable so that when the tire or rim is worn out another can be put in its place by any employee with no other tool than a common wrench.

Bowler & Co. 10 TO 24 Winter St. **Cleveland, O.**

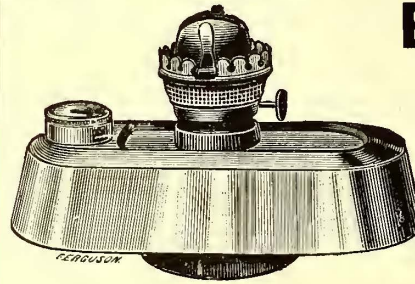
ESTABLISHED 1847.

A. WHITNEY & SONS, CAR WHEEL WORKS, PHILADELPHIA, PENN.

CAST CHILLED WHEELS, AXLES AND BOXES

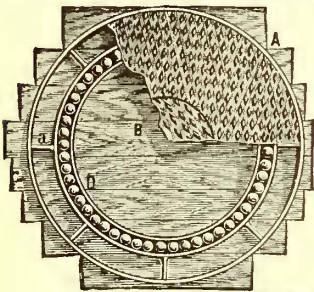
FOR EVERY KIND OF SERVICE.
Street Railway Wheels of all Sizes.

Clute's Patent Double Bottomed Street Car LAMP,



Is one that assures safety, durability, and is perfect in regard to leakage.

GEORGE M. CLUTE, Sole Manufacturer;
Also Dealer in Car Reflectors, Chimneys, Burners, Etc.
WEST TROY, N. Y.

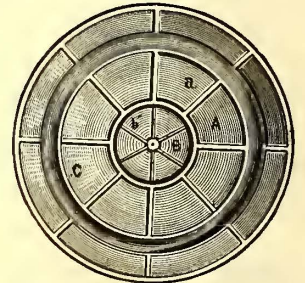


S. M. CARPENTER, Prop.

C. J. LANGDON, Secy.

FULTON FOUNDRY,

MANUFACTURERS OF



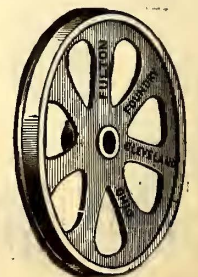
STREET RAILWAY SUPPLIES, Carpenter's Patent Turn-tables and Transfer-tables,

Open Wheels of all sizes and weights. Wheels and Axles of all sizes fitted on short notice.

Chilled curve rail, Turnouts, Switches, etc., etc. Blue prints and Bills Furnished on Application. Send for Illustrated Catalogue. Address,

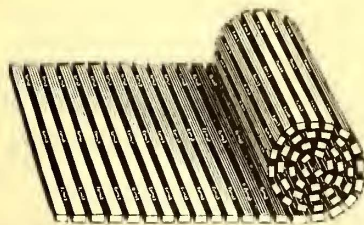


FULTON FOUNDRY,



202 MERWIN ST.

CLEVELAND, OHIO.



WARNECK & TOFFLER,
211 East 22nd Street, New York.
Sole Mfrs. & Patentees of the only
ROLLING WOOD MAT
FOR STREET CARS.

This matting, made either in round or square slats, is a self cleaning mat, neat, convenient, and by far the cheapest one in the market. Please send for particulars.

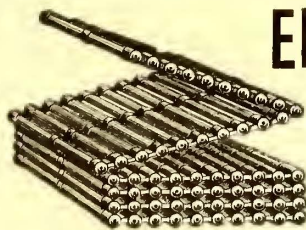


Monthly, \$1 per Year.
Sample Copy Free.
Power, 113 Liberty St.
NEW YORK.

POWER is a practical journal covering that branch of mechanics which includes all forms of development and transmission of power.



EVERIT'S
Patent Car Floor Rack.
Cheap, durable, cleanly, firm,
labor saving, easily swept or
washed without removal.
Put down by any mechanic.
W. L. EVERIT,
New Haven, Conn.



EDWARD BEADLE,

Sole Manufacturer

OF THE

Eureka Folding Mat.

The Most Durable, Easiest Cleaned and Repaired Wood Mat ever made.

I would respectfully call the attention of Managers of Street Railways to my latest improved Reversible Folding Mat, made to fit any size car. Sample order solicited.

1193 Broadway, New York.

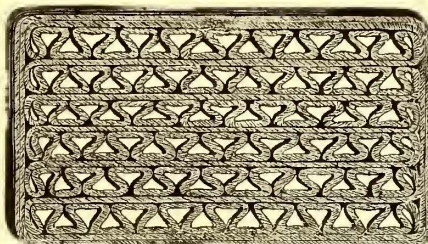
FACTORY—CRANFORD, N. J.

LYNN & PETTIT,

MANUFACTURERS OF

Machine Braided Cocoa Car Mats.

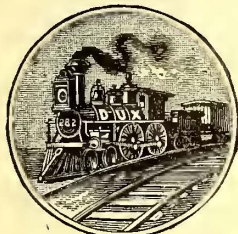
707 Market Street, Philadelphia.



A Sample

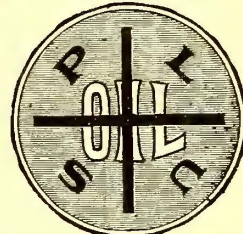
Order

Solicited.



Trade Mark Pat. Mar. 13, 1883

DUX LUBRICANT.



Trade Mark Pat. Mar. 13, 1883.

The Leading New Grease for Street Railways

The Best Lubricant for Street Railways Known.

Will run for One Year on One Packing. Cars will run easier packed with Dux, than with oil and waste. Why? Because we give you a better lubricant. No drip from Car Boxes when packed with Dux, and, therefore, keeps the car boxes and trucks clean.

Try it and you will use no other Lubricant.

DUX FOR STREET RAILWAYS.

PITTSBURG, ALLEGHENY & MANCHESTER RY. Co., PITTSBURG, PA., Aug. 13, 1885.
Leib Lubricating Co.
GENTLEMEN—We have used Dux Lubricant for the past nine months. It has given entire satisfaction; in fact, it is the best I have ever used. Think it fully as good as represented.
Yours truly,
J. C. CORTON, Supt.

OFFICE OF CAMDEN HORSE RAILROAD Co., CAMDEN, N. J., Dec. 14, 1886.
Leib Lubricating Co., 196 and 198 Chicago st., Buffalo.
We have used your "Dux Lubricant" for about two years and regard it as the best and cheapest lubricant ever used by this company.
JOHN HOOD, Supt., etc.

OFFICE OF ACUSHNET STREET RAILWAY Co., NEW BEDFORD, MASS., Dec. 11, 1886.
The Leib Lubricating Co., Buffalo, N. Y.
DEAR SIR—We have used several packages of your "Dux" and like it very much. We can recommend it to any one using axle grease.
Yours very truly,
A. P. SMITH, Treas.

BYRON WESTON, FIRST-CLASS LEDGER AND RECORD PAPER, }
DALTON, MASS., Oct. 15, 1886.
Leib Lubricating Co., Buffalo, N. Y.
GENTLEMEN—Yours of the 13th inst. received. In reply; we like your Dux

Lubricating Compound very much, and when this is used up that we have on hand shall order more. I find on heavy bearings where no other oil or grease would cool it yours did the work.
Yours truly,
HARRY W. HITT, Supt.

FAULKNER MILLS.—F. J. HASTINGS & Co., MILLERS.
SO. ACTON, MASS., Dec. 23, 1886.

Leib Lubricating Co., Buffalo, N. Y.
GENTS:—Your favor of the 17th inst. duly received. In reply we would say, that for several years we had much trouble and annoyance to find a lubricant for our heavy bearings that would stand, and tried various articles on the market without being satisfied, until a friend connected with a large manufacturing concern gave us a few pounds of the Dux Lubricant to try. It worked so much better than anything we had ever had that we ordered enough from you to give it further trial, and as a result have used it ever since, and can truly say it is the best lubricant we ever used. It will stand heat, gives off no drip and is economical, and we are very much pleased with it and do not hesitate to declare that it is our firm belief that there can be nothing ever made to equal it. Our experience on wagons has been equally satisfactory; our first attempt being on a heavy wagon used every day, heavily loaded, ran 21 days when it went into the shop to be painted, and then was in a good condition to run longer. The only thing we regret is that we did not at once try and arrange to sell it in this locality, still one of our townsmen to whom we gave your address, Mr. Littlefield, has since obtained the agency, we learn, and we can obtain it through him.
Yours truly,
F. J. HASTINGS & Co.

MANUFACTURED BY

The Leib Lubricating Co., 196 & 198 Chicago St., Buffalo, N.Y.

FRANTZ & ENNIS, WILKESBARRE, SOLE AGENTS FOR PENNSYLVANIA.

PRESCOTT'S DOOR HANGER.

TRUSS HANGERS, for Barns, Warehouses, Freight Stations, etc.,
BRACE HANGERS, Concealed from View, for Parlor Doors.

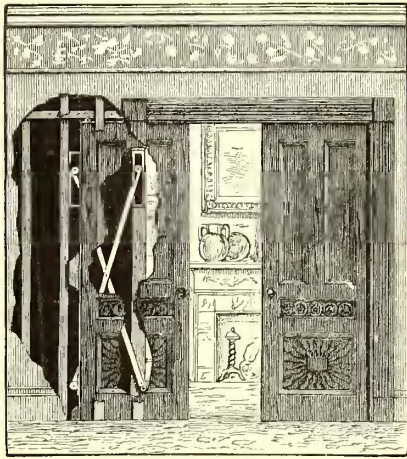
NO ROLLS OR TRACK.

Hangers for Elevator Doors a
Specialty.

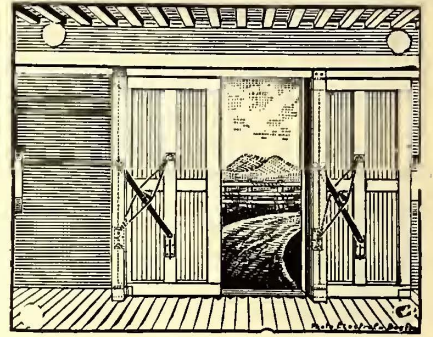
Send for Circular.

Prescott Manuf. Co.,

61 & 63 OLIVER STREET, BOSTON, MASS., U. S. A.



BRACE HANGER.



TRUSS HANGER.

**THE HAYCOX
PATENT DOOR FASTENER.**

ADOPTED BY

All Cleveland Railway Companies.

Patented May 5, 1885.

Fastener detached, made of malleable iron,
weight about five pounds.

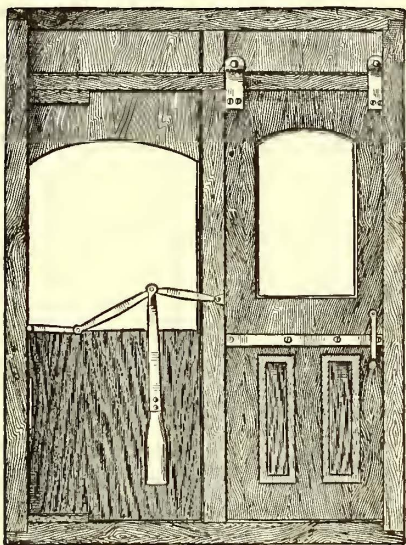
Especially adapted for Elevator Doors.

For further particulars, prices, circulars,
etc., address

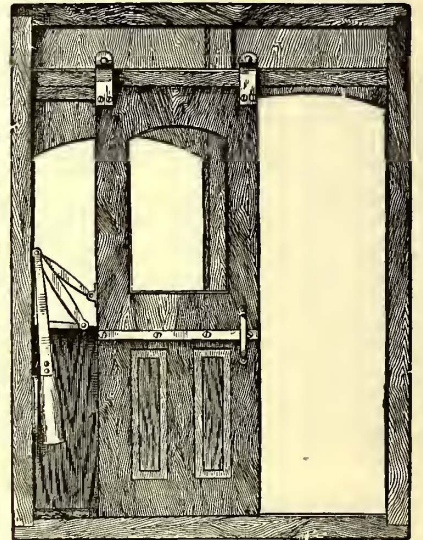
Haycox Door Fastener Company,

W. E. HAYCOX, Manager.

1,158 Euclid Avenue, Cleveland, O.



Door closed, fastener in position, weight suspended from the toggle joint, holding it closed.



Door open. Fastener thrown back.

HENRY KAILLO.

WALTER PICKENS.

JOHN C. WUERFEL.

THE ROOT PATENT CAR HEATERS.

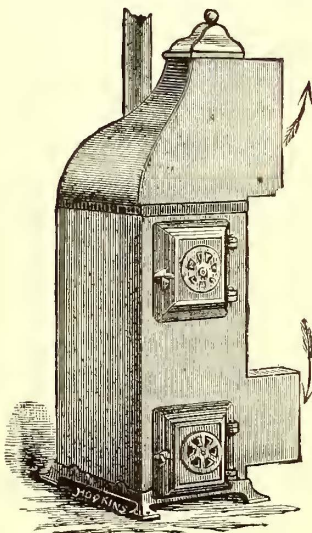
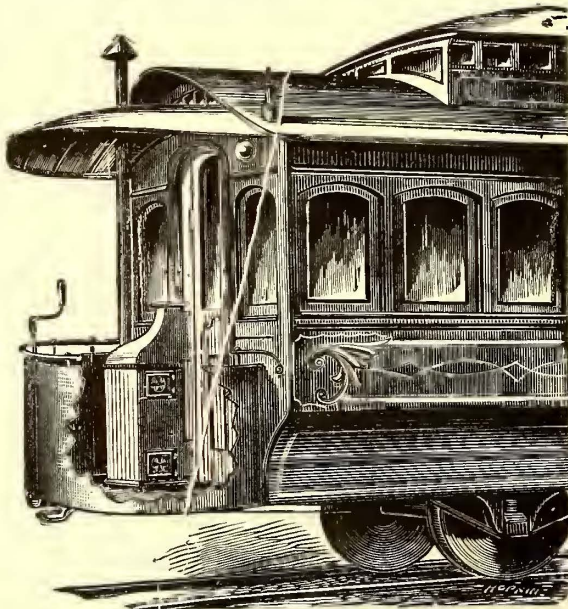


FIG. 1.
External appearance of
The Root Patent Car Heater.



Represents Heater in Position on Front Platform of Cars.

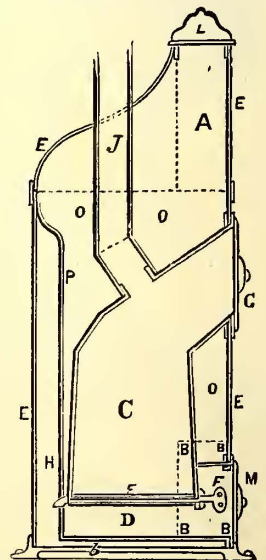


FIG. 2.
Sectional View of
The Root Pat. Car Heater.

Description of Fig. 1.—Is the Heater detached, showing a section of Smoke Pipe 3 inches in diameter, the upper door for coal and the lower door for removal of ashes. Arrows indicate hot and cold air registers. The doors contain dampers for regulation of draft.

Description of Fig. 2.—A, hot air; B B, cold air receivers; C, fire pot; D, ash pit; E E, outline of heater; F, double dumping and shaking grate; G, door; H, cold air space between outside casings; J, Lue; L, removable tops; M, lower door; O P, air passage.

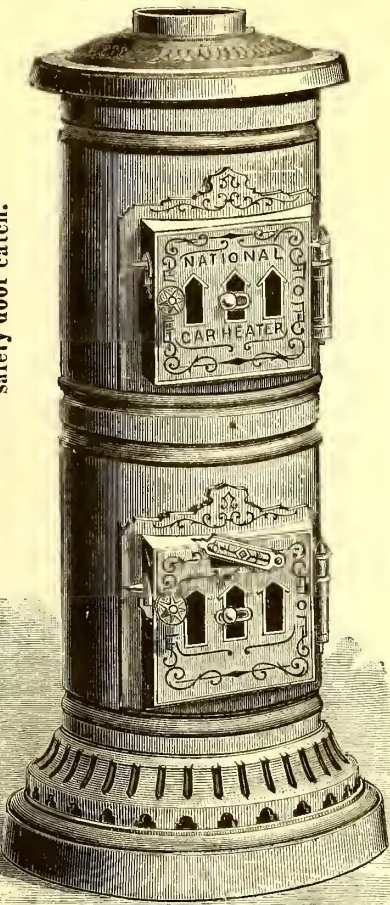
The features of excellence claimed for the Root Patent Car Heater are: They occupy a space of only 10 1/2 x 14 inches, and are located on the front platform of cars; they furnish heat for the driver and do not interfere in the discharge of his duties; the cars are not mutilated in attaching the Heaters; neither the sitting nor standing capacity of car is curtailed; the heat is made uniform by drawing the cold air from the bottom of cars; they render cars abundantly warm in the coldest weather and are easily operated and regulated. They are convenient, economical and efficient.

The Root Patent Car Heaters have been in use from one to six years on Street Railways in Rochester, Brooklyn, Albany, Pittsburgh, Wheeling, Baltimore, Elmira, Milwaukee, Minneapolis, St. Paul, Bay City, St. Joseph and other cities. We have many testimonials in behalf of all that is claimed for them. Further information can be obtained by addressing

THE TOLEDO CAR HEATER COMPANY,
FACTORY, WATER AND CHERRY STREETS, TOLEDO, OHIO.

NATIONAL CAR HEATER.

It is brick lined, has rotating and dumping grate, and safety door catch.



IMPROVED.

For Warming Horse or Street Railway Cars.

These car heaters are in successful operation on all of the street railway lines in the city of Brooklyn, New York, and on railroad lines in the United States and Canada, and give entire satisfaction.

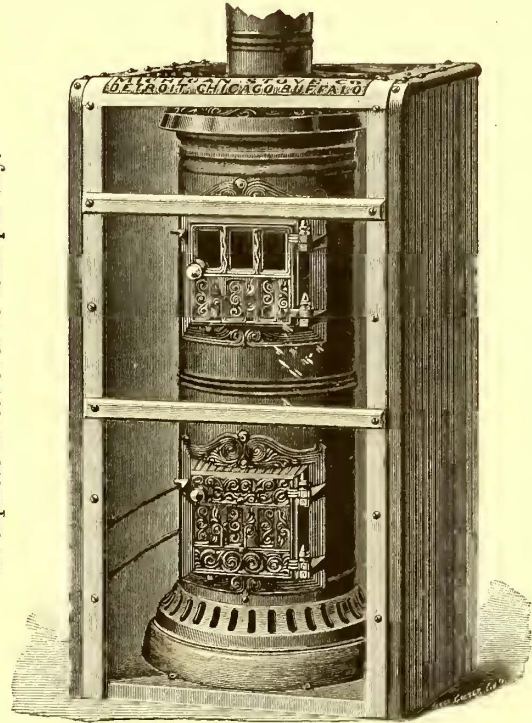
It is neat in appearance, occupies but little space, is an ornament to a car, is not costly in price, nor expensive in its operation.

Sole Manufacturers,

NATIONAL STOVE CO.,
243 Water St.,
New York City.

Garland Car Heater

They are in use upon all of the Street Car lines in Detroit, Mich., at an expense of not over 10 cents per day.



This is the most attractive as well as the most efficient Car Heater ever made.

The Michigan Stove Company,
SOLE MAKERS,
Detroit, Mich. Chicago, Ill. Buffalo, N. Y.

CAR HEATING

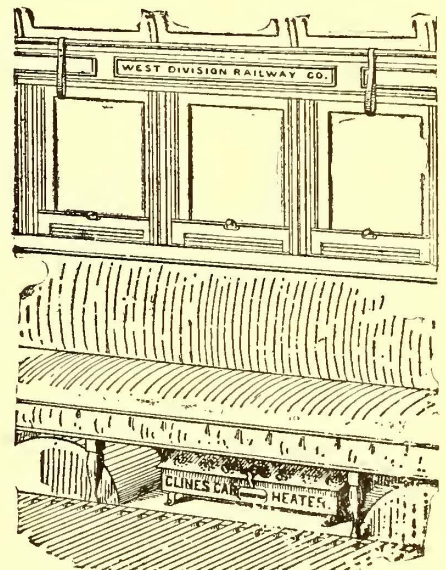
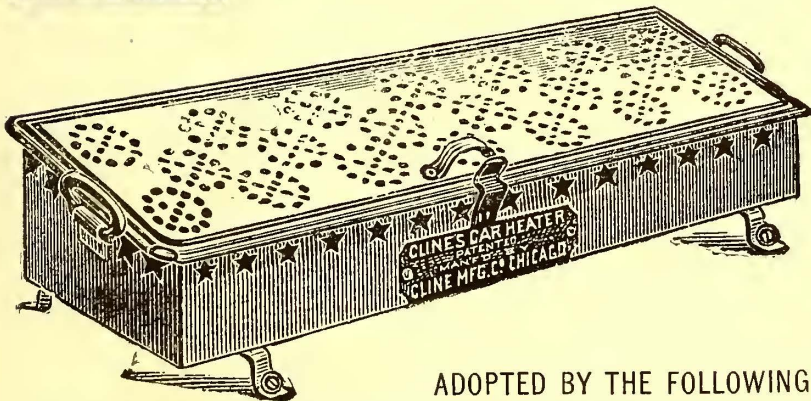
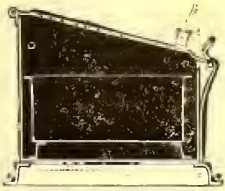
BY CLINE'S PATENT

Aromatic Carbonic Compound Fuel.

Cheap. Convenient. Safe.

Once Filling lasts 18 hours.

NO CUTTING OF CAR TO PUT IN.



ADOPTED BY THE FOLLOWING ROADS:

CHICAGO WEST DIVISION; CITY OMNIBUS CO., Chicago; SOUTH CHICAGO CITY RAILWAY CO.; PEOPLE'S PASSENGER, Philadelphia; PITTSBURG & BIRMINGHAM AND OTHERS.

CLINE MANUFG. CO., 277 and 279 South Canal Street, CHICAGO, ILL.
SOLE AGENCY FOR MISSOURI & KANSAS, 219 & 221 MARKET ST., ST. LOUIS, MO.



Parrott Varnish Co.,

FINE COACH AND CAR VARNISHES.

Bridgeport, Conn., U.S.A.

The "BROADWELL CAR STARTER," having been subjected to practical tests, is now placed on the market at a very low price.

C. B. BROADWELL,

169 Laurel Street, - New Orleans, La.

2 LIBERTY SQUARE

JOHN BABCOCK & CO

MANUFACTURERS OF

RAILWAY CAR VARNISHES

BOSTON MASS.

CHICAGO WOOD FINISHING CO.

Manufacturers of Wood Fillers, Rough Stuff, Wood Stains & Polish for Car Interiors.

143 & 145 South Clinton St., Chicago, Ill.

VULCANIZED FIBRE FLEXIBLE DUST-GUARDS.

SUPERIOR TO LEATHER OR ANY OTHER MATERIAL.

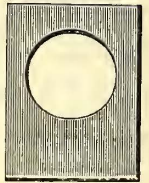
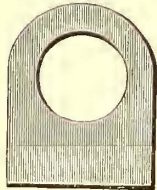
Keep the Oil in the Car Boxes, and Sand and Dust out of them.

They are not affected by oil, grease, or petroleum; do not cut the axles, as grit does not adhere to them; keep their shape well, and will outwear several leather ones. Cut to order of any desired thickness or pattern. Send drawing or sample for estimate. This material is absolutely free from grit and will not become brittle and break. Now in use on the Leading Railroads, giving general satisfaction.

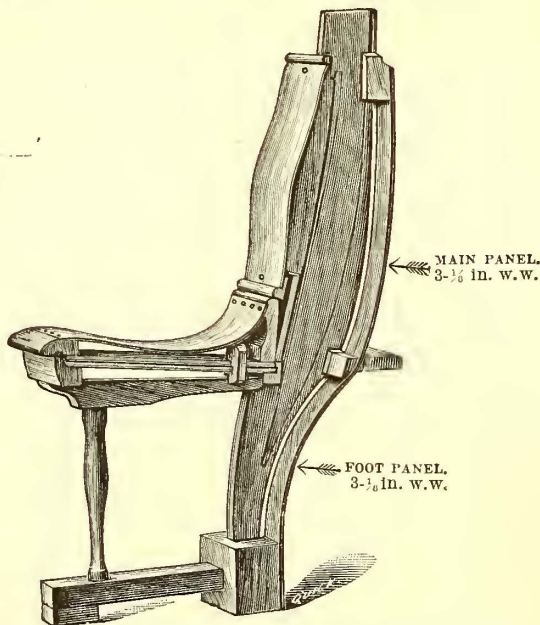
BE SURE TO SEND FOR SAMPLES AND PRICES.

New York Office, No. 14 Dey St.

VULCANIZED FIBRE CO., Wilmington, Del.



STREET CAR SEATS & BACKS.



THREE-PLY CAR SIDES.

Having given our three ply white wood car sides a thorough trial for a number of years in our city street and railway lines, which test has left them as firm and good as the day they were put in, we unhesitatingly place these sides in the market as a superior article. They are composed of three white wood (or poplar) veneers, each $\frac{1}{4}$ inch thick, the grain of the center layer running at right angles with the two outside layers. Hence they derive all the special and well-known advantages of glued up wood over single ply, namely:

- 1st. They are fully 75 per cent stronger, for they brace and stiffen the car.
- 2nd. They are lighter, being only 3-8 inch thick, and so do not add so much dead weight to the car.
- 3rd. They will not check or split by change of atmosphere.
- 4th. They will not split or crack when nailing into place, even though the nail be placed near the edge.
- 5th. Being laid over a form to suit the shape of the car frame or post they cannot buckle or twist, a feature which also adds strength to the car.

For repairing cars these sides have no equal. Our Three Ply Car Seats and Backs, so well known all over the world, are now the most popular seat and back in the market, and recommend themselves especially for their *Lightness, Cleanliness, Healthfulness and Beauty*, as also their *Cheapness and Durability*. For they are indestructible by moths (the great enemy of upholstering), and will not harbor vermin or insects, or carry or communicate contagion or disease. Our trade in this line has grown in thirteen years to vast proportions, which in itself is a sufficient guarantee of their merits. They are made either perforated or plain to suit customers. Birch is the wood most generally used. Today fully one-half the railroads in the country are using these seats and backs. We would also call attention to our *Veneer Ceiling* for cars. They are made either plain, perforated or decorated, and greatly add to the beauty of the car. For repairing cars they have no equal, for they are placed over the carlines and cover all the old paint and wood work. The woods generally used are *Birch, Birdseye Maple, Oak and Mahogany*.

GARDNER & CO.

Manufacturers of Car Seats and Ceilings and Depot Seating,

OFFICE AND FACTORY: 643, 645, 647, 649, 651, 653, 655 and 657 West 48th St., New York.

Sample and Salesroom: 206 Canal St., cor. Mulberry.

Send for Catalogue.

Address all Communications to Office.

"The Reliable Sand Box"

Over 500 Now in Use.

JERSEY CITY, June 4th, 1887.

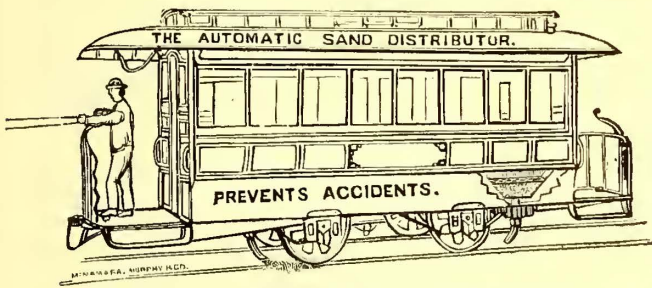
W. T. BUTLER, Esq.

19 Tremont Row, Boston:

DEAR SIR:—In reply to yours of the 20th ult., I would state that your Sand Boxes as applied to one of our Cars is, I think, a success, and is the only box which I have seen that will do the work under all the circumstances to which street cars are subject.

Yours truly,

J. H. SMALL, Manager,
Pavonia Horse R. R. Co.



THE AUTOMATIC SAND DISTRIBUTOR,

For Horse, Cable, Electric and Steam Cars.

Charges the Sand direct on top of rail, in front of wheel, in any quantity, whenever wanted. Acts instantaneously by foot pressure.

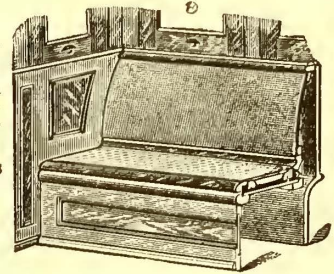
Patented and manufactured by

The Jordan-Mills Manufacturing Co.,
32 Nassau Street, New York.

THE HALE & KILBURN MANFG. CO.,

Extensive makers of Patented
Street Car Seats
of every description.

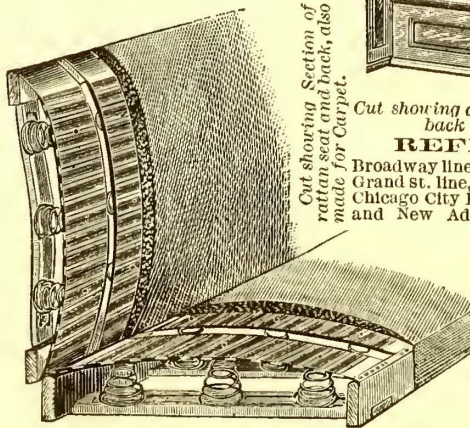
Our Patent Spring Seats covered with Rattan or Carpet are fast being adopted by the best railroads in the country. Seats for Steam Cars a Specialty. owners and makers of all the Cobb patents



Cut showing car with rattan seat and back without springs.

REFERENCES:

Broadway line (Pullman cars) New York
Grand st. line, 3d and 4th Ave lines, NY
Chicago City R.R. Chicago W. Div. line,
and New Adams street line, Chicago;
East Cleveland R. R. Co.
and Woodland Ave. and
West Side R. R. Co.
Cleveland; Union Line,
St. Louis; 2d & 3d St. R.
R. Co., Frankford and
Southwark R. R. Co.,
Union Line, Chestnut &
Walnut R. R., Ridge Ave
R. R., or any other road
in Phila.; and 100 others
elsewhere.



Cut showing Section of rattan seat and back, also made for Carpet.

Many R. R. Co's use our Rattan Pat. Canvas Lined Seats for Summer and cover the same with carpet for Winter. This method of seating we recommend as durable and economical, for the reason both a Summer and Winter seat is obtained in one.

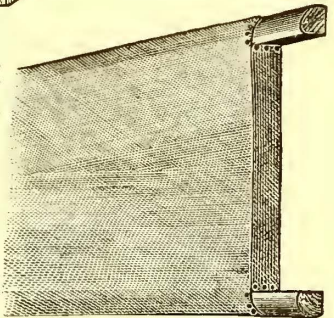
Estimates & Particulars cheerfully given (mention this paper), satisfaction guaranteed.

A TRIAL SOLICITED.

OFFICES: 48 & 50 NO. SIXTH ST.,

FACTORIES: 615 to 621 Filbert St.,

PHILADELPHIA, PA. Cut of section of cross for summer car.



STREET CAR SEATS & BACKS.



THREE-PLY CAR SIDES.

These seats and backs have been in use a number of years and have given universal satisfaction. They have received such a thorough test and are so well known that they show their good qualities and we need say nothing for them. Our facilities for doing this work are the largest in the world. We own the forest from which our lumber is cut. We cut our own veneer and do our own work in all its departments. We keep laid up in stock, seats and backs and can fill all orders promptly. Our 3-ply white wood car sides, ends and roof add fully 75 per cent to the strength of cars. We can also furnish car ceilings made of any kind of wood desired, plain or decorated. Send for Railroad Catalogue.

Frost & Peterson, 161 & 163 West 18th St., N. Y.

W. P. SECUNE, Manager Railroad Department.

PURDY & HUNTINGTON CO., Limited, Agents, 59 Shoe Lane, London, E. C.

RAILWAY REGISTER COMPANY.

MANUFACTURING

MANUFACTURERS AND OWNERS OF THE Latest Designs, Improvements and Inventions in Registers, Indicators, Classifiers and Punches, for the Recording of Fares Collected on Street and Steam Railroads.



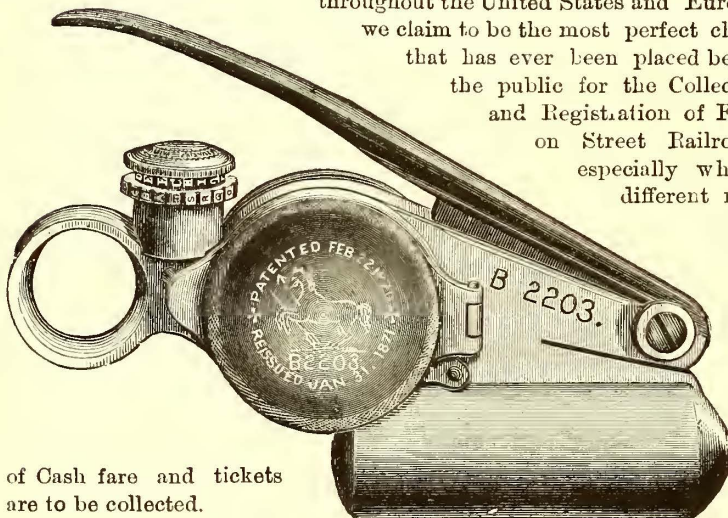
JAMES McCREDIE, Pres., Buffalo, N. Y.

COMPANY.

This company owns over 100 Patents embracing all the Valuable Features of Fare Registers, Indicators, etc., and was awarded three Medals at the Chicago Exposition of Railway Appliances.

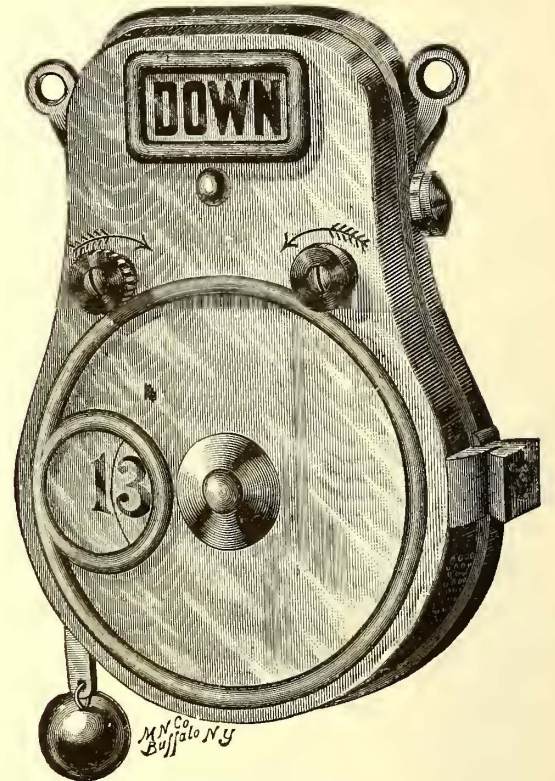
The Alarm Registering Punch.

This Register, which is so generally used throughout the United States and Europe, we claim to be the most perfect check that has ever been placed before the public for the Collection and Registration of Fares on Street Railroads, especially where different rates

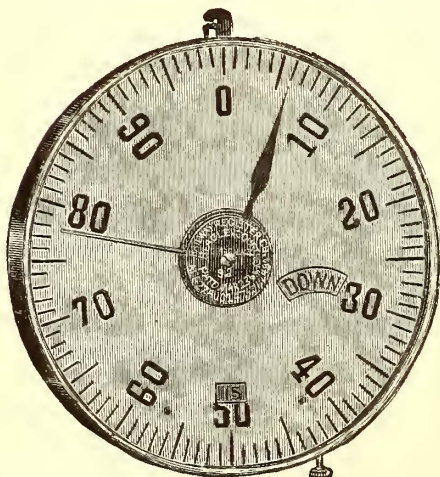


of Cash fare and tickets are to be collected.

Benton Register.

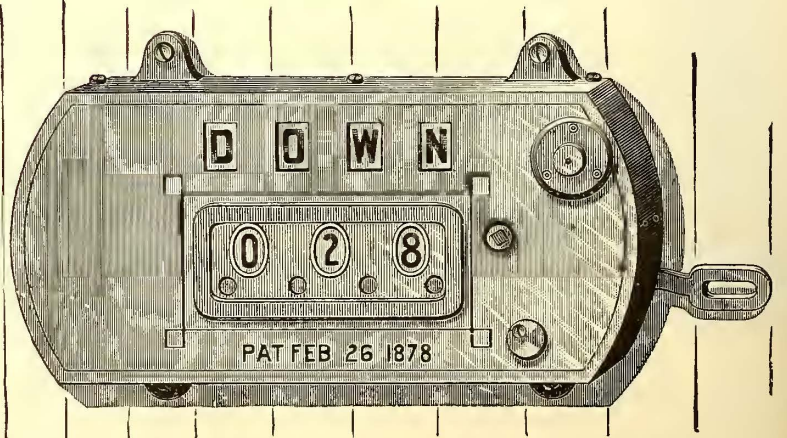


The Monitor Register.



Railway companies desiring to use a Stationary Register will consult their own interest by examining this Register before adopting any of the cheap devices now offered as it is the most Reliable Register of its kind. For further particulars address

The Pond Register.



EDWARD BEADLE, Manager, 1193 Broadway, New York City, N. Y.

JOHN F. COURTNEY, Gen. Agt., 423 Walnut St., Philadelphia, Pa.

ELI BALDWIN, President.

WALTER S. BALDWIN, Sec'y & Treas.

THE STANDARD INDEX AND REGISTER COMPANY,

138 FULTON STREET, NEW YORK,

SOLE LICENSEES AND MANUFACTURERS OF THE

SIMPLE.

IMPROVED

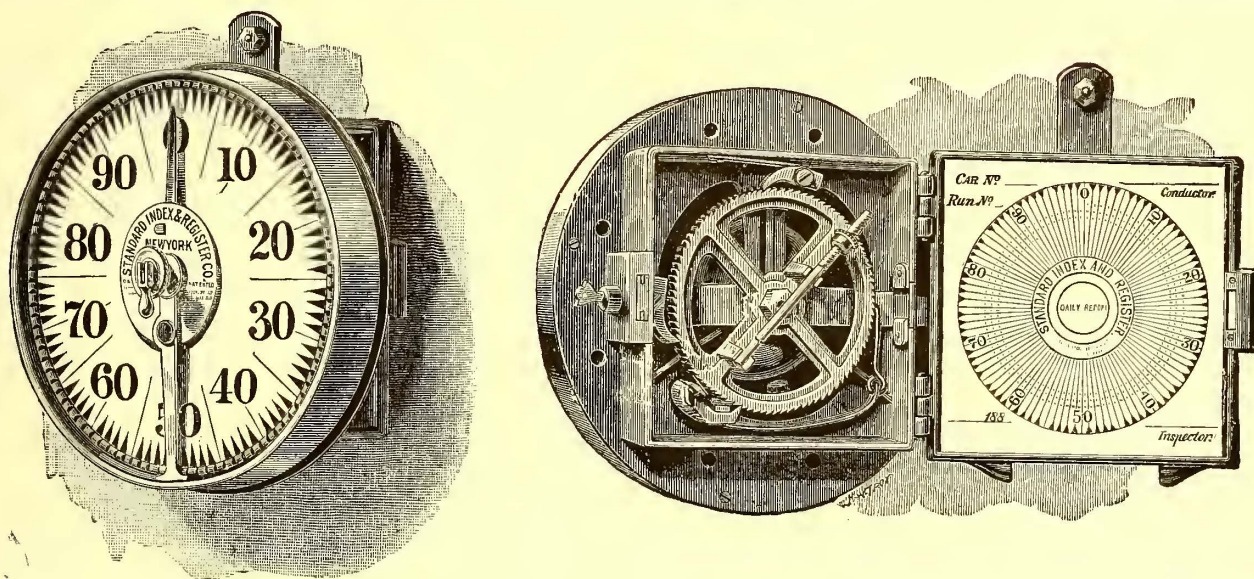
DURABLE.

STANDARD

INFALLIBLE.

INDEX & REGISTER.

ECONOMICAL.



ADOPTED BY THE LEADING RAILROADS IN THE UNITED STATES.

Besides indicating upon its face, the fares as the alarm is rung, this register indelibly records them as well as the trips made upon a paper dial inside. This paper dial is removed at the end of the day and is a correct report of the fares registered each trip and the number of trips made, which cannot be altered or obliterated.

We therefore claim our system of registering fares to be the simplest and best, and it positively stops any collusion between employees.

Testimonials confirming this statement from roads on which the "Standard" has been used for the past five years will be furnished upon application.

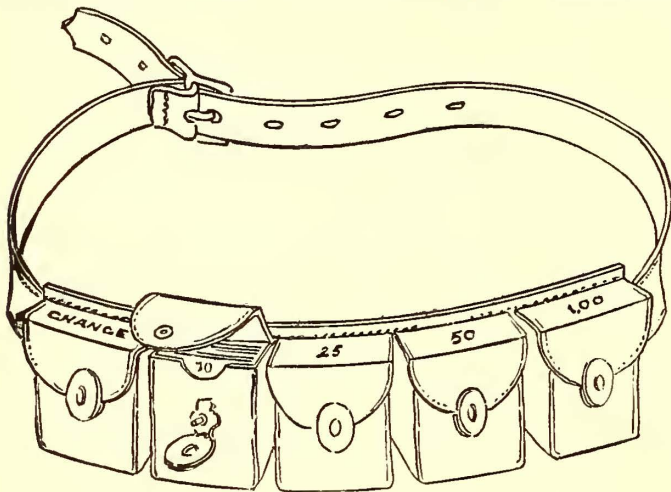
RUFUS MARTIN & CO.,

13 Park Row, New York.

MAKERS OF AND DEALERS IN

STREET RAILWAY MATERIALS AND SUPPLIES.

Martin's Change Belt.



BRILL'S PAT. CAR APPLIANCES.

"EQUALIZING GEAR."

"CHANGEABLE END-LIGHT."

"RATCHET BRAKE-HANDLE."

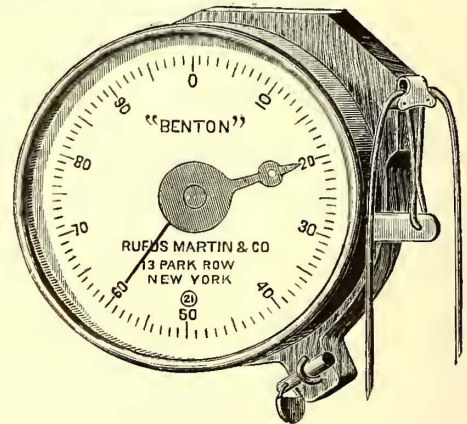
"REVERSIBLE SIGN-CASTING."

CAR TRIMMINGS

—IN—

Iron, Brass & Bronze.

"Benton" Register.



Stationery & Office Supplies.

Harnesses & Stable Supplies.

Rubber Goods & Step Treads.

Lubricants and Oils.

FARE BOXES.

WESTERN AGENCY

Wichita Construction and Supply Co., - - Wichita, Kan.

Wilson Brake Shaft.

ENTIRELY NEW & NOVEL IN CONSTRUCTION.

POSITIVE AND SURE IN ACTION.

BRAKES SET WITHOUT COMPLETELY TURNING THE HANDLE.

MADE ON THE PRINCIPLE OF A FRICTION CLUTCH.

SIMPLE IN DESIGN.

Saves Room, Adds to Available Braking Power, and Gives the Driver the Best Possible Control over the Car.

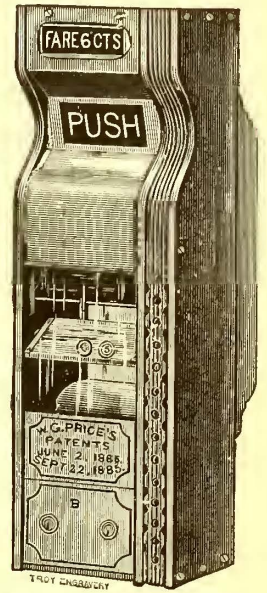
Mordecai M. Wilson, Agent,
TROY, N. Y.

Horace A. Keefer & Co.,
KANSAS CITY, MO.

St., Cable & Motor Road
Track, Material & Equipment a Specialty.



PRICE'S IMPROVED FARE BOX.
THE BEST FARE COLLECTOR
NOW IN THE MARKET.



The ringing of a gong for each fare, checks the passenger as well as driver, and hence conductors' bell punch is unnecessary.

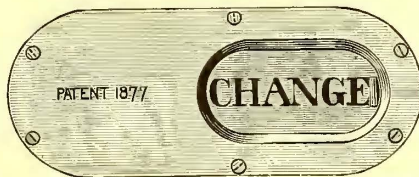
SEND FOR PRICES AND CIRCULARS BEFORE BUYING.

WESTERN AGENTS FOR

Hamilton-Corliss Engine. Bemis Car Box Co.
The A. French Spring Co., Ltd. Fulton Foundry Co.
Rails, Splices, Spikes, Bolts & Nuts of all Kinds.

SLAWSON'S PATENT FARE BOXES

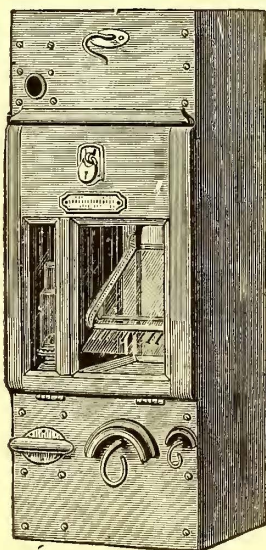
These Boxes are of the latest and most approved pattern, and contain a front door, by opening which all of the glass inside can be conveniently cleaned. This is a late patent, and is a very valuable improvement over the old method of taking the boxes apart for that purpose. They are well made and not liable to get out of order, cannot possibly be picked, and even if all the glass is broken no fare can be extracted from the drawer. The late J. B. Slawson originated the "FARE BOX SYSTEM," and all of his Boxes, Change Gates and Drivers' Change Box are protected by several patents, and parties using them are not liable to claims for infringements, as may be the case with some boxes which are now being offered for sale.



These Boxes, etc., are now in use not only in the United States and Canada, but in Mexico, South America, Europe, Asia, Africa and Australia—in fact, nearly all places where street cars are used.

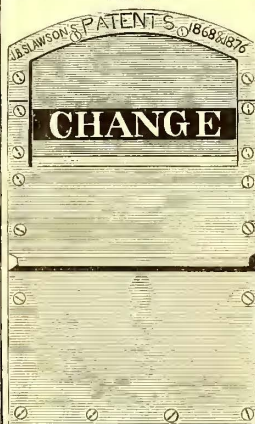


C. Front View.

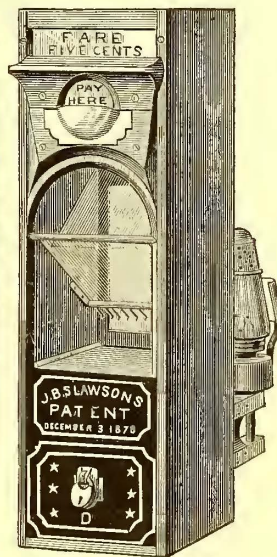


C. Back View.

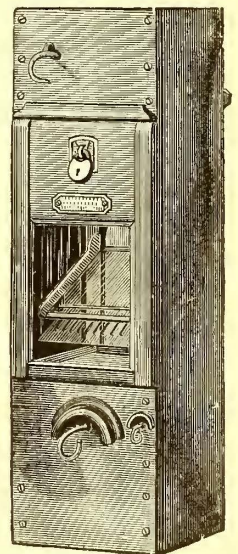
Change Slide. Outside View.



Change Gate. Outside View.



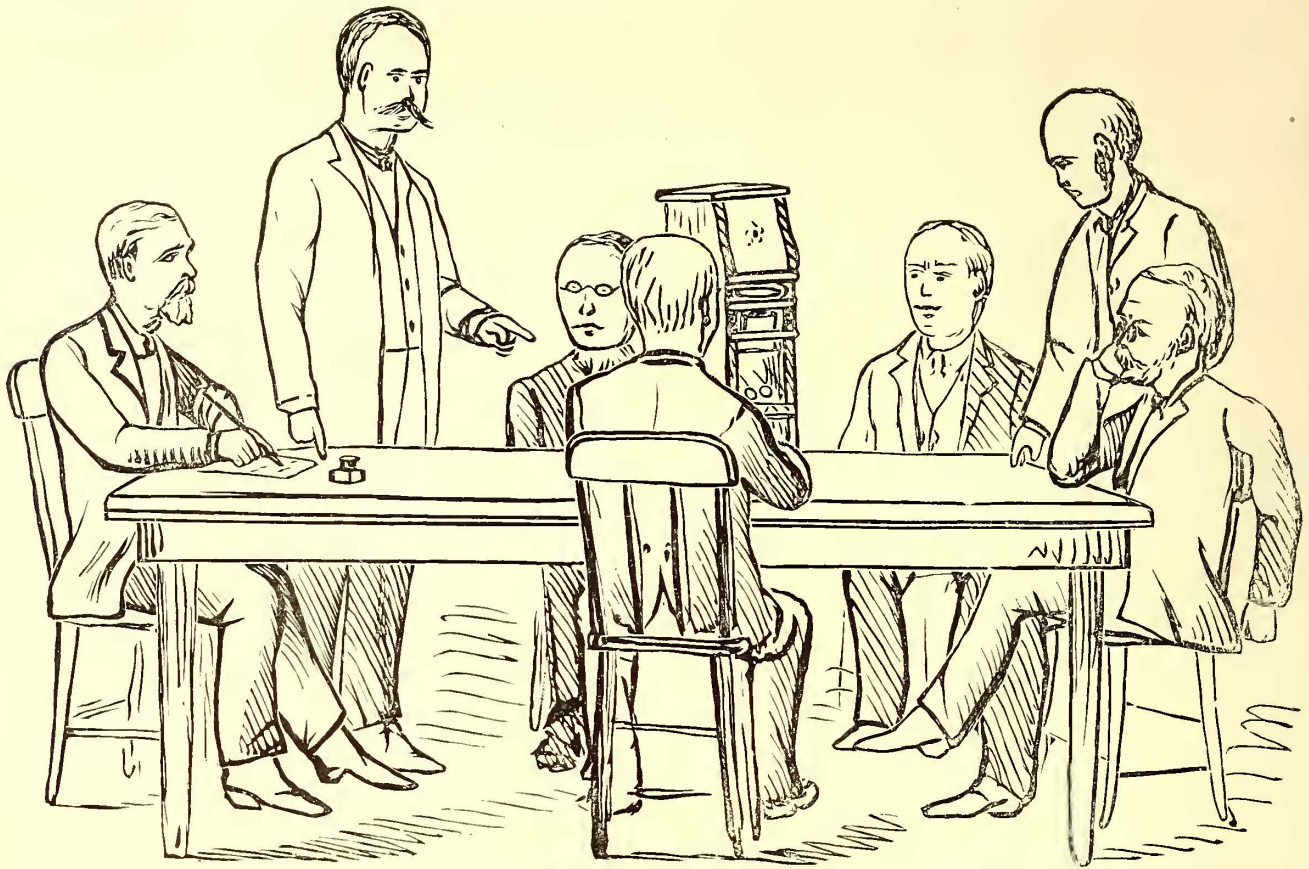
D Front View.



D. Back View.

The prices have been greatly reduced, and are made to fit the times. Orders will be promptly filled by addressing,

MILTON I. MASSON, Agent, 365 AVENUE A, NEW YORK.



At a meeting of the directors of the Street Railway Company it was decided that the Wales Fare Box was the best, and it was unanimously voted to adopt them on all their cars. The Secretary was instructed to order the boxes at once from
 See page 926. **WALES MANUFACTURING COMPANY, SYRACUSE, N. Y.**

“PAY HERE.”

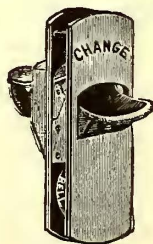
Fare Boxes and Change Receptacles FOR STREET CARS.

OUR NEW FARE BOX NO. 3

Is pronounced by the many Street Car Companies using it to be the best.

The following are some points of superiority in this box over others:

Simplicity of Construction, Quickness and Convenience of Cleaning, Security of Money Drawer, Beauty of Finish and Much Cheaper in Price.



CHANGE RECEPTACLE.

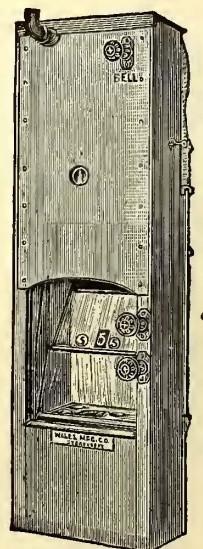
Descriptive and Illustrated Circular on application.

Examine the merits of this box and get our prices before buying.



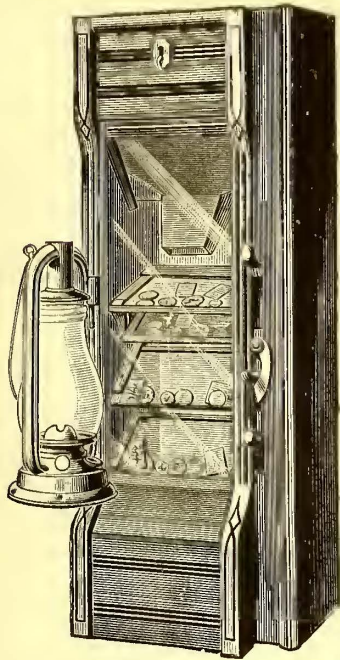
Box No. 3. Front or Passengers' View.

The only satisfactory arrangement in use for making change with the driver.



Box No. 3. Back or Driver's View.

WALES MANUF. CO., 76 & 78 E. Water St., Syracuse, N.Y.



THE BEAMAN FARE BOX.

MANUFACTURED UNDER TWO PATENTS OF FEB. 15th, 1887.

Absolutely Secure, Whether Fastened to the Car, or Not.

No Fares can Possibly be Turned Out or Abstracted by any Known Means.

EVERY CONVENIENCE PROVIDED FOR THE INSPECTION OF FARES. Easily Cleaned, Simple and Durable in Construction. The Smallest Detail has been Carefully Designed. Its many New and Important Features, it is Conceded, place It Beyond Competitors.

For Full Particulars, Address,

T. L. BEAMAN, Knoxville, Tenn.

TOM L. JOHNSON'S IMPROVED FARE BOX.

NOW IN GENERAL USE IN CITIES THROUGHOUT THE U. S.

Patented Oct. 14, 1873.

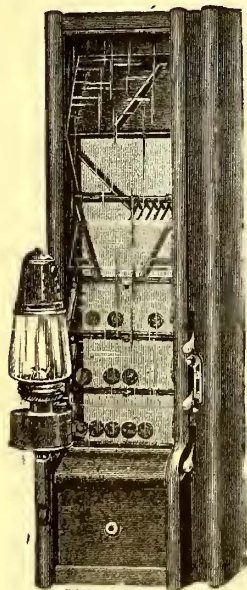
Fares Cannot be Extracted or boxes Robbed without violence.

Roads Equipped with Boxes on Trial, and if not satisfactory, returned without any expense to the company trying them.

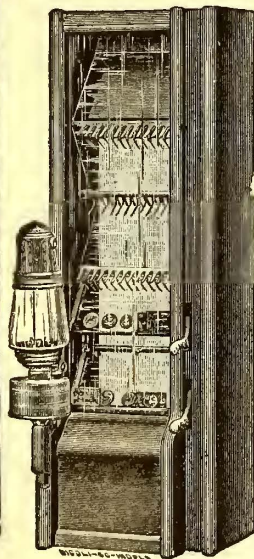
Ornamental to any Car.

Special Sizes built to order.

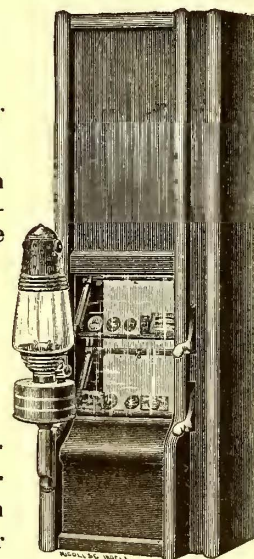
NOTICE.—All parties are cautioned against using fare boxes recently placed on the market which are direct infringements on our patents.



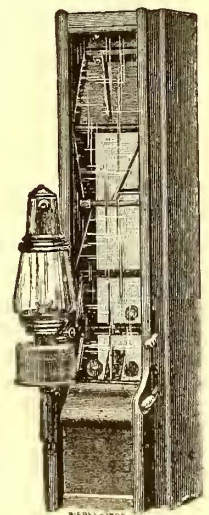
BOX NO. 1.



BOX NO. 2.



BOX NO. 3.



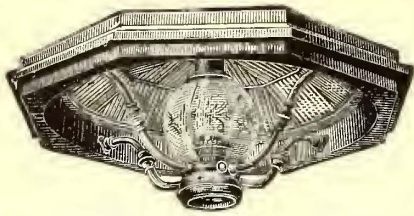
CHARIOT PATTERN.

REDUCED PRICES.

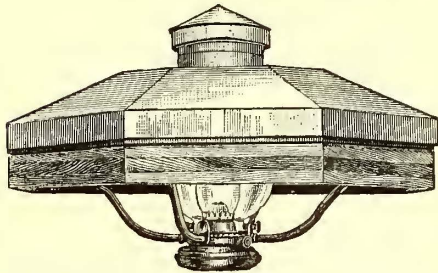
Write for Descriptive Circular and Price List. Address all correspondence to

A. A. ANDERSON, INDIANAPOLIS, IND.

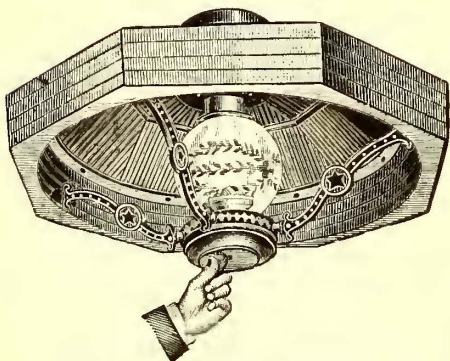
JOSEPHINE D. SMITH, Successor to the late WILLARD H. SMITH, 350 & 352 Pearl Street, New York.



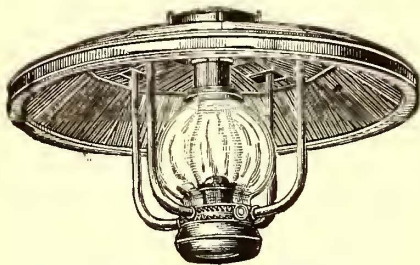
No. 3. Bombay Center Car Lamp, fancy arms, 25 in. corrugated glass reflector, with cover. Finished in brass or bronze.



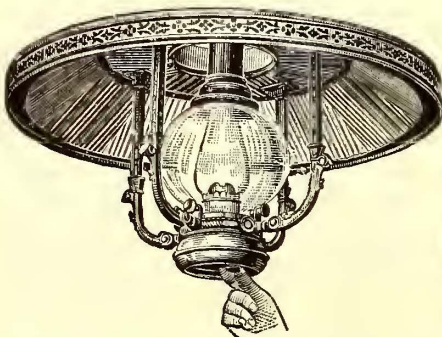
No. 1. Bombay Center Car Lamp, plain arms, 25 in. corrugated glass reflector, with cover. Finished in brass or bronze.



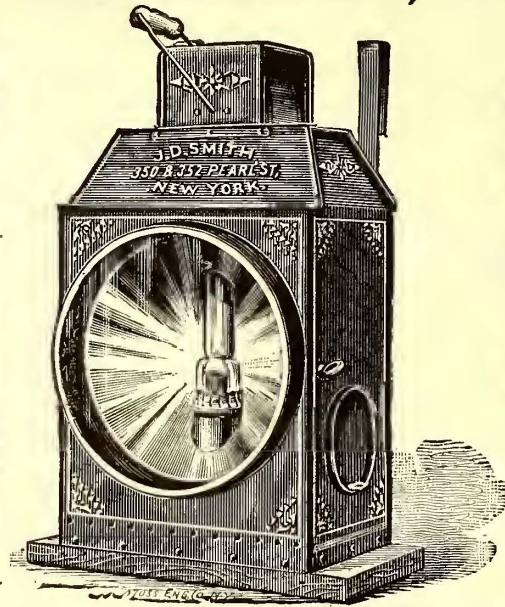
No. 4. Bombay Center Car Lamp, fancy arms, 25 in. corrugated glass reflector, with cover. Finished in brass or bronze.



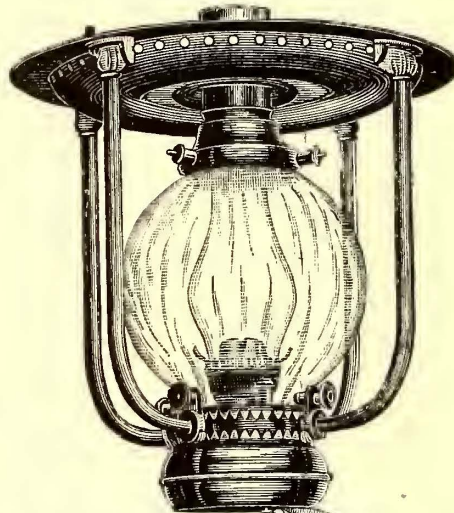
No. 1. Center Car Lamp, with 25 in. corrugated glass reflector; in general use on horse railways throughout United States and Canada.



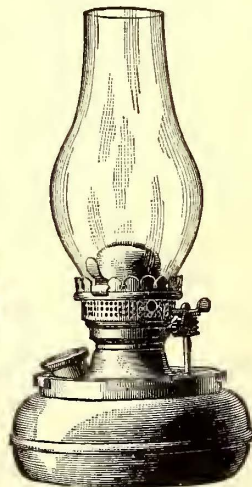
No. 3. Center Car Lamp, with 25 in. corrugated glass reflector.



No. 10. Head Light. As used on Tenth Avenue, New York, Cable Road. Throws a powerful light 100 feet. The best in the market for Cable Roads.



No. 2. Center Car Lamp, 14 in. Nickel Reflector. In general use throughout the United States and Canada.



Center Car Lamp Oil Fountain with J. B. M. Burner and patent wick raising attachment. This fountain interchanges with all of my Center Car Lamps.



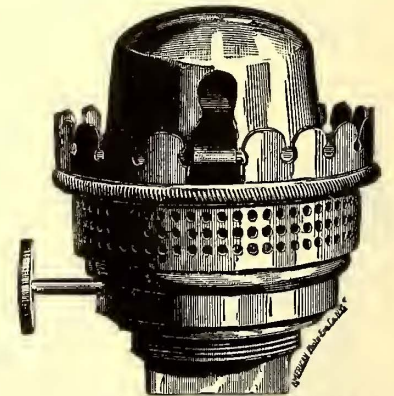
No. 3. Brass Box Lamp, with drip pan and J. B. M. Burner.



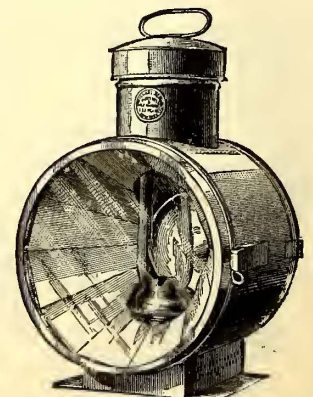
No. 10.—Two-light Car Lamp as used on Tenth Avenue (N. Y.) Cable Road.



No. 14. Center Car Lamp, with 25 in. corrugated glass reflector.



J. B. M. Two-spring Burner. This is the best double-spring burner made. Universally used for Street Car Center and Box Lamps.



No. 20. Small Head-light, 16 in. high over all, 10 in. face.

Manufacturer of Smith Patent Center Car Lamps & Reflectors.
For Street Cars, Cable, Elevated & Steam Passenger Coaches. Also all kinds Trimmings pertaining to Car Lamps, Burners, Chimneys, Globes, Wicks, Corrugated Reflector Glass, etc., etc.

RICHARD VOSE,

13 Barclay Street, . New York,

PATENTEE AND MANUFACTURER OF

Graduated Street Car Springs.

RUBBER CONE.

Patented, April 15th, 1879.

ADAPTED TO THE

STEPHENSON,

BEMIS,

RANDALL,

HIGLEY,

BRILL,

JONES,

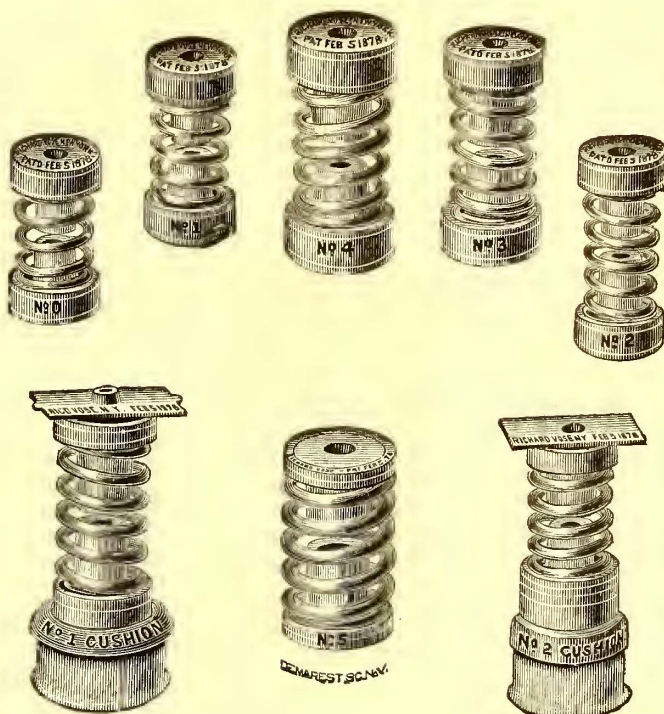
BALTIMORE,

VOLK,

CHAPLIN,

LACLEDE

And all other Boxes.



No. 0, for 10-ft. Light Cars.

No. 1, for 10-ft. Cars.

No. 2, for 12-ft. Cars.

No. 3, for 14-ft. Cars.

No. 4, for 16-ft. Cars.

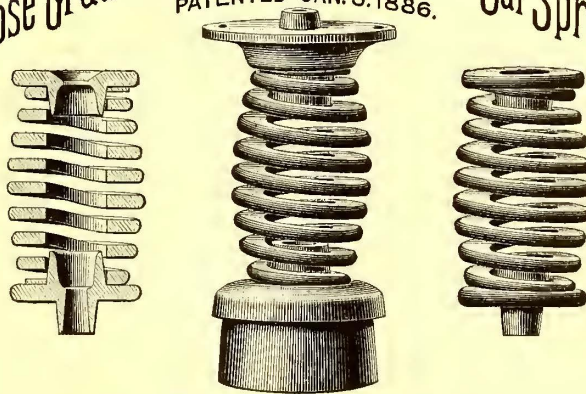
No. 5, for 16-ft. Cars.
(Single Pedestal.)

No. 1, Cushion, for 16-ft. Cars.

No. 2, Cushion, for 12 and 14-ft. Cars.

Vose Graduated Taper Bar, Street Car Spring,
PATENTED JAN. 5. 1886.

Adapted to all
Pedestal AND Post
Gears.



Motion Soft and
Slow.

It has no Rapid
Vibrations.

This Spring is weakest on the ends, and strongest in the center. The bar is coiled on a mandril of equal diameter throughout. Thus where the greatest strength is needed the greatest amount of metal is found. The load first compresses the ends of the coils, and as the load is increased the center of the spring is brought into requisition.

Evans & Patriquin,

BUILDERS OF

Street Railroad CARS

Of Every Description.

W. EVANS.

LOUIS PATRIQUIN.

KUHLMANN CAR CO.

CLEVELAND, O.

BUILDERS OF

Street Railway Cars,

—AND MANUFACTURERS OF—

ALL NECESSARY WOOD WORK for CONSTRUCTING SAME.

OFFICE—490 ST. CLAIR ST.

WORKS—488 & 590 ST. CLAIR STREET AND

221 & 223 OREGON STREET.

Street Railway Journal.

It tells the whole story about street railways, and frequently contains a single article worth many times the year's subscription.

Price, **\$2.00** per Year.

STREET RAILWAY JOURNAL,

113 LIBERTY ST.,

New York.

Established,
1831.

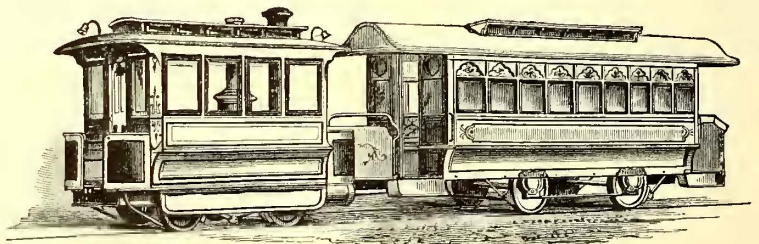
BALDWIN LOCOMOTIVE WORKS.

Annual Capacity,
600.

BURNHAM, PARRY, WILLIAMS & CO., Props.,
PHILADELPHIA, PA.

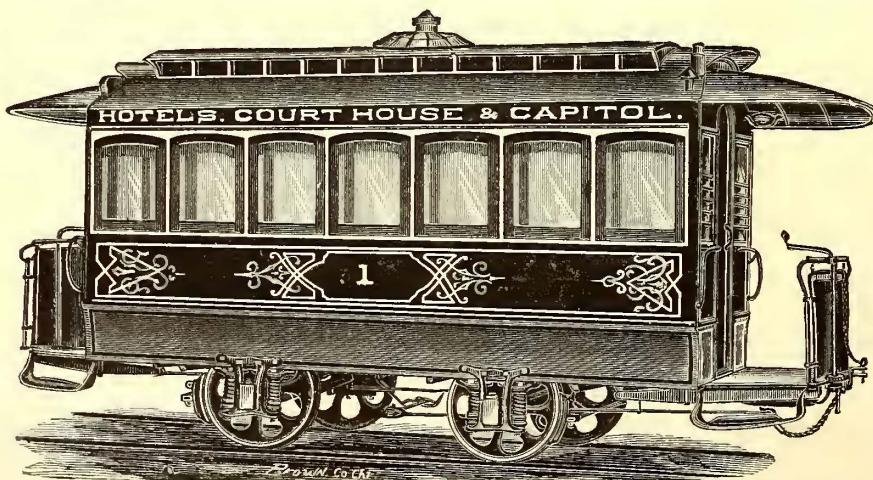
LOCOMOTIVE ENGINES,

Adapted to every variety of service, and built accurately to standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.



Noiseless Motors and Steam Cars for City and Suburban Railways.

Catalogue sent upon application of customers.



ROBINSON & HITT,

WATERLOO, IOWA,

Manufacturers of all kinds of

Street Cars

AND

OMNIBUSES.

Also Contractors for

Building and Furnishing Street Railways.

St. Louis Car Co.,

MANUFACTURERS OF

Horse, Cable, Electric, and all
other Motor Cars,

Narrow Gauge Coaches, &c.

The Largest Car Works in the U. S.

Office: 3023 North Broadway,

ST. LOUIS, MO., U. S. A.

ESTABLISHED 1857.

INCORPORATED 1875.

Brownell and Wight Car Company,
St. Louis, Mo.

BUILDERS OF

STREET CARS

OF EVERY STYLE AND SIZE FOR

Horse, Cable or Other Motive Power.

EXCLUSIVE MANUFACTURERS OF

BROWNELL'S PATENT COMBINATION CARS

FOR SUMMER AND WINTER SERVICE.

J. M. JONES' SONS,

AGENTS,

Street Railway Car Builders,

West Troy, New York.

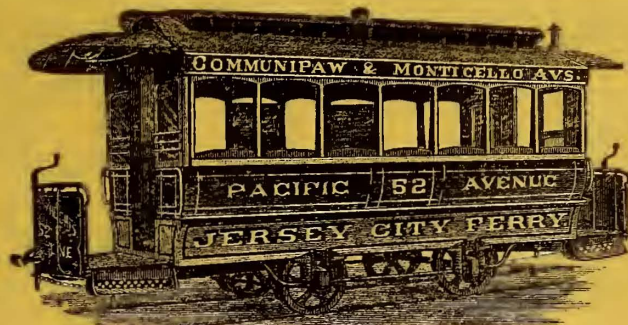
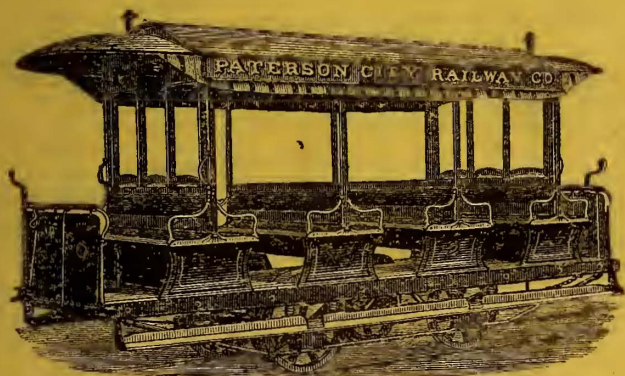
ESTABLISHED, 1856.

INCORPORATED, 1883.

THE FEIGEL CAR COMPANY.

BUILDERS OF

CARS FOR STREET RAILWAYS.



TESTIMONIAL.

HALIFAX, Sept. 10th, 1887.

MESSRS. HUTTON & SWAN, Managers,

FEIGEL CAR CO., New Utrecht, L. I.

GENTLEMEN: The Open Cars down here are a great success and have become very popular at once.

They are beauties and no mistake about it.

Yours, &c., JOHN F. ZEBLEY, Treas.

HUTTON & SWAN, Managers,

FACTORY: New Utrecht, N. Y.

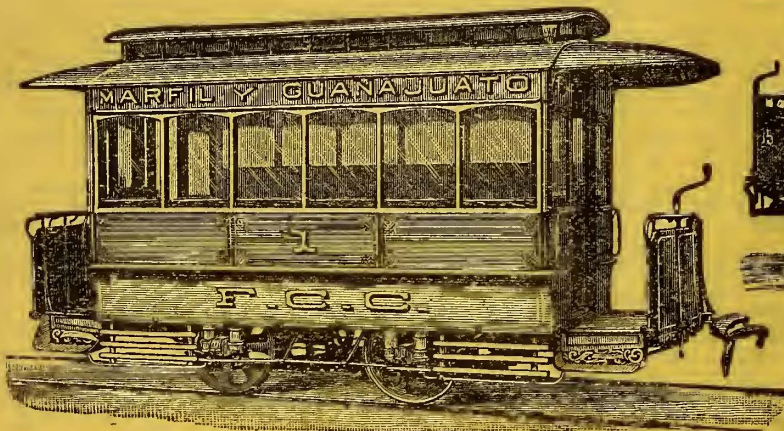
OFFICE: 108 Wall St., New York.

J. G. BRILL COMPANY,

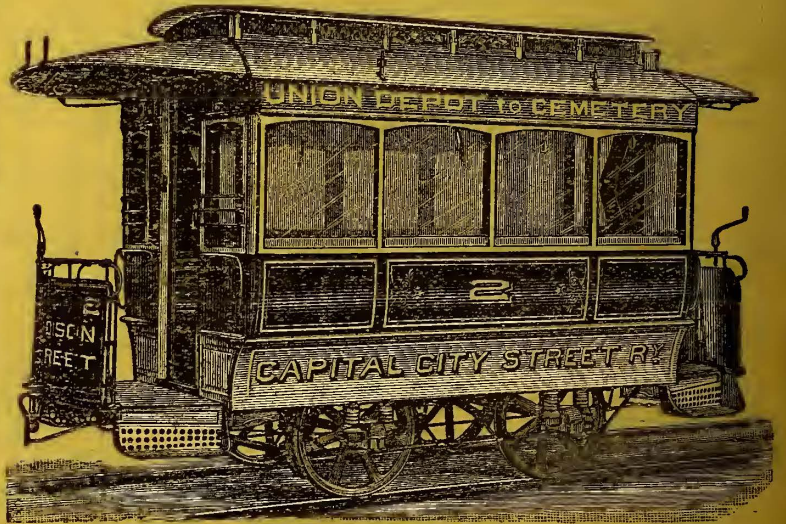
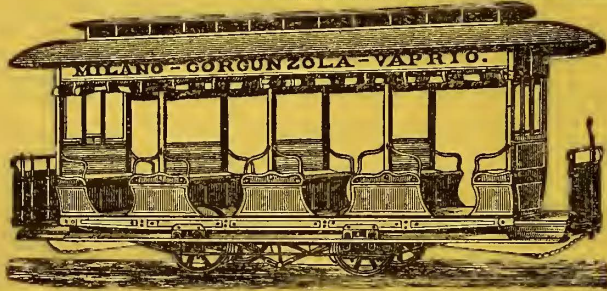
PHILADELPHIA,

BUILDERS OF

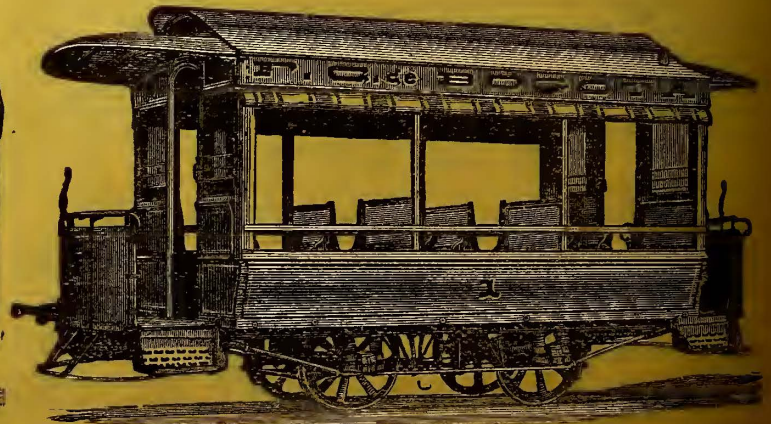
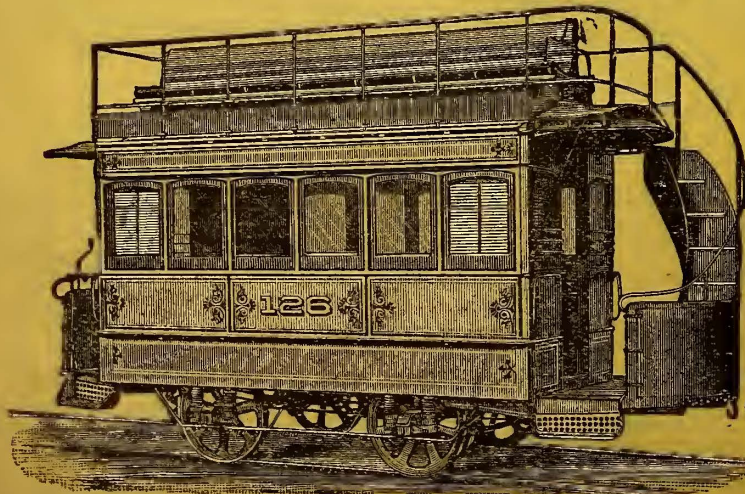
Railway and Tramway Cars



Gold Medal at Chicago Exhibition
OF
1883.



Gold Medal at New Orleans Exhibition of 1885, for Best Open Cars.

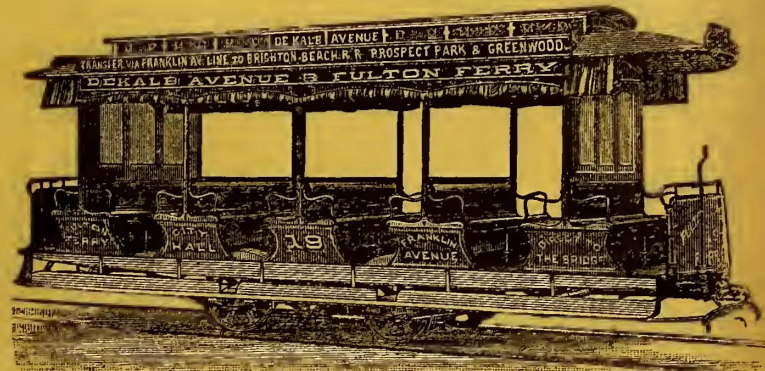
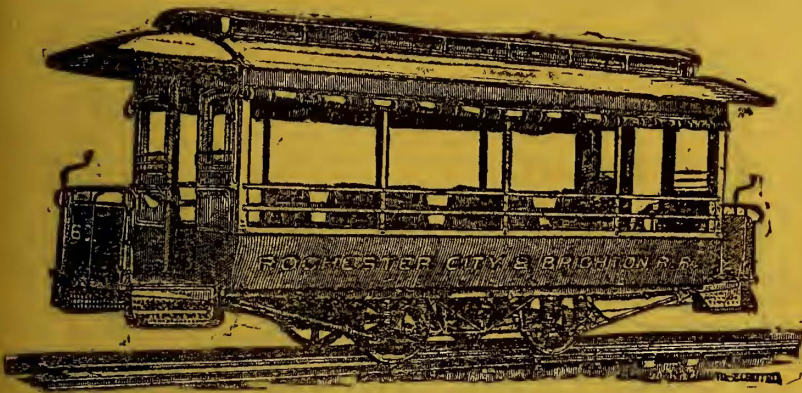


J. G. BRILL COMPANY,

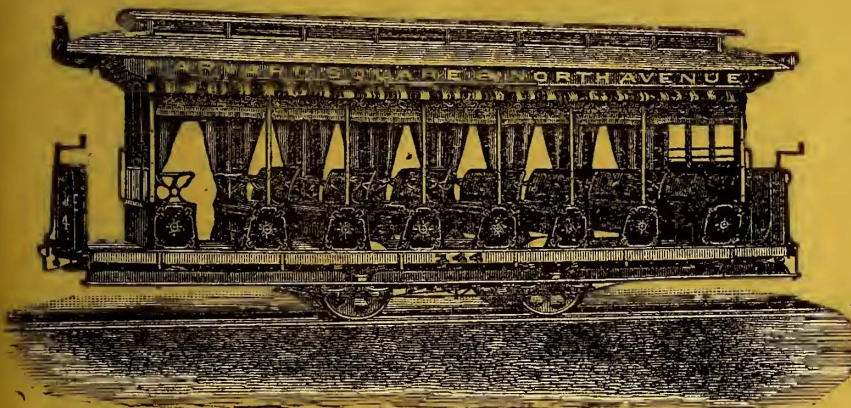
PHILADELPHIA,

BUILDERS OF

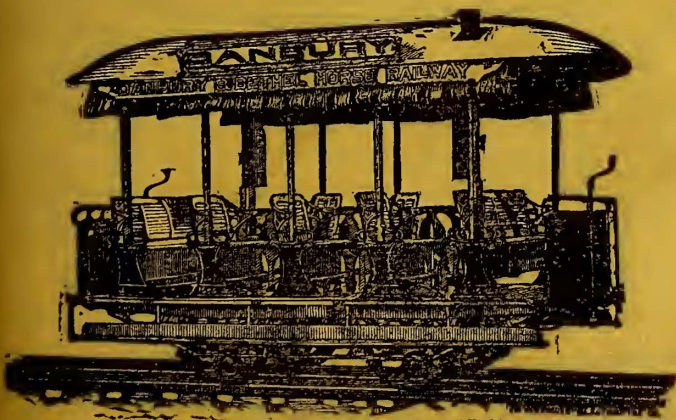
RAILWAY & TRAMWAY CARS



Passenger Cars of all Kinds.



Light Cars for Suburban Roads.



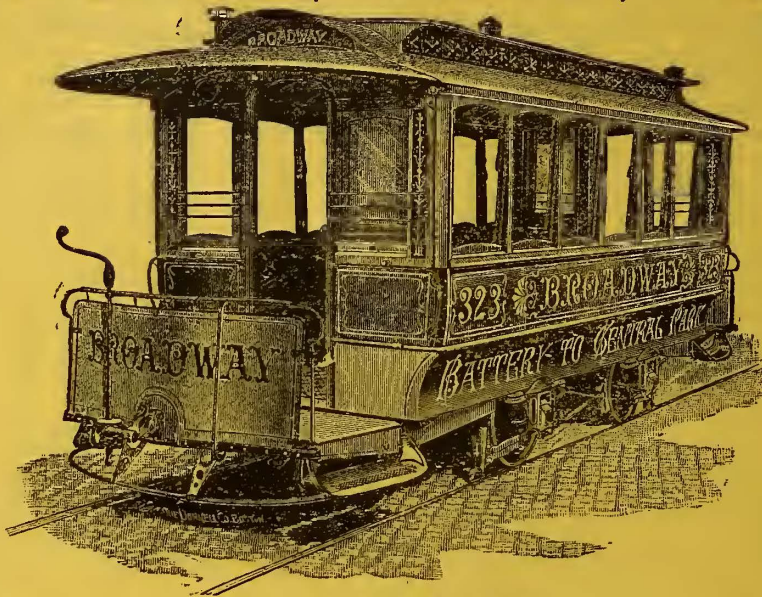
Construction Cars, Cane Cars, Power Hand Cars, Small Merchandise Cars.

ESTABLISHED 1831.

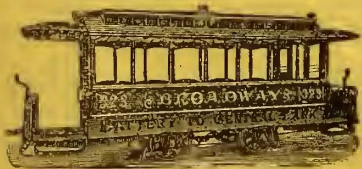
JOHN STEPHENSON COMPANY, (LIMITED), NEW YORK.

STREET (TRAMWAY) CARS

IN
Great Variety,
AND
Combining
ALL
Valuable
Improvements.



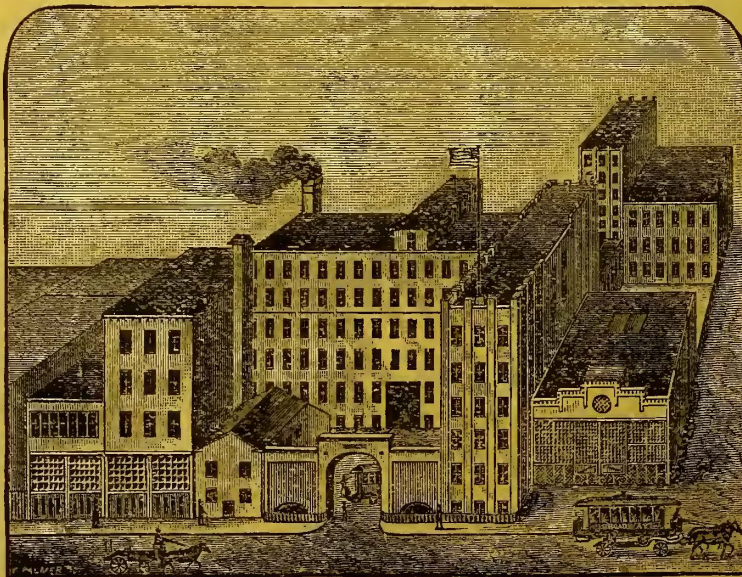
LEADING
"THE TIMES"
AND OF
—BEST—
Standards.



—SUPERIOR—
Elegance, Lightness, Durability,
THE RESULT OF
FIFTY-SIX YEARS EXPERIENCE.



ADAPTED
—TO ALL—
COUNTRIES
—AND—
CLIMATES.
—O—
PARTICULAR
ATTENTION
—TO—
SHIPMENTS.



Cable Cars.
—O—
Electric
Motor
Cars.
—O—
STREET CAR
SUPPLIES
OF EVERY
DESCRIPTION.



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Chicago: Phenix Building.

