



VOL. II.

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NO. 1.

**Julius S. Walsh.**

The newly elected President of the American Street Railway Association has been prominently identified with various important industries in St. Louis, as well as with the Street Railways in the capacity of President, and has been an earnest worker for the promotion of the interests of the Association since its organization.

Mr. Walsh was educated at St. Louis University and St. Joseph's College; graduating from the latter in 1861, and receiving from the former in 1863 the degree of Master of Arts, and from Columbia College, in 1864, the degree of L.L.B.

Early in life Mr. Walsh was engaged in mercantile business, but soon abandoned it and turned his attention to the street railway system of St. Louis, and is among the most active of those who have contributed to its extension and development.

Mr. Walsh is now President of the People's, the Tower Grove, Citizen's and Park Railroads, and has held at different times various important positions in connection with public institutions and banks.

During his Presidency of four years, of the St. Louis Agricultural and Mechanical Association, a large part of the improvements were made which now render the grounds so attractive. Among other prominent positions which he has filled is the Presidency of the St. Louis Bridge Company.

Mr. Walsh is an earnest, warm-hearted, but non-tentative man, who will discharge with ability the duties of the office to which the Association has wisely elected him.

**Methods of Propelling Street Cars.**

We have before us a pamphlet report to the President of the "City" Railroad of San Francisco, which discusses the more prominent systems of propelling street cars with a view of selecting one suitable to the conditions of that road, to supplant its present animal power service. The report is by Wm. H. Milliken, cable railroad en-

gineer, and is sufficiently interesting to warrant us in giving a synopsis.

Speaking of the "City" road, the writer describes it as having  $4\frac{1}{2}$  miles of double main track and  $1\frac{1}{4}$  miles of branch line. The service is carried on with 34 single horse-cars, requiring 285 horses; the daily expense for motive power for each car being set down at \$6.50 per car. The grades are practically level, there being but two short inclines of 1.92 per cent and 5.3 per cent rise.



JULIUS S. WALSH, PRES. AM. STREET RY. ASSOCIATION.

The cable system is elaborately reviewed, and in discussing its availability, the conclusion is arrived at that mechanically considered, its merits are undisputed, having no competitors on steep grades—though for levels and moderate grades it has formidable rivals in both compressed air and electricity.

Much stress is laid upon the importance of constructing underground tubes for cable roads in a most thorough manner, and instances are given where flimsy structures have already gone to decay.

This system is found unavailable where a line passes along the track of an existing cable line, as often occurs in large cities,

because two independent tubes and cables are not practical in one road-bed. The system is highly recommended for economy and development of both traffic and property interests along a route, but is spoken of as too expensive for roads having light business.

The various electric systems are mentioned. The storage battery plan, and the one using an overhead conductor, are not thought practical. Speaking of the system using an underground conductor the writer says:—

"The underground conductor of necessity requires an underground tube, a tube not unlike that required in the cable system, though perhaps a trifle smaller. As this tube will be subject to all the conditions and requirements attending the use of the cable tube, especially as to its supporting ordinary street traffic, it will need to be equally strong and of quite an expensive construction; any attempt to lay down a cheaply constructed tube would be poor economy. The matter of insulating the conductor will prove a difficult problem to solve, and constant care will need to be exercised to preserve it. The rolling stock will need to be new, and more expensive, probably, than that of the cable system, whilst but very little difference in cost of engine house plant can be expected.

"Whilst I am at present unable to state what the actual cost of an electric plant would be to serve the requirements of your road, I can say positively that it will vary but little from the cost of the cable system, as each requires an underground tube, continuous conductor, (cable or rod) expensive engine house plant, and special motors or rolling stock.

"A disadvantage belongs to the electric system relating to the speed with which the dynamos on the cars are run; as the ordinary speed of a street car wheel is about 80 revolutions per minute, and as it is necessary to run the dynamos about 1,200 revolutions, there is required a system of speed reducing gears to transmit the motion from the dynamo to the car wheels. These gears

make a great noise, and render it uncomfortable for passengers to ride near them. This difficulty was found to be very pronounced in the experimental cars lately run on the Garden Street line in Cleveland, Ohio; the noise from the transmitting gears was so great, that it was difficult to hear the loudest conversation within the car; otherwise the system is free from most of the objections urged against the employment of mechanical motors, but it is not established that a reasonably profitable result can be obtained.

"Of the several electric roads now running, none operate under the conditions of your case, so that should your company adopt this system, it would be purely an experiment without precedent anywhere, and no satisfactory deductions could be made as to its availability, until you had built and equipped your road thoroughly and completely."

The usual objections are made against steam motors, as being expensive, too heavy for ordinary road-beds, they carry too much dead weight, whilst they are not sufficiently cleanly, and free from smoke and fumes to be acceptable to the public.

Coal gas motors are condemned because they lack recuperative power, have no reverse motion, are complicated in structure, difficult to stop and start, and expensive to operate and maintain.

The high pressure compressed air system is favorably considered, and claimed to be satisfactory under proper conditions.

The machines, however, are found to be necessarily heavy and cumbersome, and require a heavy road-bed and track. They cannot be profitably employed to carry light loads, and make frequent trips; whilst they are expensive to construct, and somewhat wasteful of power.

The following is a description of the Pardy Low Pressure Compressed Air System, finally recommended for the "City" Railroad Company's adoption:—

This system proposed by Mr. George Pardy, consists in employing a number of light weight motors, supplied with receivers to contain about fifty cubic feet of air at about 100 lbs. pressure per square inch. These receivers are placed on the car either on the sides over head, or under the seats; in either position, owing to their small dimensions, they are not unsightly. Ordinary locomotive engine cylinders are carried under the floor of the car, and connections are made directly with the car axles or wheels. There is an underground pipe placed between the up and the down track, four to six inches diameter, running the entire length of the line. At every 500', a branch from this pipe leads to the center of each track, these branches terminating in a peculiar form of valved outlet, having 2½" diameter opening at the street surface.

The street openings are left uncovered, but any dust, dirt, water, &c., which passes into them is caught in a receptacle, to be removed periodically, or it may pass into the adjacent sewer. There is a flexible nozzle carried on the car connected with the receivers, which nozzle the engineer pushes

down into these street openings to open the valved outlets and form air tight connections with the receivers, whenever he desires to replenish them. The operation of replenishing requires about six seconds, and takes place during the ordinary stops the car makes to pick up or let down passengers.

The underground pipes are kept constantly filled by compressing machinery located anywhere near the route, and shut off valves are placed at intervals, so that short sections of the pipe may be temporarily closed for repairs, when leaks are discovered. The car is provided with a long slotted opening in its floor or platform where the engineer stands, through which slot the nozzle is inserted into the street opening, so that if the car stops anywhere within 7' of the opening, the engineer has full access to it.

The Pardy system is an improvement upon the high pressure systems in the following very important particulars:—

1st. As it is operated with a low air pressure not exceeding 100 lbs. per square inch, the air may be compressed at one operation in a single machine, instead of progressively in several, thus saving the original cost of, and power necessary to run these additional machines; also at this low pressure the proportional useful effect is much greater. 2nd. It permits the adoption of light weight motors, so that an ordinary road-bed and track will amply sustain them, and the power required to move them will be much less. 3rd. It permits the replenishment of the air to recuperate the power at any point on the line, so that at every starting the motor may exert its maximum power. 4th. In its adoption the system involves less expenditure of capital in providing motors and compressing machinery, and avoids the cost of replacing a roadbed. 5th. It would be less of an experiment mechanically and financially, offering no risk whatever in its adoption. 6th. It permits the application of the machinery and motive power upon the ordinary form of car, without encroaching upon the space reserved for passengers.

It improves upon the cable system in the following points:—

1st. It can be put in operation at about one-fourth the cost. 2nd. It can be operated at about 30% less expense. 3rd. It is never liable to get out of order to such an extent as to suspend traffic. 4th. A better schedule time may be made. 5th. It may be operated on branch lines running on streets already having cables. 6th. It can be put in operation without interfering with traffic or disturbing the road-bed. 7th. It involves no financial experiment, as its daily running expenses, including interest on capital, will not increase, but rather materially decrease expenses.

It is better than the electric system—

1st. Because it will not cost over one-third the money to put it into use. 2nd. The daily expenses will be about 20% less, including interest on capital invested. 3rd. There will be no disturbance of present road-bed. 4th. It will not be affected by storm water which, in the electric system, will, at times, flood the underground tube, destroy insulation, and suspend the operation of the whole line.

The following table exhibits an approximate estimate of the cost of constructing and operating each system, exclusive of such items as taxes, licenses, engine house or stable rent, drivers' and officers' salaries,

&c., for these items being common to all systems, they may be omitted without impairing the accuracy of the comparison.

COMPARATIVE TABLE, SHOWING COST OF CONSTRUCTING AND OPERATING VARIOUS SYSTEMS.

System.	Cost of Plant.	Daily Expenses.
Cable.....	\$450,000	\$203.00
Electric.....	375,000	165.00
Coal Gas.....	130,000	200.00
High Pressure Air..	175,000	164.00
Low Pressure Air..	105,000	125.00

The estimated cost of the construction of the different systems is based upon the assumption that each will be provided with thirty-four motors and necessary machinery to run them.

In the concluding "recommendation" the writer says:—

"The cable system will not suit the conditions of your case, because of the great expense attending its adoption. The electric system being both expensive and undeveloped, would be experimental, both in a financial and mechanical sense, with, I am convinced, a positive certainty of its proving unsatisfactory.

"The only system that I feel warranted in accepting is the Pardy Low Pressure Air System, which is at once the cheapest, and promises to be the best for your purpose; and inasmuch as the Risdon Iron Works Company offer, under certain reasonable conditions, to put this system into practice on any suitable line at their own risk, terms can be made which will completely relieve your company of all consequences of mechanical failure."

Parties interested desiring further information may address Mr. Milliken, at 22 California St., San Francisco.

#### Florence Marryat's Advice.

Miss Marryat says, "We must sit on the men," in a lecture addressed to her sex: We must sit on them once and then sit again; 'Tis the way to solve problems that vex.

"As you've done in the past continue to do; The men will be wiser for it; Wherever you find a male biped or two, Sit down on them, sisters, O, sit!"

We interpret this vigorous injunction to mean— If to illustrate we are allowed— That women must sit not behind nor between, But always on men in a crowd.

This will simplify matters upon the street cars If the women, whenever they sit, Will look over the lot, when the seats are so scarce, And pick out the men that will fit.

In case explanation is needed of that, We would add, this is just what we mean: That fat women sit on the men that are fat, And lean ones on those that are lean.

Next Convention, Cincinnati third Wednesday in October. Subjects for discussion: Causes, Prevention and Settlement of Accidents; Sanitary Condition of Street Cars; Ventilation, Lighting and Care of Cars; Progress of Cable Motive Power; Progress of Electric Motive Power.

This is the only paper devoted wholly to street railway interests. \$1.00 a year.

**Andrews & Clooney's Street Railway Snow Plow.**

Our illustration gives so clear an idea of the working of this plow\* that much description is unnecessary. It is operated entirely by levers, which raise and lower the plows very easily. There are, also, rope attachments to fasten to the mould boards, which are wings of the plow and are intended to reach out further into the street. They can be easily operated from the platform by means of the ropes, pulling them out of the way of passing vehicles or in narrow streets, or when the tracks run near curbstones, etc. The power used is six, eight, or ten horses according to the

showing its capacity for snow. It excited the admiration of all those Western gentlemen who saw a sweeper for the first time. The agent received orders for four of them on the spot.

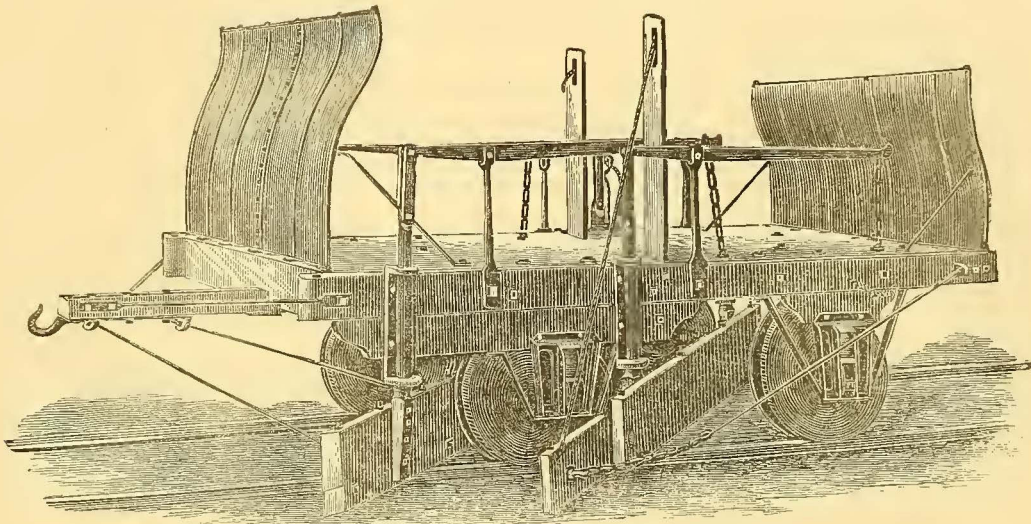
**Watson & Stillman's Hydraulic Press.**

This press embraces many changes and additions, and is a very complete tool for use in street railroad shops, small railroad repair shops and engine shops, for forcing in shafts, etc. The makers\* say: "The hydraulic part is our most reliable and convenient style of large jack. The lever works perpendicularly and at right angles to line of press, and convenient for opera-

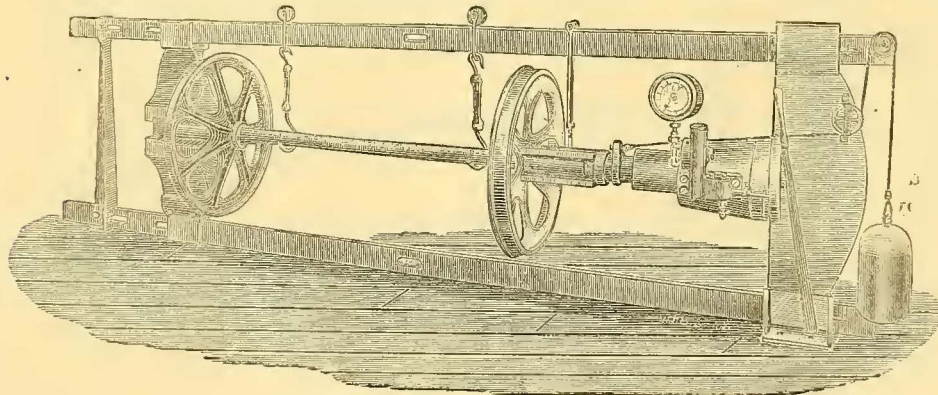
template for the other end of axle. The block is also used when forcing a shaft into a wheel. The pull back weight is now suspended from upper bar and so does not require any pit."

**Schwaab's New Method of Shoeing.**

This is a radical innovation in horse shoeing, the merits of which are worth looking into by horse owners. The inventor says in a letter describing his idea. "I advocate a new method to permanently shoe horses, without the barbarism of nailing. It is an absurdity to claim that nailing does not hurt the horses. My shoe is constructed in two sections, inwardly rim-



ANDREWS & CLOONEY'S STREET RAILWAY SNOW PLOW.



WATSON & STILLMAN'S HYDRAULIC WHEEL PRESS.

amount of snow on the track, and roads using it and following it with the improved sweeper will have a very clean and handsome track. They are in use on many of the principal lines of street cars in our large cities and we are told give excellent satisfaction.

An exhibition of one of their largest size snow sweepers, made for the Union Depot R.R. Co. of St. Louis, Mo., and drawn by ten horses, was had in that city on Friday before the convention, the ribbons being in the hands of Mr. Wm. M. Morrison, Supt. of the Bushwick R.R. of Brooklyn. It did its work admirably in mud and dust, thereby

tor to easily watch the work. The valves are large, perpendicular and easy of access. The piston is entirely enclosed, thus preventing all grit or foreign material getting into the pump and cutting or preventing its working. The cylinder is made from crucible steel and has a good bearing on stationary beam. The movable beam runs on rollers upon the lower bar, which is planed. The moving beam is recessed so that blocks may be placed in it of sufficient thickness to act as a template in forcing on car wheels, etc. A swinging chuck is placed against the ram of jack to act as

med or flanged, jointed at front toe and secured by lock bolt. It is provided with a full protecting sole plate so as to allow the horse to always stand on a level platform, no matter how uneven the road he has to travel, thus avoiding painful distortions and preventing from hurting against and picking up any sharp excumbrances. The pad is secured on inside of shoe rim by rivets and is provided with strap and buckle on the upper small part of hoof-wall, so as to help in concert with lock-bolt to firmly secure the shoe to the hoof. Calks are steel-hardened and so constructed as to prevent transverse slipping. It is a very un-

\*Andrews & Clooney, 545 W. 23d St., N. Y. City.

\*Watson & Stillman, 470 Grand Street, New York City.

\*Law. Schwaab, 70 Varick street, N. Y. City.

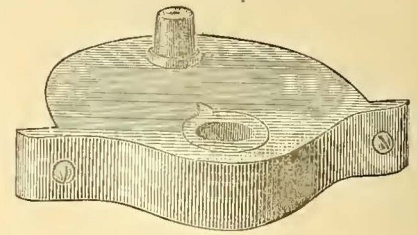
practical method to drive 24, or 28, sharp edged and pointed iron spikes through the poor animal's hoofs, thus unnaturally pinching him at every step. This shoe will prevent snow-balling, corns, blubber legs, falsely termed shoulder lameness, in most instances the natural result of nailing. It is conveniently taken off after toil, so as to make the animal's rest perfect and natural."

**Gould's Track-Support, Traction Cable and Electric Conductors Conduits.**

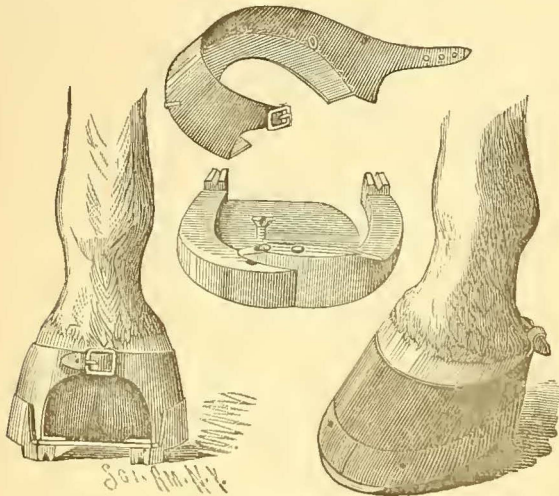
We illustrate herewith a combined railway track-support and traction-cable and electric-conductors conduit\* designed to pro-

phonic, telegraphic, and electric-light wires. *D* and *E* represent railway-rails, which may be formed integral with the tubes *A* *B*, or be fastened thereto. In laying the structure the ground will be excavated in two parallel channels to receive the conduits, leaving a ridge between on which the cross-pieces *C* *C*, will rest. The tubes *A* *B*, which are formed in sections of suitable or convenient length, are then laid in the excavation and the sections fastened end to end, or jointed together in any suitable manner, as by bolting. The earth is then filled over the cross-pieces and around the tubes, and the paving laid, the tops of the tubes being on a level with the paving.

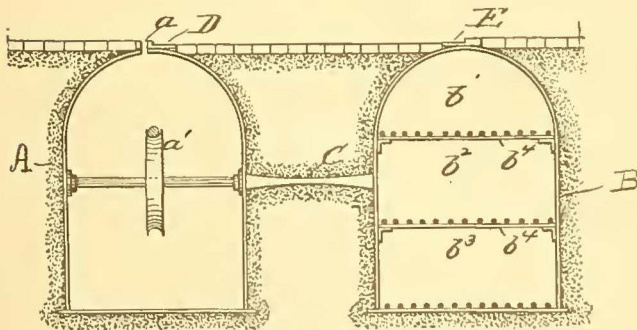
not to have an extension plate connected with it. With the old arrangement the stud or bolt, fastening the pawl, is apt to wear the wooden sill of the car and become



loose, so that the pawl will get out of the proper working position in reference to the ratchet wheel. The improvement consists in joining the stud firmly to the shaft bear-



SCHWAAB'S NEW METHOD OF SHOEING.

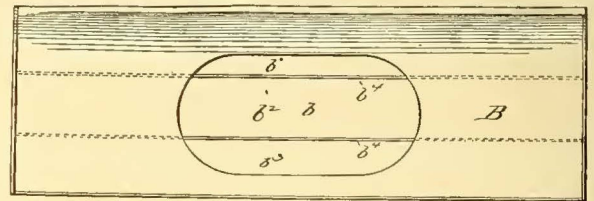


**Fig. 1.**

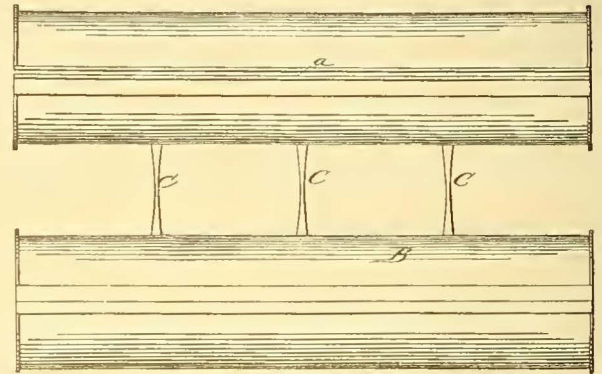
GOULD'S CONDUITS.

vide a structure that will form a support or bed for railway and street-railway tracks, and also conduits for a traction-cable and for electric conductors. Fig. 1 is a vertical section of the device; Fig. 2 a side elevation, and Fig. 3 a plan view. *A* and *B* represent two tubes of metal which are held parallel and in fixed relation to each other by cross-pieces *C* *C*. The tube *A* is slotted longitudinally on its upper side, as shown at *a*, for the passage of a gripping-lever to engage with a traction-cable running on pulleys *a'*, in the tube. The tube *B* has a man-hole *b*, in its outer side to permit access to the conductors therein, and the tube may be divided horizontally into compartments *b*<sup>1</sup> *b*<sup>2</sup> *b*<sup>3</sup>, by means of shelves *b*<sup>4</sup>, for the reception and separation of different classes of electric-conductors—viz., tele-

\* John H. Gould, Philadelphia, Pa.



**Fig. 2.**



**Fig. 3.**

GOULD'S CONDUITS.

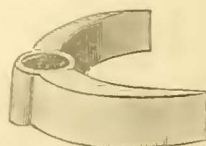
The device is applicable to horse-railways, and all other railways, including the electric roads, and the tubes are designed for telephone, telegraph, and electric cable conduits.

ing, in fact casting the whole in one piece. To allow for the wearing of the journal of the reel shaft, an adjustable bushing is inserted in the casting, which can be replaced when worn. The stud is fitted with a square hole on the bolt, which facilitates removing the attachment, as will be seen by

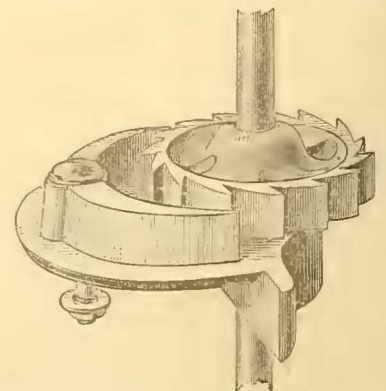
An advantage derived from the use of the device is that the necessity of repeated tearing up of the streets is obviated, while the employment of timber is entirely avoided.

**An Improvement in Brake Reel Attachments.**

Our illustration shows an improvement in the construction and arrangement of bearing for reel shaft, for street and other railway cars. The invention\* is specially



designed for street cars. The usual custom is to fasten the reel block to the sill, but



reference to the cuts. The bushing for the bearing of the shaft is made tapering, and may be made of better material than is used for the other part of the block; the whole tending to keep the shaft, the ratchet wheel and the pawl in their proper relative positions.

\* J. H. Randall, Metropolitan St. Railway Co., Boston, Mass.

The Cable Railways.

Among the busiest men in this city are the officers of the New York Cable Railway Company. The report of the commissioners appointed by the Supreme Court to pass upon the question whether the railways mentioned in the petition of the Cable Railway Company ought to be constructed and operated, unanimously recommended the construction of the railways.

Mr. W. C. Andrews, representing the syndicate which will furnish the money to carry on the work, says: "We are abundantly able to go on with the plan which we have laid out, and we are thoroughly convinced of the entire practicability of the cable system. There is a pressing need in this city of additional street railroad facilities, and to properly appreciate what this demand is it is necessary to study the vast increase of the past fifteen years in the business, traffic and population within the limits of this island. We propose simply to supply New York City with an ideal surface system of communication. It is intended to furnish a thorough system of transit, with due consideration to the convenience and economy of the people and the development of property interests. Our plan embraces three axial lines, partly on the surface and partly elevated, to give continuous transit from the Battery to Harlem River. The other lines are transverse and chiefly surface ones, intersecting the axial lines and connecting with the ferries on the Hudson and East rivers. These axial routes in connection with the cross-town lines will, it is thought by the commissioners, lead to a great improvement in the taxing values of property on the cross streets and lateral portions of the city, which are now comparatively out of the way. The great popular advantage of the system is that a person starting anywhere in the city may, on payment of a single fare of five cents, reach any other point in the city. The system of transfers will be such as to admit of this, and with the least inconvenience to the passengers."

"The plan of a comprehensive system of lines, all under one management and ownership, is desirable to the public who patronize the street railroad, as well as to all others in any way affected. The proposition of the company to carry passengers for single trips over the main line and branches at a single five-cent fare is entirely practicable, so far as the management of the business is concerned, and it presents to that very large class of our people to whom the expense of street car fares is an unavoidable tax, the possibility of choosing comfortable residences far away from the more crowded portions of the city without any increase in this personal tax. A careful study of the existing street car traffic in this city shows that, exclusive of the Fourth avenue horse car line, which makes no separate report, the fourteen other surface roads show, in February, 1885, a market value of 48.61% greater than the par value of their stocks and bonds. Their gross earnings for the

year 1883 amounted to \$8,355,545, equal to 30.17% upon their total capital. An expensive operating system left them still a total, net, of \$2,407,871, or about 8.69% upon the entire nominal capital, taking them good and bad together. Their total market value at this time, distributed on the mileage of 1883, amounts to about \$431,000 per mile."

"There is a wonderful amount of opposition shown to these cable roads, but it is not unlike that which opposed the elevated roads. Lot-owners thought that the iron road was like a Juggernaut to them, but instead it has turned out to them a very Argonaut of wealth. The cable road will undoubtedly be a great benefit to New York. The problem is a growing one every day. There was a passenger traffic in 1874 of 152,927,233. Ten years later (1884) that traffic became 302,183,362. Now, that is an increase of 200%. Carry that forward ten years longer in the same ratio, and it will be 604,000,000. How are these people going to live here and do business? The elevated roads carried 96,000,000 of people last year, and have reached their capacity; all other railroads, 187,000,000, and we are hanging by the strap now, there are no seats for the people who ride. When we get a surplus over that in ten years of 420,000,000 of people who can neither get a seat nor hang on the strap, what are we going to do? This is the exact question before us. A great many people who now ride on the elevated railroads don't like it because they have got to walk a distance at either end to get to the stations. They will take the cable cars because they can ride to their very doors. But there is this fact before us—there is this 420,000,000 to be provided for ten years hence, very soon after these cable roads can be completed; a 420,000,000 who, with all our present methods, can neither get a seat to sit on nor a strap to hang on. That is the problem to solve. And in that question and its solution lies the future interest, growth and welfare of our city."

Our Startling Age.

The following lines, by Citizen George Francis Train, of Tramway note, and who has previously contributed to our columns were specially composed for the STREET RAILWAY JOURNAL.

Genius *en regle* never stands:  
It cuts and carves its own career,  
Making new rules with its own hands,  
Independent of Prince and Peer!

Canals are always dug by rule  
(As Grundy Fashion's Cosmos way  
In Custom Pond of Stagnant Pool;)  
But Rivers flow both night and day  
Untaught in any worldly school.

The Patent office shows what mind  
When Genius mad in world can find,  
To Psycho evolve mankind;  
It laughs at time and shortens space,  
To elevate the Human Race.

Electric currents laugh at steam  
In lightning flashes on machine!  
With wire and type, with light and sound,  
It talks to Cosmos earth around!  
(As pulsæ beats thought with car on ground.)

Fare Register for Trams.

A patent check designed to show the number of passengers who travel in any tramcar to which the patent may be applied was recently tested at Belle Vue Gardens, Manchester, in the presence of the representatives of various carriage and tram companies. A working model of a tramcar, with the patent apparatus attached, was run several times round the large ball-room. In this model are sixteen seats, separated from each other much after the fashion adopted in first-class railway carriages. Each seat rests on mechanism which communicates with a number of rollers in a box at the end of the tramcar. In this box is a long roll of paper, perforated by wheels, which correspond in number with the seats in the car. When a passenger takes his seat one of these wheels is brought in contact with the roll of paper; when he leaves the car the pressure of the wheel on the paper is removed. At Thursday's trial of the patent passengers were represented by weights which were placed on the seats at any point suggested by those who were present. At the end of each journey the box at the rear of the car was unfastened and a portion of the roll of paper was cut off. On each occasion this slip of paper correctly showed the number of seats which had been used and also the length of time each seat had been occupied. The objection to the system is that if a passenger in a car fitted with the patent shifted from one seat to another the roll of paper would apparently indicate two passengers, one of whom had left the car at the point where the other got on. This defect, it was remarked, was sufficient to prevent the adoption of the patent in Manchester, though it might be found serviceable, perhaps, in towns where the tram companies have adopted the system of penny stages.—*Mech. World, Eng.*

A Singular Car Accident.

A horse car of the Fourth and Eighth Street Line, Philadelphia, was passing up Walnut street recently, loaded with passengers, when it suddenly sank into the earth above the wheels, toppling the car slightly on its side. Women and children began to scream, while the men hustled themselves to the platform, eager to make their escape. At the intersection of Walnut and Fifth streets workmen are employed in laying a large water main, and the earth having been dug away close to the track caused the car to break through the road. It was blocked for a long time. None of the passengers were seriously hurt.

THERE WAS A WAILING BABY in a young mother's arms, and that child (it was on a day-time trip) screamed so that all the passengers were uneasy, and all friendly offers failed; whereupon the conductor tapped on the shoulder a man who sat by the window next the driver, and saying "maybe it 'll quiet to see the horses," persuaded him to change seats with the disheartened little mother. The child stopped crying as if by magic. So there was one man who understood his business—to the credit of conductors be it said, they generally do.—*Phila. Ledger.*



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E. P. HARRIS, General Manager.

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### St. Louis Backbone and Generosity.

The Street Railway Managers of the country have had, during the past month, an opportunity of witnessing the demonstration in their St. Louis brethren of two qualities which rarely exist in so marked a degree in combination. We speak of backbone and generosity, both of which are, not only admirable in themselves, but we believe quite essential to successful street railway management.

The position taken by the St. Louis Managers in a strike which occurred at the worst possible time, and the firmness and consistency with which under the most trying circumstances, that position has been maintained, presents to the railway people of America, an example which if always followed, would soon render strikes unheard of.

The generosity shown by the hospitality extended to the delegates of the Street Railway Association and their friends in allied industries, during their stay in St. Louis, could hardly be surpassed. Such generosity—when manifested in the form of courtesy to the public consideration, for the comfort of passengers and welfare of employees, can hardly result in anything but successful railway management.

### Volume II, Number I.

This number of THE STREET RAILWAY JOURNAL is the beginning of a new volume. The past year's experience has proven most conclusively the need of such a journal, and the constant increase in numbers of our subscription list indicates that we have filled that want. Our pages have increased from sixteen to forty in the present issue, and the files are replete with practical matter that is of great value to street railway men. The interests of every Company will be better taken care of if its entire staff are provided with it. Look this number over and order your subscriptions to begin with this volume.

### Euphony and Right Names.

It is said of an ex-conductor the company "let him go" on account of "a small card," or he was caught "knocking down," and "got through." Why not call things by their right names? "Let him go," "small card," "knocking down," "got

through," etc., are comparatively euphonic words, but would it not be better English and more conducive to correct ideas to say, he was discharged for *stealing* fares. Stealing is stealing, whether in the case of a conductor or cashier. In either case it is a crime which is not lightly regarded by the right minded, and should not be smoothed over by wrong words.

### First Count the Cost.

When we mean to build  
We first survey the plot, then draw the model;  
And when we see the figure of the house,  
Then must we rate the cost of the erection:  
Which if we find outweighs ability,  
What do we then, but draw anew the model  
In fewer offices; or, at least, desist  
To build at all?

Henry IV., II, i, 3.

This country is full of metaphorical half-dry wells; some fair and round, well placed, clean-cut and straight, some rough, careless, and in spots where no return need have been expected for the toil of the digger even had he pierced the lowest strata.

Railroads which start nowhere, run through no place in particular, and end in No Man's Land; factories for making impossible things from impracticable materials; societies for producing Utopian results from incongruous members; all these are the half-dry wells of which we speak. The projectors do not count the cost. Since the world got well to spinning through space, it has required money to make the mare go, whether for work, or pleasure, or deeds of mercy.

Nearly three centuries ago, the myriad-minded bard of Avon, writing of times then past by 200 years, put into the mouth of Bardolph, urging caution before hazarding a battle, the quotation with which we head these paragraphs. The caution was then apt and wise; it is no less so to-day and we may apply it with use and profit, in all our on-goings of to-day and of all days to come.

### The Strike at St. Louis.

Early last month a large part of the drivers and conductors on the various street car lines in St. Louis struck for shorter hours and higher wages. A local organization had been formed under the name of the Knights of Industry its ostensible object being benevolence. Such was its character however that it was readily merged with the Knights of Labor, who on complaint being made by street railway employees wrote a formal letter to the managers of the various lines requesting them to call and adjust the difficulties complained of by its members. The official naturally failed to respond to this request, paid little or no attention to the note, and declined to recognize the Knights of Labor.

With the strike that followed and destruction of property attending it our readers have been made pretty familiar by the daily press. Employees hired to take the places of strikers were beaten, attempts made to blow up cars, cars overturned, horses injured, harness cut and in all about \$25,000 worth of property destroyed. The managers of the railways however, made up their minds at the outset to manage their busi-

ness in their own way even at the sacrifice of their property and of the loss of revenues from the immense traffic caused by the Fair then in progress. Within three days the places of the 650 strikers were filled with new men and the companies began to turn away applicants. At last accounts the striking conductors and drivers were either idle or engaged in other pursuits. It is safe to say that those of the strikers who do not regret the action and wish themselves back on the ears at the old wages and hours are the exceptions to the rule.

### Cable Traction for Elevated Railroads.

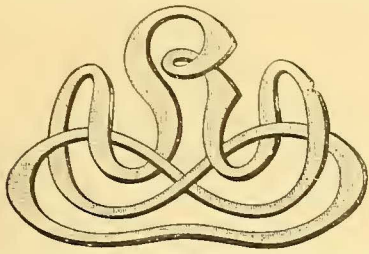
Our worthy neighbor the *Car Builder* in its September issue says:—

The article of Angus Sinclair on the Work of Operating Elevated Railroad Trains, which was published in our July number, has elicited quite a good deal of discussion in the technical press and among railroad mechanical men. The general opinion appears to be that the experiments gave a correct estimate as to the amount of work that had to be done. In several instances exception is taken to some parts of the article, but the general conclusions are not disputed. The STREET RAILWAY JOURNAL thinks, assuming the figures to be correct, "that there is ample reason for looking into the cable system for the shakely elevated railroads of New York." We do not think such a change advisable. An indispensable requirement of a railroad performing traffic of the kind done by suburban and elevated roads is punctuality in the running of trains. The public will insist that trains of this kind shall be operated in the manner that provides the most regular service. To operate the New York elevated roads by cable traction, it would be necessary to keep the cables running at the maximum speed of the trains, which is about thirty miles an hour. Engineers connected with existing cable roads, where the speed is about ten miles an hour, say that it would be impracticable to operate trains with a cable running thirty miles an hour, or that the wear and tear would be enormous. Where cable traction is used, even with the low speed employed, breakages that cause several hours' stoppage of the cable are by no means uncommon. The city of New York would be in great tumult if the Elevated Railroad Company were operating the Third Avenue line by cable, and a break occurred at 4 o'clock p. m., that could not be repaired in less than three hours. There are numerous other objections to cable traction for rapid suburban transit, but as there is no probability of the system being applied to moderately high-speed trains, there is no use in discussing it.

*Propos* of this we might offer, without comment, the following from a N. Y. daily of recent date:—

A derangement of the machinery of the locomotive of one of the Third Avenue Elevated trains, near the Twenty-eighth street down-town station, at 6:40 A. M., yesterday, caused a long interruption to travel, a considerable amount of profanity and loss of money to working men and women who were unable to reach their shops at 7 o'clock. The blockade continued for half an hour and the trains were banked close to each other as far as Eighty-ninth street. The cars were crowded and the third commandment was generally violated. Some of the passengers became so impatient that they walked from the trains to the stations on the side of the track.

We don't think that much argument is needed in this connection!



**American Street Railway Association.**

OFFICERS, 1885-6.

*President.*—Julius S. Walsh, President Citizens Railway Co., St. Louis, Mo.

*First Vice-president.*—Wm. White, President Dry Dock, East Broadway & Battery R. R. Co., New York City, N. Y.

*Second Vice-president.*—C. B. Holmes, President Chicago City Ry. Co., Chicago, Ill.

*Third Vice-president.*—Samuel Little, Treasurer Highland St. Ry. Co., Boston, Mass.

*Secretary and Treasurer.*—William J. Richardson, Secretary the Atlantic Avenue Railway Co., Brooklyn, N. Y.

*Executive Committee.*—C. A. Richards, President Metropolitan R. R. Co., Boston, Mass.; Jno. Kilgour, President Cincinnati St. Ry. Co., Cincinnati, O.; Jno. McGuire, President City R. R. Co., Mobile, Ala.; T. W. Acklev, President Thirteenth & Fifteenth Sts. Pass. Ry. Co., Philadelphia, Pa., and C. W. Woodworth, Secretary Rochester City & Brighton R. R. Co., Rochester, N. Y.

**American Street Railway Convention.**

The Annual Convention of the Association met in the Southern Hotel, St. Louis, Mo., Wednesday Oct. 21st, at 10:30 o'clock a. m. The meeting was called to order by the President, Calvin A. Richards of Boston, and the following delegates were found to be present:—

Highland Street Railway. Sam'l Little, Treas.; J. E. Rugg, Supt.

Metropolitan, Boston, C. A. Richards, Pres.; I. Randall, Supt. Car Cons.

Brookton (Mass.) Street Railway. Horace B. Rogers, Supt.; C. J. Kingman, Director.

Atlantic Avenue Railroad Company, Brooklyn, Wm. Richardson, Pres.; W. J. Richardson, Sec.

Brooklyn City Railroad, Wm. H. Hazard, Pres.

Bushwick Railway Co., W. M. Morrison, Supt.

Buffalo East Side Railway Co., S. S. Spaulding, Pres.

Buffalo Street Railway Co., Henry M. Watson, Pres.

Chicago City Railway Co., H. H. Windson, Sec.; T. C. Pennington, Treas.

Chicago West Division, James K. Lake, Supt.

No. Chicago City Railway Co., V. C. Turner, Pres. and Supt.; Jacob Rehn, Vice Pres.; Augustine W. Wright, Supt. of Track.

Cincinnati Street Railway Co., A. G. Clark, Vice Pres.

Mount Adams & Eden Park Inclined Plane Railway, Cincinnati, J. P. Kerper, Pres.; John Harris, Supt.; Benj. F. Houghton, Pur. Agt.

Superior Street Railroad Co., Cleveland, F. De H. Robison, Pres.

Brooklyn Street Railway Co., Cleveland, A. J. Moxham, Vice Pres.

East Cleveland (O.) Street Railway Co., H. A. Everett, Sec.; G. E. Herrick, Direc.

Woodland Avenue & West Side Street Railway Co., Cleveland, J. B. Hanna, Sec.; J. F. Carl, Director.

Columbus, (O.) Consolidated Street Railway Co., A. Rodgers, Pres.; E. K. Stewart, Sec.

Dayton, Ky. Newport & Dayton Street Railway Co., W. W. Bean, Pres. and Supt.

Dayton, (O.) Street Railway Co., J. W. Stoddard, Pres.; A. W. Anderson, Supt.

Oakwood Street Railway Co., Dayton, O. Chas. B. Clegg, Pres.

Denver City Street Railway Co., D. F. Longstreet, Director.

Easton, (Pa.) & South Easton Passenger Railway Co., H. A. Sage, Pres.

Globe Street Railway Co., Fall River, Mass., John H. Bowker, Supt.

Hartford (Conn.) & Wethersfield Horse Railway Co., E. S. Goodrich, Pres. & Treas.

Citizens' Street Railway Co., Indianapolis, Ind., Tom L. Johnson, Treas.

Jersey City, (N. J.) & Bergen Railroad Co., Charles B. Thurston, Pres.; E. F. Brooks, Engineer.

Lexington (Ky.) City Railway Co., John Cross, Pres.

Long Island City, N. Y. Steinway & Hunter's Point Railway Co., Chas. J. Campbell, Supt.

Louisville (Ky.) Central Passenger Railway Co., Thos. J. Minary, Vice-Pres.

Louisville, (Ky.) City Railway Co., H. H. Littell, Supt.

Lowell, (Mass.) Horse Railroad Co., J. A. Chase, Gen. Man.;

Lyons, (La.) Clinton & Lyons Horse Railway Company, R. N. Rand, Vice Pres.

Memphis City Railroad Co., R. Dudley Frayer, Pres.

Minneapolis, (Minn.) Street Railway Co., Thos. Lowry, Pres.; C. G. Goodrich, Sec.

Mobile, (Ala.) City Railroad Co., John Maguire, Pres.; M. Frohliehstein, Director.

New Albany (Ind.) Street Railway Co., Mrs. L. V. Vredenburg, Treas.

Central Park, North and East River Railroad Co., C. Densmore Wyman, Vice Pres.; J. L. Valentine, Treas.

Dry Dock, East Broadway & Battery Railroad Co., New York. Wm. White, Pres.

Omaha, (Neb.) Horse Railway Co., W. A. Smith, Supt.

Central City Horse Railway Co., Peoria, Ill., H. R. Woodward, Pres.; Eliot Callender, Treas.; Jas. A. Smith and Joseph Elders Director.

Fort Clark Horse Railway Co., Peoria, Ill., J. H. Hall, Pres.

Lombard & South Streets Passenger Railway Co., Philadelphia, John B. Parsons, Pres.

Pittsburgh, Allegheny & Manchester Passenger Railway Co., C. Atwell, Pres.; J. T. Speer, Man.

Pittsburgh, (Pa.) & Birmingham Passenger Railway Co., W. W. Patrick, Pres.

Pittsburgh, (Pa.) Oakland & East Liberty Passenger Railway Co., J. T. Jordan, Pres.

Union Railroad Co., Providence, R. I. D. F. Longstreet, Vice Pres.

Belle City Street Railway Co., Racine, Wis., Chas. Hathaway, Treas.

Rochester (N. Y.) City & Brighton R. R. C. C. Woodworth, Sec.

Saginaw (Mich.) Street Railway Co., F. G. Benjamin, Supt.

Naumkeag Street Railway Co., Salem, Mass. Chas. Odell, Pres.; Wm. B. Ferguson, Supt.

Salem (Mass.) & Danvers Street Railway Co. Benjamin W. Russell, Pres.; Thos. H. Johnson, Director.

Salt Lake City (Utah) Railway Co. Orson P. Arnold, Supt.

City Railway Co., San Francisco, Cal. R. B. Woodworth, Pres.; O. W. Meysenberg.

Sioux City (Ia.) Street Railway Co., E. T. Evans, Sec.

Citizen's Street Railway Co., Springfield, O., D. W. Stroud Pres.

Benton-Belfontaine Railway, St. Louis,

Mo., J. G. Chapman, Pres.; Chas. Parsons, Vice Pres.; Robert McCulloch, Sec.

Citizens' Railway Co., St. Louis, Mo., Julius S. Walsh, Pres.

Lindell Railway Co., St. Louis, Mo., John H. Maquon, Pres.; John H. Lightner, Vice-President.

Missouri Railroad Co., St. Louis, P. C. Maffit, Pres.

People's Railway Co., St. Louis, Mo., Chas. Green, Pres.

Southern Railway Co., St. Louis, Mo., E. R. Coleman, Pres.; W. L. Johnson General Manager.

St. Paul (Minn.) City Railway Co., Thos. Lowry, Pres.

Taunton (Mass.) Street Railway Co., ——— Pres.

Toledo (O.) Consolidated Street Railway Co., J. E. Bailey, Pres.

Troy (N. Y.) & Lansingburg Railway Co., Charles Clemminshaw Vice-President.

The following new roads were added to the Association:

Cream City Railroad Company, Milwaukee, Wis., Winfield Smith, Pres.; Newburyport & Amesbury Horse Railroad Company, Newburyport, Mass., E. P. Shaw, Lessee; Kansas City Cable Railroad Company, Kansas City, Mo., Edward J. Lawless Supt.; St. Louis Railroad Company, St. Louis, Mo., Christian Peper Pres.; Washington & Georgetown Railroad Co., Washington, D. C., Henry Hunt, Pres.; Cass ave. & Fair Grounds Railroad, St. Louis, Mo., W. R. Allen Pres.; Dayton Street Railroad Company, Dayton, O., A. W. Anderson Supt.; Union Depot Railroad Company, St. Louis, Mo., John Scullin Pres.; South Boston Railroad Company, Boston, Mass., Daniel Coolidge Supt.; Des Moines (Ia.) Street Railway Company, M. P. Turner Pres.; Mrs. M. A. Turner, Treas.; St. Clair Street Railway Company, Cleveland, O., Chas. Hathaway Pres., M. S. Robison Sec.

Letters were received from the following regretting the necessity of their absence.

WALTER A. JONES wrote from Carlsbad, Austria, making suggestions as to distribution of officers, and referring to his tour and return to America in December.

WM. MACNAMARA, Pres. Albany (N. Y.) Street Ry.

A. S. CHASE, Pres. Duluth, Minn., Street Ry.

J. W. FOSHAY, Pres. Broadway and Seventh Avenue, N. Y., R. R.

H. C. WHITEHEAD, Treas. Norfolk, Va., R. R.

JAMES GREEN, Sec. Toronto Street Ry.

E. TUSHER, General Manager Montreal, Can., City Passenger Co.

The minutes of the last meeting were adopted as printed, without reading.

PRESIDENT RICHARDS then addressed the convention as follows:

GENTLEMEN OF THE CONVENTION:—

Let me assure you at the beginning, that the first words of your presiding officer, will be to extend to one and to all a hearty, glad and joyous welcome. I welcome you as you come from the sea-washed shores and pine tree forests of New England, and you also who come from her bustling cities and busy towns; I welcome you from all parts of the Empire State, and from the great metropolis, New York City, and you from the sister city of Brooklyn; I welcome you from the great and teeming marts of trade, and from the rich and prosperous

towns of the Middle States; I welcome you from all parts of that boundless Empire of the West; I welcome you from the revived, growing, and regenerated cities and towns of the Sunny South, and I welcome you from the Golden Gate of California. I welcome you all, from the Pacific to the Atlantic coast, and from our Canadian border. Indeed, I extend to one and to all of the representatives of this great and widespread country, a most hearty, cordial, and fraternal greeting.

The convention to which you have been summoned, presents to us among its many benefactions, nothing richer, nothing better, and nothing of deeper import or more lasting value, than the opportunity it offers for the permanent enrichment of those social bonds that have in the past, and will in the future, do so much to encourage, cheer, and benefit in every way these toil-some lives of ours. Indeed, I may say, that in the cluster of advantages that frame these annual gatherings, the social ties that are formed are more productive than anything else for the good work in which we are engaged. And let me hope that the cordial and friendly greetings that you have exchanged together, and the kindly emotions of friendly fellowship, will remain with you as the most pleasant event of this occasion. It has seemed to me the last few hours that the severance between the rails of all our companies was now connected, and the electric current from the batteries within our breasts had flashed from rail to rail, until we were all united in one grand and glorious network of brotherhood, each and all glad and ready to receive and to impart the teachings of their experiences during the time that has passed since our last parting words were said.

With my greetings I also offer words of sincere congratulation. I congratulate you upon the results of a successful year. Favoring circumstances have, as far as I know and can learn, given us all an opportunity to reap from their results what may be termed a good, strong, successful business. I wish just here to remark that in my judgment it is not alone the prevailing low prices of provender and of all materials that are used, that have contributed to that result. Is it not a fact, and may we not continue to look right here for it? Is it not because there is a stronger, and more abiding sentiment abroad, all over the world, as to the real value and importance of the street railway, as a most important factor in the prosperity and growth of every city or town where its rails are laid, and where the merry and enlivening sound of the car bells is heard? Do you not find this to be true, when you consult the statistics and learn the steady, strong and unvarying advance in the value of street railway securities, plainly pointing to a settled fact, that the public believe in their ultimate and permanent prosperity?

The street railway is a domestic institution, it is used around and about our homes, it needs no exhaustive inquiries to ascertain its prosperity or its adversity. The public contribute to its gains every day,

and all days, as they go from their homes to the scenes of their daily employment. The constant dropping of the regular and ever increasing receipts into the treasury, can be seen, contributed to, and understood by all. Again the street railway comes as a benefactor, its mission is to create, not to destroy. It is the pioneer who causes the outlying and waste places to spring up into life. It furnishes an incentive for the ambition, and goes hand in hand with the progress of every city and town. Hand in hand, do I say? No, not that; it marches ahead of the column and flourishes with drum major pomp its invitation to follow. It beckons on the twin brothers, prosperity and progress.

The day has passed and vanished forever, into the dark night of error, when our business can be derided, or put aside. It now belongs to all classes, and especially to the poor. It needs not greater age than mine, or of the majority of you here to-day, to recall the early history of the street railway car. In those days a ride for a poor man was almost unknown, its cost banished it from amongst his pleasures or his necessities. Even the rich rarely rode then for pleasure. Locomotion other than walking was the exception, never the rule. Look at the difference to-day. The horse car has been well named, *it is* the poor man's carriage. The poor, ay the very poor, can now ride for pleasure. The introduction of the open car has developed and opened the door, and has given to the poor man a blessing that comes into his every-day life, to bestow a beneficent privilege. No longer must he and his family be shut up in the hot and crowded city, away from all those sweet and health-giving blessings, that nature has so freely given for his welfare. No need now for those sad and touching lines.

"Oh, but to breathe the breath  
Of the cowslip and the primrose sweet,  
With the sky above my head  
And the grass beneath my feet;  
For only one short hour  
To feel as I used to feel,  
Before I knew the woes of want  
And the walk that costs a meal."

Is there a man here to-day who can contemplate that phase of his business and not feel that he is assisting, as an instrument, in the design of a kind Providence, who careth for, and provides for the poor and lowly, as well as for the rich and prosperous. Often have I felt this emotion as I have been riding out into the country on a pleasant spring Sunday, and have seen the seats of the car filled with the class of people I have spoken of. Here was the father, toilworn and careworn; here was the mother, sickly and shrinking from the unaccustomed situation; and here the little family of children, clean, neat and oh, so happy, all so pleased to simply see the green grass and the blue sky, to hear the birds sing, or to gather the simplest wild flower of the field. Proud, pleased and gratified beyond measure was I, that the means was thus provided that this pleasure, and this health giving privilege was now within the reach of all. And I repeat, it is

because of this and the many advantages to the daily life and wants of the whole community, that makes the STREET RAILWAY a grand factor in the prosperity and progress and perpetuity of our modern civilization.

But let me turn to other matters. We have met to-day, gentlemen, as all conventions of business men meet, actuated by one sole motive,—to exchange the ideas that spring from the knowledge and best thought of our daily business experiences; to give and to receive; and to take back to our homes the newer thoughts derived from an analysis of old and familiar things, and the fresh born intelligence gained from an examination and discussion of new ideas, new inventions, and new theories, that belong to our business. We need that, so that we may return to our labors with fresh invigoration, and with better understanding, and let us hope with a more determined purpose, to do all that lies within us, to elevate and improve the standard of our business. We need it so that it shall continue to hold that high position in public estimation that we desire for it. Let me therefore, gentlemen, beseech you all to enter now into the spirit and meaning of the occasion. It invites your grave and careful participation in these debates, and I ask you not to refrain from giving expression to your ideas upon the subject matter under discussion. I ask you to present to the convention your best and earnest thoughts; so that the light may break in upon matters now darkened by a want of understanding.

I invite you now to this preliminary banquet, enriched by the regular dishes, made from our daily business experience, and garnished with entrees of fresh and novel ideas, the whole festive board decorated, enlivened colored, and sweetened to both the eye and the taste, by those lovely flowers, true brotherhood, fraternal respect, and social affection; so that man's most earnest and most constant want, "true friendship," shall be supported into life so lasting that its years can only be numbered by the days allotted to each one of us to live.

Gentlemen, we will now proceed and open the regular business of the meeting.

The secretary then read the

REPORT OF EXECUTIVE COMMITTEE,

Which stated that immediately following the adjournment of the last meeting the following subjects were chosen for discussion at this meeting, viz:

Diseases common to car horses, and their treatment.

Progress of the cable system of motive power.

Progress of electricity as a motive power.

Repairs of tracks.

Rules governing conductors and drivers.

Taxation and license.

Ventilation, lighting and care of cars.

Committees were promptly appointed and it was expected that from the great variety of subjects to be considered the meeting would be of unusual interest.

Report stated that as all were more or less concerned in them all, no matter what motive power was used, or what was the



nature of construction and equipment, that improvement in street railway methods and appliances was very rapid, and he was a prudent man who kept abreast of the times in these matters; that through the medium of this Association, street railway men were better enabled to keep informed in this matter than in any other way.

MEMBERSHIP.

The Association began its last session in New York with a membership of seventy-four companies, and closed with twenty-eight added, making 102.

During the year twenty-three companies have joined.

Total membership was 125 companies (not including those joining at the meeting), the largest companies with scarcely an exception being enrolled. Indeed there is hardly a city of any prominence in the United States and Canada, that has not one or more street railway companies hailing from it in this Association. All known kinds of successful motive power, from horses, about which we all claim to know something, to electricity, of which the wisest know so little, are in use by our members, while it is quite safe to assume that nearly if not quite three-quarters of the street railway wealth of America, is represented in the association.

FREE PRINTED MATTER.

Committee stated that while the free distribution of its printed matter in the past had been beneficial in adding very greatly to the membership at the last meeting, it was deemed wise to now discontinue the sending of same to non-members. A letter was accordingly sent out by the Secretary setting forth this fact and calling attention to the great value of legal opinions published by the association; and as a result of this letter several new members were added.

SALT.

The publication of the pamphlet giving the report of the committee on the following: "Track cleaning and the removal of snow and ice. Is salt necessary? If so, is its use detrimental to the public health, and especially is it injurious to horses?" and other valuable papers desired in connection with the subject, had been of great value in correcting public opinion on this subject. Reference was made to its beneficial effects in removing obnoxious laws in Philadelphia and in bringing about a change in the code in New York State, whereby the free use of salt is now permitted, whereas it has heretofore been made a misdemeanor.

FIRE INSURANCE.

The idea of a mutual fire insurance company for street railways, having been suggested by President Chas. J. Harrah, of Phila., was discussed by the New York State Street Railway Association, a letter issued by the Secretary eliciting the fire insurance statistics from all the companies in New York State. These showed that the street railway companies were charged an amount far in excess of what they should be.

The Executive Committee of the American Association then took the matter up, a letter being issued to all companies, which

having been received by all we need not here reprint.

The following is a summary of statistics of one hundred and seventy-eight companies as completed from replies to the circular letter referred to:

Total value of property.....	\$22,416,332.13
Insured for.....	14,111,970.03
Percentage of insurance to value nearly.....	.63
Amount of premium paid last year.....	196,540.66
Total loss since operation of roads.....	1,163,807.33
Estimated total premiums paid since commencement of operation.....	3,498,331.24
Percentage of premiums paid back for losses.....	.33.27

In view of these facts the Executive Committee took suitable measures to secure the passage of a law authorizing the formation of a Street Railway Mutual Insurance Company. This law as our readers know was passed and was printed in our issue of June 1885, page 166. The company was then organized, as reported in former issues of the STREET RAILWAY JOURNAL. The committee strongly commended the plan and the company as a means of greatly reducing the cost of street railway insurance.

LEGAL PAPERS.

Attention was called to the legal papers published by the association, reference being made to their great value and companies being urged to forward promptly to the Secretary opinions in cases in which they are interested, whether for themselves adversely decided or otherwise.

REDUCED RATES OF FARE TO MEETING.

Reference was made to the correspondence of the Secretary with the New York Central & Hudson River Railroad, in relation to special rates of fare, and hearty appreciation of the consideration and courtesy of that road was expressed.

The belief was expressed that the time has come when all the steam railroad lines, by reason of the natural sympathy that exists between their business and that of the street railways, should and will gladly secure to the latter the consideration of reduced fares in traveling from one part of the country to another to attend annual meetings.

The report closed by saying that notices had been sent to all street railways in the United States and Canada, inviting the participation of all in so interesting an occasion to the street railway community. Then followed the Treasurer's report, which showed the

Amount on hand Oct. 15, 1884.....	52.06
" received from admissions....	1,300.00
" " " annual dues..	1,755.00
" " " sale of pamphlets.....	157.60
Total.....	3212.60
	\$3264.66

EXPENSES.

Treasurer's salary.....	1,000.00
Printing report of proceedings.....	540.00
Miscellaneous.....	931.96
	2,471.96

Cash on hand..... \$792.70

Mr. Julius Walsh, in behalf of the street railroads of St. Louis, then extended to the delegates an invitation to attend the Exposition in the evening, to take a drive the following day to the fair grounds, take lunch and inspect the parks of the city, and

on the evening of the third day to participate in a banquet.

On motion of Mr. Wm. Richardson, the invitation was accepted with thanks.

The Sec'y then read the report of the special committee on Diseases Common to Car Horses, and Their Treatment. The report being of great length and containing a great many technical words and phrases, on motion of Mr. White of N. Y. only the conclusions were read. The substance of this report together with remarks made thereon by Mr. White of N. Y. and Mr. Cleminshaw of Troy, will be given in a later number of the JOURNAL.

MR. AUG. W. WRIGHT of Chicago then read the report of the special committee on the Progress of Electricity as a Motive Power, after which the convention adjourned to meet at three o'clock P. M.

AFTERNOON SESSION.

Meeting called to order at three o'clock. The Sec. read the report of the special committee on Repairs of Track. Some positions were taken relative to the life of hemlock and spruce for ties and sleepers, from which Mr. Hazzard of Brooklyn dissented, and at his suggestion the discussion of the report was deferred until Mr. Moxham of the committee could be present, when he desired to give the result of his experience against the conclusions arrived at in the report. On motion the report was accepted.

The discussion of Mr. Wright's paper on the Progress of Electricity as a Motive Power was then taken up. The conclusions of this paper may be summarized in the statements that while there is much interest and some expectation on the part of street railway men as to the future of electricity as a motive power for street railways, the results as yet attained have not demonstrated its practicability and economy. Attention was however called to the Bentley-Knight Co.'s offer to put in their plant, the payment for which should be entirely conditioned upon its economical and satisfactory results to any street railway company who saw fit to avail themselves of the offer.

MR. HERRICK from Cleveland made some remarks on the Cleveland experiment with the Bentley-Knight system, the substance of which was that as yet the system had not proven itself either economical or satisfactory as to the uniformity and control of speed and the ability to stop and start at pleasure.

Mr. PARSONS of Philadelphia, made some remarks as to his observation of the test of an electric motor, saying that its speed and power were very much less near the end of the route than at the beginning. He could get no data as to the cost, and the system must have a third rail. He thought some motor besides horses would soon be used for propelling street cars, but as yet his experience in the matter of electricity had not been satisfactory.

THOMAS L. JOHNSON of Cleveland gave as the result of his observation of the Cleveland experiment the opinion that it was neither economical or otherwise satisfactory.

MR. WILLIAM RICHARDSON of Brooklyn

made some remarks as to the result of the Cleveland experiment and a test witnessed sometime since by him at Menlo Park; he thought the plant in the latter case altogether too expensive to render the system practicable. He was glad to hear of the offer made by the Bentley-Knight Co., where they offer to take the chances on the success of their system. He also referred to the use of the Daft system in Baltimore. He read a letter received from Mr. T. C. Robbins, General Manager of the Union Railroad of that city. Mr. Robbins said that since Sept. 1st, 1885, two motors, two cars each, had been at work on that road, and that two more had been ordered, each motor costing about \$2,000; each requiring steam power costing about one-half that of horse power for same work, the cost of the plant being about \$12,000. Cars run every half hour; maximum grade being 353' to the mile, and in one place the cars run on a curve 90' radius and 40' grade, and in another 350' grade on a curve of 70' radius equaling 470' grade on a straight track. Mr. Robbins considered the system entirely satisfactory and asserted that with the Daft motor electricity is under as complete control as when used for telegraphy or electric lighting. He gave as advantages more speed and less dirt. He was satisfied that in the matter of cost the figures would show in favor of electricity; he farther added that the conduit (above ground) cost \$2,000 a mile.

MR. HERRICK of Cleveland, when asked why he did not give the cost of running by electricity in that city, said he did not consider figures as to dollars and cents in place when "it did not run at all."

MR. LONGSTREET of Providence, said that he granted the Bentley-Knight people permission to try their system on his road, but after obtaining it they confessed that they would be unable to propel his cars as cheaply as it could be done by horses.

MR. RICHARDS, of Boston, made a similar report.

MR. WINDSOR of Chicago, had no less authority than Cyrus W. Field for the assertion, that while cars may be run by electricity and with reasonable speed, that they could not be run as cheaply as by horses was beyond a doubt. He made some assertion as to the loss of power in the Chicago Cable R.R., in reply to some previous remarks of Mr. Wright; but this, and the response of Mr. Wright, were ruled out of order.

MR. WM. RICHARDSON thought that all should make further inquiries as to the Daft experiment in Baltimore and watch it.

MR. HAZZARD spoke of a previous experiment of the Daft system.

The report of the special committee on the Progress of the Cable System of Motive Power having been read by the Secretary, was then discussed. As this report will be given at length later in the STREET RAILWAY JOURNAL, we will not repeat it here. Some interesting figures were given.

MR. LAWLESS, formerly of San Francisco, now of the Kansas City Cable Road, made remarks showing the favorable working of

that road, and stated that the traffic was much larger than had been anticipated and was beyond the capacity of their present equipment. Said the beauty of the system was, that having the reserve power which should always be provided, the road was ready at any moment for a practically unlimited amount of traffic by simply adding cars. He gave as the life of the cable in San Francisco on the Sutter Street road eighteen months, and on the Clay Street twenty-four months. He thought about seven miles per hour a desirable speed for the cable to travel. He favored long cables. The longest he knew of was that in St. Louis, 35,000'. He then gave some figures as to the cost of road, but being uncertain in his own mind we do not reproduce them.

MR. LONGSTREET asked if cars could be run on level road by the cable system more rapidly than the cable travels; also if it was practicable to gain speed on down grade by releasing the grip.

MR. LAWLESS replied that it was not usual to gain speed on down grades by letting go of the cable, but that it was done by drivers in some instances to gain time.

MR. D. J. MILLER, Engineer of the Third Avenue Company's Cable R.R. of N. Y., referring to Mr. Longstreet's question, as to the possibility of running cars more rapidly than the cable traveled on level road, said it could be done for a few feet, owing to the cable regaining its slack, but the amount was so little as to be of no account in practice. He said that in New York the cars do release the cable on down grades and thereby gain time. Said that the New York Cable Road runs its cable eight miles an hour. Various improvements had been made in the tube for cable railroads. Mr. Miller when asked under what patent the most improved tubes were built, did not reply directly, but from his remarks was inferred that various conflicting claims were made. In reply to the question how much did the N. Y. Cable Road cost a mile, he said about \$90,000, including the cable and carrier wheels, but not including the pavement. This was for new road.

MR. LAWLESS spoke of the increase in value of real estate on cable roads. In reply to the question whether the Market Street road in San Francisco was built under later patents than the earlier roads, said, the patents were substantially the same, the only improvements being in minor detail.

#### THURSDAY MORNING SESSION.

The discussion of the Special Committee's report on the Repairs of Track was taken up.

MR. WRIGHT of Chicago gave, as the result of several hundred experiments with different kinds of spikes in the same wood, and the same spike in different kinds of wood, the general conclusion that the holding power of spikes was found to be in proportion to the friction on the surface; thus the same metal in four  $\frac{1}{4}$ " spikes presenting twice the surface would hold twice as much as one inch spike. Regarding the durability of timber he called attention to the fact that it was dependent largely upon such

circumstances as the time of year at which it was cut, whether it had been girdled, whether it grew upon high or low land, and especially whether it was well seasoned; stated that low land timber being porous and sappy was much less durable, and if girdled the timber had lost its life and was therefore less durable than it would otherwise be. He said that on their road, timber was all thoroughly air seasoned, most of the stringers being piled up three or four years before using them. He spoke of taking out last year some pine ties which looked as good as new after laying nine years and new track was relaid on the old ties.

MR. ATWELL of Pittsburgh thought water-soaked timber would last longer and warp less. He asked Mr. Wright if this opinion was founded on fact, to which Mr. Wright replied that water-soaking for removing sap was a very good substitute for air seasoning.

MR. HAZZARD of Brooklyn thought that spruce of all timbers was the poorest for places where it was alternately wet and dry; thought hemlock much better, but much the same; white and yellow pine for wet and dry places he found to be about equally durable. He said that, while lumber kept constantly wet would not rot, if taken out and replaced it would soon decay. He spoke of timber lasting 60 years below low water mark, and of removing Manhattan water pipe in excavating for the N. Y. Produce Exchange, which had been laid at least 50 years; the latter not being in a wet place but having been kept from the air. He had yet to find a rotten log below low water mark. The time of year of cutting had much to do with durability of timber and the farther it was under ground the better it would last. Used oak and chestnut ties and yellow pine stringers; thought high ground white oak the best for durability. In reply to the question as to the durability of cypress said he knew little personally about it, but believed that the average life of ties on the Brighton Beach steam road was five years, the ties being on the surface of the ground. Believed yellow pine the best to lie still and straight. In reply to a question could not say as to the effect of salt for preserving timber but ships in which salt was carried were said to be preserved from decay.

MR. MOXHAM thought the question difficult to deal with by the committee excepting in one way, and that was to give as large a fund of information as possible, drawing only certain general conclusions, leaving the individual roads to make special applications of the data, according to local circumstances.

MR. WHITE thought that while stringers might be in good condition apparently when removed for relaying track, he would not advise relaying them if they had lasted nearly the natural life of the timber, as their exposure to the air and relaying under different circumstances would most invariably cause them to rot.

MR. THURSTON of Jersey City called attention to different soils and pavements as

affecting the life of timber, saying that in their experience timber lasted longer in damp than in sandy soil.

President RICHARDS thought soil was the touchstone of the whole matter.

MR. PAGE, of Easton, spoke of the influence of rafting logs down the river upon their durability.

MR. JOHNSON, of Cleveland, thought street sprinkling tended to very greatly lengthen the life of timber; had taken up oak ties which had been laid twenty years where the streets were constantly sprinkled and found ninety per cent of them good.

MR. HAZZARD said that white hemlock would last much longer than red.

MR. ATWELL, of Pittsburgh, called attention to the fact that rats would not trouble hemlock.

MR. LITTELL, of Louisville, spoke of three quarters of a mile of track laid in 1864 in which not more than twenty stringers had ever been renewed. Stringers were of white hill oak, floated down the river in the log, track paved with cobble stone, a part of it constantly sprinkled and a part of it not. In reply to a question from Mr. Wright, Mr. Littell said the rails were of iron 45 lb. 5" tram, and had never been renewed but had been repunched.

MR. WOODWARD, of Rochester, spoke of some track fifteen years old.

In reply to a question from Mr. Hazzard, Mr. Johnson said he attributed the longer life of timber where streets were kept sprinkled to their exclusion from the air.

MR. LITTELL thought that oak ties and streets kept constantly sprinkled would last twice as long as where not sprinkled.

MR. RICHARDS thought the debate was on questions the answers to which were foregone conclusions.

MR. MAGUIRE, of Mobile, spoke in favor of creosote as a preservative of wood; in their country pine was largely used but cypress would stand the hot sun and rain better.

MR. CLEMINSHAW spoke in favor of Southern pine. The opinion was expressed that the holding power of spikes was of minor importance as the heads would wear off most invariably before the spike would draw.

MR. SMITH, of Milwaukee, made a few remarks, after which on motion the committee's report on Repairs of Track was accepted.

The special committee on the Rules for the Government of Conductors and Drivers, then reported through the Secretary.

#### RULES REGARDING THE CONDUCT OF CONDUCTORS AND DRIVERS.

The report contained many interesting points. We shall endeavor to find space for it in a later number, but as the discussion is intelligible without the report, we give the substance of the remarks which followed.

MR. LAWLESS, of Kansas City, thought the driver should look out for possible passengers and the conductor on the rear of the car should give his attention to the accommodation and comfort of passengers inside the car. The opinion was expressed that the driver had all he could do to look after

his horses, to which Mr. Lawless replied that his experience being with cable roads "horses" were under complete control of the driver.

MR. WHITE, of New York, in quite extended remarks emphatically expressed the opinion that in no material respect could the street railway companies' treatment of the public be improved, that not one complaint reached him out of one million passengers carried, and he thought that if there were many he should hear of them. "If there be no rejoinder to this assertion," he said, "let us consider it conclusive as the sense of this meeting." He would submit that the street railway companies were victims of the grossest misrepresentation on the part of the public and the press.

MR. FRAYZER thought it best in hiring conductors and drivers to in all cases, if possible, hire those who are natives of the city, and whose interests were identified with it; thought that foreigners were much more apt to create dissatisfaction among employees.

To the remark of Mr. White, that eternal vigilance is the price of success in street railway business, that night and day the street railway manager was on the alert for the improvement of his system of operation, Mr. Littell thought eternal vigilance is the price of liberty, to which Mr. White responded, concurring with what Mr. Littell said, and stating that if he were to sacrifice his independence in the street railway business he would get out of it at once.

MR. KERPER thought that when strangers came well recommended they should be taken in.

MR. PARSONS, in the course of an interesting talk, said that if street railways could select their employees from among those who intended to make railroading a permanent business, instead of from those who merely embark in it as a make-shift, a large part of the difficulty in management of conductors and drivers would vanish. He thought that either the companies had not educated the public up to the point where it regarded railroading as a respectable occupation, or such men were not selected as to give it that position in the public mind; that a large proportion of those who presented themselves as applicants were only interested in their day's wages. As many changes were now necessary as before the register and punch were introduced. Thought the driver should look out for passengers, and that it was a great improvement to exclude passengers from the front platform as rigidly as possible.

MR. THURSTON, of Jersey City, dwelt upon the importance of requiring conductors and drivers to report at once the full circumstances of any accident which should occur on their line, getting the names of witnesses; that he made the first accident merely a cause for suspension, while the second was regarded as sufficient reason for discharge.

MR. WRIGHT, of Chicago, was much surprised at the representation of the character of employees in Philadelphia, stating that

they had men who had been in the employ of the company 20 years, and that there was no reason why they should not be 20 years more.

MR. WYMAN, of New York, thought that commiseration should be tendered the roads of Philadelphia for the condition of affairs represented by Mr. Parsons. On his road he had 75 men who had been in the employ of the company a year or more, and others ten, fifteen or eighteen years. With him employment was not sought as a mere temporary resort, but railway employment was considered desirable. He had applications from mechanics who wished to have steady work, even at lower wages than they were accustomed to, and from clerks in brokers' offices, and various similar positions of life. He thought the street railway companies paid higher and got a better class of help than any other class of employers in the country; men could be secured with sufficient politeness and courtesy for their positions.

MR. WINDSOR, of Chicago, thought one of the strongest bonds of union between employer and employee might be formed by encouraging the men to save their wages, and he thought it practicable and advisable to reserve such deposits, to receive deposits of such earnings and to allow interest on them, and said that his company had now \$40,000 of its employees' money on this plan.

At this point a letter was read from Mr. C. B. Holmes, of Chicago, expressive of his regret at his inability to be present, and expressing satisfaction with the year's work with his cable road.

The Chair then appointed the following committee on nominations of officers for the ensuing year: Messrs. Cleminshaw, Longstreet, White, Green, Johnson, Kerper and Wright.

#### FRIDAY MORNING SESSION.

MR. WHITE, of New York, spoke against the present departure from the former rules in allowing reporters of the press to be present.

MR. CLEMINSHAW, of Troy, also spoke in the same vein.

MR. FRAYZER, of Memphis, Tenn., thought reporters should be admitted.

A letter was read from Walter Jones, from Carlsbad, Austria, regretting his inability on account of ill health to prepare a report of his committee on the "Ventilation, Lighting and Care of Cars." It was best, however, to discuss the subject without report.

MR. WOODWORTH, of Rochester, N.Y., desired information on the washing and cleaning of cars.

MR. HAZZARD, of Brooklyn, said he employed men for this purpose, and had a room especially devoted to it, using hot water in the winter and cold water in the summer, with bristle brushes made for that purpose, and gave special directions to his cleaners to use different brushes to get the mud off the cars.

MR. CLEMINSHAW had a man and room for the purpose, which was heated in winter.

MR. RICHARDS, of Boston, thought there was nothing the public more desired than clean cars. Said that his plan was substantially that of Mr. Hazzard. Thought it important to have the car house detached from the stable, in order that the odor from the barn would not affect the cars. In reply to a question by Mr. Hazzard, Mr. Richards said, regarding signs in cars, that he was formerly applied to by ladies' church fairs, theatres, etc., and found it a great source of annoyance. But he had now leased the advertising privilege in all his cars, and not only found it a great relief, but that the patrons of the road actually liked to see the advertisements in the cars. He only reserved space for their own official notices and the privilege of posting on the dashboards any attraction of the day, like base ball games, etc. He said that the ladies felt gratified to have something for the gentlemen to look at, especially the gray headed ones, when they entered the car, instead of staring at them. The only restriction placed upon the contract matter of the advertising privilege was that nothing should be placed in the cars objectionable to him (Mr. Richards). He said he finally let the front windows for stained glass advertisements. They never allowed dodgers to be hung up in the cars to strike the passengers' faces. In reply to the question as to what he received for the advertising privilege in his cars, he said it was between \$2000 and \$3000. He also stated that he sold the privilege of selling newspapers in his cars to a contractor who uniformed his boys, and took the risk of injury to them. For this privilege he received a number of hundred dollars. He subsequently stated that for the entire advertising privilege of all cars they receive \$4000. He would advise the street railway companies to take this course.

Recurring again to the car cleaning subject, Mr. Wright, of Chicago, said they had a room heated in the winter in each car house in which to wash cars. To a question he stated that he had heard of no difficulty on account of the heat affecting the car washer. Different brushes were used on different parts of the car and hose pressure was also made use of. In reply to the question what water cost, he said twenty cents for the first hundred thousand gallons and eight cents afterward. Said that their cars were put through the car house and varnished yearly as a rule.

MR. TURNER used salt on the platform to prevent water from freezing, after washing the car, before it evaporated.

MR. ATWOOD of Pittsburgh had the dashboard washed every trip. Stated that water should not be allowed to freeze on the car.

MR. CLEMINSHAW thought this the most important subject yet brought up for discussion; his cars were washed and dried before removing from the room to prevent injury to the varnish; thought that care in this direction paid well by preserving varnish.

MR. LITTELL thought a good quality of sheep's wool sponge was preferable to

brushes or other devices for cleaning cars.

MR. WM. RICHARDSON had separate men for cleaning cars who understand the business.

MR. WHITE of New York said he kept thirteen cleaners busy day and night, one of whom was a foreman receiving fifty cents more a day than the others, and was held responsible for the work.

MR. RICHARDS, at the request of the Convention, made somewhat lengthy but very interesting remarks descriptive of his system of management which we shall give at length in a later number of the STREET RAILWAY JOURNAL.

WM. RICHARDSON of Brooklyn, thought that no matter how large the road, the President should meet personally every conductor and driver hired, and see every horse bought. He thought best for conductors to turn in money every trip. He would not hire a new man unless the applicant could get one of the old men on the road to brake him in. He had blanks on which the conductor must report every accident. The company's surgeon was always sent in case anyone was hurt no matter through whose fault.

In reply to a question by Mr. Hathaway, of Cleveland, Mr. Richards said his conductors must always know how to drive. He said, "tow boys" made good drivers.

MR. RICHARDSON never made drivers conductors, and always promoted receivers, starters, inspectors, etc., from the ranks of conductors.

MR. WOODRUFF of Rochester, has trouble with tow boys, and thought it better to hire men for driving horse to help car up hill.

MR. WHITE of New York, employed men at \$1.75 per day.

The following officers were reported by the nominating committee for the ensuing year, and were elected unanimously.

President—Julius S. Walsh, St. Louis; First Vice President—Wm. White, New York; Second Vice President—C. B. Holmes, Chicago; Third Vice President—Samuel Little, Boston.

Executive Committee—C. A. Richards, Boston; Jno. Kilgour, Cincinnati; Jno. McGuire, Mobile; T. W. Ackley, Philadelphia, and C. C. Woodworth, Rochester.

Secretary and Treasurer—Wm. J. Richardson, Brooklyn.

Motions were made by Mr. White, to return thanks to special committees for their able reports; to the retiring President for his efficient services, and the press for reports of meetings.

MR. CLEMINSHAW moved to thank the Secretary and Treasurer for his efforts in behalf of the Association.

MR. WRIGHT moved to thank the friends of St. Louis for their whole-souled hospitality.

On motion the officers of the St. Louis Fair grounds were also thanked for their hospitality.

Brief remarks were then made by the retiring President, and Mr. Walsh the newly-elected President was introduced, and also spoke briefly.

The convention then adjourned to meet in Cincinnati, on the third Wednesday in October next.

### The Banquet.

The banquet given the delegates to the Street Railway Convention and their friends in the Southern Hotel, St. Louis, on the evening of October 23, was one of the finest ever given in that magnificent house.

Julius S. Walsh, the newly elected President of the Association, presided. After the numerous dishes and delicacies of an elaborate menu had been served, with flowers, plants, beautiful decorations, and in the sound of the sweet strains of an orchestra, employed for the occasion, and a happy speech by the President, the following toasts were proposed by him.

[We regret that our lack of space prevents us from giving an abstract of the speeches which abounded in wit, wisdom and even in some cases verging upon sublimity and pathos.]

#### TOASTS.

"Our Guests." Response by President Thomas Lowry, of Minneapolis.

"Our Retiring Officers: As a reward for their services, they carry with them the respect of the Association, and the conscientiousness of duties well done." Response by President C. A. Richards, of Boston.

"Our Homes: Mid scenes of business and pleasure our hearts fondly revert to home." Response by President William Richardson.

"Our Patrons: As all classes are our patrons, we support all classes when they wisely decide to ride." Judge C. H. Krum, of St. Louis.

"Our Employees: That labor is best which is based upon confidence, honesty and good will." Response by Supt. Aug. W. Wright, of Chicago.

"Our Absent Friends: Remembering with affection, we deeply sympathize with them in the loss they sustain by their absence." Response by President William White, of New York.

"The Supply Men: What would they be without us; and where would we be without them." Response by Secretary H. C. Simpson, of the Lewis & Fowler Manufacturing Company.

"The Press: The mirror of civilization. May it never reflect anything but the truth." Response by E. P. Harris, of the STREET RAILWAY JOURNAL.

Judge Barrett, of Minneapolis, being present, also spoke, being called upon by the President. Laughter and frequent applause showed the hearty appreciation of the various speeches, and also the recitations of the celebrated Gus. Williams, who was present.

The St. Louis street railway people entertained the delegates, and their friends, by giving them drives to the exposition, to the Fair grounds and city parks, and by a royal banquet. The last named is described elsewhere.

### The Street Railway Journal Exhibit at the Convention.

The exhibit of Street Railway Appliances at the Southern Hotel, St. Louis, under the auspices of the STREET RAILWAY JOURNAL, embraced the following:

THE JOHN STEPHENSON CO., New York, showed a section of car platform with latest improved draw head, step, and windlass handle; a pedestal and fixtures of their most perfect super spring running gear with life guard attached. Also a section of car body which exhibited their new sash with metal stiles, the glass being held in rubber grooves, preventing noise and rattling, and giving larger scope of vision; telephone, by which seated passengers can communicate with the conductor; improved signal light, giving a distinguishing color to the car at night and also containing lettering to indicate special route.

LEWIS & FOWLER M'F'G Co., Brooklyn. The "Alarm" Passenger Register operated mechanically and by electricity. "Randall's" Improved Running Gear. "Small's" Automatic Fare Collector. "Naylor's" Patent Sash & Blind Spring. "Otis" Safety Coupling Pin. "Van Tassel's" Patent Brake Rod, &c., most of which are familiar to street railway people, but some of which we shall describe in a later issue.

ANDREWS & CLOONEY, New York, showed a variety of patterns of car wheels, springs and street railway castings. They also exhibited in the city, one of their most improved street sweepers, before which ten horses were driven.

THE RAILWAY REGISTER M'F'G Co., Buffalo, Beadle & Courtney, agents, New York and Philadelphia, showed the Bell Punch and Monitor, Benton, Pond, Hornum and Chesterman Fare Register's.

BEADLE & COURTNEY showed a sample of the Eureka Folding Mat.

E. W. ROSS & Co., Springfield, O., showed a heavy power Feed Cutter of which they make a full line for street railways. The machine will cut hay from one-eighth of an inch in length up, a four horse power machine cutting five tons per hour. Has upward cut adjustable self-feeding rollers. More will be said later about this very useful machine.

W. G. PRICE, St. Louis, a new patent Fare Box with "push back" so designed as to ring a bell when pushed back and fare or ticket deposited, but would not ring by merely pushing back without depositing fare or ticket. The bell is caused to ring by the coin or ticket obstructing two combs from passing through each other and not by weight of ticket or coin.

SHOBE & EDGAR, Jerseyville, Ill., showed a system of Metal Street Railway which we shall describe later.

J. H. PITARD & Co., Mobile, Ala., showed a new Brake Shoe for street cars provided with wooden face with end of grain to the wheel.

NEVERSLIP HORSE SHOE CO. Shoe with removable steel centre calk.

CUTTER REVOLVING CAR CO., Galveston. A car which is itself supplied with a turn table. May be turned at any place in the street. Gearing is claimed to be lighter, cheaper and more durable than the ordinary gear.

P. GOLDMAN, New York. An assortment of Uniform Caps, including his patent Spring Top Cap, which is so supplied with springs as to keep its shape in all kinds of weather and under all kinds of treatment.

W. L. EVERIT, New Haven, Conn., Everit's patent Ornamental Car Window, so constructed as not to rattle, and to be readily handled.

Everit's patent Car Floor Rack, a cheap and clean floor covering.

COVERT M'F'G Co., West Troy, New York. A line of chains, snaps, halters and various economical devices for street railway harness.

G. B. GREENSFELDER & Co., St. Louis. Sponge, Chamois, &c.

J. P. REASONER & Co., Halstead, Kansas. Street Car Starter, patented by Emil Utz.

STARK NUT LOCK CO., St. Louis, Mo. A new Nut Lock with groove in nut and bolt and spring key to hold nut in place.

TOM L. JOHNSON, Indianapolis, Ind., showed samples of his improved Fare Box, which is already familiar to the street railway public.

D. F. LONGSTREET, Providence, R. I., showed the Providence Girder Rail, which has already been freely described in the STREET RAILWAY JOURNAL.

THE JOHNSON STREET RAIL CO. showed sample of Rails, Frogs, &c., of which we hope to say more later.

Considerable attention was attracted by the devices shown, some of which were entirely new, and it was frequently said by street railway men, that the exhibit added materially to the interest of the Convention. It would not be surprising if this small beginning was the nucleus of a large and interesting annual display of Street Railway Appliances.

### Convention Briefs.

The St. Louis Cable road was visited.

The John Stephenson Co.'s exhibit attracted much attention.

It was the kind of a convention to make absentees wish they had been there.

The Brownell & Wight Car Co., had carriages at the hotel, for all who wished to visit its works.

C. A. Richards said at the banquet: "I have heard of three important cities, somewhere in the Northwest, Minneapolis, St. Paul and Tom Lowry."

H. C. Simpson in response to a toast at the banquet told an amusing true story, showing the potency of banquet in reducing the amount paid for leases of street railways.

F. T. Lerner, of Andrews & Clooney, made a very satisfactory display of one of their largest size street railway sweepers with ten horses before it. It takes about ten horses to make a good team for Lerner.

The following gentlemen went to the

convention in special Parlor car, "Marlbough & St. Nicholas," as guests of the Lewis & Fowler M'f'g Co., Messrs Andrews & Clooney, and the National Car Spring Co:

Presidents—C. A. Richards President, of the Convention; D. W. Russell; Chas. Odell; E. P. Shaw; John Gordon; C. G. Goodrich; J. S. P. Speer; Chas. Atwell; A. L. Rogers; E. S. Goodrich. Directors—T. J. Johnson; Mr. Chase; G. J. Kinman; John Ryer; D. J. Miller Chief Engineer (Cable System.) Superintendants—W. B. Ferguson; Danl. Coolidge; J. H. Bowker; Wm. Morrison; Chas. Campbell; H. B. Rogers; Isaac H. Randall; John W. Fowler; F. T. Lerner; H. C. Simpson; Wm. Silver; E. Pace; John England; T. Bishop; Chas. Stearns.

The following supply men, were among those present at the Convention: J. W. Fowler; F. T. Lerner; D. W. Pugh; H. C. Evans; W. Meisenburg; H. C. Simpson; E. Packer; L. E. Roberts; J. H. Small; R. G. Mattern; Jno. S. Pugh; S. E. Lincoln; N. G. Price; M. A. Hunt; C. A. Edgar; S. H. Frohlichstein; S. Brady; O. M. Edgerly; J. S. Silver; W. S. Silver; Chas. Hathaway; A. W. Slee; W. P. Williams; A. S. Littlefield; C. G. Stearns; Edw. Beadle; Jno. Courtney; A. L. Johnson; Wm. Sutton; Geo. Morris; Geo. S. Brown; A. Rapp; Edw. Brill; Geo. H. Kirk and Mr. Brownell.

### The Effects of Strikes and Riots.

The question is sometimes asked, Why do great corporations yield to the demands of strikers, who seize on their property, obstruct public and private business, threaten life and limb, and generally clog even if they do not actually injure the wheels of human progress?

Perhaps the answer to this will be suggested by the following paragraph from Macaulay:—

"In the meantime, the effect of the constant progress of wealth has been to make insurrection far more terrible to thinking men than maladministration. Immense sums have been expended on works which, if a rebellion broke out, might perish in a few hours. The mass of movable wealth collected in the shops and warehouses of London alone exceeds five hundred-fold that which the whole island contained in the days of the Plantagenets; and if the government were subverted by physical force, all this movable wealth would be exposed to the imminent risk of spoliation and destruction."—*Hist. England, Vol. I., Chap. 1.*

If for "insurrection" we substitute "riots," and for "maladministration" we read "impudent and extortionate demands," the first sentence, written thirty years ago, in reference to events which took place prior to the Restoration, we find in great measure applicable to New York or Cleveland or Chicago.

The Convention report and other matter so crowds this issue that we are obliged to carry several valued favors over till next month.

## Notes and Items.

[All our readers are particularly requested to send us, at the earliest possible moment, notes concerning actual or proposed improvements in street railways. It is by this means that the STREET RAILWAY JOURNAL will increase its usefulness to each one who receives it.]

THE PEOPLE'S LINE, Springfield, (O.) is extending about half a mile.

THE NASHVILLE CITY has been consolidated with the Nashville & Edgefield.

THE ST. NICHOLAS AV. (N. Y. City) road was incorporated at Albany, Oct. 26.

THE NEWPORT, R. I., people are excited over a proposed new street railroad. It is chartered but not located.

THE SPRINGFIELD, (O.) Street Railway will construct about two miles of track using Johnson 40 lb. rail.

WYMORE (Neb.) & BLUE SPRINGS is a new street railway building about two miles of track. Reynolds's Bros., proprietors.

ATHENS, GA. The Classic City Street Railroad Co., has awarded the contract for building its road to James G. Scott.

WABASHA, MINN. The Wabasha Street Ry. Co. has obtained a charter, but has not commenced work as yet on the road.

DAVENPORT, IA. The Brady Street line belongs to the Davenport Central Street Ry. Co. The City Ry. Co. is leased by H. Schuitger.

THE CHARLES RIVER, Cambridge, Mass., road have a four cent fare on one of their lines, the result of the competition with the old company.

MONTGOMERY, ALA. The Capital City Street Railway Co., has increased its capital stock and will extend its lines and build a large stable.

THE CITIZEN'S STREET RAILWAY, MEMPHIS TENN., has gained the suit permitting it to build tracks and will at once construct and equip its lines.

NEW YORK CITY. The Aldermen have granted franchises for cross-town lines on every street but one from Twenty-ninth to Thirty-fourth Street.

CROSS-TOWN LINE FRANCHISES IN NEW YORK. The Aldermen have granted franchises for roads through Thirty-second and Thirty-third Street.

CAMBRIDGE, MASS. The difficulties between the Charles River Street Ry. Co. and the Cambridge Company are still an unsettled question.

STERLING, ILL. The street railway here is as yet only a scheme on paper. The prospect of the enterprise being pushed through is said to be very slight.

MONTREAL, CAN., is to have a system of elevated railways through the principal streets, and around the mountain and to the surrounding villages.

NEW YORK ELEVATED SUTS. William Watson and others have been awarded a verdict of \$19,600 damage by the Park Place and Church Street station.

KANSAS CITY CABLE CO. The officers of the company, recently elected, are Wm. J. Smith Pres. and Treas.; Wm. H. Lucas Sec. and Auditor; Edward J. Lawless Supt.

BELLEVILLE, ILL. The Citizen's Horse Ry. Co., is an enterprise as yet all on paper. Its promoters, we understand, are not very sanguine of an early completion of the scheme.

PITTSBURGH, PA. The officers of the Union Passenger Railway Company, for the ensuing year, are Pres., Chas. Atwell, Sec. C. Seibert; Tres., J. J. Donnell; Cash., Saml. C. Hunter; Supt., James C. Cotton.

THE BLEECKER ST. (N. Y.) cars now run down Broadway to Ann St. Mr. Sharp has secured all the privileges from the courts which he claimed, and which Com. of Public Works Squires denied his right to.

LACROSSE (WIS.) CITY RAILWAY CO. The officers of this company for the ensuing year are:—Geo. F. Guud, Pres.; B. E. Edwards, Vice Pres.; Fred Tillman, Treas.; Mills Tonetellotte, Sec.; George Smith, Supt.

CHARLOTTE N. C. is soon to have a line of street cars propelled by electricity. The line is to be built by a Chicago firm, who will furnish the electric engines to propel the cars. Work, it is said, will soon be commenced.

SOUTH CHICAGO ST. RY. CO. This company has just placed an order for three new cars with Messrs. Robinson & Hitt, of Waterloo, Ia. This is the second order placed with the same parties within the last few months.

MELBOURNE, AUSTRALIA. Messrs. Dankes & Barnes write us that they have contracted with the Victoria Government to work a line of street cars with their new Tram Car Motor. They expect to have their cars running next month.

NEW ORLEANS EXPOSITION. An electric railway, similar to that on the grounds of the Canadian Exposition at Toronto, will be completed before Nov. 10., on the grounds of the Exposition. The Van De-poele Electric Mfg. Co., of Chicago, are the contractors.

THE NEVERSLIP HORSESHOE CO., of Boston, have just received a large order from Dr. M. P. Turner, proprietor of the Des Moines Street Ry., for their Neverslip Shoes, Calks, etc. Mr. Turner has been experimenting with this Shoe and has evidently found it very much to his satisfaction.

IMPROVED STREET CAR WINDOW. Mr. W. L. Everit of New Haven, Ct., has procured a patent on new window sash for cars. Sash 22½ x 28½; glass 20 x 24. The glass is packed in rubber on both sides, and in place of the usual mortise and tenon there are brass clasps. By this means the objectionable wide rail is avoided. It is firm and noiseless and makes a good appearance.

CABLE ROAD IN BROOKLYN. The Montague Street Railroad Company, which was incorporated a few days ago with a capital of \$500,000, will start its engineers and sur-

vveyors at work this week. It is proposed to lay a line of route from Wall Street Ferry to the City Hall at once. It is to be a cable road, built after the most approved model, and so constructed as not to impede travel or interfere with carriages or vehicles on the streets or crossings.

BROOKLYN, N. Y. A track is being laid by the Brooklyn City and DeKalb Avenue Companies on Johnson street, from Fulton to Washington street. It will be used as a siding for the accommodation of theatre cars, and will be used only late at night and possibly on the afternoons when matinees are given. But one track will be laid, both companies bearing an equal amount of the expense. It will not be extended further than one block.

We regret to learn that Mr. Samuel Lewis, of Lorrimer street, Brooklyn, the manufacturer of street car matings, has recently met with a severe loss by fire. His improved machinery, devised mostly by himself, as the result of many years' practical experience in the needs of his business, was nearly all swept away, and such was the inflammable nature of his factory, that he was unable to get insured. With indomitable energy, however, Mr. Lewis has ordered new machinery and is rapidly reconstructing his factory. There will be little or no delay in filling his orders, and we trust they may pour in upon him.

THE CABLE ROAD on Teuth Avenue, N. Y., has some of the finest equipment of rolling stock of any surface road in the country. The open cars invented by Mr. J. H. Robertson, Supt., are about perfect, as to style, comfort, and appointments. They have panels made to inclose the sides in the winter, adapting them to all kinds of weather. The box cars are unsurpassed, in appearance and comfort, being higher than the ordinary cars, and with a larger seating capacity. They were built in the Third Avenue Company's shops.

THE BROADWAY (N. Y.) STREET CARS are bringing a great deal of trade down town that for some years has stayed above Fourteenth Street. The Keep Manufacturing Company, No. 640 Broadway, whose main products are shirts, collars and cuffs, are according to Mr. J. H. Dunham, manager of the retail department, \$25,000 ahead of last year's sales. "We were," he continued, "569 special custom orders ahead on Monday the 12th, of the same number of months in 1884. One reason for our success is the putting on of cars and the taking off of the Broadway 'busses.' The cars bring trade down town that never came down before."

BROCKTON, MASS. "The Montello & Warren Avenue Street Ry. Co.," is the name of the new street railroad corporation. The road will run from the corner of Montello and Plain streets through the principal streets of the city. The distance traveled will be about six and one half miles. The capital stock is fixed at \$70,000, divided into 700 shares at \$100 each. The following directors have been chosen: H. W.

Robinson, C. C. Bixby, D. H. Blanchard, F. E. White, E. Goldthwaite, E. E. Dean and Ellis Packard. Other stockholders are William S. Green, Baalis Sanford, L. F. Severance, F. M. Bixby, Edward Crocker, S. J. Gruner and Veranus Filoon.

**HOLYOKE, MASS.** The result of the first year's running of the Holyoke Street Railway is a gratifying exhibit. For stockholders to receive a four per cent dividend the first year is unusual in street railway history. The people at large are beginning to realize what a great accommodation the road is, and the fact that the average of the 14,365 round trips was fourteen passengers to each trip, shows that the road is appreciated. When the year began the road was running but five horses and the whole number of cars was not bought. The road-bed is laid in an especially good manner and the outfit is first-class. The road was especially fortunate in its selection of Treasurer, Mr. C. F. Smith, whose management during the past year is shown in the above result. The prospect for the coming year is much better than it was a year ago.

**THE TRENTON (N. J.) IRON COMPANY** are manufacturing steel or charcoal iron wire rope of superior quality, for inclined planes, cable railroads, tramways, etc. In a circular letter they say: "This system furnishes, without doubt, the most economical means of transportation. In our opinion the wire rope tramway is peculiarly adapted to the requirements of this country; independence of snows and floods, and the absence of cuttings, embankments and bridges being among the various advantages offered. In view of the increasing demand for such a system, it is our purpose to make special endeavors to secure a general introduction of the wire rope tramway into this country. If you are interested in this matter, we shall be pleased to mail you our pamphlet upon the subject." The company's New York office is 17 Burling Slip.

**THE FIFTH AVENUE (N. Y. City) RAILWAY.** This company is energetically pushing its enterprise. They have issued a circular offering the first issue of \$1,000,000 stock exclusively to residents along the proposed line. The amount each investor is permitted to take is limited to 500 shares, so that every resident will have opportunity to become a stockholder if he desires. The opposition to the scheme is, as would be expected, very strong, but the agitation has developed the fact that a large number of the property owners on the avenue are in favor of having the road built; and it is only a question of time, money, and much litigation. The road is bound to be built. Some people profess to see Jay Gould's hand in the matter, because one of the directors is president of his bank, the Fourth National. The company announce that they will use a peculiar rail that will make the road practically noiseless.

**HOUSTON STREET AND HOBOKEN FERRY.** Articles of incorporation have been filed by the Houston street and Hoboken Ferry

Railway Company. The capital stock is \$1,000,000. The directors are John J. Patterson, Fred M. Walton and Josiah F. Bailey, all of Philadelphia; Jacob Kunzmann, Rastus S. Ransom, Henry R. Hoyt, and E. J. Kuauer, all of New York. The length of the road is to be three miles, commencing at the eastern end of Grand street, running through Grand to East street (double track), to Broome, to Tompkins street (single track), to Rivington, to Orchard, to Houston, to First street, to the Bowery, to Great Jones, to West Third, to Sixth avenue, to Washington place, to Barrow, to Bedford, to Grove, to Waverley place, to Mercer, to Fourth, to First avenue, to First street, to Houston, to Suffolk, to Stanton, to Tompkins, to Rivington, to East, to Grand, and through Grand to the eastern end thereof.

**PHILADELPHIA TRACTION Co.** Some changes are to be made in the Market street system of the Traction Company about November 1. As soon as the Novelties Exposition closes the traction cars are to be temporarily withdrawn and the Market street cable, which now crosses below the Seventh and Ninth street cables, is to be raised above them. This will do away with the necessity of using horse power, as at present, to propel the Market street cars across Seventh and Ninth streets. Another improvement is the substitution of heavier cog-bearings. Those at present in use are fourteen-inch wheels, which will be replaced with wheels twenty-six inches in diameter. This has been found necessary, owing to the great strain on the wheels, especially at curves, when several cars take the grip at about the same moment. These alterations will take from six to ten days to complete, after which the cable road will be in full operation and the Traction Company will sell its horses and stable property.

**BROOKLYN (N. Y.) RAPID TRANSIT.** It is reported that the Long Island R. R. and the Kings County Elevated R. R. Co., will jointly use an elevated track from the Bridge to East New York. The former company will build an elevated structure over its surface tracks in Atlantic ave., from Flatbush ave., to East New York; and the Kings County Company is to build the elevated structure in Flatbush ave., and Fulton street, from the Long Island depot to Adams and Willoughby streets. At this point a union depot will be erected, and a trunk line will be erected by the two companies jointly in Adams street to the Bridge. It is expected that the bridge cars will run over this trunk line to the union depot, and a fare of two cents will be charged upon it, the city having the right to buy the structure at any time in seven years. The project of a cable elevated road in Boerum place and Atlantic ave. will be given up. No freight cars will be run over the elevated structure, and the Long Island Railroad cars will not run further than the present depot, the cars on the extension of the road to be of the light rapid transit pattern. Only two tracks will be built in Flatbush ave. and Fultou street.

A provisional agreement has been made by the companies interested to carry out the scheme.

**WORCESTER.** Preliminary steps for the formation of a new street railway company in this city, under the state law, have been taken. The following are the directors: Charles B. Pratt, Henry S. Pratt, Hiram Forbes, Eli J. Whittleman, of Worcester, Griffiths M. Haffards and Azarah Tripp of Fall River and Frank S. Stevens of Swansea. They have organized with Charles P. Pratt President; Frank Brightman of Fall River Treasurer and R. James Salmon of Worcester Clerk. Of the capital stock of \$100,000, \$85,000 was subscribed, mostly by the out of town members of the board of directors. The company proposes to build out Pleasant street direct from Main street to Park avenue; and in Salisbury, Boynton, Agricultural, Elm and Hudson street to connect with the main line in Pleasant street; and in Merrick, Chandler and Piedmont streets, to connect the main line in Pleasant street and the present line in Main street; in West and Cedar streets, to connect with the line in Pleasant street and the line in Agricultural street. One of the considerations which led to the favorable action on the new company's petitions is that the proposed lines be built by July 1.

**NEW YORK CITY.** The Citizens Railway Company of New York City, was incorporated Oct. 10. The capital stock is fixed at \$2,500,000, to consist of 25,000 shares of \$100 each. The length of the road is five miles. The seven directors are Isaac B. Newcombe, William D. Hatch, James S. Negley, Frederic Taylor, C. Weidenfeld, Henry S. May, all of New York, and James McCormick, of Brooklyn. The subscribers of stock are F. E. Trowbridge, Windsor Hotel; Hoffman Miller, No. 270 Madison avenue; Howard Meyer, Fifth avenue; F. H. Hatch, No. 5 Nassau street; C. L. Montague, No. 5 Nassau street; Samuel Lichtensater, C. F. Wetmore, Henry Altman, Mitchell J. Ash.

The road is to commence at the intersection of West Fourth street and South Fifth avenue and will be built through West Fourth street to Mercer street, to Howard, to Hester, to Baxter street, to Chatham, to Roosevelt, to Madison street, to Rose, to Frankfort, to William, to South William, to Broad, to Water, to Moore, to South.

Also from the tracks at the intersection of Broad and South William streets through Broad to Nassau, to Spruce street, to William, and there connecting with the tracks to be laid on William street; also from the tracks to be laid on William street at its intersection with Frankfort street, through William street to Duane, to Park, to Mulberry, to Hester, to Baxter, there connecting with the tracks to be laid at the intersection of the two last named streets, together with the necessary switches, sidings, turnouts, turntables and suitable stands for the convenient working of the road.

### Street Railway Construction.

EDS. STREET RAILWAY JOURNAL:—

It is almost impossible to write upon Street Railway Construction, without encroaching on and borrowing the ideas of others, but as we are all aiming for the same results, viz., durability of structure, ease and comfort of passengers, and the minimum first cost, with a reduction of expenses in repairs for the future, we can allow any such trespass.

We know from experience what the timber cross ties and stringer system, with spikes, bolts, plates, knees, etc., (and their name is legion) costs, and we are aware of the great annoyance such a system entails upon citizens during its construction, which have long to be endured, for the system is very, very slow in construction. And but a very little while after construction "trouble and sorrow" begin, not only to the railway company but to the passengers, from low joints and loose spikes, and but a few years intervene before streets are again torn up and the same old story has to be repeated.

The stable manager could a "tale unfold" of the over consumption of grain, and also the great depreciation in value of horses, caused by defective road. Horses, as well as steam engines, require extra fuel to keep up steam, for heavy grades or bad roads, and bad track soon unmakes both engine and horse, leaving them only fit for the scrap heap.

Timber "has but a short time to live, and full of trouble" to superintendents, and a source of great expense to railway companies, and the only way to remove these evils is to remove the cause.

The renewing of timber and re-driving spikes is at the best only patching up. The trouble and expense still exists. Would it not, therefore, be well to substitute iron or steel longitudinal sleepers in place of the present timber cross ties and stringers?

The former would make a *permanent* track, while we know the latter is a perishable one.

Iron cross ties have been used on railways in India for forty years with no perceptible depreciation, and it is fair, under such a test, to say it would save at least the expense of renewals, and would insure a smooth, easy passage of the cars and consequently light pulling for the horses.

There are now practically but three systems in use in this country. *First.* The timber system, above described. *Second.* The same as the first, with the exception of cross ties, for which are substituted iron tie rods and bolts. *Third.* The girder rail system; the rail resting on the ground and supported at intervals by metal chairs, which are spiked to cross ties or embedded in concrete, the rails being spliced together by fish plates, bolts and nuts.

The lateral and vertical stiffness is obtained by great increase in depth of web, and consequently heavier rail.

Now all these systems use timber and some if not all the objectionable features,

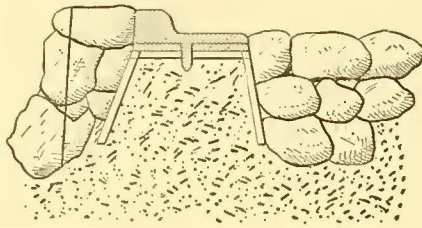
which entail permanent annoyances and expenses.

These are some of the thoughts which have suggested themselves, respecting the value of these systems, and we might multiply them by asking if the system of deep digging for cross ties and stringers is not a misfortune, by piercing the crust, the compact part of the road-bed, and building on softer substratum.

It is a rational deduction, that the system would be more thoroughly supported in the compact crust, than it now is by the soft substratum.

"The railroad timber system while in the road-bed" is in no sense *part thereof*; there is no natural bond of cohesion. By natural bond we mean the tendency of all particles to interlock and become mutually supporting.

It does not appear impossible to depend upon the compact upper surface of the road-bed for support of the track, and to secure in a street railroad a perfect bond



with the street as shown on this cross section.

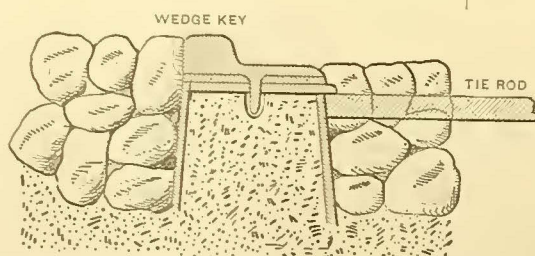
In your August issue you illustrated a system a new departure\*, which I think is far above in merit any other system; it removes all the objections of the present system, and meets the requirements for a durable, and smooth track. The vertical and lateral stiffness must exceed in this system at least three to one, as compared with a 45 lb. rail and a 5" x 9" stringer combined.

It further presents an opposing surface to movement in any direction, capable of perfect jointing, it is absolutely continuous and must be regarded as a system and not as a single rail.

Hence it has an element of strength contributing to its stability which is absent in every other system.

Any force applied to move or displace it, such as the impact of a heavy wagon, can only be applied at one point, this is met by resistance at all points. The part attacked cannot yield unless the whole system goes too.

It is not necessary to fall back upon the strength and stability of this system, in



paved streets the bond and strength needs no discussion. In macadam or gravel it

\* Metallic Street Railway Co., Albany, N. Y.

will be equally efficacious; its unity of parts, made so by the wedge key passing through the mortices in the sleeper and the slots in the web or girder of the rail, is absolute, and although the rails are locked together yet they are individual and can move in the space allowed by expansion and contraction, which no other known system can.

The transverse tie rod when placed in the sockets of the sleepers, not only ties the tracks together, but accurately gauges the track also.

The fewness of parts, viz., rail sleeper, tie rod and wedge keys, and all of them locked together by simply driving the wedge key, is a marvel of simplicity, and the system must be laid with great rapidity.

I should, and no doubt others would, (who are interested in this important branch,) like to see an article from your pen, on construction of street railway, and material to be used.

TRAMWAY.

### Where Chicago is Ahead of Philadelphia.

A correspondent of the Philadelphia Press writes it as follows:

"Everybody has noticed the fact, doubtless, that whenever there is a strike of horse car employees, the great majority of the community in which it occurs sympathize with the strikers. This is evident in Chicago, where a strike of large proportions has been in force for four days past. *The Press, July 2.*"

Yes, and the West Division Railroad Company of Chicago runs open Summer cars, one minute apart, allows smoking on the three rear seats and sells coupon tickets entitling the holder to twenty-five rides for one dollar.

When will old foggy Philadelphia awake from its Van Winkle sleep? Look at any great city and compare the local transportation lines with those of this city.

C. B. S.

### Wharton's Patent Durable Shovel.

Among the exhibits at the Novelties Exhibition of the Franklin Institute, Philadelphia, is a shovel\* the peculiar construction of which, it is claimed, adds from 50 to 100% to its durability. The object in construction is to prevent the rapid wear and subsequent curling over of the shovel near the end. This is accomplished by rolling the steel plates from which the blades are made in such a manner that when cut into lengths there is a band about 2" wide of slightly increased thickness across the end of each shovel blade. The added weight is less than one ounce to each shovel.

G. B. H.

\* Wm. Wharton, Jr. & Co., (Limited), 25th st. and Washington ave., Philadelphia.

THE STREET RAILWAY JOURNAL is the only paper in this country devoted to the street railway interests. Subscribe for it and know what is going on in the street railway world. Only \$1 a year



### Lateral Stiffness of Street Railway Track.

MESSRS EDITORS:—In relation to the "Lateral Stiffness of Street Tracks," treated by you editorially in the September JOURNAL, I would note:—

The ordinary width of timber-stringer, equal to width of rail, is five inches. The greatest depth probably never exceeds nine inches. With me it is seven inches. Of course the tendency of the car when stationary is simply to deflect the track. But I think you greatly overestimate the strains resulting from the car in motion to spread the track. If the track is not tight gauge, the car wheel exerts little strain to spread the rails. The lateral inequalities are so slight, comparatively, and the speed so slow, the track would not spread. This is proved to be true, by track laid with center bearing rails, which does not spread nearly so much as a side bearing rail. The reason is to me obvious. Our tracks are spread by the heavily loaded teams that seek its smooth surface, and must turn out for the cars. Consider the force exerted by the front wheels of a heavily loaded truck drawn by four or more horses, and acting with a leverage equal to the distance from the end of the tongue to the center of the front wheel. One half the weight of vehicle and its load must be lifted one inch, for this is the height of the head of our rail above the train. This is the great force tending to spread our tracks, not the ear wheels, in my opinion.

If I am right this force is applied at the top of the rail at the inside corner. The head being 2" wide it acts 2" from the outside. The tendency is to turn the stringer on the lower outer corner, the height being greater than the width. This is prevented by the outside knee if it be firmly spiked. The stringer can then give only by its bottom coming in. This is prevented by the small knee. In my practise there are four knees upon each cross-tie and the cross-ties are spaced 4' from center to center. The small knee is 2" high. It is fastened to the cross-tie by two spikes  $\frac{5}{16}'' \times \frac{5}{16}'' \times 5''$  and to the stringer by one spike  $\frac{5}{16}'' \times \frac{5}{16}'' \times 3''$ . The outside knees come up to the bottom of the rail. Their height varies with that of the stringer. They are fastened to the cross-tie by three spikes  $\frac{5}{16}'' \times \frac{5}{16}'' \times 5''$  and to the stringer by an old rail spike  $\frac{1}{2}'' \times 4''$  say. The base of the small knee is 4" and the large knee 8", not 4" high and 3" base as you assume.

This construction is costly. My small knee weighs 2½ lbs. and large knee 8" high 7½ lbs. They might have been made lighter, but I err on the side of strength. Light knees would be so frequently broken by careless workmen in putting them on, that the breakage would go well towards paying for the increased weight, and I do not see why these knees should not outlast several stringers.

Your "strap knees" as proposed would interfere with the paving. Some roads depend upon wrought iron  $\frac{1}{2}$  round iron tie

rods with large square wrought iron washers upon each outside end to hold stringers to gauge. But the width of their stringers varies. Common workmen will not cut out just enough if the stringer be too wide. He invariably cuts out too much and sticks in a "chip" when it is too narrow, between the washer and the stringer. This chip soon drops out or at best in a short time rots and the track spreads. Mr. Crosby of the South Boston road used a flat tie rod,  $1\frac{3}{8}'' \times \frac{3}{8}''$  weighing 10 lbs. 6 oz. These were twisted half around at the stringer and spiked to the top of stringer under the rail. This is better than the round rod: but both interfere more or less with stone pavements.

I have never experienced any trouble from my spikes in the knees getting loose, as you describe. A  $\frac{5}{16}''$  spike does not crush the fibre of the wood, as does a half inch spike. See my paper in the *American Engineer*, May 1881, upon "The Adhesion of various Nails, Spikes and Screws."

Everything considered, I think the cast iron knee the best.

AUGUSTINE W. WRIGHT.

Chicago, Ills.

### Luminous and Musical Cars.

EDS. STREET RAILWAY JOURNAL:—The learned, poetical and very facetious writer in this journal, has edified and amused us by the vivid descriptions he has given of luminous cars. If his strange fancies shall ever become realities, the luminous car would put Barnum's wonders into the shade. A well lighted street car is attractive; and it is in the interest of every company to have the cars brightly illuminated. But how to have them *luminous* is not yet well defined. Perhaps a coating of phosphorus would give this luminous glare to the cars in running through unlighted streets of a dark night. But suppose you could make the cars as luminous as Elijah's chariot, would it not rather tend to repel than to attract passengers?

For the people would look at the car ablaze,  
So luminous and so bright,  
And some would open their eyes and gaze,  
Or spellbound linger in strange amaze,  
Beholding this wonderful sight;  
While through blinds half-open, and doors ajar,  
The timid would peep at this phantom car.

Although this is an age of progress and invention, yet it is an utilitarian age. The main object of most of the companies, is to secure the dollars and cents; and I suppose they consider the luminous car scheme too quixotic for the prosaic shareholders, and too chimerical for the business portion of the passengers.

Now another scheme is introduced—the musical car; not the tinkling of the bells to warn the carter of the approaching car, but real, artistic, symphonious music. The hints given, as to how the thing could be done, show that it is not altogether a utopian attainment. The scheme might be realized, but the time of its accomplishment is too remote for me to enjoy it.

The luminous cars and luminous harness—and I may add luminous horses—and why not luminous conductors and

drivers? and the passengers like blanched spectres, blinded through excess of light—all this glare would not be half so attractive in winning passengers as the musical car.

By all means let us have a tuneful car. Too often the passengers complain of the harsh, grating, discordant music of the street car. So whether we invoke the aid of Timotheus or Cecilia, to elevate mortals or draw down angels, it matters little so long as it increases the number of passengers and adds to the revenue of the company. Where there is no ear for music, there can be no heart for love. But why omit the Americans in the selection of tunes? Would not Yankee-doodle and Dixie-land be appropriate? Or you might take selections from your Fourth of July music, such as would be most in keeping with the tastes of the people. I know a company that gives the successful conductors a half yearly bonus. An aspiring conductor gained the first prize by having a musician in his car, which so attracted the young people that he took a first place.

The eye may be charmed with the harmony of colors, but more soothing to the heart and more thrilling to the ear is the harmony of sweet, melodious sounds by which sweet memories are awakened, and a longing desire created for joys yet to come.

Dancing music would be unsuited for a street car. No room for dancing there, the music would be a failure if there were. Sacred music would displease the gay and frivolous, so there must be special music selected or composed for the Street Railway Musical Cars. VERITAS.

Quebec.

### Capital and Labor.

EDITORS STREET RAILWAY JOURNAL:—

I am glad you have opened on capital and labor. Each in its proper sphere is the willing helpmeet of the other. 'Tis only when the scheming, intriguing mountebank unlimbers his jaw-tackle to foment dissatisfaction amidst

That hydra-headed, fickle-minded, monster thing—  
The fantastic, changeling crowd—the popular school,

that the *unthinking* brawn worker arrogates to *his* class all the rights that labor has. Fortunately, habits of quiet thought are gaining ground, where brute force used to rule supreme, and the gassy, gabby parasite, who has found it easier to lead in turmoil than to serve under the grand law, which bids him earn *his* bread by the sweat of his *own* brow, is losing ground.

Capital and labor are *not* at "onts." A skilled-industry hunting hand is capital; an industrious, disciplined mind is capital; where thou can we draw the line of independence

'Twixt labor and its part—'twixt labor and its sense  
'Tis the strife for dominion, that ignorance breeds,  
Which gives vigor to senseless and turbulent creeds,  
Feed the memory full and the product is pride,  
Train the reason to work, 'tis humility's bride.

Every prosperous industry has its pimps, parasites, baruaeles, camp-followers, *et al.*, and intrigue rules the unthinking units. There's only one way out of the state of

mental development which is never at home in a healthy atmosphere, and that is education to the habit of counting the cost of any act, any expression, not storing the memory with a mass of flippant surds—a lot of platitudes. Without the budding mind is trained, as it should be, in infancy and youth, it will not be as a valuable chest of tools to its owner. No amount of schooling without subsequent and life-long habits of thought, will counteract vicious training in the cradle. "As the twig is bent, &c."

Frank Stockton was right in his scheme for the "training of parents." Some one might take equal pains to show the value of adequately paying teachers.

Whisky is an excellent servant, but when it dominates so as to get ten times as much of the wage-workers' earnings as is put on their children's schooling, it is time for *capital* to give tone to the moral atmosphere surrounding its elements.

ED. B. MEATYARD.

**Tramway Junctions and Crossings.**

Under the above caption, the *Mechanical World* of London says as follows:

"During the present era, which has perhaps been justly called the "wire age," no small amount of time and consideration has been given by our engineers, both civil and mechanical, to what has proved itself to be one of the most convenient and perhaps the cheapest system of locomotion on the high roads and public thoroughfares. Much time, labor, and money have been spent in experiments so as to prove the superiority of steam power (in different forms), compressed air, and electricity as a cheaper mode of applying tractive force, over the power of the venerable horse. Much thought has also been given to the mode of carrying the rails, so that the permanent way shall be as durable as it is possible to make it, whilst what may be termed as a weak link in an all important chain, has almost entirely escaped notice, as would appear from the limited number of devices now in use at junctions, crossings, and passing stations, and the great number of inconveniences felt by the public in delays due to the cars taking the wrong direction at a junction, facing point or passing station, which often necessitates bringing the horses to the opposite end of the car, or otherwise pushing the car back by hand, either of which will frequently lose three to five minutes, while cases are not wanting in which many a good horse has been lamed by being thrown down, and its haunches getting under the car, or a car wheel being wrenched off by the horses pulling along one way and the heavy car running in another. The straight, deep groove will do well enough at passing stations where the traffic in one direction always takes one side, as long as it is clean and free from stones, but a pebble will sometimes alter this entirely. At junctions, however, it is quite different; the loose switch is mostly used; this too may be deemed a safe means of altering the course when in proper care,

but unfortunately it appears to be much neglected, and often unattended, in which case the conductor acts as pointsman, and as the driver does not wish to bring the car to a stand (out of respect for his horses) the conductor runs in front and often tries to put the switch over by the use of his boot heel, in which he often fails, resulting in a delay. Where cars follow frequently these points should have a pointsman, and where the traffic will not warrant this outlay, a man should be constantly walking the length to keep clear these points and crossings, so as to admit of their more certain action. Perhaps the best arrangement we have seen is in Liverpool, where several junctions are worked by signal and levers from a signal box, as at a railway junction."

Perhaps the Liverpool method might be of some use in one or two places in Brooklyn and Boston, but take it all in all, we think that our British cousins could take a few lessons from this side the Atlantic. We have a good many systems by which the weight of the horse (or mule) is the operating force to open or close the switch, when desired to move it.

**The Van Depoele Electric Motor.**

The electric motor invented by Mr. Charles J. Van Depoele, which has been tried in Toronto, and very highly spoken of by the press of that city, will be applied on various street railway in the United States. Contracts have been made to equip roads at South Bend Ind., Minneapolis, Detroit and New Orleans. The results at these points will be looked for with interests as the proprietors of the system, the Van Depoele Electric Mfg., Co., Chicago, are very sanguine of success, and the results thus far attained by them, certainly merit an investigation of the plan on the part of live street railway men. We shall soon have more to say on the subject.

**OFFICIAL LIST OF THE STREET RAILWAYS IN THE UNITED STATES & CANADA.**

Compiled from data furnished the editors of "The Street Railway Journal," by the officers of the various roads.

[The following is a complete list of the Street Railways of the United States and Canada, so far as we have received the official returns from the various roads. Will those roads not reported kindly fill out the blanks sent them and mail to us without delay, so that they may be properly represented in the STREET RAILWAY JOURNAL.]

ABBREVIATIONS—m, miles; g, gauge; lb r, pounds rail to the yard; c, cars; h, horses; mu, mules. Officers' addresses are the same postoffice as the company unless otherwise specified.

- AKRON, O.**—Akron St. Ry. & Herdic Co. 2½ m, 66, 81 h. Pres. Ira M. Miller, V. Pres. James Christy, Treas. B. L. Dodge, Sec. F. M. Atterholt, Supt. John T. Metlin.
- ALBANY, N. Y.**—Watervliet Turnpike R.R. Co. 7½ m, 26-45 lb r, 27 c, 143 h. Pres. Chas. Newman, Sec. & Treas. P. Way, Supt. M. C. Foster.
- The Albany Ry. 10 m, 4-8½ g, 33-47 lb r, 51 c, 194 h. Pres. & Supt. and Treas. John W. McNamara, Sec. Jas. H. Manning. Offices 3 & 5 N. Pearl St.
- ALLENTOWN, PA.**—Allentown Pass. R.R. Co. 3½ m, 6 c, 22 h. Pres. Samuel Lewis, Treas. & Sec. Joseph E. Balliet, Supt. Russel A. Thayer.
- ALTON, ILL.**—Alton & Up. Alton Horse Ry. Co. **ALTOONA, PA.**—City Pass. Ry. Co. of Altoona. 3½ m, 5-3 g, 43 lb r, 17 c, 38 h. Pres. John P. Levan, Sec. & Treas. L. B. Reifsnelder, Supt. John J. Buch.

- AMSTERDAM, N. Y.**—Amsterdam St. Ry. Co. 1½ m, 4-8 g, 25 lb r, 3 c, 10 h. Pres. Henry Herrick, Treas. David Cady, Sec. M. L. Stover, President's office 112 Front St., L. Island City, N. Y.
- ANNISTON, ALA.**—
- ASHTABULA, O.**—Ashtabula City Ry. Co. 4 m, 4-8½ g, 40 lb r, 6 c, 60 h. Owner & Prop. Jno. N. Stewart.
- ATCHISON, KAN.**—Atchison St. Ry. Co. 5½ m, 4-8½ g, 20-30 lb r, 19 c, 60 h. Pres. & Gen. Man. J. H. Beeson, Treas. H. M. Jackson, Sec. J. P. Adams.
- ATLANTA, GA.**—West End & Atlantic R.R. Co. 2m, 4-8½ g, 20 lb r, 6 c, 34 mu. Pres. J. D. Turner, V. Pres. T. L. Langston, Sec. & Treas. B. H. Brumhead, Man. & Purch. Agt. Jno. S. Brumhead. Atlanta St. R.R. Co. Gate City St. R.R. Co. 2½ m, 4-8½ g, 16 lb r, 7 c, 26 h. Pres. L. B. Nelson, V. Pres. L. DeGlive, Sec. & Treas. John Stephens, Solicitor, A. Renharat. Metropolitan St. R.R. Co.
- ATLANTIC, N. J.**—Atlantic City Ry. Co.
- AUBURN, N. Y.**—Auburn & Owasco Lake R.R. Co. 1½ m, 4-8½ g, 28-30 lb r, 3c, 12 h. Pres. D. M. Osborne, Sec. & Treas. C. B. Koster, Supt. B. F. Andrews. East Genesee & Seward Ave. Ry. Co. 1½ m, 4-8½ g, 30 lb r, 6 c, 25 h. Pres. David M. Osborne, Sec. & Treas. C. B. Fosters, Supt. B. F. Andrews.
- AUGUSTA, GA.**—Augusta & Somerville R.R. Co.
- AURORA, ILL.**—Aurora City Ry. Co. 5 m, 4-8½ g, 28 lb r, 7 c, 10 h, 30 mu. Pres. H. H. Evans, V. Pres. S. W. Thatcher, Sec. A. J. Hopkins, Treas. E. W. Truth, Supt. J. B. Chattee.
- BABYLON, N. Y.**—Babylon Horse R.R. Co. 1½ m, —, lb r, 2 c, 3 h. Pres. W. F. Norton.
- BALTIMORE, MD.**—Baltimore & Powhatan Ry. Co. 6 m, 5-4½ g, 4 c, 17 h. Pres. & Treas. E. D. Freeman, Sec. R. B. Clark, Supt. I. M. Ketrick. Baltimore City Pass. Ry. Co. 40 m, 5-4½ g, 46 lb r, 154 c, 1000 h. Pres. Oden Bowie, Treas. John Bolgian, Sec. S. L. Bridge. Baltimore Union Pass. Ry. Co. Baltimore & Catonsville Ry. Co. Baltimore & Halls Spring R.R. Co. Baltimore & Pimlico & Pikesville R.R. Co. Central Ry. Co. 5½ m, 5-6 g, 40 lb r, 22 c, 180 h. Pres. Peter Thompson, Sec. & Treas. Walter Blakistone. Citizen's Ry. Co. 20 m, 5-4½ g, 46 lb r, 34 c, 360 h. Pres. Jos. S. Hagarty, Treas. Wm. S. Hammersley, Supt. C. C. Speed. Monumental City Ry. Co. North Baltimore Passenger Ry. Co. People's Pass. Ry. Co. 6½ m, 5-4½ g, 42-45 lb r, 30 c, 200 h. Pres. R. E. Hamilton, Treas. Gustavus Ober, Sec., Supt. & Pur. Agt. Wm. A. House, Jr. Office, Fort Ave. & Johnson St. Soon move to Druid Hill Ave. York Road R.R. Co.
- BATTLE CREEK, MICH.**—Battle Creek Ry. Co. 5 m, 3-6 g, 28 lb r, 8 c, 18 h, 3 mu. Pres. Geo. Det. J. White, V. Pres. H. H. Brown, Sec. Chas. Thomas, Supt. John A. White, Gen. Man. J. W. Hahn.
- BAY CITY, MICH.**—Bay City St. Ry. Co. 7½ m, 4-8½ g, 18 lb r, 13 c, 35 h. Pres. James Clements, Treas. Wm. Clements, Sec. Edgar A. Cooley.
- BEAVER FALLS, PA.**—Beaver Valley St. Ry. Co. 3-1-10 m, 5 c, 21 h. Pres. M. L. Knight, Sec. & Treas. J. F. Merrihan, Supt. of Construction, J. C. Whitla.
- BELLAIRE, O.**—Bellaire St. R.R. Co.
- BELLEVILLE, ONT., CAN.**—Belleville St. R.R. Co.
- BEREA, O.**—Berea St. Ry. Co. 1½ m, 3-6 g, 28 lb r, 2 c, 2 h. Pres. C. W. D. Miller, V. Pres. T. Chinchward, Sec. & Treas. A. H. Pomeroy, Supt. A. W. Bishop.
- BINGHAMTON, N. Y.**—Washington Street & State Asylum R.R. Co. 4½ m, 4 g, 16-25 lb r, 13 c, 23 h. Pres. B. H. Mcagley, V. Pres. Geo. Whitney, Sec. C. O. Root, Treas. F. E. Ross. Binghamton Central R.R. Co. 3½ m (2½ laid), 3 g, 28 lb r, 6 c (not in operation). Pres. Geo. L. Grandall, V. Pres. Nelson Stow, Sec. & Supt. Chas. O. Root, Treas. H. J. Kneeland. Offices 63 Court St. Binghamton & Port Dickinson R.R. Co. 5 m, 4-8½ g, 20-30 lb r, —, c, — h. Pres. Harvey Westcott, Sec. & Treas. G. M. Harris, Supt. N. L. Osborn. (Leased to Mr. Osborn). Offices 112 State St. Main, Court & Chenango St. R.R. 5 m, 4-8 g, 40 lb r, 10 c, 25 h. Supt. & Lessee, N. L. Osborn. Offices 83 Washington St.
- BIRMINGHAM, ALA.**—Birmingham St. Ry. Co. 3½ m, 4-8 g, 16 lb r, 4 c, 12 m. Pres. B. F. Roden, Sec. & Treas. J. H. Williams.
- BLOOMFIELD, N. J.**—Newark & Bloomfield R. R.
- BLOOMINGTON, ILL.**—Bloomington & Normal Horse Ry. Co.
- BOONE, IA.**—Boone & Boonsboro St. Ry. Co. 1½ m, 3 g, 20 lb r, 3 c, 10 h. Pres. L. W. Reynolds, Treas. J. B. Hodges, Supt. A. B. Hodges.
- BOONSBORO, IA.**—Twin City & Des Moines River Motor St. Ry. Co. 3 m, 3-6 g, 2 motors, 3 c. Pres. & Supt. J. B. Hodges, Treas. A. B. Hodges, Sec. S. K. Huntsinger.
- BOSTON, MASS.**—Highland St. Ry. Co. 19 m, 4-8½ g, 50 lb r, 187 c, 925 h. Pres. Moody Merrill, Clerk R. B. Fairbairn, Treas. Samuel Little, Supt. J. E. Rugg. Lynn & Boston. 34½ m, 4-8½ g, 25-48 lb r, 114 c, 514 h. Pres. Amos F. Breed, Treas. & Sec. E. Francis Oliver, Supt. Edwin C. Foster. Metropolitan R. R. Co. 80 m, 4-8 g, 50 lb r, 700 c, 3,600 h. Pres. C. A. Richards, Sec. H. R. Harding, Treas. Chas. Boardman. Office, 16 Kilby St. Middlesex R.R. Co. 26 m, 4-8½ g, 50 lb r, 150 c, 700 h. Pres. Chas. E. Powers, Treas. & Supt. John H. Studley. Address, 27 Tremont Row, Boston. So. Boston Ry. Co. 13 m, 4-8½ g, 42-50 lb r, 193 c, 900 h. Pres. Chas. H. Hershey, V. Pres. Jas. C. Davis, Sec. & Treas. Wm. Reed, Supt. Daniel Coolidge.
- BRADFORD, PA.**—Bradford & Kendall R.R. Co. 1½ m, 4-8½ g, 38 lb r, 3 c, 4 h. Pres. James Brodey, Sec. N. B. Parsons, Gen. Man. & Supt. Enos Parsons.
- BRIDGEPORT, CONN.**—The Bridgeport Horse R.R. Co. 5 m, 4-8½ g, 42 lb r, 14 c, 70 h. Pres. Albert Eamer, Sec. & Treas. F. Hurd, Supt. E. F. Lashar.
- BROCKTON, MASS.**—Brockton St. Ry. Co. 8½

m, 24 c, 97 h. Pres. W. W. Cross, Treas. & Sec. Z. C. Keith, Supt. H. B. Rogers.

**BROOKLYN, N. Y.**—The Atlantic Avenue R.R. Co. of Brooklyn. 2 1/2 m, 4-8 g, 60 lb r, 244 c, 882 h. Pres. William Richardson, Sec. W. J. Richardson, Treas. Newburg H. Frost. Office cor. Atlantic & Third Aves.

Broadway R.R. Co. 10 1-10 m, 4-8 1/2 g, 45-50-60 lb r, 166 c, 657 h. Pres. W. H. Husted, V. Pres. Edwin Beers, Sec. & Treas. Robert Sealey, Supt. Joshua Crandall. Office 21 Broadway, E. D.

Brooklyn Cross Town R.R. Co. 8 m, 4-8 1/2 g, 40-60 lb r, 72 c, 400 h. Pres. Henry W. Slocum, V. Pres. Ezra B. Tuttle, Sec. & Treas. John R. Connor, Supt. D. W. Sullivan. Offices 585 Manhattan Ave.

Bushwick R.R. Co. 20 m, 4-8 1/2 g, 45-50-60 lb r, 172 c, 600 h. Pres. Frank Cromwell, V. Pres. Wm. H. Husted, Treas. & Sec. S. D. Hallowell, Supt. Wm. M. Morrison. Office 22 Broadway, N. Y.

The Brooklyn Bushwick & Queens County R.R. Co. 6 m, 4-8 1/2 g, 42-47 lb r, 41 c, 117 h. Pres. Richard H. Green, V. Pres. James W. Elwell, 59 South St. N. Y. Sec. John D. Elwell, Treas. Wm. W. Greene.

Brooklyn City R.R. Co. 44 m, 4-8 1/2 g, 60 lb r, 761 c, 3,045 h. Pres. William H. Hazzard, V. Pres. William M. Thomas, Sec. & Treas. Daniel F. Lewis, Asst. Sec. Francis E. Wrigley. Offices 8 & 10 Fulton St.

Brooklyn City & Newtown R.R. Co. 11 m, 4-8 1/2 g, 45-60 lb r, 128 c, 419 h. Pres. Louis Fitzgerald, N. Y. City, Sec. & Treas. H. A. Schuz, Supt. H. W. Bush. Office cor. DeKalh & Central Aves.

Calvary Cemetery, Greenpoint & Brooklyn Ry. Co. Coney Island and Brooklyn R.R. Co. 11 2-5 m, 45 lb r, 4-8 1/2 g, 103 c, 316 h. Pres. James Jourdan, Sec. Ed. F. Drayton, Supt. William Farrell. Office cor. Smith & Huntington Sts.

Coney Island, Sheepshead Bay & Ocean Avenue R.R. Co. Pres. A. A. McClemer, V. Pres. Daniel Mone, Sec. John McMahon, Sheepshead Bay, Treas. Horace Valkuliyh. Office 16 Red Hook Lane.

Crosstown Line, Hamilton Ferry to Bridge.

Grand St. & Newtown R.R. Co. 8 1/2 m, 4-8 1/2 g, 45-50 lb r, 72 c, 250 h. Pres. Martin Joost, Sec. & Treas. Wm. E. Horwill, Supt. Walter G. Howey. Office 129 First St.

Grand Street, Prospect Park & Flatbush R.R. Co. 4 1/2 m, 4-8 1/2 g, 50 lb r, 75 c, 244 h. Pres. Louis Fitzgerald, 120 Broadway, N. Y., Sec. & Treas. Duncan B. Cannon, Supt. Jno. L. Heins. Offices Franklin Ave. and Prospect Place.

Greenpoint & Lorimer St.

Prospect Park & Coney Island R.R. Co. 4 7-10 m, 45-50 lb r, 4-8 1/2 g, 89 c, 214 h. Pres. A. R. Culver, Treas. A. C. Washington, Sec. George H. Smith, Eng. Supt. R. Schermerhorn, Supt. Robert Attlesley. Offices Ninth Ave., 19th & 20th Sts.

Prospect Park & Flatbush R.R. 1 1/2 m, 4-8 1/2 g, 34 lb r, 70 c, 260 h. Pres. Loftis Wood, Sec. & Treas. Sam'l Parkhill, Supt. Loftis Wood.

South Brooklyn Central R.R. Co. 7 m (4 1/2 m laid), 4-8 1/2 g, 60 lb r, 42 c, 192 h. Pres. Wm. Richardson, Sec. Wm. J. Richardson, Treas. N. H. Frost, Supt. James Ruddy.

The New Williamsburgh & Flatbush R.R. Co. 6 1/2 m, 4-8 1/2 g, 47-50 lb r, 74 c, 253 h. Pres. Geo. W. Van Allen, 54 Ann St. New York, Sec. W. B. Waitt, 34th St. & 9th Ave. New York, Treas. C. B. Cottrell, 8 Spruce St., N. Y. City, Supt. Chas. E. Harris, Nost-rand Ave. & Carroll St., Brooklyn.

The Union Railway Co. of the City of Brooklyn (not in operation).

Van Brunt St. & Erie Basin R.R. Co. 1 1/2 m, 4-8 1/2 g, 45 lb r, 7 c, 24 h. Pres. John Cunningham, Sec. & Treas. Edmund Terry.

**BRUNSWICK, GA.**—Brunswick St. R.R. Co.

**BUFFALO, ILL.**—See Mechanicsburg, Ill.

**BUFFALO, N. Y.**—Buffalo St. R.R. Co. 17 1/2 m, 4-8 1/2 g, 50 lb r, 96 c, 510 h. Pres. Henry M. Watson, V. Pres. P. P. Pratt, Sec. S. Spaulding, Treas. W. H. Watson, Supt. Edward Edwards.

Buffalo East Side St. R.R. Co. 24 4-5 m, 4-8 1/2 g, 42 lb r, 47 c, 218 h. Pres. S. S. Spaulding, V. Pres. Joseph Churchyard, Sec. H. M. Watson, Treas. W. H. Watson, Supt. Edward Edwards. Office 346 Main St.

**BURLINGTON, IA.**—Burlington City R.R. Co. 2 1/2 m, 4-8 1/2 g, 22 lb r, 9 c, 30 h. Pres. John Patterson, Sec. & Man. C. T. Patterson. Union St. Ry. Co.

**CAIRO, ILL.**—Cairo St. R.R. Co.

**CAMBRIDGE, MASS.**—Cambridge R.R. Co. 43 m, 4-8 1/2 g, 50 lb r, 245 c, 1,410 h. Pres. Prentiss Cummings, Treas. & Clerk F. T. Stevens, Exec. Com. I. M. Simpson, P. Cummings, O. S. Brown, Clerk of Directors, O. S. Brown, Supt. Wm. A. Bancroft.

Charles River St. Ry. Co. 10 4-5 m, 2-8 1/2 g, 50 lb r, 50 c, 330 h. Pres. Chas. E. Raymond, Corp. Clerk C. E. Harden, Treas. Daniel U. Chamberlain, Supt. John N. Akerman.

**CAMDEN, N. J.**—Camden & Atlantic St. Ry. Camden R.R. Co. 9 m, 5-1 c, 35-47 lb r, 26 c, 85 h. Pres. Thos. A. Wilson, Sec. Wilbur F. Rose, Treas. & Supt. John Hood.

**CANTON, O.**—Canton St. R.R. Co. (new road).

**CAPE MAY, N. J.**—Cape May & Schellenger Landing Horse R.R.

**CARTHAGE, MO.**

**CEDAR RAPIDS, IA.**—Cedar Rapids & Marlon St. Pass. Ry. Co.

**CHAMPAIGN, ILL.**—Champaign R.R. Co. Urbana & Champaign St. R.R. Co. (See Urbana).

**CHARLESTON, S. C.**—Charleston City Ry. Co. 3 1/2 m, 4-8 1/2 g, 38-42 lb r, 22 c, 84 h. Pres. Jno. S. Riggs, Treas. Ewan Edwards, Sec. Frank Whelden, Supt. Jno. Mohlenhoff.

Enterprise R.R. Co. 12 m, 5 g, 42 lb r, 14 c, 51 h. Pres. A. F. Ravenel, Sec. & Treas. U. E. Hayne, Supt. T. W. Passafalgere.

**CHATTANOOGA, TENN.**—Chattanooga St. R. R. Co. 2 1/2 m, 4-8 1/2 g, 16-25 lb r, 8 c, 50 h. Pres. J. H. Warner, Sec. C. R. Gaskill, Supt. A. B. Wingfield.

**CHESTER, PA.**—Chester St. Ry. Co. 5 1/2 m, 5-2 1/2 g, 12 c, 70 h. Pres. Richard Peters, Jr., Solicitor, Geo. B. Lindsay, Treas. Sam'l A. Dyer, Sec. E. M. Cornell.

**CHICAGO, ILL.**—Chicago City Ry. Co. 87 m, 4-8 1/2 g, 45 lb r, 567 c, 1,416 h, cable doing work of 2,500 h.

Pres. C. B. Holmes, Sec. H. H. Windsor, Treas. T. C. Pennington, Supt. C. B. Holmes.

Chicago West Division Ry. Co. 40 m, 4-8 1/2 g, 40 lb r, 620 c, 3,425 h. Pres. J. K. Jones, Sec. George L. Webb, Supt. Jas. K. Lake.

Chicago & Hyde Park St. — m, — g, — lb r, — c, — h. Pres. Douglas S. Clarke.

North Chicago City Ry. Co. 35 m, 4-8 1/2 g, 45 lb r, 316 c, 1,700 h. Pres. & Gen. Supt. V. C. Turner, V. Pres. Jacob Rehn, Sec. & Treas. Hiram Crawford, Supt. of Track & Construction, Augustine W. Wright, Asst. Supt. Fred L. Threedy, Supt. Horse Dept. Robt. Atkins, Purch. Agt. John W. Roach, Master Mechanic J. Miller.

**CHILLICOTHE, O.**—Chillicothe St. R.R. Co. 1 1/2 m, 3 g, 16 lb r, 7 c, 10 h. Pres. E. P. Safford, Sec. A. E. Wenis, Treas. William Polanel, Supt. Evel McMartin.

**CINCINNATI, O.**—Cincinnati Inclined Plane Ry. Co. 3 m, 5-2 1/2 g, 43 lb r, 24 c, 150 h. Pres. Geo. A. Smith, Sec. & Supt. James M. Doherty, Treas. Jos. S. Hill.

Cincinnati St. Ry. Co. 98 m, 5-2 1/2 g, 43 lb r, 254 c, 1,815 h. Pres. John Kilgour, Sec. & Aud. James A. Collins, Treas. R. A. Dunlap, Con. Eng. F. R. Weizenacker, Supt. John Harris.

Cincinnati & Mount Auburn R.R. Co.

Columbia & Cincinnati St. R.R. Co. 3 1/2 m, 3 g, 25 lb r, 3 c, dummy g. Pres. C. H. Kilgour, V. Pres. John Kilgour, Treas. B. P. Branham, Sec. A. H. Meier, Mt. Lookout, O. Supt. J. J. Henderson, Mt. Lookout, O.

Mt. Adams & Eden Park Inclined R.R. Co. 3 1/2 m, 5-2 1/2 g, 42 lb r, 40 c, 320 h. Pres. & Treas. J. P. Kerper, Sec. J. R. Murdoch, Supt. John Harris, Purchasing Agt. Benj. F. Houghton.

So. Covington & Cincinnati. (See Covington, Ky.)

**CLEVELAND, O.**—The Brooklyn St. R.R. Co. 8 1/2 m, 4-8 1/2 g, 52 lb r, 66 c, 375 h. Pres. Tom. L. Johnson, V. Pres. A. J. Moxham, Sec. J. B. Hoefgen, Treas. John McConell, Supt. A. L. Johnson.

Broadway & Newburg St. R.R. Co. 6 m, 4-8 1/2 g, 10 c, 160 h. Pres. & Supt. Joseph Stanley, V. Pres. Sam'l Andrews, Sec. & Treas. E. Fowler.

Superior St. R.R. Co. 15 m, 4-8 1/2 g, 45 lb r, 46 c, 225 h. Pres. Frank De H. Robison, V. Pres. John Koch, Sec. & Supt. M. S. Robison, Jr.

The Eco., Cleveland R.R. Co. 30 m, 4-8 1/2 g, 35-40 lb r, 32 c, 450 h, electric motor. Pres. A. Everett, V. Pres. Chas. Wason, Sec. & Treas. H. A. Everett, Supt. E. Dwy. Offices, 1154 & 1158 Euclid Ave.

Woodland Avenue & West Side St. R.R. Co. 17 m, 4-8 1/2 g, 43 lb r, 100 c, 350 h. Pres. M. A. Hanna, V. Pres. C. F. Emery, Sec. J. B. Hanna, Gen. Supt. George C. Mulhen.

South Side St. Ry. Co.

St. Clair Street Ry. Co.—m—g,—lb—c,—Pres. Chas Hathaway.

West Side R.R. Co.

**CLINTON, IA.**—Lyons & Clinton Horse R.R. Co. (see Lyons).

**COLUMBUS, GA.**—Columbus St. R.R. Co. 3 m, 4-8 1/2 g, 16 lb r, 6 c, 25 h. Pres. Cliff B. Grimes, Sec. L. G. Schnessler, Treas. N. N. Curtis, Supt. J. A. Gabourgh.

**COLUMBUS, O.**—Columbus Consolidated St. R.R. Co. 19 m, 5-2 g, 30-46 lb r, 83 c, 350 h. Pres. A. Rodgers, V. Pres. H. T. Chittenden, Sec. & Treas. E. K. Stewart, Supt. J. H. Atcherson.

Glenwood & Greenlawn St. R.R. Co. 4 1/2 m, 3-6 g, 24 lb r, 9 c, 25 c. Pres. A. D. Rodgers, V. Pres. B. S. Brown, Sec. R. S. Rockley, Treas. S. S. Rickley, Supt. Jonas Wilcox.

**CONCORD, N. H.**—Concord Horse R.R. Co. 8 m, 3 g, 30-33 lb r, 10 c, 14 h, 2 steam motors. Pres. Moses Humphrey, Treas. H. J. Crippin, Clerk E. C. Hoag.

**CORTLAND, N. Y.**—Cortland & Homer Horse Ry. Co. 4 m (2 1/2 laid), 4-8 1/2 g, 25-30 lb r. Pres. Chas. H. Garrison, Troy, N. Y., Sec. J. M. Milne, Treas. S. E. Welch, Supt. S. E. Welch. (Leased to D. N. Miller.) Office 23 No. Mercer St.

**COUNCIL BLUFFS, IA.**—Council Bluffs St. R.R. Co.

**COVINGTON, KY.**—So. Covington & Cincinnati St. Ry. Co. 17 1/2 m, 5-2 1/2 g, 43 lb r, 46 c, 296 h. Pres. E. F. Abbott, Sec. S. C. Buntout, Treas. G. M. Abbott.

**DALLAS, TEX.**—Dallas St. Ry. Co. 4 1/2 m, 4-8 1/2 g, 20-38 lb r, 12 c, 4 h, 72 mu. Pres. Wm. J. Keller, Sec. Harry Keller, Supt. C. E. Keller. Commerce & Way St. R.R.

**DANVILLE, ILL.**—Citizens' St. Ry. Co. 4 m, 4 g, 20 lb r, 7 c, 35 mu. Pres. Wm. I. Cannon, V. Pres. & Gen. Man. Wm. Stewart, Sec. & Treas. Adam P. Samuel.

**DAVENPORT, IA.**—Davenport Central St. R.R. Co. 2 1/2 m, 4-8 1/2 g, 20 lb r, 12 c, 36 h. Pres. James Grant, V. Pres. W. L. Allen, Treas. J. B. Fidler, Supt. B. Rumsey, Sec. O. S. McNeill.

Davenport City Ry. Co. H. Schuitger, Lessee.

**DAYTON, KY.**—Newport & Dayton St. Ry. Co. 2 m, 5-2 1/2 g, 44 lb r, 9 c, 36 h. Pres. & Supt. W. W. Bean.

**DAYTON, O.**—Dayton St. R.R. Co. 3 1/2 m, 4-8 1/2 g, 44 lb r, 23 c, 66 h. Pres. J. W. Stoddard, V. Pres. H. S. Williams, Sec. C. B. Clegg, Supt. A. W. Anderson. Oakwood St. Ry. Co. 3 1-3 m, 4-8 1/2 g, 38 lb r, 12 c, 60 h. Pres. Charles B. Clegg, Sec. M. P. Moore, Supt. Wm. Davis.

The Wayne & Fifth St. R.R. Co. 3 1/2 m, 4-8 1/2 g, 34-38 lb r, 5 c, 30 h. Pres. Geo. M. Shaw, Sec. & Treas. Eugene Winchet, Supt. N. Routhahn.

**DECATUR, ILL.**—Decatur Horse Ry. Co. Citizens' Street R.R. Co. 2 m, 4-8 1/2 g, 20 lb r, 7 c, 47 h & mu. Pres. D. S. Shellabarger, Sec., Treas. & Supt. A. E. Kinney.

**DEERING, ME.**—See Portland.

**DENISON, TEX.**—Denison St. Ry. Co. 3 m 3-6 g, 16 lb r, 5 c, 22 mu. Pres. C. A. Waterhouse, Supt. S. A. Robinson.

**DENVER, COL.**—Denver City Ry. Co. 16 m, 3-6 g, 16 lb r, 50 c, 250 h. Pres. Geo. H. Holt, 10 Wall St., New York City, Sec. G. D. Lullier, 10 Wall St., New York City, Treas. & Man. G. E. Randolph.

**DES MOINES, IA.**—Des Moines St. Ry. Co. 10 m, 3 g, 25-30-38-52 lb r, 15 c, 100 h. Pres. M. P. Turner, Sec. M. A. Turner.

Des Moines & Sebastopol St. Ry. Co.

**DETROIT, MICH.**—Fort Wayne & Elmwood Ry. Co. 6 m, 4-8 1/2 g, 45 lb r, 30 c, 190 h. Pres. H. B. Brown, V. Pres. Edward Kanter, Treas. George B. Pease, Sec. N. W. Goodwin, Supt. Geo. S. Hazard.

Detroit City Ry. 30 m, 4-8 1/2 g, 40-43 lb r, 120 c, 700 h. Includes Jefferson Ave. line, Woodward Ave. line, Michigan Ave. line, Gratiot Ave. line, Brush St. line, Cass Ave. line, Congress & Baker line. Pres. Sidney D. Miller, Treas. George Hendrie, Sec. James Heugh, Gen. Supt. Robert Bell, Mast. Mech. John Willis.

Grand River St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 42 lb r, 13 c, 110 h. Pres. & Treas. Jos. Dalley, Sec. J. W. Dalley, Supt. C. M. Dalley.

**DOVER, N. H.**—Dover Horse R.R. Co. 2 2-5 m, 3 g, 30 lb r, 4 c, 14 h. Directors, Z. S. Wallingfor, Chas. H. Sawyer, Jas. E. Lothrop, C. W. Witzgin, Harrison Haley, Frank Williams, Cyrus Littlefield, Treas. Cyrus Littlefield.

**DUBUQUE, IA.**—Dubuque St. R.R. 5 m, 4-8 1/2 g, 21 c, 45 h. Pres. J. A. Rhonberg, Sec. & Treas. B. E. Litcham, Supt. J. J. Linchan.

**DULUTH, MINN.**—Duluth St. Ry. Co. 3 m, 3-6 g, 30 lb r, 6 c, 7 h, 31 mu. Pres. A. S. Chase, V. Pres. O. P. Searns, Sec. & Treas. L. Mendenhall, Supt. & Pur. Agt. W. T. Hoopes.

**EAST OAKLAND, CAL.**—Oakland, Brooklyn & Fruitvale R.R. Co.

**EAST SAGINAW, MICH.**—Street R. R. Co. of East Saginaw — m, 4-8 1/2 g, 30 lb r, 14 c, 25 h. Pres. & Supt. W. J. Barton, Sec. W. H. Hark, Treas. J. B. Peter.

**EAST ST. LOUIS, ILL.**—East St. Louis St. R.R. Co.

**EASTON, PA.**—The Easton & So. Easton Passenger Ry. Co. 1 1/2 m, 5-2 1/2 g, 45 lb r, 4 c, 20 h. Pres. H. A. Sage, Sec. & Treas. H. W. Cooley, Supt. Elisha Burwell, So. Easton.

The West End Passenger Ry. Co. 1 1/2 m, 5-2 1/2 g, 45 lb r, 6 c, 20 h. Pres. H. A. Sage, Sec. & Treas. H. W. Cooley, Supt. Samuel Berry.

**EAU CLAIRE, WIS.**—Eau Claire City Ry. Co.

**ELGIN, ILL.**—Elgin City Ry. Co. 2 c. 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 g, 30 lb r, 24 c, 74 h. Pres. & Treas. Jacob Davis, Sec. & Supt. John F. Pritchard.

**ELKHART, IND.**—Elkhart City R.R. Co.

**ELMHRA, N. Y.**—The Elmira & Horseheads Ry. Co. 9 2-3 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, Supt. Henry C. Silsbee. Officers, 212 E. Water St.

**EL PASO, TEX.**—El Paso St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 20 lb r, 8 c, 25 h. Pres. G. B. Zimpelman, V. Pres. A. Krockauer, Treas. F. Magoffice, Sec. & Supt. I. A. Tays.

**EMPORIA, KAN.**—Emporia City Ry. Co. 3 1/2 m, 5 g, 20 lb r, 6 c, 23 mu. Pres. Van R. Holmes, Treas. A. 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. Jno. Gaston.

**ERIE, PA.**—Erie City Passenger Ry. Co. 5 m, 4-8 1/2 g, 30-40 lb r, 17 c, 70 h. Pres. Wm. W. Reid, Treas. J. C. Spencer, Sec. A. L. Lettall, Supt. Jacob Berst.

**EUREKA SPRINGS, ARK.**—Eureka Springs City Ry. Co.

**EVANSVILLE, IND.**—Evansville St. Ry. Co. 12 m, 4-8 g, 28 lb r, 31 c, 190 mu. Pres. John Gilbert, Sec. P. W. Raleigh, Treas. John Gilbert, Supt. W. Bahr.

**FALL RIVER, MASS.**—Globe St. Ry. Co. 12 m, 4-8 1/2 g, 40-46-47 lb r, 40 c, 160 h. Pres. Frank S. Stevens, Treas. F. W. Brightman, Sec. M. G. B. Swift, Supt. John H. Bowler, Jr.

**FORT SCOTT, KAN.**—Bourbon County St. Ry. Co. 1 m, 4 g, 22 lb r, 2 c, 4 m. Pres. Isaac Tadden, V. Pres. Benj. Files, Sec. Wm. Perry, Treas. J. H. Randolph.

**FORT SMITH, ARK.**—Fort Smith St. Ry. Co. 2 m, 3-6 g, 16-28 lb r, 5 c, 16 h. Pres. Sam'l M. Loud, Sec. & Treas. Geo. T. Sparks.

**FORT WAYNE, IND.**—Citizens' St. R.R. Co.

**FORT WORTH, TEX.**—Fort Worth St. Ry. Co. 7 1/2 m, 4 g, 25-38 lb r, 16 c, 73 m. Pres. K. M. Vandant, Treas. W. A. Hoffman, Acting Sec. & Gen. Man. S. Mims.

**FRANKFORD, N. Y.**—Frankfort & Lion Street Ry. Co. 2 1/2 m, 5 g, 4 c. Pres. A. C. McGowan, Frankfort, Sec. D. Lewis, Lion, Treas. P. Remington, Lion, Supt. Fredk. Gates, Frankfort.

**FREDONIA, N. Y.**—Dunkirk & Fredonia R.R. Co. 3 1/2 m, 4-10 g, 25 lb r, 5 c, 8 h. Pres. Wm. M. McCinsty, Sec. & Treas. M. N. Penner, Supt. Z. Eimer, Wheelock.

**GAINESVILLE, FLA.**—Gainesvi

**GAINESVILLE, TEX.**—Gainesville St. Ry. Co. 2 1/2 m, 3-6 g, 17 lb r, 4 c, 12 h. Pres. C. N. Stevens, V. Pres. J. T. Harris, Sec. & Treas. F. R. Sherwood.

**GALESBURG, ILL.**—Galesburg Horse R.R. Co.

**GALVESTON, TEX.**—Galveston City R.R. Co. 18 m, 4-8 1/2 g, 30 lb r, 68 c, 169 mu. Pres. Wm. H. Sinclair, Sec. & Treas. F. D. Merritt, Supt. M. J. Keenan. Gulf City St. Ry. & Real Estate Co.

**GLOUCESTER, MASS.**—Gloucester City R.R.

**GRAND RAPIDS, MICH.**—Street Ry. Co. of Grand Rapids, Mich. 13 m, 4-8 1/2 g, 30-35 lb r, 21 c, 175 h. Pres. C. A. Otis, Cleveland, O. V. Pres. L. H. Withey, Grand Rapids, Treas. M. S. Crosby, Grand Rapids, Sec. J. M. Weston, Grand Rapids, Asst. Sec. Jas. Pickands, Cleveland, O.

**GREEN CASTLE, IND.**—Green Castle City St. Ry. Co. 2 m, 4-8 1/2 g, 23 lb r, 3 c, 12 h. Pres. & Supt. D. Rogers, Sec. James S. Nutt, Treas. Rudolph Rogers.

**GREENVILLE, S. C.**—Greenville City Ry. Co. 1 m, 5 g, — lb r, 5 c, 20 h. Proprietors, Gilreath & Harris.

**HAMILTON, O.**—The Hamilton St. Ry. Co. 4 m, 3 g, 28 lb r, 11 c, 12 h. Pres. James F. Griffin, Sec. O. V. Parrish, Treas. H. L. Morey, Supt. J. C. Bigelow.

**HANNIBAL, MO.**—Hannibal St. Ry. Co. 2 m, 4-8 1/2 g, 16-36 lb r, 6 c, 22 h. Pres. & Supt. M. Doyle, Sec. & Treas. James O. Hearn.

**HARRISBURGH, PA.**—Harrisburgh City Passenger Ry. Co. 2 1/2 m, 5-2 1/2 g, 42-47 lb r, 15 c, 36 h, Pres. H. A. Kelker, V. Pres. Daniel Epply, Sec. John



Houston, West Street & Pavonia Ferry R.R. Co. 5 m, 4-8 1/2 g, 60 lb r, 50 c, 400 h. Pres. Richard Kelly, Sec. & Treas. Daniel B. Hasbrook. Office, 415 E. 10 St.

Jerome Park R.R. 1 m, 4-8 3/4 g, 50-56 lb r. Pres. Leonard M. Jerome, Sec. Fred A. Lovecraft, Treas. Theodore Moss. Office, cor. 5th Ave. & 23d St.

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. 5 1/2 m, 4-8 3/4 g, 56-75 lb r, 144 c, 1,408 h. Pres. W. H. Vanderbilt, V. Pres. & Sec. Cornelius Vanderbilt, Treas. Ed. V. W. Rossiter, Supt. Alfred Skitt, Pur. Agt. Chas. Reed.

Sixth Ave. R.R. Co. 4 m, 4-8 3/4 g, 60 lb r, 127 c, 1296 h. Office, 756 Sixth Ave.

South Ferry Ry. Co. 3/4 m, 4-8 3/4 g, 60 lb r, 13 c, 41 h. Pres. Henry Hart, Sec. Wm. N. Cohen, Treas. Albert J. Elias, Supt. Chas. H. Meeks. Office 20 Whitehall St.

The Second Ave. R.R. Co. 13 m, 4-8 3/4 g, 60 lb r, 316 cars, 1750 h. Pres. W. Thorn, V. Pres. J. Wadsworth, Sec. & Treas. J. B. Underhill. Office Second Ave. cor. 96th St.

The Third Ave. R.R. Co. 13 1/2 m, 4-8 3/4 g, 60 & 74 lb r, 318 c, 2150 h. (3/4 m of cable road on 10th ave.) Pres. Lewis Lyon, 739 Madison ave., V. Pres. Henry Hart, 110 Tribune Building, Sec. Alfred Lazarus, 436 W. 61st st., Treas. John Beaver, 21 E. 112th st., Supt. John H. Robertson, 307 E. 65th st.

Twenty-third St. R.R. Co. 7 m, 4-8 3/4 g, 54 lb r, 102 c, 692 h. Pres. Jacob Sharp, Sec. Thos. H. McLean, Treas. Lewis May, Act-Supt. George Ferry. Office 621 West 23d St.

Niagara Falls, N. Y.—Niagara Falls & Suspension Bridge Ry. Co. 2 1/2 m, 4-8 3/4 g, 38-42 lb r, 8 c, 36 h. Pres. Benj. Flagler, V. Pres. Alva Chich, Sec. W. J. Mackay, Treas. A. Schoellkopf.

Norfolk, Va.—Norfolk & City R.R. Co. 3 1/2 m, 5-2 g, 44 lb r, 18 c, 65 h. Pres. John B. Whitehead, Treas. H. C. Whitehead, Supt. E. W. Savage.

Northampton, Mass.—Northampton St. Ry. Co. 3 1/2 m, 4-8 3/4 g, 32 lb r, 7 c, 26 h. Pres. Oscar Edwards, Sec. M. H. Spaulding, Treas. & Sup. E. C. Clark.

Norwalk, Conn.—Norwalk Horse R.R. Co. 2 m, 4-10 g, — lb r, 7 c, 20 h. Pres. James W. Hyatt, V. Pres. & Sec. Edwin G. Hoyt, Sup. James W. Hyatt.

Norwich, Conn.—Norwich Horse R.R. Co. — m, — g, — lb r, — c, — h. Pres. —, Sec. —, Treas. —.

Oakland, Cal.—Alameda, Oakland & Piedmont R.R. Co. — m, — g, — lb r, — c, — h. Pres. —, Sec. —, Treas. —.

Berkley Villa R.R. Co. — m, — g, — lb r, — c, — h. Pres. —, Sec. —, Treas. —.

Broadway & Piedmont St. R.R. Co. — m, — g, — lb r, — c, — h. Pres. —, Sec. —, Treas. —.

Oakland R.R. Co. — m, — g, — lb r, — c, — h. Pres. —, Sec. —, Treas. —.

Ogden City, Utah—Ogden City Ry. Co. 3 m, 4-8 3/4 g, 20 lb r, 4 c, 21 h. Pres. L. W. Shurtlett, Ogden City, V. P. & Supt. O. P. Arnold, Salt Lake City, Sec. & Treas. H. S. Young, Ogden City.

Olean, N. Y.—Olean St. Ry. Co. 1-1-10 m, 3-6 g, 25 lb r, 3 c, 8 h. Pres. M. B. Fobes, Sec. & Treas. M. W. Barse.

Omaha, Neb.—Omaha Horse Ry. Co. 15 m, 4-8 3/4 g, 35 lb r, 40 c, 300 h. Pres. Frank Murphy, V. Pres. Guy C. Barton, Treas. W. W. Marsb, Supt. W. A. Smith.

Oneida Village, N. Y.—Oneida St. Ry. Co. — m, — g, — lb r, — c, — h. Pres. Jerome Heacock.

Philadelphia Traction Co. 109 m, 5-2 1/2 g, 45-78 lb r, 595 c, 3,160 h. Pres. W. H. Kemple, V. Pres. P. A. B. Widener & W. L. Elkins, Sec. & Treas. D. W. Dicklson.

Philadelphia & Gray's Ferry Pass. R.R. Co. 10-1-3 m, 40 c, 200 h. Pres. Matthew Brooks, Treas. J. C. Dawes, Sec. J. Crawford Dawes, Supt. Patrick Lovett.

Ridge Avenue Pass. Ry. Co. 14 m, 5-2 g, 47 lb r, 55 c, 352 h. Pres. E. B. Edwards, V. Pres. John Lambert, Sec. & Treas. Wm. S. Blight, Supt. William Ingles.

Second & Third Sts. Pass. Ry. Co. 37 m, 116 c, 669h. Pres. Alexander M. Fox, Treas. William P. Miller, Sec. Charles D. Matlack, Supt. David W. Stevens.

Seventeenth & Nineteenth Sts. Pass. Ry. Co. 7 1/2 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, 43 lb r, 73 c, 452 h. Pres. Thos. W. Ackley, Sec. & Treas. Thos. S. Harris, Supt. Wm. B. Cooper.

Union Pass. Ry. Co. 70 m, 348 c, 1,724 h. Pres. Wm. H. Kemple, Sec. & Treas. John B. Peddie, Supt. Jacob C. Petty.

West Philadelphia Pass. Ry. Co. 18 1/2 m, 122 c, 646 h. Pres. Peter A. B. Widener, Sec. & Treas. D. W. Dickson. [Leased by the Phila. Traction Co.]

Phillipsburgh, N. J.—Phillipsburgh Horse Car Ry. Co. 2 1/2 m, 4-8 g, 35 lb r, 4 c, 13 h. Pres. Daniel Runkle, Sec. & Treas. James W. Long.

Pittsburgh, Pa.—Central Pass R.R. Co. 3 m, 16 c, 95 h. Pres. J. F. Cluley, Sec. F. L. Stephenson, Treas. E. R. Jones, Supt. R. G. Heron.

Beaver Falls & New Brighton Ry. Co. Citizens' Pass. Ry. Co. 16 1/2 m, 5-2 1/2 g, 47 lb r, 40 c, 337 h. Pres. Jno. G. Holmes, Sec. C. M. Gormly, Supt. Murry Verner.

Federal St. & Pleasant Valley Pass. Ry. Co. 26 m, 5-2 1/2 g, 46-50 lb r, 20 c, 154 b. Pres. Wm. H. Creery, Treas. James Boyle, Supt. Wm. J. Crozier, Allegheny City.

People's Park Pass. Ry. Co. 2 m, 5-2 1/2 g, — lb r, 10 c, 75 h. Pres. Wm. McCreery, Treas. James Boyle, Supt. Wm. J. Crozier, Allegheny City.

Pittsburgh, Allegheny & Manchester Pass. Ry. Co. 5 m, 5-2 1/2 g, 46 lb r, 40 c, 275 h. Pres. Chas. Atwell, Sec. & Treas. Chas. Selbert, Supt. James C. Cotton. Manager J. P. Speer.

Pittsburgh, Oakland & East Liberty Pass. Ry. Co. 11 m, 5-4 1/2 g, 47 lb r, 32 c, 110 b, 61 mu. Pres. J. T. Jordan, Sec. John G. Traggardt, Treas. D. W. C. Bidwell, Supt. H. M. Cherry.

Pittsburgh Union Pass. R.R. Co. 5 m, 5-2 1/2 g, 45 lb r, 29 c, 170 h. Pres. Chas. Atwell, Supt. James C. Cotton, Sec. & Treas. Chas. Selbert, Cash. Saml. C. Hunter.

Pittsburgh & Birmingham Pass. R.R. Co. 3 1/2 m, 5-2 1/2 g, 48 lb r, 20 c, 170 h. Pres. W. W. Patrick, Sec. D. F. Agnew, Treas. John G. Holmes.

Pittsburgh & West End Pass. Ry. Co. 3 1/2 m, 5-2 g, 35 lb r, 13 c, 75 h. Pres. John C. Kelly, Sec. & Treas. Thomas S. Elgelow, Supt. William J. Burns.

Pittsburgh & Wilksburg St. Ry. Co. Second Avenue Pass. Ry. Co. South Side Pass. R.R. Co. 2 1/2 m, 5-2 1/2 g, 45 lb r, 12 c, 80 h. Pres. D. Z. Brickett, Sec. & Treas. W. T. Wallace, Supt. W. M. Rosborough.

Transverse Pass. Ry. Co. 6 1/2 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.

Pittston, Pa.—Pittston St. R.R. Co. 1 1/2 m, 3 c, 5 h. Pres. Thomas Griffith, Treas. M. W. Morris, Sec. William Allen.

Port Huron, Mich.—Port Huron St. Ry. Co. 6 1/2 m, 4-8 3/4 g, 7 c, 22 h. Pres. Jno. P. Sanborn, V. Pres. Frank A. Beard, Sec. Treas. & Man. J. R. Wastell.

Portland, Me.—Ocean St. R.R. Co. Portland R.R. Co. 7 1/2 m, 4-8 3/4 g, 30-35-45 lb r, 34 c, 154 h. Pres. H. J. Libby, Treas. & Gen. Man. E. A. Newman, Supt. Geo. W. Soule.

Sec. & Treas. F. D. Mellen, Man. C. M. Baeton, Supt. Charles Sleders.

Rochester, N. Y.—Rochester City & Brighton R.R. Co. 22 m, 4-8 3/4 g, 45 lb r, 120 c, 560 h. Pres. Patrick Barry, Sec. C. C. Woodworth, Treas. C. B. Woodworth, Supt. Thomas J. Brower.

Citizens' St. Ry. Co. Pres. Wm. H. Jones, Sec. & Treas. J. E. Pierpont, Supt. S. A. Green.

Rockford, Ill.—Rockford St. Ry. Co. 6-2-5 m, 4-8 3/4 g, 30 lb r, 13 c, 52 h, 16 m. Pres. Anthony Haines, V. Pres. L. Rhodes, Sec. Miss A. C. Arnold, Treas. N. E. Lyman, Supt. Fred Haines.

Rock Island, Ill.—Rock Island & Milan St. Ry. Co. 7 m, 4-8 3/4 g, 20-30-42 lb r, 10 c, 7 h. Pres. & Supt. Bally Davenport, Sec. E. H. Gayer, Treas. John Peety.

Rondout, N. Y.—Kingston City R.R. Co. 2-4-5 m, 4-8 3/4 g, 40 lb r, 10 c, 40 h. Pres. James G. Lindsley, V. Pres. S. D. Corykold, Sec. & Treas. John C. Romeyer, Supt. Wm. H. DeGarmo.

Sacramento, Cal.—Sacramento City St. R.R. Co. Saginaw, Mich.—Saginaw St. R.R. Co. 2 1/2 m, 4-8 3/4 g, 42 lb r, 10 c, 50 h. Pres. David H. Jerome, V. Pres. Geo. F. Williams, Sec. & Treas. Geo. L. Burrows, Supt. Fred G. Benjamin.

Salem, Mass.—Salem & Danvers St. Ry. Co. 6 m, 4-8 3/4 g, 35-47 lb r, 15 c, 45 h. Pres. Benj. W. Russell, Sec. G. A. Vleckery, Treas. Geo. W. Williams, Supt. W. B. Furgurson, Asst. Supt. David N. Cook.

Naumkeag St. Ry. Co. — m, 4-8 3/4 g, 30-35-45 lb r, 50 c, 140 h. Pres. Chas. Odell, Clerk Joseph F. Hickey, Treas. Henry Wheatland, Supt. Willard B. Ferguson.

Salt Lake City, Utah—Salt Lake City R.R. Co. 13 m, 4-8 3/4 g, 20 lb r, 20 c, 115 mu. Pres. John Taylor, Sec. David McKenzie, Treas. James Jack, Supt. Orson P. Arnold.

San Antonio, Tex.—San Antonio St. Ry. Co. 15 m, 4 g, 30 lb r, 38 c, 125 mu. Pres. A. Belknap, San Antonio, V. Pres. F. W. Pickard, N. Y. City, Treas. I. Withers, San Antonio, Sec. E. R. Norton, Supt. John Robb.

Prospect Hill St. Ry. Co. Sandusky, O.—Sandusky St. Ry. Co. 2 m, — g, — lb r, — c, — h. Pres. Chas. B. Ods, Sec. & Treas. A. C. Morse, Supt. Clark Rude.

San Francisco, Cal.—California St. R.R. Co. Central R.R. Co. 6 m, 4-8 g, 45 lb r, 31 c, 290 h. Pres. Chas. Main, V. Pres. Jos. Roseberg, Treas. A. J. Gunnison, Sec. C. G. LeBreton, Supt. J. F. Clark.

Clay St. Hill R.R. Co. 1 m, 3-6 g, 30 lb r, 11 c, 12 dummy cars. Pres. Joseph Britton, V. Pres. James Moffit, Treas. Henry L. Davis, Sec. Chas. P. Campbell, Supt. Joseph Britton.

Clay St. Park & Ocean R.R. Co. Market St. Cable Ry. Co. 10-9-10 m, 4-8 3/4 g, 45 lb r, 137 c, 2 motors, 73 h. Pres. Leland Stanford, V. Pres. Chas. F. Crocker, Treas. N. T. Smith, Sec. J. L. Willcutt.

North Beach & Mission R.R. Co. 8 m, 5 g, 46 c, 400 b. Pres. Jos. Roseberg, Sec. H. W. Hathorne, Treas. Carl Ahnel, Supt. M. Skelly.

Omnibus R.R. & Cable Co. 8 1/2 m, 5 g, 35-45 lb r, 50 c, 364 h. Pres. Gustav Sutro, V. Pres. D. Callaghan, Sec. G. Ruegg, Supt. M. M. Martin.

Portrero & Bay View R.R. Co. 1 1/2 m, 5 g, 35 lb r, 20 c, 64 h. Pres. Leland Stanford, V. Pres. Chas. Crocker, Treas. N. T. Smith, Sec. J. L. Willcutt.

Sutter St. R.R. Co. 5 1/2 m, 4-11 g, 35-45 lb r, 30 c, 125 h. Pres. F. Morrow, Sec. A. K. Stevens, Treas. M. Schmitt, Supt. James McCord.

Telegraph Hill St. Ry. Co. 1,707 ft, 4-11 g, 36 lb r, 3 c, — h. Pres. Gustav Sutro, V. Pres. E. O. Demlocke, Sec. & Treas. C. J. Werner.

The City R.R. Co. 5 1/2 m, 5 g, 48 lb r, 73 c, 285 h. Pres. R. B. Woodward, V. Pres. Geo. E. Raum, Sec. M. E. Willis, Treas. J. H. Goodman, Supt. William Woodward.

San Jose, Cal.—San Jose & Santa Clara R.R. Co. First St. & San Pedro St. Depot R.R. Co. Market St. & Willow Glen R.R. Co. North Side R.R. Co. People's R.R. Co.

Santa Barbara, Cal.—Santa Barbara St. R.R. Co. 1 m, 3-6 g, 3 c, 8 mu. Pres. A. W. McPbail.

Saugatuck, R.R.—Westport & Saugatuck Horse R.R. Savannah, Ga.—City & Suburban Ry. Co. 15 1/2 m, 5 g, 16-30 lb r, 49 c, 110 h, 3 engines. Pres. J. H. Johnson, Asst. J. W. Alley, Treas. E. Schmidt.

**SOUTH CHICAGO, ILL.**—Chicago Horse & Dummy R.R. 5 m, 4-8½ g, — 1h r, — c, — h. Pres. D. L. Huff, Treas. A. C. Calkins, Sec. E. R. Bliss. [Not in operation.]

**SOUTH PUEBLO, COL.**—Pueblo St. R.R. Co. **SPRINGFIELD, ILL.**—Citizens' St. R.R. Co. 9½ m, 3 6 g, 20-36 lb r, 23 c, 100 h. Pres. J. H. Schrick, Treas. Frank Relsch, Sec. Chas. F. Harman. Springfield City Ry. Co.

**SPRINGFIELD, MASS.**—Springfield St. Ry. Co. 4-8½ g, 33-40 lb r, 28 c, 115 h. Pres. John Olmstead, Auditor L. E. Ladd, Clerk Gideon Wells, Treas. A. E. Smith, Supt. F. E. King.

**SPRINGFIELD, MO.**—The People's Ry. Co. of Springfield, Mo. 3½ m, 4-10 g, 33 lb r, 5 c, 30 h. Pres. J. C. Cravens, Sec. Benj. N. Massey, Treas. Chas. Sheppard, Supt. H. F. Denton.

**SPRINGFIELD, O.**—Citizens' St. R.R. Co. 10 m, 4 g, 29 c, 135 h. Pres. D. W. Stroud, V. Pres. A. S. Bushnell, Treas. Rose Mitchell, Sec. F. S. Penfield, Supt. W. H. Hanford.

**STATEN ISLAND, N. Y.**—Staten Island Shore Ry. Co.

**ST. CATHARINE'S, ONT.**—St. Catharine's, Merril-st & Thorold St. Ry. Co. 5½ m, 4-8½ g, 30 lb r, 7 c, 30 h. Pres. E. A. Smythe, Sec. S. K. Smythe, Supt. E. A. Smythe.

**ST. JOSEPH, MO.**—Citizens' St. R.R. Co. 3 m, 4-8½ g, 28 lb r, 14 c, 52 mu. Pres. Richard E. Turner, Sec. & Treas. Arthur Kirkpatrick, Supt. John F. Merlam.

Frederick Ave. Ry. Co. 1½ m, 3 g, 16 lb r, 6 c, 16 h. Pres. Thomas E. Tootle, V. Pres. Winslow Judson, Sec. W. D. B. Motter, Treas. Thomas W. Evans, Supt. S. Rowen.

St. Joseph & Lake St. R.R. Co. Union Ry. Co.

**ST. LOUIS, MO.**—Baden & St. Louis R.R. Co. 3½ m, 4-10 g, — 1h r, 7 c, 21 h. Pres. George S. Case, V. Pres. William Z. Coleman, Supt. J. H. Archer.

Benion & Bellefontaine Ry. Co. 7½ m, 4-10 g, 45 lb r, 29 c, 200 h. Pres. J. G. Chapman, V. Pres. Chas. Parsons, Sec. Robert McCulloch.

Cass Avenue & Fair Grounds Ry. Co. 8 m, 4-10 g, 38 lb r, 37 c, 290 h. Pres. W. R. Allen, V. Pres. Geo. W. Allen, Sec., Treas. & Supt. G. G. Ghson, Cashier O. H. Williams.

Citizen's Ry. Co. — m, — g, — 1b r, — c, — h. Pres. Julius S. Walsh. Jefferson Ave. Ry. Co.

Lindell Ry. Co. 13½ m, — g, — r, 65 c, 475 h. Pres. John H. Maquon, V. Pres. John H. Lightner, Sec. & Treas. Geo. W. Baumhoff, Supt. Jos. C. Llewellyn.

Missouri R.R. Co. — m, — g, — 1b r, — c, — h. Pres. P. C. Maffit. Mound City R.R. Co.

Northern Central. Springfield Ry. Co. 2 m, 4-8½ g, 25-40 lb r, 7 c, 40 h. Pres. C. W. Rogers, St. Louis, Sec. & Treas. B. F. Hobart, Springfield, Supt. J. A. Stoughton, No. Springfield, Asst. Supt. Frank B. Smith, No. Springfield.

Southern Ry. Co. 7-4-5 m, 4-10 g, 35-52 lb r, 49 c, 250 h. Pres. E. R. Coleman, Sec. J. S. Minary, Man. W. L. Johnson.

St. Louis R.R. Co. and the People's R.R. One management. 11 m, 4-10 g, 38-44 lb r, 58 c, 375 h. Pres. Chas. Green, Sec. & Treas. John Mahoney, Supt. Patrick Shea.

Tower Grove & Lafette R.R. Union Depot R.R. Co. — m, — g, — 1b r, — c, — h. Pres. John Scullin. Union R.R. Co.

**STONEHAM, MASS.**—Stoneham St. R.R. Co. 2½ m, 4-8½ g, 33 lb r, 10 c, 25 h. Pres. A. V. Lynde, Melrose, Treas. & Clerk Lyman Dyck, Supt. John Hill.

**ST. PAUL, MINN.**—St. Paul City Ry. Co. 25 m, 4-8½ g, 80 c, 150 h, 294 mu. Pres. Thos. Lowry, V. Pres. C. G. Goodrich, Sec. J. H. Randall, Treas. Clinton Morrison, Supt. A. L. Scott.

**STILLWATER, N. Y.**—Stillwater & Mechanicsville St. Ry. Co. 4½ m, 4-8½ g, 25-30 lb r, 3 c, 6 h. Pres. S. Rowley, V. Pres. W. L. Denison, Sec. H. O. Bailey, Mechanicsville, Treas. E. N. Smith.

**STROUDSBURG, PA.**—Stroudsburg Passenger R.R. Co. 1-4-5 m, 4-8½ g, 28-30 lb r, 3 c, 9 h. Pres. & Treas. J. Lantz, Sec. Jacob Houser.

**SYRACUSE, N. Y.**—Syracuse & Onondaga R.R. Co. 2-3-5 m, 4-8 g, 28-47 lb r, 9 c, 18 h. Pres. Peter Burns, Sec. & Treas. Lyman C. Smith, Supt. Henry Thompson.

Central City Ry. Co. 2½ m, 4-8½ g, 40 lb r, 12 c, 37 h. Pres. George N. Kennedy, V. Pres. Daniel Pratt, Sec. & Treas. James Barnes, Supt. George Crampton. 4 Syracuse Savings Bank Building.

Fifth Ward R.R. Co. 2½ m, 4-8½ g, 35-56 lb r, 8 c, 30 h. Pres. P. B. Brayton, Sec. & Treas. O. C. Potter, Supt. Hugh Furnell. Office W. Washington St.

Genesee & Water St. R.R. Co. and Fourth Ward R.R. Co. 4 m, 4-8½ g, 18-30 lb r, 10 c, 35 h. Pres. Roht. G. Wynkoop, Sec. & Treas. Geo. J. Gardner, Supt. W. J. Hart. Onondaga Savings Bank Building.

New Brighton & Onondaga Valley R.R. Co. 1½ m, 4-8 g, 16 35 lb r, 2 c, 4 1 h dummy. Pres. Matthias Britton, Sec. T. W. Meacham, Treas. J. H. Anderson, Supt. J. H. Anderson.

Syracuse & Geddes Ry. Co. 2 m, 4-8½ g, 35-45 lb r, 10 c, 32 h. Pres. R. Nelson Gere, Sec. & Treas. Rasselias A. Bonta, Supt. Wm. J. Hart.

**TAUNTON, MASS.**—Taunton St. Ry. Co. 4½ m, 4-8 g, 14 c, 44 h.

**TERRE HAUTE, IND.**—Terre Haute St. Ry. Co. 4½ m, 4-8 g, 28 lb r, 16 c, 48 h. Pres. T. C. Buntlo, V. Pres. Josephus Collett, Sec. John R. Hagen, Supt. John T. Surliver.

**TEXARKANA, ARK.**—Texarkana St. Ry. Co.

Pres. Jno. J. Shipperd of Cleveland, Treas. H. E. Wells of Cleveland, Gen. Man. T. F. Shipperd, Supt. Jno. A. Wat-on.

Monroe Street R.R. The Central Passenger R.R. Co. of Toledo, O. 8 m, 3 g, 27 lb r, 17 c, 70 h. Pres. F. E. Seagrave, V. Pres. & Treas. James Pazneer, Sec. Chas. F. Parks, Supt. A. R. Seagrave.

Toledo Street R.R. Co. **TOPEKA, KAN.**—Topeka City Ry. Co. 9 m, 4 g, 25-48 lb r, 25 c, 90 h. Pres. Joah Mulvane, V. Pres. D. W. Stormont, Sec. & Treas. E. Wildes, Supt. Jesse Shaw.

**TORONTO, CAN.**—Toronto St. Ry. Co. 18 m, 4-10½ g, 30 lb r, 136 c, 670 h. Pres. Frank Smith, Sec. James Green, Supt. John J. Franklin.

**TRENTON, N. J.**—Trenton Horse R.R. Co. 1½ m, 5-2 g, 43-47 lb r, 10 c, 31 h. Pres. Gen. Lewis Perrine, Sec. & Treas. Lewis Perrine, Jr., Supt. Thomas Sillorris.

City Ry. Co. 3 m, 5-2 g, 45 lb r, 15 c, 69 h. Pres. Adam Extolr, V. Pres. W. H. Skinn, Sec. H. B. Howell, Treas. & Mang. Director Chas. J. Bramford.

**TROY, N. Y.**—Cortland & Homer Horse R.R. Co. 4 m, 4-8½ g, 25 30 lb r, 2 c. — h. Pres. C. H. Garrison, Troy, V. Pres. E. A. Fish, Cortland, N. Y., Treas. Jas. M. Milen, Cortland, Sec. S. E. Welch, Cortland.

Troy & Albia Street Ry. Co. 3½ m, 4 g, 35-45 lb r, 9 c, 41 h. Pres. Thos. A. Knickerbocker, Sec. & Treas. Theo. E. Haselhurst, Supt. W. R. Bean.

Troy & Lansingburgh R.R. Co. 20½ m, 4-8½ g, 47 lb r, 91 c, 466 h. Pres. William Kemp, V. Pres. Charles Clemmshaw, Sec. & Treas. Joseph J. Hagen, Supt. Leader C. Brown, 295 River St.

**URBANA, ILL.**—Urbana R.R. Urbana & Champaign St. Ry. Co. 2 m, 4-8½ g, 33 lb r, 4 c, 20 h. Pres. Wm. Park, Sec. & Treas. Frank G. Jaques, Supt. W. Park.

**UTICA, N. Y.**—Utica, Clinton & Binghamton St. R.R. 7½ m, 4-8½ g, 43-56 lb r, 17 c, 82 h. Pres. Isaac Maynard, Sec. & Treas. Robt. S. Williams, Supt. Roger Rock.

The Utica & Mohawk R.R. Co. 2½ m, 4-8½ g, 25-40 lb r, 9 c, 5 h. Pres. Chas. W. Hutchinson, V. Pres. Nathan S. Haynes, Sec. Geo. M. Weaver, Treas. Joshua W. Church.

**VAITSBURGH, N. J.**—Newark, So. Orange, Ferry St. & Hamburg Place R.R. Co.

**VALEJO, CAL.**—Valejo St. Ry. Co.

**VICKSBURG, MISS.**—Vicksburg St. Ry. Co.

**VINCENNES, IND.**—Vincennes St. Ry. Co.

**WACO, TEX.**—Waco St. Ry. Co. 5 m, 4-8 g, 14 18 lb r, 9 c, 44 h. Pres. E. Rotan, Sec. & Treas. W. R. Keillum, Supt. J. W. Sedbury.

**WALTHAM, MASS.**—Waltham & Newton St. Ry. Co. 3½ m, 4-3½ g, 30 lb r, 6 c, 14 h. Pres. R. E. Robbins, Sec. & Treas. Henry Bond.

**WASHINGTON, D. C.**—Capital, No. O. St. & So. Washington R.R. Anacostia & Potomac River Ry. Co. 3 m, 4-8 g, 37 lb r, 9 c, 24 h. Pres. H. A. Griswold, Sec. Edward Temple, Treas. T. E. Smithson.

Columbia R.R. Co. of the District of Columbia, 2½ m, — g, — 1b r, 19 c, 56 h. Pres. H. A. Willard, Sec. & Treas. Wm. H. Clayette, Supt. Thos. E. Benson.

Metropolitan R.R. Co. 21½ m, 4-8 g, 38 lb r, 90 c, 400 h. Pres. George W. Pearson, V. Pres. A. A. Wilson, Sec. & Treas. William M. Morse, Supt. L. W. Emmart.

Washington & Georgetown R.R. Co. 10 m, 4-8½ g, 42 lb r, 161 c, 750 h. Pres. H. Hunt, Sec. & Treas. C. M. Koones, Gen. Supt. C. C. Salles.

**WATERFORD, N. Y.**—Waterford & Cohoes R.R. Co. 2 m, 4-8½ g, 45 lb r. Pres. Thos. Breslin, Sec. & Treas. C. B. Ormsby. (Leased by the Troy & Lansingburgh R.R. Co.)

**WEST HURON, CONN.**—New Haven & West Haven R.R. Co.

**WESTPORT, CONN.**—Westport & Saugatuck Horse R.R.

**WICHITA, KAN.**—Wichita City Ry. Co. 6 m, 8 Pres. J. W. Ground, Sec. & Mangr. E. R. Powell.

**WHEELING, W. VA.**—Citizens Ry. Co. Wheeling & Elm Grove R.R. 7 m, 4-8½ g, 30 lb r, 12 c, 4 Baldwin Motors. Pres. J. D. DuBols, Sec. E. J. Kutter.

**WILKESBARRE, PA.**—Wilkesbarre & Kingstons Pass. R.R. Wilkesbarre & Ashley Passenger R.R. Co.

Coalville Passenger R.R. 2½ m, 4-8½ g, 20-34 lb r, 4 c, 10 h. Pres. Chas. A. Miner, Sec. & Treas. George Loveland, Supt. Albert G. Orr.

**WILLIAMSPORT, PA.**—Williamsport St. R.R. Co.

**WILMINGTON, DEL.**—Front & Union St. Passenger Ry. Co. Wilmington City Ry. Co. 4½ m, 5-2½ g, 45 lb r, 20 c, 82 h. Pres. W. Canby, Sec. & Treas. John F. Miller, Supt. Wm. H. Burnett.

**WINDSOR, CAN.**—Sandwich & Windsor Passenger R.R. Co.

**WINNIPEG, MANITOBA, CAN.**—The Winnipeg St. Ry. Co. 5 m, 4-8½ g, 35 lb r, 13 c, 75 h. Pres. Duncan MacArthur, Sec. & Mangr. Albert W. Austin, Supt. Geo. A. Young.

**WINONA, MINN.**—Winona City Ry. Co. 4 m, 3-6 g, 27 lb r, 10 c, 39 h. Pres. John A. Mathews, V. Pres. B. H. Langley, Sec. & Treas. C. H. Porter.

**WOBURN, MASS.**—No. Woburn Horse R.R. 2½ m, 4-8 g, 4 e, 4 h. Pres. & Treas. John Carter, Sec. J. G. Macuire, Supt. Dexter Carter.

**WORCESTER, MASS.**—Worcester St. Ry. Co. ½ m, 4-8½ g, 45 lb r, 19 c, 100 h. Pres. Geo. H. Seeley, Y. City, V. Pres. Nathan Seeley, N. Y. City, Treas. & Supt. Harry S. Searls, Worcester.

**YOUNGSTOWN, O.**—Youngstown St. R.R. Co.

**ZANESVILLE, O.**—Bellair, Chillicothe & Canton. Zanesville & McIntire St. Ry. Co. 3 m, 3-6 g, 35 lb r, 12 c, 54 m. Pres. J. Bergen, Sec. W. C. Townsend, Treas. T. B. Townsend.

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ISSUE OF AUG. 4, 1885.

323,817—Car for cable railways. Grip. G. P. H. Lottis, San Francisco, Cal.  
 323,829—Car-starter. T. F. Bourne, Bloomfield, N. J.  
 323,834—Fare-box, signal attachment. W. J. Abernethy, Minneapolis, Minn.  
 323,553—Fare-recorder. E. Baldwin, New York, N. Y.

ISSUE OF AUG. 11, 1885.

324,084—Car draft apparatus. J. W. Cloud, Altona, Pa.  
 323,962—Car-starter. J. C. Price, Taylorsville, Ill.  
 323,967—Car window-sash. J. Stephenson, New York, N. Y.

ISSUE OF AUG. 18, 1885.

324,396—Fare-box register. F. F. Mattoon, Boston, Mass.  
 324,731—Railways. Rail-scraper for street and other. W. H. Robertson, Toronto, Ontario, Canada.

ISSUE OF AUG. 25, 1885.

325,135—Cars. Lamp-box for street. J. J. Walton, Newark, N. J.

ISSUE OF SEPTEMBER 1, 1885.

325,348—Fare box. F. O. Landfrane and M. E. Willis, San Francisco, Cal.  
 325,531—Combined railway track support and traction cable and electric conductor conduit. J. H. Gould, Philadelphia, Pa.

ISSUE OF SEPTEMBER 8, 1885.

325,043—Car starter. A. Kruzner and F. Tent-schert, Vienna, Austria.  
 325,908—Street car. F. M. Brooks, New York, N. Y.  
 326,527—Street railway car. T. B. Stewart, Hartford, Conn.  
 326,535—Cable railway. A. Bonzrno, Phoenixville Pa.

ISSUE OF SEPTEMBER 15, 1885.

326,120—Street cable railway. J. D. Isaacs, Oakland, Cal.  
 326,198—Hydromotor for street railways. R. F. Bridewell, San Francisco, Cal.

ISSUE OF SEPTEMBER 22, 1885.

325,585—Car starter. C. Dickenson, Portland, Oregon.

326,730—Car starter. F. Rousseau, Detroit, Mich.  
 326,779—Fare box. W. O. Price, New Orleans, La.  
 326,723—Fare register and recorder. J. Corbett, New York, N. Y.

ISSUE OF SEPTEMBER 29, 1885.

327,096—Switching wheel for street cars. H. G. Lowrie, Denver, Col.

ISSUE OF OCTOBER 6, 1885.

327,632—Street car-motor. W. C. Trussell, Boston, Mass.

ISSUE OF OCTOBER 13, 1885.

328,121—Street car-pole. W. H. Keller, Boston, Mass.  
 328,326—Fare-box. T. Mangan and J. T. Wilson, New Orleans, La.

ISSUE OF OCTOBER 20, 1885.

328,493—Car-starter and brake. J. Kubler, Hot Springs, Arkansas.

ISSUE OF OCTOBER 27, 1885.

329,104—Elec. cable conveyance. C. J. Van Depole, Chicago, Ill.  
 329,170—Car cable Railway Grip. S. W. Jackson, Chicago, Ill.  
 329,319—Car starter. J. A. Lane and J. M. Thorp, Detroit, Michigan.


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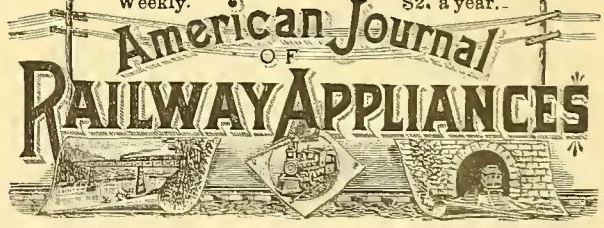
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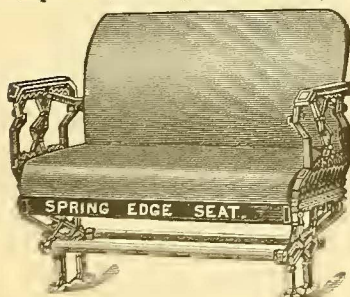
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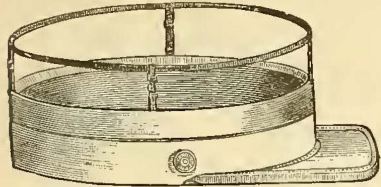
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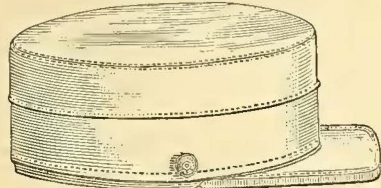
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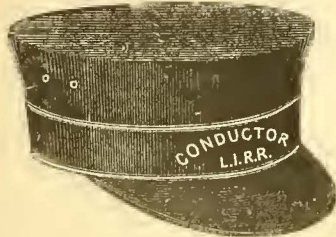
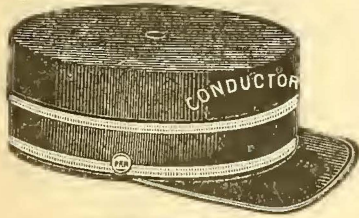


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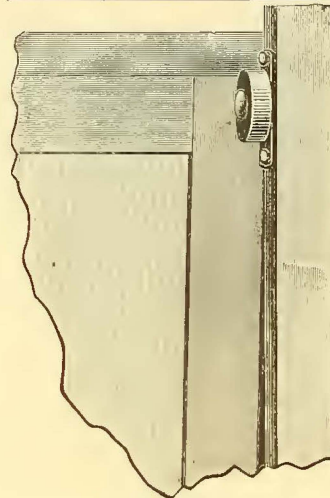
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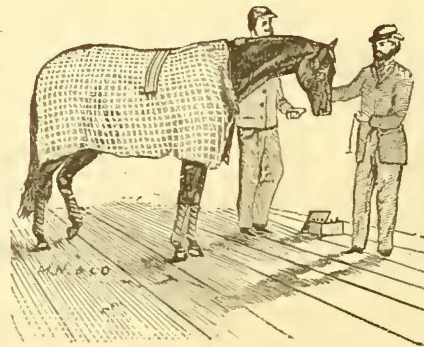
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This valuable Medicine is now used by the principal stables in the country, by the U. S. and American Express Companies, and many of the street car companies. Use one bottle and you will be convinced of its value in your stable.

Sold by all Druggists. Price \$1 per Bottle. Discount to the Trade. Address

**WM. SOMERVILLE & SONS, V. S.,**

**BUFFALO HORSE INFIRMARY,**

**127 ERIE STREET, BUFFALO, N. Y.**

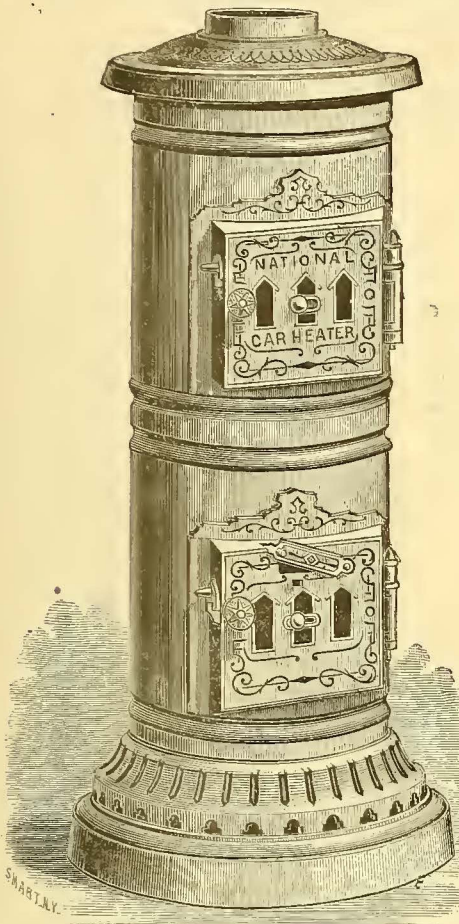
For sale in Chicago by W. R. Wilson; Lord, Stoughtenburgh & Co.; Morrison, Plummer & Co.; and wholesale druggists.

REFERS TO:

Buffalo St. Ry. Co., Buffalo, N. Y.; East Cleveland St. Ry. Co., Cleveland, O.; Lowell Horse R. R. Co., Lowell, Mass., and others.



# THE NATIONAL CAR HEATER,



Especially Adapted  
FOR  
Warming Horse  
OR  
Street Rail Road  
CARS.

Brick Lined, Rotating  
and Dumping Grate,  
Safety Door Catch.

For Neatness of Ap-  
pearance, Compact-  
ness in Space, and  
Safety it has no  
equal.

These Car Heaters are  
in use on Railroad Lines  
in different Cities and  
Towns of the United  
States and Canada, and  
are giving entire satis-  
faction.

Sole Manufacturers,  
**NATIONAL  
Stove Co.,**  
243 Water St.,  
NEW YORK CITY.

# WIRE CABLES

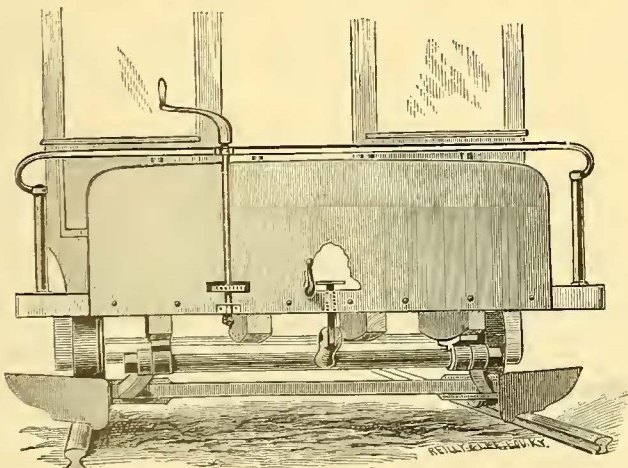
FOR

## STREET RAILROADS:

MADE BY

**Broderik & Bascom Rope Company,**  
**ST. LOUIS, MO.**

# LITTELL'S TRACK SCRAPER



END VIEW.

Patented June 16th, 1885.

These scrapers are forged from the best steel and wrought iron—no castings to break—easily attached and removed from any street car without disfiguring or cutting the dash. They can be instantly applied to remove any obstruction on the track, or as quickly raised out of position.

They have the great advantage over all other scrapers of being controlled by the foot of the driver, allowing him the full use of his hands to handle the brake lines, make change, etc.

Having once tried them you will abandon all others.

**H. H. LITTELL,**  
LOUISVILLE, KY.

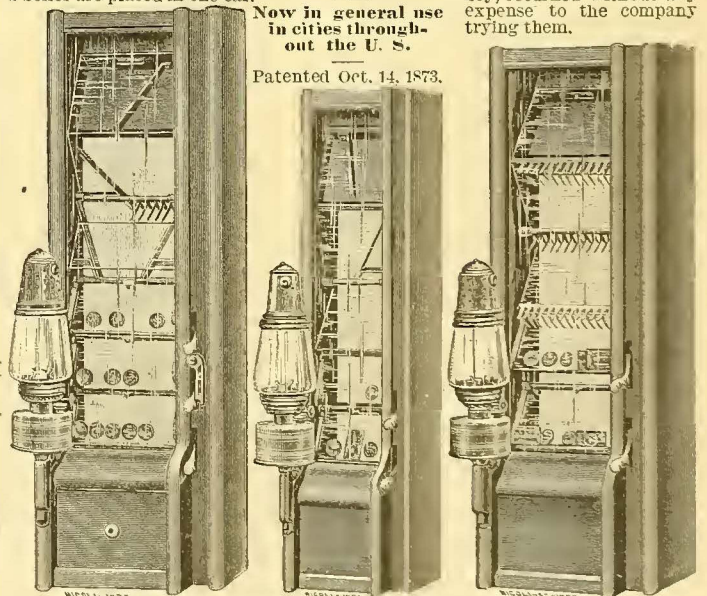
Ornamental to any car. Re-  
duction in price where  
2 boxes are placed in one car.

**TOM L. JOHNSON'S**  
**IMPROVED FARE BOX.**

Roads equipped with boxes on trial, and if not satisfactory, returned without any expense to the company trying them.

Now in general use  
in cities through-  
out the U. S.

Patented Oct. 14, 1873.



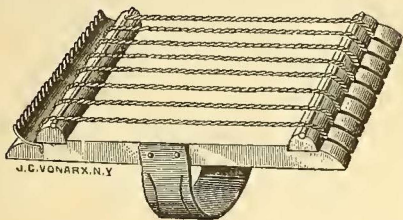
BOX NO. 1.

CHARIOT PATTERN.

BOX NO. 2.

One of the principal merits of these Fare Boxes over all others, consists in the fact that the fares are not turned out of sight at once by the drivers, leaving nothing but the bare word and memory of the parties as evidence of the payment, thereby making it easy for deception to be practised, even though an officer is on the car, and is endeavoring to see that the driver is faithfully performing his duties. They are so constructed that the fare are kept in sight from one end of the road to the other, and at any point on the line an officer of the company, or indeed any other person, can tally passengers with the fares. The drops can easily carry from 75 to 80 fares, and can be counted without mistake, and counterfeit money can be easily detected. These boxes are very simple in construction, being cleared, when required, in five minutes, what as any other box takes a much longer time. The glass fronts and drops render them so transparent that a person sitting in the further end of car can readily count the fares and make the tally, without making himself conspicuous in the matter, if desirable. They are lighted from an outside lantern, (which is only on the car at night, and should be taken off during the day,) giving an excellent light, for the fares can be seen all most as plain as by day. When the box is put in a car it can not be taken out or tampered with, unless the keys are obtained from the office, and can not be robbed without violence. Special attention given to correspondence on the subject of street railway construction, equipment and operation. Address all cor-  
respondence to A. A. ANDERSON, with Tom L. Johnson, Indianapolis, Indian

# JAY-EYE SEE Patent Curry Comb.



Best in the World. Can't Scratch or Hurt the horse. Cleans off mud and sweat with ease and rapidity. Most Durable and Lightest Comb made. Give it a trial. Needed in all Car Stables.

**MUNCIE NOVELTY CO., Muncie, Ind.**

MALTBY, CURTISS & CO., O. S. CHAMBERLAIN,  
No. 20 WARREN ST., New York, 55 DEARBORN ST., Chicago,  
Eastern, Southern & Export Agents. Gen. Western Agent.

# N. J. Car Spring and Rubber Co.,

Cor. WAYNE and BRUNSWICK STS.,  
JERSEY CITY, N. J.,

MANUFACTURERS OF

## RUBBER CAR SPRINGS

OF EVERY STYLE AND SHAPE,

CUSHIONS, BRAKE PADS, RUBBER MATTING  
and STEP PLATES, HOSE, DOOR STOPS, &c.

Being one of the oldest manufacturers in the business, we have a MOST COMPLETE assortment of moulds.

WRITE FOR PRICES.

# THE BRYDEN FORGED HORSE SHOE WORKS

(Limited),

Catasauqua, Lehigh County, Penn.,

Are making a plain, narrow-webbed shoe, with beveled surfaces for Horse Railroad work. It is "FORGED" from the very best Iron, and is tougher and harder than any shoe heretofore made, and will be sold to consumers at a small advance on the prices charged for ordinary mill shoes. They also make a Calked Shoe with a Square Toe, just the same as hand made, and the company warrants them to wear as long as the very best hand work.

Among others who are using this Shoe, are the

- Third Avenue Railroad Co., New York.
- Eighth Avenue Railroad Co., New York.
- Twenty-third Street Railroad Co., New York.
- Christopher Street Railroad Co., New York.
- Brooklyn City and Newtown Railroad.
- Bushwick Railroad Co., Brooklyn, N. Y.
- Crosstown Railroad Co., Brooklyn, N. Y.
- Coney Island and Brooklyn Railroad Co., Brooklyn, N. Y.
- North Hudson County Railroad Co., Hoboken, N. J.
- Jersey City and Bergen Railroad Co., Jersey City, N. J.
- Ridge Avenue Passenger Railway Co., Philadelphia, Pa.
- Citizens' Passenger Railway Co., Philadelphia, Pa.
- Buffalo Street Railway Co., Buffalo, N. Y.
- New Orleans City and Lake Railroad.
- Philadelphia Traction Company, Philadelphia.
- Second and Third streets Railroad Company, Philadelphia.
- Atlantic Avenue Railroad Company, Brooklyn, N. Y.

Also fully prepared to furnish any kind, weight or shape of shoe desired. Estimates on cost of producing such special patterns will be furnished on receipt of model, with estimate of the probable number of kegs required.

The Rates of Freight are as Low from their Factory West and East AS THE LOWEST.

A Mild Tough Steel Shoe supplied at a small advance over Iron Shoes.

# "PAY HERE." Fare Boxes and Change Receptacles for Street Cars.

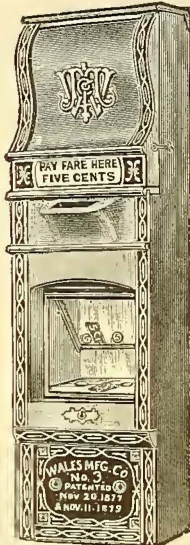
OUR NEW FARE BOX NO. 3.

The following are some points of superiority in this box over others:

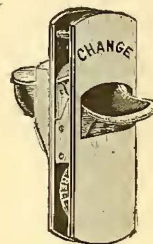
SIMPLICITY OF CONSTRUCTION, QUICKNESS and CONVENIENCE OF CLEANING, SECURITY OF MONEY DRAWER, BEAUTY OF FINISH, and MUCH CHEAPER in PRICE.

We have just added to this box a very valuable Improvement, viz., a small mirror placed back of first slide or rest, which presents to driver's view the back side of fare as well as front, when resting on first rest. He can by this quickly detect any purious or mutilated coin or ticket that may be split and put in box. It often happens in all Fare Boxes, to the annoyance of driver and passenger, when several fares are resting on first slide, one or more coins are liable to be

behind a ticket, and the driver cannot see them, and quite often a passenger is "rung up," when his fare is concealed behind the ticket, from the driver. This arrangement gives driver view of both sides of fare.



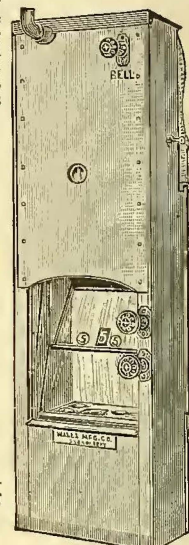
Box No. 3.  
Front or Passengers' View.



CHANGE RECEPTACLE.

The only satisfactory arrangement in use for making change with the driver.

Descriptive and illustrated circular on application. Get our prices before buying.



Box No. 3.  
Back or Driver's View.

WALES MFG. CO., 76 & 78 E. Water St., Syracuse, N. Y.

# Gourdier's Steel, Rubber Cushioned BAR HORSE SHOE.

For Street Railway Horses.

A POSITIVE CURE FOR LAMENESS.

It saves Horseflesh. Its use Guarantees Soundness.



Address

It furnishes a proper support for the frog; ensures better health, more speed and greater endurance, and is more economical than any other shoe. It is theoretically the only true shoe for horses, and is the result of over thirty-five years practical experience and observation with horses. It is recommended by many eminent veterinary surgeons and endorsed by numerous metropolitan railway lines where it is in constant use. The Gourdier shoes are made in fifteen sizes.

DIRECTIONS. Pare the foot ready for shoeing; make a careful tracing of the hoof on paper, and mail it to us. We will furnish sample shoes to R. R. companies for trial, free.

**Henry Gourdier & Co.,**  
1584 Broadway, N. Y

**WM. P. CRAIG,**  
Street Railway Builder and dealer in Railway Supplies.

OLD ROADS RE-LAID, GRADING, PAVING, &c.

Special attention given to laying Switches, Curves, Turnouts, Connections and Turn-tables; also Building Tracks for Excavation, Grading, Mining and Factories.

Office, 95 LIBERTY STREET, - NEW YORK.

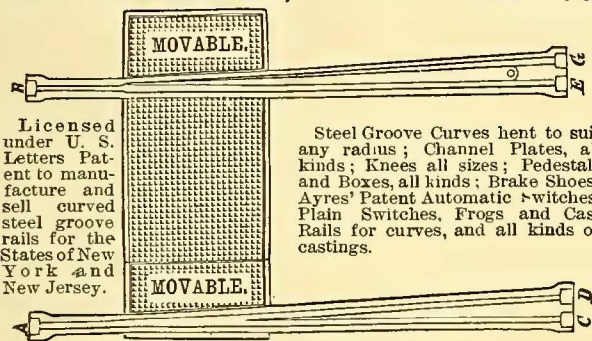
**STEEL STREET RAILS.**  
The Pittsburgh Bessemer Steel Co., Limited.  
48 Fifth Ave., Pittsburgh, PA.

Section No. 17  
46 lbs. per Yard

**A. AYRES,**  
Manufacturer and Patentee.

Send me full size section of rails to be used at points A, B, C, D, E, G.

No. 625 TENTH AVENUE, NEW YORK.



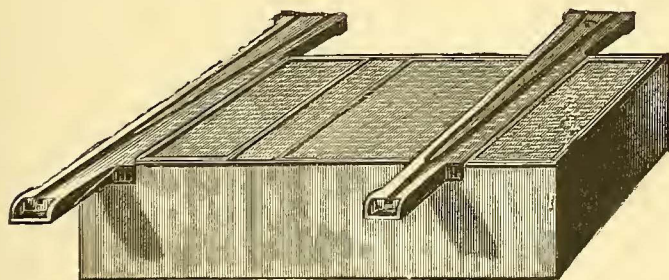
Licensed under U. S. Letters Patent to manufacture and sell curved steel groove rails for the States of New York and New Jersey.

Steel Groove Curves bent to suit any radius; Channel Plates, all kinds; Knees all sizes; Pedestals and Boxes, all kinds; Brake Shoes; Ayres' Patent Automatic Switches, Plain Switches, Frogs and Cast Rails for curves, and all kinds of castings.

**M. M. White & Co.,**

531 WEST 33d STREET,

NEW YORK.



OWNERS AND BUILDERS OF

**H. DOUGLASS'**

**Patent Automatic Switch**

FOR STREET RAILROADS.

**EUROPEAN COLIC CURE.**



A speedy and sure cure for Colic—has saved hundreds of horses where all other remedies have failed. Horse need not be run or trotted around to start the wind. Let him stand or lie down as he feels inclined and he will be ready for work almost immediately after recovery. A cure guaranteed in ninety-nine cases in a hundred. Endorsed by the leading street railway companies of the country, some of which we append.

DECATUR, ILL., Oct. 2, 1884.

MESSRS. JONES & ROACH, Chicago, Ill.

I have used your Colic Cure for my horses and mules on my street car lines and found it the best and surest medicine I have ever used. I have not lost a horse since I commenced its use. It gives relief in a short time after it is taken. I can cheerfully recommend it as a sure relief if given in time. I keep it constantly on hand.

Truly yours,

FRANKLIN PRIEST,  
President Decatur Street R. R.

MESSRS. JONES & ROACH:

Gentlemen: I cheerfully recommend your European Colic Cure for horses as being the best that I have ever used. When once introduced no horse owner can well afford to be with-

out it. I hope you will meet with the success your cure deserves.

Truly yours,

VALENTINE BLATZ,  
Per H. Lieh, Manager.

OFFICE OF NORTH HUDSON COUNTY  
RAILWAY Co.  
HOBOKEN, N. J., Oct. 4, 1884.

Gentlemen: It gives me pleasure to say that I can heartily recommend your European Colic Cure to all horse owners, from a personal knowledge of its curative qualities. I have used it in our stables, containing about six hundred horses, and have always found it to be beneficial. Yours very truly,  
ALBERT SAILLET,  
Foreman and Veterinary Surgeon for the North Hudson County Ry. Co.

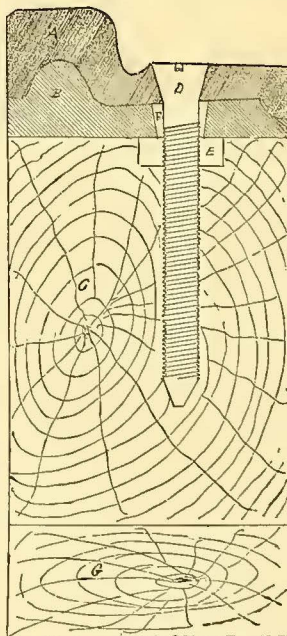
Sample Bottles Furnish'd Street Railway Companies Gratis.

For further information, prices, etc., address

**JONES & ROACH, 259 Fremont Street, Chicago.**

**WRIGHT'S**

**PATENT JOINT FASTENING.**



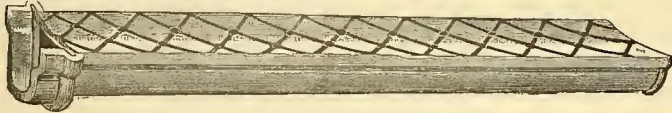
The accompanying cut shows a cross section through joint. A is the rail, B the joint chair, C the stringer, D the patent screw fastening, E the nut, F a slot in chair allowing rails to contract and expand. The chair cannot settle and the rail ends are held level with each other, preventing the many evils of ordinary construction.

For Further Particulars Address

**AUGUSTINE W. WRIGHT,**  
NORTH CHICAGO CITY RAILROAD,

CHICAGO, ILL.

**STREET RAILWAY WHEELS AND TURNOUTS.  
Graded Stable Gutter with Straight or Curved Cover.**



Descent 1/8 in. per foot. Pieces 5 feet lengths. Short pieces furnished to suit any length. Spouts to connect with Sewer, &c.

**BOWLER & CO., Cleveland, Ohio.**

**THE AJAX METAL CO.**

WE CLAIM FOR AJAX METAL.



25 to 50 per cent. more mileage.
33 1-3 " greater tensile strength.
100 " greater crushing strength.
20 " less friction and wear upon journals.
85 " less hot journals than any known Bronze named or unnamed.

Costs no more than copper, and tin or gun metal.

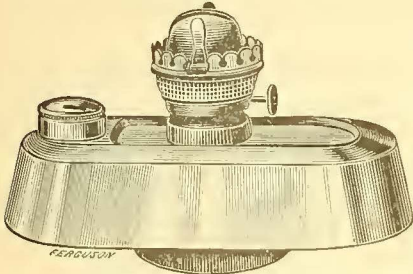
**AJAX METAL CO.,**

2040 No. Tenth Street, PHILADELPHIA, PA.

**CLUTE PATENT**

DOUBLE-BOTTOM

**STREET CAR LAMP.**



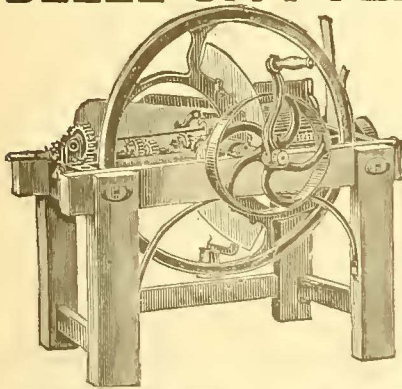
Is one that assures Safety, Durability, and is perfect in regard to Leakage.

**GEO. M. CLUTE, Sole Manufacturer.**

Also Dealer in Car Reflectors, Chimneys, Burners, &c., WEST TROY, N. Y.

**THE**

**BELLE CITY FEED CUTTER**



IS THE

Strongest, Most Durable, and on the whole it is the

**BEST FEED CUTTER IN THE WORLD.**

For Street-car Barns it has no equal. Write for Reference, Circular, &c., to

**THE BELLE CITY M'FG CO.,**

RACINE, WIS., U. S. A.

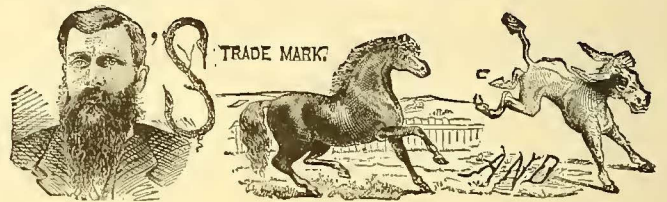
**F. W. JESUP & COMPY.,  
67 LIBERTY ST., NEW YORK,  
Street Railway Supplies,  
OF EVERY DESCRIPTION.**

Steel Rails, all patterns; Cars; Automatic Switches; Turntables; Curved Rails; Channel Plates; Frogs; Crossings and other Track Castings, Knees, &c. Countersunk Spikes, specially adapted for Centre-bearing Rails.

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.



(This Trade Mark on all Gemine Covert Goods.)

We call particular attention of all horse railroad companies to our celebrated

- HARNESS SNAPS,
- SWIVEL SNAPS,
- OPEN EYE BIT, CHAIN AND TRACE SNAPS,
- ROPE AND WEB HALTERS,
- HALTER LEADS,
- BREAST CHAINS,
- HALTER CHAINS,
- TRACE CHAINS,
- REIN CHAINS AND
- BREAK CHAINS.

Send for illustrated catalogue and price list.

**COVERT MANUFG. CO.,**

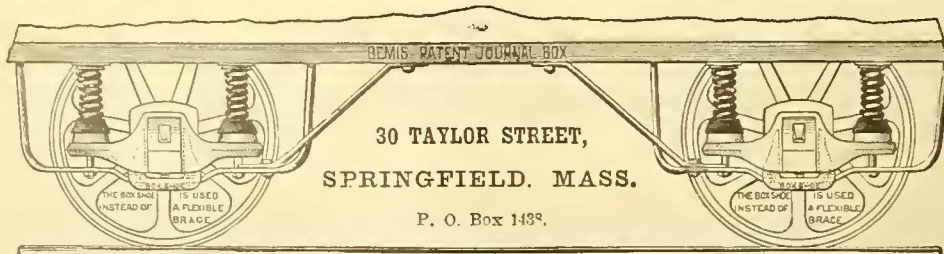
SOLE MANUFACTURERS,

WEST TROY, N. Y.

**THE BEMIS CAR BOX CO.,**

Light Draft, Easy Riding, Durable Economical.

Brasses are warranted for 10 years and Journal for 20 years.



30 TAYLOR STREET,  
SPRINGFIELD, MASS.

P. O. Box 1439.

Requires oiling or inspecting but once in 12 months.

Boxes are positively dust proof.

MANUFACTURERS OF

**THE BEMIS PATENT JOURNAL BOX.**

ESTABLISHED 1857.

INCORPORATED 1875.

# BROWNELL & 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.

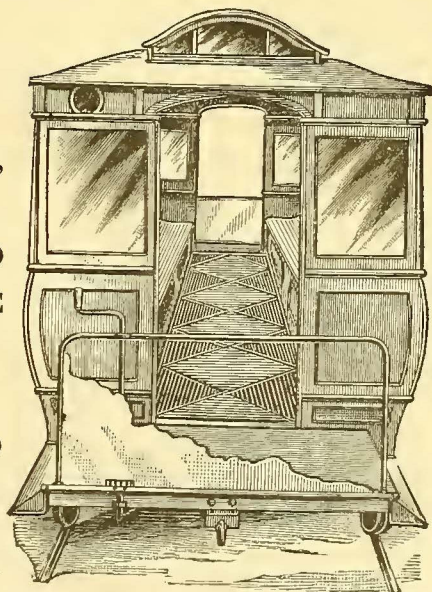
ESTABLISHED 1869.

## LEWIS'

### Improved Sectional Diamond and Plain CAR MAT

IS THE

LIGHTEST,  
STRONGEST,  
CHEAPEST,  
HANDSOMEST,  
EASIEST  
CLEANED AND  
MOST DURABLE  
MAT FOR RAIL-  
WAY CARS  
EVER DESIGNED



*Used extensively  
all over the World.*

**SAMUEL LEWIS, Patentee & Sole M'r,**

12 to 18 LORIMER STREET (near Broadway),

BROOKLYN, E. D., N. Y.

## J. M. JONES' SONS,

AGENTS,

### Street Railway Car Builders

## WEST TROY,

NEW YORK.

## PENNSYLVANIA

### STEEL COMPANY,

MANUFACTURERS OF

## STEEL RAILS

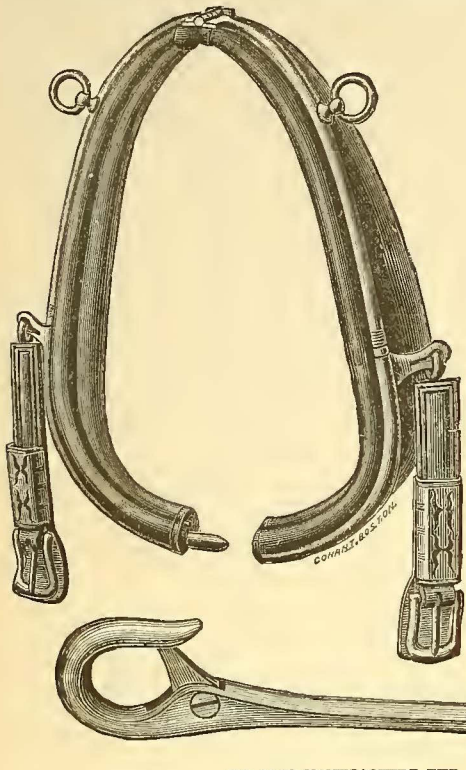
Of **T** patterns, weighing from 16 to 76 lbs. per yard.  
CENTRE BEARING Street Patterns, 42 to 60 lbs. per  
yard, TRAM Street Patterns 45 to 47 lbs. per yard,  
and Street Patterns for STEAM ROADS.

WORKS AT

STEELTON, DAUPHIN CO., PENN.

**NEW YORK OFFICE,** - 160 Broadway.  
**Philadelphia Office,** 208 South Fourth St.

# BERRY'S PATENT HARNESSES.



Lightness, Strength,  
Durability, Quick-  
ness and Sim-  
plicity.

They have the advantage of easy adjustment. No buckles or straps are used. They can be applied in an instant, being fastened to the collar. The collar is divided and there is no strain upon the collar or the eyes of the horses.

In case of accident the whole harness can be removed at once.

They are adapted to the use of Fire Departments, Horse Railroads, Express Wagons, Teams and Light Carriages, and are in use in over one hundred cities and towns in the United States and Canada.

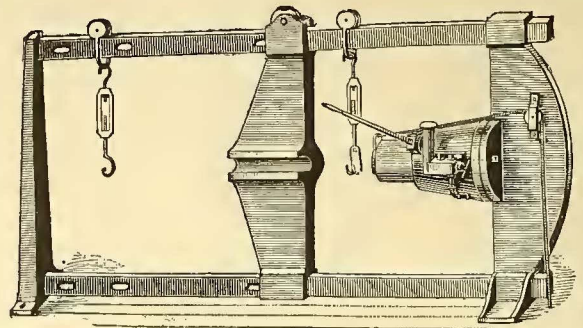
WE ALSO MANUFACTURE THE

## REGAN PATENT SNAP.

They are made of the best gun metal and malleable iron, with a brass spring which is inclosed in a water-tight socket and made rust and dust proof. It is an impossibility for it to become detached. Write for illustrated catalogue and prices.

CHARLES E. BERRY, Cambridge, Mass.

# HAND POWER, LEVER AND HYDRAULIC PRESSES.



HAND AND POWER CAR-WHEEL PRESSES. (See page 197, July, 1885.)

## Screw and Hydraulic Jacks.

WATSON & STILLMAN,  
471 S. GRAND ST., N. Y.

## FRED. J. KALDENBERG,

SUCCESSOR BY PURCHASE TO THE

### NEW ENGLAND CAR SPRING CO.

(ESTABLISHED 1851),

MANUFACTURER OF SUPERIOR QUALITY

## VULCANIZED RUBBER CAR SPRINGS,

AND ALL KINDS OF

## RUBBER HOSE, VALVES, ETC.

FACTORY AND OFFICE :

213 to 229 E. Thirty-third St., New York,  
(Bet. 2d and 3d Aves.)

TELEPHONE CALL, NASSAU 696.

Correspondence Solicited.

DOWNTOWN OFFICE: 125 FULTON ST.

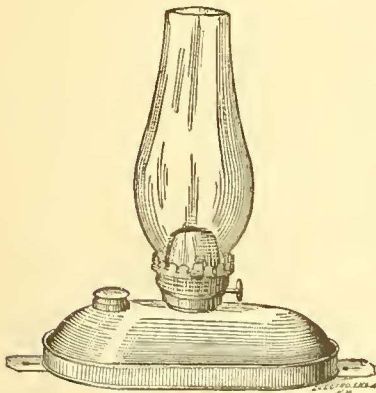
P. O. Box 91. Send for Price List.



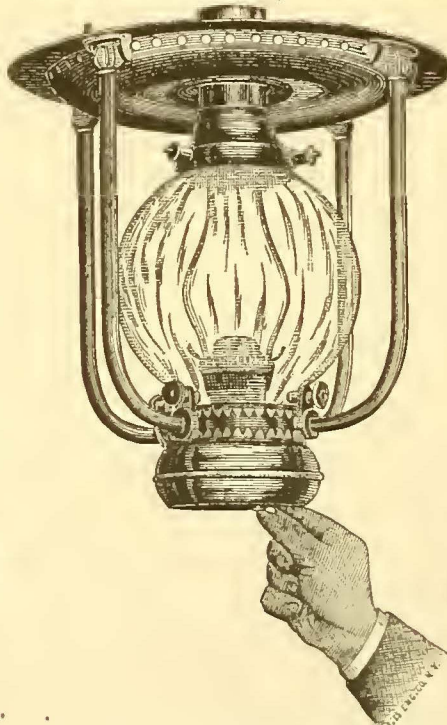
# JOSEPHINE D. SMITH,

Successor to the late WILLARD H SMITH,

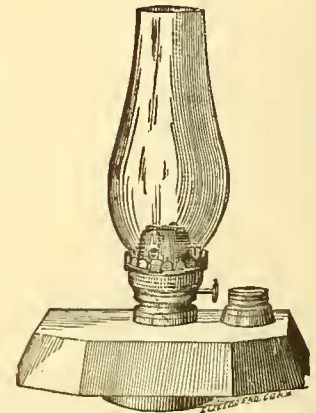
350 and 352 Pearl Street, . . . New York.



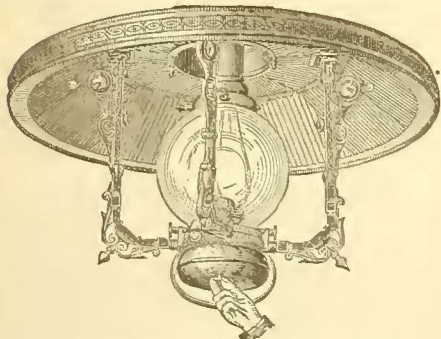
No. 2. Oval Top Brass Box Lamp.



No. 2. Center Car Lamp, with 14-inch Reflector.



No. 1. Tin Box Lamp, Brass Bottom.



No. 6. Center Car Lamp.



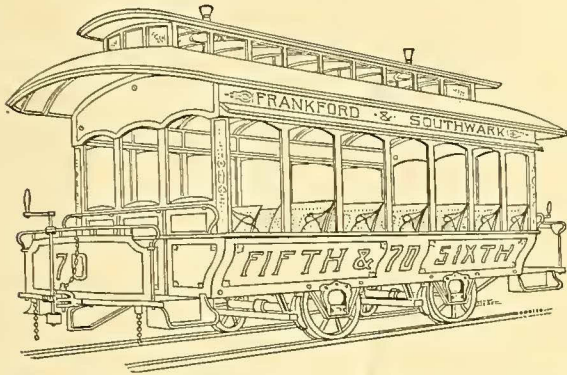
No. 1. Center Car Lamp.

# RAILROAD CENTER LAMPS AND REFLECTORS,

AND ALL KINDS OF SHIP AND MARINE LAMPS.

MANUFACTURER OF

**FOR SALE.**



Four Summer Cars, good as new, built in very best manner, perforated seats bronze trimmings, etc., centre aisle, seating room for 30. The company having discontinued the use of summer cars offer the same for sale on very reasonable terms. For description and price apply to FRANKFORD & SOUTHWARK R.R. CO., 3501 Kensington Ave., Philadelphia.

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.**

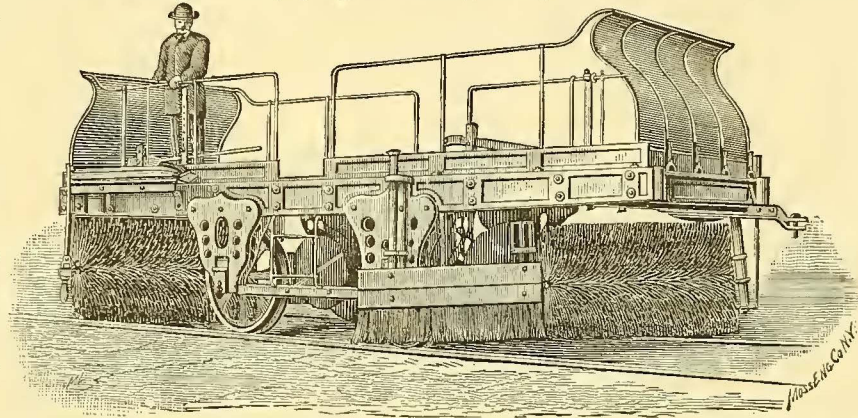
**The Brooklyn Railway Supply Company's Snow Sweeper and Plow.**

Best Materials only used in construction.

White oak frames.

Many improvements.

The famous cylinder brooms, or heavy snows, under United States Letters Patent, supersede old six wing sectional broom.



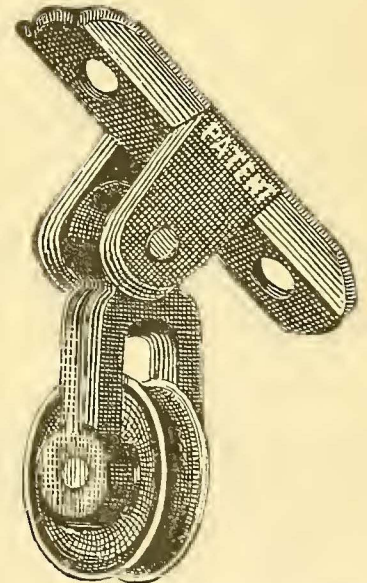
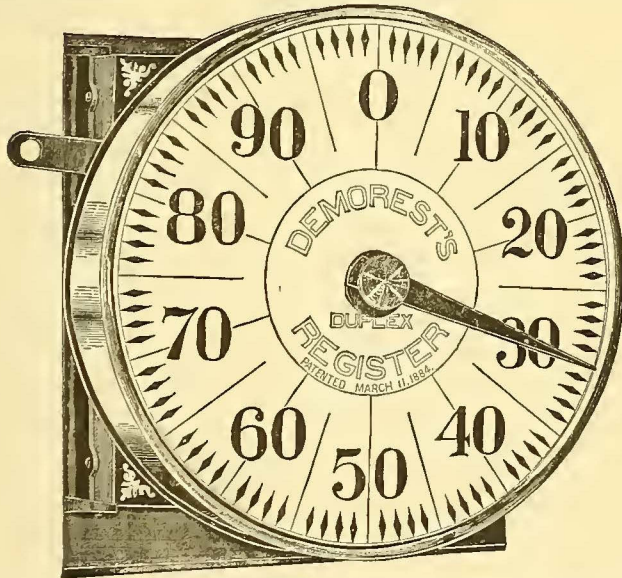
Refer to the larger companies who have used all kinds of snow sweepers, and can therefore speak from actual experience.

WORKS:

37<sup>AND</sup> 39 Walworth St.

BROOKLYN, N. Y.

**DEMOREST'S DUPLEX FARE REGISTERS.**



The Half Trip system and the perfect safety in allowing the conductor to reset his register by being required to sign his name, surpass anything of its kind ever before offered to the public.

All companies who use the Duplex Register will be indemnified.

We will place any number of our Duplex Registers (with or without the fare box, according to the kind of car), upon trial for any time desired, at a very slight cost. Our terms of trial are quite reasonable. A trial is solicited.

Address the proprietor,

**W. JENNINGS DEMOREST,**

R. M. ROSE, Manager.

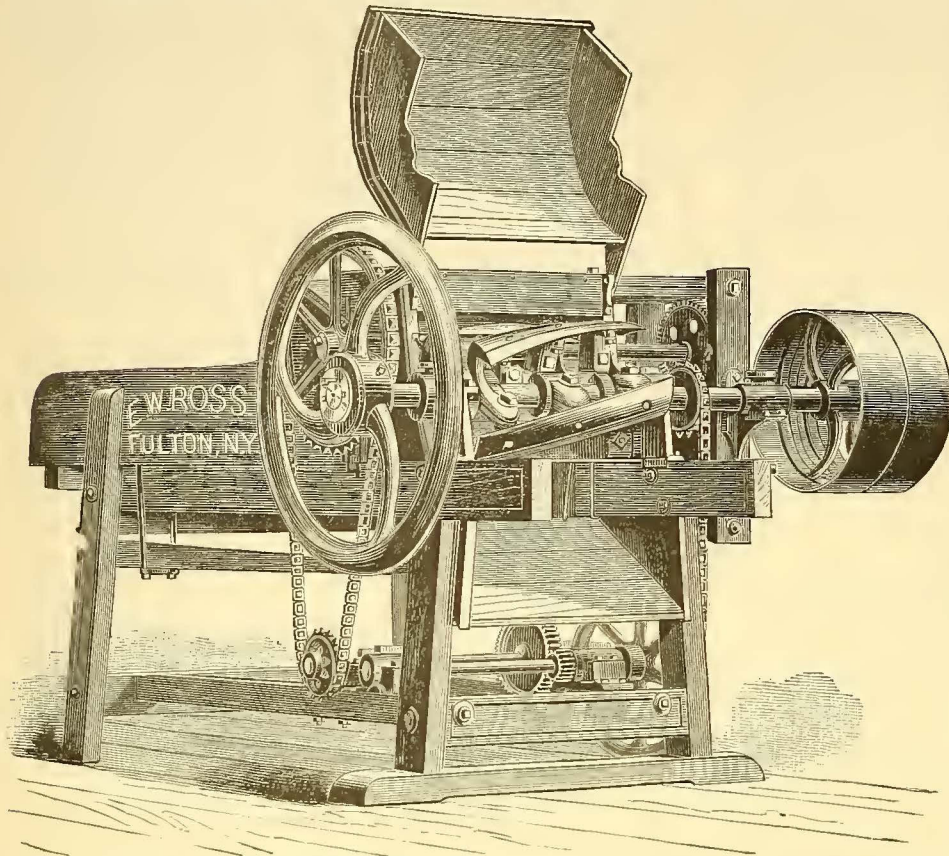
15 East 14th Street, New York City.

The fare-box and register combined is the only perfect system of checking the driver in respect to register fares put in the box, and marking the registrations upon a paper dial serves as an infallible record to be filed away for future reference.

Patent Hinge Rib Pulley is acknowledged the best.

Railroad companies should be careful in ordering this line of goods. As owner of the patents we are the only ones to order from.

# THE ROSS HAY CUTTERS.



A FULL LINE OF CUTTERS BUILT EXPRESSLY FOR STREET RAILWAY BARN.

THEY HAVE COMBINED STRENGTH, DURABILITY AND GREAT CAPACITY.

ARE EASILY OPERATED AND CAN BE RUN TO FULL CAPACITY BY SMALL GAS ENGINE.

MACHINES SENT TO ANY PART OF THE U. S. ON APPROVAL IF DESIRED.

GUARANTEED TO BE THE BEST.

ILLUSTRATED CATALOGUE AND FULL PARTICULARS FURNISHED WHEN REQUESTED.

E. W. ROSS & CO., SPRINGFIELD, OHIO.

# The NEVERSLIP HORSESHOE

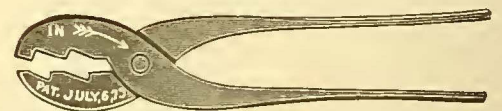
WITH

Removable Steel Centering and Self-Sharpening Calks.

AN ENTIRE SET can be CHANGED in a few MOMENTS with the

**NEVERSLIP WRENCH.**

Made in Two Sizes.



For applying Never Slip Calks. Is also a handy and useful tool wherever pipe tongs or wrenches are required.

**NEVERSLIP TAP.**



For cutting threads for Never Slip Calks. The small end, A in cut, of tap indicates size of hole to be drilled in the shoe.

The Never Slip Horseshoe Co.,

36 INDIA WHARF,  
BOSTON, MASS.

My opinion of the Never Slip Shoe is, that it gives the most perfect satisfaction, and for a winter shoe it has no equal. For economy it saves the horse's feet from the frequent shoeing that fills them full of nail-holes. I never had our horses so free from lameness as at the present time; and should recommend them to everyone who has to get horses shod often in the winter.

A. Q. GAGE,  
Supt. Manchester Horse R.R.  
Manchester, N. H.,  
April 28, 1885.

THIS CUT  
GIVES  
FULL SIZE  
OF A

No. O A Pattern or Flat Shoe.



J. W. FOWLER, President.

THE

DAN'L F. LEWIS, Treasurer.

# LEWIS & FOWLER M'F'G CO.

P. O. BOX 102.

BROOKLYN, N. Y.

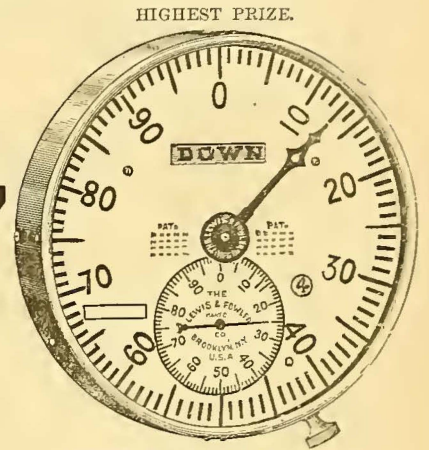
Patentees and Manufacturers of

IMPROVED

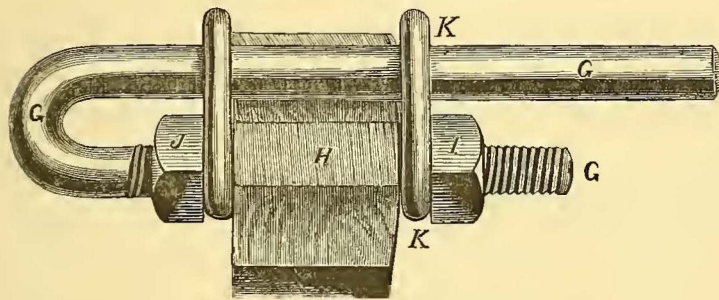
## "ALARM"

PASSENGER REGISTER.

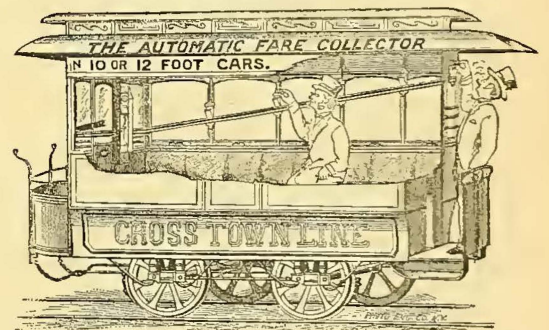
—SOLE AGENTS AND MANUFACTURERS—



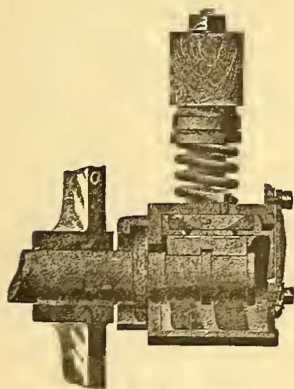
### VAN TASSEL'S Patent Brake Rod FOR STREET CARS.



### SMALL'S Automatic Fare Collector. FOR FARE BOX CARS.

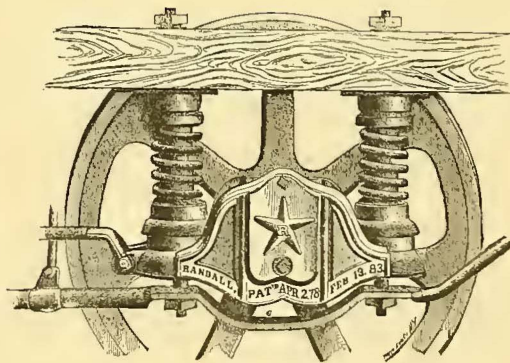


## "RANDALL'S" PATENT CAR AXLE AND BOX.



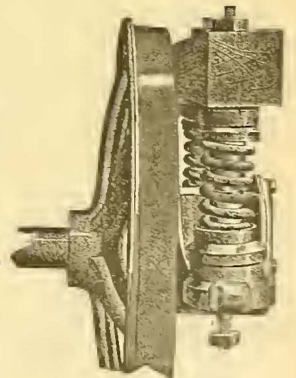
SECTIONAL VIEW.

DUST  
TIGHT.



FRONT VIEW.

ANTI-  
FRICTION



END VIEW.

Agents for ORIENTAL METAL for Street Car Journal Bearings.

# The Goodenough System

OF

# HORSE-SHOEING.

*The Goodenough System of Horse-Shoeing, of which the GOODENOUGH HORSE-SHOE is the exponent, is an endeavor to take from the hand of unthinking and barbarous method, the important art of farriery.*

*In the correct use of the system and proper application of the shoe, the sole bars and frog of the horse's foot are never cut, the rasp and knife being applied only to the wall of the foot, and no fire is used in the fitting.*

*The shoe is very light and narrow (Army pattern), easily worked cold and allowing frog bearing, without which there can be no good horse-shoeing.*

## FROG PRESSURE

*is as important a factor to the health of the horse's foot as air is to the lungs or food to the stomach. It is the*

## KEY-STONE OF THE ARCH.

The advantages of the Goodenough System are, first and foremost, **SOUND HORSES;** Secondly, **CHEAP HORSE-SHOEING.**

*Horse railroads using the system in its entirety not only buy much less iron and pay for much less labor, but have also much more serviceable stock.*

*Said a horse railroad superintendent of now the largest road in the United States:*

*"We don't wear iron nowadays, we wear frogs and cobble stones; nature provides frogs and Boston finds cobble stones."*

*To those who desire to read further upon the subject we will send upon application free of cost our pamphlets entitled,*

**"HORSE-SHOEING," and "FACTS FOR HORSE-OWNERS."**

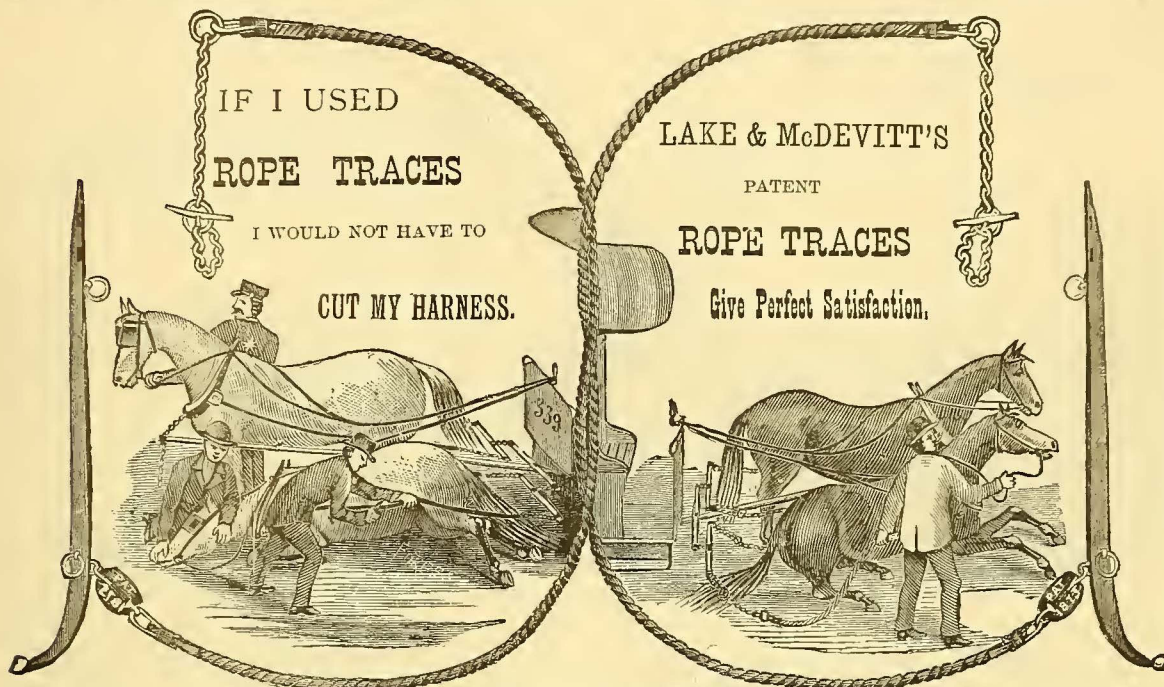
# THE GOODENOUGH COMPANY,

156 and 158 East Twenty-Fifth Street,

# NEW YORK.

# LAKE & McDEVITT'S Patent ROPE TRACE

For Horse Railways, Omnibus Lines, Etc.



The Advantages

OF THE

ROPE TRACE

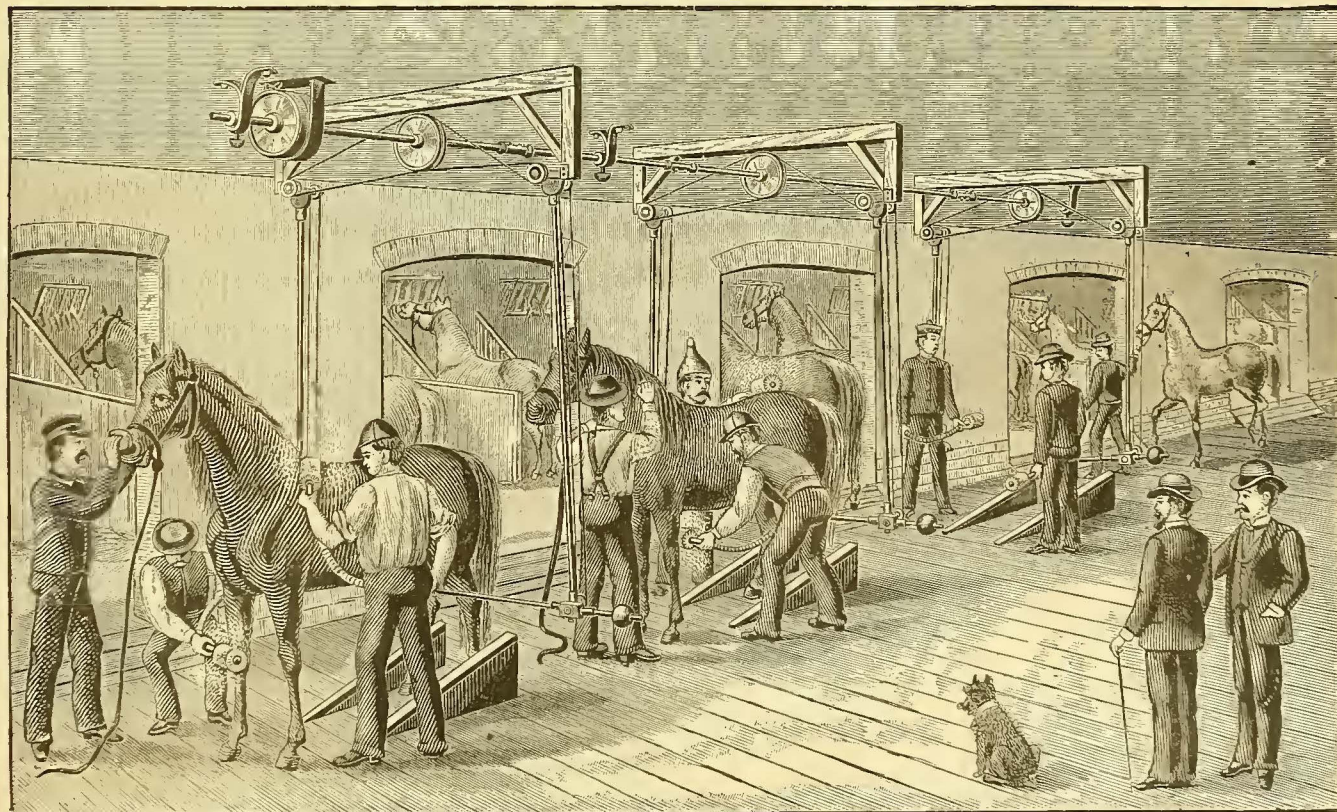
are its ready application to Horse-Car service, or to any other purpose where cheap harness is required. It only costs about half as much as leather traces, while at the same time one set of ROPE TRACES will (when used on horse cars) take the place of three or more sets of leather traces, as the Tugs remain attached to the car all day, no matter how many changes of stock are made. The relief horses having hoods attached to their hames, all that is necessary is to unhook the tugs from the working team back in the fresh horses, hook on the tugs, and the change is made. Railroad men will at once perceive their adaptability and economy from the above facts. They will also last longer than leather traces, and require but very little care. From their durability and cheapness they are also especially adapted for all kinds of farm use and heavy teaming, as farmers, etc., can easily repair them.

Patent No. 171,232, December 21, 1875.

In use on the Chicago West. Div. R'y.; Louisville City R'y Co.; Milwaukee City R'y; Transverse R'y Co., Pittsburg, Pa.; Citizens Street R'y Co., Pittsburg, Pa.; Pittsburg and Birmingham, Pittsburg, Pa.; Central City R'y, Peoria, Ill.; Grand Rapids R'y; Minneapolis St. R'y Co.; St. Paul City R'y; Houston City R'y, Texas; Superior Street R'y, Cleveland, O.; Cincinnati City R'y Co.; Fifth Ward Street R'y, Syracuse; Detroit City R'y.; Ft. Wayne and Elmwood St. R'y, Detroit, Mich.; Galveston City R'y; Springfield City R'y, Springfield, Ill.; Toledo St. R'y, Toledo, O.; Adams St. R'y, Toledo, O.; Atlanta Street R'y, and others, in all on about 100 Street R'ys in United States and Canada, and a large number of other prominent Street R'y Companies throughout the Country. Send for descriptive Circular containing testimonials, prices, etc., to

LAKE & McDEVITT, 161 South Robey Street, Chicago, Ill.

## CLARK'S PATENT POWER GROOMING MACHINE, SINGLE OR DOUBLE.



TO STREET RAILWAY COMPANIES AND OTHER STOCK OWNERS.

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. Machine Grooming is found to be less expensive than hand grooming, saving in food and medicines, and materially increasing the value of the animal.

The Curry Comb and Hand Process Superseded! Economy of Labor! Perfection of Work!

Three Hundred Head of Stock Thoroughly Groomed with Each Machine every Ten Hours.

This Grooming Machine is in daily use in some of the largest Street Railway Companies' stables, and has always given perfect satisfaction. Among those using it are the City R'y Co., Chicago, Ill.; Detroit City R'y Co., Detroit, Mich.; Central City R'y, Peoria, Ill.; M. W. Dunham, Wayne, Ill.; West Division Street R'y Co., Chicago, Ill.; Lindell Street R'y Co., St. Louis, Mo.; Pleasant Valley R'y Co., Allegheny City, Pa.; Marshall, Field & Co., Chicago, Ill.; Leroy Farm, Chicago, Ill.; Saginaw City R'y, Saginaw, Mich.; Pittsburg and Birmingham R'y Co., Pittsburg, Pa.; and a number of others who have given testimonials as to the perfect working of the machine. For prices, circular and other information apply to

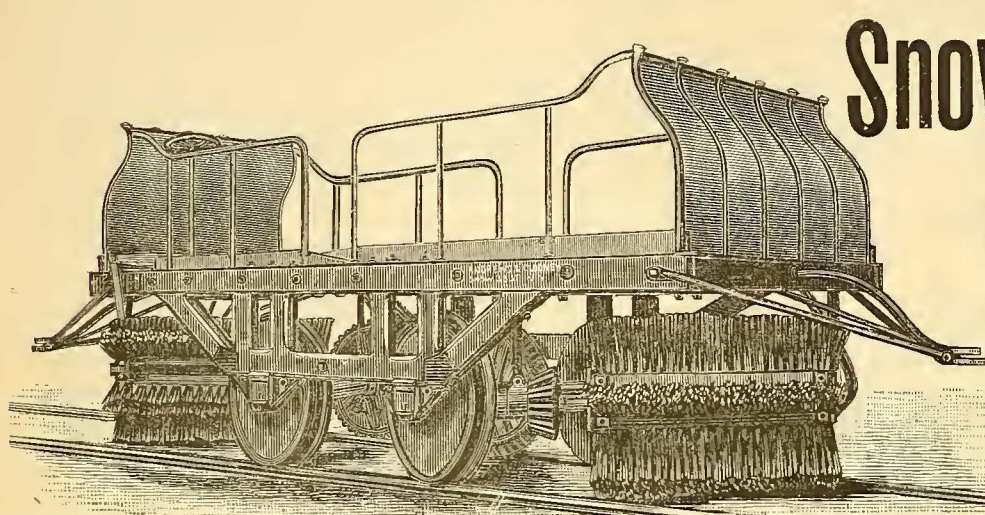
161 SOUTH ROBEY STREET, CHICAGO, ILL.

# ANDREWS & CLOONEY,

F. H. ANDREWS.

F. T. LERNED, Gen. Agent.

B. A. CLOONEY.



## Snow Sweepers, Ploughs & Sand Cars.

# THE STREET RAILROAD SNOW SWEEPER

KNOWN AS THE

## “White” or “New York” Sweeper.

MADE EITHER WITH SECTIONAL BROOMS, AS SHOWN IN THE ABOVE CUT, OR WITH CYLINDRICAL BROOMS

Sectional brooms are provided unless otherwise ordered, owing to their superiority in heavy snows. In localities having only light snows a cylindrical broom answers the purpose. No patents on either kind, all having expired. No difference in price.

We make two sizes: Full Size for 8 and 10 Horses; 3-4 Size for 6 and 8 Horses.

Over One Hundred are in use in New York, Brooklyn and Philadelphia,

And we are now building (August, 1885) sweepers for Chicago, St. Louis, Boston, Salem, Mass., and six additional ones for roads in New York City. References can be made to any or all of the roads in New York City or Brooklyn; Philadelphia City Pass. Ry. Co. (Chestnut & Walnut St.), Second and Third St. Pass. Ry. Co., Union Pass. Ry. Co.; Phila. Traction Co., all of Philadelphia; Citizens' Ry. Co., Pittsburgh; Pittsburgh & Birmingham R. R. Co.; Pittsburgh, Alleghany & Manchester R. R. Co., Pittsburgh; Rochester & Brighton R. R. Co., Rochester, N. Y.

**Sweepers made with Brooms propelled by Steam if required.**

**NOTE---**No Patent on Broom Heads or manner of arranging the same.

Works: 535 to 551

West Thirty-third Street,

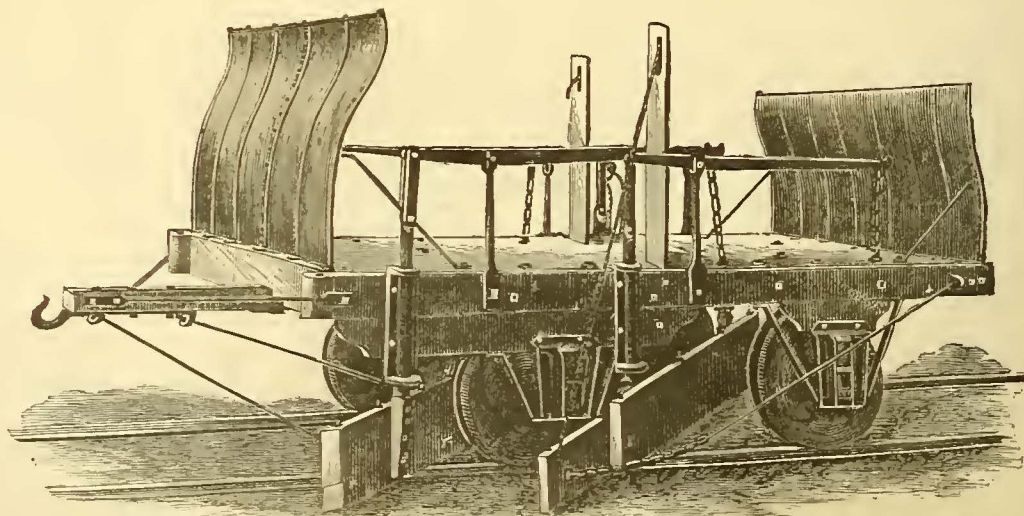
and 538 to 552

West Thirty-fourth Street.

Office: 545

West Thirty-third Street,

NEW YORK.



LATEST IMPROVED STREET RAILWAY SNOW PLOW.

F. H. ANDREWS.

F. T. LERNED, GEN'L AGT.

B. A. CLOONEY.

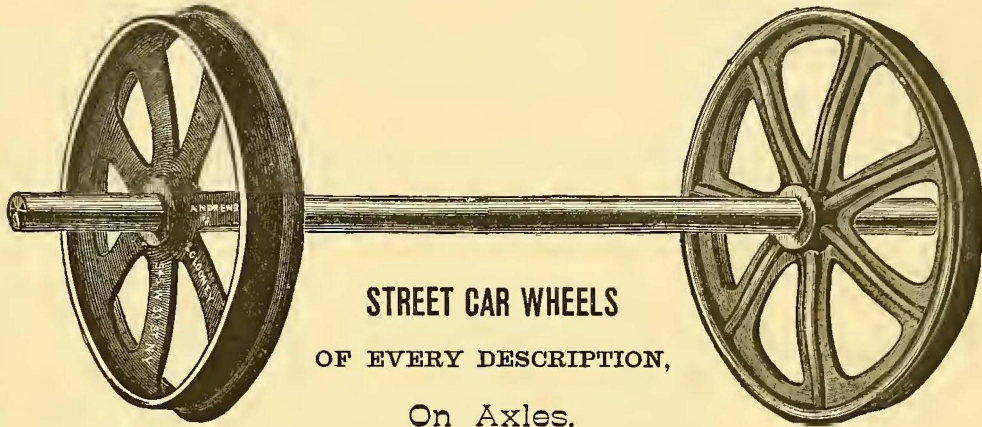
# ANDREWS & CLOONEY,

OFFICE :

545

W. 33d St.,

NEW YORK.



STREET CAR WHEELS  
OF EVERY DESCRIPTION,  
On Axles.

WORKS :

535 to 551

West 33d St.,

AND

538 to 552

West 34th St.,

NEW YORK.

Manufacturers of

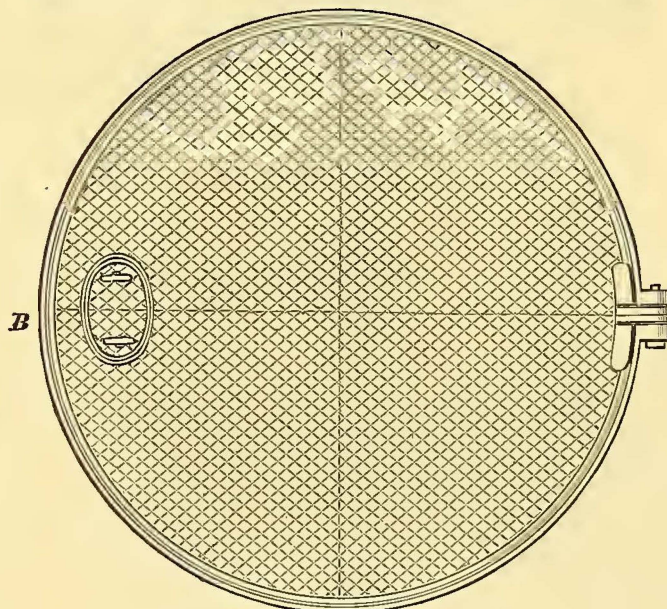
Elliptic, Spiral,

Volute, Car and

Engine

## SPRINGS

Of Every Description.



Street Railway Turn-table.

Car Wheels,  
Axles,  
Brake Shoes,  
Pedestals,  
Boxes,  
Brass Bearings  
AND  
Castings

of all Descriptions where great  
Strength is Required.

Also,

SWEEPERS, SNOW PLOWS,  
TURN-TABLES,

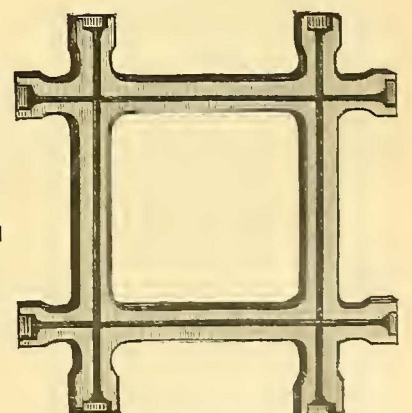
Track Work, Automatic Switches, Etc.

STEEL GROOVE RAILS AND MACHINERY

SEND FOR ILLUSTRATED CATALOGUE,



Street Car Springs.



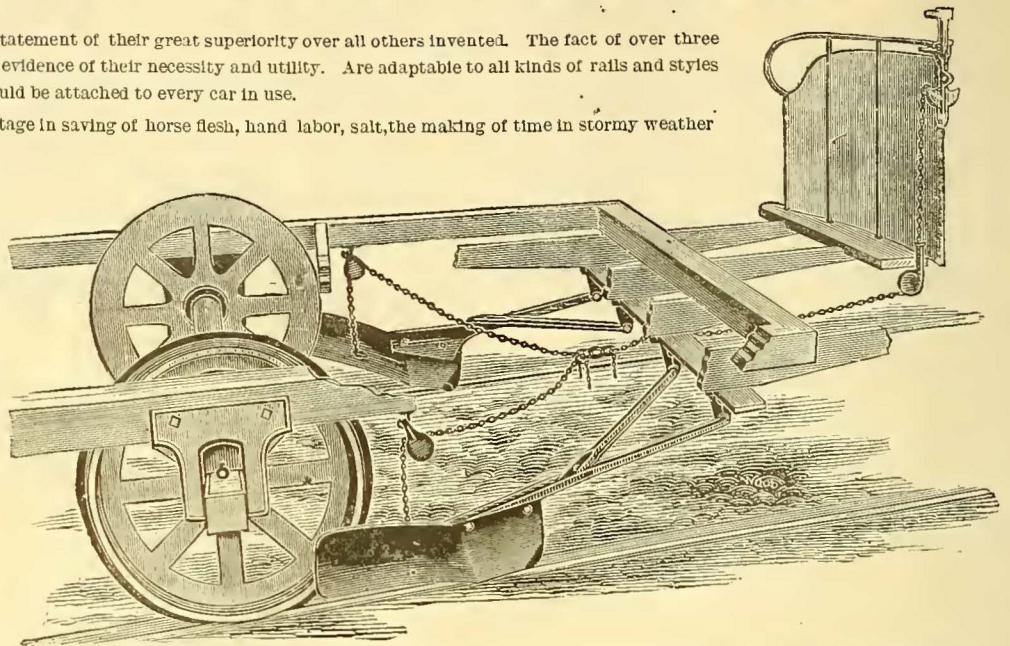
Street Railway Crossings.

# DAY'S IMPROVED STREET RAILWAY TRACK CLEANERS.

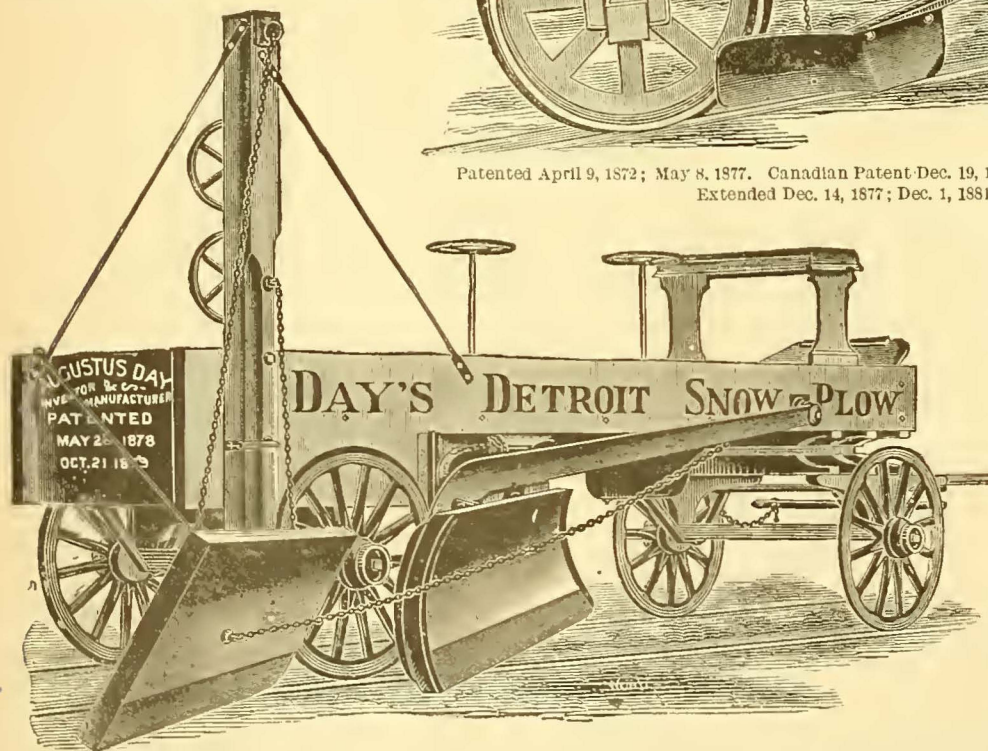
These Track Cleaners need no extended statement of their great superiority over all others invented. The fact of over three thousand pairs being now in use is sufficient evidence of their necessity and utility. Are adaptable to all kinds of rails and styles of cars. To secure the largest benefit they should be attached to every car in use.

No estimate can be made of their advantage in saving of horse flesh, hand labor, salt, the making of time in stormy weather. Since their introduction new and valuable improvements have been made in their construction, mode of attachment, and convenience of handling. They are finished in a thorough, workmanlike manner of the best material obtainable, the design being to manufacture the best and most efficient article in preference to other considerations. Method of sale and price considerably changed.

Reference is made to a few of the many roads using these Cleaners, with respective numbers of each, viz.:



Patented April 9, 1872; May 8, 1877. Canadian Patent-Dec. 19, 1872; Dec. 18, 1876. Reissued Aug. 27, 1878. Extended Dec. 14, 1877; Dec. 1, 1881; Dec. 12, 1882. ;



Fort Wayne & Elmwood Ry., Detroit, Mich.....	30 pair.
Detroit City Ry., Detroit, Mich.....	135 "
Chicago City Ry., Chicago, Ill.....	350 "
Rochester City & Brighton R. R., Rochester, N. Y. . . .	75 "
Albany Ry., Albany, N. Y. . . .	40 "
Waterville Turnpike & R. R. Co., Albany, N. Y. . . .	24 "
Elmira & Horseheads R. R., Elmira, N. Y. . . . .	11 "
Lynn & Boston R. R., Boston, Mass. . . . .	68 "
Boston Highland Ry., Boston, Mass. . . . .	46 "
Lowell Horse Ry., Lowell, Mass. . . . .	27 "
Grand Rapids Street Ry. . . .	50 "
Naumkeag Street Ry., Salem, Mass. . . . .	40 "
Merrimack Valley Ry., Lawrence, Mass. . . . .	21 "
Louisville City Ry., Louisville, Ky. . . . .	55 "
Cream City Ry., Milwaukee, Wis. . . . .	37 "
Milwaukee City Ry., Milwaukee, Wis. . . . .	40 "
Buffalo Street Ry. . . . .	40 "
And many others.	

Taunton Street Ry., Taunton, Mass. . . . .	10 pair.
New Haven & West Haven Ry., New Haven, Conn. . . . .	16 "
Bridgeport Horse Ry., Bridgeport, Conn. . . . .	32 "
Adams Street Ry., Toledo, Ohio. . . . .	14 "
Toledo Street Ry., Toledo, Ohio. . . . .	13 "

For Illustrated Circular and New Price List, address

## AUGUSTUS DAY,

## Detroit, Mich., U.S.A.

76 State Street.

# RICHARD VOSE,

13 Barclay Street, . New York,

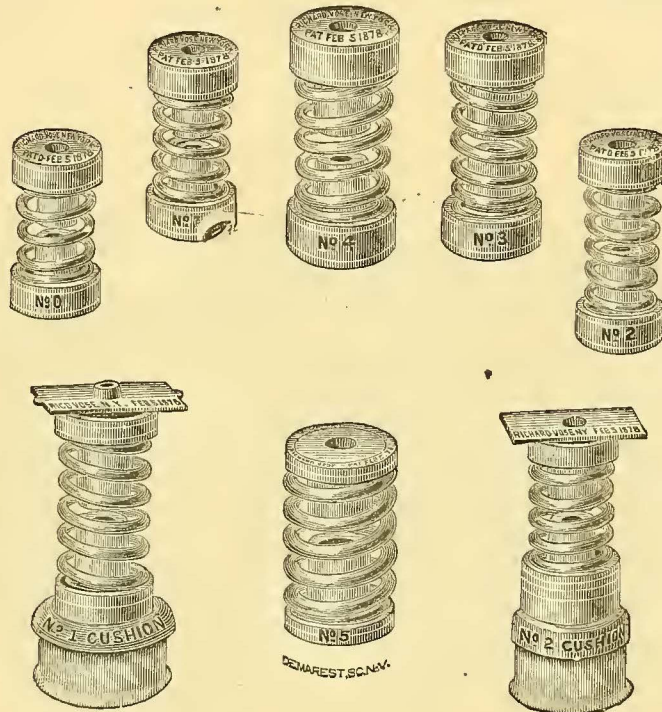
PATENTEE AND MANUFACTURER OF

## Graduated Street Car Springs.

### RUBBER CONE.

Patented, April 15th, 1879.

ADAPTED TO THE  
 STEPHENSON,  
 BEMIS,  
 RANDALL,  
 HIGLEY,  
 BRILL,  
 JONES,  
 BALTIMORE,  
 —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.

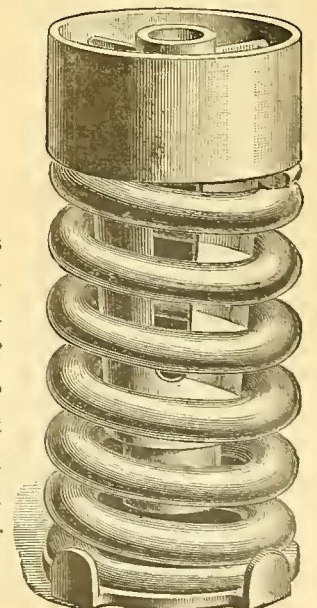
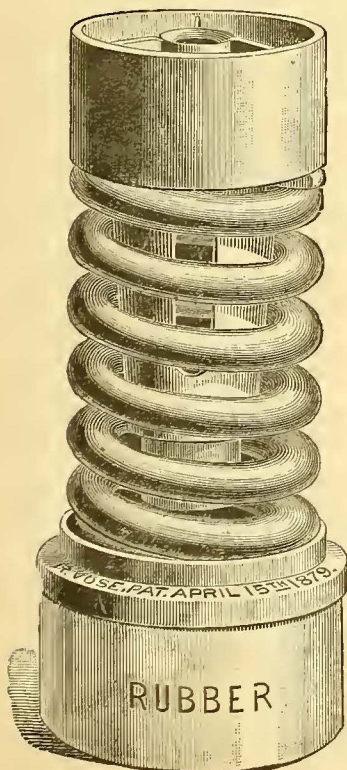
## STEEL CONE CITY CAR SPRING.

Patented April 15, 1879—August 5, 1884.

The unprecedented popularity of the

### “VOSE GRADUATED RUBBER CONE SPRING”

for HORSE CARS has induced the inventor to bring this class of Springs as near perfection as possible, and after a series of experiments and tests now presents for favor what he claims to be the *MOST PERFECT SPRING FOR HORSE CARS* ever offered. It is exceptionally SOFT AND EASY with the EMPTY CAR or with the GREATEST LOAD. It is believed to be the MOST DURABLE, being constructed upon a principle that seems to insure that the Spring must ACTUALLY WEAR OUT. The very Finest Quality of *Crucible Cast Steel* will always be used in these Springs.



# JOHN STEPHENSON COMPANY

(LIMITED),

**New York.**

## TRAMWAY CARS

MEDAL OF FIRST CLASS, WORLD'S INDUSTRIAL COTTON EXPOSITION, NEW ORLEANS, 1885.



### LIGHT ELEGANT, DURABLE.

*Every Description.*

*Best Materials.*

*Minimum Prices.*

ORDERS QUICKLY FILLED. CAREFUL ATTENTION TO SHIPMENTS.

**All Climates Suited.**