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THE STREET RAILWAY JOURNAL.

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

Contributions. Those interested in street railways will greatly assist us in making the JOURNAL of value if they will send us such items of news as come under their observation, results of tests, questions of practical interest to street railway men, contributions giving their ideas and the results of their experience in practical matters pertaining to the service, and in short everything you would like yourself to read if contributed by others.

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

NEW ADVERTISEMENTS.

- THE DAFT Co. show a new cut.
- AUGUSTUS DAY gives new matter.
- THE LEIB LUBRICATING Co. changes its copy.
- THE CHAPLIN MANUFACTURING Co. use a half page.
- JOHN STEPHENSON Co. has a more attractive display.
- RUFUS MARTIN & Co. mention new appliances in their line.
- THE BROOKLYN RAILWAY SUPPLY Co. insert new testimonials.
- THE MICHIGAN STOVE Co. advertise the Garland street car heater.
- THE BROWNELL & WIGHT CAR Co.'s advertisement is increased in size.
- THE VULCANIZED FIBRE Co. call attention to their new flexible dust-guard.
- JOHN WILEY & SONS announce J. Bucknall Smith's new book on cable railways.
- MILTON I. MASSON uses another page to show additional fare boxes of the Siawson pattern.
- THOMAS B. KERR gives some new points in regard to the Overhead Conductor of the Electric Railway.
- HATHAWAY & ROBISON insert a general advertisement for their contracting, cable and switch business.

CONTENTS.

Illustrated Articles.

A New English Cable Railway.....	764
Elevated Cable Railroad.....	765

Editorial.

Heating Cars with Electricity.....	768
Sunday Cars. A Catechism.....	768
Exhibit at Convention.....	768
Sale of Franchise—Legal Points.....	768
Comparative Popularity of Street Cars.....	769
The Storage Battery Car.....	769
Boston's Street Railway Combination.....	769

Editorial Notes.

The Field Motor.....	757
Adhesive Traction.....	757
Parisian Street Railways.....	757
Legal Expenses of Street Railways.....	757
Dr. Richard T. Ely on Street Railways.....	757
"Taxation Without Representation".....	757
Pay for the Use of Streets.....	757
Convention of the American Street Railway Association.....	757
Loss of Heat in Coal.....	757
Comparison of French and American Street Railways.....	758

Editorial Correspondence:

Parisian Street Railway Stables.....	761
The Paris Tramway.....	768

Correspondence.

Claims for the Daft System.....	763
Double-Decker Cars.....	763
A Novel Electric Car.....	763

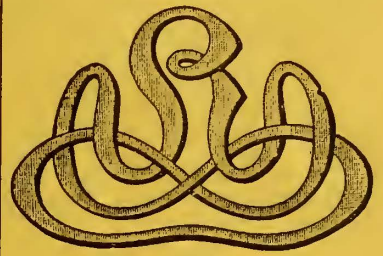
Miscellaneous.

The Daft Road at Pittsburgh.....	762
Funeral Street Cars.....	763
The New York Sun on Electric Roads.....	765
Increasing Traction Adhesion by Electricity. By Elias E. Ries.....	766
Electric Propulsion at Southwick.....	767
Fight for a Franchise.....	767
Early Methods of Supplying Electricity to Street Cars.....	767
Julius S. Walsh on Cable Roads.....	779
Louisville Street Cars.....	779
Sunstroke in Horses.....	779

Stocks and Bonds.

Boston.....	781
New Haven, Conn.....	780
New York.....	781
Philadelphia.....	781
Providence, R. I.....	780
St. Louis.....	781

Among the Supply Men.....	780
Business Notes.....	780
Directory of Street Railways.....	782-800
Facts and Opinions.....	760
Legal Intelligence.....	762
New Publications.....	779
Personal Directory.....	756
Personal Mention.....	760
Street Railway News.....	769-779
Street Railway Supply Directory.....	754-755



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The next regular meeting of the Association will be held in Philadelphia, Pa., the third Wednesday in October, (the 19th), 1887. Communications concerning Membership, Reports, etc., should be addressed to the Secretary. Communications on subjects for discussion should be sent to the committees.

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 Frank H. Andrews, 545 W. 23d st. N. Y.....818-819
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y.....816-817

AXLES.

F. W. Jesup & Co., 67 Liberty st., N. Y.....713
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y.....816-817
 A. Whitney & Sons, Philadelphia, Pa.....824
 Frank H. Andrews, 545 W. 33d st., N. Y..... 818-819
 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O.....824
 Fulton Foundry, Cleveland, O..... 824
 Bowler & Co., Cleveland, O..... 823

BEARINGS.

Frank H. Andrews, 545 W. 33d st., N. Y..... 818-819
 John Stephenson Co., New York.....840
 Pugh & Russell, Stewart Building, New York...815
 Edward C. White, 531 W. 33d st., New York....828
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y.....816-817
 Chaplin Mfg. Co., Bridgeport, Conn., and 69 Wall
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 Chas. B. Miller, 541 W. 32d st., New York..... 829

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A. Whitney & Sons, Philadelphia, Pa.....824
 Lewis & Fowler, Brooklyn, N. Y.....816-817
 Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 Chaplin Mfg. Co., Bridgeport, Conn., and 69 Wall
 st., New York.....825
 Bemis Car Box Co., Springfield, Mass.....825
 Chas. B. Miller, 541 W. 32d st., New York.....829
 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O.....824
 Fulton Foundry, Cleveland, O..... 824

BRAKES.

Rufus Martin & Co., 13 Park row, New York...820

BRAKE RODS.

Lewis & Fowler, Brooklyn, N. Y.....816-817
 Mordecai M. Wilson, Agent, Troy, N. Y.....823

BRAKE SHOES.

A. Ayres, 502 to 518 W. 45th st., New York.....813
 Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 John Stephenson Co., New York.....840
 Rufus Martin & Co., 13 Park row, New York...820
 Lewis & Fowler, Brooklyn, N. Y.....816-817
 Fulton Foundry, Cleveland, O..... 824

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J. H. Gould, 9th and Market sts., Phila., Pa...801
 D. B. Anders, 2313 Ridge ave., Philadelphia, Pa.807

CABLE ROADS.

D. J. Miller, 234 Broadway, N. Y..... 808
 Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 Poole & Hunt, Baltimore.....807
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa.....812
 Neffel & Oothout, 41 Liberty st., N. Y. City...812
 J. H. Gould, 9th and Market sts., Phila., Pa...801

CABLE ROPES.

Broderick & Bascom Rope Co., 704-706 N. Main
 st., St. Louis, Mo.....808
 John A. Roebling's Sons Co., 117 & 119 Liberty
 st., N. Y.....808
 Hazard Mfg. Co., Wilkesbarre, Pa.....809
 Washburn & Moen Mfg. Co., Worcester, Mass.;
 16 Cliff st., New York; 107 & 109 Lake st.,
 Chicago.....813

CABLE ROAD CEMENTS.

Empire Warehouse Co., 198-210 Market st., Chi-
 cago, Ill.....811

CABLE CONCRETE MIXERS.

H. W. Caldwell, 131-133 W. Washington st., Chi-
 cago, Ill.....812

CALKS, TOE.

P. F. Burke, 860 Dorchester ave., So. Boston.. 804

CAR CEILINGS.

Gardner & Co., 643 to 657 W. 48th st., N. Y.....826
 Lewis & Fowler, Brooklyn, N. Y.....816-817
 Frost & Peterson, 161 & 163 W. 18th st., New
 York.....827

CAR HEATERS.

Cline Mfg. Co., 42 & 44 W. Monroe st., Chicago. 829
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y.....816-817
 Michigan Stove Co., Detroit, Mich.....795

CAR LAMPS.

Geo. M. Clute, W. Troy, N. Y.....826
 Josephine D. Smith, 350 & 352 Pearl st., N. Y.....832
 Pugh & Russell, Stewart Building, New York...815
 Lewis & Fowler, Brooklyn, N. Y.....816-817

CARS, NEW.

John Stephenson Co., New York.....840
 J. G. Brill Co., Philadelphia, Pa.....838-839
 Felgel Car Co., 108 Wall st., N. Y.....837
 Brownell & Wight Car Co., St. Louis, Mo.....836
 J. M. Jones' Sons, West Troy, N. Y.....836
 Pullman's Palace Car Co., Chicago, Ill.....835
 St. Louis Car Co., St. Louis, Mo.....834
 Robinson & Hitt, Waterloo, Ia.....834
 Kuhlmann Car Co., Cleveland, O.....834

CARS, SECOND HAND.

Humphreys & Sayce, 1 Broadway, N. Y.....781
 Brooklyn Railway Supply Co., 37 Walworth st.,
 Brooklyn.....821

CAR SASH.

Ayers' Patent Sash Holder Co., Stewart Build-
 ing, New York City.....827

CAR SEATS.

Gardner & Co., 643 to 657 W. 48th st., N. Y.....826
 Hale & Kilburn Mfg. Co., 43 & 50 N. 6th st.,
 Philadelphia, Pa.....827
 Hartford Woven Wire Mattress Co., Hartford,
 Conn.....824
 Frost & Peterson, 161 & 163 W. 18th st., New
 York.....827

CAR SPRINGS.

Lewis & Fowler, Brooklyn, N. Y.....816-817
 Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 Richard Vose, 13 Barclay st., N. Y.; Wm. P.
 Williams, Chicago representative, 117 Adams
 Express Bldg.; A. W. Slee, St. Louis represen-
 tative, 104 N. 3d st.....853
 Pugh & Russell, Stewart Building, New York...815
 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O.....824

CAR STARTERS.

C. B. Broadwell, 169 Laurel st., New Orleans, La.826

CAR WHEEL PRESSES.

Watson & Stillman, 204-210 E. 43d st., N. Y., ...824

CAR WHEELS.

A. Whitney & Sons, Philadelphia, Pa.....824
 Lewis & Fowler, Brooklyn, N. Y.....816-817
 Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 Pugh & Russell, Stewart Building, New York...815
 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O.....824
 Peckham Car Wheel Co., Syracuse, N. Y.....823
 Fulton Foundry, Cleveland, O.....824
 Bowler & Co., Cleveland, O.....823

CASTINGS.

Bowler & Co., Cleveland, O.....823
 F. W. Jesup & Co., 67 Liberty st., N. Y.....813

A. Whitney & Sons, Philadelphia, Pa.....824
 Lewis & Fowler, Brooklyn, N. Y.....816-817
 Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 A. Ayres, 502 to 518 W. 45th st., New York.....813
 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O.....824
 Fulton Foundry, Cleveland, O.....824

CLUTCH AXLES.

Empire Axle Mfg. Co., 32 Nassau st., New York.810

CURVED RAILS.

Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 Pugh & Russell, Stewart Building, New York...815
 Wm. P. Craig, 95 Liberty st., N. Y.....812
 Johnson Steel Street Rail Co., Johnstown, Pa..814
 Lewis & Fowler, Brooklyn, N. Y.....816-817
 A. Ayres, 502 to 518 W. 45th st., New York.....813
 Fulton Foundry, Cleveland, O.....824

CURVED RAILS—Pat. Steel Grooves.

A. Ayres, 502 to 518 W. 45th st., New York.....813

CROSSINGS.

Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa.....812
 Lewis & Fowler, Brooklyn, N. Y.....816-817
 Bowler & Co., 10 to 24 Winter st., Cleveland, O..823
 Fulton Foundry, Cleveland, O.....824

CHANNEL PLATES.

Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 Wm. P. Craig, 95 Liberty st., N. Y.....812
 A. Ayres, 502 to 518 W. 45th st., New York.....813

DUST GUARDS.

Vulcanized Fibre Co., Wilmington, Del.....795

DOOR STOPS.

Haycox Door Fastener Co., 1158 Euclid ave.,
 Cleveland, O.....828

ELECTRIC RAILWAYS.

Van Depoele Electric Manufg. Co., 203 Van Bu-
 ren st., Chicago, Ill.; New York office, 41-45
 Broadway and 17-21 Trinity place.....785
 Sprague Electric Ry. & Motor Co., 16 & 18 Broad
 st., New York.....787
 Julien Electric Co., 120 Broadway, New York...783
 Safety Electric Ry. & Power Co., 41-43 Wall st.,
 New York.....793
 Bentley-Knight Electric Ry. Co., 115 Broadway,
 New York.....791
 Daft Electric Light Co., 115 Broadway, N. Y...769
 Overhead Conductor Electric Ry. Co., Pitts-
 burgh, Pa.....793
 U. S. Electric Co., Denver, Col.....791
 Chadbourne & Hastings, Philadelphia, Pa.....795

FROGS.

A. Ayres, 502 to 518 W. 45th st., New York.....813
 Frank H. Andrews, 545 W. 33d st., N. Y.....818-819
 Pugh & Russell, Stewart Building, New York...815
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa.....812
 Lewis & Fowler, Brooklyn, N. Y.....816-817
 Bowler & Co., 10 to 24 Winter st., Cleveland, O..823
 Fulton Foundry, Cleveland, O.....824

FARE BOXES.

T. L. Beaman, Knoxville, Tenn.....831
 Rufus Martin & Co., 13 Park row, New York...820
 Wales Manuf. Co., 76 and 78 East Water st.,
 Syracuse, N. Y.....830
 Tom L. Johnson, Indianapolis, Ind.....830
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y.....816-817
 J. B. Slawson, 365 Ave. A, New York.....802, 831
 John Stephenson Co., New York.....840
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DIRECTORY OF MANUFACTURERS AND DEALERS IN STREET RAILWAY SUPPLIES.—Continued.

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 Rufus Martin & Co., 13 Park row, New York.... 820
 Standard Index & Register Co., 138 Fulton st.,
 New York..... 803
 Railway Register Mfg. Co., 1193 Bdy., N. Y. . 807

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GROOVED CURVES.

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 Humphreys & Sayce, 1 Broadway, N. Y. 781
 Frank H. Andrews, 545 W. 33d st., N. Y. 818-819
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y. 816-817
 Pugh & Russell, Stewart Building, New York. . 815
 Wm. P. Craig, 95 Liberty st., N. Y. 812
 Johnson Steel Rail Co., Johnstown, Pa. 814
 Fulton Foundry, Cleveland, O. 824

HARNESSES.

Rufus Martin & Co., 13 Park row, New York.... 820

HYDRAULIC JACKS.

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 F. P. Roberge, 1741 Broadway, N. Y. 813
 Bryden Forged Horseshoe Co., Catasauqua, Pa. 805

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 Putnam Nail Co., Neponset P. O., Boston, Mass 804
 S. D. Kimbark, Mich. ave. & Lake st., Chicago,
 Ill. 802

KNEES.

A. Ayres, 502 to 518 W. 45th st., New York..... 813
 Frank H. Andrews, 545 West 33d st., N. Y. 818-819
 Wm. P. Craig, 95 Liberty st., New York. 812
 Pugh & Russell, Stewart Building, New York. . 815
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa. 812
 Lewis & Fowler, Brooklyn, N. Y. 816-817
 Fulton Foundry, Cleveland, O. 824

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 Rufus Martin & Co., 13 Park row, New York.... 820
 Leib Lubricating Co., 196 Chicago st., Buffalo,
 N. Y. 822

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 D. F. Longstreet, Providence, R. I. 813

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 W. L. Everit, New Haven, Conn. 828

METALS, ANTI-FRICTION.

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 Edw. C. White, 531 W. 33d st., New York..... 828

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Pole St. Car Motor System, 310 Chestnut st.,
 Philadelphia, Pa. 799
 Baldwin Locomotive Works, Philadelphia, Pa. . 834
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 way, New York. 785
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 way, New York. 787
 U. S. Electric Co., 120 Broadway, N. Y. 783

N. Y. Railway Supply Co., Lim., 40-42 Wall st.,
 New York. 812
 Overhead Conductor Electric Ry. Co., Pitts-
 burg, Pa. 793
 Safety Electric Ry. & Power Co., 41-43 Wall st.,
 New York. 793
 Chadbourne & Hastings, Philadelphia, Pa. 795
 Bentley-Knight Electric Ry. Co., 115 Broadway,
 New York. 791
 Daft Electric Light Co., 115 Broadway, N. Y. . 789
 U. S. Electric Co., Denver, Col. 791

PEDESTALS.

John Stephenson Co., New York. 840
 Frank H. Andrews, 545 West 33d st., N. Y. . 818-819
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y. 816-817
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 Pugh & Russell, Stewart Building, N. Y. 815
 F. W. Jesup & Co., 67 Liberty st., N. Y. 818
 Frank H. Andrews, 545 W. 33d st., N. Y. 818-819
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 row, Boston, Mass. 826
 Jordan-Mills Mfg. Co., 32 Nassau st., N. Y. 827

SIGNAL LIGHTS.

Rufus Martin & Co., 13 Park row, New York.... 820

SPIKES AND FASTENINGS.

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 Ill. 800

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 Philadelphia, Pa. 800
 Humphreys & Sayce, 1 Broadway, N. Y. 781
 F. W. Jesup & Co., 67 Liberty st., N. Y. 818
 Worcester Steel Works, Worcester, Mass. 813
 Johnson Steel Rail Co., Johnstown, Pa. 814
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa. 812
 Fulton Foundry, Cleveland, O. 824
 N. Y. Railway Supply Co., Lim., 40-42 Wall st.,
 New York. 812

SEATS & SEAT SPRINGS.

Hale & Kilburn Manuf'g Co., Philadelphia, Pa. . 827

STATIONERY, STREET RAILWAY.

Rufus Martin & Co., 13 Park row, New York.... 820

STREET RAILWAY BUILDERS.

James Raymond, 45 Broadway, N. Y. 795
 A. Ayres, 502 to 518 W. 45th st., New York..... 813
 Lewis & Fowler Mfg. Co., Brooklyn, N. Y. 816-817
 Metallc St. Railway Supply Co., Albany, N. Y. 813
 Wm. P. Craig, 95 Liberty st., N. Y. 813
 Frank H. Andrews, 545 West 33rd st., N. Y. 818-819
 A. J. Hutchinson, 120 Broadway, N. Y. 812
 Nettel & Oothout, 41 Liberty st. N. Y. City. . 812
 M. W. Conway, 487 Monroe st., Brooklyn, N. Y. . 812
 T. Wm Harris & Co., 2 Nassau st., New York.... 811
 Hathaway & Robison, 14 Case Block, Cleveland, 811

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A. Ayres, 502 to 518 W. 45th st., New York..... 813
 John Stephenson Co., New York. 840

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 F. W. Jesup & Co., 67 Liberty st., N. Y. 813
 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O. 824
 Wm. P. Craig, 95 Liberty st., N. Y. 812
 Lewis & Fowler, Brooklyn, N. Y. 816-817
 Frank H. Andrews, 545 West 33rd st., N. Y. . 818-819
 Brooklyn Railway Supply Co., 37 Walworth st.,
 Brooklyn. 821
 Fulton Foundry Co., 202 Merwin st. Cleveland, O. 824
 M. W. Conway, 487 Monroe st. Brooklyn, N. Y. . 812
 Edward Beadle, 1193 Broadway, N. Y. City. . 824
 Rufus Martin & Co., 13 Park row, N. Y. 820
 Cambria Iron & Steel Works, 218 So. Fourth st.,
 Philadelphia, Pa. 800
 T. Wm. Harris & Co., 2 Nassau st., N. Y. 811
 J. C. Saxton, 52 Broadway, New York. 808
 N. Y. Railway Supply Co., Lim., 40-42 Wall st.,
 New York. 812
 Horace A. Keefer & Co., Kansas City, Mo. 829

SNOW PLOWS.

Frank H. Andrews, 545 West 33rd st., N. Y. 818-819
 Augustus Day, Detroit. 822
 Brooklyn Railway Supply Co., 37 Walworth st.,
 Brooklyn. 821

SWITCHES.

Humphreys & Sayce, 1 Broadway, N. Y. 781
 M. M. White & Co., 531 West 33rd st., N. Y. 812
 Frank H. Andrews, 545 West 33rd st., N. Y. 818-819
 Lewis & Fowler, Brooklyn, N. Y. 816-817
 Johnson Steel Rail Co., Johnstown, Pa. 814
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa. 812
 Bowler & Co., 10 to 24 Winter st., Cleveland, O. 823
 A. Ayres, 502 to 518 W. 45th st., New York..... 813
 Fulton Foundry, Cleveland, O. 824
 Hathaway & Robison, 14 Case Block, Cleveland, 811

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 Frank H. Andrews, 545 West 33rd st., N. Y. 818-819
 Bowler & Co., 14 Winter st., Cleveland, O. 823
 Fulton Foundry, Cleveland, O. 824

TURN TABLES.

Frank H. Andrews, 545 West 33rd st., N. Y. 818-819
 Bowler & Co., 14 Winter st., Cleveland, O. 823
 A. Ayres, 502 to 518 W. 45th st., New York..... 813
 Fulton Foundry, Cleveland, O. 824
 Hathaway & Robison, 14 Case Block, Cleveland, 811

TRACK CASTINGS.

Humphreys & Sayce, 1 Broadway, N. Y. 781
 Frank H. Andrews, 545 West 33rd st., N. Y. 818-819
 Augustus Day, Detroit. 822
 Johnston Frog and Switch Co., 307 Walnut st.,
 Philadelphia, Pa. 812
 Bowler & Co., 14 Winter st., Cleveland, O. 823
 Lewis & Fowler, Brooklyn, N. Y. 816-817
 Street Railway Supply Co., Herald st. & Dell
 ave., Cleveland, O. 824
 Fulton Foundry, Cleveland, O. 824

TRACK SCRAPERS.

Frank H. Andrews, 545 W. 33d st., N. Y. 818-819
 Brooklyn Railway Supply Co., 37 Walworth st.,
 Brooklyn. 821
 Augustus Day, Detroit, Mich. 822

VARNISHES.

John Babcock & Co., 2 Liberty sq., Boston, Mass. 826
 Parrott Varnish Co., Bridgeport, Conn. 826

VETERINARY REMEDIES.

Wm. Somerville & Sons, 127 Erie st., Buffalo, . 804

WHEEL PRESSES.

Watson & Stillman, 204-210 E. 43d st., N. Y. 824

WOOD FILLERS.

Chicago Wood Finishing Co., 143-145 So. Clin-
 ton st., Chicago, Ill. 826

Personal Directory of Street Railway Supply Men.

Table listing names and addresses of street railway supply men, organized in three columns. Includes entries for Allyn, Chas. B., Gardner, John M., Pugh and Russell, D. W., and many others.

U. S. PATENT OFFICE.
OCT 2 1890

THE STREET RAILWAY JOURNAL



Vol. III.

NEW YORK & CHICAGO, SEPTEMBER, 1887.

No. 11.

E. P. HARRIS, Editor and Manager.
GEORGE L. FOWLER, Mechanical Editor.

Double decked cars are attracting attention.

Now is the time to make your plans to be at the Philadelphia convention.

If, in the STREET RAILWAY JOURNAL, you don't see what you want, ask for it.

The programme of the street railway convention to be held in Philadelphia, beginning Oct. 19th, may be found on the first page of our cover.

Street Railway Mutual Insurance, it is hoped, will not be entirely overshadowed by the motive power question at the Philadelphia convention next month.

No, electricity has not overcome all the obstacles in the way of, and filled all the conditions of a perfect street railway motor, but at the present writing it may be pronounced without hesitation a success.

Among street railway managers confidence in electricity as a street railway motive power has grown very rapidly during the past twelve months, and at the Philadelphia convention we expect to note less incredulity than was shown at the Cincinnati meeting.

The Field motor, being tried on the New York elevated railway, can be so constructed as to be placed upon each truck of the ordinary cars of that road, and controlled by the gateman at either end of the car. Electricity is conducted by means of a third rail. The motor is now being tested, however, on an independent car, forming an electric locomotive.

Adhesive traction, Mr. Ries' experiments indicate, can be nearly doubled by passing an electro-magnetic current through one wheel to the track along the rail to and through the other wheel, thus making a completed circuit. We print in this issue what Mr. Ries said about the matter at the recent meeting of the American Association for the Advancement of Science. This is a very interesting subject at this stage of proceedings in the motive power question.

Reference was made in our last issue to the way in which the Parisian street railways were handicapped by the police authorities' regulations. We have private advices to the effect that such unreasonable interference is instigated by a rival company, whose object is to get control of the street railways and who take this means of depreciating their stock. This is certainly a contemptible piece of business, but is not without precedent in American history.

In fixing the terms on which a railway company may have the use of streets, neither party is usually governed by any well defined principle except that the city on the one hand and the company on the other each tries to get as much and give as little as possible. This manner of dealing may or may not result in a good bargain for the company, but for the sake of future peace it would be far better if the compensation were fixed by established principles.

Of the immense legal expense incurred annually by the railways of the country it would be interesting to know what proportion is due solely to the unjust prejudice that exists in the public mind against corporations. Against street railways in particular hundreds of cases are trumped up that never would be thought of against an individual. It is not infrequently the case that a street railway company takes as a matter of course that which would be generally regarded as an outrage against an individual.

Speaking of street railways and other similar enterprises, Dr. Richard T. Ely in Harper's for July says: "All charters for performing the functions of a natural monopoly should be limited to a brief period, with the reversion of the entire property to municipality, State or federal government, either without compensation or with compensation at an appraised value for actual outlays." That reads well and would be a good scheme for the public if it did not take two to make a bargain. But who will "be the goat to see the play go on?"

If a corporation, as such, has no voice in the election of civil officers, and wields no influence in legislation, it affords an example of "taxation without representa-

tion," a thing which, as we understand it, caused some little unpleasantness in this country something over a century ago, and is causing some little dissatisfaction among the women of the country at the present time. As street railways certainly bear their share of the burdens of taxation, it might be well to recognize a well-established principle of justice by according them some voice in making the laws by which they are to be governed.

If the railway company is required to pay for the use of streets as it would expect to pay for the use of private property, that is one thing. If, however, the street railway is so far a public benefactor as to be practically given the use of streets on the condition that it provide adequate accommodations as to length of line and number and kind of cars to satisfy the needs of the public, that is another and quite different thing. In many cases the company would prefer the first alternative, provided it is guaranteed the rights for which it has fully paid, and its profits are not all eaten up by "regulation."

Unless signs fail and appearances deceive, the Convention of the American Street Railway Association to be held in Philadelphia, October 19th, 20th and 21st, will be by far the most important meeting in the history of that very successful organization. Had the executive committee foreseen the rapid growth in interest in the motive power question, a programme could hardly have been arranged to better meet the demands of the time. The largest part of the time by far will doubtless be devoted to the discussion of motors. But the question of Mutual Insurance is an important one; Track is always a subject of interest, even in less skillful hands than those of the present committee, while if the interest in Practical Devices wanes, the supply men will come to the rescue.

Of the heat in coal ninety per cent is lost in transforming it by the use of the best steam engine into mechanical energy. Of this available ten per cent not more than forty per cent can be by the storage battery system be made available at the car axle, or four per cent of the original. Of this twenty-five per cent is required to haul the electrical machinery on the car, leav-

ing three per cent of the coal's heat available in power to haul the car and passengers. And yet the storage battery system is cheaper than horse power by probably anywhere from twenty-five to seventy-five per cent. Of the heat of coal then only three per cent is available at the axle, and assuming no loss by slipping of wheels, two-thirds of the three per cent is necessary to haul the empty car, leaving barely one per cent of the equivalent in power of the coal's heat for hauling passengers. It would seem that there is a little room for improvement somewhere.

In making a comparison of the French and American street railway lines from the data given by our correspondent in another column, we find that the buildings of the latter are far more elaborate than any which the Paris companies possess, and that the improvements which we use are unknown there. The French stable is merely a reproduction of the old inn stables in the days of the postchaise. On the other hand the French drive a far better horse, and manage to give him nearly four times the life of service that we obtain. As a matter of economy in this particular, it would seem advisable for some of the larger of our roads to try this experiment of better horses and a shorter mileage, upon some of the lines, in order to determine if the waste of horseflesh, which is now so excessive, cannot be cut down. It is possible, to be sure, that the extra price that would be paid for the animal, coupled with the increased number that the company would be required to maintain, would more than eat up the saving in wear. Still it would seem that the experiment were worth the trying.

Heating Cars with Electricity.

A recent car heater consists of a conducting wire covered with fire clay. Electricity, passing through the conductor, heats the clay, and this, by radiation, warms the car. It is proposed to place two heaters in a car, each to be the length of the car inside—say 12 feet—and to be 8 inches wide and 1 inch thick. Each is to rest on supports 3 inches from the floor. The radiating surface of the two heaters would be a fraction over 36 square feet. In actual tests made with a heater of one-tenth ohm resistance in circuit, with ten arc lights, it was found that the interposition of the heater had no perceptible effect on the brilliancy of the lights, nor was there the least flickering in them when the heater was rapidly cut in and out of the circuit. In thirty minutes the heater attained the temperature that would be ordinarily required for a street car. The temperature of the heater, however, would depend on the requirements of the moment, but probably in no case would it be necessary to exceed 180° F.

There is nothing the matter with this idea, so far as its working is concerned, except that the power required to put it into execution is comparable with that re-

quired to draw the car itself. Baron Gostkowski, General Manager of Austrian Railways, has calculated the power necessary to heat a railway car in this way, and his results for an ordinary German car holding 42 persons, show that 20 H. P. are necessary to heat it, while it requires only 8 H. P. to haul it at the rate of 22 miles per hour. Proceeding in the same way with an ordinary street railway car seating 20 persons, we find that to keep the temperature of the interior of the car 30° F. above that of the exterior requires an expenditure of about 3 H. P. So it seems to us that, so far, heating street railway cars in this way is rather visionary.

Sunday Cars.

A CATECHISM.

Q. What is Sunday for?

A. Sunday is a day of rest.

Q. By what authority is that statement made?

A. Laying aside the claim of its sacredness on account of its origin as matter of dispute, science and common consent unite in requiring for the sake of pleasure, health and morals, relaxation and rest from toil about one day in seven.

Q. What is rest?

A. Rest is the exercise of different faculties from those wearied by use. It is not inaction but *different* action.

Q. Should the day be held sacred?

A. It should. By him who does not believe in revealed religion for the reason that only by holding the day sacred can it be free from work and work-day cares and so wholly a day of rest.

Q. Have street railways then a right to deprive their employees of their Sunday's rest by running cars on Sunday?

A. It is not only the company's right but also its duty to run cars Sunday.

Q. Why?

A. To secure the "greatest good to the greatest number."

Q. How?

A. By allowing thousands to secure real rest by the use of street cars who could not obtain it any other way.

Q. But what of the employee?

A. This is a case of which civilization affords many—preachers for example—where the interests of one must be temporarily sacrificed for the many. The well-being of hundreds of passengers is more than that of one employee.

Exhibit at Convention.

THE STREET RAILWAY JOURNAL will as usual have charge of the exhibition of street railway appliances at the Philadelphia convention. The unusual interest felt at the present time in improved devices, especially in the motive power line, will probably bring out a great number of inventions. The hotel at which the meeting is to be held is not yet decided upon, but we are assured ample facilities for the display of all classes of appliances. Early arrangements for space are desirable.

Sale of Franchise—Legal Points.

In the matter of the sale of the Elmwood avenue franchise in Buffalo recently, a number of important legal questions arose.

The opinions of Corporation Counsel Worthington on these points are of interest to street railway managers in cities of over 85,000 inhabitants in New York State.

One opinion is that a company is a legal bidder, though they have neither made application to the Common Council for the franchise nor obtained the consents of property holders. In substance that the Council in giving its consent to any company practically gives it to all legally constituted companies in the city. Otherwise the law to sell to the highest bidder could not be carried out.

Again, the "highest bidder" is the one making the bid of the highest rate per cent of its gross earnings, and *not* the one whose bid *might* or *would be likely* to yield the city the largest gross amount on account of its larger gross earnings. In the case in question it was held that a bid of one-half of one per cent from the new Queen City company should be considered as higher than one-seventieth of one per cent from the Buffalo East Side company, even though it was very obvious that the latter bid, owing to the larger gross earnings of the bidder, would yield the city more money. "The bid being a percentage upon a future earning of a new or old company, how can you say that the new company may not so extend its line and receive such patronage from our people as to have its gross receipts soon equal or exceed those of the old company?"

The last question considered involves some interesting points:—

"The condition referred to is that but a single fare of five cents be charged for transporting a passenger from Seneca street along Main street and through Elmwood avenue to the park. The law prohibits one street railway company from using the tracks of another, even with its consent, for a distance of more than one thousand feet; and also provides that no company shall lay its tracks along a street occupied by the tracks of another company without the consent of such company. It will, therefore, be impossible for the new company to literally comply with this condition of sale without the consent of the old company. The new company has one year to comply with the conditions of sale, and you are not called upon, I think, in passing upon these bids, to assume that the new company will not be able to make some arrangement satisfactory to the old company by which a compliance with this condition of sale may be effected."

The Counsel foresees also that "difficulties may be encountered by the Queen City company in obtaining the proper consent of the property owners along the line, the other company having obtained such consent in a formal acknowledged manner. But though the people may for some time be deprived of street railroad facilities in consequence of these steps yet required to

be taken by the new company, you have nothing whatever to do with that but should award the franchise to the company which agrees to give the largest portion of its receipts per annum to the city."

Comparative Popularity of Street Cars.

Tables recently prepared show a wide difference in street railway traffic in proportion to population in different Eastern cities. The following table show the gross number of passengers carried in 1886 in four leading cities and the number of rides per inhabitant.

	Total Passengers.	Rides per Inhabitant.
Boston	86,000,000	221
Brooklyn	100,000,000	177
Philadelphia	102,000,000	104
New York	210,000,000	166

Boston's long lead in the number of rides per inhabitant is due very largely to geographical conditions, but probably quite as much or more to its fine cars. While the other cities have been making progress in this respect during the past few years, street car riding is largely a matter of habit, and it takes some time to feel the full benefit of such improvements. And the Boston Herald's claim that Boston's cars are "cleaner, neater, and every way more attractive" than the street cars of New York, Brooklyn or Philadelphia, could probably be substantiated at the present time, for there are a few companies in these cities whose cars are so bad that it is difficult to judge what principle of business policy permits them to run.

The Storage Battery Car.

In a paper read before the National Electric Convention just held in Boston, and reported in the Electrical Review, Prof. A. Reckenzaun brings out some very interesting points with regard to the use of the storage battery for propelling street cars. Prof. Reckenzaun has made a special study of storage batteries, and has for some years been making experiments with them for street car use in Europe and America. He leaves us to take for granted the advantages of the system in the way of convenience, etc., and devotes his attention mainly to answering various objections raised against the system.

The first objection spoken of, is that of loss of energy incident to the storage of electricity instead of its direct use. This he states will be in practice twenty to thirty per cent. He points out, however, that efficiency is only a relative term, inasmuch as the best steam engine only utilizes for power one-tenth the equivalent of the heat in the coal, and that small engines are three times as expensive to run as large ones; therefore, while the storage battery may not return exceeding seventy per cent of the work expended in charging it, it may yet prove an economical motor.

The second objection, to which he refers as being more formidable, is that of the weight of storage batteries, involving two disadvantages, viz., the waste of power in propelling the accumulator along with the car and the increased pressure upon the

rails. This objection he would overcome by distributing the weight among eight instead of four wheels, by substituting trucks. The weight of the battery is given as 41 lbs. per cell, when in running order. Of these cells 70, weighing 2,870 lbs., will propel a street car, under ordinary circumstances, though in the experiment now going on in Philadelphia 80 cells are used, as the track in this case has some very sharp grades. On this point attention is called to the fact that more power can be developed from the battery when it is slowly discharged, therefore additional cells are economical from this standpoint. Assuming the weight of the loaded car to be 1,500 lbs., a battery of 70 cells would be about twenty per cent or one of 80 cells about twenty-five per cent of the entire weight of the car loaded, and this, it must be borne in mind, does not include the motor and driving machinery, which he should judge would add anywhere from one-third to fifty per cent to the weight of the ton and a half batteries.

In subsequent discussion of the paper above referred to, the fact was brought out that not exceeding forty per cent of the power required to charge the battery could be delivered on the axle, but the writer says: "From numerous and exhaustive tests with accumulator cars in this country and abroad, I have come to the conclusion that the motive power for hauling a full-sized street car for fifteen hours a day does not exceed \$1.75, and this includes fuel, water, oil, attendance and repairs to engine, boiler and dynamo. We have thus an immense margin left between the cost of electric traction and horse traction, and the last objection, that relating to the depreciation of the battery plates, can be most liberally met, and yet leave ample profits over the old method of propulsion by means of animals."

In response to questions it was stated that the 70 cell battery, on ordinary traffic, or 80 cell battery on very hard traffic, was capable of running continuously four and one-half hours, but that it was found advisable to change the batteries about once in three hours. As one set of cells is being charged when another is being discharged, two sets of cells are required. It need not take more than three minutes to make a change of batteries. The loss of power in standing is practically nothing.

Various other matters are brought out in the paper, but they are of more interest to the electrician than to the practical street railway manager.

Boston's Street Railway Combination.

The history of the West End Land Co., of Boston, which has absorbed, one after another, the leading street railroads, though brief, is probably without precedent in the magnitude of the financial interests involved and the rapidity with which plans most comprehensive have been put in execution. Unknown to the public until the early part of last March, the operations of the new company at once

came into prominence, absorbing a large share of public attention in the City Councils, the State Legislature, and in financial circles, and the company has become in three months the West End Street Railway Co., the largest street railway company in the world, now practically controlling the entire transit facilities of the city and many of its suburban towns, with nearly 200 miles of track and a total railway property valued at not less than \$12,000,000.

On the last day of February an insignificant little street railway company, called the Suburban Street Railway Co., having a nominal capital of \$50,000, petitioned and had a hearing before the Board of Aldermen for the purpose of obtaining track locations on Beacon, Park, Arlington and others of the principal streets on the Back Bay and West End sections. A cable or electric road was first proposed; then a change of location, as a compromise, was agreed to, and it was proposed to occupy certain portions of the Common malls, great opposition being met with, among others, from representatives of some of the other street railway lines. No location was granted, the members of the company, or syndicate, working in other directions, and the matter is still pigeonholed, though, it is said, the location can be had at any time it suits the gentlemen interested to ask action of the Board. The Suburban Co. will shortly be consolidated with the West End.

About the same time the Metropolitan Railway Co., which controls the bulk of the city traffic, was having a small war with the South Boston Co., and was petitioning the Board for the right to lay tracks of its own in South Boston. The next heard was that a party of five capitalists, comprising Mr. Henry M. Whitney, Mr. Asa P. Potter, Mr. Isaac T. Burr, Mr. Grenville T. W. Braman and Mr. Henry D. Hyde, had bought about 5,000,000 ft. of land, situated on both sides of Beacon street and extending out some three or four miles through the suburbs of Brookline, at a cost variously estimated at from \$1,000,000 to \$2,500,000, being the same gentlemen interested in the Suburban Street Railway, and that the stock of the South Boston, Metropolitan and Cambridge railways was being bought for control. This has since been accomplished, and the Boston Consolidated (comprising the old Highland and Middlesex roads) has been added.

After protracted hearings and much opposition and discussion, the members composing the West End Land Co. obtained a bill permitting consolidation of these lines into one company, the West End Street Railway Co., which has been organized with a capital stock of \$80,000, all of which is held by the trustees of the West End Land Co., except enough to qualify directors. The Land Co., which is a trust, or association, has its interest divided into 250,000 shares, no par value. The land is said to be all paid for and the trustees are prohibited from contracting debt. This stock is now on the market, and has

risen, through speculation, from \$14 or \$15 per share to nearly \$40, its present value, \$27, equalling a market value of \$6,750,000 for the prospective worth of the land and railway properties. To take up the present stock of the four street railways in the consolidation, preferred stock to the amount of \$6,400,000, entitled to 8 per cent cumulative dividends, was allowed by the bill and will be issued during this month. The basis on which the consolidation has been effected is as follows:

Shares.	Co.	Par.	New Stock Rate.	Shares.
			Par \$0.	
19,500	Cambridge	100	1 19-39	23,000
40,000	Metropolitan	50	1½	50,000
15,000	South Boston	50	1½	18,750
17,000	Boston Con'd	100	1 53-68	30,250
91,500	Totals.			128,000

The total income of these roads, for the year ending Sept. 30, 1886, was \$4,440,480; net income, \$761,527; dividends, \$370,000, which will be increased \$142,000, or to \$512,000, on the new stock. The surplus of net income last year was \$228,975, after paying dividends. The increase in value of these lines is shown by the number of passengers carried during the last few years, and if each passenger is taken at 5 cents it is found that the total income thus arrived at is accurate within a small fraction of one per cent.

	Passengers.	Increase.	Per cent.
1882	57,399,298*		
1883	70,427,138		
1884	73,692,465	3,265,327	4.6
1885	77,618,920	3,926,455	5.3
1886	83,648,229	6,029,309	7.8

*No returns given for Cambridge road.

The figures for 1886 are not the total traffic, which was 86,246,780, adding the passengers of the Charles river road, which has recently become a part of the Cambridge. Probably even the largest percentage will be increased this year.

By another provision of the West End bill, the proceeds of sales of land can be used for the construction of the West End Street Railway, and the hearings now taking place before the Board of Railroad Commissioners are on the petition of the company to increase its capital stock (common) from \$80,000 to \$1,200,000, part of which money is to be spent in paying for land acquired to make the West End Railway scheme possible. Before locations could be obtained either in Boston or Brookline it became necessary to purchase one-third the entire land fronting on the route of the Beacon street line, and to give sufficient of this to widen the street from about 70 ft. to 160 ft., which will make it one of the finest avenues in the world. Locations have been obtained for 10½ miles of new single track, 8 miles of which, double track, will be built this year. Work of laying has begun, and, together with that of widening the avenue, is being pursued with great vigor, 300 men being employed. Rails are of imported "Liverpool" make, with narrow groove for flanges. They are of the I girder form, weighing 92 pounds per yard, laid on longitudinal wooden stringers, supported on cross-bars of concrete, 6 ft. apart, paving blocks coming flush with the top of rails. The cost will be \$20,000 per mile.

PERSONAL MENTION.

J. H. MCGRAW is in Boston.

S. W. HUME is in New York.

COL. VOSE is at Long Beach.

JOHN EXTON of Trenton is dead.

J. C. N. GUIBERT and family are at Fairfield, Conn.

H. M. SWETLAND, of the STREET RAILWAY JOURNAL, is on a Western trip.

CHARLES CLEMINSHAW is very much interested in electricity as a motor.

HON. G. HILTON SCRIBNER has been spending a few days at Clifton Springs.

C. A. RICHARDS is General Manager of the new West End Street Railway of Boston.

E. G. PINKHAM is editor of the news and directory departments of the STREET RAILWAY JOURNAL.

F. J. SPRAGUE, of the Sprague Electric System, is recovering from an attack of typhoid fever.

COL. W. W. DUDLEY, of Richmond, Va., is the head of the new \$1,200,000 cable railway at Indianapolis.

GEORGE V. FORMAN, of Olean, N. Y., President of the new Queen City Street Railway Co., of Buffalo, is a wealthy oil man.

GEORGE L. FOWLER, Mechanical Editor of the STREET RAILWAY JOURNAL, now at the Paris Railway Exposition, sails for America Sept. 24th.

GILBERT N. MARSHALL, Superintendent of the El Paso Street Railway Co., was recently married to Miss Lelia Rose Ecue, of a wealthy New Orleans creole family.

T. C. ROBBINS, General Manager of the Baltimore Union Passenger Railway Co., has undergone two amputations of parts of his foot, but is now reported as being out of danger.

CHARLES E. COOK has been elected Superintendent of Stables and Shops, and William H. Allen Superintendent of Transportation, of the Union Street Railway Co., of New Bedford, Mass.

PETER PETRIE, Foreman of the stables of the Atlantic Avenue R. R. Co. of Brooklyn, died Aug. 14. He had the confidence of his employers and at the same time the good will of his fellow workmen.

E. J. LAWLESS, Superintendent of the Metropolitan Street Railway Co. of Kansas City, is on the lookout for a good headlight for cable cars. He favors electricity, provided the cost be reasonable.

FRANK E. FISHER, inventor of the Fisher patent electric railway system, is not yet twenty-eight years of age, but seems to have been very active as an inventor, having fifty patents now standing in his name, mainly for electric devices.

W. E. CHAMBERLAIN, former General Superintendent of the Providence & Worcester Railway, is now at Bristol, Tenn., in charge of the construction of the South Atlantic & Ohio Railway, a street railway and various other enterprises for Eastern capitalists. He is North on business.

FACTS AND OPINIONS.

Prof. Reckenzaun says that electricity for street railway propulsion costs about half as much as horse power.

It is better, especially under a republican form of government, to demand inalienable rights than it is to beg for them. It is certainly better than to buy them.—Hon. G. Hilton Scribner.

In one field, that of surface street railroads, the universal employment of the electric motor is without doubt only a question of time, and not a very long time either.—Electrical Engineer.

Two horses, it has been ascertained by experiment, when doing ordinary work, exert from two to three mechanical horse power, but each horse is capable of exerting for a few minutes about eight horse power.

We know that it is not always the thing, perhaps, for a man to vacate a seat in order to accommodate a woman, but somehow we think that a thoughtful, well-bred and gallant gentleman always will do it.—Jersey City Journal.

Electricity has demonstrated its practicality and economy as a street car motive power. The only question now to be settled by the street railway managers is the relative merits of different systems.—Thomas Whiteside Rae.

The Emperor of Brazil has ordered a palace car to be equipped with the storage electric battery and the Sprague electric motor; and so it transpires that among the first to put the storage electric car into practical use is a South American road.

Among partial or total monopolies which he claims competition is not entirely successful in regulating, T. H. Farrer enumerates: "Harbors and natural navigations, canals, docks, lighthouses, roads, bridges and ferries, railways, tramways, gas works, water works and telegraphs."

"It is now about two years since it became known that we intended to construct a cable road on Castro street, and in that time the values of real estate along the route have about doubled."—J. L. Willcutt, Secretary of the Market Street Railway Co., San Francisco, Cal.

Under a government like our own, where the majority of individuals, and not the majority in interest, rule (either directly or indirectly), the corporation, as such, is especially disfavored, and suffers severe hardships. For instance, it can take no part in governing, nor even participate in selecting its rulers.—Hon. G. Hilton Scribner.

When a man treats his employees in such a way as he would wish to be treated, were their places changed, his action cannot be far removed from fair, honest and upright dealing. In this, we contend, the managers of street railroad companies will compare favorably with any of the great business enterprises in the country.—Executive Committee American Street Railway Association.

Editorial Correspondence.

Parisian Street Railway Stables.

The stables of the General Omnibus Co. are scattered all over the city, to suit the convenience of the several lines that are to be served. There are fifty-one in all, including the general hospital at Charenton, just outside of the fortifications, and the auxiliary hospital of Jemappes and Maine. The capacity of the stables varies from ninety to eleven hundred. The greater number range from two hundred to four hundred.

The Wagram stables, upon the Avenue de Wagram, which can give accommodations to three hundred and fifty-seven horses, may be taken as a sample of the average both in size and arrangement. The stables serve a tramway line running through the avenue upon which it is placed.

The buildings stand back from the street and about a courtyard, back of the houses fronting on the avenue as well as those on the neighboring streets. Entrance is effected through an arched gateway which may be closed by iron gates. Passing along a stone wall on the right we first come to the house and office of the chief of the depot. This is a three-story building, with offices upon the ground floor and living apartments above. It is a small house, and is entirely distinct from the stables proper.

These latter consist of a row of long buildings, made of stone, and with red-tiled roofs, standing with their gable ends to the court. They are only one story in height, with a skylight and ventilator running the length of the roof. They have bare, whitewashed interiors, and are paved with stone in blocks of about six inches square. Down each side is placed a long iron trough which is divided into twelve separate mangers, while above it is a rick in which hay or straw may be placed. At the farther end of the door there is a rack where forks, curry-combs and stable tools may be kept, but it is untidy, and looks like a catch-all that is not much used. Each of these buildings accommodates twenty-four horses, which stand tied facing the wall. There are no stalls, the only partition separating the space given to one horse from his mate being a plank swung by two light iron rods from the ceiling. These swing to and fro as they are struck, and frequently get up quite a kicking match among the horses. The space given to each animal is about four feet.

The floor is paved on an incline from the outer wall to a gutter just back of where the back feet of the horse come, so that a natural drainage is obtained. The center portion is paved crowning, so that the whole floor space is drained by the two parallel gutters, and these are given a gentle inclination toward the door, so that no water stands in them at any time.

Owing to the hardness of the floor the horses are kept standing upon bedding at all times. Straw is very extensively used,

though the management have been experimenting with the use of turf, and so successfully that they are replacing the straw with it whenever it is practicable.

One of the stables is merely a duplicate of its mate, and they occupy one side of the long court about which the buildings are grouped. One of them is used for a hospital, though with the exception of the tubs that are used for soaking the feet of the invalids, there is nothing about it to mark it from the others.

The end of the court opposite the chief's office has a bath for the horses, which may be filled from a tank placed overhead, and into which the water is pumped by a horse power placed just back of the bath. The bath is also paved with stone.

On that side of the court opposite to the stables, the storehouse for grain and fodder is located. It has a hoist outside which is worked by the horse power already referred to, and an elevator inside for the distribution of the corn and grain. All fodder is carried across the court and distributed whenever the horses are to be fed. This building is three stories in height, and is furnished with cement floors throughout; and while it has sufficient capacity for a large amount of grain, only so much is kept on hand as the immediate necessities of the stable demand.

Next to the granary is the blacksmith shop. The tools here are about what we use, with the exception of the details of construction. The knives, hammers, rasps and anvil are all shaped differently from ours, but all of our tools for shoeing are duplicated in one form or another. Two men are employed for shoeing. The helper has a sling about his neck, with one long free end. The horse's hoof is placed upon this band or end, and the assistant holding the end keeps the hoof from the floor. The smith stands directly in front of the face of the shoe, and drives the nails home with a single blow. It seems a dangerous position when working upon the hind feet, for, should the horse kick, the smith would certainly be struck full in the pit of the stomach, and the helper has no means of preventing the kick. The shoes used are rough and rather ungainly in shape, weighing one kilogram, or two and one-fifth pounds each. In summer no calks are used at all, and the horses are smooth shod except for the projecting heads of the nails. In winter, when there is snow and ice upon the streets, a toe calk only is used, the place of the heel calk being supplied by nails with larger heads.

Six nails suffice for the front shoes, and seven for the back. As for the shoes themselves, they are made of iron, though the company has been successfully experimenting with steel. For the most part they are roughly made by hand upon the premises where they are used, though some few are machine made. There is no groove for the reception of the nail, but merely a deep countersink, which, however, will not take in the whole head. The latter therefore projects and takes the

place of the toe and heel calks in slippery weather in summer.

The saddler's shop follows the blacksmith's, and here we have the repair work of the stables. There are no especial features that would distinguish it from a similar shop in the United States except in the shape of some of the tools.

In the care of the stables the utmost cleanliness is preserved. All about the court are hydrants from which water is obtained for washing down the floors and pavements, which is done every morning. Owing to the position of the stables in the center of a block of dwelling houses that are located in one of the finest parts of Paris, the police do not allow any manure or refuse to be retained upon the premises. Therefore, all that may accumulate during the day is heaped upon a wagon standing in the court and removed at night. The result of this is that there are very few flies about, and the whole atmosphere of the place is remarkably free from stable odors.

It is of course necessary that the horses should be cared for with absolute and unvarying regularity, and this is done. A peculiarity of their system is the frequency with which the horses are fed. Upon the door of each stable is posted the following notice:—

GENERAL OMNIBUS COMPANY.

Regulation for the Distribution of the Rations to the Horses.

DAY HORSES.

AT 4 A. M.

1-6 of the rations of grains.

$\frac{1}{2}$ " " " hay.

AT 5 A. M.

Water.

AT 6 A. M.

1-6 of the rations of grain.

AT 10 A. M.

1-6 of the rations of grain.

$\frac{1}{2}$ " " allowance of straw.

AT 11 A. M.

Water.

AT NOON.

1-6 the rations of grain.

AT 2 P. M.

1-6 of the rations of grain.

AT 3 P. M.

$\frac{1}{2}$ of the rations of hay.

Bran mixed with water.

AT 7 P. M.

Water.

1-6 of the rations of grain.

$\frac{1}{2}$ " " allowance of straw.

NIGHT HORSES.

AT 5 A. M.

1-6 of the rations of grain.

$\frac{1}{2}$ " " allowance of hay.

AT 6 A. M.

Water.

1-6 of the rations of grain.

AT 8 A. M.

$\frac{1}{2}$ of the allowance of straw.

AT NOON.

Water.

1-6 of the rations of grain.

AT 2 P. M.

1-6 of the rations of grain.

AT 3 P. M.

$\frac{1}{2}$ of the rations of hay.

Bran mixed with water.

AT 6 P. M.

Water.

1-6 of the rations of grain.

UPON BEING RETURNED TO THE STABLE.

$\frac{1}{2}$ of the allowance of straw.

1-6 " " rations of grain.

Horses which are worked up to the time when the bran is usually given do not get it at that time, but have only hay to eat upon their entrance.

This stringing along of the food, and the giving of a little at a time but at frequent

intervals, requires a great deal of work, but the excellent condition of the horses goes far to prove that it is efficacious.

As to the food that is given, it consists of hay, oats, corn, beans, bran and carrots. The horses are placed upon regular rations, and in the following proportions:—

Hay	8.62
Oats	5.50
Corn	12.93
Beans10
Bran and Carrots.....	.54
Total.....	27.69

It will be seen that these large horses really eat very little if any more than the smaller and lighter horses in use upon American roads; for from 25 to 27 lbs. of food per day would not be far from the average rations with us. The food is given to the horses in its natural condition, and none is ground except the bran. Some years ago the company fed ground food to the stock very extensively, but as they could not see sufficient advantage resulting therefrom to pay for the extra expense, the system was discontinued and the whole grains fed in its place.

In addition to the food each horse averages an allowance of 7.3 lbs. of straw and .7 lb. of turf for bedding. This does not accurately represent the precise state of affairs, because .7 lb. of turf per day would not suffice for a horse. But not all of the horses are bedded with it, so that while this represents the average for the whole stock, those horses which are bedded with this material receive considerably more.

In addition to the care bestowed upon the food and the cleanliness of the stables, the horses are thoroughly cleaned every morning, the work being begun at six o'clock. This work is done entirely by hand, as grooming machines have not yet been introduced. In the fall some of the horses are clipped for the winter, the work being done about November 1, although it is not done to all. The management think, however, that with the improved clippers that they have used, the hair is cut too closely, so that the harness is apt to chafe those parts of the body which have been denuded of the natural covering and are subjected to a direct contact with the harness. The work of grooming is well done, and the horses will compare very favorably in appearance with those of the same grade in any city in the United States.

In addition to the system of stable care, the same regularity is carried into the work of the horses. Here the regulations are a little more exact than they would average with us. It will be remembered that, in a previous article, it was stated that the cars were numbered by the police. As these cars are assigned to regular runs, and as pains are taken that the cars shall follow each other in the order of their numbers, it becomes a comparatively easy matter to assign a horse to a car and never to use it upon any other. To do this the horses for three cars are put in the same stable. Three sets of numbers are used. The first is the number of the car, which is hung over the central part of the stalls

allotted to its horses. Directly underneath this the numbers from one to eight are painted upon the wall over each stall, while upon the manger is attached the number of the horse as it is recorded upon the company's books.

When two horses are used at a time upon a car, which is usually the case, eight horses are assigned to the car. These are sent out at regular intervals, and at times to suit the necessities of the traffic, precisely as our roads are accustomed to do.

The horses are, however, given a shorter daily mileage than with us, which may perhaps serve as the reason for the far greater life of service, which the Paris company have been enabled to obtain, as compared with what has thus far been possible with us. As this mileage is only 10½ miles per day, it will be seen to be about 33½ per cent less than our managers usually attempt to procure. But the horses show the effect of this moderate amount of work that is required of them, and the fact that the expenses of renewal average less than nine cents per day per horse, speaks well for it also.

While speaking of the stables it may not be out of place to conclude with a few words relative to the expense of feed and the prices paid. As we have said, the grains are all fed whole. They are obtained from France, Italy and the United States, while the hay is bought in the French provinces. Everything of this nature is sold by the weight in France, but to enable the American reader to grasp the prices readily and compare them with the current rates at home, they will be reduced to prices per bushel, allowing 32 lbs. of oats, 56 lbs. of corn and 60 lbs. of beans to the bushel. When reduced to these standards the prices of feed for the stock are as follows:—

Hay, per ton.....	\$16.36
Straw, per ton.....	10.77
Oats, per bushel.....	.43
Corn, per bushel.....	.68
Beans, per bushel.....	.92
Bran, per 100 lbs.....	1.05

These prices will be found to average higher, it is believed, than in the United States.

The hay and straw, which are the only two products for which the company depend entirely upon the French farmers, are supplied in what are called "*bottes*," or bundles, weighing 11 lbs. each. These are tied up in something the form of a sheaf, and form a very distinctive feature in a load of hay. Besides this form of delivery, the company also press a part of the hay, which is bought in distant provinces, into bales of light weight, in order to obtain better shipping facilities, for it was found that the high prices prevailing in the immediate neighborhood of Paris rendered it necessary to take advantage of the cheaper productions of the remoter provinces.

The company have devoted a great deal of time and care in the systemizing of their cavalry department, and in comparing the data accumulated from a long series of years during which the Paris om-

nibus and tramway lines have been in operation. These compilations now enable the managers to act upon the experience of their predecessors, and it is rarely that any step is taken that does not result in an increased economy of service. If they were to be followed in this regard by many of the American roads, there is no doubt but that the result would be to the advantage of the latter.

G. L. F.

LEGAL INTELLIGENCE.

Pratt and others v. Des Moines N. W. Ry. Co. Supreme Court of Iowa. June, 1887.

1. RAILROAD COMPANIES—DAMAGES TO ABUTTING PROPERTY—LIMITATION TO ACTIONS.

In Iowa the right of an owner of property abutting on a street to recover damages against a railroad company for the occupation and use of the street for its tracks is dependent upon statute (Code Iowa, § 464;) and, where such damages have not been ascertained and paid at the start, an action therefor is barred by five years.

2. SAME—CONSENT OF OWNER OF LAND.

In an action against a railroad company for damages by an abutter who bought subsequent to the occupation of the street, the company may show that the plaintiff's grantor consented that its road might be constructed and operated along the street.

3. SAME—ASSIGNMENT OF CLAIM.

The right to compensation given in Iowa by Code Iowa, § 464, to abutters on a street occupied by a railroad company, is not an interest in the street, but simply a claim to damages, which may be waived or assigned in parol.

4. SAME—RIGHTS OF GRANTEE.

The damages contemplated by Code Iowa, § 464, giving abutting owners of land a right to damages caused by construction of a railroad, being full and permanent, there can be but one recovery, and that only in favor of the abutter who owned the property when the road was built, or the assignee of his claim. A purchaser from such abutter, under a warranty deed, who bought after the road was put in operation, cannot recover. 33 N. W. Rep., 666.

Beck, J., dissents.

The Daft Road at Pittsburgh.

The Pittsburgh, Knoxville & St. Clair R. R. is to have five 35 H. P. Daft motors. As a familiar illustration of their capacity, each is capable of carrying 60 loaded cars on a level, or giving about three times the maximum power ever required. This road will contain some grades of nearly 14 per cent, and while it is expected that the ordinary adhesion of wheels, under ordinary circumstances, will be sufficient, the track is provided with a perforated strip of iron or rack, between the two rails, in which a sprocket wheel works when necessary. Electricity is used by both overhead and conduit plans at different parts of the road.

CORRESPONDENCE.

Claims for the Daft System.

EDITORS STREET RAILWAY JOURNAL:—

The feasibility of electric propulsion may be regarded as fully established, and the only question for street railway companies is to choose the best system.

Economy of operation and practicability or handiness, are the points at issue, and it ought to be better known than it seems to be that electrical efficiency, as determined by a laboratory experiment, does not necessarily imply an effective machine; nor does an abstract economy always prove the same in practice.

The case is too complex to be judged on only one count. The exigencies inseparable from the use of a new force and new mechanism are literally unforeseeable, and the only safe criterion is their uniform behavior under the conditions of practical use.

The Daft company feels especially strong on this point, and falls back upon the economic comparison drawn by Mr. T. C. Robbins, General Manager of the Union Passenger R. R. Co. of Baltimore. No other statement of the kind is in existence to my knowledge.

This comparison shows results of the first year's running of the Baltimore & Hampden road by Daft electric motors, as follows:—

In the year ending Sept. 1, 1885, with horses, at a speed of 4.033 miles per hour.	In the year ending Sept. 1, 1886, with electricity, at a speed of 8 miles per hour.
Pass. carried.....227,155311,141
Gross Earn'g's....\$11,357.75\$15,657.05
Cost of Motive P....7,117.504,380.00
Cost of M. P. per Pass. per mile.....0156007

In this peculiarly unfavorable case, electricity accomplishes: 1. An increase in traffic of 37 per cent, nearly. 2. A reduction in cost of motive power in gross of 38 per cent. 3. A reduction in cost of motive power per passenger per mile of 55 per cent.

The forte of the Daft company is the thoroughness with which its entire system is worked out and its perfection of detail. The point of having the platforms unobstructed, and the machinery entirely independent of the body of the car, is one of vast importance, especially to roads already equipped with rolling stock and only desirous of changing their motive power. The balance and easy riding quality of street cars is the result of years of trial and experiment, and any change that disturbs it is a serious matter. Placing a heavy weight of machinery on one platform necessitates a resuspension of the entire car, and prevents the driver being in front for half the time, which is an unwarrantable risk of both car, passengers and the community.

It has been stated that the machinery must be under the eye of the driver. All I can say is that protracted experience has not shown that the Daft motors require any such close supervision.

In the details of line work and regular

operation, such as expansion joints, switches, lubrication, etc., everything has been thought out and provided for in advance; and the crude practices that exist, to my personal knowledge, in other systems, such as switching to a branch line by the driver's pushing over the swing rails with a pole carried on the car for the purpose; or stationing a man armed with a slush bucket and shingle over the machine to insure its sufficient lubrication, have no place in the Daft.

Interchangeability of parts is another valuable feature of our system. It recently came to my knowledge that the operation of shifting an armature of one of our rivals' motors involved jacking up the body of the car, running out the truck and disconnecting the entire apparatus; the process altogether occupying two or three hours. Changing a Daft armature occupies only twenty minutes. Practical conveniences of this nature weigh heavily against mere abstract economy.

The use of currents of harmless potential is too obvious an advantage, in view of the catastrophes occurring with such startling frequency, for me to waste your time and mine in calling attention to it. It will

The first double-deck cars were put in use June 26th, and from that date to the present time, when we have twelve of them on the road, they have been well patronized. I think the enclosed article clipped from the Globe-Democrat, will best explain their popularity.*

The experiment has been accompanied by most satisfactory results, when you take into consideration that the seating capacity is only eighty people per car.

A. DE FIGUEIREDO,
General Manager.

St. Louis, Mo., Aug. 13.

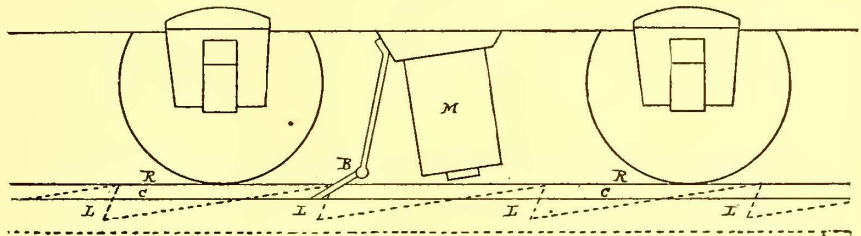
*The article referred to was printed in substance in the AUGUST STREET RAILWAY JOURNAL.

A Novel Electric Car.

EDITORS STREET RAILWAY JOURNAL:—

I notice that a Chicago inventor is experimenting in the barns of the Chicago City road with a novel electric car. The car contains no machinery whatever and no revolving part excepting wheels and axles.

The plan, something after that shown in the illustration, is to place a lodestone, something in the form of a saw tooth, between the rails *LLLL* in the engraving, which attracts a magnet *M*, which is



A NOVEL ELECTRIC CAR.

shortly be incumbent upon the government to legislate upon this matter, as that of Great Britain has already done through the medium of the Board of Trade.

THOMAS WHITESIDE RAE.

Jersey City, N. J.

Double-Decker Cars.

The J. G. Brill Company recently built the St. Louis Cable & Western Railway twelve double-decked cars. In response to a letter written by us to General Manager A. de Figueiredo asking about the popularity of the innovation, we have the following:—

EDITORS STREET RAILWAY JOURNAL:—

Your letter of inquiry dated Aug. 10 received, and in compliance with same I have taken some days as samples, and send you a correct statement of number of trips made, and passengers carried.

Coach No.	No. Trips	Passengers	Average per Trip
81	13	2,223	171 5-13
82	14	2,249	160 9-14
84	5	1,304	260 4-5
82	16	1,651	103 3-16
84	10	1,289	128 9-10
85	9	1,033	114 7-9
83	9	1,311	145 6-9
81	10	1,093	103 9-10
84	9	840	93 1-3
92	8	1,000	125
85	8	961	120 1-2
91	9	944	104 8-9
83	15	1,549	103 4-15
81	15	1,498	93 3-15

charged by a brush *B*, which collects its electricity from a current conductor *CC*. As the magnet reaches the point of the lodestone it is demagnetized momentarily and in turn attracted by the next "tooth" of the lodestone. A small sized motor is said to have performed very nicely, but so far as I can learn the full sized car has not yet been able to obtain more than about a snail's speed.

The idea, however, is a novel one, and like the storage battery, only more so, it is very fascinating for its simplicity.

G. D.

Funeral Street Cars.

The J. G. Brill Company has in course of construction a number of hearse or funeral cars for a South American city. In a large majority of the cities in all the Spanish speaking American countries having tramways, the funeral transportation is conducted by the tramway company. In fact, it is not an uncommon thing for the cities of South America to concede to a tramway company the exclusive privilege of carrying funerals.

The cars now building are first, second and third-class. The first-class is 14 ft. long, extreme width 7 ft. It is set high, so that the wheels do not pass through the floor, the front platform is enclosed with

gates, and the rear platform is depressed with step in rear, the platform being protected at sides with heavy brass railing and a safety gate which will shut down behind the rise of step at the rear. The rear end of body will have two large doors supported on bronze hinges at the sides, with plate glass in the upper part, and will extend the whole width of the car. Two biers of oak will hold the corpse. A cane seat is placed across the front end of the car inside, and a movable seat to fold up will occupy one side, to be used by the near relatives and mourners. The roof has two rows of glass lights of rich colors, or cathedral glass, the lower row of lights being in leaded frames, as in a church. The windows will be of very large plate glass, and as low as they can be made. The outside will be adorned

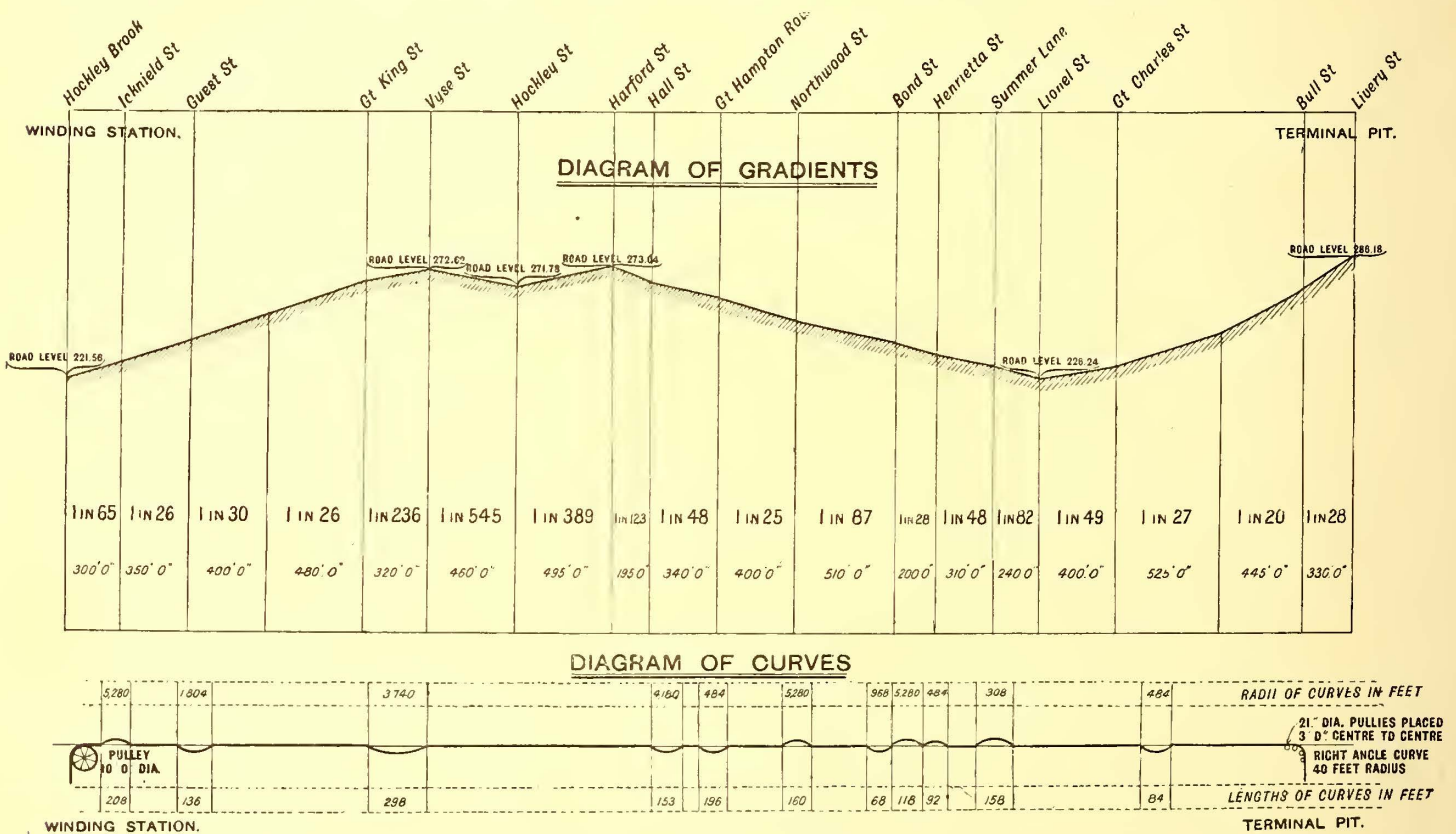
A New English Cable Railway.

We are indebted to the courtesy of Edward Pritchard, M. Inst., C. E., Engineer of the Birmingham Central Tramways Co., Lim., for the following particulars of the cable road which this company is about to construct. There are to be about six miles of cable, which must be delivered by the 20th of September. The material from which the wire is to be drawn is to be of the best quality of improved patent crucible steel; no German or Swedish ingots will be permitted to be used. As the tests will be rigidly carried out, the engineers do not insist upon being informed as to the composition of the metal; they, however, suggest for the consideration of the contractor that in the composition of the metal the following percentage shall

turns in a length of 8 in. The guaranteed breaking strain of each cable to be 33 tons.

The cables to be supplied are to be two in number, each being 4,666 yards in length.

The cable will be driven by a pulley 10 ft. in diameter, the system of driving being that known as the Gordon plane, the cable nearly forming a figure 8, or approximately covering two-thirds of the periphery of the driving pulley. The smallest diameter curve pulley, where the cable travels round one-half of their periphery, will be the pulley at the terminal pit, the diameter of the pulley being 7 ft. 8½ in. The cables will be supported by carry pulleys 28 ft. apart, and they will travel in a conduit, and will not be directly exposed to the weather.



A NEW ENGLISH CABLE RAILWAY.

with three mourning plumes on the sides and one on each end. Arrangements are made for candles in the front end, and for the windows to be screened with silk curtains, and the whole car to be painted a jet black and highly polished. The second-class will have a plain arched roof, iron railings, ordinary glass, wooden seats, no curtains used, and general shape, excepting roof, same as the first-class. The third-class car will be of the same size and general arrangement, but will have Venetian blinds and no glass and be of plainest finish.

The railroad company for whom these cars are intended, to some extent do the business of a funeral director, that is, they will hire cars and hearses, and at a stated time will carry the corpse and mourners to the cemetery, for a charge which is slightly in advance of the ordinary fare.

not be exceeded: Silica, .012; phosphorus, .030; sulphur, .045; manganese, .200; total, .287.

The cables will be 3½ in. in circumference, containing 6 strands of 19 wires each, or 114 in all; laid round a hemp center core. The wire is to be .072 in. in diameter, each strand having a core consisting of 6 of the 19 wires contained in the whole strand, twisted round a single wire specially annealed and used as a foundation. The number of wires for the outer covering is to be 12, and all the wire in the strand except the single one in the center is to be of best patent crucible steel wire by one of the original patentees.

The tensile strain of each wire, excepting the central wire of each strand, must be equal to 95 tons per square inch; the elongation of such wire being 1¼ per cent; each wire must bear a torsion test of 55

The cables will travel round one severe curve in Colmore Row and Snow Hill, but upon all curves there will be special pulleys fixed. The velocity of the cable will be six miles per hour, and it is intended, with a few exceptions, to run single cars upon bogie frames.

After inspection by the engineers, the cables must be protected by castor oil, tar or other approved coating. There must also be fixed in the rope lead, over the incoming cable, a mechanical arrangement by which this material may be properly applied when running. An approved automatic tell-tale must also be supplied to the incoming rope, which, when stranded, will signal to the engine driver by ringing a bell.

The accompanying diagram gives the approximate curves and gradients of the road.

Elevated Cable Railroad.*

In the Leavitt system of elevated cable* for propelling, of which a cut is given, the car tracks are laid on the ground in the usual manner, while the cable is elevated about 18 ft. and supported by posts set in the center between the two tracks, the posts being supplied with adjustable arms with carrying wheels or sheaves at their extremes. A tilting clutch or grip is connected with the top of the car, that, when depressed, passes under the carrying sheaves, and when elevated is made to lift and grasp the cable, in which latter position the clutch passes above the carrying sheaves.

Mr. Leavitt recommends that the cars be made about 10 ft. longer than the ordinary street car, with double trucks; that the posts will require to be set about 100 ft. apart and may be made light and ornamental; that the posts will afford a place for electric light and other electric wires. The grip is under the control of the driver, who when he wishes to stop the car releases the cable and applies the brake. It is claimed that a horse railroad can be changed to this system for what the horses and equipment will sell for, and that a first-class cable road on this plan can be built more cheaply than a horse railroad, to do the same work, occupying very much less ground. Mr. Leavitt has elaborate arrangements for turning corners, crossing right angles, etc. One of the principal advantages claimed

for the system is that the machinery is all above ground and easy of access.

*Charles Leavitt, 18 Diamond Park, Cleveland, O.

The New York Sun on Electric Roads.

There is no doubt that the electric motor for street railway service has passed beyond the experimental stage. In a small way it has been in use in Europe since 1881, a track one and one-half miles long, with two cars, having been a sort of plaything in Berlin from that date to the present time. Another road one mile in length, with the same number of cars, was opened in Brighton, England, in 1883, and during the same year, and the year following, several short roads were constructed in different parts of Europe. But these experiments were hardly to be considered as final tests of a complicated engineering problem. The solution of this problem, like the solution of so many other problems that involve inventive skill, has been reserved for men working under the inspiration of American patent laws. The commercial utility of the electric motor on

prolonged lines of street railway has been very well demonstrated in this country during the past two years, and the work of constructing new roads, and changing horse roads to electric roads, goes rapidly forward.

Electricity as a motor for street railways has now only one rival—the cable system, a system which works well and has been proved to be economical, but which has not yet captured the field and seems to be handicapped in its efforts at getting possession of the streets.

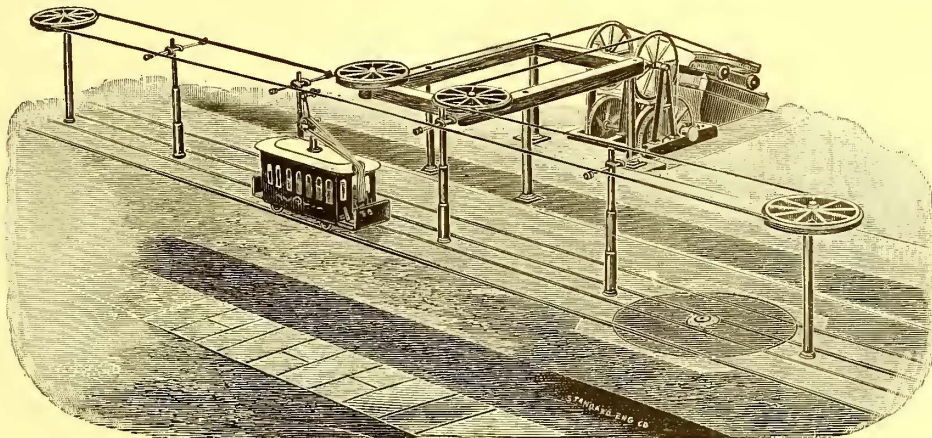
The disability of the cable system is in its first cost. A road that calls for \$80,000 per mile in construction must be sure of a very large traffic before the money can be ventured. Cable roads can be operated profitably where a horse railroad would be profitable. But horse railroads are usually very unprofitable in third-class cities, and, except upon a few streets, not very much of a bonanza in cities of the second class. The field for an \$80,000-per-mile railroad seems to be extremely limited when the ground is contested by a system that costs very little more than a well-equipped horse road, and which will yet

as a consequence of the introduction of electricity as a railway motor.

There are three different systems of transmission in use, the first on overhead wires, and the second on wires placed in conduits, while the third is operated by means of accumulators or storage batteries. As usual in this country in the introduction of new inventions, the system which is least expensive and complicated will be first in securing possession of the field. This is known as the overhead system. A hard-drawn copper wire of small size but great tensile strength is suspended about eighteen feet above the tracks, where it is supported either by bracketed posts set in the curb or by special supports on lateral wires which cross the street from side to side. In distributing the current the rails are generally grounded, and form one side of the circuit, but in case the connection between the rails is not good they are re-enforced by a continuous conductor. A trolley, which is connected with the motor by a suspended conductor, runs along the overhead wire, and makes the desired connection with the engine. In some systems the motor is placed under

the car in such a manner that no space is lost and no detached motor needed; but in other devices the motor is detached and resembles a steam locomotive in its methods of operation.

The conduit system, the system which it is proposed to apply on the Fulton street road in this city, is hardly to be called more complicated than



THE LEAVITT ELEVATED CABLE RAILROAD.

the overhead system, but the first cost will be necessarily somewhat greater. It seems also that greater difficulty will be experienced in meeting the obstructions caused by wintry weather. But this is an obstacle to be met and overcome by the resources of invention. For large cities and in crowded streets it must be found more available than the overhead system, with its apparently greater liability to accident.

At all events the horse must go, and there is good reason to think that the electric motor is making much more rapid progress in the United States on street railways than the cable system. In Richmond, Va., a well-known company is equipping twelve miles of road, on which forty cars are to be run. The same company is equipping roads also at St. Louis, Boston, Woonsocket, Baltimore, St. Joseph and various other points. At Pittsburgh three roads are under construction. Binghamton is to have a road four and a half miles long, operating eight motor cars. At San Diego a nine-mile road is being built, over which 40 H. P. motor cars are to furnish the traction. But these are only a few of the more prominent enterprises. Not less than fifty-five or sixty roads are either under construction or projected in the United States, and the movement is continually extending. What will prove one of the heaviest industries in the country is apparently springing up

It is hoped by electricians that the system of storage batteries, or accumulators, carried on the cars and securely packed away under the seats, may eventually be utilized to an extent that will render any outside mechanism unnecessary. This seems to be the ideal system, but it does not yet appear to be sufficiently perfected to enable electricians to dispense with the use of conductors along the tracks.

THE MEIGS ELEVATED RAILWAY CONSTRUCTION Co. ask for proposals for manufacturing the girders, posts, etc., for their railway system in Boston. The line will extend from Boston to Harvard square, Cambridge.

Increasing Traction Adhesion by Electricity.

BY ELIAS E. RIES.*

A method of increasing the traction of railway motors has been devised, which is particularly adapted to electric motors for street railways. Electro-magnetism provides the means whereby the increase in tractive adhesion is produced.

The system owes its efficiency to the formation of a complete and constantly closed magnetic circuit, moving with the vehicle and completed through the two driving axles, wheels, and that portion of the track rails lying between the two pairs of wheels.†

Each axle of the motor car is wound with a helix of insulated wire, the helices in the present instance being divided to permit the attachment to the axles of the motor connections. The helices on both axles are so connected that when energized they induce magnetic lines of force that flow in the same direction through the magnetic circuit. There are therefore four points at which the circuit is maintained closed by the rolling wheels, and as the resistance to the flow of the lines of force is greatest at these points, the magnetic saturation there is most intense and produces the most effective results just where it is most required. Now when the battery circuit is closed through the helices, it is found that the torque or pull exerted by the motor car is fully twice that exerted by the motor with the traction circuit open, and by increasing the battery current until the saturation point of the iron is reached the tractive force may be increased from 150 to 300 per cent.

A large portion of this resistance to the slipping or sliding of the driving wheels is undoubtedly due to direct magnetic attraction between the wheels and track, this attraction depending upon the degree of magnetic saturation and the relative mass of metal involved; but by far the greater portion of the increased friction is purely the result of the change in position of the iron molecules due to the well-known action of magnetism, which causes a direct and close interlocking action, so to speak, between the molecules of the two surfaces in contact. This may be illustrated by drawing a very thin knife blade over the poles of an ordinary electro-magnet, first with the current on and then off.

The helices are fixed firmly to and revolve with the axles, the connections being maintained by brushes bearing upon contact rings at each end of the helices. If desired, however, the axles may revolve loosely within the helices, and instead of the latter being connected for cumulative effects they may be arranged in other ways

so as to produce either consequent or opposing magnetic forces, leaving certain portions of the circuit neutral, and concentrating the lines of force wherever they may be most desirable. Such a disposition will prove of advantage in some cases.

The amount of current required to obtain this increased adhesion in practice is extremely small, and may be entirely neglected when compared to the great benefit derived. The system is very simple and inexpensive, and the amount of traction secured is entirely within the control of the motor man, as in the electric system.

The resistance of the helices needs scarcely exceed two ohms, the current from two or three cells of secondary battery being probably sufficient to energize them. The revolution of the driving axles and wheels is not interfered with in the slightest, the former because the axle boxes are outside the path of the lines of force, and the latter because each wheel practically forms a single pole piece and in revolving presents a continuously new point of contact of the same polarity to the rail, the flow of the lines of force being most intense through the lower half of the wheels and on a perpendicular line connecting the center of the axle with the rail. In winter all that is necessary is to provide each motor car with a suitable brush for cleaning the track rails sufficiently to enable the wheels to make good contact therewith, and any tendency to slipping or sliding may be effectually checked. By this means it is easily possible to increase the tractive adhesion of an ordinary railway motor from 50 to 100 per cent, without any increase in the load or weight upon the track, for it must be remembered that even that portion of the increased friction due to the direct attraction does not increase the weight upon the roadbed, as this attraction is mutual between the wheels and track rails; and if this car and track were placed upon a scale and the circuit energized it would not weigh a single ounce more than with the circuit open.

It is obvious that this increase in friction between two moving surfaces can also be applied to check a car or train of cars as well as to augment tractive power. A portion of the traction current is made to circulate around a coil on the iron brake beam, inducing in the brake shoes magnetism of like polarity to that in the wheels to which they apply. They are therefore repelled from the wheel tires instead of being attracted to them. Suppose now that it is desired to stop the motor car; instead of opening the traction circuit, the current flowing through the helices is simply reversed by means of this pole changing switch, whereupon the axles are magnetized in the opposite direction and the brake shoes are instantly drawn to the wheels with a very great pressure, as the currents in the helices and brake coil now assist each other in setting up a very strong magnetic flow, sufficient to bring the motor car almost to an instant stop, if desired.

The same tractive force as has previously

been applied to increase the track adhesion now exercises its influence upon the brake shoes and wheels, with the result of not only causing a very powerful pressure between the two surfaces due to the attractive force, but offering an extremely large frictional resistance by virtue of the molecular action before referred to—part traction and part braking.

The method just described is equally applicable to increase the coefficient of friction in apparatus for the transmission of power, its chief advantage for this purpose being the ease and facility with which the amount of friction between two wheels can be varied to suit different requirements, or increased and diminished (either automatically or manually) according to the nature of the work being done. With soft iron contact surfaces the variation in friction is very rapid and sensitive to slight changes in current strength, and this fact may prove of value in connection with its application to regulating and measuring apparatus. In all cases the point to be observed is to maintain a closed magnetic circuit of low resistance through the two or more surfaces the friction of which it is desired to increase. Experiments have also been and are still being made with the object of increasing friction by means of permanent magnetism, and also with a view to *diminishing* the friction of revolving and other moving surfaces.

Enough has been said to indicate that the development of this method of increasing mechanical friction opens up a new and extensive field of operation, and enables electricity to score another important point in the present age of progress. The great range and flexibility of this method peculiarly adapt it to the purposes considered and to numerous others. Its application to the increase of the tractive adhesion of railway motors is probably its most prominent and valuable feature at present, and is calculated to act as an important stimulus to the practical introduction of electric railways on our city streets, inasmuch as the claims heretofore made for cable traction in this respect are now no longer exclusively its own. On trunk line railways the use of sand and other objectionable traction increasing appliances will be entirely dispensed with, and locomotives will be enabled to run at greater speeds with less slipping of the wheels and less danger of derailment. Their tractive power can be nearly doubled without any increase in weight, enabling them to draw heavier trains and surmount steeper grades, without imposing additional weight or strain upon bridges and other parts of the roadbed. Inertia of heavy trains can be more readily overcome, loss of time due to slippery tracks obviated, and the momentum of a train at full speed almost instantly checked by one and the same means.

THE HOOF OF A HORSE contains a series of vertical and thin laminae of horn, amounting to about 200, and forming a complete lining to it. In this are fitted as many laminae belonging to the coffin bone.

*From a paper read at the meeting of the American Association for the Advancement of Science.

†The writer here showed a model of a second motor car equipped with the apparatus, mounted on a section of track and provided with means for measuring the amount of tractive force exerted both with and without the passage of the current.

Electric Propulsion at Southwick.

An electrical syndicate has been carrying on experiments upon the electric propulsion of street cars, at Southwick, Eng. For the data concerning the electro-motive and the electric car that they are using we are indebted to the Engineer.

The car weighs about one ton, carries 20 passengers, and runs at the rate of from 12 to 15 miles an hour. It is driven by an Immisch series wound motor, supplied with electricity from a storage battery of 80 cells, which weighs, altogether, about a ton and a half. The motor, gearing, etc., weigh nearly a ton, and the passengers may be assumed to weigh about a ton and a half. Including everything, there are about 5½ tons to be moved. The speed of the motor first used was 350 revolutions a minute when the car was running at 8 miles an hour, but, as the results attained were not satisfactory, a smaller motor, making about 1,000 revolutions, was substituted.

On the motor shaft there is a chain wheel 6 in. in diameter, which is connected by means of a steel straight-link chain with a 20-in. wheel on an intermediate shaft; and by a similar chain of double strength a 7-in. wheel on this shaft is connected to a 21-in. wheel on the driving axle. The road is for the most part straight and level, but there are a few very sharp curves on it, one being only 30 ft. in radius; and there are two gradients of 1 in 30, and one of 1 in 20. When the car was rounding the sharp curve referred to, the ampère-meter showed double the current that it did on the straight track immediately preceding. Owing to grit and coarse sand upon the track, the traction necessary to draw the car on a level stretch of track was as high as 40 lbs. per ton, and yet the results attained thus far are satisfactory and were very favorably commented upon by Major-General Hutchinson, who inspected and tested the car for the Board of Trade. The only additional feature that is to be desired is an arrangement whereby the speed of the car may be varied without varying that of the motor.

The electro-motive, with which the syndicate has also experimented, carries two Immisch motors which can be worked either separately or together. Each of them is capable of exerting 15 H. P. when necessary. They are run by 192 Tatham cells, half of which are on the front platform and half on the rear. The electro-motive will have seats for 14 people, and the car which it draws will have 60 more, making 74 in all. The working load of the motive and car, taken together, is about 20 tons, and to move this weight with a velocity of 8 miles an hour requires a current of from 40 to 55 ampères, and under these circumstances one charge of the battery will suffice for 25 or 30 miles travel, or about half a day's work. It is proposed to have twice the necessary number of motors, so that one half can be charged while the other half is at work.

In this way the handling of the cells is made unnecessary, the motive being run into the car shed and the charging wires connected with it directly.

Fight for a Franchise.

One of the hardest battles that was ever fought in Syracuse for a franchise is just ended by the granting of a franchise to the Third Ward Railway Co. over the Mayor's veto. It has quite a history. In February, 1886, the Third Ward Railway Co. was duly organized to construct a road through the Third Ward of Syracuse to the Solvay Process Works at the westerly line of the village of Geddes—a distance of about three miles.

Application was made to the City Council for its franchise March 8, 1886, about a year and a half ago, but the so-called Cantor bill, requiring street railway franchises in cities of over 40,000 population to be sold to the highest bidder, became a law about one week before the Council could legally grant the franchise. On the day appointed for the sale, May 25, 1886, there appeared upon the scene members of the Syracuse & Geddes R. R. Co., who were strongly opposed to the building of the Third Ward road, as it made a competing line to their road to the village of Geddes, although through an entirely different territory.

The Third Ward Company started the bid at $\frac{1}{30}$ of 1 per cent, that being the price at which two other franchises were sold that day to other companies.

The bid of the Third Ward Co. was raised by its opponents and was run up to 101 per cent, at which price it was sold to a member of the Third Ward Co., they being determined to hold the franchise at any price, as the law then did not compel a company to build its road. The sole object of the Geddes Co. in forcing it up to this figure was to prevent the road from being built, and for the time being accomplished its purpose.

The Third Ward people filed their bond with the City Treasurer for \$60,000 to secure the city on its bid, and this ended the matter until this summer, when it was discovered that the Third Ward Co. had succeeded in getting a bill through the Legislature, exempting cities of 85,000 population (which exempted this city) from the bidding clause of the Cantor bill.

On May 23d last, the Third Ward Co. again applied to the City Council for a franchise under the new law. At this time there appeared again, asking for a similar franchise, the Syracuse & Geddes Co. and the Syracuse R. R. Co., a new organization composed of the leading capital and political power of the city, with some of the old Geddes company as its members.

The Syracuse R. R. Co., during the time between the passage of the franchise by the Council and the vetoing by the Mayor, deposited with the City Treasurer their certified check for \$10,000, which they

agreed should become the property of the city, provided among other things that the Mayor should veto the Third Ward Co.'s franchise and no franchise be granted to them and a franchise be granted to the Syracuse R. R. Co. This was their last resort.

Notwithstanding the great political and financial backing and the prominent citizens connected with the Syracuse R. R. Co., the Common Council granted the franchise by a unanimous vote to the Third Ward Co. It was vetoed by the Mayor (who has been against the Third Ward Co. from its origin), and at a special meeting of the Council held Aug. 10th, the resolution granting the franchise was sustained over the Mayor's veto. Great rejoicing and general good feeling prevailed over the result. Cannons were fired and other demonstrations of joy were shown. It was a great fight and a great victory for the Third Ward Co., and great satisfaction is expressed at the result. Public sympathy seems to have been from the beginning with the Third Ward Co. They were the originators of the enterprise, and have conducted the fight in an able and defensive manner, and the public have felt that what they did was in good faith.

The Third Ward Co. is composed of stirring business men of the city. William B. Cogswell, General Manager of the Solvay Process Works, is President of the company; W. S. Wales, President of the Wales Manufacturing Co., Secretary and Treasurer.

In view of the fact that the road is to run through and into a fast growing section of the city, to the city park of 150 acres which has lately been given to the city, to the proposed permanent location of the State Fair, and to a locality that is fast building up with large manufactories, it is believed to be a very valuable franchise.

The consents of the property owners have been obtained, and the building of the road will be commenced at once, expecting it to be completed this fall.

It is expected that electricity will be used for power.

Early Methods of Supplying Electricity to Street Cars.

The idea of an overhead conductor with a traveler running along it and connected with the car by a flexible cord, seems to have occurred to Dr. Joseph R. Finney as long ago as 1878. He was then a dentist in Pittsburgh, Pa., and had given considerable attention to electrical matters, particularly to telegraphic communication with moving trains. In his 1879 invention Dr. Finney used a single overhead conductor, with a traveler, and completed the circuit through the rails upon which the car ran. The traveler consisted of a metal frame in which four wheels were fitted, two running on the upper surface of the conductor and the remaining two bearing upon its lower surface, so that the conductor was firmly grasped. A conducting

cord passed from the traveler to the car and was there wound around a spring reel so as to be always taut. In the course of his experiments it occurred to Dr. Finney that a similar arrangement might be used to supply electricity to motors on street cars, and he at once turned his attention to this subject, and ran an experimental car in Pittsburgh during the early summer of 1882, supplying it with electricity by means of an overhead wire.

Meantime, Mr. Cowles, of Cleveland, O., had reinvented Mr. Finney's device, but in the legal process that followed the patent was awarded to Finney.

Dr. Siemens also invented an electric railway independently, and exhibited it at the Paris Electrical Exhibition in 1881. There was nothing in it, however, that differed essentially from Finney's patent of 1880.

In the early part of 1883 Mr. Charles J. Van Depoele fitted up an electric railway in Chicago, placing the conductor between the rails, underneath the car. In September of the same year he had a complete plant in operation, the conductors, two in number, being placed over the cars and very close to them.

The general adoption of Finney's device, or of some modification of it, seems to show that it was found to be the most efficient and convenient arrangement for establishing connection between the conductor and the car. By the use of two conductors, or of a single compound one containing two wires, Finney's method might be extended to the propulsion of surface carriages not running on rails. Indeed he foresaw this himself, and proposed that permanent mains should be erected in the streets, so that carriages might be run from them.

Editorial Correspondence.

The Paris Tramway.

Whatever may be said of the management and accommodations afforded to the public by the tramway and omnibus lines of Paris, all adverse criticism must fall to the ground when the subject of the roadway is taken up. The old method in which the roads have been laid is called the American Tramway, and differs in none of its essential particulars from the ordinary street railway track as laid in most American cities. There are the same longitudinal stringers, with the rails screwed or spiked to them, and held in position by cross-ties, knees, braces and straps in very much the same way that obtains with us.

The grooved rail is, however, universal, and will run about 50 lbs. to the yard. The objections that are raised in the United States against the use of the grooved rail fall to the ground in Paris. The streets are kept so free from dirt that there is no danger of a filling up of the groove, and it is always clean. The streets are flooded with water every day, and, as it is done by means of a hose and not by a watering cart, the channels of the rails are readily cleaned, it being a part of the in-

structions of the street sprinkler that he shall wash out these rails. In winter there is no trouble experienced with the ice and snow, because there is none, or so little that it can be wholly disregarded.

In the laying of these tracks the greatest care is taken to secure solidity of construction. The stringers are heavy and so are the ties, and the latter are frequently imbedded in beton. The streets are excellently drained, and the whole roadbed is built to last for years if not forever.

But the General Omnibus Co. have found that timber will rot, however carefully it may be protected, and that the American tramway with its wooden stringers will get out of line and need repairs. They have therefore discarded the wooden construction, and adopted a standard of their own, which will be seen to be far more elaborate than anything with which we are familiar, and which will certainly appear to possess the necessary requirements to last for years without the slightest touch of repairs, especially in this city of no frosts and perfect drainage.

A trench about 8 ft. wide and 14 in. deep is excavated in the street. In the bottom of this is placed a layer of broken stone mixed with a light cement, making a beton, and the top is floated even with a coating of concrete, the whole having an average thickness of 8 in. or a little more. This bed forms a perfectly smooth and even surface, and is free from the destructive action of the frosts, as the street is well drained and it is itself below the bottom of the paving stones.

After this concrete bed has hardened the rails are put in position. As we have said, the grooved rail is universal in Paris, and in this case it is formed from two light double-headed rails. The upper head of these rails is 2 in. wide, the web is $\frac{7}{8}$ in. thick, and the bottom head is a trifle over $1\frac{1}{2}$ in. wide. The depth through all is $4\frac{1}{2}$ in. The weight is about 40 lbs. to the yard.

In order to form the groove, two of these rails are placed side by side and are held in position by bolts and cast-iron thimbles. The double rails are put together on the spot. First cast-iron chairs are laid at intervals of 3 ft. 3 in. along the line for the length of a rail. These chairs have a base 1 in. thick, with an upward projecting lug that serves as a separating piece for the rails, and against which the web of the rail is brought. The area of the base is $5\frac{1}{2}$ in. in length by 5 in. in width. This base affords a secure resting place for the bottom heads of the rails.

The rails are now brought into position on either side of the chairs, and with the bolt holes that have been punched in them so placed that the bolts can pass through the opening left in the chair for the purpose. Midway between the chairs small square cast-iron thimbles are fitted in between the rails, and short bolts are put through and screwed fast. This securely holds the two rails together, and for the present nothing is done with the chairs.

The ends of the rails are held together by ordinary flat plates, with two bolts in

each end. These bolts pass through the two rails, which have cast thimbles between the flanges, and are tightened with the nuts on the inner side of the track. The ends of the rails are laid $\frac{1}{16}$ in. apart in warm weather.

After the two lines of rails have been strung, the cross-ties are put in and the rails brought to gauge.

The ties are made of $\frac{5}{16}$ in. by $1\frac{1}{2}$ in. iron, drawn down at the ends and cut with a thread for a $\frac{3}{8}$ in. nut. This thread is of sufficient length to run through the double rail. A check nut is run upon the thread, the bolt put through the rails on one side, and then the outer nut is put on. As this thread or bolt passes through the separating piece attached to the chair, it serves when tightened to bind the rails together, so that they become tied at intervals of $19\frac{1}{2}$ in.

The other end of the tie is then put through the opposite rail, and the check-nut set so that the track is brought to gauge, and the outer nut put on and screwed up, the tie being placed on edge.

This gives a track with a built-up grooved rail. The thimbles used are $2\frac{1}{2}$ in. in width, which makes the groove between the heads 1 in. wide.

The space between the rails is then carefully paved with stone laid upon a bed of coarse sand. After the stone is laid the whole is covered with a layer of sand in the ordinary way, but no care is taken to prevent the filling up of the spaces between the rails. Indeed, when the road is first finished that space is entirely rammed full of sand, and has to be partially cleaned before the cars can be run.

The standard gauge of the Paris roads is 4 ft. $8\frac{1}{2}$ in.

It will be readily understood that, with a roadway constructed as we have described, the smoothness with which the cars are run is very great, and that the interruptions to travel due to repairs are practically nothing. The expense of the first cost is what would militate against the system of construction in the United States. The company do all of their own constructive work, and their standard road costs them about \$14,000 per mile. This is so far above what our street railways are accustomed to pay that it is doubtful if they could ever be brought to consider it. But it could be lessened by using a girder rail. The labor would be no more in America than in France, because the American workman does his work enough more rapidly to more than compensate for his extra pay; whereas, when such a road is once in position, even the paving would last for years without one cent of expense for repairs, and it should be carefully considered by wealthy roads in relaying their tracks whether such a construction would not, in the end, be the cheapest that could be put down.

G. L. F.

CAR HORSES suffer most from flies on Sunday, because there are then so few other horses on the streets for the flies to torment.

STREET RAILWAY NEWS.

Akron, O.

AKRON ST. RY. & HERDIO Co. increases, since its last report to us, from 2½ to 3½ miles of track, of 4 ft. 8½ in. gauge and 40 lb. rail. They also increase from 6 cars to 9 and from 31 horses to 40. Will. Christy is now Secretary and Treasurer.

Albany, Ga.

ALBANY ST. RY. Co. is a new organization that asks the Georgia Legislature for incorporation.

Albany, N. Y.

THE ALBANY RY. increases from 11 miles to 15, from 54 cars to 59 and from 232 horses to 250.

Anniston, Ala.

DUMMY ROAD. W. B. Kearney and associates, of Birmingham, have asked for a permit to build a dummy street railroad at Anniston.

ANNISTON ST. RY. Co. was organized Aug. 6, with John W. Noble as President and William A. Davis as Secretary and Treasurer. Work has already begun. The capital stock is \$20,000, all subscribed.

Asbury Park, N. J.

SEASHORE ELECTRIC RY. Co. A number of the 15 Daft electric cars to be furnished for this road are now running.

Asheville, N. C.

IT IS REPORTED that Ohio parties contemplate building a street railroad here.

ASHEVILLE IMPROVEMENT & ST. R. R. Co. has applied for a permit to build a street railway, to be run by horses or dummy.

Ashland, Wis.

ASHLAND ST. RY. Co. began work on its new road early in August, and expects to open it about Oct. 1. The capital stock of the company is \$50,000, and the officers are: President, Edwin Ellis; Secretary, W. M. Tomkins; Treasurer, Thomas Bardon; Superintendent, G. H. Hopper. They will have three miles of track, of 4 ft. 8½ in. gauge, with 35 lb. rail, 5 cars and about 40 horses.

Atlanta, Ga.

ATLANTA ST. RY. Co. has 14 miles of track, 40 cars, 125 horses, 50 mules.

ATLANTA & EDGEWOOD ST. R. R. Co. has authorized the purchase of 2 steam dummies and 4 passenger coaches, also the necessary iron for a 2-mile track. Contracts were let by which the approaches to the Foster street bridge would be completed before the 1st of September.

Baltimore, Md.

BALTIMORE & POWHATAN RY. Co. has now 5 cars and 19 horses.

BALTIMORE & SPARROW'S POINT RY. Co. has been incorporated by George Small, Frederick W. Wood and Nicholas P. Bond.

Bangor, Me.

D. F. LONGSTREET and Joshua Wilbour, of Providence, write that they are not interested in this project, as reported.

Beatrice, Neb.

BEATRICE ST. RY. Co. The only change is an increase in horses to 30.

Bellaire, O.

BELLAIRE ST. R. R. Co. The entire line

is to be rebuilt and 6 new cars to be purchased, also a number of horses. George W. Stetson of New York owns the road.

Beloit, Kan.

BELOIT CITY ST. RY. Co. The officers of this road, which is now being built, are: President, D. W. Soper; Secretary, Purchasing Agent and Superintendent, F. F. Burnham; Treasurer, M. S. Atwood.

Bessemer, Ala.

BIRMINGHAM & BESSEMER DUMMY LINE. The contract for building this road has been let to J. W. Worthington & Co.

Bilbao, Spain.

AN ELECTRIC RAILWAY is being built between Bilbao and Santurce.

Binghamton, N. Y.

COURT ST. & EAST END R. R. Co. will build their road this fall. It will have 2 miles of track, 4 ft. 8½ in. gauge, with 45 lb. flat rail; and they will have 3 one-horse cars, and 12 or 15 horses. Charles M. Stone is President, W. G. Phelps Secretary and Treasurer. The capital stock of the company is \$20,000. The road will be completed some time before the 1st of January.

WASHINGTON ST. & SPRING FOREST CEMETERY RY. Co. have a charter for a line to run out Clinton street toward the Ashery. The intentions of the company were to lay the road this year, but the project was deferred after the burning of Weed's planing mill. In the spring, however, it is expected that the road will be built. It will develop a new section.

Birmingham, Ala.

HIGHLAND AVE. & BELT R. R. Co. have 25 miles of their road completed, of 4 ft. 9 in. gauge, of which 13 miles is laid with 56 lb. rail and 12 miles with 30 lb. rail. They have 16 passenger cars and 7 flats, 5 dummy engines and 2 freight engines. R. H. Adams is now Engineer. They connect with all the railroads, and besides their passenger business transfer to the various manufactories that are being built or are already in operation along the line.

Birmingham, Conn.

BIRMINGHAM & ANSONIA HORSE R. R., which has just gone into operation, has 3½ miles of track, of 4 ft. 8½ in. gauge, with 30 lb. side bearing rail, 6 cars and 25 horses. The officers are: President, William H. Williams; Secretary, Edwin B. Gager; Treasurer, Eugene M. Cole.

Boston, Mass.

So. BOSTON RY. Co. Charles B. Cummings is now Treasurer and M. Anagnos Clerk.

BOSTON CONSOLIDATED ST. RY. Co. President Powers says that the line from Boston to Medford and Malden is the most profitable of the company's branches. This line will probably soon be extended to Arlington, and afterwards perhaps to Winchester, where connection can be had with a horse railroad running between that town and Woburn. The Consolidated road has been granted a location in Buckman street, Everett, which is an improvement that was much needed.

CAMBRIDGE R. R. Co. The car driven by Sprague electric motors and Julien

storage cells, with which this company has been making experimental runs, will be regularly employed in carrying passengers to and from Boston, with a view of thoroughly proving the advantages of this form of motive power. The Cambridge Board of Aldermen has passed an order allowing this company to establish and maintain electric motive power for propelling its cars on North Howard street, from Western avenue to Cambridge street.

THE CONSOLIDATION. The Directors of the Boston Consolidated St. Ry. Co. passed a resolution Aug. 9 (it is understood by a vote of 8 to 4 of those present) recommending that the stockholders accept the offer of the West End St. Ry. Co. to exchange its cumulative preferred 8 per cent stock for the stock of the Consolidated company in the proportion of 1 53-68 shares of the former for each share of the latter. President Powers and Moody Merrill, ex-President of the Highland, were both strong advocates of consolidation. As two-thirds of the stock of the Cambridge, Metropolitan and South Boston had already come in for exchange, this action of the Boston Consolidated practically completes the amalgamation of all the street railways of Boston. The West End Street Railway Co. starts out with a capital stock of \$6,400,000, in 128,000 shares of \$50 each; with about 215 miles of track, or more than would reach from one end of the State to the other; with 1,516 cars and 7,741 horses,—making this by far the largest street railway company in the country. The West End company will lay track at once on Beacon street between St. Mary and St. Paul streets. They will lay 10 or 12 miles this year, and rails and paving blocks are now being delivered. A girder rail with grooved head has been adopted and is being imported.

Brenham, Tex.

BRENHAM ST. R. R. Co. will extend their road.

Bridgeport, Conn.

BRIDGEPORT HORSE R. R. Co. has 100 horses now, a gain of 10.

Brockton, Mass.

BROCKTON ST. RY. Co. has 138 horses. The offices of this company are at Campello.

Brooklyn, N. Y.

BROOKLYN CROSS TOWN R. R. Co. are now running all large cars.

NEW WILLIAMSBURG & FLATBUSH R. R. Co. increases from 278 horses to 299.

TEN HOURS A DAY. It is understood that early next year the employees of the various street railroads will unite in demanding that ten hours be the extreme limit of a day's work.

BROOKLYN CITY R. R. Co. Under President Lewis's management the expense of running the road for the past three months has been \$33,000 less than for the corresponding period last year.

So. BROOKLYN R. R. A map of the proposed route of the trunk line from Thirtieth street ferry to Parkville, has been filed by S. McElroy, Chief Engineer. The

road will be in a cut from 9 to 25 ft. deep and 95 ft. wide.

SEVENTH AVE. ROAD. The drivers and conductors actually make a serious grievance of the fact that they are obliged to attend to the lamps on their cars; and there is talk of a strike. This is part of the Atlantic Ave. R. R. Co.'s system.

BROOKLYN CITY R. R. Co. On July 27 a car on the Greene and Gates avenue line was run into by a dummy of the Bushwick R. R. Co. at Cypress avenue. The engine struck the rear of the car, throwing the passengers into the street and injuring two of them.

Buffalo, N. Y.

QUEEN CITY ST. RY. Co. was incorporated at Albany Aug. 5, with a capital stock of \$100,000, and with the following officers: President, George V. Forman, of Olean; Vice President, Hascal L. Taylor, Buffalo; Secretary, Charles M. Howe, Buffalo; Treasurer, W. W. Welch, Gowanda. The company was formed to bid for the franchise for Elmwood avenue and connecting streets, making a line to the Park; but was outbid by the new West Side Co. They proposed to use the cable or electricity, probably the latter.

BUFFALO WEST SIDE ST. RY. Co. was incorporated Aug. 16, with a capital stock of \$50,000; and the next day outbid the Queen City Co. for the Elmwood avenue franchise, bidding 36 per cent of its gross receipts. The Richards patent girder rail must be used. It is understood that the new company is composed of parties who are identified with the Buffalo East Side Ry. Co.

Canandaigua, N. Y.

CANANDAIGUA ST. R. R. Co. Contracts are now being awarded for the construction of this new road. The officers are: President, Frank O. Chamberlain; Secretary, Charles F. Milliken; Treasurer, Alfred Denbow; Superintendent, Charles L. Sackett.

Carlsbad, Austria.

ELECTRIC RAILWAY. A concession has been obtained by an Austrian company for an electric railway at this place.

Charleston, S. C.

CHARLESTON CITY RY. Co. are preparing to extend their road.

Charlotte, N. C.

CHARLOTTE ST. RY. Co. will add to their length of line in a short time. Since their last report they have increased from 2½ to 3½ miles of track, and from 20 mules to 26.

Chattanooga, Tenn.

UNION RY. Co. are building 6 miles of extensions. A portion of the line will be double tracked. They have now 25 miles of track.

Cheyenne, Wv. T.

THE NEW STREET RAILWAY. Superintendent Flanigan is rapidly pushing forward the work of construction, which began Aug. 9. The east line of the proposed system—about a mile and a half in length—will be completed by Nov. 1; and the west line, or route to the Fair Grounds, will be built next year.

Chicago, Ill.

VAN DEPOELE ELECTRIC MANUFACTURING Co. have asked for a franchise from the Lake View City Council to run overhead wires from Diversy street north six miles. The company agrees to go underground in one year. If this line proves satisfactory to Mr. Yerkes, the President of the North Side system of street railways, he will adopt the Van Depoele electric railway upon other lines.

UNION PASS. RY. Co. has filed articles of incorporation. The capital stock is placed at \$1,000,000; and it is to operate a horse, cable, electric or steam railway. The incorporators are James C. Page, Volna Parker Sherwin and Frank F. Douglas. Cincinnati capitalists are said to be interested. The company propose to build on the South Side, and to use horses; and it is intimated that Third avenue may be used. Ultimately an extension may be built to the West Side, running a cable line through the Washington street tunnel; as the Chicago Pass. Ry. Co. has the right to a monopoly of horse car traffic only through the tunnel.

Cincinnati, O.

VINE ST. CABLE RY. The John Stephenson Company of New York have shipped the first of their new cars for this road.

CINCINNATI ST. RY. Co. expect to have their new line running by Sept. 1. An extension of track in Queen City avenue about 2 miles in length has recently been completed, also an extension in Coleraine pike and Hamilton pike about 3 miles. They have recently added 25 new cars, 15 open and 10 closed, of the John Stephenson Company's build.

Clay Center, Kan.

CLAY CENTER CITY R. R. Co. opened their road July 4. They have 5 miles of track, of 4 ft. 8½ in. gauge, 24 lb. rail, 4 cars, using motor. The officers are: President, G. M. Stratton; Vice President, J. M. Frank; Secretary and Treasurer, William Sharpe. The company has a capital stock of \$100,000.

Cleveland, O.

ST. CLAIR ST. RY. Co. has two fine new cars of its own construction. President Hathaway, speaking of them, says: "Yes, we built a couple of good cars because we could not get them built elsewhere quick enough, but we dare not figure the expense." He does not think it economical for the road to build its own cars.

Concord, N. H.

NEW STREET RAILWAY. A bill is before the Legislature for a new street railway company here, but meets with a good deal of opposition.

Council Bluffs, Ia.

LAKE MANAWA RY. Co.'s motor line is now in successful operation.

Covington, Ky.

So. COVINGTON & CINCINNATI ST. RY. Co. Bruce Morton, of Newport, has been awarded the contract to extend this road. They report now 25½ miles of track, against 17½; 61 cars, against 46; and 370 horses, against 296.

Dallas, Tex.

DALLAS CONSOLIDATED ST. RY. Co. increases from 13 miles of track to 16, from 26 cars to 40, and from 126 mules to 130.

DALLAS & OAK CLIFF RY. will be completed by Oct. 1. They have a capital stock of \$400,000 and the following officers: President, T. L. Marsalis; Vice President, Thomas Field; Secretary, Frank Field; Treasurer, J. T. Elliott. They will have 3½ miles of track, of 4 ft. 8½ in. gauge, 35 lb. rail, 2 cars, 2 steam motors.

Davenport, Ia.

BRIDGE, SECOND ST. & NORTHWESTERN ST. RY. Co. will commence work on their road about Oct. 1. H. F. Petersen is President, F. H. Hancock Vice President, Joseph Ochs Secretary, and G. M. Schmidt Treasurer. They have now a capital stock of \$25,000, which will be increased to \$100,000. They will have 2½ miles of track, with 4 ft. 8½ in. gauge, 38 lb. rail, 6 cars. It has not yet been decided whether animal power or electricity will be used. If the former, 40 horses will be required.

Dayton, O.

WHITE LINE ST. RY. Co. Work was begun on this new road Aug. 1, and it is expected that the road will be opened by Nov. 1. They will use electricity, employing the Van Depoele system, having part overhead wires and part underground conduit. The total length of track will be 8½ miles, of 4 ft. 8 in. gauge, 38 lb. rail, 16 cars, 13 motors. The capital stock of the company is \$200,000, and the officers are: President, John A. McMahon; Secretary, Charles D. Iddings; Treasurer, Michael A. Nippen.

DAYTON TERMINAL & BELT R. R. Co. This road is designed for steam, and not for horse cars, as previously reported.

Decatur, Ala.

DECATUR ST. RY. Co. The material, rails, etc., have been bought, and work will be commenced at once. The officers are: President, W. G. Wharton, of Montgomery; Secretary, S. D. Wharton, of Montgomery.

DECATUR & TRINITY BELT LINE R. R. It is proposed to build a dummy road to a health resort near Trinity. Joseph Shackelford is interested.

Denver, Col.

DENVER CITY RY. Co. has ordered the rails for the Argo line, and cars will soon be running from the depot along Lorimer street, Twenty-third street, Argo avenue and across the viaduct. This company increases from 24 to 30 miles of track, from 64 cars to 80 and from 332 horses to 450.

DENVER CABLE RY. Co. are now constructing their road, and expect to open it by April 10, 1888. They have a capital stock of \$500,000. Will have 6 miles of narrow gauge road, with 35 lb. rail, and will have 36 cars altogether, but only 12 for the first line of 2 miles. Each line will have two 500 H. P. engines.

Detroit, Mich.

EAST DETROIT & GROSSE POINTE ELECTRIC RY. Co., Detroit, have already laid 3 miles track, 25 lb. T rail, of their new electric

line, which is to extend from the terminus of the City Ry. Co.'s Jefferson avenue line to Grosse Pointe. The road will probably be in operation Oct. 1st. The system used is similar to the one now operated by the Highland Park Ry. Co. The Pullman people are to furnish 5 new cars. The contract for the boiler and engine house has just been let, and it will probably be completed Sept. 1st.

HIGHLAND PARK RY. Co. has added 2 new cars, which have the electric motors on the front platform. They have now 4 cars.

DETROIT CITY RY. Co. have recently re-laid their tracks on the Cass avenue line, a distance of a little over half a mile. They will also extend the line on Third street as far as Holden road, thence as far as the railroad track. Ten box cars have recently been purchased of the J. M. Jones Co.

FORT WAYNE & ELMWOOD RY. Co. have recently increased their capital stock from \$150,000 to \$250,000. They have under construction on Lafayette street and Helen avenue a stable which will accommodate 70 horses, and which will cost \$4,000. Four open and 4 closed cars have recently been added, and they have increased their stock from 216 horses to 270.

Dover, N. H.

DOVER HORSE R. R. Co. A syndicate of Massachusetts capitalists offers to buy a controlling interest in this road, and to extend it to Great Falls and build other extensions in the city. The capital stock is \$20,000, and the road is 2½ miles long, with 5 miles of track.

Easton, Pa.

ELECTRIC RAILWAY. The Daft system will be used.

East Portland, Ore.

SELLWOOD & VANCOUVER ST. RY. Co. The ordinance authorizing this company to build its road has been passed.

East Saginaw, Mich.

EAST SAGINAW ST. RY. Co. Work on the extensions to Saginaw, across Bristol and Mackinaw streets, will be pushed rapidly forward. This will give three crossings of the river instead of one. The company contemplates establishing a first-class pleasure ground. It is probable that the stock of the company will be increased by \$50,000, which is what the extensions, additional barns, etc., will cost. The new lines will be about 3 miles long.

Elizabeth, N. J.

A FRANCHISE through Third street is asked for by the Third St. & Trumbull St. Ry., which is a branch of the Elizabeth & Newark Horse R. R.

ELECTRIC RAILWAY. Active canvassing is still going on in behalf of the electric railway to run from the Union Depot to Staten Island Sound.

Elsinore, Cal.

ELSINORE ELECTRIC R. R. has been incorporated, to build around Elsinore Lake, 30 miles. Rails have been ordered, and work will be begun at once. Elsinore is in Los Angeles county.

Fall River, Mass.

GLOBE ST. RY. Co. Work on the new stable and car-house on Stafford road is going forward rapidly. The company will extend its lines in this section in the spring. An increase in cars from 51 to 61, and in horses from 210 to 230, is reported.

Findlay, O.

GEORGE B. KERPER, of Cincinnati, who owns the franchise for a line on Main and other streets, will begin work soon.

Flushing, N. Y.

FLUSHING & COLLEGE POINT R. R. Co. has decided to adopt the Julien storage system of electric traction. The company has obtained its franchise in College Point, agreeing to pay 1-20 of 1 per cent of its gross receipts in College Point. It is expected to have at least a part of the road in operation this fall.

Fond du Lac, Wis.

A FRANCHISE is asked for by a local company, who propose if they get it to enlist outside capital.

Fort Smith, Ark.

A SYNDICATE contemplates building a line of street railways about 2½ miles in length, and a survey of the route is now being made. It is possible that the parties may build for a longer distance, and, if so, will probably put in a steam or electric motor. G. Tilles, who is prominently interested, intends coming East as soon as surveys are made, for the purpose of making contracts, etc., for material.

ANOTHER REPORT is that E. E. Bryant, A. D. Holstein and others will build a line.

Fort Worth, Tex.

NORTH SIDE RY. Co., previously reported as chartered, will build a 2-mile dummy or cable street railway. They expect to finish it in about eight months. John D. Templeton is interested.

Framingham, Mass.

FRAMINGHAM UNION ST. RY. Co. In consequence of the severe rules laid down by the Selectmen, the work of construction will be delayed. An order for ties has been countermanded.

Graz, Austria.

AN ELECTRIC RAILWAY is being constructed in Graz, on the Schlossberg. Another Austrian road to be worked electrically is that from Hainfield to Ramsan, for which a concession has already been obtained.

Greensboro, N. C.

NEW STREET RAILWAY. J. W. Griffith has received permission to build a street railway here.

AN ELECTRIC STREET RAILWAY is talked of.

Harrisburg, Pa.

EAST HARRISBURG PASS. RY. Co. have begun work on their road, and expect to finish it some time in October. They will have 3½ miles of track, of 5 ft. 2 in. gauge, 52 lb. rail, and will have 8 cars, operated by electricity. They have not decided yet whether they will use storage batteries or overhead wire. They will have 4 motors. The officers are: President, W. J. Calder; Secretary, D. Fleming, Jr.; Treasurer, T. D. Greenawalt. The capital stock of the company is \$100,000.

Haverhill, Mass.

HAVERHILL & GROVELAND ST. RY. Co. has now 38 cars and 110 horses.

Hiawatha, Kan.

C. H. LAWRENCE, who is interested in the proposed street railway here, writes that they have not organized yet, and will not this year.

Hopkinsville, Ky.

NEW STREET RAILWAY. It has been decided not to begin work until the 1st of January.

Huntington, W. Va.

J. L. CALDWELL has agreed to build a street railway provided he can secure a satisfactory charter.

Hutchinson, Kan.

HUTCHINSON ST. RY. Co. opened April 15, with 1½ miles of track and 3 cars. They have now 4 miles, besides 4 more under construction, including 1 mile of double track, of 4 ft. 6 in. gauge. They pass the depots of the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, and the Missouri Pacific. They have 6 cars at present, and will receive 6 more from the Brownell & Wight Car Co., of St. Louis. They have 19 head of horses and 7 mules; and Secretary Forsha at last accounts was buying mules for the new lines. The officers are: President, A. L. Forsha; Vice President, John Severance; Secretary, Fred A. Forsha; Treasurer, S. W. Campbell.

THE CITY AUTHORITIES are reported to object to the setting up of a pole line for electric railway purposes.

Indianapolis, Ind.

INDIANAPOLIS CABLE ST. R. R. Co. will have a cable, horse and motor line. They have a capital stock of \$1,200,000. They will begin work on their horse line by the 15th September, on cable line during the winter, and track laying March 15. They will have 14½ miles of cable and 15½ miles of horse railway, all of 4 ft. 8½ in. gauge. The weight of rails will probably be 54 lbs. to the yard. The number of cars is likely to be 70, with 20 open summer cars. The officers of the company are: President, W. W. Dudley; Vice President, T. A. Morris; Secretary, W. R. Holloway; Treasurer, Oran Perry. Their plan is to build a road to Woodruff place first, and from there down to Michigan street, extending the road westward toward the river. This is to be a horse car line, tributary to the cable road. The engine for the cable road is now being built at Pottsville, Pa. It is estimated that the cable road will cost \$60,000 to \$75,000 a mile. The horse car lines will connect with the cable road, and be feeders for it.

Ithaca, N. Y.

ITHACA ST. RY. Co. The work of construction has been completed and the road will be opened at once. They have 3½ miles of track, of 4 ft. 8½ in. gauge, with 30 lb. T rail, 6 cars, Daft electric system. Charles D. Haines is President, E. T. Haines Vice President, and S. D. Lake Secretary and Treasurer. The capital stock of the company is \$25,000.

Jackson, Tenn.

JACKSON & SUBURBAN ST. R. R. have let contracts for material, and expect to open their road by the 1st of October. They have a capital stock of \$50,000, and the following officers: President, C. P. Heath, Sioux City, Ia.; Vice President, J. H. Duke; Secretary, R. B. Crawford; Treasurer, J. L. Wisdom. They will have about 7 miles of track, of 4 ft. gauge, 30 lb. rails, 4 cars for the present but will be largely increased next year, and 12 mules at first. Their address for the present is Sioux City, Ia.

Jacksonville, Fla.

AN ELECTRIC RAILWAY is projected here.

Jamaica, N. Y.

BROOKLYN & JAMAICA R. R. Co. This horse railroad, commonly known as the plank road, recently decided to adopt the Van Depoele system of electric traction, proposing to use 10 cars. As soon as they began to put up their poles the city of Brooklyn stopped the work, but Supt. Scott got out an injunction against the city, and the remainder of the poles were erected. The question of the ownership of the road will be argued when the case comes up on the motion to make the injunction permanent, it being claimed that the charter of the company has been repeatedly forfeited. "We intend to abandon our old method," Supt. Scott states, "and lay two tracks down the center of the thoroughfare, all the way from the present starting point in the Twenty-sixth Ward to Jamaica, and we will run cars on an average of fifteen minutes' headway, charging 10 cents for the through trip. We will put on fine rolling stock, and, as I said, operate the cars with electric motors. We have entered into a contract with the Van Depoele Electric Manufacturing Co., and they have most of the material on hand and are ready to do the work so that it will be in operation early in the fall. We expect, however, in addition to running the railroad with the electric power, to light the streets of Woodhaven and Jamaica."

Jersey City, N. J.

THE PAVONIA bobtail car track from Pavonia to Newark avenue is so well laid that a person can write easily while the car is running. It runs through Jersey avenue, which is paved in a superior manner.

No. HUDSON Co. RY. Co. A large number of citizens residing on the Heights have petitioned the Mayor and Aldermen to allow this company to extend their cable road northward and westward.

Kansas City, Mo.

MCGEE, EAST SEVENTEENTH & SUBURBAN RY. Co. ask for a franchise for a single or double track railroad on McGee, Seventeenth, Thirteenth and other streets in the southern and eastern portions of the city; the cars to be propelled by dummy motors. They have obtained the consent of a majority of the property owners on the proposed route. Their capital stock is \$500,000, and among the local stockholders are B. F. Jones, M. J. Payne, Thomas H. Edwards, W. O. Thomas and Isaac Whitaker.

GRAND AVE. RY. Co. This new cable road is nearly completed, and will be opened early in September. They have a capital stock of \$1,200,000, and the officers are: President, W. H. Holmes; Vice President, V. B. Buck; Treasurer, O. P. Dickinson; Auditor, T. J. Fry; Superintendent, C. F. Holmes. They will have 6½ miles of road, of double track, making 13½ miles of single track; 4 ft. 8½ in. gauge, 58½ lb. rail, 50 cars. They will have a single power house.

Keene, N. H.

KEENE ST. RY. Co. The following officers of the new company have been elected: President, Hon. R. F. Batchelder; Treasurer, William B. Frink; Clerk, Charles H. Henry.

Keypoint, N. J.

KEYPORT & MATAWAN ST. RY. Co. The construction of this new street railroad is progressing rapidly, and it will be completed in September. It has steel rails, and will be a first-class road in every particular.

Knoxville, Tenn.

KNOXVILLE REAL ESTATE Co. will build the dummy line previously reported, and the work of construction will begin at once.

H. SCHUBERT is President and P. Kern Secretary of a new street railway company that will begin work at once and expect to complete their road in 60 days. The road will be about 2 miles long, and they will have 2 cars and about 12 horses.

Laconia, N. H.

LACONIA & LAKE VILLAGE HORSE R. R. Work will begin at once on the new stable on Union avenue.

La Grange, Ga.

LA GRANGE ST. R. R. Co. has been chartered.

Lexington, Ky.

LEXINGTON CITY RY. Co. increases to 22 cars and 111 horses.

Lincoln, Neb.

NEW CABLE LINE. The work of construction has begun, and it is expected that the cars will be running before winter.

RAPID TRANSIT ST. RY. Work has been pushed forward with energy the past month, and the track has been completed to West Lincoln. They will use compressed steam motors at first, though they feel very favorably disposed towards electricity as the ultimate motive power. Three combined cars and motors are now on the road, and the company expect to have the road in operation early in September. The route is through Fourteenth street to the State Fair Grounds and the corner of Yolande place, thence westward to West Lincoln.

Litchfield, Ill.

LITCHFIELD ST. RY. Co. The following are the Directors of the first street railroad in the city: J. A. Beverly, H. H. Beach, S. M. Grubbs and B. F. Johnston.

Long Island City, N. Y.

STEINWAY & HUNTER'S POINT R. R. Co. increases from 68 cars to 90 and from 225 horses to 300.

Los Angeles, Cal.

LOS ANGELES & VERNON ST. R. R. Co. has been incorporated by D. G. Stephens and others, with a capital stock of \$90,000.

LOS ANGELES CABLE RY. Co. is the successor of the City & Central R. R. Co. and the East & West Los Angeles R. R. Co.

SAN GABRIEL VALLEY RAPID TRANSIT Co. has been incorporated with a capital stock of \$250,000, to build a line from Los Angeles to Monrovia, about 15 miles. Steam or electric traction will be employed.

Lowell, Mass.

BOTH STREET RAILWAY COMPANIES have asked the Aldermen for permission to extend their tracks.

Lynchburg, Mass.

LYNCHBURG ST. RY. Co. has been extending its line and increasing its facilities, and is now looking into the subject of electric motors.

Macon, Ga.

VINEVILLE ST. RY. Co. has been organized.

METROPOLITAN ST. R. R. Co. has been incorporated.

MACON CITY & SUBURBAN RY., LIGHT & POWER Co. A bill has been introduced into the Legislature to incorporate this company.

CENTRAL CITY ST. RY. Co. is another projected company here, a bill having been introduced into the Legislature to incorporate it.

Madison, Wis.

MADISON ST. RY. Co. It is rumored that the company is likely to change hands in the near future, and that electric motors will be adopted.

Mansfield, O.

MANSFIELD ELECTRIC ST. RY. Co. By the time this paper reaches its readers, 2 of the Daft electric cars will be running on this road. They will have 10 in all, and the road will be in full operation in September.

Marble Falls, Tex.

NEW ROAD. A. R. Johnson and others will build a new street railway.

Marion, Kan.

MARION ST. RY. Co. has been incorporated by R. C. Cable and others, with a capital stock of \$10,000.

Marlboro, Mass.

A SCHEME is being agitated for the connection of Marlboro and Hudson by a belt line of electric railroad, Boston and New York parties being interested, it is reported, in the project.

Mechanicsburg, Ill.

MECHANICSBURG & BUFFALO RY. Co. has 7½ miles of track. J. B. Hunter is now President, H. Thompson Vice President, J. T. Fullenwider Secretary, and A. T. Thompson Treasurer.

Memphis, Tenn.

MEMPHIS & CHELSEA RY. Co. has been chartered to build a street railroad. Thomas F. Duffin, J. H. Smith, Luke E. Wright, J. J. Smith, E. B. McHenry, and W. D. Beard are the incorporators.

JACKSON MOUND PARK R. R. Co. has been

organized to build a street railroad, to use either steam or electric power. They ask for a right of way from near Jackson square to Jackson Mound Park.

EAST END RY. Co. have finished about 5 miles of grading, and have begun laying track. They expect to commence running by the 1st of October. The whole length of track contemplated is 20 miles, of standard gauge, 35 lb. rail, with 8 cars and 3 dummies. The company has a capital stock of \$200,000, and the officers are: President, W. M. Sneed; Vice President, B. M. Stratton; Secretary and Treasurer, J. W. Falls. Three of the eight Directors are citizens of Birmingham, Ala. The company asks the city for a right of way on Third, Fourth, Madison, Monroe and other streets.

Milwaukee, Wis.

ROBERT NUNNEMACHER, William Sander-son, H. M. Benjamin and others, ask for a horse or cable railway along Broadway, Oneida, Wells and other streets.

MILWAUKEE ELECTRIC R. R. Co. ask for a franchise on River, East Water and Commerce streets, Island avenue, North, Richards, Booth and Lloyd streets. Stringent provisions as to rate of speed, kind of rail, etc., are provided. Adolph Toellner is the leading spirit in this enterprise.

MILWAUKEE & WAUWATOSA CABLE RY. Co. ask for permission to build to Wauwatosa, and an ordinance favorable to them has been reported to the Council, in spite of considerable opposition from the present street railway companies of the city. They must begin construction in 60 days, must lay at least 600 ft. of track per month except during the winter, and must complete their road by July 1, 1889.

THE THIRTEENTH WARD RAILROAD WAR is to be settled by compromise, the Milwaukee City Ry. Co. being allowed one route and the Cream City Co. another.

DUMMY LINE. The franchise for the dummy line to Whitefish Bay is to be forfeited unless the road is completed by Jan. 1, 1888.

MILWAUKEE CABLE CAR Co., of Hinsey project, is likely to be favorably reported on by the Council, but with a different route from that first proposed.

WEST SIDE ST. RY. Co. will adopt the cable system.

Middleboro, Mass.

NEW STREET RAILWAY. Dr. Charles Copeland, J. B. Ryder and other prominent citizens are understood to be engaged in working up a street railway enterprise. A railway 1½ miles in extent, from the railroad station to the Star mills, is proposed, and the prospect of its being soon built is believed to be good. It will require a capital of about \$30,000. The opportunity to use electricity is excellent.

Milford, Mass.

MILFORD & HOPEDALE ST. RY. Co. will commence work on their line next spring. They are guaranteed about \$60,000 capital. The company will be organized the coming winter. They contemplate having 4 miles of track, of 4 ft. 8 in. gauge, with

heavy rails, 6 or 8 cars, and either horses or electricity as a motive power.

Mobile, Ala.

MOBILE ST. RY. Co. is the name of the consolidation to which we referred last month. They have 23 miles of track, of 5 ft. 2½ in. gauge, 35 to 60 lb. T and tram rail, 74 cars, both one and two-horse, 4 freight cars, 230 mules and horses. The officers are: President, W. M. Duncan; Vice President, Gaylord B. Clark; Secretary and General Manager, R. K. Warren. This company invites proposals for building a stable and car house, 37 by 300 ft.

MOBILE & SPRING HILL R. R. Co. will issue bonds, and will spend from \$75,000 to \$100,000 in laying from 5 to 7 miles of track, purchasing new rolling stock, etc.

MOBILE & DAUPHIN ISLAND R. R. W. W. Ansley & Co., of Birmingham, have received the contract to grade 5 miles of this road, and to lay the track from Mobile to Cedar Point.

Moline, Ill.

UNION ST. RY. Co. reports 5.4 miles of track, of 4 ft. 8½ in. gauge, with 38 lb. Johnson girder rail for 1½ miles and 42 lb. tram rail for the balance of the line. They have 6 one-horse and 2 two-horse cars, 16 horses, 12 mules, 2 steam motors. The officers are: President, Eugene Lewis, Moline; Vice President, W. H. Decker, Davenport, Ia.; Secretary and Treasurer, G. Watson French, Davenport, Ia.; Superintendent, James Cazatt, Moline.

MOLINE CENTRAL ST. RY. Co. reports the following officers: President, P. H. Wes-sel; Vice President, M. Y. Cady; Secretary, W. R. Moore; Treasurer, C. F. Hemenway. They have 1½ miles of track, of 4 ft. 8½ in. gauge, 1 mile tram and ½ mile T rail, 3 cars, 10 horses.

Montreal, Can.

MONTREAL ST. RY. Co. are importing 500 tons of Belgian paving blocks. Six new sleighs have been ordered from Lariviere and 6 covered cars from J. M. Jones' Sons of Troy.

Mount Vernon, N. Y.

MOUNT VERNON & EAST CHESTER R. R. was sold at foreclosure sale Aug. 2 to Leopold Wertheimer of New York, Secretary of the old company. He will try to make it a paying property. The road has been in operation about 18 months, and there are 7 cars and 13 horses.

Nashville, Tenn.

MAIN ST. & GALLATIN PIKE ST. R. R. Co. began work on their new road Aug. 1, and they expect to open it about Nov. 1. They will have 2½ miles of track, of standard gauge, with 38 lb. Johnson girder rail, 6 cars and 45 mules. The officers are: President, Thomas L. Dodd; Secretary, J. W. Baker; Treasurer, W. C. Dibrell. The company has a capital stock of \$50,000.

OVERLAND ST. RY. The company has completed 7 out of the 8 miles of line. Some of the cars have been delivered, and the road will be opened in October. Engines have been ordered from Philadelphia, and by next spring there will be 12 cars and 2 engines in use.

So. NASHVILLE ST. R. R. Co. have commenced to replace their 16 lb. iron rail with steel girder rail. They will put down 10,000 ft. of track. This company has now 10 cars and 70 horses.

NASHVILLE & EDGEFIELD ST. R. R. Co. Thomas R. Donahue is now Superintendent of this road.

Natchez, Tenn.

NATCHEZ ST. RY. Co. This is now a private line, but they will organize soon and build 2 miles more of track.

New Albany, Ind.

NEW ALBANY RY. Co. has 14 cars and 55 horses.

Newark, N. J.

NEWARK & IRVINGTON ST. RY. Co. has received permission from the Common Council to build a cable road up Market street from the Pennsylvania R. R. station to Springfield avenue, and thence to Irvington, 3 miles. They were relieved from the provision of a free transfer system with other companies but must pave with ob-long granite blocks, which it is said will cost them \$35,000 additional. It is understood that the company will adopt a comparatively low cost cable system.

ESSEX PASS. RY. Co. will extend the Roseville and Market street line through Chapel street and Albert avenue to Lockwood avenue. It is proposed to adopt an electric motor system.

New Bedford, Mass.

UNION ST. RY. Co. Charles E. Cook has been elected Superintendent of Horse and Car Stables and Shops, and William H. Allen Superintendent of Transportation. The company has voted to discontinue its track on Acushnet avenue from Weld to Union. Travel from the Head of the River and to the Cove will be over the Purchase street line. This company now has 84 cars and 290 horses.

New Brunswick, N. J.

NEW BRUNSWICK CITY R. R. Co. The Board of Aldermen Aug. 15 received a favorable report from the committee appointed to investigate the Van Depoele electric system of street railroading, and a resolution was framed giving the street railway company the right to erect poles along its route, provided no opposition was encountered from property owners. The resolution was allowed to remain inoperative in the hands of a special committee until the next meeting of the Council, when final action will be taken upon it. In the mean time the railroad company is to prepare a guarantee offering to give bonds for the good repair of the streets if the franchise is given at the coming meeting.

Newburgh, N. Y.

THIRD ST. RY. Co. expect to build their cable road next spring. The capital stock is \$40,000. C. L. Waring is Secretary and Treasurer. Their proposed line is ½ mile long, and they will have 4 cars.

New Orleans, La.

CANAL & CLAIBORNE STS. R. R. Co. The City Council has advertised for proposals for the franchise.

New York, N. Y.

CENTRAL PARK, NORTH & EAST RIVER R. R. Co. The John Stephenson Company have turned out their first installment of cars for this road, to take the place of those burned.

STREET RAILWAY EARNINGS for the quarter ending June 30 show a return to normal conditions, as compared with the strike period last year. The Third Avenue Co. increases about 40 per cent as compared with the same time last year, and the Broadway also shows a small increase; while the Second, Fourth and Sixth Avenues show a falling off. The Third Avenue is paying a dividend of 3 per cent, the first it has made since February of last year.

TRANSFER SLIPS. Complaint is made that the Broadway road is being defrauded through the free transfer slips which are given by this company in connection with the cross-town lines which it controls. Passengers put the slips in their pockets and use them later in the day. It is probable that slips will now be used that will only be good within the hour punched by the conductor.

NORTH & EAST RIVERS RY. Co., which has laid double tracks on Fulton street, has secured permission from Arthur Leary, President of the Bleecker street line, to relay the tracks of the latter company on Fulton street. When this is done the electric conduit, which is in process of construction at Pittsburgh, will be put in place. The stationary engines and boilers are ready and awaiting shipment from Providence. The J. G. Brill Company, of Philadelphia, have notified the company that the 20 cars they ordered some time ago are almost ready, so there will be no delay after the tracks are ready. The Eighth Avenue R. R. Co. and the Belt Line Co. have given the electric company the right to run the cars over their tracks on Fulton and West streets.

FORTY-SECOND ST. & GRAND ST. FERRY R. R. Co. have now 55 cars and 480 horses.

NIAGARA FALLS & SUSPENSION BRIDGE RY. Co. increase to 14 cars and 50 horses.

Norwalk, Conn.

NORWALK HORSE R. R. Co. has now 7 cars and 21 horses.

Oakland, Cal.

BROADWAY & PIEDMONT R. R. Co. are building a mile of additional track, which they will lay with 38 lb. girder rail. Walter Blair is President of this road.

Omaha, Neb.

OMAHA SOUTHWESTERN ST. RY. Co. have 2½ miles of their road completed and in operation. Their contemplated length of track when completed is 25 to 30 miles, of standard gauge, with 25 lb. No. 1 steel rail, 30 to 40 cars. They use a motor now, but will employ electricity ultimately. The officers of the company are: President, Henry Ambler; Vice President, C. R. Woolley; Secretary, Samuel J. Howell; Treasurer, C. F. Harrison.

OMAHA MOTOR RY. Co. Dr. S. D. Mer-

cer, President of this company, has closed a contract with the Van Depoele Manufacturing Co. of Chicago, to equip the line, and they will put in 20 12 H. P. motors and 250 H. P. generators. The overhead wire system will be used. Mr. E. A. Benson is no longer connected with this company. He built a piece of the road, but no longer controls it. At a special election in South Omaha this company was granted a franchise and right of way by an almost unanimous vote. The work of construction has been going rapidly forward during the past month, and they expect to be in operation in November. There is sharp rivalry between this company, the Omaha Horse, the Metropolitan, and the Northwestern; and there has been some talk of injunctions, tearing up of tracks, etc.

OMAHA & SO. OMAHA ST. RY. Co. were refused a franchise by the people of South Omaha, and have appealed to the courts. They have done a small amount of construction.

METROPOLITAN CABLE RY. Co. have already begun work, and hope to open the road by Sept. 1, 1888. They have a capital stock of \$1,000,000 and the following officers: President, F. L. Underwood; Vice President, N. D. Allen; Secretary, R. W. Patrick; Treasurer, G. A. Joslyn. They will have 4.7 miles of track, of 4 ft. 8½ in. gauge, with 56 lb. rail, 20 cars, 10 motors. The road will extend from the center of the city to the western part of the Patrick farm. The negotiations to have the Cable Tramway Co. build the Metropolitan's road fell through. Vista street, where this road will run, will be 80 ft. wide and paved with cedar blocks. Two grading machines, two gangs of wheeled scrapers and about 80 teams are at work.

OMAHA HORSE RY. Co. The extension on Cuming street, from Brown street to Pleasant, was opened Aug. 1. This makes the Cuming street line 4½ miles long, or the longest in the city. The company is building a new line from Lake and Twentieth streets to the Fair Grounds, to be in operation by the time of the Fair, and possibly to be used the year round. The line on Fifteenth street, from Capitol avenue to Webster street, is completed. This company had it in contemplation not long since to adopt the cable system. It is understood, however, that the idea has now been abandoned, except possibly in the case of one line. The street railway people believe in the superiority of the electrical system, and think it will soon reach commercial perfection.

CABLE TRAMWAY Co. Preparations are making for commencing work at an early day.

Orange, N. J.

CABLE RAILWAY. A syndicate will build a cable railroad from the Orange station on the Delaware, Lackawanna & Western, up Orange mountain, to open up real estate on the summit.

Orlando, Fla.

ORLANDO & WINTER PARK RY. Co. The

original plan of a motor road has been abandoned; and, as this will be a regular steam railroad, we drop the company from our Directory.

Oswego, N. Y.

AN ELECTRIC RAILWAY will be constructed, using the Daft system.

Owensboro, Ky.

OWENSBORO ST. RY. Co. will extend their track to the Fair Grounds this season. They have been surveying for the extension to Elmwood cemetery. The additional cars have been received.

Paris, Tex.

PARIS RY. Co. The capital stock has been increased to \$50,000.

Passadena, Cal.

ELECTRIC RAILWAY. This road will employ the Daft system.

Passaic, N. J.

BRADSTREET & CURTIS write that they are not interested in the proposed street railway here, as reported.

Pelham, N. Y.

PELHAM PARK R. R. Co. has 4 cars and 9 horses.

Philadelphia, Pa.

THE J. G. BRILL COMPANY has on its books new orders for 12 open cars for La Plata, 10 open cars for Para, a sample car for the Island of Luzon off the coast of Asia, three hearse cars for a South American city. They have just completed their large order for South America and have sent the last vessel load. This was probably the largest order for horse cars ever given, it amounting to nearly \$200,000. Among their home orders may be mentioned those of Newark, O.; Savannah, California, Wheeling, London, Ont.; Tuscaloosa, Ala. They are just completing their orders for the Belt Railway in New York.

PHILADELPHIA TRACTION Co. A special meeting of the stockholders, Aug 10, authorized the issue of \$1,300,000 4 per cent bonds, secured by the stocks of the Market Street and Union Passenger Railway Companies. Most of the money is to be used in extending the company's cable system on Seventh and Ninth streets from Sansom street to McKean. When the new conduits are completed, about the middle of October, the cable cars will run on Franklin and Seventh streets from Columbia avenue to McKean and on Ninth street from McKean to Spring Garden, from there to Seventh street, thence to Columbia avenue. It is intended to dispense with the horse cars on Seventh and Ninth streets, and under the new arrangement the green cars on the Richmond branch will be attached behind a cable car at Franklin and Master streets and drawn as far as Seventh and Passyunk avenue, where they will be detached and horses again put to the traces on the up trip, the horses to draw it to Ninth and Christian, where it will again be fastened to a cable car and drawn up to Seventh and Oxford streets, where the horses are connected, thence to the depot at Norris and Thompson streets. The Fairmount car will be coupled to the motor car at Franklin and Wallace streets, and will follow it over the

entire route up again to Ninth and Spring Garden streets. It is expected that the running time will be greatly reduced, being at least 25 per cent better. The motor cars, it will be seen, will be required to pull two others over the greater part of the route, and to be capable of doing this must be of exceptionally strong build. They are now in course of construction, and in the main are modeled after those now in use on the Columbia avenue branch, which are considered a near approach to perfection as cable cars. From four to five hundred horses will be dispensed with by the company, the change obviating their necessity. The great strain on the cables occurs at curves, the cable slipping from the wheels and thus stranding. New curve wheels with a face of 16 in. are now being put in in the place of the old ones of 3 in. face. It is said that it will be utterly impossible for the cable to slip from the new wheels, and it is expected that one rope may be used continuously for from 12 to 15 months. The new cable will be run by the engine at Ninth and Sansom streets, and the additional machinery made necessary by it is already in place there. The Traction Co. carried 1,000,000 more passengers in July than in the same month of last year.

MANAYUNK & ROXBOROUGH INCLINED PLANE RY. Co. is a suburban street railway that has been in operation ten or twelve years. It is 5½ miles long, has 45 lb. rail, 8 cars and 33 horses. The officers are: President, C. J. Walton; Secretary, W. H. Lewis; Treasurer, C. J. McGlinchey; Superintendent, A. Tibben.

Pine Bluff, Ark.

CITIZENS' ST. RY. Co. has been in operation since November, 1886. They have a capital stock of \$30,000 and the following officers: President, John M. Taylor; Vice President and Superintendent, H. P. Bradford; Secretary, John O'Connell; Treasurer, H. H. Hunn. They have 2½ miles of track, of 4 ft. 8½ in. gauge, 35 lb. T rail, 8 cars, 50 mules.

Pittsburgh, Pa.

PITTSBURGH, KNOXVILLE & ST. CLAIR ST. RY. Co. The stationary plant and 5 35 H. P. motors for this electric railway have just been completed by the Daft Electric Light Co., of Jersey City, N. J. These motors have a wheel base of 5 ft. and weigh about 6 tons, and would draw 60 loaded street cars on a level. They have already developed, under dynamometric test, thrice the tractive power they will ever be called upon to exert, and are especially interesting as being adapted to both overhead and conduit conductors and making use of a sprocket wheel engaging with a rack, between the rails on the steepest grades—14 per cent—for use when the track is icy or slippery with mud. On the level this sprocket wheel is triced up and inoperative. The Pittsburgh, Knoxville & St. Clair has 3 miles of track, of 5 ft. 2½ in. gauge, with 40 lb. tram rail. The officers are: President, Thomas Evans; Secretary, J. W. Patterson; Treasurer, Henry Stamm.

OVERHEAD CONDUCTOR ELECTRIC RY. Co. has filed articles of incorporation. The company is organized for the purpose of purchasing, holding and selling patent rights for electric railway purposes, with the right to issue licenses for the same. The capital stock is \$300,000, in 6,000 shares, of which George Westinghouse, Jr., has 1,200 shares and Thomas B. Kerr, Trustee, 2,000 shares.

SQUIRREL HILL ROAD. The name of this new company has not yet been decided upon, but it will probably be the Eastern Heights R. R. Co. The proposed capital stock is \$60,000. All the money needed is assured, as well as the right of way through private property. The method of propulsion has not been decided upon, but it will be either steam or electricity. The road will be of narrow gauge, and will have 3 miles of track. It will intersect the new Pittsburgh Traction Co.'s Fifth avenue cable line, probably at Boundary street; and will run to the Homewood and Lutheran cemeteries. It is expected to do a large business in connection with the cable line. George R. Stewart has been retained as Engineer, and preliminary surveys have already been made.

CITIZENS' PASS. RY. Co. The work of changing this road to a cable line will be pushed forward rapidly. The contracts have been given, and some of the iron has already been made. The road will consist of three divisions. One will extend from Forty-seventh street to Sixth street, a second from Thirty-fourth street to East Liberty, while a third will be from Forty-seventh street to the Sharpsburg bridge. A power station will be located near Thirty-third street, it being a central point for the work to be done. The main cable from Forty-seventh to Sixth street will be connected with the power house, and the two branch lines will be operated by the main cable. This will be 1½ in. in diameter. The cables will probably be made by the Roeblings. The Johnson rail will be used.

OAKLAND CABLE LINE. The work of excavation began Aug. 18. Some of the iron has already been delivered.

Pittsfield, Mass.

PITTSFIELD ST. RY. Co. This is the only street railway at Pittsfield and its statistics are unchanged. There is no Sunset R. R. Co., as some papers have reported.

Plymouth, Mass.

PLYMOUTH & KINGSTON ST. R. R. Co. will build their road in the spring if the accumulator system of electric traction is perfected by that time. They contemplate a length of track of 2½ miles, 4 ft. 8½ in. gauge, about 35 lb. rail, 4 to 6 cars. Capital stock, \$25,000. James D. Thurber is interested.

Point of Pines, Mass.

AN ELECTRIC RAILWAY ¼ mile long has been doing a good business this season, justly claiming to be "the only electrical railroad in New England."

Port Huron, Mich.

PORT HURON ELECTRIC RY. Co. This

company's boilers are heated by natural gas.

Portland, Me.

NEW CABLE RAILWAYS. The following companies have filed certificates of incorporation: Mayall Cable Elevated Railway Supply Co., Mayall Cable Combined Elevated and Surface Railway Supply Co., Mayall Pneumatic Surface Railway Supply Co., Mayall Pneumatic Elevated Railway Supply Co., all of Portland. President, Thomas J. Mayall, Reading, Mass.; Treasurer, F. H. Raymond, Somerville, Mass.

Portland, Ore.

PORTLAND TRACTION Co. has been incorporated by Rudolph Kaufman, D. F. Sherman and Charles Kennedy, with a capital stock of \$250,000, to build a passenger and freight railroad on certain streets.

STARK ST. FERRY Co., of which A. J. Knott is President, ask for a franchise to run street cars as feeders of their ferries.

Portrush, Ireland.

THE PORTRUSH ELECTRIC TRAMWAY, which has been running so successfully for three years past, has now been extended from Brushmills to the Giant's Causeway, and the new section is already in operation.

Portsmouth, Va.

PORTSMOUTH ST. RY. Co. This projected road has headquarters at 45 Broadway, New York. The Commissioners in charge of its affairs are W. H. Stewart, S. T. Dunham and J. L. Watson.

Poughkeepsie, N. Y.

CITY R. R. Co. deny the report that they contemplate changing from horses for traction.

Providence, R. I.

CABLE ROAD. The Providence, Warren & Bristol R. R. Co.'s cable extension from their present terminus to the center of the city will be about three-quarters of a mile long. The intention is to haul their trains by means of a grip car kept in motion by a cable operated by a two-cylinder engine at one end of the route; passengers other than those of their steam road being, of course, accommodated. They hope to commence work within a few months.

UNION R. R. Co. will probably extend their road through Park avenue before the fall of 1888, and perhaps at once, so as to connect with the Agricultural Park. The Agricultural Society are willing that the cars should run into their grounds.

Raleigh, N. C.

RALEIGH ST. RY. Co. will extend their road.

Reading, Pa.

No ELECTRIC RY. Co. has been formed here, as reported.

Richmond, Va.

MANCHESTER RY. & IMP'T Co. will extend their line.

RICHMOND CITY RY. Co. will extend its lines from Broad street on Brook avenue to the city line, and on other streets.

RICHMOND UNION PASS. RY. Co. expected to complete their road and open it by the last week in August. Their capital stock

is \$500,000. They have 13 miles of track, of 4 ft. 8 in. gauge, 45 lb. rail, 40 cars, Sprague electric motors, two on each car. The cars are to be heated by an electric apparatus invented by Dr. W. Leigh Burton, of Richmond.

Riverside, Cal.

RIVERSIDE & ARLINGTON ST. RY. The work of construction will begin within two months. They will have 12 miles of track, of 4 ft. 8½ in. gauge, 16 lb. T rail, method of propulsion not yet determined. Thomas Bakewell is President, and I. S. Castleman Treasurer. Capital stock, \$500,000.

Rochester, N. Y.

WEST SIDE R. R. Co. has been incorporated by C. B. Woodworth and others, with a capital stock of \$50,000, to build and operate a street railway.

ROCHESTER CABLE R. R. Co. have a capital stock of \$1,000,000. They will begin work as soon as the franchise is obtained, and hope to open their road by July 1, 1888. They contemplate having 10 miles of single track, of 4 ft. 8 in. gauge, about 60 cars. The officers are: President, Valentine Fleckenstein; Vice President, John W. Harman; Secretary, Paris G. Clark; Treasurer, George W. Archer.

ROCHESTER CITY & BRIGHTON R. R. Co. began laying track Aug. 7 from the terminus of the Lake avenue route toward Charlotte, and the tracks will be laid to the cemetery and to Charlotte as soon as the right of way can be secured. Part of this route was included in the plans of both the cable road and the electric road, and the action of the old company has aroused a good deal of ill feeling. The company has given bonds to the city for the completion of the East Main street and Park avenue route extension. The company will pay 1-20 of 1 per cent of the gross annual receipts.

ELECTRICAL RY. Co. have already put a force of men at work near Charlotte. It is probable that they will obtain a franchise over the boulevard to the lake.

FRANCHISE TO THE DRIVING PARK. The Council voted, Aug. 15, to give the franchise from the rapids to the driving park to the highest bidder, subject to certain restrictions.

Rockaway, N. Y.

AN ELECTRIC RAILWAY is projected here.

Rockland, Mass.

NEW ROAD PROPOSED. It is proposed to build a street railway on Union and Webster streets and on North avenue to North Abington.

Rome, Ga.

G. J. DYKES writes us that their street railway enterprise has been abandoned for the present; and in place of it a coach line will soon be put in operation.

ROME LAND Co., who own the Rome Street Railway, will extend it 3 miles south, 1½ miles west, and 7-10 mile north, and will at once add 2 dummy engines. The routes for the extensions have already been surveyed.

Rutland, Vt.

RUTLAND ST. RY. Co. The annual report

shows a satisfactory financial condition, the floating debt having been largely reduced. It is hoped that the next year's business will enable them to pay off their floating debt and leave a balance for the stockholders. The track to West Rutland has been almost entirely raised and relaid, and 1,400 new ties have been put in.

Salem, Mass.

NAUMKEAG ST. RY. Co., who purchased the Salem & Danvers St. Ry. Co. in April, now operate it as the Naumkeag St. Ry. Co. Their present mileage is 34 miles of tram and T rail, 4 ft. 8½ in. gauge, with 55 box cars and 49 open cars, and 360 horses. Charles Odell is President and Henry Wheatland Treasurer.

Salt Lake City, U. T.

ELECTRIC RAILWAY. Application has been made to the City Council for right of way for an electric railway on South Second street from the Reservation to Second West street, thence to Hot Springs. It is stated that the project has good financial backing.

San Antonio, Tex.

RICHARD WOOLLEY, JR., of Cincinnati, O., will build a horse car line, also a dummy line, at San Antonio.

WEST END ST. CAR Co. has been incorporated, with a capital stock of \$50,000, by G. W. Russ, J. W. Moon, H. B. Andrews and others.

San Bernardino, Cal.

NEW MOTOR ROAD. A motor road has been projected to Harlem Springs, and about \$20,000 worth of stock subscribed already. The road will start from Ninth street, thence down Base Line. Some of the section to be opened up will be subdivided into small lots and put on the market.

MOTOR LINE TO COLTON. Mr. Button's motor road to Colton is now one of the best paying investments in the valley.

San Diego, Cal.

THE HENRY ELECTRIC RAILWAY Co., having completed its Kansas City road, is now equipping some roads in San Diego, Cal., and suburbs. On one of the roads a speed of a mile a minute will be attempted. The machinery and plans of the Kansas City roads will be followed except in the matter of conductors. Old railroads will be buried and insulated parallel with the track, and connected at intervals with small overhead wires, thus affording a reinforced quantity current. The potential used at Kansas City is 250 volts. The armatures of the motors have never been hot, show no sparking at the commutators, and no light is visible on the darkest nights from the traveling contact or brushes. The armatures are wound with but a single layer of wire and show remarkable efficiency. The road has made money since it started, and the indications are the cost per passenger will soon be decreased to one cent per mile. Dr. Granchenor is President and Juan Francesco Vice President of the San Diego company.

A COMPANY has been organized to build a motor line from Upper Fifth street over

the Mesa to El Canon, 15 miles. The motive power will be electricity.

San Francisco, Cal.

MARKET ST. CABLE RY. Co. are now pushing work on the Castro street road. From the corner of Market and Valencia streets to Castro street the extension is about a mile long, and from Castro and Market to the terminus at Twenty-sixth street is another mile. A car house will be built at Twenty-sixth street. The Castro street line will probably begin running before New Year's. The Pacific Improvement Co. have charge of the work of construction, under the superintendence of G. R. Guppy. The company intend, when they change the Mission street line to a cable road, to extend it for some distance along the county road. They also own the franchise for the Potrero & Bay View Railroad, but they will not build the cable line over this route for at least two years.

POWELL ST. CABLE RY. Co. have begun putting up their engines, which are of 600 H. P., each cylinder being 22 by 48 in. Thirty-eight combination cars are now being built at Oakland for the company. Three ropes will be used on the two lines, one making the circuit of Mason, Washington, Central avenue and Jackson street, another from the ferries around on Washington, Mason, Jackson, Battery and the ferries, and another on the Powell street line from Market street to North Beach. It now looks as though the western part of the system, including the Powell street line, would be finished by Nov. 1. Altogether there will be 10 miles of cable running when the whole system is in operation, and the total cost will be between \$700,000 and \$800,000.

J. M. DAVIES and **J. L. Wetmore** have applied to the City Council for a franchise to build and operate an electric or cable road on Franklin, Twentieth, Webster and Locust streets.

NO. BEACH & MISSION R. R. Co. Two passenger dummies are being built for the road, to be used on Folsom street, and to be run by electricity. Each of the dummies will carry 20 passengers and weigh 2,100 lbs. This company has now 64 cars and 400 horses.

CENTRAL R. R. Co. At the recent annual meeting the only change in officers was the election of J. L. Willcutt as Secretary.

A NEW CABLE ROAD is to be built to the beach. Thomas Magee is interested.

THE HAYES STREET CABLE LINE has a car equipped with an apparatus by means of which the names of the streets and also of the principal buildings are shown on a register box just before they are reached.

San Jose, Cal.

ELECTRIC RAILWAY. The Fisher system is to be used for the 8 mile conduited road between San Jose and Santa Clara. Eight motor cars will be used, each hauling 2 cars; and the dynamo capacity will be 12 cars. The total estimated cost is \$300,000. Samuel A. Rich is President of the company and E. A. Rich Vice President. If the system is a success at San Jose, it will be tried at San Francisco.

Saugerties, N. Y.

A HORSE RAILWAY will be built, it is stated, to accommodate travel on the West Shore R. R.; but no company has yet been formed.

Savannah, Ga.

SAVANNAH ST. & RURAL RESORT RY. Work will be commenced on this new road as soon as the city gives its permission. They will have 6 miles of track, of 4 ft. 8½ in. gauge, about 15 cars, and hope to use electric motors. H. P. Smart is Manager. The capital stock is \$100,000.

Schenectady, N. Y.

SCHENECTADY ST. RY. Co. This road has been in operation since July 15. They have at present 2 miles of track, of 4 ft. 8½ in. gauge, 40 lb. rail, 5 cars, 1 snowsweeper, 28 horses. D. G. Christie is Superintendent and Purchasing Agent.

Selma, Ala.

SELMA ST. RY. Co. has 7 cars and 7 horses.

Sheffield, Ala.

SHEFFIELD ST. RY. Co. The road is about completed, and will be put in operation at once. The capital stock of the company is \$50,000, and the officers are: President, H. B. Tompkins; Secretary, Edward B. Almon; Treasurer, C. D. Woodson; Superintendent, W. S. White. They have 6 miles of track, broad gauge, medium rail, 4 cars, 4 dummy engines.

South St. Paul, Minn.

SOUTH ST. PAUL RAPID TRANSIT Co. are actively at work on their new road, and expect to open it this fall. They will have 8 miles of track, 40 and 56 lb. rail, about 10 cars, electric motors, 4 to each car, using the Enos system. They have a capital stock of \$500,000, and the officers are: President, Arthur E. Clark; Secretary and General Manager, J. H. Lawrence.

Spartanburg, S. C.

SPARTANBURG LAND & IMP'T Co. has been chartered by John B. Cleveland, S. J. Simpson, W. E. Burnet, Joseph Walker and J. H. Sloan, with a capital stock of \$10,000. One of their purposes is to build a street railroad.

Springfield, Mass.

THE DAFT SYSTEM will be adopted on the electric railway.

Springfield, Mo.

CITIZENS' ST. RY. Co. ask permission to extend their Chestnut street track north so as to connect with the Center street track near the new opera house. They agree to put down a flat rail.

Staten Island, N. Y.

THE STATEN ISLAND BELT LINE R. R. Co. has filed articles of incorporation at Albany. The company proposes to operate a surface railroad from Bowman Point to South Beach, with loops to Tompkinsville and Port Richmond; length, 18 miles; capital, \$200,000. James Moore, Seth B. Ryder and John Kean, Jr., are the leading stockholders.

St. Catharine's, Ont.

ST. CATHARINE'S, MERRITTON & THOROLD ST. RY. Co. are actively engaged in the work of changing their road from a horse to an electric railway; and they hope to

open the road by the 1st of October. They will have 6 miles of track, 4 ft. 8½ in. gauge, 30 lb. rail, 12 cars, 10 motors, Van Depoele system. This company has a capital stock of \$80,000, and the officers are: President, E. A. Smyth; Secretary, A. P. Friesman; Electrician, Walter Bradley.

St. John, N. B.

ST. JOHN CITY RY. Co. have received permission from the Common Council to lay tracks on Prince William street as part of a circuit line.

St. Joseph, Mo.

WYATT PARK RY. Co. will have 5 miles of track, of standard gauge, cable road. They expect to begin work about the 1st of October, and to finish the line early next year. Their capital stock is \$300,000. J. M. Huffman is President and I. R. Williams Secretary.

ANOTHER CABLE ROAD will soon be built here.

FREDERICK AVE. RY. Co. are making important improvements on their own line as well as that of the Citizens' R. R., which they recently acquired by purchase. The Frederick avenue line will be double tracked its entire length, from the City Hall to the end of the avenue, and constructed on newly paved streets. Arrangements are making for converting the company's lines to an electric road, and it is stated that the change will be made within six months, or as soon as some preliminary tests are completed. On the old Citizens' line, connecting the city with South St. Joseph, an entire new roadbed and new steel rails will be put down. Ten new cars have been received.

UNION RY. Co. began building a mile of new electric railway in April, and it is now ready to open. If the experiment is successful this method will be extended to their whole street railway system. The gauge is of 4 ft. 8½ in., 35 lb. rail, 3 cars, overhead wire.

St. Louis, Mo.

STREET RAILWAY TO EAST ST. LOUIS. Mayor Stephens of East St. Louis has been consulting with the citizens of that place with the view of raising \$15,000 or \$20,000 to build a street railway. The growth of the Illinois town has been seriously retarded by the lack of facilities of communication with St. Louis.

ST. LOUIS ELEVATED RAILWAY Co. believe their bill will pass both branches of the Assembly early in November. They are making some changes in their organization, with a view to meeting all the requirements embraced in the recent laws pertaining to the building of elevated railways; and new articles of association will be filed with the Secretary of State, under the corporate name of the Rapid Transit Railway Co., with a capital stock of \$8,000,000. The total length of the proposed lines is 20 miles of double track, 4 ft. 8½ in. gauge, of which 10½ miles will be elevated way and 9½ miles surface and underground w. y. The elevated structure will be similar to the Second avenue line, in New York—1,400 lbs. per lineal foot, 60 lb. rails. There

will be about 30 elevated stations and 20 surface stations. The estimates for the equipment cover 30 locomotives and 90 cars, Manhattan Railway pattern, and 30 saloon and drawing room cars.

CITIZENS' R. R. Co. will open their cable line in September. The boiler houses are about completed, and the engines and boilers will be put in place at once. The curve pulleys will be noiseless; the work is being done by Wright, Meysenburg & Co. The John Stephenson Company has notified Mr. Walsh that the 42 grip cars ordered will be on hand when needed, and the two sample cars being constructed by the Pullman Car Co. will also be ready.

CASS AVE. & FAIR GROUND RY. Co. The substitution of the cable for horses is under consideration. If the change is decided upon, the work will be begun in the early spring.

LINDELL RY. Co. "We will have three electric motors running this month," said Capt. Robert McCulloch. "We have sent up to the depot this morning for part of our storage batteries, which have just arrived. The company making them is far behind in its orders. That has delayed us some. Then the motor companies have been slow. Mr. Sprague of the Sprague Motor told Mr. McKittrick, when he was in New York, that he would not send his motor out here until it had been adjusted in New York and Philadelphia, so that the man who will have charge of the work there will come out here, and he will be saved the experimental part of the work. I understand the Brush motor is almost ready, and Mr. Possons, the manager of the company, is so much interested in the experiment that he will himself come over here to witness the test." The Lindell Railway Co. has put \$5,000 into the batteries, \$2,000 into the two electric cars, and \$1,500 into one of the new motors, so far.

MISSOURI R. R. Co. The work of changing this company's line to a cable road began Aug. 16. The tracks on Olive street between Fifteenth and Twenty-third streets will be taken up first and the excavation made for the conduits. In the mean time the Olive street cars will run through Market street. The excavation will be carried on at the rate of 1,000 ft. per day. The contract specifies that the cable machinery and all the accessories shall be completed and in thorough running order by Oct. 15, between Fourth street and Channing avenue. The power house will be located where the present stables are on Olive street and Channing avenue. This Olive street cable will cost half a million dollars. President Maffit says: "I am not prepared to say that cables will eventually take the place of horses, but I think something will, electricity probably." The company will have a new equipment throughout, including rolling stock, and cars are already being built for them.

ST. LOUIS CABLE & WESTERN RY. Co. Various rumors are afloat about this company obtaining control of the Union Depot and People's lines. The presence of a repre-

sentative of Lee, Higginson & Co., of Boston, supposed to be in the interest of the Boston owners of the Cable & Western, gave color to the reports. A settlement has been arrived at between this company and the city, by which the former is to be allowed to lay its double track on the steam part of its road, but with the agreement that the track must be torn up if a bill authorizing its continuance fails to pass the Municipal Assembly this fall.

UNION DEPOT R. R. Co. President Scullin says he has contracted to put in the California cable, and will proceed with the work next spring.

TOWER GROVE PARK FRANCHISE. A sharp struggle for this franchise, controlling much of the business of the southwestern part of the city, is going on between the Union Depot, the Lindell, and the St. Louis Cable & Western.

So. St. Louis Ry. Co. W. L. Johnson, late Superintendent, has been elected President. He and his brother practically own the road, and they have decided to put in the Johnson-Rasmussen cable as soon as practicable, which will probably be not before next spring.

St. Louis R. R. Co. President Peper says they will make no change till they see how electricity as a motor turns out.

St. Paul, Minn.

ELECTRIC RAILWAY. The Daft system will be employed here.

ST. PAUL CABLE RY. CO. The foundations are being laid for the terminal machinery at the foot of Fourth street. Col. Dudley, who represents the New York Cable Street Car Construction Co., says that arrangements have been made to put a large force of men at work at once. All the material will be on hand in a few days, and the line will be hurried towards completion.

Syracuse, N. Y.

PEOPLE'S R. R. Co. will begin work in September, and expect to open their road next April. They will have 5½ miles of track, of 4 ft. 8½ in. gauge, 45 cars, 165 horses. The company has a capital stock of \$300,000, and the officers are: President, J. R. Swan, Utica; Vice President, Daniel Candee, Syracuse; Secretary, S. A. Beardsley, Utica; Treasurer, C. H. Childs, Utica.

THIRD WARD RY. Co. Track laying will begin early in September, and it is expected that the road will be in operation by the 1st of December. It will start at the Empire House, run along Genesee street to West street, thence up Park avenue across the "Sackett tract" to Genesee street, west to Willis avenue, and thence to the city line near the soda ash works. The distance is a trifle over three miles and a quarter. The Daft electric system, with Sprague truck and bearings, will be used. The cars will run at the rate of eight miles an hour, or as fast as an ordinary horse car, but can run ten miles an hour, and even faster. The cars will be run on ten minute time, or oftener, if necessary. The metallic street railway will be em-

ployed. The generating station will probably be built about the middle of the route. The building will be of brick; and adjoining it will be the car sheds. The estimated cost of the road is \$80,000, which will include the electrical generating plant valued at \$20,000. The branch to Burnet Park will not be built this year, as the park is not far enough advanced.

GENESEE & WATER ST. R. R. Co. increase from 35 horses to 47.

CENTRAL CITY RY. Co. have now 14 cars and 48 horses.

PALMYRA ST. SURFACE R. R. Co. expect to begin work early in September, and to finish the road by the 1st of December. It will have 2 miles of track, of 4 ft. 8½ in. gauge, 36 lb. rail, 4 cars, 10 horses. The capital stock is \$30,000. John Hadcock of Chicago is President, William A. Beach of Syracuse Vice President, and T. D. Brewster of Syracuse Secretary and Treasurer.

HUDSON ST. SURFACE R. R. Co. will begin construction in September, and the road will be opened about Nov. 20. It will be 2 miles long, of 4 ft. 8½ in. gauge, 36 lb. rail, 5 cars, 12 horses. President, D. C. Hadcock; Vice President, W. A. Beach; Secretary and Treasurer, T. D. Brewster. Capital, \$30,000.

LYONS ST. SURFACE R. R. Co. will begin work on their road in September, and expect to open it by the close of November. It will have 2 miles of track, of 4 ft. 8½ in. gauge, 36 lb. rail, 4 cars, 12 horses. The company has a capital stock of \$30,000, and the officers are: President, William A. Beach; Vice President, D. C. Hadcock; Secretary and Treasurer, T. D. Brewster.

Tarpon Springs, Fla.

A STREET RAILROAD will probably be built here this winter.

Topeka, Kan.

TOPEKA RAPID TRANSIT RY. Co. have 12 of their 30 miles constructed, and have probably already opened their line. The road is of 4 ft. 8½ in. gauge, with 35 and 38 lb. rail, 24 cars, 12 steam motors. Capital stock, \$250,000. Officers: President, John Francis; Secretary, J. B. Bartholomew; Treasurer, John Norton; Superintendent, J. F. Gwin.

Toledo, O.

TOLEDO CONSOLIDATED ST. R. R. Co. are double tracking the Broadway line a distance of 1½ miles with 42 lb. tram rail. Six new 16 ft. box cars of the Brownell & Wight make have recently been added. The track to the Union depot is also being extended. They have just completed a new barn 100 ft. in length, in Adams street, also one 60 ft. in length, on Monroe street, is under construction.

Tuskaloosa, Ala.

NEW DUMMY LINE. Ties and supplies are arriving, and work is being pushed forward rapidly.

Union Springs, Ala.

UNION SPRINGS ST. CAR Co., of which T. H. Mabson, Jr., is Secretary, have been laying track this month. The cars have been ordered.

Waco, Tex.

WACO ST. RY. Co. has 8 miles of track, 15 cars and 55 mules.

Waltham, Mass.

WALTHAM & NEWTON ST. RY. Co. has now 8 cars and 20 horses.

Westfield, Mass.

WESTFIELD ST. RY. Co. ask for a franchise for a street railway to be run by electricity with an overhead conductor, and right to lay tracks on Elm, Broad, Silver and Court streets and Day avenue. Two New York men with capital to invest furnish the bulk of the money to secure the plant, and offer to take the entire \$25,000 of capital stock in case the local business men who have pledged \$6,000 or \$8,000 to the enterprise wish to withdraw. The Selectmen have agreed to grant a franchise, but with certain requirements that the projectors wish rescinded. The changes asked include the laying of T rails instead of flat or grooved rails, hardening inside the track and 18 inches on the outside instead of paving. It is stated that the paving would cost \$6,000. It is thought the changes will be granted. The road will be 2½ miles long.

Wheeling, W. Va.

WHEELING RY. Co., with a capital of \$10,000, has been incorporated and received permission to build an electrical street railroad. The incorporators are N. Riester, J. M. Sweeney and E. W. Dunaway.

CITIZENS' RY. Co. contemplate extending their road.

Wichita, Kan.

WICHITA RIVERSIDE & SUBURBAN R. R. Co. have 6 of their 10 miles in operation already. The road is of standard gauge, 35 lb. rail, 8 cars, 6 electric motors. The company has a capital stock of \$100,000. J. O. Davidson is President and Treasurer, and Thomas G. Fitch Secretary.

Woonsocket, R. I.

WOONSOCKET ST. RY. Co. The first car was run over the line Aug. 1, drawn by horses, as the electric motors would not be ready till the end of the month. The overhead system of wire has been adopted, and the cars will be lighted by electricity. A part of the basement of the Providence & Worcester R. R. station will be used for a waiting room. The company has a capital stock of \$100,000 and the following officers: President, Horace A. Jenckes; Secretary, Willard Kent; Treasurer, Francello G. Jillson. They have 7 miles of track, of 4 ft. 8½ in. gauge, 30 and 50 lb. rail, 20 cars.

Wooster, O.

ELECTRIC RAILWAY. A number of leading citizens have petitioned the City Council for the right to construct and operate an electric railway on the principal streets of the town.

Worcester, Mass.

THE LAKE QUINSIGAMOND ROAD, 4 miles, is to be changed from steam to electricity. The Daft system will be used.

Yonkers, N. Y.

YONKERS R. R. Co. Cars have commenced running on the New Palisade avenue branch.

Julius S. Walsh on Cable Roads.

President Walsh, of the Citizens' and other St. Louis lines, said recently: "The Citizens' line, which is now being cabled, will be finished under the contract by the 15th of September, and will be commercially open ten days later. We have put a million dollars into the improvement, besides the losses sustained by the shrinkage of old property (horses, for instance) on our hands, and are certainly as anxious as the public can possibly be to begin active business. Some of the advantages of the cable will be apparent when it is known that there will be no change of cars to the Fair Grounds nor to King's Highway, giving an uninterrupted transit from Fourth street through.

"Our old equipment will bring about the same relative value in the market that second-hand furniture does at an auction sale. Used up street car mules are not cash by any means. Converting to a cable is almost a total waste of horse property. We will use the cars now on the road, attaching grips to some of them, until January 1, when the road will be newly equipped throughout. Two cars will be run together and they will pass over the road every two minutes.

"The maximum rate of speed for cable cars is fourteen miles an hour, and if the city will grant us permission, we will travel at that pace, after leaving the town proper. Down town the rate will be about eight miles an hour. It would be dangerous to go faster.

"Are cables really very dangerous?"

"Cable cars were first introduced in San Francisco in 1873, and statistics go to show that they are really less dangerous than the horse cars. You smile; but it is a fact nevertheless.

"St. Louis will ultimately be supplied with cable lines. Of that there is no doubt. The system is only two years old here, and is in high favor."

"Do you think it will finally supersede the old horse car style entirely?"

"No; the cost of cabling is too great. A town never grows too large to furnish patrons for small enterprises. Roads whose receipts for ten years would not cable one-fourth their length, may some day undergo this change, but other horse lines will grow up in their stead."

Louisville Street Cars.

Few Louisville people have a proper appreciation of the street car facilities of this city. I believe it is no exaggeration to say the system and service are the finest of any city in the world. This is a pretty sweeping statement, but I am confident it can be substantiated. No matter how large the crowd or at what distant point it is collected, it can be handled easily and speedily by our street car lines. I doubt if an assemblage of even 15,000 could stagger the car companies here or exceed their resources. They seem able to cope with any sized multitude at any

point. The system of transfer also is the most complete that can be devised, and enables a passenger to go where he will for a single fare. The cars also are large, airy and comfortable, and ride easy. Competition is doubtless largely responsible for this, but whether it is or not, one thing is certain—we have the best that can be procured.—Louisville Post.

Sunstroke in Horses.

The symptoms of sunstroke in a horse are that the head droops, the eyes have a stony glare, the skin gets dry and begins to shrivel up, and the animal drags himself along as if he could scarcely keep his feet. An animal in that condition should be instantly unharnessed and carefully treated. The ordinary course is to douche the horse's head first with ice water, just as the doctors would with a human being. The disease and the cause are the same in the horse's case as in the man's. The blood is heated up to an extraordinary degree and rushes to the head. The quicker it is sent back through the natural channels the better. After the application of the ice water, some stimulant should be given to restore strength. Any of the ordinary stimulants are good, but brandy or whiskey or aconite is generally used. Then the horse should be allowed to rest, and if he is not too far gone he will recover. If the disease is treated in time the proportion of death among horses is no greater than that in the case of sunstroke among men.

In New York during the hot season the street railway companies established relays along the route, and whenever a horse showed symptoms of sunstroke or illness from any other cause, the car was stopped and a fresh animal sent for. In spite of these precautions, however, the mortality was great. In July the Society for the Prevention of Cruelty to Animals took charge of 165 cases, in 150 of which the horse had to be killed. Most of these were car horses.

Street Railway Exchange.

Parties wishing to buy or sell street railway property of any kind will do well to make use of our department of "Special Notices." By reference to that column it will be seen that no charge will be made for such advertising if it is preferred to have us take the chances and give us a commission if sale or purchase is effected. Our object in making this offer is not speculation, but to bring the department into more general use, as its merits deserve.

General Managers, Superintendents, Foremen and others who wish to secure positions, or companies requiring such positions filled, can make their wants known to the street railways of the country by this means, and will usually find it to their advantage to put in an ad. The commission plan also applies to these cases; and whether advertised or not we should be

glad to learn of your wants, as we frequently have inquiries for men and positions and for property.

NEW PUBLICATIONS.

CABLE OR ROPE TRACTION ON STREET AND OTHER RAILWAYS, by J. Bucknall Smith, C. E., is a work reprinted from London Engineering, and just brought out by John Wiley & Sons, 15 Astor place, New York. Price \$2.50.

This book, of 195 7" by 10" pages, is illustrated, has a complete index, is well gotten up, and has chapters on "Mining and Rope Railway Haulage;" "Street Cable Tramways in California;" "The Chicago, Philadelphia, New York, etc., Cable Lines;" "New Zealand Cable Railways;" "Cable Traction in Europe and Australia;" "Cost of Constructing and Working the System;" "Considerations in Tramway Working;" "The Manufacture of Wire Rope and Their Appliances;" and an appendix. Further reference to the work will be made in a later issue of the JOURNAL.

POOR'S DIRECTORY OF RAILWAY OFFICIALS.

The second annual number of this publication, issued by the publishers of Poor's Manual, has been received. It contains not only a directory of railroads with their officials, arranged alphabetically as to name of road, but also special lists of General Managers, Superintendents, Chief Engineers, Freight and Passenger Agents, Master Mechanics, Master Car Builders, Master Car Painters and Purchasing Agents; also a list of the manufacturers of rails, engines, cars, axles, springs, wheels, etc. The book is not gotten up in quite as good style as the Manual, and the aim seems to have been to furnish everything and thereby suit all, rather than to arrange the book with reference to any special requirements. While it may, therefore, be a little confusing on account of the mass of matter it contains, it is certainly very complete, and to him who becomes familiar with its arrangement will be very useful. In its preface it states that the length of the railroads of the United States at the present time is 140,900 miles, and that in their construction over \$8,500,000,000 have been expended, and that their earnings in 1887 will exceed \$900,000,000; that at the close of 1887 120,000 miles of line will be in operation in the United States.

JACOB SHARP has been granted a stay of proceedings by Judge Potter on the ground that Sharp was compelled to testify against himself.

The overhead system is applicable to its own particular purposes, to a line running. Where there are only five or ten, or even twenty cars running on one line, and that line runs through a suburb or a part of a city where there are not many houses, that system is to be preferred.—A. Reckenzaum.

AMONG THE SUPPLY MEN.

Bridgeport, Conn.

BURNS, SILVER & Co., manufacturers of cabinet hardware and railway specialties, are building an addition to their factory, 40 by 100 ft. in size, to accommodate their rapidly increasing trade. Their present force consists of 70 skilled workmen. Their New York office is 13 Barclay street.

Chicago, Ill.

THE FOLLOWING letter from B. C. Faurot, President of the Lima (O) Street Railway, Motor & Power Co., to A. K. Stiles, Manager Van Depoele Electric Manufacturing Co., Chicago, speaks for itself:—

"DEAR SIR:—This is to certify that I bought of the Van Depoele Electric Manufacturing Co. of Chicago, on the 31st day of January, 1887, the electrical machinery for the Lima Street Railway, of Lima, O.

"My contract with the Van Depoele people was that they were to guarantee the power (sixteen hours being a day's work and the cars running eighty miles per day and carrying forty passengers each trip) should not cost over two dollars per car per day and that I was to have a trial of six months before final settlement was made or required. I have operated these cars about forty days and have so thoroughly satisfied myself of the worth of the system that I have settled and paid the company in full.

"I find from actual trial, with new track and cars and everything close and tight, making the cars require more power than they do to-day and very much more than they will three months hence, that the actual figures for cost for power alone show less than one dollar per day per car for a run of seventeen hours and does not exceed three dollars per car per day for the entire expense.

"I have no hesitancy in saying to the public that it is a grand success, and that too much cannot be said in its favor.

"Any one doubting the truthfulness of this report will do well to visit Lima and investigate for themselves.

"Respectfully yours,

"B. C. FAUROT, Pres."

Cleveland, O.

HATHAWAY & ROBISON are receiving orders for their transfer and turn-tables from various parts of the country. Among recent ones may be named those from Denver and Richmond, Va.

FULTON FOUNDRY has just sold turn-tables to the Cincinnati St. Ry. Co.; the Hastings (Neb.) Improvement Co.; and the Sioux City (Ia.) Street Railway. Their recent orders have included the complete equipment of roads, including cars, steel rails and entire track.

Jersey City, N. J.

DAFT ELECTRIC LIGHT Co. The electric railways which this company now have in operation are the Baltimore & Hampden, which has been running for two years; the Los Angeles, Cal., for eight months; the Mansfield, O., $4\frac{1}{2}$ miles of track and 5 cars of 15 H. P. each; and the Asbury Park, N. J., 4 miles of track and 15 cars of 15 H. P. each, just started. The Pittsburgh equip-

ment is referred to in the notes under that head. The Daft company is in consultation for tractive systems involving novel and difficult conditions, at St. Paul, Minn., and Springfield and Worcester, Mass.; also for roads of the customary type at Oswego and Ithaca, N. Y., Easton, Pa., Findlay, O., and Pasadena, Cal. The motor Franklin, for the Ninth Avenue Elevated Railroad, will also be in regular operation during the autumn. She might have been run some time ago, but the pressure of work whose completion was compulsory at specific dates thrust it temporarily in the background.

New York, N. Y.

JOHN STEPHENSON COMPANY, LIM., are now constructing cars for the following places, representing 18 States of our Union, as well as other countries: Boston, Lowell, Taunton and Stoneham, Massachusetts; Meriden, Connecticut; New York City, Brooklyn, Newburgh, Rome, Utica, Elmira, Binghamton, New York; Elizabeth, Orange and Keyport, New Jersey; McKeesport, Pennsylvania; Atlanta, Georgia; Jacksonville and Pensacola, Florida; Nashville, Knoxville and Columbia, Tennessee; Baltimore, Maryland; Washington, District of Columbia; St. Louis and Kansas City, Missouri; Arkansas City and Topeka, Kansas; Pine Bluff, Arkansas; Omaha and Lincoln, Nebraska; Oakland and San Bernardino, California; Owensboro, Paducah and Covington, Kentucky; Cincinnati, Ohio; Burlington, Vermont; also for Ottawa, Ont., Mexico and New Zealand. They are adapting cars to both the cable and electric motors.

WARNECK & TOFFLER report among recent sales of car mats two good shipments to London, England, effected to Purdy & Huntington Co. They have also supplied the following lines: Harlem Bridge, Morrisania & Fordham R. R.; Laconia & Lake Village Horse R. R.; Albany Ry.; Concord Horse R. R.; Northampton St. R. R. Co.; Richmond City R. R.; Steinway & Hunter's Point R. R., etc. Although their rolling matting has been greatly improved, the old price only is charged.

St. Louis, Mo.

THE BROWNELL & WIGHT CAR Co. are now building an extensive addition to their works, which when completed will double their capacity, making the most

extensive plant for the manufacture of street cars in the West. They report a larger amount of work on hand than ever before, with good prospects for the future.

BUSINESS NOTES.

AUGUSTUS DAY, manufacturer of track scrapers, Detroit, Mich., will make liberal discounts on scrapers from former price on prompt payment, and especially on foreign orders and from the extreme South and West.

THE EAST SAGINAW, MICH., HERALD, speaking of the Port Huron Van Depoele electric railway, says, "The success of this system has convinced street car men that the horses must go, more especially since it has been fully demonstrated that cars can be run by electricity for one-half the cost of running by horses."

CHARLES B. MILLER, the success of whose Magnolia metal has been mentioned from time to time in these columns, has prepared to meet the increasing demand for his metal and brasses complete by leasing a factory 90 by 100 ft. at 44, 46, 48 and 50 Jay street, Brooklyn. His office will be at 102 Chambers street, New York. The metal is meeting with hearty approval.

THE FOLLOWING refers to the Van Depoele electric system:—

APPLETON, WIS., April 27, 1887.

Mr. A. K. STILES, Manager Van Depoele Electric Manufacturing Co., Chicago, Ill.

DEAR SIR:—I have been trying to get time to write for several days, but have been moving into my new house. I promised to write and give the weak points about our street railway, so far as I could.

Our road, as you know, commenced operating August 16th last; except a few weeks to get the track all right, and get the cars limbered up, we had a continuous run. The snow we found we could master, and did with the electric cars, pushing a snow plow which we made ourselves.

The overhead wire, which we feared would give us the most trouble, has never bothered us to exceed two hours twice this winter, although the telephone and telegraph wires were made useless for their business many times. We know that we have made more hours and better time all winter than we could possibly have done with animal power. We operate our road three miles in schedule time, with three cars regularly, and the time does not vary a minute any day at the switches, or at the end of the line. We run five cars on busy days. I do not need to elaborate: we cannot find any fault with the system. The wires have not been touched since last fall, and the motors are doing their work perfectly. The travelers are doing well. The dynamo I have not heard from for a long time, although a new man is running it. All of the help that we have are new at the business, yet all runs like a clock.

Surely your system must find its way into more places than you can equip. Hundreds have been here to examine our road, and, without an exception, have been perfectly satisfied that electricity is the future power for street railways on account of its simplicity, reliability, rapidity and neatness.

You may quote our company and our citizens as for it, first, last and all of the time.

Respectfully,

J. E. HARRIMAN,
President.

STREET RAILWAY STOCK QUOTATIONS.

PROVIDENCE STOCKS.—Corrected by CHACE & BUTTS, Bankers, Providence, R. I.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Union R. R. Co., Prov.....	100	\$1,500,000	Q.—J.	8	July, 1887.	200	204
Pawtucket St. Ry. Co.....	100	270,000	New.	New.		107½	110

NEW HAVEN STOCKS.—Corrected by H. C. WARREN & Co., Bankers & Brokers, New Haven, Conn.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Fair Haven & Westville R. R. Co....	25	\$301,000	J. & J.	4	January, 1887	136	
State Street Horse R. R. Co.....	25	23,000	J. & J.	3	January, 1887	100	
" Bonds.....		12,800	J. & J.	7		110	
New Haven & West Haven R. R. Co.	25				12	
New Haven & Centerville H. R. Co.							
Whitney Ave. Ry. Co.....	50	25,000				6	
Bridgeport Horse R. R. Co.....	100	140,000					
" Bonds.....	1,000	50,000		6			

STREET RAILWAY STOCKS.—Continued.

NEW YORK STOCKS.—Corrected by H. L. GRANT, 145 Broadway, New York.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Bleecker St. & Fulton Ferry	100	\$900,000	J. & J.	5	January, 1887	28	31
1st mort.	1,000	700,000	J. & J.	7	July, 1890	114	115
Broadway & Seventh Avenue	100	2,100,000	Q.—J.	2	January, 1886		180
1st mort.	1,000	1,500,000	J. & D.	5	June, 1904	100	103
2d mort.	1,000	600,000	J. & J.	5	July, 1914	103	105
Broadway Surface Guaranteed.	1,000	1,500,000	J. & J.	5	July, 1924		100
Additional	1,000	1,000,000	J. & J.	5	July, 1905		100
Brooklyn City—Stock	10	2,000,000	Q.—F.	2	May, 1887	124	130
1st mort.	1,000	800,000	J. & J.	5	January, 1902	106	110
Brooklyn Crosstown	100	200,000	A. & O.	4	April, 1887	160	165
1st mort bonds	1,000	400,000	J. & J.	7	July, 1888	105	109
Central Park, North & East River	100	1,800,000	Q.—J.	2	January, 1887	78	81
Con. mort. bonds	1,000	1,200,000	F. & D.	7	December, 1902	120	121
Christopher & Tenth	100	650,000	F. & A.	1	August, 1887	120	125
Bonds	1,000	250,000	A. & O.	7	October, 1898	110	111
Central Crosstown	100	800,000	Q.—F.	1	July, 1887	145	150
1st mort.	1,000	250,000	M. & N.	6	November, 1922	118	125
Dry Dock, East B'way & Battery	100	1,200,000	Q.—F.	2	August, 1887	145	150
1st mort. consol.	500	1,900,000	J. & D.	7	June, 1893	108	111
Scrip.	100	1,200,000	F. & A.	6	August, 1914	105	107
42d & Grand St. Ferry	100	748,000	Q.—F.	3	August, 1887	204	210
1st mort.	1,000	236,000	A. & O.	7	April, 1893	110	112
42d St., Manhattan & St. Nich. Av.	100	2,500,000				38	42
1st mort.	1,000	1,200,000	M. & S.	5	1910	108	110
2d mort. in. bonds	1,000	1,200,000	J. & J.	6	1915	60	63
Eighth Avenue—Stock	100	1,600,000	Q.—J.	2	July, 1887	155	160
Scrip.	100	1,000,000	F. & A.	6	August, 1914	105	110
Houston, West St. & Pavonia Ferry	100	1,000,000	Q.—F.	2	August, 1885	150	160
1st mort.	500	250,000	J. & J.	7	July, 1894	110	111
Second Avenue—Stock	100	500,000	J. & J.	5	January, 1887	118	121
1st mort.	1,000	1,862,000	M. & N.	5	November, 1909	104	106
Consol.	1,000	650,000	M. & N.	7	November, 1887	101	103
Sixth Avenue	100	1,050,000	M. & S.	3	August, 1887	175	180
1st mort.	1,000	500,000	J. & J.	7	July, 1890	110	112
Third Avenue—Stock	100	2,000,000	Q.—F.	3	August, 1887	210	220
1st mort.	1,000	2,000,000	J. & J.	7	January, 1890	110	112
23d St.—Stock	100	600,000	F. & A.	5	August, 1887	225	230
1st mort.	1,000	250,000	M. & N.	7	May, 1893	110	113
Ninth Avenue	100	800,000				107	112
Chicago City Railway	100				September, 1885	299	325

PHILADELPHIA STOCKS.—Corrected by ROBERT GLENDINNING & Co., 303 Chestnut st., Philadelphia.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Citizens	50	\$500,000	Q.—J.				
Continental	50	1,000,000	J. & J.				125
Frankford & Southwark	50	750,000	Q.—J.			270	272
Germantown	50	1,500,000	Q.—J.			91	95
Green & Coates	50	600,000	Q.—J.				116
Hestonville	50	2,050,000				25	
Lombard & South	25	500,000					95
People's	25	1,500,000					34
Philadelphia City	50	1,000,000	J. & J.			140	145
Philadelphia & Gray's Ferry	50	617,500	J. & J.			85	90
Philadelphia Traction	50	5,000,000				67	68
Ridge Avenue	50	750,000	Q.—J.				
Second & Third	50	1,060,200	Q.—J.			155	
Seventeenth & Nineteenth	50	500,000	J. & J.				
Thirteenth & Fifteenth	50	1,000,000	J. & J.				150
Union	50	1,250,000	J. & J.			160	185
West Philadelphia	50	750,000	J. & J.			165	180

BOSTON STOCKS.—Corrected by R. L. DAY & Co. 51 State st., Members of Boston Stock Exchange.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
Metropolitan	50	\$2,000,000	J. & J.	10	July, 1887	107	110
South Boston	50	750,000	J. & J.		July, 1886	105	110
Boston Consolidated	100	1,700,000	J. & J.	8	July, 1887	130	135
Cambridge	100	1,950,000	J. & J.	5	January, 1887	110	112

ST. LOUIS STOCKS.—Corrected by JAMES CAMPBELL, Banker & Broker, 307 Pine st., St. Louis, Mo.

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
STOCKS.							
Benton-Bellefontaine	100	\$400,000	Jan.	1½		95	100
Cass Ave. & Fair Grounds	50	300,000				80	
Citizens'	100	1,000,000	Apl. '76	1½		65	70
Forest Park & LaCledé	100	100,000				100	
Jefferson Avenue	100	112,000				100	
Lindell	100	600,000	June	2		110	125
Missouri	100	600,000	April	2		150	
Mound City	100	125,000				103	107
Northern Central	100	300,000					
People's	50	300,000	June	2		40	42½
St. Louis	100	900,000	May	2		50	55
Tower Grove	50	300,000	Jan.	.50			9
Union	50	600,000				13	15
Union Depot	100	400,000				75	80
St. Louis Cable	100	1,000,000					

Company.	Par.	Capital.	Period.	Rate.	Date.	Bid.	Asked.
BONDS.							
Benton-Bellefontaine	1,000	\$50,000	A. & O.	6	1880	102	
Cass Avenue	1,000	20,000	F. & A.	6	1886	102	
Citizens'	1,000	200,000	J. & J.	6	1882	103	
Lindell	1,000	87,500	F. & A.	7	1879	102	
Mound City	1,000	125,000	J. & J.	6	1884	102	
People's 1st mort.	1,000	125,000	J. & D.	6	1882	103	
" 2d mort.	1,000	75,000	M. & N.	7	1886		
Northern Central	1,000	200,000	J. & J.	6	1884	102	
St. Louis Cable	1,000	600,000	M. & N.	6	1884	105	
Union	1,000	150,000	M. & N.	6	1885	102	
Union Depot	1,000	350,000	A. & O.	6	1886	102	102½

SPECIAL NOTICES.

TO RAILWAY OFFICIALS.

SELLING ON COMMISSION.

In order to make known the value of the STREET RAILWAY JOURNAL as a medium of communication between the buyer and seller of street railway property or services, we will insert advertisements of property "Wanted" or "For Sale," "Position" or "Help Wanted" free of charge, unless sale or purchase is effected. In case sale or purchase is effected the price to be paid for the advertisement will be five per cent of the amount of the transaction brought about by the advertisement.

DESCRIPTION SHOULD BE SENT US

Of property advertised on commission. In case of Position Wanted, names of references, salary expected, experience and other particulars should be given.

REGULAR CASH RATES.

When not inserted on commission, Wants, For Sale, etc., are charged at the rate of ten cents per line, about eight words to a line. Street Railway Companies, or their Officers, may send advertisements to be billed and paid for after insertion.

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Please state whether ad. is to be paid for at regular rates or on commission. If more convenient for advertiser the advertisement will be written at this office, full particulars being sent to us. Unless parties are known to us or appear in some of our directories, cash should accompany ad.

FOR SALE.—A full-sized Andrews Improved Snow Plow and Sweeper. Been used only six times. Would exchange for open cars in good condition. WATERBURY HORSE R. R. Co., Waterbury, Conn. 14

WANTED.—Workmen experienced in the construction of street car bodies and the application of the side wood-work to the same. Address H. H. SESSIONS, Supt. of Construction, Pullman Car Works, Pullman, Ill.

FOR SALE.—We have one second-hand 16 ft. closed, eight window, Horse Car for sale. This Car is in thorough repair and will be repainted and relettered to suit purchaser. It is fitted with floor racks, center lamp, carpet seats, bronze trimmings, and can be arranged to receive fare boxes. Immediate delivery. Price F. O. B. New York City, \$600.00, RUFUS MARTIN & Co., 13 Park Row, N. Y.

WANTED.—A position as General Manager on a new or old established Street Railway by thoroughly practical man. Location no object, and willing to work for a small salary. Can give the best of New York City references. Parties wanting a man who is able to look sharp after the interest of the company, will please address J. L. D., care of STREET RAILWAY JOURNAL, 113 Liberty street, New York.

AN experienced and thoroughly practical Street R. R. man, at present filling combined positions of Supt., Secy and Accountant desires a change, location no object; would prefer taking hold of large failure or entire charge of operating a medium sized road A 1 opportunity for a President or Company to secure a first-class, reliable, all-round man. Excellent references from former and present R. R. Co's. Address General Manager, care of STREET RAILWAY JOURNAL, 113 Liberty street, N. Y. City.

FOR SALE.—A first-class Street Railway line in a thriving city in Indiana. Four miles of track, mostly paved with cobble, 9 cars, 46 animals, good barn and car house. Franchise very valuable, being in perpetuity over all streets in the city. Profitable extensions can be made. Road in good condition and doing good paying business. Address "OWNER," care STREET RAILWAY JOURNAL, 113 Liberty street, New York.

Steel Rails.

COMPLETE OUTFIT FOR

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Light sections Rails & Spikes in stock.

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HUMPHREYS & SAYCE,

No. 1 Broadway, New York.

The Julien Electric Company.

OFFICE, 120 BROADWAY, N. Y

FACTORY, CAMDEN, N. J.

Electric Street Cars on Secondary Battery Principle.

EDMOND JULIEN, Engineer, of Brussels, Belgium, is the inventor both of the Traction System and Secondary Battery System of this company. The present car is the result of six years of unceasing experiments, carried on at his works in Brussels and on the streets of that city, at great cost.

The leading principle of Mr. Julien's System has been the application of an Electric Motor and Batteries to the present existing rolling stock of street railways, and to construct a car so simple in its management that the drivers and conductors at present in charge of horse cars may take to the new service as easily as to the old. Mr. Julien, after running an Electric Car on the Rue de la Loi in Brussels, during the years 1884 and 1885, and ascending a grade of 5 per cent on that street, put his car in service at the Antwerp International Exhibition of Mechanical Traction in May, 1885, and ran it daily a distance of 57 miles, sometimes drawing an ordinary street car, both cars filled with passengers, and in competition with steam and compressed air motors; and the jury, consisting of eminent Engineers from England, Germany, France and Belgium, awarded Mr. Julien the First Prize and Diploma of Honor for the best System of Mechanical Traction for street cars.

At the end of this Exhibition, Mr. Julien placed two cars on the streets of Hamburg, and afterwards added a third. Those cars have now been running since February, 1886. They each make 69 miles a day and in one place over a 4 per cent grade, carrying passengers; and, although the municipal requirements of Hamburg were very exacting, yet the Electric car has so satisfactorily met them, that it has been adopted in that city. Readers are requested to write to Hamburg to satisfy themselves. The batteries used upon these cars were examined by the municipal officers two months ago, and were found in as perfect condition as when they were first put in the cars.

In April, 1886, Mr. Julien closed a contract with all the Brussels street railways, whereby they have agreed to adopt his System and to put 107 cars in use in Brussels. They are now ready to put three lines of Mr. Julien's system in service, if they have not already done so. The street railways at Rio Janeiro have also adopted Mr. Julien's system.

Last June, Mr. Julien placed two of his cars in service on the Champs Elysees under the supervision of ten members of the International Society of Electricians of France, M. Fontaine at the head. They did service between the Place de la Concorde and the Palais de l'Industrie during the entire summer, and, at the end of the Exhibition, were awarded a first prize and Diploma of Honor. Mr. Julien's Batteries were also put in competition there with those of Faure and Plante under the supervision of Mr. Hospitalier, an eminent Electrician; and Mr. Julien was awarded the first prize and a Diploma of Honor. The Faure and Plante batteries received a third prize and silver medal. Mr. Julien's car, which is now exhibited on Eighth Avenue, New York City, is working its way into favor and has been so adapted to the new conditions arising from sharp curves and an irregular track, as to travel easily at a rate of eight and one-half ($8\frac{1}{2}$) miles an hour and carrying a full load.

COST.

The cost of Installation of Mr. Julien's System is about the same as that of horse system. It is, in all probability, less; and, once installed, the expense of maintaining it is, of course, much less. In Brussels, this expense has been found, after an examination, covering a period of nearly a year, by a committee of Street Car men, to be a little over Three Dollars (\$3.00) a day for each car. In this country, the expense will not exceed Four Dollars (\$4.00) per day. From our observations on the Eighth Avenue line, it will be less than that on that line, owing to the favorable nature of the grades. The cost of horse traction is deemed to be at least Seven Dollars (\$7.00) a day. We speak, of course, of two-horse cars.

The manipulation of the System is far easier than that of the horse system. Each car will require about three horse power in the way of steam engine, so that a road maintaining, say, 40 cars, would require three 60 horse power engines, one engine being in reserve. The dynamic power required is the same. Each car will require about three tons of battery; this will enable the car to be run about 80 miles a day with but one change of battery. It requires

about eight hours to charge each battery. The three tons will be divided into two batteries, one being charged while the other is being used on the car. The batteries are ranged on either side of the car on benches; when the car comes in from service and its batteries are exhausted, it is run up between empty benches, which are on a level with the panels of the car, the panels are let down and the batteries are easily drawn out on greased rods. Adjoining the empty benches are the benches with the charged batteries, which take the place of the discharged ones.

Mr. Julien's batteries being made on a new principle—that is, *inoxidizable support plates*—are found to have an unlimited life and to be capable of being run up to a very high intensity without any injurious effect. In heavy grades, and going around curves, the current may be run up to 70 amperes without any fear of injury to the battery. As all Electricians know, Mr. Julien's is the only battery that can pretend to stand so high an intensity. Yet it may be seen every day on the Eighth Avenue road. The motor required for a large car will vary, according to the grades of the road, from 7 to 10 horse power. We do not consider it economical to overcome long grades of more than 5 per cent, though of course the car may be made to overcome much higher grades than this, especially for short distances. Curves should be at least 40 feet radius, although, on the Eighth Avenue road, we are compelled to run around curves of only 29 feet radius; yet there is an element of danger to the gearing of the car in so short a curve.

Next to Mr. Julien's motor, which is especially adapted, by its simplicity, for use on a Street Car, the Electrical Regulator is worthy of admiration. It is placed at either end of the car and controls so effectively and so methodically the application of power that an ordinary driver may learn the use of it with entire success in less than a few hours. Of course, railroads using this Company's cars will be enabled to light their stables with the Secondary battery employed in the service; the cars are, of course, lighted from the same batteries. One company now adopting Mr. Julien's System are undertaking to light the streets along which the cars will run from their stables, thereby reducing the cost of their installation by getting a profit from the City.

JOS. A. SLEEPER, Pres.
W. A. STILES, Secy. and Treas.

CHAS. J. VAN DEPOELE, Electrician.
AARON K. STILES, Manager.

Van Depoele Electric Manufg. Co.

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ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION.

We respectfully call the attention of those interested to our Electric Railway System now in practical operation at Scranton, Pa., Appleton, Wis., Montgomery, Ala., Detroit, Mich., Windsor, Ont., Port Huron, Mich., Lima, O., and Binghamton, N. Y., and will shortly be running in Ansonia, Conn., St. Catharine's, Ont., and Brooklyn, N. Y.

EVERY ROAD A GRAND SUCCESS.

We say nothing about what we are GOING to do. We call your attention to what we HAVE DONE. Investigate for yourselves. Write for estimates and further information.
Address

Van Depoele Electric Manufacturing Company,

15, 17, 19 and 21 NORTH CLINTON STREET,

NEW YORK OFFICE :

Rooms 220, 221 and 222, No. 45 BROADWAY.

CHICAGO, ILL., U. S. A.

EASTON, PA.—Easton, So. Easton & West End Pass. Ry. Co. 4 m, 5-2 1/2 g, 45 lb r, 11 1-h c, 36 h. Pres. H. A. Sage, Sec. & Treas. H. W. Cooley, Gen. Supt. Elisha Burwell.

EAU CLAIRE, WIS.—Eau Claire St. Ry. Co. 5 m, 4-8 1/2 g, 27 lb, 42 lb center bearing steel, and 60 lb grooved steel r, on all curves, 16 c, 80 h. Pres. A. G. Bradstreet, New York, V.-Pres. Geo. B. Shaw, Eau Claire, Sec. & Treas. Weston Lewis, Gardiner, Me.

ELGIN, ILL.—Elgin City Ry. 2 1/2 m, 4-8 1/2 g, 25 lb r, 4 c, 18 h. Pres., Sec., Treas. Supt. & Owner, B. C. Payne.

ELIZABETH, N. J.—Elizabeth & Newark Horse R.R. Co. 14 m, 5-2 1/2 g, 4-10 1/2 g, 30 lb r, 24 c, 74 h. Pres. & Treas. Jacob Davis, Sec. & Supt. John F. Pritchard. 6 Elizabeth St. Ry. Co. Pres. & Supt. Amos Clark, Sec. & Treas. John P. Earl.

ELKHART, IND.—Citizens' Ry. Co. 4 1/2 m, 4-8 1/2 g, 30 lb r, 7c, 25 h. Pres. F. W. Miller, V. Pres. J. W. Ellis, Sec. C. W. Fish, Treas. J. A. Cook, Man. Director, J. A. Kavanagh. Office, 101 N. Main st.

ELMIRA, N. Y.—Elmira & Horseheads Ry. Co. 10 m, 4-8 1/2 g, 25-30-40 lb r, 18 c, 34 h. Pres. & Treas. George M. Diven, V. Pres. Geo. W. Hoffman, Sec. Wm. S. Kershner, Acting Supt. B. F. Jennings. Office, 212 E. Water st.

EL PASO, TEX.—El Paso St. Ry. Co. 6 m, 4-8 1/2 g, 30-40 lb r, 18 c, 40 mu. Pres. J. F. Crosby, V. Pres. B. H. Davis, Treas. C. R. Morehead, Sec. & Supt. G. N. Marshall. Office, 175 Seventh st.

EMPORIA, KAN.—Emporia City Ry. Co. 3 1/2 m, 3-6 g, 20 lb r, 8 c, 24 h. 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, 21 lb r, 2 c, 6 h. Pres. John Kampe, V. Pres. E. B. Gaston, Sec. & Treas. J. W. Gaston.

ERIE, PA.—Erie City Passenger Ry. Co. 8 1/2 m, 4-8 1/2 g, 30, 40 & 45 lb r, 20 c, 85 h. Pres. W. W. Reed, Treas. Wm. Spencer, Sec. J. L. Sternberg, Supt. Jacob Borst. Office, cor 2d & State sts.

EVANSVILLE, IND.—Evansville St. Ry. Co. 12 m, 4-8 g, 27 lb r, 32 c, 200 mu. Pres. John Gilbert, Sec. & Treas. W. S. Gilbert, Supt. T. J. Gist. Office, cor. First and Main sts.

FALL RIVER, MASS.—Globe St. Ry. Co. 16 m, 4-8 1/2 g, 35-40-45 lb r, 51 c, 210 h. Pres. Frank S. Stevens, Treas. F. W. Brightman, Sec. M. G. B. Swift, Supt. John H. Bowler, Jr. Office, 182 N. Main st.

FAR ROCKAWAY, N. Y.—Village Ry. Co. 1 m, 4-8 1/2 g, 47 lb r, 5 c, 10 h. Pres. C. A. Cheever, Treas. D. L. Haight, Sec. J. S. Auerbach, Supt. Rutus Martin. Office, 13 Park row, New York.

FITCHBURG, MASS.—Fitchburg St. Ry. Co. 3 1/2 m, 4-8 1/2 g, 35 lb r, 9 c, 35 h. Pres. H. A. Willis, V. Pres. H. I. Wallace, Treas. B. F. Wallis, Sec. H. C. Hartwell, Supt. & Pur. Agt. Wesley W. Sargent. Office of Pres. 131 Main st.; Supt., 41 River st.

FORT MEADE, FLA.—Fort Meade St. Car Co. 2 1/2 m, 3 g, 25 lb T r, 2 1-h c, 2 mu. Pres. J. A. Edwards, Sec. C. C. Wilson, Treas. J. G. Carter, Supt. G. Darbishire.

FORT SCOTT, KAN.—Bourbon County St. R. R. Co. 7 m, 4 g, 16 lb r, 5 c, 22 h. Pres. J. D. Hill, Sec. C. O. French, Treas. J. H. Richards, Supt. E. Strong.

FORT SMITH, ARK.—Fort Smith St. Ry. Co. 4 1/2 m, 3-6 g, 30 & 45 lb T steel and tram r, 18 1-h c, 56 mu. Pres. Sam'l M. Loud, Sec. & Treas. Geo. T. Sparks, Supt. W. A. Evers.

FORT WAYNE, IND.—Citizens' St. R. R. Co. 7 m, 4-9 g, 23 & 30 lb tram r, 2 1-h, 11 2-h c, 41 h. Pres. J. H. Bass, Sec. Jas. M. Barrett, Treas. C. F. W. Scheiman, Receiver S. C. Lumbard.

FORT WORTH, TEX.—Fort Worth St. Ry. Co. 7 1/2 m, 4 g, 25-30 lb r, 16 c, 89 mu. Pres. K. M. Vandant, Treas. W. A. Huffman, Supt. J. T. Payne.

FRANKFORT, N. Y.—Frankfort & Iilon Street Ry. Co. 2 1/2 m, 5 g, 5 c, 5 h. Pres. A. C. McGowan, Frankfort, Sec. & Treas. John A. Giblin, Iilon, Supt. Fredk. Gates, Frankfort.

FREDONIA, N. Y.—Dunkirk & Fredonia R.R. Co. 3 1/2 m, 4-10 g, 25 lb r, 5 c, 9 h. Pres. W. McKinstray, Sec. & Treas. M. M. Fenner, Supt. Z. Elmer Wheelock.

FREEPORT, ILL.—Freeport St. Ry. Co. 4 1/2 m, 4-8 1/2 g, 3 c, 48 h. Pres. Jacob Krohn, V.-Pres. F. C. Platt, Sec. W. G. Barnes, Treas. John B. Taylor, Supt. H. T. Warner.

FULTON, N. Y.—Fulton & Oswego Falls St. Ry. Co. 6,000 ft, 4 8/8 g, Gibbons' metallic stringer and r, 4 c, 8 h. Pres. Joseph Walker, Jr., V. Pres. N. N. Stranahan, Sec. and Treas. Chas. Lyman. Capital, \$15,000. Office, 15 Broad st., New York.

GAINESVILLE, FLA.—Gainesville City & Suburban Ry. Co. 1 1/2 m, 4-8 1/2 g, 20 lb T r, 5 c, 40 mu. Pres. Wm. H. Robertson, Treas. Jas. D. Matheson, Supt. & Pur. Agt. R. L. Robb.

GAINESVILLE, TEX.—Gainesville St. Ry. Co. 3 m, 3-8 g, 16 1/2 lb r, 4c, 22 h, 1mu. Pres. Sam. Lazarus, V. Pres. L. Dreyfoos, Sec. & Treas. Zac. Farmer.

GAINESVILLE, GA.—Gainesville & Hall Co. St. R. Co. 2 1/2 m, 4-8 1/2 g, 20 lb crescent r, 3 pas, 2 freight c, 8 mu. Pres. Jas. R. Barnes, Sec. C. W. Du Pre, Treas. & Pur. Agt. Robt. E. Green.

GALESBURG, ILL.—College City St. Ry. Co. 5 1/2 m, 4-8 1/2 g, 18-20-35 lb r, 9 c, 24 h. Pres. L. W. Sanborn, V. Pres. A. S. Hoover, Sec. & Supt. Geo. W. Delaney, Treas. J. K. Mitchell.

GALVESTON, TEX.—Galveston City R.R. Co. 25 m, 4-8 1/2 g, 30 lb r, 7c, 218 mu. Pres. Wm. H. Sinclair, Sec. & Treas. F. J. DeMeritt, Supt. M. J. Keenan. Office, cor. Twenty-first & 1st sts.

GARDEN CITY, KAN.—Garden St. Ry. Co. 4 GLENS FALLS, N. Y.—Glens Falls, Sandy Hill & Fort Edward St. R. R. Co. 8 c, 25 h. Pres. Henry Crandall, Sec. & Treas. B. B. Fowler, Acting Supt. Martin Byrnes.

GLOUCESTER, MASS.—Gloucester City R. R. Co. 4 m, 4-6 g, 35 lb r, 10 c, 90 h. Pres. Morris C. Fletcher, V. Pres. Walter A. Jones, Sec. D. G. Pearson, Treas. F. W. Homans. Office, Railroad ave.

GLOUCESTER, MA.—Gloucester City R. R. Co. 4 m, 4-8 1/2 g, 38 lb r, 13 c, 86 h. Pres. Morris C. Fitch, V. Pres. Walter A. Jones,

Sec. D. S. Presson, Treas. F. W. Homans, Supt. W. A. Strongman. Office, Railroad ave.

GRAND ISLAND, NEB.—Grand Island St. Ry. Co. 4 m, 4-6 g, 20 lb steel T r, 5 2-h 1-h c, 32 h. Pres. A. H. Baker, V. Pres. H. A. Koenig, Sec., Pur. Agt. & Supt. O. B. Thompson, Treas. Wm. A. Haggie.

GRAND RAPIDS, MICH.—Street Ry. Co. of Grand Rapids, Mich. 1 1/2 m, 4-8 1/2 g, 25, 35 & 40 lb r, 61 c, 240 h. Pres. W. J. Hayes, Cleveland, O., V. Pres. L. H. Withey, Grand Rapids, Treas. C. G. Swensberg, Grand Rapids, Sec. I. M. Weston, Grand Rapids, Supt. A. Bevier, Grand Rapids. Office, cor. Pearl & Canal sts.

GRATIOT, MICH.—Gratiot Elec. Ry. Co. 1 1/2 m, 16 lb steel r, 1 motor c, 1 summer c, Van Depoele overhead system. Pres. Wm. F. Botstord, V. Pres. John F. Talbot, Sec. J. H. Talbot, Treas. Chas. A. Ward. Capital, \$25,000.

GREENBUSH, N. Y.—North & East Greenbush St. Ry. Co. 1 1/2 m, 4-8 1/2 g, 4 c, 12 h. Pres. & Treas. A. Bleekerbanks, Supt. J. Gascolgne.

GREEN CASTLE, IND.—Green Castle City St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 23 lb r, 3 c, 14 h. Pres. & Supt. Dudley Rogers, Sec. James S. Nutt, Treas. Ralph Rogers, Gen. Man. E. W. Rogers. Office, 16 S. Jackson st.

GREENVILLE, S. C.—St. Ry. Co. of the City of Greenville. 2 1/2 m, 5 g, 16 lb r, 7 c, 31 mu. Pres. T. C. Gowen, Sec. G. G. Wells, Supt. P. H. Reilly. Props. & Owners, Gowen & Reilly.

HALIFAX, N. S.—Halifax St. Ry. Co. (Lim.) 7 m, 4-8 1/2 g, 45-60 lbs. r, 15 c, 65 h. Pres. John R. Bothwell, V. Pres. & Treas. John F. Zebley, Sec. H. B. Zebley, Supt. J. C. McDonald. Offices, Room 39, Drexel Building, New York, and Halifax, N. S.

HAMILTON, O.—Hamilton St. Ry. Co. 4 m, 3 g, 25 lb r, 11 c, 15 h. Pres. James S. Giffin, Sec. D. V. Parrish, Treas. H. L. Morey. Office, Bechtel Block.

HANNIBAL, MO.—Hannibal St. Ry. Co. 2 m, 4-8 1/2 g, 36 lb r, 6 c, 22 h. Pres. & Supt. M. Doyle, Sec. & Treas. James O'Hern, Office, 300 Market st.

HARRISBURG, PA.—Harrisburg City Passenger Ry. Co. 6 m, 5-2 1/2 g, 42-47-50 lb r, 26 c, 72 h. Pres. H. A. Keltner, Sec. John T. Ensminger, Treas. R. F. Keltner, Capital, \$100,000. Office, 27 South 2d st. e East Harrisburg Pass. Ry. Co. 1 1/2 m, 5-2 1/2 g, 38 & 52 lb steel girder r, 4 1-h c, 14 h. Pres. W. J. Calder, S. C. F. R. Leib, Treas. T. D. Greenwaldt, Supt. Jacob Schaffer.

HARTFORD, CONN.—Hartford & Wethersfield Horse R.R. Co. 12 m, 4-8 1/2 g, 45 lb r, 53 c, 259 h. Pres. E. S. Goodrich, Sec. Dan' R. Howe.

HARTLAND, KAN.—Hartland St. Ry. Co. 3-6 g, 20 lb T r, 2 1-h 2-h c. Pres. & Pur. Agt. E. S. Snow, Sec. Geo. Stallard, Treas. J. T. Kirtland, Supt. W. S. Handy.

HAVERTHILL, MASS.—Haverhill & Groveland St. Ry. Co. 13 1/2 m, 4 4/8 g, 30 35 lb r, 36 c, 131 h. Pres. Jackson B. Sweet, Treas. John A. Colby. Office 3 Water st.

HELENA, M. T.—Helena St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 35 lb r, 5 2-h c, 17 h. Pres. C. W. Cannon, V. Pres. J. B. Wilson, Sec. & Treas. L. A. Walker, Supt. J. A. Strong.

HERKIMER, N. Y.—Herkimer & Mohawk St. Ry. Co. 1 1/2 m, 4-8 1/2 g, 25 lb r, 3c, 6 h. Pres. J. M. Ausman, V. Pres. Aaron Harter, Sec. Henry McNeal, Treas. H. D. Alexander.

HOBOKEN, N. J.—North Hudson County Ry. Co. 2 1/2 m, 4-7 g, 50-60 lb r, 116 c, 635 h. Pres. John H. Bonn, Sec. F. J. Mallory, Treas. Fredk. Michel, Supt. Nicholas Goelz.

HOLYOKE, MASS.—Holyoke St. Ry. Co. 3 1/2 m, 4-8 1/2 g, 35 lb r, 15 c, 55 h. Pres. Wm. A. Chase, Treas. C. Fayette Smith, Supt. H. M. Smith.

HOT SPRINGS, ARK.—Hot Springs R.R. Co. 3 m, 4 g, 25 lb r, 11 c, 30 h. Pres. S. W. Fordyce, Sec. C. E. Maurice, Supt. J. L. Butterfield.

HOUSTON, TEX.—Houston City St. Ry. Co. 14 m, 4-8 1/2 g, 20-30-40 lb r, 40 c, 118 mu. Pres. Wm. H. Sinclair, Galveston, V. Pres. & Gen. Man. H. F. MacGregor, Houston, Supt. Henry Freund, Houston, Sec. & Treas. E. H. Bailey, Houston. Office, 90 Travis st.

HUTCHINSON, KAN.—Hutchinson St. Ry. Co. 2 1/2 m, 4-4 g, 20 lb r, 14 c, 39 h. Pres. A. I. Forsha, V. Pres. John Severance, Treas. S. W. Campbell, Sec. Fred. A. Forsha. Office, 5 North Main st.

ILION, N. Y.—Frankfort & Iilon St. R. R. Co. 2 1/2 m, 5 g, 25 lb r, 5 c, 5 h. Pres. A. C. McGowan, V. Pres. P. A. Skiff, Sec. & Treas. John A. Giblin, Supt. J. J. Hannabur.

INDIANAPOLIS, IND.—Citizens' St. Ry. Co. 35 m, 4-8 1/2 g, 33-35-45-50 lb r, 70 c, 550 mu. Pres. A. W. Johnson, Indianapolis, Treas. Tom L. Johnson, Cleveland, O. Sec. A. A. Anderson, Indianapolis, Man. W. T. Steele, Indianapolis, Office 80 W. Louisiana st.

JACKSON, MICH.—Jackson City Ry. Co. 4 m, 3-6 g, 28 lb r, 11 c, 40 h. Pres. Hiram H. Smith, Treas. Samuel Hopewell, Gen. Supt. Henry H. Smith.

JACKSON, MISS.—Jackson City R. R. Co. 1 1/2 m, 5 g, 3c, 9 mu. Pres. F. W. Peoples, Sec. & Tr. J. B. Bradford.

JACKSONVILLE, FLA.—Pine St. R.R. Co. 2 1/2 m, 5 g, 25 lb r, 4 c, 18 m. Pres. S. B. Hubbard; V. Pres. J. M. Schumacher; Treas. J. C. Greeley; Sec. & Man. H. S. Ely.

JACKSONVILLE, FLA.—Jacksonville Ry. Co. 8 m, 5 g, 25 lb r, 22 c, 93 mu. Pres. H. S. Haines, Savannah, Ga.; V. Pres. Geo. R. Foster, Jacksonville, Fla.; Treas. J. M. Lee, Savannah; Supt. G. W. Haines, Savannah; Agent M. H. Matte, Jacksonville.

JACKSONVILLE, ILL.—Jacksonville Ry. Co. 4 1/2 m, 4-8 1/2 g, 30 lb r, 16 c, 30 h. Pres. Wm. S. Hook, Sec. T. J. Hook, Treas. Marcus Hook, Supt. B. F. Sibert.

JAMAICA, N. Y.—Jamaica & Brooklyn R.R. Co. 10 m, 4-8 1/2 g, 56-60 lb r, 29 c, 56 h. Pres. Aaron A. DeGrauw, Sec. Martin J. Duna, Treas. Morris Fosdick Supt. Wm. M. Scott.

JAMESTOWN, N. Y.—Jamestown St. Ry. Co. 4-3 1/2 m, 4-8 1/2 g, 30-42 lb r, 13 c, 40 h. Pres. Jas. B. Ross, V. Pres. L. B. Warner, Sec. F. E. Gifford, Treas. A. N. Broadhead, Supt. G. E. Malby.

JANESVILLE, WIS.—Janesville St. Ry. Co. Pres. Stephen G. Clarke, Chicago.

JERSEY CITY, N. J.—Jersey City & Bergen R. R. Co. 28 m, 4-10 g, 47-60 lb r, 80 c, 630 h. Pres. Chas. B. Thurston, V. Pres. Wm. Keeney, Treas. C. B. Place, Sec. Warren E. Dennis, Supt. Thos. M. Sayre, Engr. E. F. Brooks.

Pavonia Horse R. R. Co. 5 m, 4-10 g, 47 lb r, 24 c, 150 h. Man. J. H. Small.

JOHNSTOWN, N. Y.—Johnstown, Gloversville & Kingsboro Horse R.R. Co. 4 m, 4-8 1/2 g, 26 lb r, 6 c, 18 h. Pres. James Younglove, V. Pres. R. Fancher, Sec. & Treas. J. McLaren, Supt. Henry Slotter.

JOHNSTOWN, PA.—Johnstown Pass. Ry. Co. 7 1/2 m, 5-3 g, 41-43 lb r, 15 c, 74 h. Pres. James McMullen, Sec. B. L. Yeagley, Treas. W. H. Rosensteel, Jr. JOLIET, ILL.—Joliet City Ry. Co. 3 1/2 m, 4-8 1/2 g, 38 lb r, 16 c, 30 h. & mu. Prop. J. A. Henry, Supt. A. Bischman, Treas. J. Hulsizer.

JOPLIN, MO.—6m, 4 g, 15, 21 & 37 lb T and tram r, 4 2-h c, 26 mu. Pres. J. B. Sergeant, Sec., Treas., Supt. & Pur. Agt. Clark Craycraft.

KALAMAZOO, MICH.—Kalamazoo St. Ry. Co. 8 1/2 m, 4-8 g, 35 lb r, 30 c, 50 h. Pres. E. M. Irish, V. Pres. Dr. Chase, Man. J. W. Bounton, Sec. & Treas. Arthur Ellithorpe, Auditor, Wm. Shakespeare. Office, 128 Main st.

KANSAS CITY, MO.—Kansas City Cable Ry. Co. 12 m, 4-8 1/2 g, 45-56 lb r, 26 grip c, 39 pass. c, Pres. Wm. J. Smith, V. Pres. Philip A. Chase, Sec. W. H. Lucas, Chf. Engr. Chft Wise, Supt. F. A. Tucker. Office, S. E. cor. Ninth & Washington sts.

Corrigan Consolidated St. Ry. Co. 20 m, 4-1 g, 30 lb r, 80 c, 350 h. Pres. Bernard Corrigan, Gen. Man. Thos. Corrigan, Sec. Jas. T. Kelley. Operated by Metropolitan St. Ry. Co.

Grand Avenue Ry. Co. 8 m, 4-8 g, 40 lb r, 15 c, 75 h. Pres. C. F. Morse, V. Pres. and Gen. Man. W. H. Holmes, Sec. & Atty. D. B. Holmes, Engineers, Knight & Bouticon, Auditor, T. J. Fry, Supt. C. F. Holmes. Capital stock, \$1,200,000. Office, 15th & Grand av.

Kansas City Electric Ry. Co. 2 m, 4 8/8 g, 70 lb girder r, 4 motor c (Henry system). Pres. W. W. Kendall, V. Pres. Hugh L. McElroy, Sec. & Treas. Warren Watson, Supt. John C. Henry. Office, 1139 E. 5th st. Capital, \$10,000.

Kansas City & Rosedale St. Ry. Co. Operated by the Metropolitan St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 42 lb steel r, 8 2-h c, 60 mu. Pres. C. T. Morse, Sec. R. J. McCarty, Supt. E. J. Lawless, Pur. Agt. T. M. Pitkin.

Metropolitan St. Ry. Co. 25 m, 4-8 1/2 g, 56 lb r, 126 c, 475 h. Pres. C. F. Morse, V. Pres. Geo. H. Nettleton, Sec. & Auditor R. J. McCarty, Treas. A. W. Armour, Supt. E. J. Lawless, Engineers, Knight & Bouticon.

KEOKUK, IA.—Keokuk St. Ry. Co. 4 m, 4-8 1/2 g, 27 lb steel r, 12 c, 40h. Pres. Jas. H. Anderson, Sec. Wm. E. Anderson.

KINGSTON, ONT., CAN.—Kingston St. R.R. Co. 1/2 m, 3-6 g, 9 lb r, 10 c, 36 h. Pres. Robert Carson, Sec. & Treas. F. Sargent, Man. William Wilson.

KNOXVILLE, TENN.—Knoxville St. R. R. Co. 3 m, 4-8 1/2 g, 25 lb r, 5 c, 38 h. Pres. John S. Van Gilder, Treas. & Man. T. L. Beaman. Office, 336 Broad st.

Mabry Bell Ave. & Hardee St. Ry. Co. 4 m, 4-8 1/2 g, 22 lb r, 4 c, 27 h. Pres. John S. Van Gilder, Man. & Treas. T. L. Beaman. Office, 336 Broad st.

Market Sq. St. Ry. Co. 2 m, 4-8 1/2 g, 22 lb r, 4 c, 18 h. Pres. John S. Van Gilder, Sec. W. B. Henderson, Treas. W. H. Simmonds, Supt. L. O. Rogers. Office, 145 Gay st.

LA CONIA, N. H.—Laconia & Lake Village Horse R.R. Co. 2 1/2 m, 3 g, 34 lb r, 5 c, 20 h. Pres. A. G. Folsom, Sec. J. F. Hutchinson, Treas. Edmund Little, Man. Bela S. Kenniston.

LA CROSSE, WIS.—La Crosse City Ry. Co. 5 1/2 m, 4-8 g, 40 lb r, 15 c, 70 h. Pres. B. E. Edwards, V. Pres. Geo. F. Gund, Treas. Fred Tillman, Sec. Jas. T. Daggett, Supt. (North Division), Peter Valler, Supt. (South Division), Geo. F. Smith. Office 222 Main st.

LAFAYETTE, IND.—Lafayette St. Ry. 2 1/2 m, 4-8 1/2 g, 35 lb r, 6 c, 38 h. Pres. F. B. Caldwell, Sec., Pur. Agt. & Supt. W. H. Short, Treas. J. W. Race.

LAMPASAS SPRINGS, TEX.—Lampasas Springs St. R. R. Co. 3 m, 4-8 1/2 g, 6 c, 13 h. Sec. & Treas. W. H. Little. Office, Elm st.

LANCASTER, PA.—Lancaster & Millersville St. Ry. Co.—m, 4 8/8 g, 30 lb r, 4 c, 14 h. Pres. J. C. Hager, V. Pres. H. S. Shirk, Sec. & Treas. Chas. Dennes. b Lancaster City St. Ry. Co. 1.1 m, 5-2 g, 38 lb r, 6 c, 4 h. Pres. W. D. Sprecher, Treas. J. H. Baumgardner, Sec. Thos. B. Cochran, Man. J. B. Long. Gen. Office, 129 North Queen st.

LANSING, MICH.—Lansing City Ry. Co. 3 m, 4-8 1/2 g, 30 lb steel r, 5 c, 24 h. Pres. Stephen G. Clarke, Chicago, V. Pres. & Treas. Harry M. Clarke, Lansing, Sec. John P. Altgeld, Supt. Byron E. Clarke, Lansing.

LARCHMONT, N. Y.—Larchmont Manor Co. 1 1/2 m, 4-8 g, 25 lb r, 2 c, 10 h. Pres. C. H. Murray, Treas. T. H. French, 38 East Fourteenth st., N. Y. City.

LARNED, KAN.—Larned St. Ry. Co. 2 1/2 m, 3-9 g, flat r, 2-2-h c, 4 mu. Pres., Supt. & Pur. Agt. D. H. Scott, Sec. G. H. Miye, Treas. Wm. Scott.

LA SALLE, ILL.—La Salle St. R. R. Co. 1 1/2 m, Sec. G. Weerts.

LAWRENCE, KAN.—Lawrence Transportation Co. 5 1/2 m, 4-1 g, 38 lb r, 8 c, 38 h, 6 mu. Pres. H. Tisdale, Sec. W. N. Bangs, Supt. Geo. Fricker.

LAWRENCE, MASS.—Merrimack Valley Horse R. R. Co. 6 1/2 m, 4-8 1/2 g, 48 lb r, 22 c, 87 h. Pres. Wm. A. Russell, Clerk & Treas. James H. Eaton, Supt. A. N. Kimball.

LEAVENWORTH, KAN.—Leavenworth & Suburban St. Ry. Co. 5 m, 4-8 1/2 g, 22 lb tram r, 12 2-h c, 22 h, 3 mu. Pres., Sec., Treas. & Pur. Agt. Geo. A. Baker.

LEWISTON, ME.—Lewiston & Auburn Horse R.R. Co. 10 m, 4-8 1/2 g, 32 lb r, 20 c, 60 h. Pres. Frank W. Dana, Clerk & Treas. C. C. Corbett, Supt. J. E. Fairbanks.

LEXINGTON, KY.—Lexington City Ry. Co. 8 m, 4-10 g, 20 lb r, 20 c, 85 h. Pres. & Treas. R. B. Metcalfe, Sec. B. F. Campbell, Supt. & Pur. Agt. W. W. Monroe.

THE SPRAGUE ELECTRIC RAILWAY & MOTOR CO.

THIS IS THE ONLY COMPANY IN THE UNITED STATES DEVOTING ITS ENTIRE ENERGIES TO THE VARIOUS QUESTIONS INVOLVED IN THE TRANSMISSION OF POWER, AND IT IS PUTTING INTO PRACTICAL USE MORE MOTORS OF AND OVER ONE-HALF HORSE POWER THAN ALL OTHER COMPANIES COMBINED.

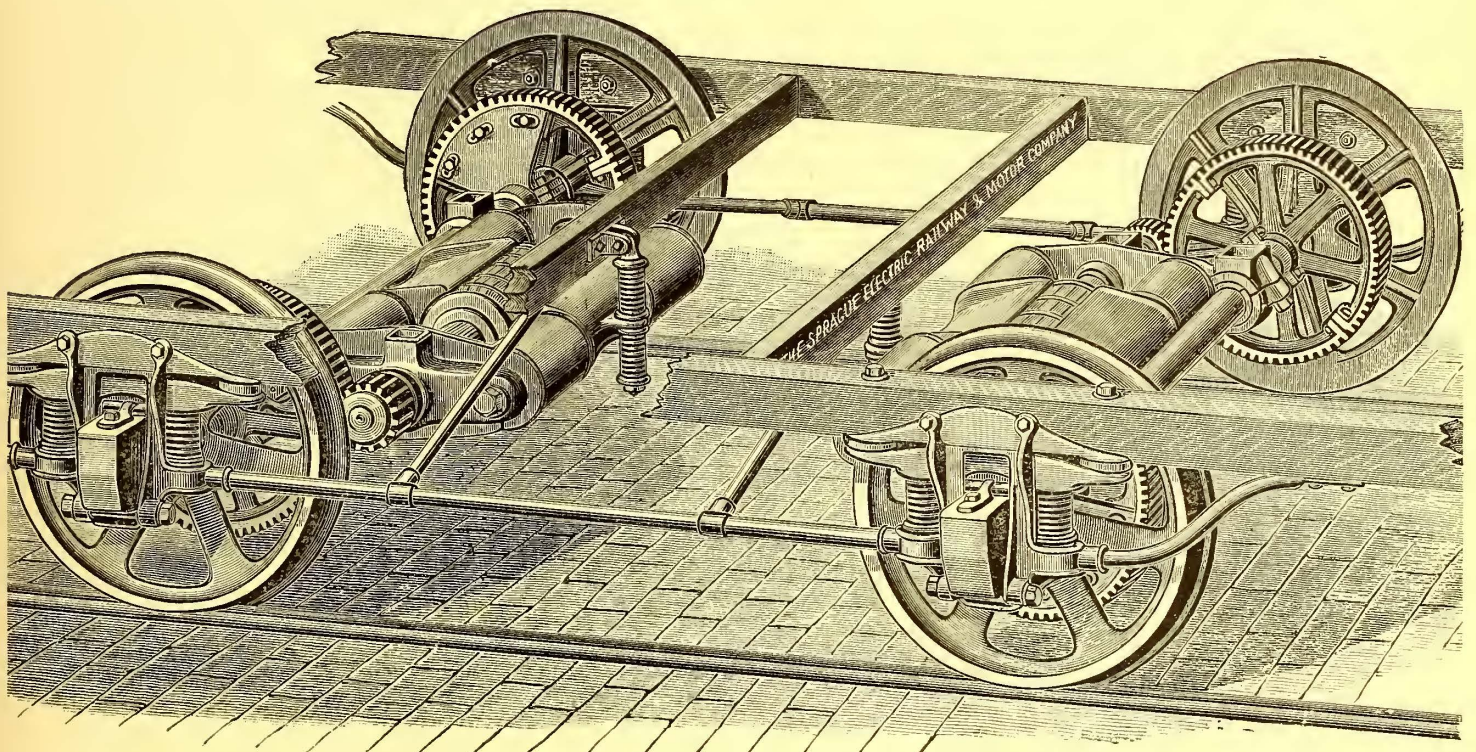
OFFICES:

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BOSTON: 55 Oliver St.
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CHARACTERISTICS OF RAILWAY MOTORS.

Lightest weight consistent with Highest Efficiency.
Simple, Compact in Construction.
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Generators of Highest Efficiency and Reliability.
Systems of Conducting Current to the Cars with the Impossibility of an Accident at any Point of the Line Interfering with the Operation of the Remainder of the Road.
Motors Flexibly Suspended from the Axles to insure Perfection of Running.
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Greatest Return for Given Amount of Coal Burned.

Entire Freedom from Disagreeable Noises by means of Split-Gears and Spring Suspension.
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No Useful Room in the Car taken up by the Motor.
No Changes in Truck.
No Complicated Nest of Gearing.
Use of Single Sets of Brushes for both Directions of Driving.
Storage Battery or Overhead System.

LEXINGTON, MO.—Lexington St. Ry. Co. 1½ m, 4-4 g, 30 lb r, 2 c, 8 h. Supt. John C. Young. Office, 124 Main st. 4

LIMA, O.—Lima St. Ry., Motor & Power Co. Elec. ry., Van Depoele system. 3½ m completed, 10 m contemplated, 4-8½ g, 40 lb Johnson steel r, 8 c, 8 motors. Pres. B. C. Faurot, Sec. & Treas. F. L. Langan. Capital, paid in, \$50,000. Office, 201 Main st. a

LINCOLN, NEB.—Lincoln St. Ry. Co. 12 m, 4-8½ g, 20 lb steel r, 24 c, 150 h. and mu. Pres. J. W. De-weese, V. Pres. John R. Clark, Sec. & Treas. C. J. Ernst, Supt. Wm. R. Carter. b
Lincoln Rapid Transit Co. 7 m, 4-8½ g, 25 & 33 lb girder r, 8 2-h c, steam motors. Pres. John Fitzgerald, Sec. J. R. Webster, Treas. Sam'l McClay, Supt. Jas. P. Walton. 9

LISBON, DAK.—Lisbon St. Ry. Co. Pres. Frank Allen. 9

LITTLE ROCK, ARK.—Citizens' & Little Rock St. Ry. Co. 12 m, 4 10 g, 25, 36 & 45 lb r, 30 c, 200 mu. Pres. Jas. R. Miller, Sec. & Treas. Allan Johnson, Supt. J. A. Garrett. Office, cor. Markham & Spring sts. d

LOCKPORT, N. Y.—Lockport St. R. R. Co. 3½ m, 4-8½ g, 42 lb r, 8 c, 33 h. Pres. & Treas. John Dodge, Sec. W. T. Ransom, Atty. E. M. Ashley. Office, 19 & 20 Hodge Opera House Bldg. 4

LOGANSPOUT, IND.—Logansport Ry. Co. 4 m, 4 g, 30 lb r, 2 c, 46 mu. Pres. Frank G. Jaques, Sec. M. Jaques, Supt. Wm. P. Jaques. Office, Urbana, Ill. 9

LONDON, CAN.—London St. Ry. Co. 6 m, 4-8½ g, 30 lb r, 12 c, 40 h. Pres. V. Cronyn, Sec. Jas. H. Flock, Treas. Chas. Currie, Supt. Henry I. Smith. Office, Richmond st. a

LONG ISLAND CITY, N. Y.—Steinway & Hunter's Point R. R. Co. 30 m, 4-8½ g, 47 lb r, 68 c, 235 h. Pres. H. A. Steinway, Steinway Hall, N. Y. City. V. Pres. Henry A. Cassebeer, Jr., Steinway P. O., Long Island City, N. Y. Sec. & Treas. Chas. F. Treubar, Steinway Hall, N. Y. City. Supt. W. H. Delahanty. Offices Steinway Hall, N. Y. d
Dutch Kills & Hunter's Point R. R. — m, — g, — lb r, — c, — h. Pres. R. J. Gleason. 9
Long Island City & Newtown Ry. Co. 4½ m, 4-8½ g, 45-55 lb r, 25 c, 60 h. Pres. Isaac Buchanan, N. Y. City, Sec. Geo. S. Crawford, Brooklyn, N. Y., Treas. Patrick J. Gleason, Supt. Michael Conway. Offices 112 Front st. 1
Riker Ave. & Sandford's Point R. R. Co. 2½ m, 4-8½ g, 47 lb r, h this year, electricity thereafter. Operated under lease by Steinway & Hunter's Point R. R. Co. Pres. J. H. Hempstead, Sec. & Treas. Oscar R. Steins. Capital, \$20,000. N. Y. Office, 107 E. 14th st. d

LONGVIEW, TEX.—Longview & Junction St. Ry. ¾ m, 3-6 g, 16 lb r, 2 c, 4 h. Pres. F. T. Rembert, Sec. R. B. Levy, Treas. F. S. Whaley, Supt. C. W. Booth. d

LOS ANGELES, CAL.—City & Central R.R. Co. 22 m, 3-6 & 4-8 g, 16 & 20 lb r, 37 c, 234 h. Pres. I. W. Uelman, Gen. Man. J. F. Crank, Sec. R. D. P. Widner, Supt. Wm. Hawks. 7
Central & Boyle Heights Co. 6½ m, 3-6 g, 26 c, 110 h. Pres. E. F. Spence, Gen. Man. J. F. Crank, Sec. Fred Harkness, Supt. W. Hawks. 6
East & West Los Angeles Co. 7 m, 2 c, 80 h. Pres. & Gen. Man. J. F. Crank, Sec. Fred Harkness, Supt. W. Hawks. 6
Los Angeles Electric Ry. Co. 5 m, 4-8 g, 4 c, Daft system, overhead wires. Pres. Geo. H. Bonebrake; Sec. & Man. C. H. Howland, Constructing Engr. A. H. Hayward. 6
Main St. & Agricultural Park Co. 8 m, 3-6 g, 15 c, 60 h. Pres. W. J. Broderick, Sec. A. C. Taylor, Supt. E. M. Lorrice. 6
Second St. Cable Ry. Co. 1½ m cable & 1½ m steam-motor extension, 3-6 g, 8 c, 6 grip c, 2 motors. Pres. & Treas. Jas. McLoughlin, Sec. & Supt. H. W. Davis, Asst. Supt. & Master Mechanic E. H. Huchinson. 6
Temple St. Cable Ry. Co. 1½ m, 3-6 g, 6 c, 6 grip c. Pres. P. Beaudry, Sec. & Man. F. W. Woods, Supt. J. Fowler. 6

LOUISVILLE, KY.—Kentucky St. R. R. Co. 5 m, 5 g, 52 lb r, 22 c — h. Pres. T. J. Minary, Sec. T. C. Donigan. 6
Central Pass. R.R. Co. 51 m, 5 g, 52 lb r, 156 c, 800 h, Pres. B. du Pont, V. Pres. & Man. T. J. Minary, Sec. T. C. Donigan. Office, 18th & Walnut sts. 6
Crescent Hill R. R. Co. 3 m. Leased and operated by Central Pass. R. R. Co. 6
Louisville City Ry. Co. 65 m, 5 g, 40 to 58 lb r, 230 c, 1,400 mu. Pres. Maj. Alexander Henry Davis, Syracuse, N. Y., V. Pres. St. John Boyle, Sec. & Treas. R. A. Watts, Supt. H. H. Little. Office, 13th and Malu sts. e

LOWELL, MASS.—Lowell Horse R.R. Co. 12 m, 4-8½ g, 28-33-45 lb r, 43 c, 160 h. Pres. Wm. E. Livingston, Gen. Man. J. A. Chase. 9
Lowell & Draut St. Ry. Co. 9 m. 4-8½ g, 35 lb iron and 1½ m Longstreet r. 16 c, 120 h. Pres. Aug. Fels, Treas. Walter M. Sawyer, Supt. John F. Murphy. 8

LYNCHBURG, VA.—Lynchburg St. Ry. Co. 2½ m, 5-1 g, 20-26 lb r, 7 c, 38 h. Pres. & Treas. Stephen Adams, Supt. William M. Payne. Office, Main st. h

LYONS, IA.—Clinton & Lyons Horse Ry. Co. 4½ m, 3-8 g, 19-30 lb r, 15 c, 40 h. Pres. D. Joyce, Sec. W. T. Joyce, Supt. Frank Crapsier. 6

MACON, GA.—Macon City & Suburban St. R.R. Co. 12 m, 5 g, 20 lb r, 23 c, 100 mu. Pres. John S. Bransford, Nashville, Tenn., Sec. and Supt. Jno. T. Voss. 7

MADISON, IND.—Madison St. Ry. Co. 2½ m, 4 g, 15 lb r, 7 c, 4 h, 11 mu. Pres. & Supt. Jacob Wendel, V. Pres. & Treas. Peter F. Robinus, Sec. John K. Weyer. Office, 1026 Walnut st. a

MADISON, WIS.—Madison St. Ry. Co. 2½ m, 4 g, 23 lb r, 8 c, 28 mu. Pres. D. K. Tenney, Sec. & Treas. B. W. Jones, Supt. A. R. Kentzler. Office, Williamson st. 4

MANCHESTER, N. H.—Manchester Horse R.R. 7 m, 3 g, 27-34 lb r, 14 c, 60 h. Pres. S. N. Bell, Treas. G. F. Smyth, Clerk J. A. Weston, Supt. A. Q. Gage. Office Depot st. e

MANKATO, MINN.—Mankato St. Ry. Co. 2½ m, 3-6 g, 27 lb steel r, 4 c, 12 h. Pres. & Man. W. M. Farr, Sec. and Treas. John C. Noe, Capital, \$30,000; Office, 313 So Front street. f

MARSHALTON, IA.—Marshaltown St. Ry. Co. 3 m, 4 g, 25 lb r, 7 c, 20 h. Pres. B. T. Frederick, Sec. C. S. Gilman, Man. & Treas. A. E. Shorthill. f

MARYSVILLE, CAL.—City Pass. R. R. Co. **MAYSVILLE, KY.**—Maysville St. R. R. & Transf. Co. 3½ m, 20 lb r, 4-8½ g, 7 c, 32 mu. Pres. L. W. Robertson, Sec. & Treas. & Supt. W. S. Frank. Office, Court st. d

McPHERSON, KAN.—McPherson St. Ry. Co. 3½ m, 3-6 g, 20 lb T r, 3 2-h c, 12 mu. Pres. A. A. Irvin, Sec. Scott Bukey, Treas. C. Aug. Heggeland, Pur. Agt. M. D. Herrington, Supt. Benj. Hunt. 9

MECHANICSBURG, ILL.—Mechanicsburg & Buffalo Ry. Co. 3½ m, 3-10 g, 16 lb r, 3 c, 4 mu. Pres. J. N. Fullenweider, Treas. A. T. Thompson, Sec. H. Thompson. 9

MEMPHIS, TENN.—Memphis City R.R. Co. 18 m, 5 g, 38-40 lb r, 80 c, 320 h. Pres. R. Dudley Frayser, V. Pres. & Gen. Man. Thos. Barrett, Sec. James Frost, Treas. S. P. Read Jr. Supt. W. F. Shippey. Office 474 Main st. f

Citizens' St. R. R. Co. 40 m, 4-8½ & 5 g, 33 lb girder & 45 lb tram r, 140 2-h c, 604 mu. Pres. Napoleon Hill, V. Pres. & Gen. Man. Thos. Barrett, Sec. R. Dudley Frayser, Treas. S. P. Read, Jr.
East End Ry. Co. 4 m, 4-8½ g, 36 lb steel r, 6 c, 2 dummy engines. Pres. W. M. Sneed, Treas. J. W. Falls. Office, 310 2d st. 9

Memphis & Prospect Park R. R. 5 m, 4-8½ g, 4 c, steam dummy. Pres. T. J. Latham, V. Pres. J. A. Van Hoese, Sec. & Treas. T. A. Lamb. Capital, \$100,000. c
Union R. R. Co. 14 m, 38 c, 200 h and mu.

MERIDEN, CONN.—Meriden Horse R.R. Co. 5 m, 4-8 g, 35 lb r, 15 c, 100 h. Pres. Geo. R. Curtiss, Sec. & Treas. Chas. L. Rockwell, Supt. Dan'l Barker. 6

MERIDIAN, MISS.—Meridian St. Ry. Co. 2½ m, 4-8 g, 16 lb r, 5 c, 20 mu. Pres. Geo. S. Covert, V. Pres. and Sup. J. L. Handley, Sec. R. M. Houston, Treas. J. A. Kelly. d

MICHIGAN CITY, IND.—Citizens' St. Ry. Co. 4 m, 4-8½ g, 30 lb r, 4 c, 15 h. Pres. Wm. G. Knight, V. Pres. John Lyons, Sec. Jacob Henderson, Treas. Jerry H. Knight. Office West Washington st., South Bend, Ind. 1

MIDDLETOWN, CONN.—Middletown Horse R.R. Co. 2 m, 6 c, 36 lb r, 30 h. Pres. John M. Douglas, Sec. & Treas. J. K. Guy, Supt. Walter Baldwin. Office 166 Main st. a

MIDDLETOWN, O.—Middletown & Madison St. R.R. Co. 2 m, 5-9 g, — r, 4 c, 8 h. Pres. C. F. Gunckel, Sec. and Treas. E. W. Gunckel, Supt. T. C. Reed. 3

MILLERSVILLE, PA.—Lancaster & Millersville St. R. R. Co. (See Lancaster, Pa.)

MILWAUKEE, WIS.—Cream City R.R. Co. 17 m, 4-8½ g, 38 & 52 lb girder r, 27 lb tram r, 80 c, 319 mu. Pres. Winfield Smith, V. Pres. Christian Preusser, Treas. Ferdinand Kuehn, Sec. Wm. Damkoehler, Gen. Man. D. Atwood, Supt. H. J. C. Berg. Office, 440 E. Water st. b
Milwaukee City Ry. Co. 30 m, 4-8½ g, 45 lb r, 81 c, 513 h. Pres. Peter McGeeoch, Sec. & Treas. Geo. O. Wheatcroft. Office 209 West Water st. a
West Side St. Ry. Co. Pres. Washington Becker Sec. Thos. J. Durnin, Supt. A. McNaughton. 4

MINNEAPOLIS, MINN.—Minneapolis St. Ry. Co. 62 m, 3-6 g, 27-35-45 lb r, 186 c, 876 h, 230 mu. Pres. Thos. Lowry, V. Pres. C. Morrison, Sec. & Gen. Man. C. G. Goodrich, Treas. M. B. Koon, Supt. D. W. Sharpe, Engr. E. T. Abbott. Office, 200 3d ave. N. g

MOBILE, ALA.—Mobile St. Ry. Co. 23 m, 5-2½ g, 35-60 lb T & tram r, 74 c, 4 freight c, 230 mu & h. P. es. W. M. Duncan, V. Pres. Gaylord, B. Clark, Sec. & Gen. Man. R. K. Warren. 9
Mobile & Spring Hill R.R. Co. 8 m, 5-2½ g, 35 lb r, 15 c, 85 h, 1 dummy. Pres. Daniel McNeill, Sec. & Treas. C. F. Sheldon, Man. F. Ingate. 3

MOHAWK, N. Y.—Mohawk & Ilion R.R. Co. 1½ m, 4-8 g, 30 lb r, 4 c (contract for motive power). Pres. O. W. Bronson, V. Pres. C. W. Carpenter, Sec. H. D. Alexander, Treas. R. M. Devendorf, Supt. O. W. Bronson. f

MOLINE, ILL.—Moline & Rock Island St. Car Co. 5 m, 4-8 g, 20 lb crescent tram & T r, 13 1-h, 2 2-h c, 44 h. Pres. Jonathan Huntoon, Moline, Sec. & Treas. J. M. Buford, Rock Island. 6
Union St. Ry. Co. 5.4 m, 4-8 g, 38 lb Johnson girder r for 1½ m and 42 lb tram r for balance, 6 1-h 2 2-h c, 16 h, 12 mu, 2 steam motors. Pres. Eugene Lewis, Moline, V. Pres. W. H. Decker, Davenport, Ia.; Sec. & Treas. G. Watson French, Davenport, Ia.; Supt. Jas. Cazant, Moline. 9

MONTGOMERY, ALA.—Capital City Electric Ry. 11 m, 4 g, 42 lb r, 20 c. Electric motors. Pres. E. B. Joseph, Gen. Man. J. A. Gaboury, Treas. Thos. E. Hannon. e

MONTREAL, CAN.—Montreal St. Ry. Co. 30 m, 4-8 g, 80 c, 80 sleighs, 40 buses, 700 h. Pres. Jesse Joseph, V. Pres. Alex. Murray, Sec. & Man. Ed. Lusher, Supt. T. H. Robillard. 3

MOULTREVIEW, S. C.—Middle St. & Sullivan's Landing Ry. 2½ m, 4-8 g, 20 lb r, 7 c 4 h. Pres. B. Callahan, Treas. B. Buckley. 7

MT. VERNON, N. Y.—Mount Vernon & East Chester R. R. Co. 5½ m. Sec. Jas. T. Byrnes, Treas. Louis Werthelm, Supt. & Pur. Agt. F. R. Rakeman. Office, 131 Water st., New York. 1

MUSCATINE, IA.—Muscatine City Ry. Co. 3½ m, 3-6 g, 21 lb r, 7 c, 34 h. & mu. Pres. Peter Musser, V. Pres. W. Hoffman, Sec. T. R. Fitzgerald, Treas. S. M. Hughes. h
Muskegon, Mich. —Muskegon Ry. Co. 4½ m, 1-6 g, 20 lb r, 8 c, 17 h, 9 mu. Pres. F. A. Nims, V. Pres. Chas. Merriam, Boston, Mass., Sec. Thomas Munroe, Treas. G. R. Sherman, Supt. Wm. McLaughlin. a

NASHUA, N. H.—Nashua St. Ry. Co. 2 m, 3 g, 35 lb r, 6 c, 24 h. Pres. John A. Spading, Clerk, R. D. Barnes, Treas. Ira F. Harris, Supt. Q. A. Woodward. e

NASHVILLE, TENN.—Nashville & Edgefield R.R. Co. Fatherland Street Railway Co. North Edgefield and Nashville St. R.R. Co., one management. 5 m, 5 g, 16-20-32 lb r, 21 c, 100 mu. Pres. Jas. H. Yarborough, Sec. & Treas. H. B. Stubblefield, Supt. D. Deaderick. j

McGavock & Mt. Vernon Horse R.R. Co. 7½ m, 5 g,

16-20-28-32 lb r, 25 c, 140 h & mu. Pres. John P. White, V. Pres. B. F. Wilson, Sec. & Treas. H. B. Stubblefield, Supt. Daingerfield Deaderick. 4

South Nashville St. R. R. Co. 4½ m, 5 g, 16-20-32 lb r, 10 c, 68 h. Pres. W. M. Duncan, Sec. & Treas. & Supt. C. L. Fuller. Office cor. So. Franklin and Cherry sts. i

NATCHEZ, MISS.—Natchez St. Ry. 2½ m, 4-8½ g, 18 & 45 lb flat & T r, 4 1-h c, 10 h. mu. Owner, Thos. Reber. 9

NATICK, MASS.—Natick & Cochituate St. Ry. 3 m, 4-8 g, 35 lb r, 7 c, 19 h. Pres. Harrison Harwood, Supt. Geo. F. Keep, Clerk Frank Hays. e

NEW ALBANY, IND.—New Albany St. R. R. Co. 6½ m, 4-11 g, 25 lb r, 14 c, 53 h. Pres. Geo. T. Vance, Treas. Letitia V. Vredenburg, Supt. & Pur. Agt. Wm. L. Timberlake. Office cor. Vincennes and Spring sts. 7

NEWARK, N. J.—Essex Pass. Ry. Co. 50 m, 5-2½ g, 47 lb r, 133 c, 797 h. Pres. S. S. Battin, Sec. Fred T. Kirk, Supt. H. F. Totten, Paymaster, W. L. Mulford. Office, 786 Broad st. d
Newark & Irvington St. Ry. Co., 7 m, 5-2½ g, 47 lb r, 32 c, 165 h. Pres. S. S. Battin, Sec. W. L. Mulford, Supt. H. F. Totten. Office 786 Broad st. d
Newark & So. Orange, Ferry St. & Hamburg Place R. R. Co. 15 m, 5-2½ g, 45 lb r, 49 c, 300 h. Pres. John Radel, Sec. Andrew Radel, Treas. Joseph Crique. Office, cor. So. Orange ave. & So. 19th st. f

NEWARK, O.—Newark City Ry. Co. 5 m, 4-8½ g, 35 lb r, 6 c, 24 h. Pres. Stephen G. Clarke, V. Pres. & Supt. Byron E. Clarke, Sec. John W. Lanehart, Treas. Harry M. Clarke. Office, 239 W. Main st. 1

NEW BEDFORD, MASS.—Union St. Ry. Co. 17.78 m, 4-8 g, 35, 45 & 50 lb tram, 45 lb steel & 38 lb girder r, 84 2-h c, 311 h. Pres. Sam'l C. Hart, Treas. A. G. Pierce, Clerk Abbott F. Smith, Auditor, Geo. R. Phillips, Supt. Chas. E. Cook. Capital, \$360,000.

NEW BRITAIN, CONN.—New Britain Tramway Co. 3½ m, 4-8½ g, 35 lb r, 4 c. Pres. Alston Gerry, Treas. Jos. A. Flynn, both of New York City. 5

NEW BRUNSWICK, N. J.—New Brunswick Horse R.R. 4 m, 4-8 g, 40 lb r, 5 c, 20 h. Pres. F. M. Delano, Treas. Carroll Sprigg.

NEWBURGH, N. Y.—Newburgh St. Ry. Co. 2½ m, 4-8 g, 40 lb r, 11 c, 60 h. Pres. Rowland F. Hill, V. Pres. Sidney W. Hopkins, Sec. & Treas. Wm. Moores, Gen. Man. H. Ives Smith. President's office, 3 Broad st., New York. b

NEWBURYPORT, MASS.—Newburyport & Amesbury Horse R.R. Co. 6 1-3 m, 4-8 g, 35 lb r, 18 c, 50 h. Pres. Chas. Odell, Sec. G. H. Stevens, Treas. A. G. Reynolds, Supt. W. B. Ferguson. 5
Black Rocks & Sallsbury Beach St. Ry. Co. Cable, 2 m, 4-8½ g, 25 lb T r, 5 c, 1 dummy engine. 9
Plum Island St. Ry. Co. 5 m, 4-8 g, 34 & 40 lb steel and Johnson r, 10 c, 20 h, 1 dummy engine. Pres. Chas. Odell, Salem, Supt. W. B. Ferguson. Capital, \$40,000. 1

NEW HAVEN, CONN.—Fair Haven & Westville R.R. Co. 10 m, 4-8 g, 50 lb r, 28 c, 207 h. Pres. H. B. Ives, Sec. & Treas. L. Candee, Supt. Walter A. Graham. Office 736 Chapel st. a
New Haven & Centreville Horse R.R. Co. 2½ m, 4-8 g, 42 lb r, 8 c, 42 h. Trustee Cornelius Pierpont. Office, 1 Broadway. 6
New Haven & West Haven Horse R. R. Co. (See West Haven).

State Street Horse R.R. Co. 2½ m, 4-8 g, 43 lb r, 6 c, 40 h. Pres. C. A. Warren, Sec. & Treas. J. E. Emery. Office 16 Exchange Bldg. d
Whitney Ave. Ry. Co. 2½ m, 4-8 g, 25 lb r, 3 c, 20 h. Pres. Geo. H. Watrous, Sec. George D. Watrous, Treas. Ell Whitney, Jr., Lessee J. A. Davis. a

NEW ORLEANS, LA.—Canal & Claiborne Sts. R.R. Co. 13 m, 6-2 g, 37 lb r, 40 c, 200 h. Pres. E. J. Hart, Sec. & Supt. Jos. H. DeGrange. a
Algiers & Gretna Ry. Co. 3.1 m, 3 g, 30 lb T r, 3 1-h c, 17 h. Pres. J. E. Auvery, Sec. & Treas. Wm. Bogel, Supt. John Reaney. Office, 382 St. Charles st. 9
Crescent City R. R. Co. 26 m, 5-2 g, 35-45 lb r, 90 c, 400 h. Pres. W. J. Behan, Sec. & Treas. J. R. Juden, Supt. A. V. Smith. c

Oreans R.R. Co. 9½ m, 5-2½ g, 35 lb r, 32 c, 155 h. & mu. Pres. & Supt. H. Larque, Sec. & Treas. P. Cougot. Office, cor. White & Laharpe sts. b
St. Charles St. R.R. Co. 15 m, 5-2 g, 35-40 lb r, 61 c, 260 mu. Pres. & Supt. Alden McLean, Sec. V. Riviere. Operates 3 lines. Office cor. Carondelet & 8th sts. a
New Orleans & Carrollton R. R. Co. 8 m, 4-8 g, 30-45 lb r, 65 c, 200 h, 19 engines. Pres. Jos. Hernandez, Sec. Walter V. Crouch, Supt. Chris. V. Halle. a
New Orleans City & Lake R.R. Co. 60 m, 5-2 g, 48 lb r, 170 st. c, 40 coaches, 7 locomotives, 800 mu. Pres. J. A. Walker, Sec. W. E. Leverich, Supt. F. Wintz. Office, 102 Canal st. 6

NEWPORT, KY.—Newport St. R. R. Co.

NEW ROCHELLE, N. Y.—New Rochelle & Pelham R. R. Co. 10 m, 4-8 g, 42 lb r, 8 c, 30 h. Pres. W. R. Bergholz, Sec. Eugene Durnin, Treas. Thos. E. Crimmins. 1

NEWTON, KAN.—Newton City St. Ry. Co. Pres. Allen Moore, V. Pres. John A. Randall, Sec. W. G. Oldfield, Treas. J. M. Ragsdale. 6 m, 3-6 g, 20 lb steel r, 8 c, 24 m. Capital, \$60,000. 7

NEW YORK, N. Y.—Ninth Ave. R.R. Co. 16 m, 4-8 g, 50 lb r, 50 c, 500 h. Pres. Geo. Law, Sec. & Treas. James Aifeck, Supt. Lewis P. Foulk. Offices, Ninth Ave., cor. 54th st. a
Broadway & Seventh Ave. R.R. Co. 16 m, 4-8 g, 47-60 lb r, 227 c, 2240 h. Pres. Henry Thompson, Sec. & Treas. Thos. P. Ryan, Supt. Henry A. Newell. Office 761 Seventh ave. 7
Central Crosstown R.R. Co. 5.22 m, 4-8 g, 52 lb r, 45 c, 241 h. Pres. Geo. S. Hart, V. Pres. A. Cammack, Sec. Milton I. Masson, Treas. E. Burton Hart. Office, 365 Ave. A. 6
Central Park, North & East River R.R. Co. 26 m, 4-8 g, 60 lb r, 162 c, 1,200 h. Pres. G. H. Scribner, V. Pres. C. D. Wyman, Sec. H. Scribner, Treas. J. L. Valentine, Supt. W. N. A. Harris. Office, Tenth Ave., 53d & 54th st. j
Chambers St. & Grand St. Ferry R. R. Pres. H. Thompson. Christopher & Tenth St. R.R. Co. 5 m, 4-8 g, 45 lb r, 47 c, 290 h. Pres. Jacob Sharp, Treas. W. T. Hatch, Sec. & Supt. G. W. Lynch. Office, 168 Christopher st. f
Dry Dock, East Broadway & Battery R.R. Co. 18½ m, 4-8 g, 60 lb r, 185 c, 1102 h. Pres. William White,

THE DAFT SYSTEM —OF— ELECTRIC RAILWAY PROPULSION.



For Street Railways the DAFT SYSTEM possesses the following named advantages:—

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The remoteness of the motive machinery from the passengers; its being insulated electrically and acoustically by India-rubber washers and bushings at its connection with the car-axles; and its being covered by a magnetic shield, which affords perfect protection to the watches of passengers from magnetization—render the "Daft System" of Street Railway Propulsion peculiarly free from the above serious objections.

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Sec. & Treas. Richard Kelly, Auditor E. T. Landon, Supt. Fred F. White. Offices, 605 Grand st. a
 Eighth Ave. R.R. Co. 20 m, 4-8½ g, 60 lb r, 112 c, 115 h. Pres. Geo. Law, Sec. & Treas. James Affleck, Supt. H. B. Wilson. Office, Eighth Ave. & 50th st. 4.
 Forty-second Street & Grand Street Ferry R.R. Co. 10½ m, 8-4 g, 64 lb r, 50c, 500 h. Pres. Chas. Curtis, Sec. & Treas. E. S. Allen, Supt. John M. Calhoun. Office, 653 W. 42d st. 6
 Forty-second St., Manhattanville and St. Nicholas Avenue Ry. Co. 18 m, 4-8½ g, 60 lb r, 105 c, 650 h. Pres. John S. Foster, Sec. C. F. Naething, Treas. Arthur Leary. Office, 118 E. 42d st. a
 Harlem Bridge, Morrisania & Fordham Ry. Co. 16.37 m, 4-8½ g, 45-60 lb r, 65 c, 316 h. Pres. and Supt., H. Spratley, V. Pres. Wm. Remsen, Sec. & Treas. Wm. Cauldwell. Office, Third ave, near 170 st. f
 Houston, West Street & Pavonia Ferry R.R. Co. 12.3 m, 4-8½ g, 60 lb r, 50 c, 340 h. Pres. Henry Thompson, Sec. & Treas. Daniel B. Hasbrouck, Supt. H. W. Edes. Office 415 E. 10 st. f
 Jerome Park R.R. 1-2-3 m, 4-8½ g, 50-56 lb r. Pres. Leonard W. Jerome, Sec. Fred A. Lovcraft, Treas. Theodore Moss. Office, cor. 5th. ave. & 22d st. 6
 New York City St. Ry. Co. 10 m, [not in operation]. Pres. Loomis L. White, Sec. W. L. McCorkle, Treas. Wm. L. Skidmore.
 New York & Harlem R. R. Co. 18½ m, 4-8½ g, 60-75 lb r, 172 c, 1,500 h. Pres. C. Vanderblit, V. Pres. C. C. Clarke, Sec. & Treas. Ed. V. W. Rosstter, Supt. Alfred Skitt, Pur. Agt. Chas. Reed. Office, Grand Central Depot. e
 Sixth Ave. R.R. Co. 9¾ m, 4-8½ g, 60 lb r, 109 c, 1250 h. Pres. Frank Curtiss, Sec. and Treas., Henry S. Moore, Supt. Edw. E. Moore. Office, 756 6th ave. 2
 South Ferry Ry. Co. 1½ m, 4 8½ g, 60 lb r, 6 box 4 open c, 32 h. Pres. Henry Hart, Sec. & Treas. Albert I. Elias, Supt. Chas. H. Meeks. Office, 20 Whitehall st. h
 Second Ave. R.R. Co. 28 m, 4 8½ g, 60 lb r, 316 cars, 1750 h. Pres. W. S. Thorn, V. Pres. J. Wadsworth, Sec. & Treas. J. B. Underhill. Office Second ave. cor. 96th st. 6
 Third Ave. R. R. Co. 28½ m, 4-8½ g, 60 lb r, 360 c, 2190 h. Pres. Lewis Lyon, 739 Madison ave., Sec. Alfred Lazarus, 436 W. 61st st., Treas. John Beaver, 211 E. 112th st., Supt. John H. Robertson, 307 E. 65th st. Eng. Wm. H. Palne. Office, 115 Third ave. 6
 Twenty-third St. Ry. Co. 14 m, 4-8½ g, 54 lb r, 122 c, 770 h. Pres. Arthur Leary, V. Pres. George N. Curtis, Sec. Thos. H. McLean, Treas. Walter T. Hatch. Office, 621 West 23d st. f
NIAGARA FALLS, N. Y.—Niagara Falls & Suspension Bridge Ry. Co. 2½ m, 4-8½ g, 38 lb r, 12 c, 41 h. Pres. Benj. Flieger, V. Pres. H. Nielson, Sec. W. J. Mackay, Man. & Treas. A. Schoelkopf. f
NIAGARA FALLS, CAN.—Niagara Falls, Wesley Park & Clifton Tramway Co. 4½ m, 4-8½ g, 30 & 45 lb r, 10 c, 40 h. Pres. J. H. Mooney, Sec. John H. Bache, Treas. John N. Hayward, Supt. J. H. Bache. h
NORFOLK, VA.—Norfolk City R. R. Co. 3½ m, 5-2 g, 43 lb r, 20 c, 67 h. Pres. John B. Whitehead, Sec. & Treas. H. C. Whitehead, Supt. E. W. Savage. b
NORRISTOWN, PA.—Citizens' Pass. Ry. Co. 4 m, 5-2½ g, 47 lb r, 6 c, 40 h. Capital, \$80,000. Pres. Geo. D. Bolton, Sec. Geo. R. Kite, Treas. Geo. Shannon, Supt. D. B. Hartrant. 8
 Norristown Pass. Ry. Co. 1½ m, 2-1 h 2-2 h c, 12 h. Pres. H. M. Lutz, Sec. Eugene D. Egbert, Treas. & Supt. Norman Egbert. 9
NORTH ADAMS, MASS.—Hoosac Valley St. Ry. Co. 6 m, 4-8½ g, 40 lb r, 8 c, 31 h, 2 steam motors. Pres. Win. B. Baldwin, V. Pres. L. W. Cronkhlite. Sec. S. Proctor Thayer, Treas. Chas. T. Beach. e
NORTHAMPTON, MASS.—Northampton St. Ry. Co. 3½ m, 4-8½ g, 32 lb r, 9 c, 35 h. Pres. Oscar Edwards, Sec. M. H. Spaulding, Treas. & Sup. E. C. Clark. l
NORWALK, CONN.—Norwalk Horse Ry. Co. 1½ m, 4-10 g, 42 lb r, 7 c, 19 h. Pres. & Supt. James W. Hyatt, Sec. Edwin G. Hoyt. f
NORWICH, CONN.—Norwich Horse R. R. Co. 6 m, 4-8½ g, 20 lb r, 12-2 h c, 39 h. Pres. Thos. Cunningham, Sec., Supt. & Pur. Agt. T. West. 9
OAKLAND, CAL.—Alameda, Oakland & Piedmont R. R. 4 m. Pres. & Pur. Agt. Theo. Meetz, Sec. R. Mohr, Treas. W. Blair, Supt. L. Koenig, Berkeley Villa R. R. Co. Props. Berryman & Chaffelot.
 Broadway & Piedmont R.R. Co. 3 m, 5 g, 30 lb r, 18 c, 46 h. Pres. Walter Blair, Sec. Montgomery Howe. 9
 Brooklyn & Fruit Vale R. R. 2½ m, 5 c, 18 h. Pres. E. C. Sessions, Sec. W. G. Gill. 2
 Fourteenth St. R.R. Co. 8 m, 5 c, 25-40 lb r, 10 c, 46 h. Pres. & Supt. Walter Blair, Sec. P. J. Van Loba, Office, 524 14th st. l
 Oakland R. R. Co. 8 m, 3 g, 60 lb r, 9 c, 83 h. Pres. Jas. G. Fair, Sec. Chas. S. Neal, Supt. Geo. Y. Loring, Office, 21st & Jones sts. 5
 Oakland, Brooklyn & Fruit Vale R. R. Co. 2½ m, 5 g, 35 lb r, 4 c, 25 h. Pres. H. Tubbs, Sec. W. C. Mason, Supt. J. Dixon, Pur. Agt. Geo. H. Mason, Office, 301 Central ave. a
 Oakland Cable Ry. Co. 5 m, 3 g, 40 lb r, 10 c. Pres. Jas. G. Fair, Sec. & Treas. Chas. S. Neal, Supt. Geo. Y. Loring, Office, 21st & Jones sts. 5
OGDEN CITY, UTAH.—Ogden City Ry. Co. 3 m, 4-8½ g, 20 lb r, 4 c, 20 h. Pres. L. W. Shurtliff, V. P. & Supt. O. P. Arnold, Sec. & Treas. H. S. Young. a
ODGENSBURG, N. Y.—Ogdensburg St. Ry. Co. 5 m, 4-8½ g, 25 lb r, 6 c, 22 h. Pres. W. H. Daniels, Sec. E. A. Newell, Treas. A. E. Smith. b
OLEAN, N. Y.—Olean St. Ry. Co. 1½ m, 3-6 g, 25 lb r, 3 c, 7 h. Pres. & Supt. M. B. Fobes, Sec. & Treas. M. W. Barse, Asst. Sec. John Fobes, Office, Union st. i
OMAHA, NEB.—Omaha Horse Ry. Co. 22 m, 4-8½ g, 30, 35 & 45 lb r, 62 c, 470 h. Pres. Frank Murphy, V. Pres. Guy C. Barton, Sec. J. E. Wilber, Treas. W. W. Marsh, Supt. W. A. Smith. Office 1504 Farman st. e
 Cable Tramway Co. of Omaha, 4 m, 4-8-1-2 g, 58½ lb r, 10 c, each with grip; operated by cable. Pres. S. R. Johnson, V. Pres. L. B. Williams, Sec. and Treas. C. E. Yost, Chief Engineer Robert Gillham. Capital stock, \$300,000, General office, 130 South 13th st. a

ONEIDA VILLAGE, N. Y.—Oneida Ry. Co. 2 m, 4-8½ g, 47 lb r, 3 c, 6 h. Pres. W. A. Stone, Sec. & Treas. W. E. Northrup, Supt. Chas. Bonta. f
ORANGE, N. J.—Orange Crosstown and Orange Valley St. Ry. Co. 2½ m, 5-2 g, 35 lb Johnson girder rail, 8-1-h, 2-2-h c, 21 h. Pres. Francis M. Eppley, of Orange, Sec. Jas. E. Brown of Elizabeth, Treas. Henry W. Pope of Elizabeth, Capital stock, \$20,000; bonds, \$20,000. 8
OSHKOSH, WIS.—Oshkosh St. R. R. Co. 3½ m, 4-8½ g, 27 lb r, 10 c, 40 h. Pres. Leander Choate, V. Pres. J. H. Jenkins, Sec. & Treas. J. Y. Hull, Sup. L. F. Thompson. g
OSWEGO, N. Y.—Oswego St. Ry. Co. 2½ m, 4-8½ g, 45 lb r, 5 c, 25 h. Pres. R. J. Olliphant, V. Pres. H. D. McCaffrey, Sec. & Treas. Albert Himes, Supt. Wm. S. Turner. Office, West Bridge, near Third ave. d
OTTAWA, KAN.—Ottawa St. Ry. Co. 2 m, 4-8½ g, 20 & 30 lb T and girder r, 1-1-h 3-2-h c, 16 mu. Pres. John P. Harris, Sec. & Treas. Peter S. Hiras, Supt. David Miller. 9
OTTAWA, ONT.—Ottawa City Passenger Ry. Co. 5 m, 4-8½ g, 30 lb r, 9 c, 40 h. Pres. Thomas C. Keefe, V. Pres. R. Blackburn, Sec. James D. Fraser. 1
OTTUMWA, IA.—Ottumwa St. R. R. Co. 2 m, 3-6 g, 27 lb r, 4 c, 2 h, 14 mu. Pres. J. M. Hedrick, Sec. & Treas. H. L. Hedrick, Supt. C. M. Hedrick.
 Mineral Springs St. Ry. 1 m, 3-6 g, 16 lb r, 1 c, 4 mu, Owner, L. E. Gray. 8
PADUCAH, KY.—Paducah St. Ry. Co. 5½ m, 4-8½ g, 30 lb hat r, 9-1-h c, 26 mu. Pres. C. Delafield, Sec. Henry H. Houston, Treas. J. C. Thompson. Office, 110 S. 3d st. 9
PARIS, TEX.—Paris Ry. Co. 2½ m, 4-8½ g, 22 lb T r, 3 pass. 4 ft c, 11 mu. Pres. D. F. Latimer, Sec. & Supt. C. G. Caviness, Treas. W. D. Latimer. a
PATERSON, N. J.—Paterson & Passaic R.R. Co. 7 m, 4-10½ g, 33 lb r, 16 c, 30 h. Pres. John N. Terlune, Sec. E. S. Brown, Treas. John J. Brown, Man. & Supt. Ambrose T. King, Asst. Supt. Townsend Rider. Office, First National Bank Bldg.
 Paterson City Ry. Co. 8½ m, 4-8½ g, 35 lb r, 10 c, 40 h. Pres. Garret Planten, Treas. & Man. H. Romani, Sec. Albert A. Wilcox, Supt. M. Pettigrew. Office 27 Broadway. a
PAWTUCKET, R. I.—Pawtucket St. Ry. Co. 8 m, 54 lb r, 4 g, 24 c, 124 h. Pres. A. B. Chase, V. Pres. & Gen. Man. D. F. Longstreet, Treas. E. N. Littlefield, Engr. Geo. C. Tingley. Office Broad st. k
PELIHAM, N. Y.—Pelham Park St. Ry. Co. 1½ m, 3-6 g, 30-57 lb T and s-b r, 4-1-h c, 8 h. Pres. W. H. Lambertson, Sec. & Treas. E. M. Able, Supt. Henry D. Carey. Office, 16 Exchange place, New York. 8
PENSACOLA, FLA.—Pensacola St. Car Co. 3 m, 4-8 g, 6 h 30 mu. Pres. A. V. Clubb, Sec. W. A. Blount, Treas. Thos. C. Watson. Capital, \$100,000. Office, 100 E. Government st. c
PEORIA, ILL.—Central City Horse Ry. Co. 10 m, 4-8½ g, 40 & 60 lb r, 40 c, 90 h. Pres. & Gen. Man. H. R. Woodward, Sec. & Treas. E. Callender, Supt. John Strong. Office 2011 N. Adams st. f
 Central Horse & Cable R. R. Co. 3 m, 4-8½ g, 30 & 40 lb r, 9 c, 22 h. Pres. & Gen. Man. H. R. Woodward, Sec. Jos. Elder, Treas. E. Callender, Supt. John Strong. Office, 2011 N. Adams st. f
 East Bluff Peoria Horse Ry. Co. 1 m, 4-8½ g, 30-40 lb r, 4 c, 24 h. Pres. N. Giles, Sec. R. R. Bourland, Treas. M. E. Culver. Capital, \$11,000. 4
 Fort Clark Horse Ry. Co. 8 m, 4-8½ g, 20-38 lb r, 32 c, 80 mu. Pres. J. H. Hall, Sec. H. W. Wells, Treas. H. Detweiler, Supt. J. H. Hall. Office, 1,600 Perry st. i
 Peoria Horse Ry. Co. 6 m, 4-8½ g, 40-60 lb r 14 c 60 h & mu. Pres. & Gen. Man. H. R. Woodward, Sec. & Treas. E. Callender, Supt. John Strong. j
PETERSBURG, VA.—Petersburg St. Ry. 3½ m, 4-8½ g, 42 & 47 lb r, 9 c, 2 h, 35 mu. George Beadle, Prop. 7
PHILADELPHIA, PA.—Citizens' Pass. Ry. Co. 10½ m, 5-2 g, 45-47 lb r, 86 c, 470 h. Pres. John McCarthy, Sec. & Treas. J. Q. Adams, Sup. H. C. Keen, Office, n w cor. 12th and Susquehanna ave. Capital, \$192,500. a
 Empire Pass. Ry. Co. 8½ m, 5-2 g, 45 lb r, 32 c, 250 h, Pres. James McManes, Sec. and Treas. John I. Adams, Office, n w cor. 12th st. and Susquehanna ave. a
 Frankford & Southwark Phila. City Pass. R.R. Co. 18.10 m, 5-2 g, 47 lb r, 100 c, 8 dummies, 650 h. Pres. John Noblit, Sec. Thos. S. Harris, Treas. R. C. Brewster, Supt. T. E. Cox. Capital, \$750,000. Office, 2501 Kensington ave. a
 Germantown Pass. Ry. Co. 29½ m, 5-2½ g, 47 lb r, Cars and horses, leased. Pres. Craig D. Ritchie, Sec. & Treas. Lewis S. Renshaw. Office, 1,001 Chestnut st. f
 Green & Coates R. R. Co. (Leased to People's Pass. Ry. Co.) Pres. John B. Parsons, Asst. to Pres. Thos C. Barr, Auditor Chas. W. Carr, Sec. & Treas. David C. Golden, Supt. Chas. S. Whiting. Office, 8th & Dauphin sts. 8
 Hestonville, Mantua & Fairmount Pass. R.R. Co. 20 m, 5-4½ g, 45 lb r, 60 c, 500 h. Pres. Charles H. Lafferty, Sec. & Treas. W. C. Foster. Office, 4,300 Lancaster ave. a
 Lombard & South Sts. Pass. Ry. Co. 10 m, 5-2 g, 43 lb r, 51 c, 276 h. Pres. John B. Parsons, Sec. & Treas. Thos. C. Barr, Supt. J. H. Fresh. Office, 25th & South sts. k
 People's Pass. Ry. Co. 45 m, 5-2 g, 47 lb r, 125 c, 1153 h. Pres. John B. Parsons, Sec. & Treas. D. C. Colden, Supt. Chas. S. Whiting. Office, 8th & Dauphin sts. a
PHILADELPHIA CITY PASS. RY. CO. 12.417 m, 5-2½ g, 47 & 78 lb r, 132 c, 708 h. Pres. Wm. W. Colket, Sec. & Treas. T. W. Pennypacker. (Leased to W. Phila. Pass. Ry. Co.) Office, 202 Walnut place. a
 Philadelphia Traction Co. 109 m, 5-2½ g, 47 lb r, 594 c, 2608 h. Pres. W. H. Kemble, V. Pres. P. A. B. Widener & W. L. Elkins, Sec. & Treas. D. W. Dickson, Engr. A. D. Whitton. Office, n w cor. 41st and Haverford sts. i
 Philadelphia & Darby Ry. Co. 6½ m, 5-2½ g, 42 lb r, road leased. Pres. C. L. Borie, Sec. and Treas. Wm. W. Colket. Office, 202 Walnut pl. Leased to Phila. City Pass. Ry. Co. a
 Philadelphia & Gray's Ferry Pass. R.R. Co. 10-1-3 m, 40 c, 200 h. Pres. Matthew Brooks, Treas. J. C.

Dawes, Sec. J. Crawford Dawes, Supt. Patrick Lovett. Office, 36th st. and Gray's Ferry Rd. 6
 Ridge Ave. Pass. Ry. Co. 15 m, 5-1 g, 47 lb r, 63 c, 350 h. Pres. E. B. Edwards, Sec. & Treas. Wm. S. Blight, Supt. Wm. Myers, Engr. Morris Vose. a
 Second & Third St. Pass. Ry. Co. 37 m, 5-2½ g, 43 to 55 lb r, 116 c, 675 h. Pres. Alexander M. Fox, Treas. William F. Miller, Sec. Charles D. Matlack, Supt. D. W. Stephens. Office, 2,653 Frankford ave. a
 Seventeenth & Nineteenth Sts. Pass. Ry. Co. 7½ m. Pres. Matthew S. Quay, Sec. & Treas. John B. Peddie. (Leased to Philada. Traction Co.)
 Thirteenth & Fifteenth Sts. Pass. Ry. Co. 14 m, 5-2 g, 47 lb r, 48 c, 52 h. Pres. Thos. W. Ackley, Sec. & Treas. Alex. Rennick, Supt. Wm. P. Cooper. Office, 15th & Cumberland sts. a
 Union Pass. Ry. Co. 70 m, 348 c, 1,724 h. Pres. Wm. H. Kemble, Sec. & Treas. John B. Peddie, Supt. Jacob C. Petty. (Leased to Phila. Traction Co.)
 West Philadelphia Pass. Ry. Co. 18½ m, 5-2½ g, 47 lb r, 122 c, 112 h. Pres. Peter A. B. Widener, Sec. & Treas. D. W. Dickson, Supt. Jas. T. Gorman. Office, cor. Haverford & 41st sts. (Leased by the Phila. Traction Co.) 5
PHILLIPSBURGH, N. J.—Phillipsburgh Horse Car R. R. Co. 2½ m, 4-8 g, 35 lb r, 4 c, 13 h. Pres. Daniel Runkle, Sec. & Treas. James W. Long. a
PITTSBURGH, PA.—Central Pass. R.R. Co. 6 m, 5-2½ g, 45 lb r, 16 c, 100 h. Pres. Geo. I. Whitney, Sec. & Treas. F. L. Stephenson, Supt. R. G. Heiron. 4
 Citizens' Pass. Ry. Co. 16½ m, 5-2½ g, 47 lb r, 52 c, 337 h. Pres. Jno. G. Holmes, Sec. C. M. Gormley, Treas. Jas. J. Donnell, Supt. Murray A. Verner. Capital, \$200,000.
 Federal St. & Pleasant Valley Ry. Co. 6 m, 5-2½ g, 45-47 lb r, 22 c, 168 h. Pres. Wm. McCreery, Sec. R. F. Ramsey, Treas. James Boyle, Supt. Wm. J. Crozier, Allegheny City. Office, 129 Taggart st., Allegheny City. a
 People's Park Pass. Ry. Co. 2 m, 5-2½ g, 45 lb r, 10 c, 80 h. Pres. Wm. McCreery, Sec. R. F. Ramsey, Treas. James Boyle, Supt. Wm. J. Crozier, Allegheny City. Office, 129 Taggart st., Allegheny City. a
 Pittsburgh, Allegheny & Manchester Pass. Ry. Co. 10 m, 5-2½ g, 46 lb r, 44 c, 278 h. Pres. Chas. Atwell, Sec. & Treas. Chas. Selbert, Supt. James C. Cotton. Office, Market & Liberty sts. a
 Pittsburgh, Oakland & East Liberty Pass. Ry. Co. 11 m, 5-4½ g, 47 lb r, 22 c, 160 h. Pres. Thos. S. Bigelow, Gen. Man. G. W. Elkins, Sec. John G. Traggardh, Treas. A. W. Mellon, Supt. H. M. Cherry. e
 Pittsburgh Union Pass. R.R. Co. 10 m, 5-2½ g, 46 lb r, 29 c, 150 h. Pres. Chas. Atwell, Sec. Chas. Selbert, Treas. J. J. Donnell, Supt. James C. Cotton. a
 Pittsburgh & Birmingham Pass. R. R. Co. 7 m, 5-2½ g, 45-47 lb r, 20 c, 177 h. Pres. W. W. Patrick, Sec. C. B. Agnew, Treas. John G. Holmes. k
 Pittsburgh & West End Pass. Ry. Co. 7 m, 5-2½ g, 40 lb r, 14 c, 74 h. Pres. & Treas. John C. Reilly, Sec. Thos. S. Bigelow, Supt. William J. Burns. Office, Wash ave. a
 Second Avenue Pass. Ry. Co. 5 m, 5-2 g, 47 lb r, 8 c, 40 h. Pres. Geo. Fawcett, Sec. Jas. F. Fawcett, Treas. W. J. Fawcett. Office, 2d ave. a
 South Side Pass. R.R. Co. 5 m, 5-2½ g, 45 lb r, 12 c, (only 6 in use), 40 h. Pres. D. Z. Brickell, Clerk J. A. Curry, Treas. W. T. Wallace, Supt. W. M. Rosborough. Office, 2,136 Sarah st. e
 Transverse Pass. Ry. Co. 6½ m, 5-2 g, 52 lb r, 39 c, 243 h. Pres. C. L. Magee, V. Pres. C. F. Klopfer, Sec. & Treas. Wm. R. Ford, Supt. Miller Elliot.
PITTSFIELD, MASS.—Pittsfield St. Ry. Co. 3½ m, 4-8 g, 30 c, 40 h. Pres. Jos. Tucker, Sec. T. Allen, Treas. T. A. Oman, Supt. C. P. Upson. 8
PITTSSTON, PA.—Pittston St. Car Co. 1½ m, 5-2 g, 42 lb r, 2 c, 6 h. Pres. Isaac Everitt, Sec. Eug. W. Mullgan, Treas. M. W. Morris. e
PORT HURON, MICH.—Port Huron Electric Ry. Co. 2½ m, 4-8½ g, 27 lb r, 8 c, (3 being motor c), 11 h. Pres. Wm. F. Botsford, V. Pres. John F. Talbot, Treas. Chas. A. Ward, Jr. Office, 306 Huron ave. h
 Port Huron St. Ry. Co. 6½ m, 4-8½ g, 7 c, 22 h. Pres. J. P. Sanborn, Sec., Treas. & Man. J. R. Wastell. 7
PORTLAND, ME.—Ocean St. R.R. Co. Operated by Portland R. R. Co. 12
 Portland R.R. Co. 9½ m, 4-8½ g, 35-45 lb r, 36 c, 167 h. Pres. H. J. Libby, Treas. & Gen. Man. E. A. Newman. Office, 484 Congress st. 4
PORTLAND, ORE.—Portland St. Ry. Co. 2 m, 3-6 g, 25-42 lb r, 11 c, 40 h. Pres. Jos. Holladay, Sec. & Supt. C. K. Harbaugh. Office, 104 Fourth st. k
 Multnomah St. Ry. Co. 2½ m, 3-6 g, 30 lb r, 19 c, 65 h. Pres. A. N. King, Sec. E. A. King, Supt. W. J. Matchette. Office, 294 Washington st. j
 Transcontinental St. Ry. Co. 10 m, 3-6 g, 25-38 lb r, 24 c, 100 h. Pres. & Gen. Man. Tyler Woodward, Sec. D. W. Wakefield. Office, 145 G st. b
PORTSMOUTH, O.—Portsmouth St. R. R. Co. 2 m, 3-6 g, 18 lb r, 4 c, 10 h. Pres. James Skelton, Treas. Sec. & Supt. Enos Reed. a
POTTSVILLE, PA.—People's Ry. Co. 4½ m, 4-8½ g, 45 to 60 lb r. Pres. T. A. Reilly, Sec. & Supt. Wm. D. Pollard. 9
POUGHKEEPSIE, N. Y.—City R. R. Co. 4 m, 4-8½ g, 35-42 lb r, 11 c, 39 h. Pres. Geo. B. Adriance, V. Pres. & Treas. Hudson Taylor, Sec. A. B. Smith, Supt. C. M. Davis. Office 491 Main st. f
PROVIDENCE, R. I.—Union R.R. Co. 53.8 m, 4-8 g, 47-54 lb r, 277 c, 1,400 h. Pres. Jesse Metcalf, V. Pres. & Gen. Man. D. F. Longstreet, Sec. and Treas. C. A. Babcock, Auditor B. A. Jackson, Engr. Geo. C. Tingley. Office, Market sq. k
PUEBLO, COL.—Pueblo St. Ry. Co. 5 m, 3 g, 22 lb iron r, 8 c, 28 h. Pres. J. B. Osman, V. Pres. J. K. Moore, Sec. & Supt. J. T. Clark, Treas. J. N. Carlisle. 5
QUEBEC, CAN.—Quebec St. Ry. Co. 3 m, 4-8½ g, 45 lb r, 9 c, 46 h. Pres. Chas. St. Michel, Quebec, V. Pres. G. R. Renfrew, Quebec, Sec., Treas. & Supt. Samuel Moore. b
 St. John St. Ry. Co. 1½ m, 4-8½ g, 35 lb r, 4 c, 23 h. Runs 4 buses out 4 m. from city limits. Pres. Jos. W. Henry, V. Pres. A. Robertson, Sec. & Man. W. W. Martin. b
QUINCY, ILL.—Quincy Horse Ry. & Carrying Co. 6 m, 5 g, 71 lb r, 21 c, 118 mu. Pres. Lorenzo Bull,

THE SHORT & NESMITH S E R I E S ELECTRICAL RAILWAY SYSTEM OF THE United States Electric Company, DENVER, COLORADO, U.S.A.

This Series System of Electrical Railway solves the problem of electrical traction. It has no disagreeable features. No unsightly poles on the street; there being but one wire in the track way, no shocking can occur. The simplicity and practical construction of the system and the fact that it is the only one on which a large number of cars can be operated makes it the system which will immediately come into general use.

See description elsewhere in "Street Railway Journal" for July, 1887.

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V. Pres. C. H. Bull, Sec. & Treas. E. J. Parker, Supt. E. K. Stone.

RACINE, WIS.—Belle City St. Ry. Co. 4 m, 4 g, 32 lb r, 9 c, 40 h. Pres. Geo. B. Hathaway, Sec. & Treas. J. E. Dodge, Office, 716 Park ave. d

RALEIGH, N. C.—Raleigh St. Ry. Co. 5 m, 4-8 1/2 g, 16 T steel r, 6 c, 36 mu. Pres. V. E. Turner, Sec. & Treas. R. T. Gray, Atty. F. H. Busbee. Capital stock, \$25,000. 6

RAPID CITY, DAK.—Rapid City St. Ry. Co. 1 1/2 m, 4 g, 1 b r, 2 c, 4 h. Pres. Fred. T. Evans, Sec. & Treas. G. Schnasse. a

READING, PA.—Reading City Pass. Ry. Co. 4 m, 5-2 1/2 g, 47, 50 & 52 lb r, 30 c, 125 h. Pres. B. F. Owen, V. Pres. Jas. L. Douglas, Sec. & Treas. H. A. Muhlenberg, Supt. J. A. Riggs. Office, 537 S. 6th st. a
Perkiomen Ave. Pass. Ry. Co. 4 1/2 m, 5-2 1/2 g, 38 45 lb r, 18 c, 75 h. Pres. Chas. Breneliser, Sec. & Treas. Isaac Hlester, Supt. John B. Houpp. Office, Perkiomen ave. & 19th st. e

RED OAK, IA.—Red Oak St. R.R. Co. 1 1/2 m, 4-2 1/2 g, 20 lb r, 2 c, 4 h. Pres. John Hayes, V. Pres. Edward Hayes, Sec. F. M. Byrket, Treas. & Supt. Marcus Bonham. a and z

RICHMOND, IND.—Richmond City R. R. Co. 4 m, 3 g, 16 & 20 lb r, 13c, 40h. Pres. J. C. Shaffer, V. Pres. J. F. Miller, Sec. & Treas. H. I. Miller. Office, 15-21 S. 7th st. e

RICHMOND, VA.—Richmond City Ry. Co. 7 1/2 m, 4-8 1/2 g, 30-40 lb r, 13 c, 185 h. Pres. J. L. Schoolcraft, Treas. Walter Kidd, Man. C. M. Bolton, Supt. Charles Selden. a

Richmond & Manchester Ry. Co. 3 1/2 m, 4-8 1/2 g, 38 lb r, 5 c, 26 h. Pres. J. E. Taylor, V. Pres. J. Bryan, Sec. & Treas. Jackson Brandt, Supt. B. R. Seiden. a

ROCHESTER, N. Y.—Rochester City & Brighton R.R. Co. 37 m, 4-8 1/2 g, 30-45-57 lb r, 170 c, 682 h. Pres. Patrick Barry, Sec. C. C. Woodworth, Treas. C. B. Woodworth, Supt. Thomas J. Brower. e
Citizens' St. Ry. Co. Pres. Wm. H. Jones, Sec. & Treas. J. E. Pierpont, Supt. S. A. Green.

ROCKFORD, ILL.—Rockford St. Ry. Co. 6-2-5 m, 4-8 1/2 g, 30-40 lb r, 13 c, 52 mu. Pres. Anthony Haines, Sec. H. H. Robinson, Treas. N. E. Lyman, Supt. Fred. Haines. c

ROCK ISLAND, ILL.—Rock Island & Milan St. Ry. Co. 12 m, 4-8 1/2 g, 20, 30 & 40 lb r, 8 pass c, 8 ft c, 7 h, 2 motors. Pres. & Supt. Bailey Davenport, Sec. E. C. Hurst, Treas. J. F. Ryan. e

ROME, GA.—Rome St. Ry. Co. 1 1/2 m, 4-8 1/2 g, 20 lb r, 1 1/2-3 1/2 h c. Pres. J. W. Rounsaville, Sec. J. L. Biss, Treas. J. F. Howell, Supt. & Pur. Agt. F. C. Hland. 6

ROME, N. Y.—Rome City St. Ry. Co. 5 m, 1 1/2 m more to be built at once, 4-8 1/2 g, 38 1/2 lb r, 13 c, 70 h. Pres. Rowland F. Hill, 3 Broad St., New York; Sec. & Treas. Wm. Moores, New York; Supt. Wm. P. Rayland, 115 John st., Rome. 8

RONDOUT, N. Y.—Kingston City R. R. 2-78 m, 4-8 1/2 g, 40 lb r, 8 c, 40 h. Pres. James G. Lindsley, V. Pres. S. D. Coykendall, Sec. & Treas. Peter E. Schoonmaker, Auditor, Oscar L. Eastman, Gen. Man. Geo. Coykendall. j

RUTLAND, VT.—Rutland St. Ry. Co. 8 m, 4-8 1/2 g, 20 lb r, 8 c, 30 h. Pres. John N. Woodfin, Treas. A. H. Tuttle, Supt. M. McKeogh. Office, 7 1/2 Center st. g

SACRAMENTO, CAL.—Sacramento City Ry. Co. 12 1/2-horse and 10 3-horse c, 60 h. Prop. R. S. Carey, Supt. Geo. W. Carey. 5

SAGINAW, MICH.—City of Saginaw St. R. R. Co. 2 1/2 m, 4-8 1/2 g, 42 lb r, 14 c, 50 h. Pres. David H. Jerome, V. Pres. Geo. F. Williams, Sec. & Treas. Geo. L. Burrows, Supt. Fred G. Benjamin. Office, 311 Court st. 5

SALEM, MASS.—Salem & Danvers St. Ry. Co. 12 m, 4-8 1/2 g, 35-45 lb r, 24 c, 117 h. Pres. Benj. W. Russell, Sec. & Treas. G. A. Vickery, Asst. Supt. David N. Cooke, Engr. Chas. A. Putnam. Purchased by Naumkeag St. Ry. Co. 6

Naumkeag St. Ry. Co. 24 m, 4-8 1/2 g, 35-45 lb r, 83 c, 275 h. Pres. Chas. Odell, Clerk Joseph F. Hickey, Treas. Henry Wheatland, Supt. Willard B. Ferguson. a

SALINA, KAN.—Salina Ry. Co. 2 1/2 m, 3-6 g, 20 lb T r, 3-2 h c, 18 mu. Pres. M. D. Herrington, Sec. A. L. Dodge, Treas. M. D. Teague, Supt. C. F. Hilton. 9

SALINA, N. Y.—Woodlawn and Butternut St. Ry. Co. a

SALT LAKE CITY, UTAH.—Salt Lake City R.R. Co. 13 m, 4-8 1/2 g, 20 lb r, 16 c, 106 mu. Pres. John Taylor, Sec. David McKenzie, Treas. James Jack, Supt. Orson P. Arnold. d

SAN ANTONIO, TEX.—San Antonio St. Ry. Co. 15 m, 4 g, 38 lb r, 40 c, 150 mu. Pres. A. Belknap, San Antonio, V. Pres. F. W. Pickard, N. Y. City, Treas. J. Withers, San Antonio, Sec. E. R. Norton, Supt. John Robb. j

Prospect Hill St. R.R. Co. 1 1/2 m, 1 c, 2 h. Pres. Sam. Maverick, v. Pres. & Gen. Man. P. J. Moss, Sec. Leonardo Garza, Treas. L. Wm. Menger. d

SANDUSKY, O.—Sandusky St. Ry. Co. 4 m, 4-8 1/2 g, 32 lb r, 7 c, 28 h. Pres. Chas. V. Olds, Sec. & Treas. A. C. Moss, Supt. Clark Rude. a

SAN FRANCISCO, CAL.—California Street Cable R. R. Co. 7 m, 3-6 g, 24 lb r, 27 c, 25 dummies, 4 h. Pres. Chas. Mayne, V. Pres. Robert Watt, Sec. T. W. Hinsman, Treas. A. Borel, Supt. J. W. Harris. Office, 1435 California st. g

Central R. R. Co. 12 m, 5 g, 45 lb r, 15-2-h & 16-1-h c, 290 h. Pres. Chas. F. Crocker, V. Pres. T. Hopkins, Sec. Jabez Hatch, Treas. N. T. Smith, Supt. J. F. Clark. Office, 44 Turk st. g

City R.R. Co. 11 m, 5 g, 45 lb r, 72c, 280 h. Pres. Leland Stanford, Sec. & Gen. Man. J. L. Willcutt, Treas. N. T. Smith, Supt. H. L. Gude. Office, 4th & Townsend sts. 7

Clay St. Hill R. R. Co. 2 m, 3-6 g, 30 lb r, 11 c, 12 dummy cars. Pres. Joseph Britton, V. Pres. Chas. Mayne, Treas. Henry L. Davis, Sec. Chas. P. Campbell. Office, s w cor. Clay & Leavenworth sts. h

Geary St. Park & Ocean R.R. Co. 9 1/2 m, (5 1/2 m cable, 4 1/2 m steam) 5 g, 45 lb r, 39 c. Pres. Chas. F. Crocker, V. Pres. R. F. Morrow, Sec. John N. Lynn, Treas. H. T. Smith, Supt. Johnson Reynolds. g

Market St. Cable Ry. Co. 25 m, 4-8 1/2 g, 37-38 lb r, 182 c, 2 motors, 86 h. Pres. Leland Stanford, V. Pres.

Chas. F. Crocker, Treas. N. T. Smith, Sec. J. L. Willcutt, Supt. H. D. Morton. Office, Fourth and Townsend streets. d

North Beach & Mission R. R. Co. 16 m, 5 g, 45 lb r, 50 two h. c. and 14 one h. c. Pres. Albert Meyer, Sec. H. W. Hathorne, Treas. Wm. Alvord, Supt. M. Skelly. Office, 4th & Louisa sts. h

Ocean Beach Ry. Co. (operated by Market St. Cable Ry. Co.) 2 m. Pres. Leland Stanford, V. Pres. Chas. F. Crocker, Treas. N. T. Smith, Sec. J. L. Willcutt, Supt. H. D. Morton. Office, 4th & Townsend sts. d

Omnibus R. R. & Cable Co. 18 m, 5 g, 40-45 lb r, 60 c, 400 h. Pres. Gustav Sutro, V. Pres. D. Skeln, Sec. G. Ruegg, Supt. M. M. Martin. Office 727 Howard st. Will soon change to cable. g

Park & Ocean R. R. Co. 8 m, 35 and 40 lb r, 4-8 1/2 g, 7 dummy engines, 16 pass. c, 6 flat and section c. Pres. Chas. F. Crocker, V. Pres. Timothy Hopkins, Treas. N. T. Smith, Sec. J. L. Willcutt, Supt. H. D. Morton. Office, 4th & Townsend sts. d

Potrero & Bay View R. R. Co. 3 m, 5 g, 35 lb r, 10 c, 43 h. Pres. Leland Stanford, V. Pres. Chas. Crocker, Treas. N. T. Smith, Sec. J. L. Willcutt, Supt. H. C. Rogers. Office, 4th & Townsend sts. d

Sutter St. R. R. Co. 14 m, 4-11 g, 45 lb r, 50 c, 185 h. Pres. R. F. Morrow, Sec. A. K. Stevens, Treas. M. Schmitt. Office, cor. Sutter & Polk sts. f

Telegraph Hill R.R. Co. 1,560 ft, 4-8 1/2 g, 45 lb r, 2 c, — h. Pres. Gustave Sutro, V. Pres. C. Kohler, Sec. & Supt. Chas. J. Werner. Suspended operations. Cable taken up and stored away. e

SAN JOSE, CAL.—San Jose & Santa Clara R.R. Co. 8 1/2 m, 4-8 and 3 g wide g, 40 lb r, narrow g, 20 lb r, 25 c, 75 h. Pres. S. A. Bishop, V. Pres. W. S. McMurtry, Treas. Jacob Rich, Sec. E. M. Rosenthal, Man. Wm. Fitts. Office, 20 W. Santa Clara st. h

First St. R. R. 4 1/2 m, 3 g, 20 lb r, 6 c, 30 h. Jacob Rich, Sole Owner; Sec. E. M. Rosenthal. Office, 20 Santa Clara st. 12

First St. & San Pedro St. Depot R. R. Co. Pres. Frank C. Bethel.

North Side Horse R.R. Co. 2 1/2 m, 3 g, 16 lb r, 3 c, 10 h. Pres. & Man, Jacob Rich, Sec. E. M. Rosenthal, Treas. S. A. Bishop. f

Willow Glen R.R. 7 1/2 m, 3 g, 20 lb r, 8 c, 30 h. Sole owner Jacob Rich, Sec. E. M. Rosenthal. Office 20 W. Santa Clara st. k

SANTA BARBARA, CAL.—Santa Barbara St. R.R. Co. 2-2-5 m, 3-6 g, 3 c, 12 mu. Pres. A. F. McPhail. Office, State st. 5

SANTA ROSA, CAL.—Santa Rosa St. Ry. Co. 1 1/2 m, 3 g, 32 lb tram r, 2 1-h 2-2-h c, 6 h. Pres. & Treas. M. L. McDonald, Sec., Supt. and Pur. Agt. J. B. Reed. 9

SARNIA, CAN.—Sarnia St. Ry. Co. 5m, 4-8 g, 32 lb r, 2 c, 9 h. Pres. J. F. Lester, Sec. & Treas. Thos. Symington, Supt. Henry W. Mills. Office, Canadian Block. c

SAUGATUCK, CONN.—Westport & Saugatuck Horse R.R. Co. (See Westport, Conn.)

SAVANNAH, GA.—City & Suburban R. R. 12 1/2 m steam line, 6 m, street line, 5 g, 35, 38 & 42 lb r, 40 street c, 12 steam c, 130 h, 3 engines. Pres. J. H. Johnston, Sec. A. L. Hartridge, Treas. E. Schmidt. 1

Coast Line R.R. Co. 7 m, 5 g, 35 lb r, 17 c, engine, 35 h, 5 m suburban line 35 lb T r steam. Pres. Geo. Parsons, New York, Sec. & Gen. Man. R. E. Cobb, Savannah. Office, Bolton st. c

SCHENECTADY, N. Y.—Schenectady St. Ry. Co. 2 1/2 m, 4-8 1/2 g, 49 lb steel girder r, 5 c, 30 h. Pres. A. L. Clusohn, Sec. L. M. Fulton, Treas. Gen. Man. & Pur. Agt. Alfred Ely, 29 Nassau st., New York, Supt. D. G. Christie, Schenectady. 8

SCRANTON, PA.—People's St. Ry. Co. of Luzerne Co. 10 m, 4-8 1/2 g, 25-40-52 lb r, 20 c, 90 h. Pres. Wm. Matthews, Sec. & Treas. Horace E. Hayd, Supt. F. Pearce. k

Scranton Suburban Ry. Co. 4 m, 4-8 1/2 g, 52 lb flat & 42 lb T r, 5 c, operated by electricity, Van Depoele system. Pres. Edward B. Sturges, Treas. T. F. Torrey, Sec. Geo. Sanderson, Supt. John Lathrop. 6

SEARCY, ARK.—Searcy & West Point R. R. Co. 8 m, 4-8 1/2 g, 20 lb r, 7 c, 8 mu. Pres. A. W. Yarnell, Sec. W. H. Lightle, Treas. Jasper Hicks. c

SEATTLE, W. T.—Seattle St. Ry. Co. 4 1/2 m, 4-8 1/2 g, 25 & 30 lb T steel r for 2 1/2 m, 35 lb flat steel r for 2 m, 7 c, 24 h. Pres. & Gen. Man. F. H. Osgood, Sec. Geo. Klnhear. a

SEDALIA, MO.—Sedalia St. Ry. Co. 2 1/2 m, 4-10 g, 22 lb r 6 c 25 h. Pres. Joseph D. Sicher, V. Pres. Louis Deutsch, Treas. F. H. Guenther, Sec. Chas. S. Conrad. f

SELMA, ALA.—Selma St. R.R. Co. 2 1/2 m, 5 g, 20 lb r, 7c, 7 h. Pres. H. L. McKee, Sec. J. F. Brown. g

SEVASTOPOL, IA.—Des Moines & Sevastopol St. Ry. Co. 2 m, 4 g, 20 lb r, 3 c, 10 h. Pres. G. Van Ginkel, Sec. G. C. Van Ginkel, Treas. John Weber. a

SHERMAN, TEX.—Sherman City R. R. Co. 4 m, 5 g, 20 lb r, 9 c, 54 mu. Pres. C. W. Batsell, Treas. J. M. Batsell, Sec. C. W. Batsell, Jr. d

SHREVEPORT, LA.—Shreveport City R.R. Co. 1 1/2 m, 4-4 g, 46 lb r, 6 c, 14 h. Pres. Peter Youree. e

SILVER CLIFF, COL.—Silver Cliff St. R.R. Co. **SIoux CITY, IA.**—Sioux City St. Ry. Co. 8 m, 4 g, 30 lb r, 16 c, 125 h. Pres. Fred. T. Evans, V. Pres. D. A. Magee, Sec. & Treas. F. T. Evans, Jr. a

Sioux City & Highland Park Motor Ry. Co. 4 1/2 m, 4-8 1/2 g, 30 lb T r, dummy engines. Pres. W. W. Byam, Sec. F. B. Hutchins, Treas. W. C. Hutchins Supt. and Pur. Agt. S. B. Jackson. d

SOUTH BEND, IND.—South Bend St. Ry. 7 m, 4-8 g, 30 lb r, 16 c, 56 h. Pres. Jacob Woolverton, Treas. & Gen. Man. Lucius Clark, Sec. W. G. George Supt. Will Miller. a

South Bend & Mishawaka St. Ry. Co. 10 m, 4-8 1/2 g, T and s b r, 13 2 h c, 44 h. Pres. J. W. Boynton, Sec. & Treas. E. W. Ellithorp, Mishawaka, Ind. **SOUTH CHICAGO, ILL.**—South Chicago City Ry. Co. 6 m (of which 3 m are 40 lb Johnson girder r, 1 1/2 m 35 lb tram & 1/2 m T r), 7 c, 37 h. Pres. Douglass Taylor, Sec. & Supt. Andrew Krimbill, Treas. C. O. Pomeroy. Office, 46 Calumet Bldg, Chicago. e

SPRINGFIELD, MASS.—Springfield St. Ry. Co. 9 1/2 m, 4-8 1/2 g, 35 lb r, 40 c, 170 h. Pres. John Olmsted, Auditor L. E. Ladd, Clerk Gideon Wells, Treas. A. E. Smith, Supt. F. E. King, Office, 1 Main st. a

SPRINGFIELD, MO.—Citizens' Ry. Co. of Springfield and No Springfield, 7 m, 4-8 1/2 g, 33-40 lb r, 15 c, 28 h, 48 mu. Pres. R. C. Kerens, V. Pres. B. F. Hobart, Sec. and Treas. A. M. Longwell, Supt. F. B. Smith, Ex-Com. H. F. Denton, L. H. Murray, C. B. McAfee. Office, North Springfield. 3

SPRINGFIELD, O.—Citizens' St. R.R. Co. 11 1/2 m, 4 g, 30 lb r, 30 c, 145 h. Pres. D. W. Stroud, V. Pres. H. S. Bushnell, Treas. Ross Mitchell, Sec. F. S. Penfield. a

STAFFORD, KAN.—Stafford St. Ry. Co. 1m, T r, 3-2-h c, 12 h. Pres. Supt. and Pur. Agt. John Clyne, S. C. J. H. Cothness, Treas. Frank Cox. **STAMFORD, CONN.**—Stamford Horse R. R. Co. 5 1/2 m, 4-8 1/2 g, 10 c, 40 h. Pres. F. M. Delano, Treas. Philip Richardson, Supt. A. H. Lombard. 3

STATEN ISLAND, N. Y.—Staten Island Shore Ry. 9 m, 4-8 1/2 g, 25 lb T r, 10 c, 40 h. Supt. Thos. Moore. Office, Tompkinsville. 8

ST. CATHARINE'S, ONT.—St. Catharine's, Merriton & Thorold St. Ry. Co. 5 1/2 m, 4-8 1/2 g, 30 lb r, 8 c, 33 h. Pres. E. A. Smyth, Sec. A. P. Friesman, Supt. E. A. Smyth. b

ST. CLOUD, MINN.—St. Cloud St. Ry. Co. 3 m, 4-2 g, 30 lb flat r, 5 1-h c, 12 h. Pres. C. P. McClure, Sec. F. Folman, Treas. A. G. Whitney. 6

STERLING, ILL.—Rock River St. Ry. Co. 4 m, 4-8 1/2 g, 20 lb T r, 8 1-h c, 45 h. Pres. Chas. D. Haines, Treas. A. G. Haines. 3

STILLWATER, MINN.—Union Depot St. Ry. & Transfer Co. 5 m, 4 1/2 g, 65 lb r. Receiver Geo. M. Brush. **STILLWATER, N. Y.**—Stillwater & Mechanicsville St. Ry. Co. 4 1/2 m, 4-8 1/2 g, 25-30 lb r, 4 c, 6 h. Pres. W. L. Denison, V. Pres. Lyman Smith, Gen. Supt. Peter Van Veghten, Sec. & Treas. Edw. I. Wood. k

ST. JOHN, N. B.—St. John St. Ry. Co. 7 m, 4-8 1/2 g, 45-10 lb r, 15 c, 65 h. Pres. John R. Bothwell, Treas. John F. Zebley. Office Room 39 Drexel Bldg., New York, and St. John, N. B. **ST. JOSEPH, MICH.**—St. Joseph & Benton Harbor St. Ry. Co. 1 1/2 m, 4-8 g, 30 lb r, 3-2 h c, 22 h, 4 mu. Pres. & Supt. M. C. Burnes, Sec. & Treas. W. Bullinger. 9

ST. JOSEPH, MO.—Citizens' St. R.R. Co. 3 m, 4-8 1/2 g, 28 lb r 14 c, 56 mu. Pres. Richard E. Turner, Sec. & Treas., Arthur Kirkpatrick, Supt. John F. Merriam. c

Frederick Ave. Ry. Co. 3 1/2 m, 4-8 1/2 g, 42 lb r, 10c, 70 h & mu. Pres. D. D. Burnes, Sec. & Gen. Man. J. A. Corby, Treas. S. A. Walker. Office, 511 Francis st. d

Union Ry. Co. 8 1/2 m, 4-8 1/2 g, 20, 30 & 52 lb r, 29 c, 110 h. Pres. Seymour Jenkins, Sec. & Treas. A. Steinacker, Supt. Chas. S. Wilson. c

ST. LOUIS, MO.—Baden & St. Louis R.R. Co. 3 1/2 m, 4-9 1/2 g, — lb r, 10 c, 23 h. Pres. George S. Case, V. Pres. William Z. Coleman, Supt. John W. Archer. Office, Broadway, near Baden ave. e

Benton-Bellefontaine Ry. Co. 8m, 4-10 g, 52 lb r, 57 c, 234 h. Pres. Chas. Parsons, Sec. & Treas. Robert McCulloch. Office, 4238 N. 20th st. d

Cass Avenue & Fair Ground Ry. Co. 8 1/2 m, 4-9 1/2 g, 69 lb r, 34 c, 278 h. Pres. Julius S. Walsh, V. Pres. & Treas. Jas. Campbell, Sec. Patk. Gorry, Supt. M. J. Moran, Engr. Jas. Boland. Office, 2,900 Cass ave. c

Citizens' R. R. Co. 21 m, 4-9 1/2 g, 63 lb r, 80 combination, 40 grip, 60 open c, 225 h, 200 mu. Pres. Julius S. Walsh, V. Pres. J. R. Helfenstein, Supt. Chas. J. Luckner. Office, Easton ave., Three-mile House. e

Forest Park, Laclede & Fourth St. Ry. Co. 5 1/2 m, 4-10 g, 44 lb r, 20 c, 190 h. Pres. C. H. Turner, Sec. & Treas. Wm. D. Henry. Office, 1,827 Market st. **JEFFERSON AVE. RY. CO.** 5 m, 4-9 g, 56 lb r, 21 c. Pres. John Scullin, V. Pres. Frank Carter, Sec. Jas. H. Roach, Treas. Clement M. Seaman. Office, Jefferson ave. & La Salle st. c

Lindell Ry. Co. 13 1/2 m, 4-10 g, 45 lb r, 75 c, 407 h. Pres. John H. Maxon, Sec. & Treas. Geo. W. Baumhoff. Office, 2307 Washington ave. b

Missouri R.R. Co. 11 1/2 m, 4-10 g, 44 lb r, 50 c, 488 h. Pres. P. C. Maffitt, Sec. Wm. D. Henry, Supt. James F. Davidson. Office, 1,827 Market st. e

Mound City Ry. Co. Pres. John Scullin, V. Pres. Frank Carter, Sec. Jas. H. Roach, Treas. C. M. Seaman, Supt. Jas. Scullin. Office, 2,500A St. Louis ave. 7

Northern Central Ry. Co. 10 1/2 m, 4-9 1/2 g, 50 lb r, 60 c, 280 h. Pres. Julius S. Walsh, Sec. & Treas. Chas. K. Dickson, Supt. John Mahoney, Foreman Wm. Hannigan, Cash, T. C. Callahan. Office, 2,401 Spring av. **PEOPLE'S R. R.** 8 m, 4-10 g, 44 lb steel r, 58 2-h c, 280 h. Pres. Chas. Green, Sec. Jos. Perry, Supt. Patrick Shea. Office, 1,810 Park ave. e

Southern Ry. Co. 7-4-5 m, 4-10 g, 35-52 lb r, 49 c, 250 V. Pres. Harry E. Drew, Sec. J. S. Minary, Man. W. S. Johnson. Office, Broadway, near Osage. **ST. LOUIS R.R. CO.** 11 m, 4-10 g, 38-44 lb r, 53 c, 375 h. Pres. C. Peper, Sec. & Treas. R. B. Jennings, Supt. Chas. Isocher. Office, 3,710 N. Broadway. **ST. LOUIS CABLE & WESTERN RY. CO.** 6 m, 4-10 1/2 g, 40 lb r, 88 c. Pres. Dwight Tredway, Auditor & Man. A. de Figueiredo, Supt. S. M. Sparklin. Office, Franklin & Channing aves. c

Tower Grove & Lafayette Ry. Co. Pres. Chas. Green, Sec. Joseph Perry, Supt. Patrick Shea. Office, 1,810 Park ave. **UNION DEPOT R.R. CO.** 16 m, 4-10 g, 45 lb r, 72 c, 375 h. Pres. John Scullin, V. Pres. & Treas. C. M. Seaman, Sec. Jas. H. Roach, Supt. Jas. Scullin, Engr. Wm. Jens. Office, Gravois & Jefferson aves. 7

Union Ry. Co. 8 m, 4-10 g, 52 lb r, 40 c, 290 h. Pres. Julius S. Walsh, V. Pres. J. P. Helfenstein, Sec. & Treas. C. N. Duffy, Supt. Michael Moran. Office, Kosuth ave., opposite Fair Grounds. 2

STONEHAM, MASS.—East Middlesex St. R. R. Co. 5 m, 4-8 1/2 g, 32-35 lb T & girder r, 11 2-h c, 30 h. Pres. A. F. Breed, Treas. F. H. Monks, Supt. G. F. Jones. Office, 35 Congress st., Boston.

GEORGE WESTINGHOUSE, Jr., President. THOMAS B. KERR, Vice President and Secretary. JOHN CALDWELL, Treasurer.

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The Patents of JOSEPH R. FINNEY, No. 231,552, Aug. 24, 1880, reissued Nov. 2, 1882; No. 270,186, of Jan. 2, 1883; and No. 285,353, of Sept. 18, 1883, owned and controlled by this Company, COVER EVERY FORM OF APPARATUS for supplying electricity to electric machinery upon moving vehicles, making use of TRAVELERS or ROLLING CONTACTS running upon OVERHEAD CONDUCTORS.

This Company owns and controls OTHER INVENTIONS of IMPORTANCE in Electric Railway Appliances.

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Two-thirds as much to run with **Electric Accumulators**,
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THE OVERHEAD CONDUCTOR IS COMPARATIVELY INEXPENSIVE.

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Of the **Fifteen** Electric Street Railways, in successful operation in this country, in August, 1887, **Thirteen** are using the **Overhead Conductor**, and many others are under construction.

This Company is now prepared to license **RAILWAY COMPANIES, CONTRACTORS,** and others desiring to use its patented inventions upon **OLD** or **NEW ROADS** upon reasonable terms.

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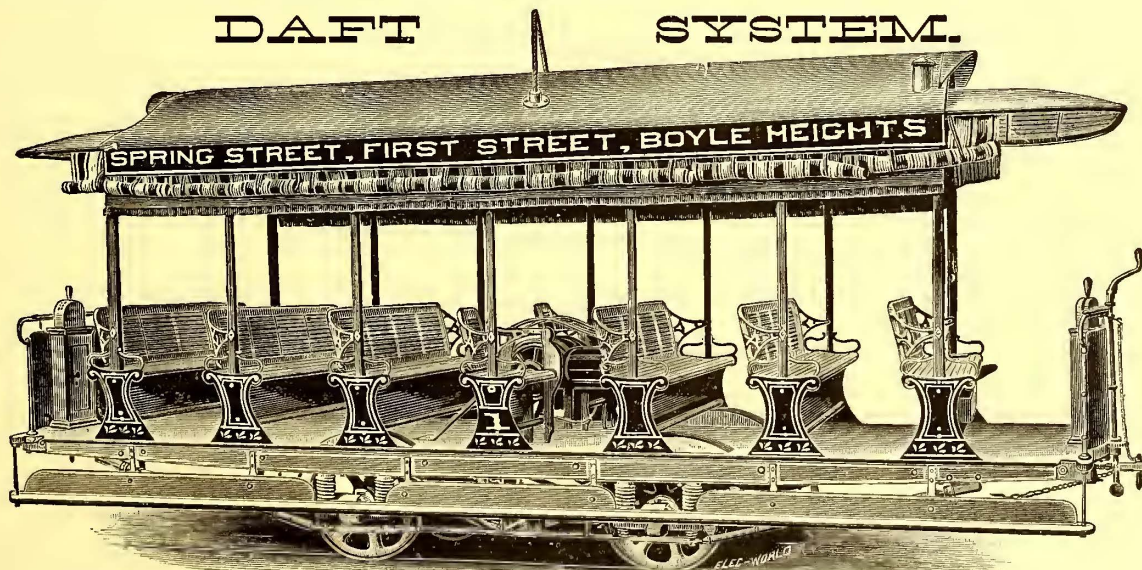
THOMAS B. KERR, Vice President and Secretary, Pittsburgh, Pa.

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We guarantee the successful operation of our system. Heaviest grades no obstacle.

We are now building, in the city of Pittsburg, a road which will cost \$120,000. This road has a 14 per cent grade, and has overhead and underground conductors, and five motors.

The cost of electric power per car per day on the Baltimore road, operating our system, is \$4.00. Fifty or more cars could be run at an average of \$1.50 per day. The grade on this road is 350 feet per mile. Average speed, eight miles per hour. By horse power the speed was only four miles per hour, and the cost under the old system was \$6.50 per car per day. **SEND FOR ESTIMATES.**

On receipt of full particulars of your road, or of power wanted, we will send you exact estimates for equipping and operating it by our system. **SEND FOR CIRCULARS.**

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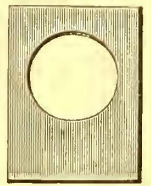
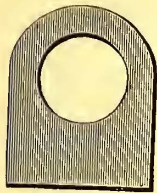
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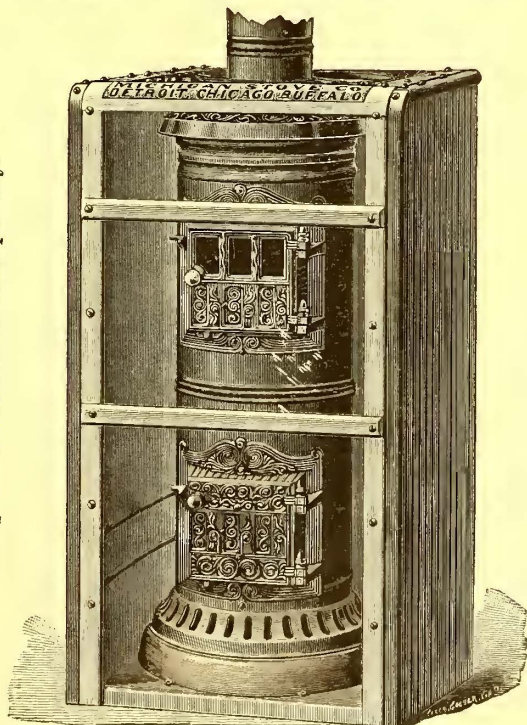
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SOLE MAKERS,

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Partly finished and road will be opened Sept. 10. Will run from Baltimore to Cedar Hill Cemetery, in Anne Arundel co., via Light st. bridge and the town of Brooklyn. Capital, \$50,000 and \$50,000 1st mortgage bonds. Office, 305 St. Paul st. Pres. C. Orrick Swann, Sec. & Atty. S. C. Long, Treas. Levi Z. Condon, Supt. I. M. Thompson. a 7
Baltimore & Sparrow's Point Ry. Co. has been incorp'd by Geo. Small, Fredk. W. Wood and Nicholas P. Bond. 9

BANGOR, ME.—Electric ry. 5
BAYONNE, N. J.—Elec. ry. talked of. 7
BELOIT, KAN.—Beloit City St. Ry. Co. Now building. Pres. D. W. Soper, Sec., Pur. Agt. & Supt. F. F. Burnham, Treas. M. S. Atwood. 8
BELLEVUE, PA.—Elec. elevator and rr. Elevator will run to height of 90 ft.; from there plane will run back 1/2 m to center of town. Now building. 6
BESSEMER, ALA.—Birmingham & Bessemer dummy line. J. W. Worthington & Co. have contract. 6 m, 4-8 1/2 g, 40 lb r, steam power. Pres. W. P. Pinkard, Sec. & Treas. Morris Adler. 9

BIDDEFORD, ME.—Biddeford & Saco Horse R. R. To be operated by animal, electric or cable power. Pres. Stephen F. Shaw, Sec. Chas. H. Prescott, Treas. Chas. A. Moody. 9

BINGHAMTON, N. Y.—Van Depoele Co. will supply plant for new road; 6 c. Nearly completed. 8
Court St. & East End R. R. Co. Will be built this fall. 4-8 1/2 g, 45 lb flat r, 3 1-h c. Pres. Chas. M. Stone, Sec. & Treas. Wm. G. Phelps. 9

BIRMINGHAM, ALA.—Birmingham & Jones Valley St. R.R. 6 m, 45 lb, steel r. Healin & Knox received proposals.
Smith & Eastman have made surveys for electric road to run 3 m from the city to their real estate near North Birmingham. 4

Western Valley St. Ry. Co. 4 m, 4-8 1/2 g, 24 lb r, 6 c, 20 mu; but will likely change motive power ultimately. Work to be commenced in 60 days and road opened in 3 or 4 months. Capital, \$ 0.00. Pres. J. C. Westbrook, V. Pres. W. E. Berry, Gen. Man. S. Torrey. 5

Walker Land Co. will build a dummy line. 8
BOSTON, MASS.—West End St. Ry. Co. H. M. Whitney, Asa P. Potter, Eben D. Jordan and others incorporators. 8 to 15 m, 4-8 1/2 g, 90 to 100 lb imported girder r with grooved head. Pres. H. M. Whitney, Treas. G. D. Braham, Clerk Elmer D. Howe. Hope to use electricity as motive power. Will lay 10 or 12 miles of track this year.

Suburban St. Ry. Co., proposes to lay tracks through Park, Beacon, Arlington and Marlboro streets to West Chester Park. 5 m, 4 8/8 g. Pres. Henry M. Whitney. Sec. & Treas. G. D. Braham. Capital, \$50,000. Office, Equitable Building. b

BRIDGETON, N. J.—Elec. ry. will be built here. 1 1/2-m, and if successful as much more will be built. Oberlin Smith is interested. 8

BRISTOL, VA.—Bristol-Goodson St. Ry. Co. has been incorporated. 7

BROOKLYN, N. Y.—Annex St. Ry. Co. in progress, to be completed soon. Pres. F. M. Delano, New York, V.-Pres. H. H. Adams, Brooklyn. Treas. Philip Richardson, N. Y. Office, 204 Montague st., Brooklyn, N. Y. 1

Brooklyn & suburban St. Ry. Co. To run from Bedford ave. through Flatbush to Flatlands, with a branch to the Cemetery of the Holy Cross. Will use either horse or cable power. Geo. Malcom. Wm. Ziegler, Wm. J. Gaynor, Henry H Adams, Jas. Ryan, Petter Sutter and Patk. McCanna, Directors. Paid-up capital, \$100,000. 4

Union Ry. Co. of the City of Brooklyn. 11
Brooklyn Heights Ry. Co. Capital, \$150,000. To build along Montague street from Court street to Wall Street Ferry. Will use electricity. Pres. S. B. Cattenden, V. Pres. John Jay Pierpont, Sec. Geo. W. Chauncey, Treas. Michael Chauncey. 1/2 m, 4 g, about 50 lb r, 6 c. 7

Capitalists interested in Calvary Cemetery road are building from Ash street to Park avenue. Pres. Jas. B. McKewen, Sec. Michael Just, Treas. John R. Connor, Man. D. W. Sullivan. 6
Line from Brooklyn to Jamaica. 7 m. To use electricity, Van Depoele system. 7

Franklin Ave. R. R. Incorporated May 21. To run from Grand and Second sts., in the Eastern District, via Second st., Wythe ave., Franklin ave., and Malbone st., to Flatbush ave., in the town of Flatbush. Capital, \$100,000. Wm. A. Wheelock and Walter R. Gorman of New York, and Thos. D. Jordan of Jersey City, are among the directors. 7

BRUNSWICK, GA.—Elec. ry. to be built in 4 months. Incorporators, Willard Bennett, Nelson Bennett and S. E. Larable. C. O. Bean has charge of construction. Pres. W. Bennett, Sec. E. E. Congdon, Treas. W. A. Clark. 8

CALEIA, ALA.—So. Calera Land & Imp't Co. Work in progress, and road will be opened about Nov. 1. 2 1/2 m, standard g, 40 lb steel r, a dummy engine. Capital, \$150,000. Office, Calera. b 8
CANANDAIGUA, N. Y.—Canandaigua St. R. R. Co. Will be built this fall. Pres. Frank O. Chamberlain, Sec. Chas. F. Milliken, Treas. Alfred Denbow, Supt. Chas. L. Sackett. 9

CARBONDALE, PA.—Carbondale & Jermy Elec. Ry. 4 1/2 m, 4-8 1/2 g, 38 lb flat & T r, 2 1/2-ft. c, Sprague elec. motors. Work begun in July; will be opened in Sept. Capital, \$50,000. Pres. John W. Aitken, V. Pres. A. Mitchell, Sec. & Treas. M. Moses. a 8

CHARLESTON, W. VA.—Glenwood Co. will lay out a town near the city and ultimately construct a road 1 1/2 m long. This is a land co. Supt. Benj. Brown. Capital, \$35,400. 8

CHATTANOOGA, TENN.—North Side St. R. R. Co. Incorporators, G. W. Thompson, Geo. W. Ochs and others. 5
Tennessee River & Walden's Ridge R. R. Co. Dummy line from Hill City to Walden's Ridge. S. J. A. Frazier, John C. Griffiss and others incorporators. 8
City St. Ry. Co. has been organized by John T. Williamson and others. 6

CHESAPEAKE, O.—Chesapeake St. Ry. Co. has been incorporated. 7

CHICAGO, ILL.—The Crosstown Pass. Ry. Co. of Chicago, 30 m, 4-8 1-2 g, 45 lb r, 75 c, 500 to 800 h, Pres. John J. Curran, Treas. Geo. P. Bunker, Sec. & Pur. Agt. Elias Curran. Capital stock, \$1,000,000. Gen. office, room 18, No. 164 Washington st. Time of commencement of work undecided. 1
Lakeside City St. Ry. Co. To operate, or dummy roads in Chicago and its suburbs. Incorporators, Sam'l P. McConnell, C. H. Merrill and Theo. P. Elliott. Capital, \$250,000. 5

Union Pass. Ry. Co. incorp'd by James C. Page, Yoana P. Sherwin and others. Capital, \$1,000,000. Horse, cable, elec. or steam. 9
CHICOPEE, MASS.—New company started under the leadership of Haines Bros. Capital, \$25,000. Work to begin soon. Line to extend from Chicopee Falls through Chicopee Center to the point where the boundary line between Chicopee and Springfield crosses the River road. About 4 m, 4 8/2 g, not less than 35 lb r. Chas. D. Haines and Geo. W. Stetson of N. Y. City are the largest stockholders. 4
CINCINNATI, O.—Cincinnati, Burnet Woods, Clifton & Cumminsville St. R. R. Co. incorporated by Thos. Morrison and others. Capital, \$50,000. 8
COLUMBUS, MISS.—City R.R. Co Capital, \$25,000. Pres. R. W. Banks, Sec. & Treas. E. T. Sykes. Will build at once. 6

COLUMBUS, O.—Third & Schuller St. R. R. Co. Franchise granted by City Council June 6. Cars must be running within 2 years. 3 1/2 m, 5-2 g. May use electricity. Capital, \$75,000. Work will begin as soon as stocks taken. Pres. P. E. Blesch, V. Pres. H. Mithoff, Sec. C. Herman, Treas. J. A. Kremer. d 7
CORSICANA, TEX.—Co. forming. 8
COVINGTON, GA.—W. C. Clark & Co. Incorporators and owners. 1 m, 20 or 30 lb r, 2 pass. c, 2 flat c, pass. cars for 1 h, 6 to 8 mu. or h. 2
CROOKSTON, MINN.—Crookston St. Ry. Co. Capital, \$100,000. Line to be built next year. Pres. Chas. E. Sawyer, Sec. John Cromb, Treas. A. D. Stephens. 8

DALTON, GA.—Dalton St. Ry. Co. Bids invited for iron, cars, etc. T. R. Jones, Secretary of Board of Directors.
DALLAS, TEX.—Dallas & Oak Cliff Elevated R. R. Co. Capital, \$100,000, incorporated by T. L. Marsalis, Thos. Field and others. Cars will be operated by cable or electricity. 7
DANVILLE, VA.—Danville St. Car Co. Now building, 1 1/2 m, 4-8 1/2 g, 33 lb steel girder r, 7 1-h c, 20 mu. Pres. T. B. Fitzgerald, Sec. & Treas. P. R. Jones. 7

DAVENPORT, IA.—Bridge, Second St. & Northwestern St. Ry. Co. to be built this year. Contracts to be given at once. Are investigating elec. ry. Sec. Jos. Ochs. 8
Davenport & Rock Island Ry. Co. 50 lb r, 4-8 1/2 g. Pres. Chas. H. Deere, Moline, Ill.; Sec. E. Carl Davenport; Treas. Morris Rosenfield, Rock Island. 7
DAYTON, O.—White Line St. Ry. Co. 9 m, elec., now building, 4-8 1/2 g, 38 lb r, 16 c, 13 motors, Van Depoele system. Pres. John A. McMahon, Sec. Chas. D. Iddings, Treas. Michael A. Nippen, Pur. Agt. Jos. C. Lewis. 9
DECATUR, ALA.—Decatur Ry. Co. Incorporated by W. G. Wharton, H. G. Bond, W. E. Forest, E. E. Greenleaf and J. D. Roquemore. 7
DENVER, COL.—Denver Cable Ry. Co. Capital stock, \$500,000. Jas. McCord and others incorporators. 6

DETROIT, MICH.—East Detroit & Grosse Pointe Ry. Co. 8 m, 4-8 1/2 g, 25 lb steel T r, 6 to 10 c. Flsher system. Capital, \$100,000. Pres. C. K. Brandon, Sec. Hubbard Baker, Treas. Frank E. Snow. Began work June 15; expect to open Oct. 1. 8
Metropolitan Elec. Ry. Co. 9
Springwells, Ecorse & Wyandotte R. R. Co. Incorporated by J. B. Molony and others. Capital, \$10,000. 8
DULUTH, MINN.—Duluth Highland Cable Ry. Co. Propose to build to the hill top unless the old Co. after notice build there. H. W. Bradley and Wm. W. Billson, of Duluth, and J. A. Willard, of Mankato, are interested. Capital, \$200,000. 5
Minnesota Point St. Ry. Co. Capital, \$100,000. Reginald W. Petrie is one of the incorporators. 6
EASTON, PA.—Elec. ry. Draft system. 9
EAST PORTLAND, ORE.—Sellwood & Vancouver Ry. Co. Motors. 7
Stark St. Ferry Co. 7
EAST ST. LOUIS, ILL.—East St. Louis Motor Ry. incorporated by H. D. Sexton, Henry O'Hara and Wm. H. Hill. Capital, \$200,000. 6
EL DORADO, KAN.—El Dorado City St. Ry. Co. Now building. Pres. John Fouch, Sec. Robt. H. Hazlett, Treas. F. P. Gillespie. 9
ELIZABETH, N. J.—Henry H. Ishaw of New York, Fredk. L. Heldritter and others, propose to build a cross-town road from Fourth ave. to the Singer factory and Elizabethport station. Elec. ry. incorp'd and ask for franchise. Ex-Freeholder Oliver, ex-Councilman Reeve and ex-Mayor Green are interested. 8
ELMHRA, N. Y.—Articles of incorporation signed by J. H. Clark, John Brand, M. H. Arnot, D. C. Robinson and others. Location, Fifth ward. Capital, \$20,000. Will use horses. Hope to complete road in 2 months. 7
EUFULA, ALA.—City of Eufaula St. Ry. Co. 4 m, 4-8 1/2 g, 20 lb r, 4 regular cars and several excursion flats. 12 h. Will commence work very soon, and the road will be opened in September. Pres. E. B. Young, Sec. Geo. McCormick, Treas. Ell Shorter. Capital \$25,000. 4
EUREKA, COL.—Co. formed to build an elec. ry. 8
FINDLAY, O.—Findlay St. R. R. Co. Elec. ry., Draft system, now building. Pres. Sam'l D. Frey, Sec. J. F. Burket, Treas. Chas. E. Niles. 9
FLUSHING, N. Y.—Flushing & College Point R. R. Co. Pres. Jos. Dykes, Sec. Arthur Herrin, Treas. Henry Clement. Have obtained a charter to run a line from Flushing to College Point. Electricity may be used. Will be built in 6 mos. 8
FORESTVILLE, GA.—Printup City & Forestville St. R. R. organized. 8
FORT SMITH, ARK.—Belt Line St. Ry. Co. Has been chartered. 6
Sulphur Springs Ry. Co. Has been chartered. 6

FORT WAYNE, IND.—Riverside St. Ry. Co. Now building. 1 1/2 m, 4-8 1/2 g, 20 lb T r, 4 1-h 9-2-h c. Pres. Edwin Evans, Sec. H. C. Hanna, Treas. Wm. L. Carnahan. 9

FORT WORTH, TEX.—North Side St. Ry. Co. chartered by J. P. Smith, John D. Templeton and others. Capital, \$100,000. 8
FRAMINGHAM, MASS.—Framingham Union St. Ry. Co. \$60,000 capital. The Haines Bros. & Geo. W. Stetson, of New York, are interested. To be in operation this fall. Sec. Clifford Folger, Treas. Sam'l B. Bird. 8
Framingham Center Ry. Co. Capital, \$25,000. 2 1/2 m, 4-8 1/2 g. 4

FREEPORT, ILL.—Freeport, Dodgeville & Northern Ry. Co. Pres. Jas. I. Neff, Sec. & Treas. B. Moe, Chicago, Ill. 9

FRYEBURG, ME.—Now building. 8
GADSDEN, ALA.—Gadsden Land & Imp't Co. will build a dummy rr. via Bellevue to Black Creek Falls. Expect to begin work this fall, and finish it by next spring. 5 m, standard g, 34 lb steel r, 8 c, 4 steam motors. Sec. & Treas. M. L. Foster, Capital, \$3,000,000. g 8

GRAND FORKS, DAK.—Secretary of State McCormack, of Bismarck, has secured franchise, and is said to be backed by Duluth and New York capitalists. 6
GRAND ISLAND, NEB.—Grand Island St. Ry. Co. Expect to have 3 1/2 m of track in operation this month, and 4 m this year. 4 g, 20 lb steel T r, oak ties, 5 c, 30 h. Will change to electricity when they can get a cheap and practicable system. Capital stock, \$100,000, of which 25 per cent is paid in. Pres. A. H. Baker, V. Pres. H. A. Koehnig, Sec. O. B. Thompson, Treas. Wm. A. Hagg. h 7

GRAND RAPIDS, MICH.—Cable St. Ry. Co. Incorporated by Robt. Wetherell and others. Capital, \$500,000. 8
Valley City St. Ry. Co. Incorporated. Capital, \$200,000. Cable and i; cable system to be opened by Jan. 1 and whole road June 1. 5 m, 4-8 1/2 g, 28 lb r, 14 c. Pres. Wm. P. Innes, V. Pres. A. M. Eggleston, Sec. & Treas. Robt. W. Innes, Engr. Wm. Sherik. g 8

GRANDS SPRINGS, KAN.—Will build next year. Man. C. R. Mitchell. 9
GRAVENSND, N. Y.—Coney Island Electrical Ry. Co. incorporated by Sumner T. Dunman and others. Capital, \$100,000. 8

GREENVILLE, TEX.—Greenville St. Ry. Co. organized. Capital, \$50,000. 7
GREENVILLE, ALA.—J. T. Perry will build a st. ry. 6
GREENWICH, CONN.—Greenwich Horse R. R. Co. To run along Putnam and Greenwich aves. and Steamboat road to the steamboat dock, with a branch along Railroad ave. to the N. Y., N. H. & H. station. Capital, \$30,000. Prob. 4 cars. Delano-Richardson syndicate are back of the scheme. 5

GREENSBORO, ALA.—Dummy line, to be built by Coleman & Coleman. 8
HARTLAND, KAN.—Hartland St. Ry. Co. 2 m, narrow g, light r, 2 c. 1 mu. Pres. E. S. Snow, Sec. & Treas. Logan A. Garten, Supt. W. S. Handy. Capital stock, \$5,000. 3
HARRISBURG, PA.—Electric road, Van Depoele system, 3 1/2 m, to Steelton. 6

HASTINGS, NEB.—Hastings Imp't Co. 10 m, 4-8 1/2 g, 16 c, 12 h, 30 mu. Pres. Jas. B. Heartwell, V. Pres. J. J. Wemple, Sec. Chas. D. Heartwell, Treas. H. Bostwick, Supt. J. A. Kraft. Line partly completed. 8
Citizens' St. Ry. Co. Franchise obtained, similar to that of the Imp't Co., and are contesting the matter in the courts. Pres. R. A. Beatty, Sec. Henry Shedd, Treas. C. L. Jones. 8

HAWATHIA, KAN.—Helena St. R. R. Co. Capital, \$30,000. Pres. Greenfield Quarles, Sec. D. T. Har- graves, Treas. S. H. Horner. 5
HOLDEN, MO.—Franchise granted to Wm. Steele, J. S. Johnson, John T. Bruce, J. N. McDonald and Thos. C. Carter. To start on Olive st. from 2d to 14th, to Main, to 2d, to starting point. 6
HOPKINSVILLE, KY.—Hopkinsville St. Ry. Co. has been incorporated. 7

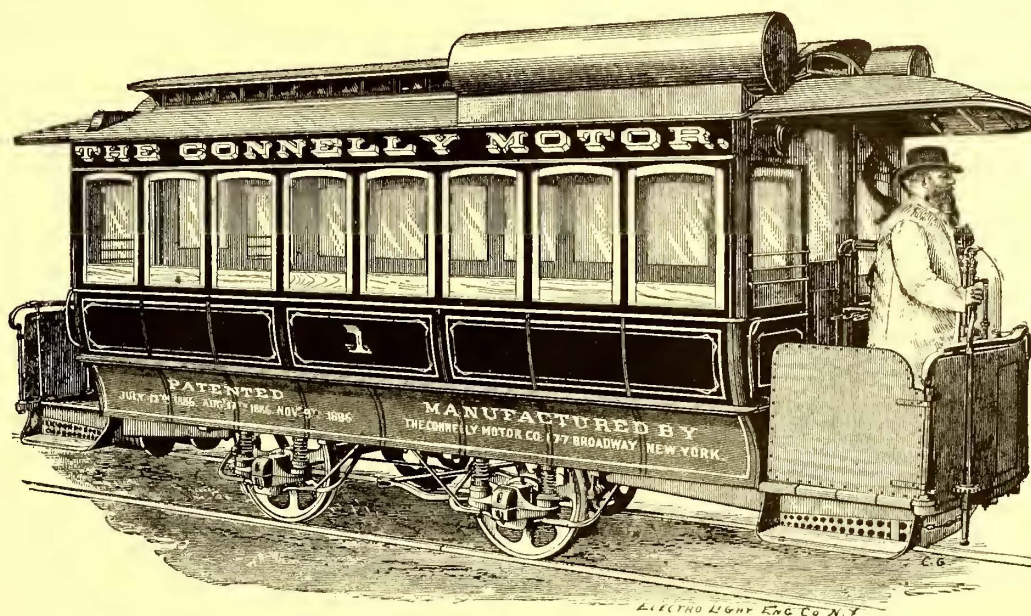
HUDSON, N. Y.—Edw. J. Hodge bought the franchise at auction, and the road will be built soon. 8
HUNTINGTON, N. Y.—3 m, from the Long Island R. R. station along the east side of Huntington Harbor. Stockholders, D. Schuberth and R. G. Phelps of New York, Henry S. Brush and others of Huntington. Capital stock, \$30,000. 8
HUNTINGTON, W. VA.—J. L. Caldwell will build a street railway here. 7

HUTCHINSON, KAN.—Metropolitan St. Ry. Co. Being rapidly pushed to completion. Capital, \$50,000. Directors G. W. Hardy, Jas. H. Perkins, Hiram Constant, J. W. Mulky and A. H. Robinson. 5
INDIANAPOLIS, IND.—Charter obtained, may use elec. cable or h. 8
Indianapolis Cable St. R. R. Co. Incorp'd by Jos. R. Jackson and others. Capital, \$1,000,000. 8
ITLACA, N. Y.—Haines Bros. are building here, and will use the Draft System, under contract with the Safety Electric Ry. and Power Co. 4
JACKSON, TENN.—Jackson & Suburban St. Ry. Co. organized, capital \$50,000. Pres. & Gen. Man. C. P. Heath, Sioux City, Ia.; V. Pres. J. H. Duke; Sec. R. B. Crawford, Wayne, Neb.; Treas. John L. Wisdom. 6 m, 4 g, 30 lb r, 4 c now, will have more, will need 40 mu. Work has begun, and will be finished in two months. e 8
JUNCTION CITY, KAN.—Junction City & Fort Riley St. Ry. Co. 8 m. Horses will be used in the city, and some other faster motor between Junction City and Fort Riley. Must obtain franchises from city, county and Congress. Expect to have bill through Congress by Feb. 1 for right of way on Fort Riley Reservation. Capital \$30,000. Pres. B. Rockwell, V. Pres. G. E. Harvey, Sec. & Treas. C. G. Thurston. 7

KANSAS CITY, MO.—Grand Avenue Ry. Co (For officers see Directory). Now constructing 8 m double track cable road.

THE CONNELLY MOTOR.

PATENTED.



No Fire! No Smoke! No Dust! No Ashes! No Fireman! No Engineer!
Complete within Itself! Generates its own Power! Perfectly Independent! Can run on any Track!

No Cables, "grips" or expensive conduits.

No "Central Station" for generating power.

No loss of power in transmission.

No dangerous Electric currents.

No tearing up of streets for repairs.

No suspension of traffic for repairs.

The Connelly Gas Motor generates its own gas from Naphtha; carries a supply for a day's run, and consumes but **ONE GALLON PER HOUR.**

It excels all other motors in **ECONOMY** and **CONTROLLABILITY**, and stands alone in its **INDIVIDUALITY.**

The daily expense of operating a road with these motors **IS IN EXACT PROPORTION TO THE NUMBER OF MOTORS IN USE**, which cannot be said of any Cable or Electric system.

The cost of equipping a road with them is about **ONE-HALF** the cost of any Electric system, and less than **ONE-FOURTH** the cost of any Cable system.

The cost of operating, including Fuel, Lubrication, Care, Repairs and Royalties, will not exceed \$2.00 per day, being about **HALF** the cost by Cable or Electricity.

Any road can adopt these motors without making any change in their system, without interruption to their business, and without risking any investment in special plant, as a few motors can be put into use along with the Horse-cars, and the number gradually increased.

All companies desiring to abandon the use of horses should examine fully into the merits and peculiar advantages of our system, before making any contracts, as it is the only system that can be applied with equal economy on both large and small roads.

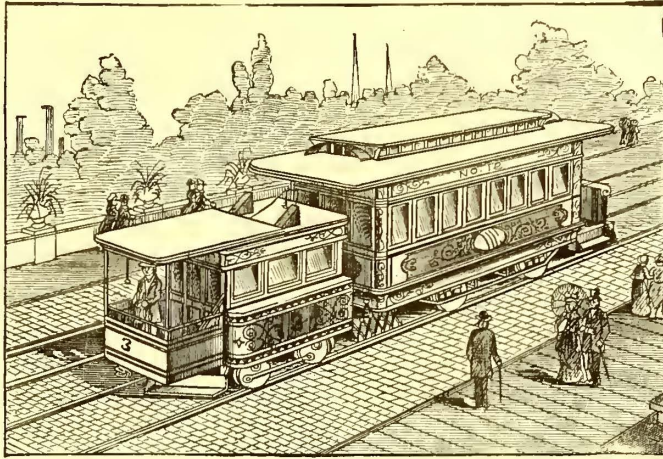
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THE CONNELLY MOTOR CO., 177 BROADWAY, NEW YORK CITY.

POLE STREET CAR

Differential Lever Car
Starter, Runner & Brake.

Starts easily, Brakes as certainly and effectively as the air or Steam brake.



Standard No. 3 Motor
Is operated by a
Specially Designed Low Pressure
Condensing Engine
of great power in small space and
having no escapes on the street.

MOTOR SYSTEM.

The system can be operated by compressed air and is so recommended where good all-the-year-round water power can be secured to compress the air. Can be operated by storage battery, electricity or soda, ammonia, and other motive powers.

Warranted to climb hills, start on hills, and when the track is so slippery that the driving wheels will slip round under the motor, we still guarantee the motors starting by a system of ground levers.

WE ARE FULLY SECURED BY PATENTS.

We claim the only motor system capable of starting and going when the tracks are slippery, excepting only the cable motor. Ours is a cheaper outfit.

Correspondence solicited.

Pole Street Car Motor System,

310 Chestnut Street, Philadelphia, Pa.

cable traction. Office, 32 Merchants Exchange. Will be opened in Oct. 15
 Telpherage Electric Ry. Co. has been incorporated. Pres. F. M. Speed. Prof. N. S. Keith has charge of eng'g. Experimenting on 19th st. 8
 Broadway Cable R. R. Co. Incorp'd by Robt. Sherwood and others. Capital, \$1,000,000. 8
SANTA ROSA, CAL.—T. J. Glary, M. Doyle and A. B. Ware have formed co. with capital of \$25,000, work to begin within next two months. 6
SAVANNAH, GA.—Cars to be furnished by Pullman Palace Car Co. 3
SCRANTON, PA.—The Nayaug Crosstown R. R. Co. Pres. G. Clark, V. Pres. H. C. Dowd, Sec. T. C. Snow, Treas. B. E. Leonard. Will build 5 m, and probably use electricity. Capital, \$50,000. 2
SELMA, ALA.—Selma Land Imp't & Furnace Co. will build electric st. ry. Capital, \$3,000,000. R. M. Nelson, W. Ullman and V. T. Vaughan are among the incorporators. 4
SHEFFIELD, ALA.—Sheffield & Tusculmba St. R. R. Co. 6 m, broad g, heavy steel r, 2 c at first, steam dummy. Will be opened very soon. Pres. F. D. McMillan, V. Pres. J. T. Hull, Sec. Ed. B. Aliman, Treas. Jo. H. Nathan. 7
SHERMAN, TEX.—H. A. Burnett will build a road this year. 5
SIoux CITY, IA.—E. W. McNeil, Manager Rasmussen cable, will build a road here, 2½ m. 3
SIoux FALLS, DAK.—Sioux Falls St. R. R. Co. Company must have 2 m running by Nov. 1 and a mile each year for five years thereafter. Incorporators, L. F. Pettigrew, L. L. Dunning and S. L. Tate, Sioux Falls; Jas. Creighton, Chicago; Elmathan Sawtelle, Evansville, Wis. Capital, \$150,000. 5
SOUTH PITTSBURG, TENN.—So. Pittsburg R. R. Co. chartered by W. M. Duncan, Sam'l Cowan and others. 7
SOUTH ST. PAUL, MINN.—Am. Rapid Transit Co. about to open electric rr. on Enos system. 7
 Charter for motors or horse power to Thos. T. Smith, A. E. Clark and others. 7
STEBENVILLE, O.—Haines Bros. propose building a new line here this year. 3
ST. AUGUSTINE, FLA.—Elec. ry. in contemplation. Northern capitalists interested. 8
ST. CATHARINES, ONT.—Electric road, on Van Depoele system, to be completed soon. 7
ST. JOSEPH, MO.—Wyatt Park Ry. Co. 5 m, 4-8½ g, cable. Pres. J. M. Huffman, Sec. I. R. Williams. Capital, \$3,000. Work to begin about Oct. 1, and to be finished early next year. e 8
 Another cable road will soon be built here. 8
ST. LOUIS, MO.—John Jackson, Julius S. Walsh, J. R. Helfenstein and others are interested in a new road on Grand avenue, to use horse, cable or electric power. 6

St. Louis Cable Ry. Assn. Capital, \$100,000. Julius S. Walsh and others, incorporators. 7
 Elec. el. ry. to be built by Henry D. Loughten. 7
ST. PAUL, MINN.—St. Paul Cable Ry. Co. V. Pres. Thos. P. Wilson. Now building. 7
 Metropolitan & Suburban Ry. asks for charter, to use cable or h. One mile must be in operation by Jan. 1, 1888. 8
ST. PAUL Elec. Ry. Co. Draft system. 9
SUFFOLK, VA.—Suffolk St. R. R. Co. Incorporated. 7
SUNBURY, PA.—Sunbury & Northumberland St. Ry. Co. Elec. ry. Pres. H. E. Davis, Sec. L. H. Case, Treas. S. P. Wolverton. 7
SYRACUSE, N. Y.—Butternut St. Ry. Co. 2m. To be built this year 2
 People's R. R. Co. Capital, \$300,000. 6 m, from Wolf st. to So. Onondaga st. Among those interested are Frank D. H. Robison, of Cleveland; Frank J. Callanen; and Frank B. Klock, of Syracuse. 6
 Palmyra St. Surface R. R. Co. Pres. John Hadcock, V. Pres. W. A. Beach, Sec. & Treas. T. D. Brewster. 7
 Hudson St. Surface R. R. Co. Pres. D. C. Hadcock, V. Pres. W. A. Beach, Sec. & Treas. T. D. Brewster. 7
 Lyons St. Surface R. R. Co. Pres. Wm. A. Beach, V. Pres. D. C. Hadcock, Sec. & Treas. T. D. Brewster. 7
 Syracuse R. R. Co. Incorp'd by Roger S. Perry and others. Capital, \$100,000. 8
 Third Ward Ry. Co. To at once build 3 m, to Geddes, franchise having been granted. Pres. Wm. B. Cogswell, Sec. and Treas. W. S. Wales. Electricity will prob. be used.
TACOMA, WASH. T.—Allen C. Mason is interested. Will be pushed to an early completion. May use any power but steam, but the co. want this restriction removed, saying they will use a noiseless motor. 6
TALLADEGA, ALA.—From city to Spring Lake park. Willis Shaw of Birmingham and W. H. Skaggs of Talladega are among incorporators. Talladega Land & Imp't Co. are interested. 8
TAUNTON, MASS.—Scadding St. Ry. Co. Franchise granted, 3½ m. To build through Cedar street from Main to Grant, thence through School, Purchase, Washington and Bay to Scadding's pond. 10 c, 30 h. Capital, \$60,000. W. W. Swan is interested. Wish to negotiate with parties who would like to take hold of the enterprise. 8
TEXARKANA, ARK.—State Line Ry. Co. Capital, \$25,000. E. A. Warner, Samuel Lemby and others are incorporators. 6
 B. H. Harrell will build a new line. 7
TIFFIN, O.—Tiffin St. Ry. Co. has been incorporated. Capital, \$10,000. Perry M. Adams and others, incorporators. May use elec. 6

TOPEKA, KAN.—Topeka Rapid Transit Ry. Co. 30 m, 4-8½ g, 35 & 38 lb r, 20 c, 10 noiseless steam motors. Pres. John Francis, Sec. J. B. Bartholomew, Treas. John Norton, Supt. J. F. Gwln. 6 m built and road to be opened soon. Capital, \$250,000. Office, 623 Kansas avenue. a 7
 Sixth Ave. & Deer Creek St. Ry. Co. Incorporators, Guilford Dudley, B. F. Golden, W. D. Alexander and others. Steam, electricity or other motive power. To accommodate the east side and to be built at once. 5
 Highland Park Circle Ry. Co. Incorporated, and first 3 m. will be completed by Dec. 1. Steel r, narrow g, dummy engine. Major Hudson is at the head of the enterprise. 5
TUSKALOOSA, ALA.—Tuskaloosa Belt Ry. will be built by Tuskaloosa Coal, Iron and Land Co. Officers of both roads: Pres. W. C. Jemison, V. Pres. B. Friedman, Sec. J. W. Castleman, Treas. Geo. A. Searcy. Work to begin at once. 6½ m, 4-8½ g, 35 lb r, 2 c, 1 steam motor. 8
TYLER, TEX.—A St. Louis party proposes to build a st. ry. here. 8
UNION SPRINGS, ALA.—Co. organized. 8
WASHINGTON, KAN.—Co. organized. 5
WATERTOWN, DAK.—Chas. Joscelyne has received a franchise allowing him the use of any streets he wishes, and to use either horse, steam or electric motors. At least 1 mile must be in operation by May 1, 1888. 5
WEATHERFORD, TEX.—Weatherford St. Ry. Co. Will begin building soon. Pres. G. M. Bowie, Sec. Jas. L. Simmons, Treas. C. H. Milliken, Supt. L. M. Bailey. 7
WESTFIELD, MASS.—Westfield St. R. R. Co. Work began in August. Directors Eugene Cole and J. W. Stall, of New York, owning a majority of stock; Orrin D. Parks, J. H. Bryan and others. 8
WICHITA, KAN.—Riverside and Suburban Ry. Co. Pres. J. O. Davidson, Sec. N. G. Lee. Capital stock \$100,000. Work now in progress. 2
 West End Motor Line Co. Capital, \$100,000. Wm. P. Carey is one of the incorporators. 6
WINSTON, N. C.—Winston Elec. Light & Motor Power Co. will build a line. 7
WORCESTER, MASS.—Lake Quinsigamond road, 4 m, to be changed from steam to electricity. Draft system. 9
WYANDOTTE, KAN.—Inter-State Consolidated Rapid Transit Ry. Co. 5.6 m, 4-8½ g, 35, 50 and 62 lb c-b and T r, 24 c, motors. Cable, 2½ m, being built. Pres. David M. Edgerton, Sec. D. D. Hoag, Treas. A. A. Calet, New York, Pur. Agt. D. E. Tyler, Supt. Tkos. E. Lewis. 7
YANKTON, DAK.—Bids asked for the building of 2 m, work to commence in 30 days. 6

CAMBRIA STEEL

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CAMBRIA IRON CO.,

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IRON, STEEL, NAILS.

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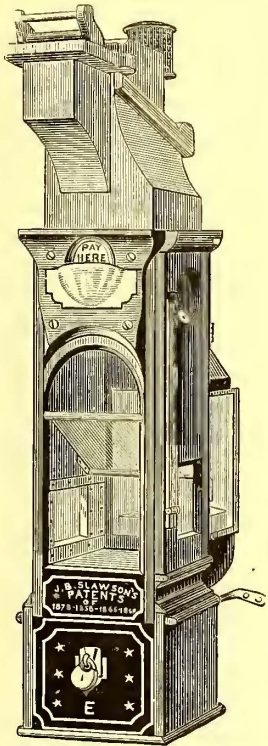
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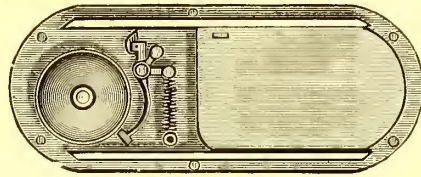
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New York.

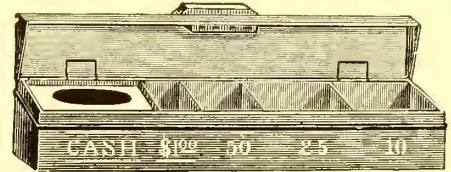
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E. Omnibus Fare Box.



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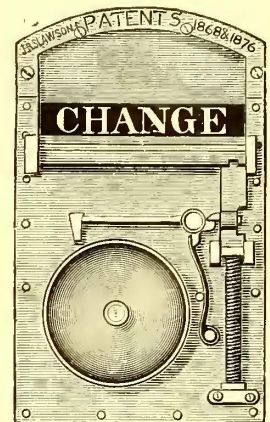
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Boxes marked A and B are of the old style, and are now unsalable.

Box marked E is adapted for omnibus use, and is arranged for outside passengers to pay, as well as those inside. Said Boxes are of the latest and most approved patterns, and contain a front door, by opening which all of the glass inside can be conveniently cleaned. This is a late patent, and is a very valuable improvement over the old method of taking the boxes apart for that purpose. They are well made and not liable to get out of order, cannot possibly be picked, and even if all the glass is broken no fare can be extracted from the drawer.

The late J. B. SLAWSON originated the "FARE BOX SYSTEM," and all of said Boxes, Change Gates, and Drivers' Change Box are protected by several patents, and parties using them are not liable to claims for infringements, as may be the case with some boxes which are now being offered for sale.

These Boxes, etc., are now in use not only in the United States and Canada, but in Mexico, South America, Europe, Asia, Africa, and Australia; in fact, nearly all places where street cars are used.



Change Gate. Inside.

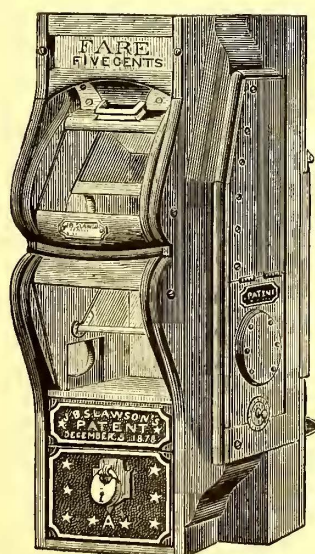
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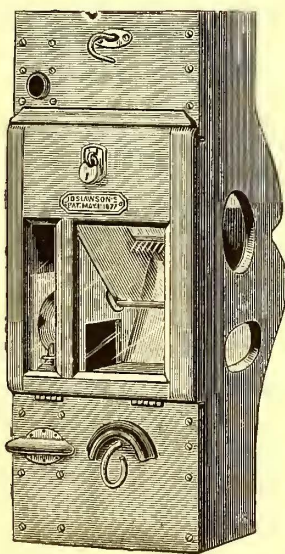
OR THE

JOHN STEPHENSON COMPANY, Limited,

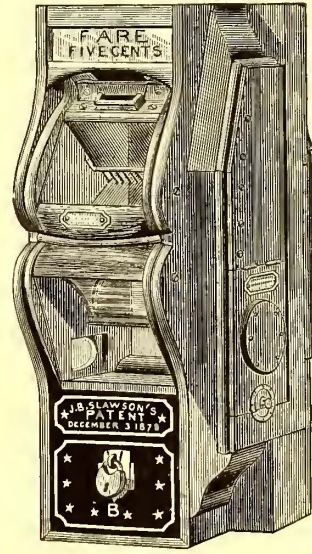
47 East Twenty-Seventh Street, New York.



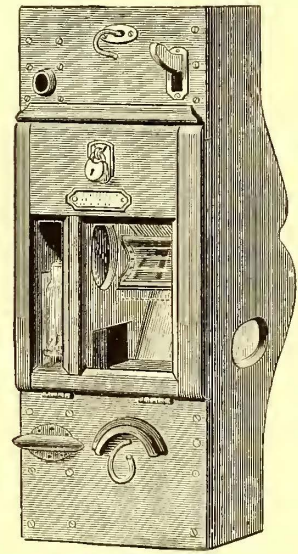
A. Front View.



A. Back View.



B. Front View.



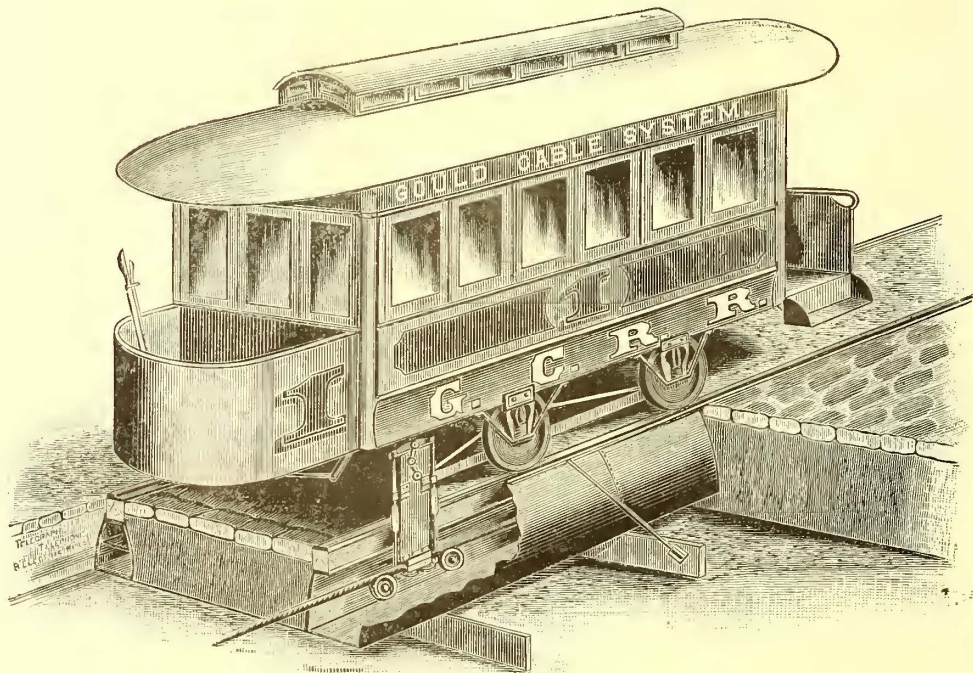
B. Back View.

For Additional Cuts see page 831 of this issue.

THE GOULD DOUBLE CONDUIT.

A CONDUIT FOR THE CABLE AND AN EXTRA CONDUIT FOR TELEGRAPH,
TELEPHONE AND ELECTRIC WIRES, ETC.

Constant Tearing up of the Street Avoided.



The Conduit for the Cable is placed at the side, doing away with the Central Conduit entirely.
A Conduit on the other side is supplied for Electric and Telegraph Wires, Gas, Steam, Etc.

The Rails are Tied Together at the Surface.

The Slot which admits the Grip is placed outside the rails. The construction of the Grip is the simplest known.

*THE INVENTOR WILL MAKE FAVORABLE TERMS WITH PARTIES WISHING
TO PUT THIS SYSTEM IN OPERATION, OR TO FORM COMPANIES
IN THE DIFFERENT STATES OR CITIES.*

Address all communications to

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ELI BALDWIN, President.

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SOLE LICENSEES AND MANUFACTURERS OF THE

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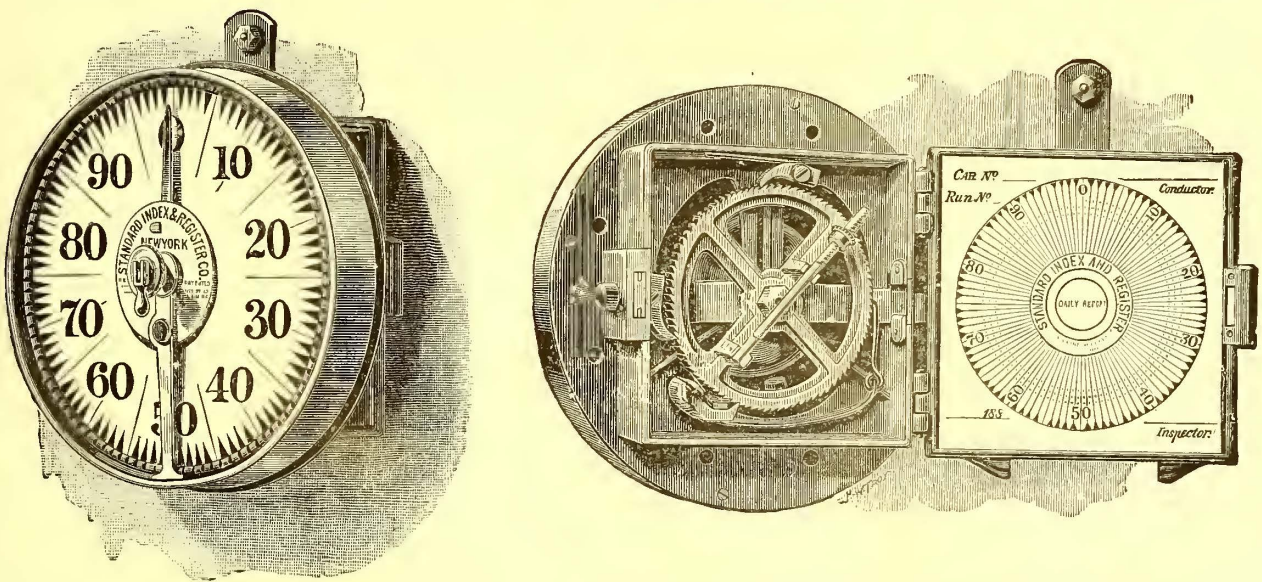
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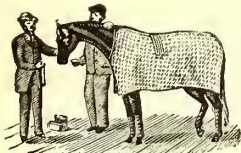


ADOPTED BY THE LEADING RAILROADS IN THE UNITED STATES.

Besides indicating upon its face, the fares as the alarm is rung, this register indelibly records them as well as the trips made upon a paper dial inside. This paper dial is removed at the end of the day and is a correct report of the fares registered each trip and the number of trips made, which cannot be altered or obliterated.

We therefore claim our system of registering fares to be the simplest and best, and it positively stops any collusion between employees.

Testimonials confirming this statement from roads on which the "Standard" has been used for the past five years will be furnished upon application.



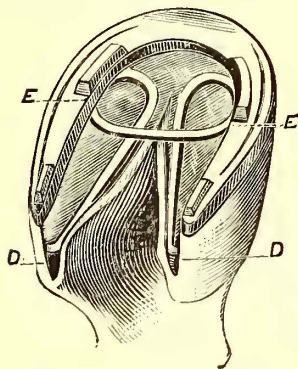
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ANTI-FEVER MEDICINE.

The Anti-Fever Medicine has now been in use for over 30 years as a specific in all Diseases of an Inflammatory Character in Horses and Cattle. Anti-Fever Medicine is a Certain Cure for Chills and Fever, Sore Throat, Inflammation of Lungs, Coughs, Staggers, Inflammation of the Bowels, Spasmodic Colic, and Pleuro-Pneumonia in Cattle. This valuable Medicine is now used by the Principal Stables in the Country, by the U. S. and American Express Companies, and many of the Street Car Companies. Try one bottle and you will be convinced of its value in your stable. Sold by all Druggists. PRICE \$1 per bottle. Discount to the Trade. Address **Wm. Somerville & Sons, Buffalo Horse Infirmary, 127 Erie st. Buffalo, N.Y.** Mention this paper.

USE PROF. ROBERGE'S PATENT HOOF EXPANDER.



Which Cures Corns, Contraction, Quarter-Cracks, &c.

It is the best invention for expanding a contracted foot, or keeping a sound foot in its natural shape.

It is used and approved by the leading horse owners of the New York Driving Park, such as

Robert Bonner, Frank Work, and hundreds of other gentlemen of repute. In ordering, send diagram of foot, with price. Same will be forwarded free by mail.

F. P. ROBERGE,
VETERINARY SURGEON,

1,741 BROADWAY, NEW YORK.

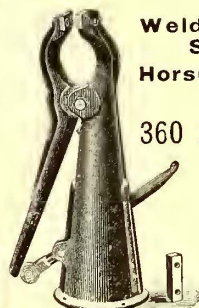
Liberal discount to the trade. They are kept by all first-class Horseshoers, Saddle and Hardware men.

P. F. Burke, c. F. Dewick & Co.,

Successor to

Manufacturer of

Patent Steel Shoe CALKS, Blunt and Sharp.

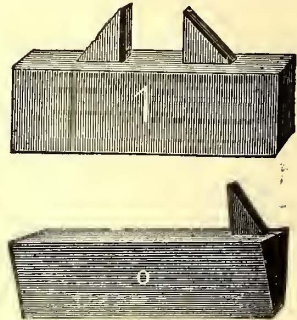


Welding Dies for Sharp, and Horse Shoers' Foot Vises.

360 Dorchester Ave.,

Boston, Mass.

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For Sale by Iron, Steel and Heavy Hardware Dealers.

CHAMPION HORSE NAILS.

Manufactured from very best SWEDISH METAL. Will not SPLIT. Are accurately pointed, tough, strong and hold the shoes. Soft enough to clinch readily; stiff enough to drive without bending. All nails uniform and perfect. They are used in thousands of shops with the best of satisfaction, and are especially liked by "floor-men" for their good reliable driving. Made in two patterns, "LARGE HEADS" and "CITY HEADS."

QUALITY GUARANTEED.
Nos. 4, 50c; 5, 28c; 6, 25c; 7, 23c; 8, 22c; 9, 21c; 10, 20c.

Champion Horse Nail Co., Appleton, Wis.

THE PUTNAM NAIL CO.

LOOK WELL

TO YOUR

Highest Award at the

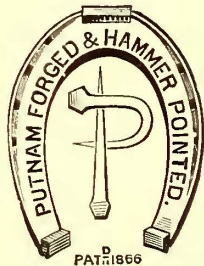


Fig. 1.

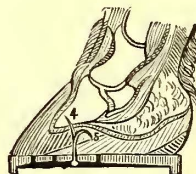
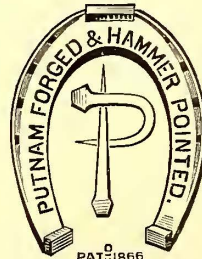


Fig. 2.



Centennial Exhibition.

HORSES' FEET

These drawings show how many horses are made lame and permanently injured by the use of the COLD CUT and SHEARED POINTED Nails. This process of manufacture produces lamination, causing the iron to form in layers, and when driven into the foot, the horny fibers of which the hoof is composed cause the nail to separate at the point, and one portion passes INTO the foot.

No. 4 represents one of these nails which was driven into the hoof and SLIVERED in driving, one THIN blade passing into the quick or sensitive sole; No. 5 the THICK blade of the nail passed out of the wall of the hoof for clinching. After a few days the horse was returned lame, and upon the removal of the shoe, a nail similar to the above was broken off, leaving the sliver in the foot: LOCK-JAW ensued, from which the horse died. Upon dissecting the foot a portion of the nail was found to have penetrated through the coffin bone, as seen in Fig. 2, letter A, thus sacrificing the life of a valuable animal.

It requires but little observation and reflection, one would think, to arrive at the conclusion as to the kind of nails to be used in the horse's foot, whether a mangled piece of iron rendered DANGEROUS by the COLD ROLLING AND SHEARING process, or one made from the rod at a welding heat, where all the fibers remain intact and a perfect ONENESS maintained and being pointed by the hammer, rendering such an accident as slivering utterly impossible.

The foot is the MOST IMPORTANT member of the animal's body, to which the greatest care and attention should be directed; for when it becomes injured or

diseased, no matter how perfect the other parts may be, the horse's services are diminished or altogether lost. Hence the value of a horse depends upon the condition of his feet.

The horse at every step brings an immense power and weight to bear upon the foot. The hoof is a *thing of life* and yields to the pressure. The PUTNAM NAIL being *forged* accommodates itself to the pressure of the hoof. It is far other-wise, however, with stiff rolled and cut nails. They remain rigid and their sheared edges are therefore pressed like sharp knives against the horny fiber. This is what causes the broken and rotten appearance so frequently seen in horses shod with cheap cut nails. Can a horse owner afford to attempt to save a few cents in price of nails and ruin his horse? Surely not, for the old adage is true as ever,

"NO FOOT, NO HORSE."

As the remedy lies with the owner of the horse, it is for him to prohibit any cold-rolled or sheared nails being used in his horse's feet.

The only Hot-Forged and Hammer-Pointed Horse-Shoe Nail in the World

that is not cut, clipped or sheared upon the point, and will not split in driving, is

THE PUTNAM NAIL.

Address for Circulars, etc.,

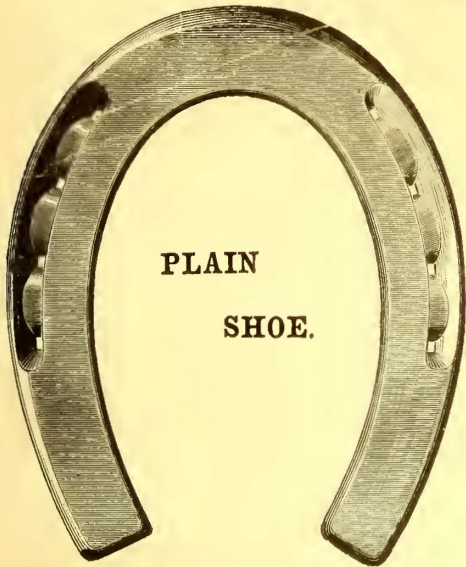
THE PUTNAM NAIL CO., NEPONSET P. O., BOSTON, MASS.

THE BRYDEN FORGED HORSESHOE WORKS, Limited, CATASAUQUA, PENN.,

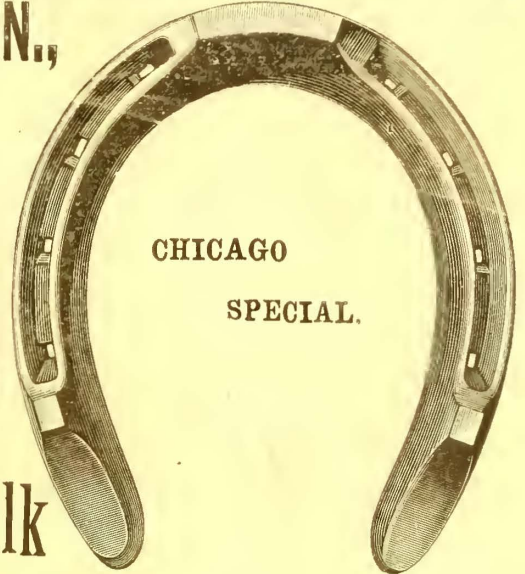
MANUFACTURERS OF

THE BRYDEN Forged Solid Calk

HORSE AND MULE SHOE.



PLAIN
SHOE.



CHICAGO
SPECIAL.

These shoes are forged into shape under heavy drop hammers, greatly condensing the iron and adding very much to wearing qualities, making it nearly equal to steel in durability.

The distinctive feature of our system of manufacture is, that it produces a *finished* shoe, calked, or plain, ready for attaching to the hoof.

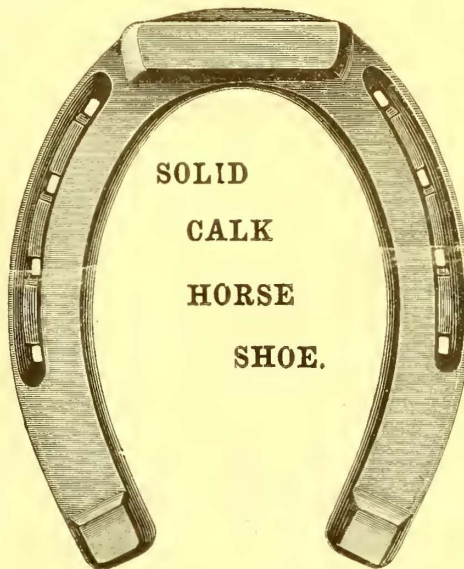
The crease is made low and the nail holes are punched well in and beveled to permit the nailhead to be well driven in, reducing the strain on the nails and insuring a firmly fastened shoe.

The foot bearing of the shoe is level, thus materially aiding in the preservation of the hoof.

It is not necessary to heat the shoe in order to fit it.

There are no welds in the shoe to break, the calks being solid forged up from the web.

OUR CALKED SHOE. A good, strong, reliable shoe to have on hand. The calks will not come off. Always ready to nail on. A handy shoe for the Winter, easily sharpened, and, as the calks will not break, will give as much service as steel. Made in sizes No. 1 to No. 6. Front and hind of steel or iron.

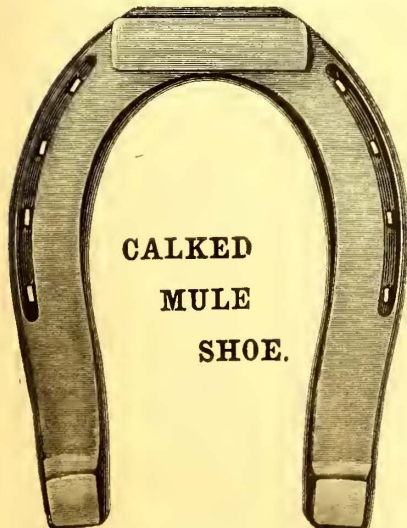


SOLID
CALK
HORSE
SHOE.

The shoes have a good substantial clip drawn up from metal driven outside the regular outlines of the shoe for that purpose. The outer edge of the clip, when drawn up, coinciding with the outlines of the shoe, requires no robbing of the hoof wall to let in the clip.

Among the street railways using our shoes are: the Third Avenue R. R. Co., Eighth Avenue R. R. Co., Broadway & Seventh Avenue R. R. Co. of New York city; Bushwick R. R. Co., Brooklyn City and Newtown R. R. Co. of Brooklyn; Philadelphia Traction Co., Citizen's Passenger R. R. Co., Second & Third Street R. R. Co. of Philadelphia; Metropolitan R. R. Co. of Washington, D. C.; North Chicago R. R. Co., Chicago City R. R. Co., West Division R. R. Co. of Chicago, Ill.; New Orleans City & Lake R. R. Co. of New Orleans, La.

We present illustrations of some of the many designs of shoes manufactured by us.

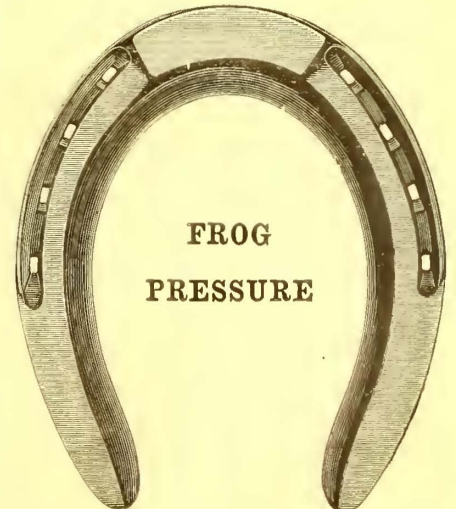


CALKED
MULE
SHOE.

OUR FROG PRESSURE SHOE. The advocates of the frog pressure system of horseshoeing have in this shoe the very thing they want. The best shoe made for curing corns or contracted feet. Made in sizes No. 1 to No. 6. Front and hind, iron, or steel.

OUR PLAIN SHOE. "The best railroad shoe made," so says one of the largest consumers of horseshoes in New York city. This shoe is used by the largest street railroads in New York city and Philadelphia. Made in sizes No. 1 to 6. Front and hind.

OUR CHICAGO SPECIAL. Designed to meet the wants of many of our western customers. Extensively used in Chicago, on the principal railroads and for custom work. A light calked shoe for shoeing trotting and driving horses. Made in sizes No. 1 to No 4 of iron or steel.



FROG
PRESSURE

OUR CALKED MULE SHOE. Just the thing for street railway and coal mining work; solid calks. Made in sizes No. 1 to No. 5 in iron or steel.

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MANUFACTURERS AND OWNERS OF THE Latest Designs, Improvements and Inventions in Registers, Indicators, Classifiers and Punches, for the Recording of Fares Collected on Street and Steam Railroads.



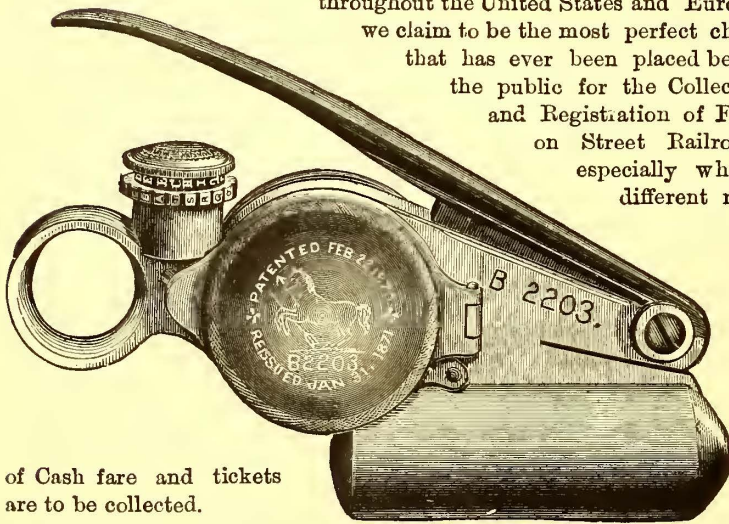
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COMPANY.

This company owns over 100 Patents embracing all the Valuable Features of Fare Registers, Indicators, etc., and was awarded three Medals at the Chicago Exposition of Railway Appliances.

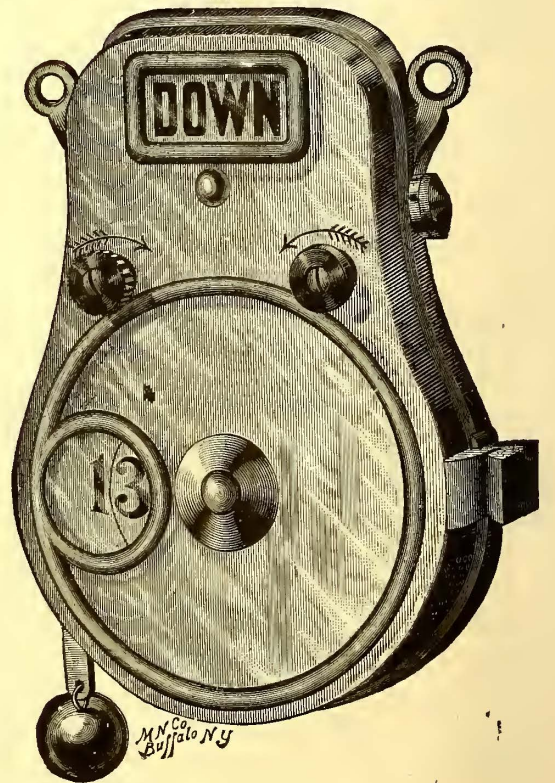
The Alarm Registering Punch.

This Register, which is so generally used throughout the United States and Europe, we claim to be the most perfect check that has ever been placed before the public for the Collection and Registration of Fares on Street Railroads, especially where different rates

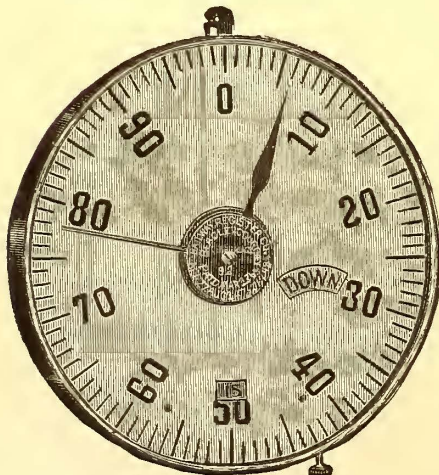


of Cash fare and tickets are to be collected.

Benton Register.

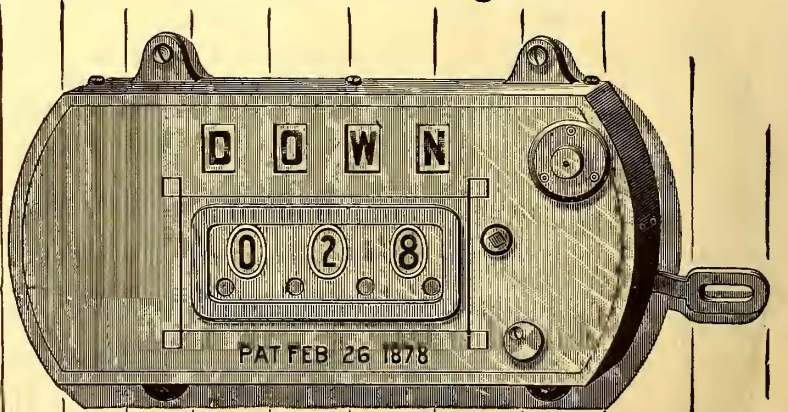


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Railway companies desiring to use a Stationary Register will consult their own interest by examining this Register before adopting any of the cheap devices now offered as it is the most Reliable Register of its kind. For further particulars address

The Pond Register.



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ANDERS' GABLE RAILWAY GRIP.

Simple, Durable, Efficient.

Cable may be dropped and picked up without leaving the platform. The whole under the constant control of the gripman.

Most efficient device in existence for releasing and gripping cable in crossing other roads.

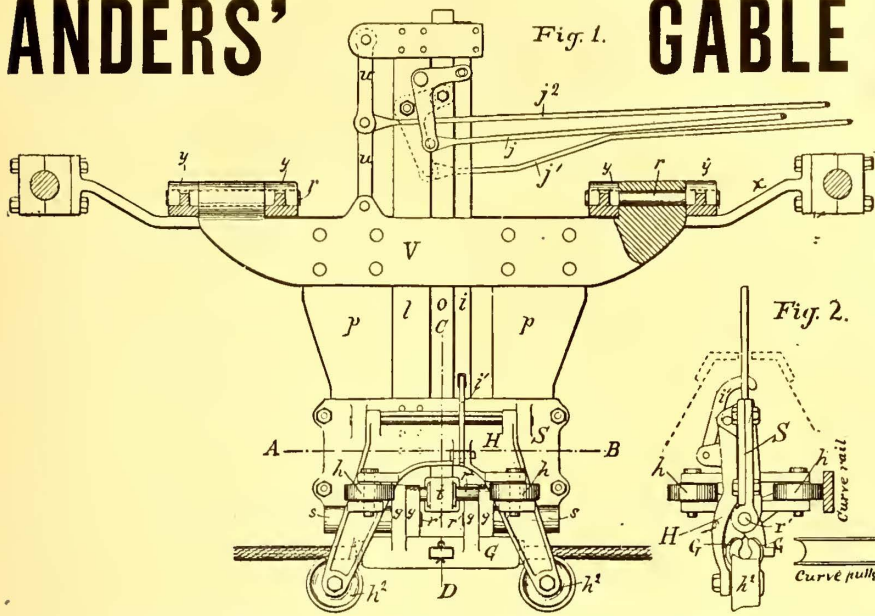
Can be worked from either end of the car.

Mechanism Simple and not Liable to get out of order.

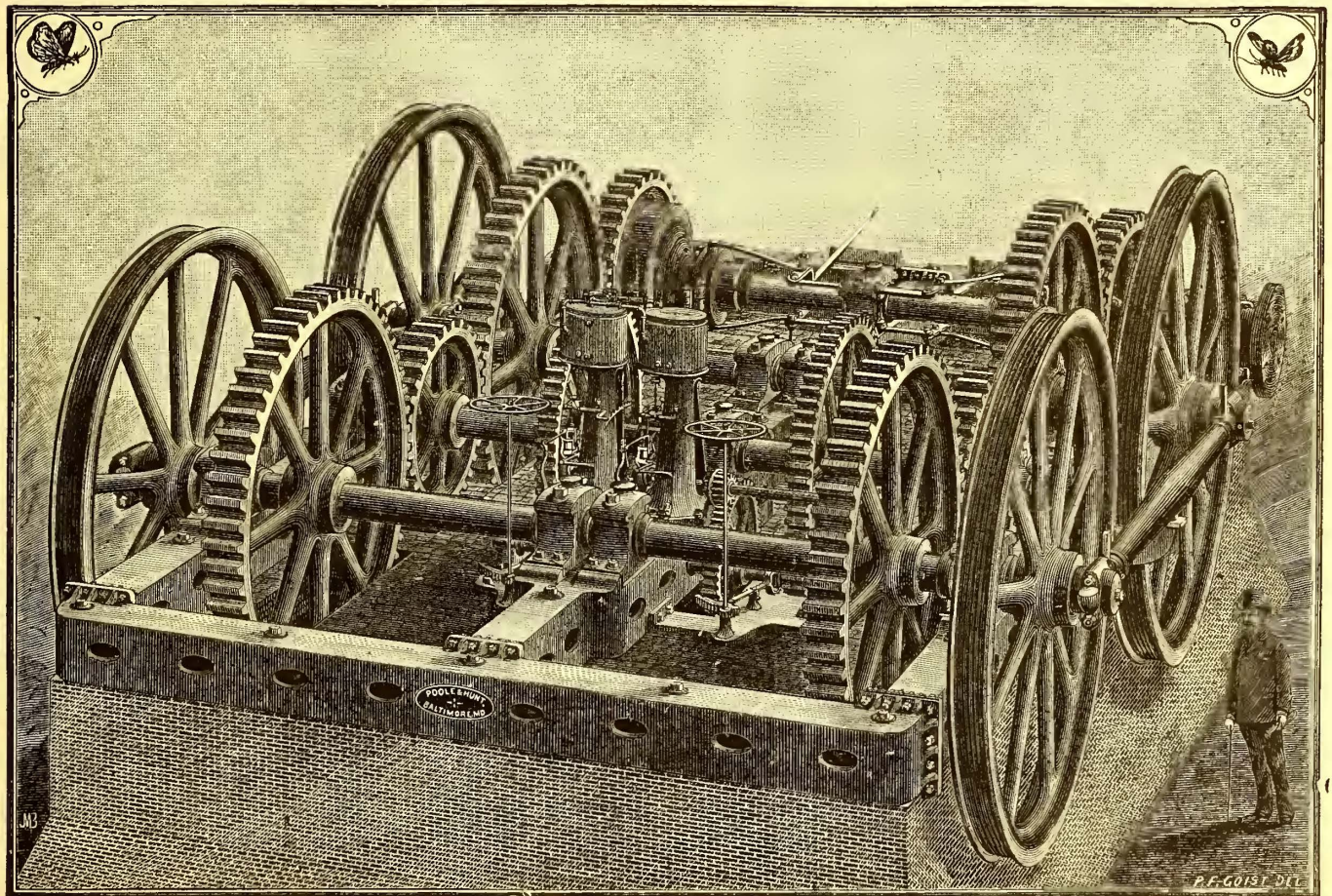
The rope may be dropped at any time to a lower level than the path of the gripping device and again raised into the gripping jaws at the will of the gripman with perfect ease and safety.

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PLOUGH STEEL
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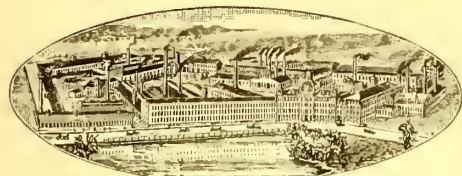
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Every Variety of

WIRE

For all Purposes.



SOUTH WORKS.

MAKERS OF IRON AND STEEL.

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WATKEYS' ADJUSTABLE CLUTCH AXLE.

1. Saves thirty per cent in the wear of wheels and rails.
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4. Enables horses to do twenty-five per cent more work, by sparing them the hard pull in rounding curves.
5. Adds greatly to the comfort of passengers, wholly avoiding the shaking up and jolting now unavoidable, and silencing the unpleasant grating noise incident to turning corners.

Satisfaction Guaranteed

AT A COST SLIGHTLY ABOVE ORDINARY WHEELS AND AXLES.

We use only the best car wheels, cold rolled steel axles of the finest quality, and our work is second to none in the country.

Our axle is now in use on the Jersey City and Bergen Railroad, and in Syracuse, N. Y. We refer to the officers of these lines to substantiate the above claims.

Now negotiating with other leading roads.

MANUFACTURED BY

THE EMPIRE AXLE MANUFACTURING COMPANY,

GEORGE B. HIBBARD, President,

32 Nassau Street, New York City.

The Clark Grooming Machine.

(Patented Dec. 15, 1874; Jan. 9, 1883.)

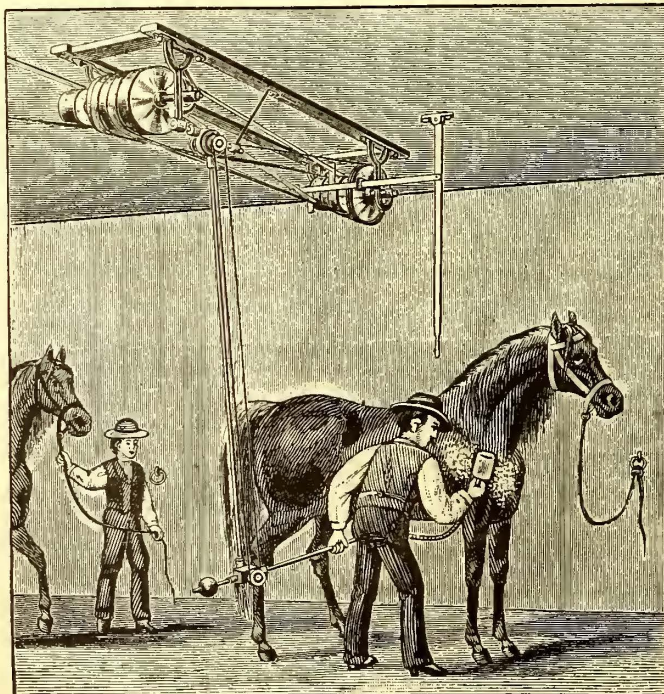
This machine for Grooming may be driven by any known power, and can readily be placed for use in any stable or out building. It can be operated by an ordinary groomer; its work is perfect; its action simple and effective. Stock owners will readily realize the importance of the machine. The perfection and rapidity of its work, and the benefits derived by its use, commend it to those interested in the care and use of all classes of thoroughbred and work stock. The most vicious animal readily submits to its use.

Foul and unhealthy accumulations are instantly and thoroughly eradicated, and the pores of the skin opened to healthy action. It not being possible to slight the work upon the animal, as in hand grooming, the hair becomes oily and glossy, a healthy action to the skin being maintained.

We now offer this Groomer to the public in confidence, knowing it will be found invaluable in its use in all stables, and especially so wherever perfection in stock raising is desired.

Grooming means the purification of the skin and the cleanliness of the coat, thereby contributing to the animal's health, and requiring proportionately less food.

Machine Grooming is found to be less expensive than hand



grooming, saving in food and medicines, and materially increasing the value of the animal.

We manufacture Grooming Machines single and double. Capacity 2-Brush Machine, 30 head per hour; Single, 12 head per hour.

Horse railroads save the cost of a double brush machine ten times a year on every one hundred horses.

All large stables will have these machines as soon as they can get them after investigation.

REMARKS.

These machines are much improved, and are now as perfect as can be made. The wearing parts were formerly iron, but are replaced with steel, and are giving perfect satisfaction.

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Turn Tables, Tram and T Rails, Switch Castings, Spikes and Street Railway Material generally on hand.

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The Electric Motor and its Applications.

By THOMAS COMMERFORD MARTIN AND JOSEPH WETZLER, Associate Editors of the Electrical World, Members of the American Institute of Electrical Engineers. — 216 large quarto pages; 200 illustrations; Price, postage prepaid to any part of the world, \$3.00.

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WATER AND GAS WORKS,
Street Railways & City Improvements Designed & Built.**

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Our brands of Portland Cement have been subjected to the most severe and exacting tests, and have been found superior to all others. Owing to their great strength and perfect condition they have been selected in every instance in the construction of the several Cable Systems of Chicago, Kansas City and Omaha. We guarantee perfect results with our Cements, and they are especially adapted for all work where great strength is required. The following Companies have used our brands exclusively:

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NORTH CHICAGO STREET RAILROAD CO., CHICAGO.

FIFTEENTH ST. CABLE LINE RAILWAY CO., KANSAS CITY.

KANSAS CITY CABLE RAILWAY CO., KANSAS CITY.

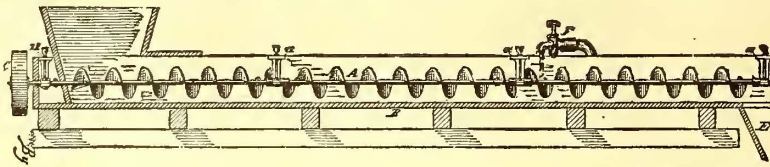
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The Caldwell Patent Concrete & Mortar Mixer. INDISPENSABLE TO CABLE RAILWAY CONSTRUCTION.

The Concrete Mixers built for the Chicago City Railway Company consist of spiral steel screws 12 in. diameter and 56 feet long, driven by a steam engine and revolving in a trough, into which the ingredients are thrown, and a stream of water run. The mixture is delivered at the farther end ready for use. During the past season the City Railway with one of these machines mixed and concreted 920 feet of track in ten hours; and the average capacity of the machine was 850 feet per day. The



Mixes Better and Quicker than by any known Process. driving engine and mixing machine are carried on trucks which run on the completed track and follow as fast as concreted. These machines have also been used in building bridge foundations and mixing mortar for some of the largest buildings in the city. Gen'l Sooy Smith and Gen'l Fitzsimons have both used them in their work. Also St. Louis Cable & other roads.

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Having had over 25 years' practical experience in Street Railway Construction feel confident in saying to parties who contemplate building will find it to their interest to correspond with me before making contracts or ordering material.

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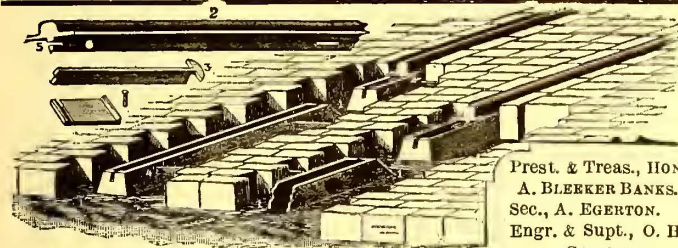
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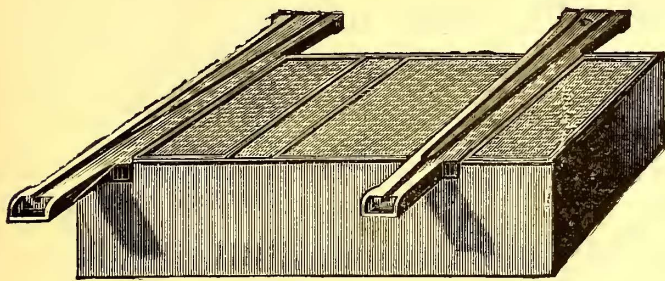
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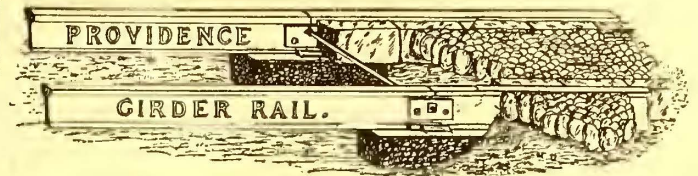
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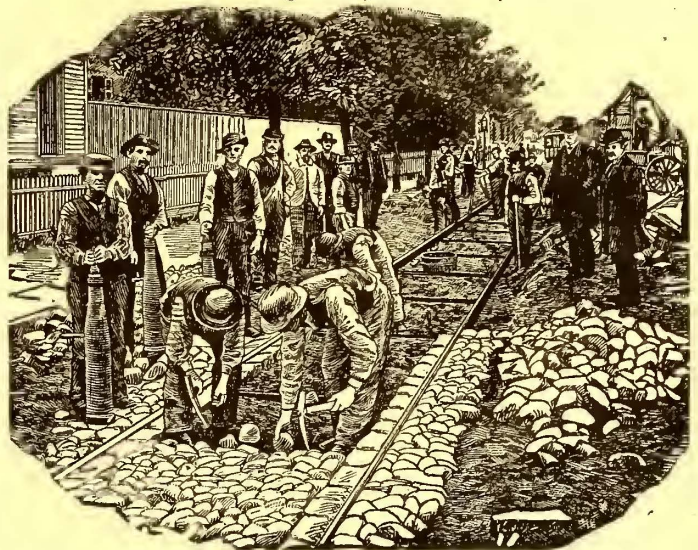


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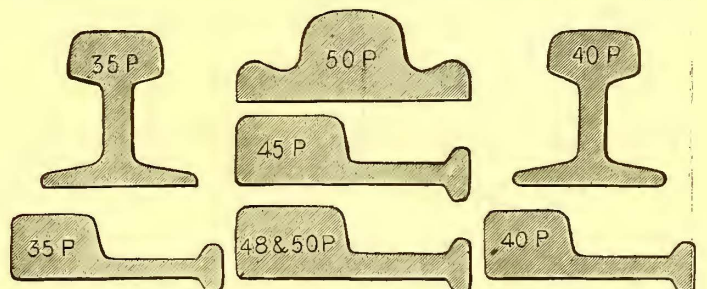
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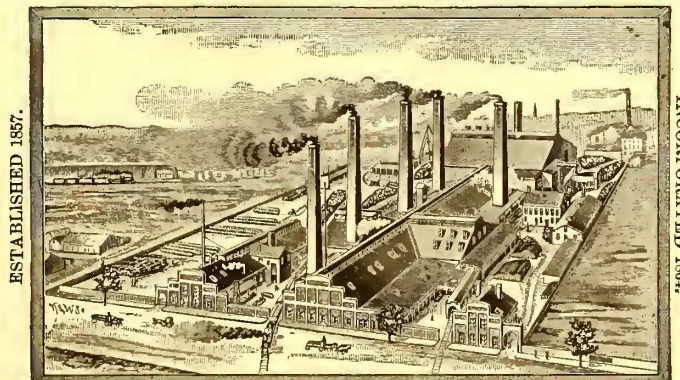
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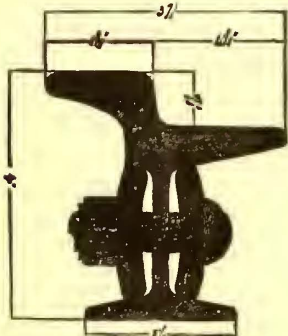
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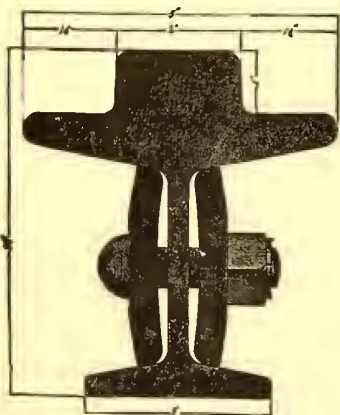
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Section C. 88, No. 111.



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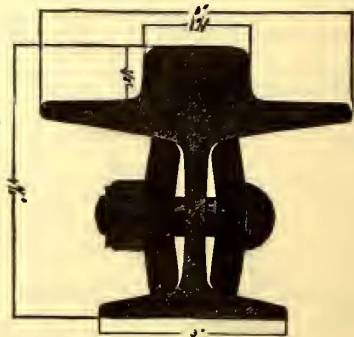
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Our customers are guaranteed against all suits for infringements on goods purchased from us and we further undertake to defend the patents covering the details of our Girder System.

To those contemplating the use of the Girder System, we offer, FREE OF COST, to survey their routes, and after consultation as to the best and most economical construction, to furnish full and complete estimates of cost of the completed work. Send for Illustrated Catalogues.

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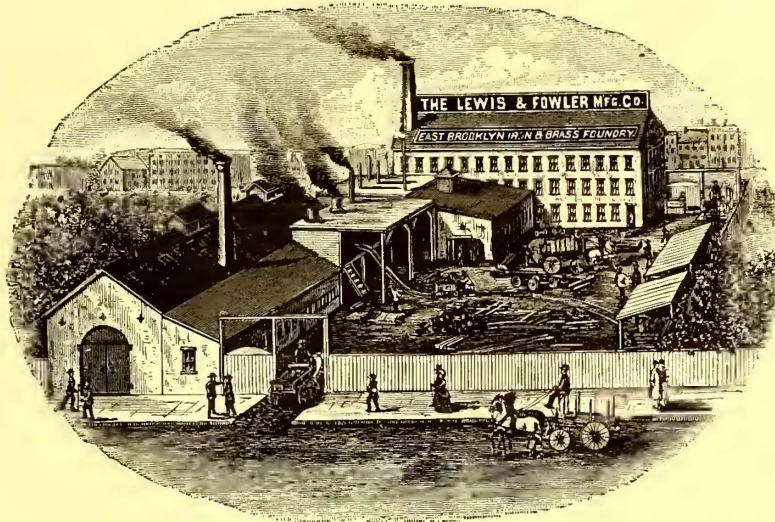
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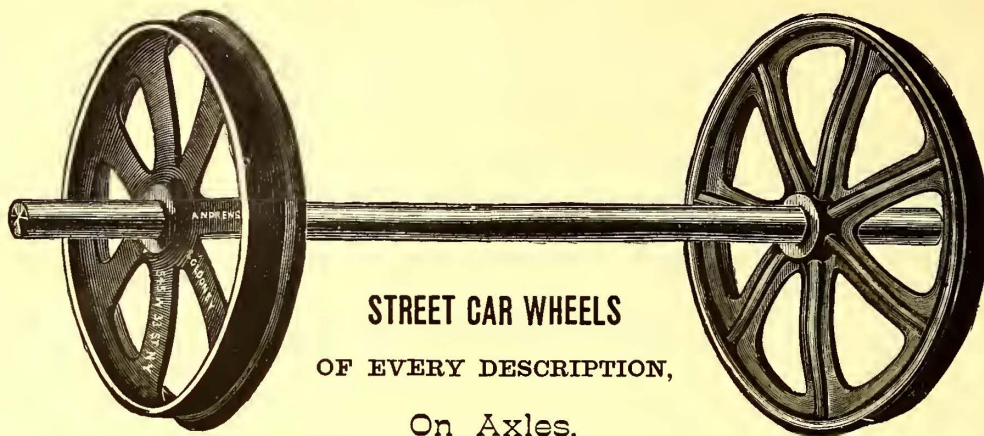
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STREET CAR WHEELS
OF EVERY DESCRIPTION,
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Manufacturers of

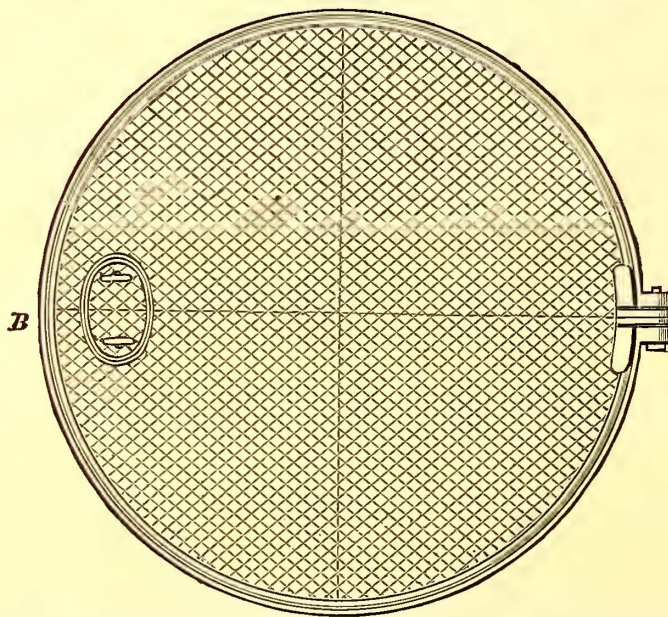
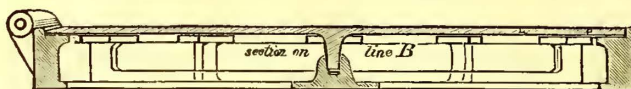
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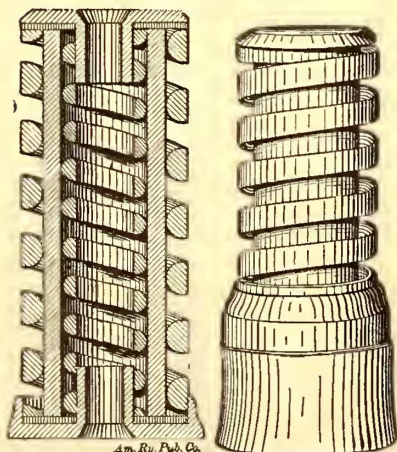
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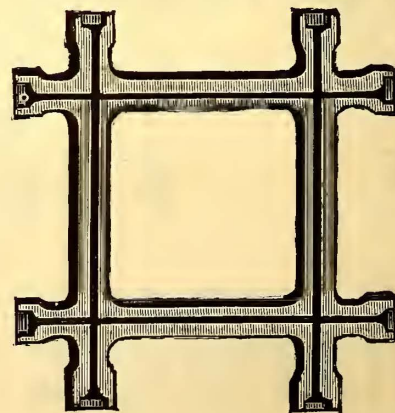
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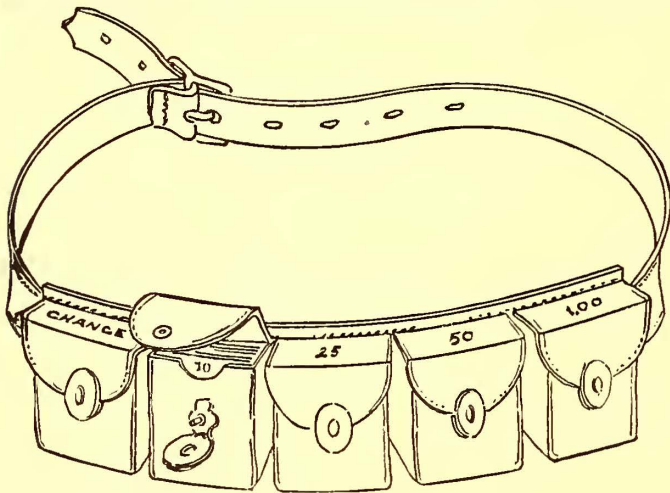
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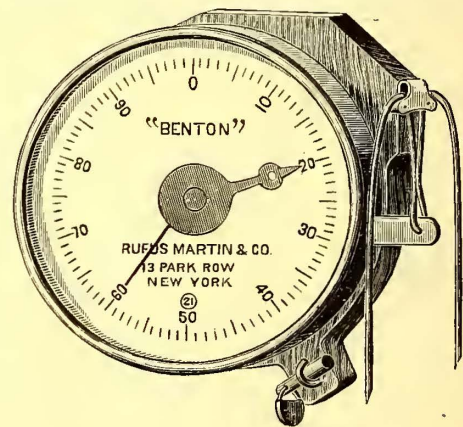
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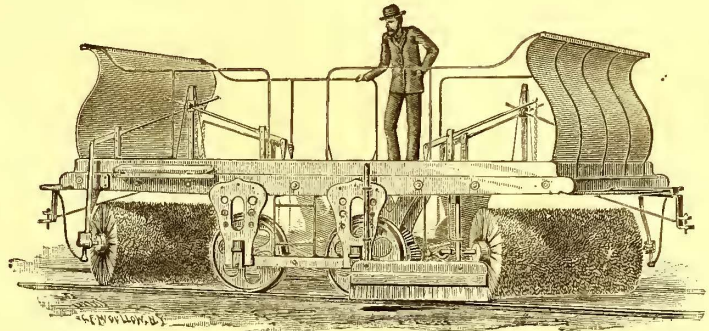
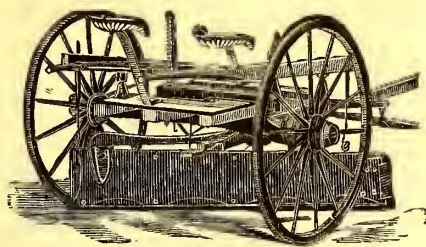
Wichita Construction and Supply Co., - - Wichita, Kan.

The "Boss" and "Walkaway" Snow Plows.

One-Third the Price of other Plows and Satisfaction Guaranteed.

We are in receipt of letters from prominent railroad men all over the country and print a few to show what they think of them. Parties needing Plows are respectfully referred to any railroad companies using them.

NET PRICE FREE ON BOARD CARS: BOSS, \$100; WALKAWAY, \$150.



BOSTON CONSOLIDATED STREET RAILWAY CO.
CHAS. E. POWERS, PRES. SAMUEL LITTLE, TREAS.
JOHN H. STUDLEY, JR., ASST. TREAS.
TREMONT ROW COR. PEMBERTON SQUARE,
BOSTON, May 25, 1887.

CHAS. B. ALLYN, Esq.:
DEAR SIR—In reply to yours of the 21st inst. I would say that during the snow storms of last winter we made use of the "Boss" Snow Plow and with very satisfactory results. It will do the work of very many men in leveling off the snow and keeping the icy ridges down.

Very truly yours,
CHAS. E. POWERS, Pres't.

MILWAUKEE, Wis., Jan. 7, 1887.

THOMAS KANE & Co.:
GENTS—The two "Boss" scrapers purchased from you some two weeks ago are doing very satisfactory work in scraping snow and ice from our tracks and leveling same. We are well pleased with them.

Very respectfully,
PETER McGEUGH,
Pres. Mil. St. Ry. Co.

ST. LOUIS, Jan. 14, 1887.

THOMAS KANE & Co.:
GENTS—Yours of recent date to hand. I have been using the "Walkaway" snow scraper on my roads for the past three weeks. It gives entire satisfaction. It paid for itself in one trip. It is almost a necessity for street railroads.

Very truly yours,
CHAS. GREEN,
Pres. People's Ry. Co.

MINNEAPOLIS, MINN., Feb. 14, 1887.

THOMAS KANE & Co.:
GENTS—I have six of your Walkaway Snow Scrapers on our roads in St. Paul and Minneapolis. We have had a very hard winter, and I have 22 snow plows, and I am pleased to say that your plows have given us the best satisfaction of any.

Respectfully yours,
C. G. GOODRICH,
Sec'y Minneapolis St. Ry. Co.

SOUTH BEND RAILWAY CO.,
SOUTH BEND, IND., Feb. 4, 1887.

FLEMING MFG. Co.:
We are perfectly satisfied with the "Boss" purchased of you, as it will do all claimed for it and we consider it the cheapest and best snow plow made for street car purposes.

A. F. SPEENK,
W. F. MILLER, Supt.

ST. LOUIS, Mo., Jan. 15, 1887.

THOMAS KANE & Co.:
GENTS—The Belle Fontaine Ry. Co. is using two of your Boss Snow Scrapers and they give entire satisfaction. It is difficult now to understand how we ever got along without them.

ROBERT McCULLOCH,
Sec'y Belle Fontaine Railway Co.

LANSING, Mich., Jan. 8, 1887.

JAMES A. BELL, Esq., AGENT FLEMING MFG. Co.,
Dimondale, Mich.:
DEAR SIR—I take pleasure in assuring you that the "Walkaway" Snow Scraper we bought of you has proved a very efficient aid in cleaning our track of snow this winter. We have had no difficulty so far in removing the snow with the scraper and one pair of horses. A specially valuable feature of the machine is the ease with which one can level the snow from the sides of the track, thus preventing it being pushed back on the track by vehicles and avoiding disagreeable controversy. The machine is strong, simple, effective and the best snow fighter of the kind I ever saw.

Yours truly,
H. M. CLARK,
V. Pres. Lansing City Ry. Co.

MERIDEN, CONN., May 23, 1887.

CHAS. B. ALLYN, Esq.:
DEAR SIR—Yours of the 21st inst. at hand and I will say in regard to the "Boss" Snow Plow that I used it in three very hard snow storms this year just after we started the R. R. and will say I would take no price for it if I could not get another one. It did all you could ask for it to do.

DANIEL BARKER, Supt.
Meriden H. R. R. Co.

HANNIBAL, Mo., Jan. 4, 1887.

THOMAS KANE & Co.:
GENTS—We are well pleased with the "Boss" Snow Scraper. You gave it the proper name, as it is the Boss. We would not be without it for double what it cost.

JAMES O'HERN, Sec.
Hannibal St. Railway Co.

THE WATERBURY HORSE R. R. CO.,
WATERBURY, CONN., May 23, 1887.

BROOKLYN RAILWAY SUPPLY CO.:
GENTLEMEN—We are very much pleased with the "Boss" snow plow purchased of you. I don't know of anything that will handle a heavy snow equal to it.

Respectfully yours,
E. A. BRADLEY, Supt.

MICHIGAN CITY, IND., Feb. 12, 1887.

SAM JENNINGS, Esq.:
DEAR SIR—The snow plow we bought from you in my opinion meets all the requirements that it is intended for, and gives good satisfaction. We have used it on our road this winter when the snow was three feet deep on our track, and must say that it did its work admirably.

Yours truly,
JOHN LYONS,
V. Pres. M. C. St. R. R. Co.

PAVONIA HORSE RAILROAD,
J. H. SMALL, MANAGER,
JERSEY CITY, N. J., Feb. 12, 1887.

BROOKLYN RAILWAY SUPPLY CO.:
In reply to yours of 7th inst. I would say that I think the Boss Snow Plow is something that every road that has to fight snow should have. It has given me very great satisfaction this winter.

Yours truly,
J. H. SMALL,
Manager Pavonia H. R. R.

EAU CLAIRE ST. RAILWAY CO.,
EAU CLAIRE, WIS. }

To THE FLEMING MFG. Co., Fort Wayne, Ind.:
GENTLEMEN—I have used the Boss Snow Scraper purchased of you and I find it giving entire satisfaction. I could not possibly run my cars had it not been for the use of it this winter, and I cheerfully recommend it to any street railway company that may be troubled with snow.

Yours very respectfully,
J. R. HARRIGAN, Supt.

ERIE, Pa., Feb. 8, 1887.

FLEMING MFG. Co., Fort Wayne, Ind.:
GENTS—Yours of 2nd inst. is at hand. In reply I would say that the "Boss" Snow Scraper and Track Cleaner is all that you recommended it to be. We have had considerable snow here, and had a good opportunity to give it a trial. It is without a doubt a Boss scraper and cleaner. I can recommend to any one requiring the same.

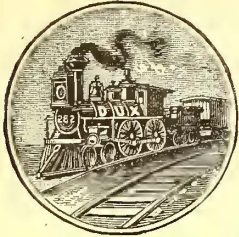
JACOB BORST, Supt.

JANESVILLE, WIS., Dec. 19, 1886.

GENTS—We have had a good chance to try the Walkaway, and it did all you claim and is the best scraper I have seen work this winter. I like it a great deal better than one that runs on the rail, for we can leave rail in so much better shape than with the V scraper.

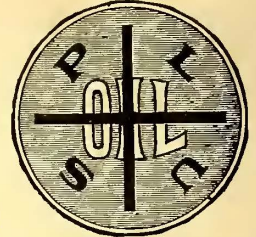
Yours truly,
CHAS. ATWOOD, Supt.
Janesville St. Railway Co.

THE BROOKLYN RAILWAY SUPPLY COMPANY,
44 Walworth St., Brooklyn, N. Y.,
AGENTS FOR THE NEW ENGLAND, EASTERN AND SOUTHERN STATES.
Machines Always in Stock for Export.



Trade Mark Pat. Mar. 13, 1883

DUX LUBRICANT.



Trade Mark Pat. Mar. 13, 1883.

The Leading New Grease for Street Railways

The Best Lubricant for Street Railways Known.

Will run for One Year on One Packing. Cars will run easier packed with Dux, than with oil and waste. Why? Because we give you a better lubricant. No drip from Car Boxes when packed with Dux, and, therefore, keeps the car boxes and trucks clean.

Try it and you will use no other Lubricant.

DUX FOR STREET RAILWAYS.

PITTSBURG, ALLEGHENY & MANCHESTER RY. CO., PITTSBURG, PA., Aug. 13, 1885.

Leib Lubricating Co.:

GENTLEMEN—We have used Dux Lubricant for the past nine months. It has given entire satisfaction; in fact, it is the best I have ever used. Think it fully as good as represented.

Yours truly,
J. C. COTTON, Supt.

OFFICE OF CAMDEN HORSE RAILROAD CO., CAMDEN, N. J., Dec. 14, 1886.

Leib Lubricating Co., 196 and 198 Chicago st., Buffalo.

We have used your "Dux Lubricant" for about two years and regard it as the best and cheapest lubricant ever used by this company.

JOHN HOOD, Supt., etc.

OFFICE OF ACUSHNET STREET RAILWAY CO., NEW BEDFORD, MASS., Dec. 11, 1886.

The Leib Lubricating Co., Buffalo, N. Y.:

DEAR SIR—We have used several packages of your "Dux" and like it very much. We can recommend it to any one using axle grease.

Yours very truly,
A. P. SMITH, Treas.

BYRON WESTON, FIRST-CLASS LEADER AND RECORD PAPER, }
DALTON, MASS., Oct. 15, 1886. }

Leib Lubricating Co., Buffalo, N. Y.

GENTLEMEN—Yours of the 13th inst. received. In reply, we like your Dux

Lubricating Compound very much, and when this is used up that we have on hand shall order more. I find on heavy bearings where no other oil or grease would cool it yours did the work.

Yours truly,
HARRY W. HITT, Supt.

FAULKNER MILLS.—F. J. HASTINGS & Co., MILLERS.

SO. ACTON, MASS., Dec. 23, 1886.

Leib Lubricating Co., Buffalo, N. Y.

GENTS—Your favor of the 17th inst. duly received. In reply we would say, that for several years we had much trouble and annoyance to find a lubricant for our heavy bearings that would stand, and tried various articles on the market without being satisfied, until a friend connected with a large manufacturing concern gave us a few pounds of the Dux Lubricant to try. It worked so much better than anything we had ever had that we ordered enough from you to give it further trial, and as a result have used it ever since, and can truly say it is the best lubricant we ever used. It will stand heat, gives off no drip and is economical, and we are very much pleased with it and do not hesitate to declare that it is our firm belief that there can be nothing ever made to equal it. Our experience on wagons has been equally satisfactory; our first attempt being on a heavy wagon used every day, heavily loaded, ran 21 days when it went into the shop to be painted, and then was in a good condition to run longer. The only thing we regret is that we did not at once try and arrange to sell it in this locality, still one of our townsmen to whom we gave your address, Mr. Littlefield, has since obtained the agency, we learn, and we can obtain it through him.

Yours truly,
F. J. HASTINGS & Co.

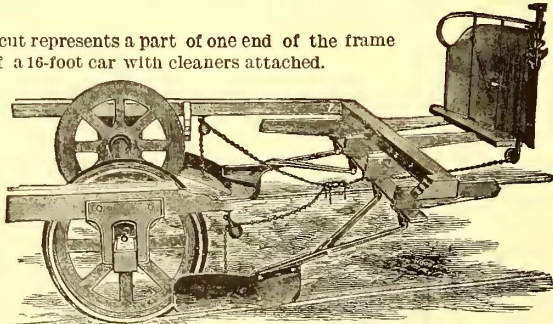
MANUFACTURED BY

The Leib Lubricating Co., 196 & 198 Chicago St., Buffalo, N. Y.

FRANTZ & ENNIS, WILKESBARRE, SOLE AGENTS FOR PENNSYLVANIA.

DAY'S IMPROVED STREET RAILWAY TRACK CLEANERS.

The cut represents a part of one end of the frame work of a 16-foot car with cleaners attached.



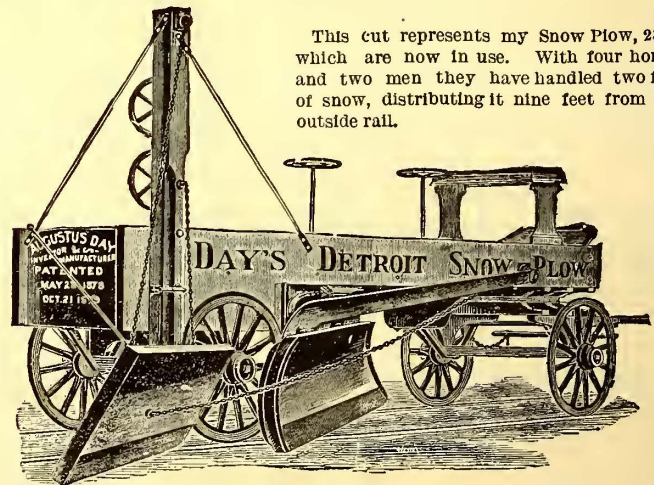
These cleaners have proved their **SUPERIORITY OVER ALL OTHERS INVENTED**, FOUR THOUSAND pairs being **NOW IN USE**. Every part is furnished complete, including bolts.

They are intended to be placed on every car in use, and thereby secure a clean rail during snow storms and the continual obstructing of the rail by passing teams.

They are adaptable to all kinds of rails and styles of cars; clean snow, ice, mud, dirt and stones from the rail; do not perceptibly increase the draft; doubling seldom required; are easily attached, and when fitted, can be shipped and unslipped in a few moments; are under the immediate control of the driver, and can be lowered or raised instantly with one hand. **ALL PARTS ARE MADE INTERCHANGEABLE AND NUMBERED** for convenience in duplicating.

No estimate can be made of their advantage in saving of horseflesh, hand labor, salt, and 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 most efficient article in preference to other considerations.

It will readily be seen that in the full use of these scrapers the whole system of cleaning tracks will be somewhat changed, and the use of the snow plow very materially lessened, and in some cases almost entirely obliterated. Long experience has proved conclusively the importance of placing them upon every car in use, as the car not having them on is continually packing down upon the track whatever is upon it, and rendering it difficult to keep a clean rail. Cleaners should be ordered 60 days before required for use.



This cut represents my Snow Plow, 23 of which are now in use. With four horses and two men they have handled two feet of snow, distributing it nine feet from the outside rail.

My Snow Plows are built to gauge of track, and the tires on wheels are made similar in shape to the flange of car wheels and run upon the tram part of the rail, and are easily kept on the track. For T rail a suitable iron wheel is made. Have been in use 10 years. During that time many improvements have been made in strength, efficiency, and adaptability. With **FOUR HORSES AND TWO MEN** they have **HANDLED TWO FEET OF SNOW**, distributing it nine feet from the outside rail.

It is adapted to **SINGLE OR DOUBLE TRACK ROADS**, adjustable where necessary; built in the most thorough and substantial manner, of the best material, with gas pipe rail all round. The plow is not intended to supply the place of the small scrapers, but to be auxiliary to them. For execution in deep snow, **EASE AND CONVENIENCE IN HANDLING**, it surpasses all others in use. **27 PLOWS NOW IN USE.**

PLOWS SHOULD BE ORDERED THREE MONTHS BEFORE REQUIRED FOR USE.

For Illustrated Circular and Price, Address

AUGUSTUS DAY, 76 State Street, cor. Park Place, - - - - - Detroit, Michigan, U. S. A.

Wilson Brake Shaft.

ENTIRELY NEW & NOVEL IN CONSTRUCTION.

POSITIVE AND SURE IN ACTION.

BRAKES SET WITHOUT COMPLETELY TURN-

ING THE HANDLE.

MADE ON THE PRINCIPLE OF A FRICTION

CLUTCH,

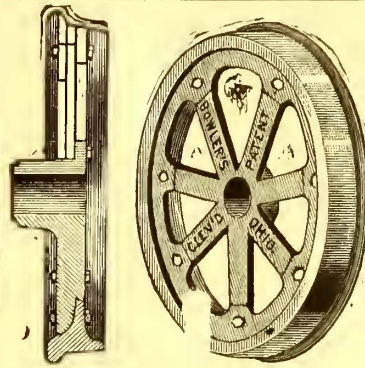
SIMPLE IN DESIGN.

Saves Room, Adds to Available Braking Power,

and Gives the Driver the Best Possible

Control over the Car.

Mordecai M. Wilson, Agent,
TROY, N. Y.

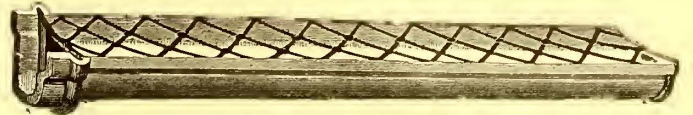


Cleveland

Foundry,

Manufacturers of

Car and Locomotive Wheels either Chilled or Steel Tired; with or without axles. Street Railway Wheels, Turnouts and Turntables. Patent Chilled Face RR. Frogs. Engine & Heavy Castings a Specialty.



Graded Stable Cutter with Straight or Curved Cover. Descent $\frac{1}{8}$ inch per foot. Pieces 5 feet lengths; short pieces furnished to suit any length. Spouts to connect with sewer.

They control and make N. P. Bowler's Patent Street Railroad Wheel. The tire of this wheel is cast separately from the hub and spokes; the latter is made of soft strong iron, and is perfectly free from strain—therefore can be made much lighter and more durable. The tires and the spokes or center of the wheel are made perfectly interchangeable so that when the tire or rim is worn out another can be put in its place by any employee with no other tool than a common wrench.

Bowler & Co. ^{10 TO 24} Winter St. Cleveland, O.

PECKHAM'S

Patent Elastic Street Car Wheel,

WITH INTERCHANGEABLE WEB, TUBULAR FIBROUS CUSHION AND INDESTRUCTIBLE CLUTCH JAW HUB.

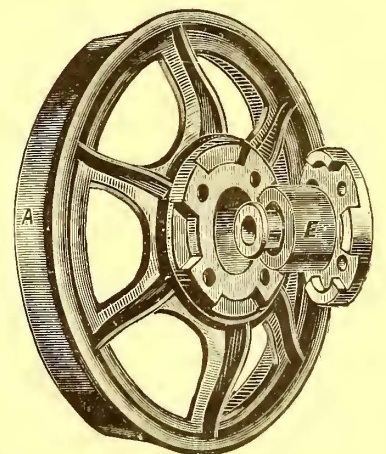
The only Cushioned St. Car Wheel.

The only Interchangeable

Street Car Wheel.

No Crystalization of Wheels or Axles.

Noise and Jolting of Cars Prevented.



No Special Machinery or Skilled Labor Required for Renewals.

All Parts Interchangeable and Warranted.

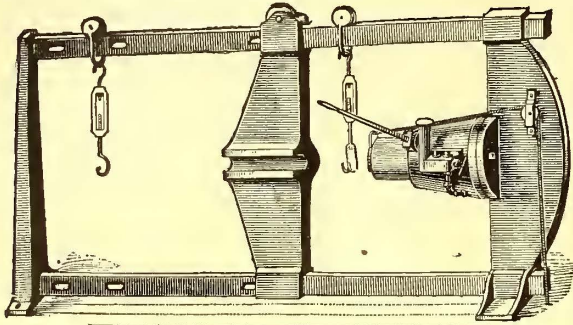
Price Lists, Descriptive Circulars and Blue Prints furnished upon application.

The Peckham Car Wheel Company,

SOLE MANUFACTURERS,

SYRACUSE, N. Y.

HAND POWER, LEVER AND HYDRAULIC PRESSES



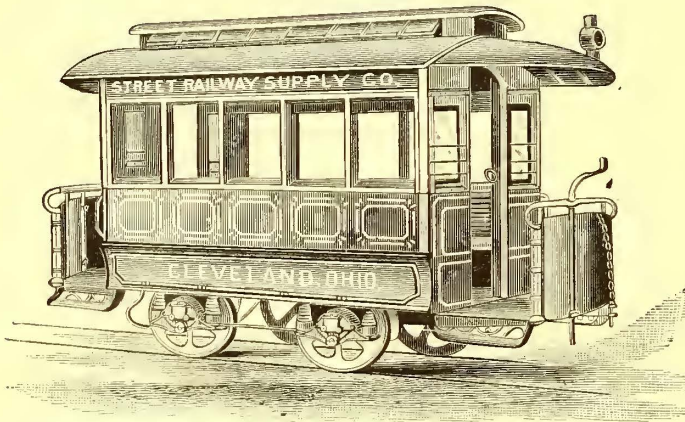
See page 197, July, 1885.

Screw and Hydraulic Jacks.
Watson & Stillman.
 204 to 210 East 43d Street. N. Y.

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.



STREET R'Y SUPPLY CO.

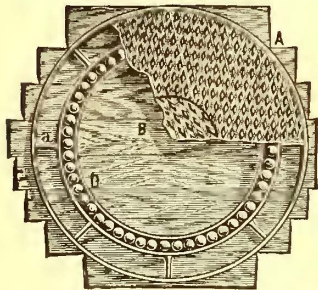
—SUCCESSOR TO—

HIGLEY CAR JOURNAL CO., CLEVELAND, O.,

MANUFACTURERS AND DEALERS IN

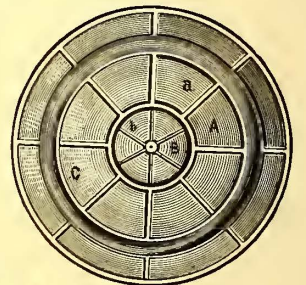
Street Railway Supplies
OF EVERY DESCRIPTION.

GEAR SUPPLIES A SPECIALTY.



S. M. CARPENTER, Prop.

C. J. LANGDON, Secy.



FULTON FOUNDRY,

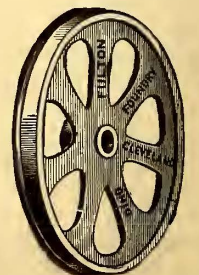
MANUFACTURERS OF

STREET RAILWAY SUPPLIES,
Carpenter's Patent Turn-tables and Transfer-tables,

Open Wheels of all sizes and weights. Wheels and Axles of all sizes fitted on short notice.

Chilled curve rail, Turnouts, Switches, etc., etc. Blue prints and Bills Furnished on Application.

Send for Illustrated Catalogue. Address,

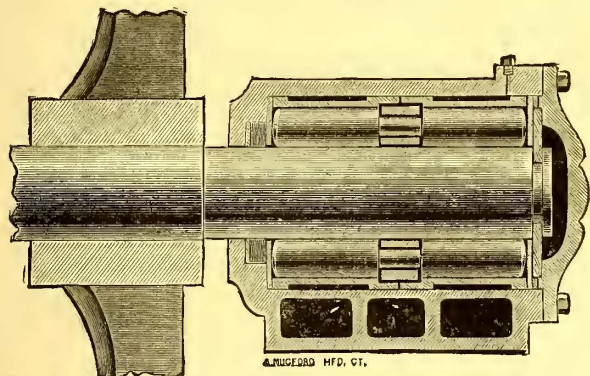


FULTON FOUNDRY,

202 MERWIN ST.

CLEVELAND, OHIO.

-The Chaplin Roller Bearing Tramway- CAR BOX AND GEAR.



LIGHT DRAFT EASY RIDING DURABLE
POSITIVELY DUST PROOF AND OIL TIGHT

Boxes Hold Sufficient Oil for One Year. No Waste Used
for Packing nor Babbitting for Boxes.
Overcomes Friction in Taking a Curve.

SUPERINTENDENT'S OFFICE, HIGHLAND STREET RAILWAY,
No. 827 SHAWMUT AVE., BOSTON, August 19, 1886.

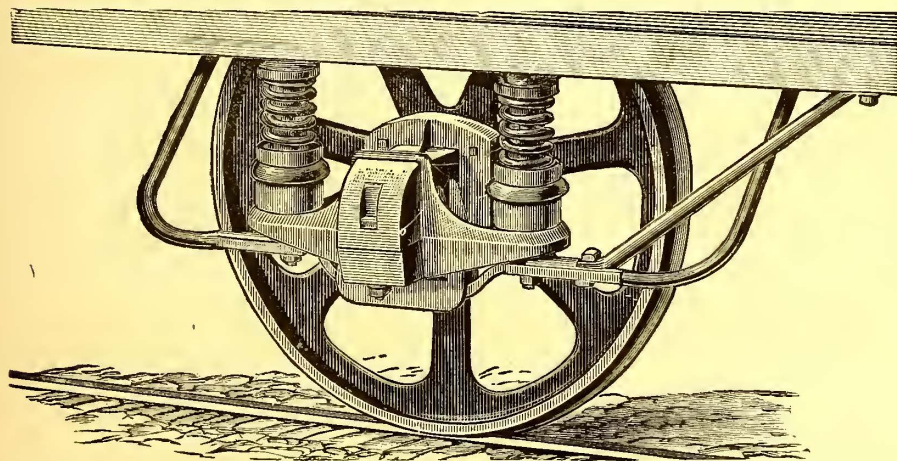
CHAPLIN M'FG CO., MESSRS.—In reply to your note I will say we have had a set of your
Gear under car, "Gov. Rice." for the past four years and it has proved very acceptable, so
much so that we have decided to put on 50 sets of your improved pattern. The wear on the
journal is imperceptible, and it is beyond question the easiest running gear in the market.

Respectfully, J. E. RUGG, Sup't.

SEND FOR CATALOGUE.

The Chaplin Mfg. Co., 69 Wall street, New York.

THE BEMIS CAR BOX COMPANY,



MANUFACTURERS OF

The Bemis Patent
Journal Box.

Light Draft, Easy Riding, Durable, Economical. Brasses are warranted for 10 years, and Journal for 20 years. Requires oiling or inspecting but once in 12 months. Boxes are positively dust proof.

We Refer to the

Boston Consolidated St. Ry. South Boston R. R. Cambridge, Mass., R.R. Lynn & Boston R. R. Union R. R., Providence, R. I. Globe St. Ry., Fall River, Mass. Citizens' St. Ry., Worcester. Brooklyn Cross Town R. R. Second Ave. R. R., New York. Forty-second St. & Grand St. Ferry Ry., New York. Rochester City & Brighton Ry. Buffalo St. R. R. Co. Citizens' Pass. Ry., Pittsburg. Pittsburg & Birmingham Pass. Ry., P'burg. Columbus Consolidated St. Ry. Detroit City Ry. Louisville City Ry. Denver City Ry. Milwaukee City Ry. Cream City Ry., Milwaukee. Minneapolis St. Ry. St. Paul City Ry. Galveston City Ry. North Baltimore Pass. Ry. Chicago Pass. Ry. Co. and others. SEND FOR CATALOGUE TO

THE BEMIS CAR BOX COMPANY.

SPRINGFIELD, MASS., or 18 & 20 Platt St., NEW YORK.



Parrott Varnish Co.,

FINE COACH AND CAR VARNISHES.

Bridgeport, Conn., U.S.A.

The "BROADWELL CAR STARTER," having been subjected to practical tests, is now placed on the market at a very low price.

C. B. BROADWELL,

169 Laurel Street, - New Orleans, La.

2 LIBERTY SQUARE

JOHN BABCOCK & CO

MANUFACTURERS OF

RAILWAY CAR VARNISHES

BOSTON MASS

CHICAGO WOOD FINISHING CO.

Manufacturers of Wood Fillers, Rough Stuff, Wood Stains & Polish for Car Interiors.

143 & 145 South Clinton St, Chicago, Ill.

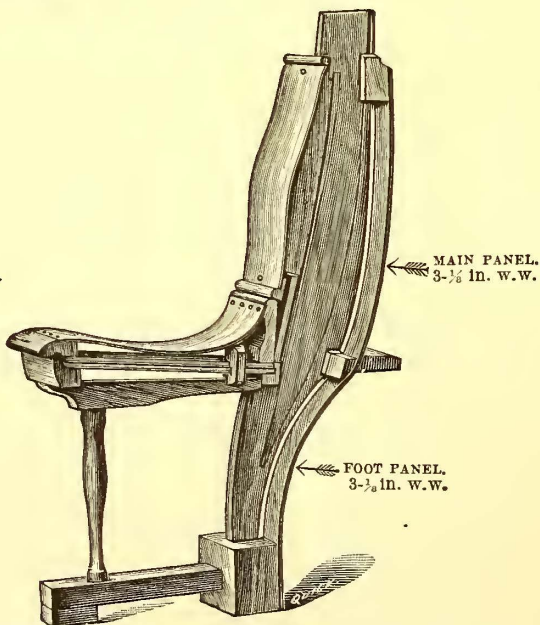
The RELIABLE SAND BOX. The Only Sand Box that will run Salt, Wet Sand or Gravel.

Over 400 now in use. Now is the time to fit up your cars for fall and winter. Orders received now it will take from four to six weeks to fill.

W. T. BUTLER, General Manager.

No. 19 Tremont Row, Boston.

STREET CAR SEATS & BACKS.



THREE-PLY CAR SIDES.

Having given our three ply white wood car sides a thorough trial for a number of years in our city street and railway lines, which test has left them as firm and good as the day they were put in, we unhesitatingly place these sides in the market as a superior article. They are composed of three white wood (or poplar) veneers, each $\frac{1}{8}$ inch thick, the grain of the center layer running at right angles with the two outside layers. Hence they derive all the special and well-known advantages of glued up wood over single ply, namely:

- 1st. They are fully 75 per cent stronger, for they brace and stiffen the car.
- 2nd. They are lighter, being only 3-8 inch thick, and so do not add so much dead weight to the car.
- 3rd. They will not check or split by change of atmosphere.
- 4th. They will not split or crack when nailing into place, even though the nail be placed near the edge.
- 5th. Being laid over a form to suit the shape of the car frame or post they cannot buckle or twist, a feature which also adds strength to the car.

For repairing cars these sides have no equal.

Our Three Ply Car Seats and Backs, so well known all over the world, are now the most popular seat and back in the market, and recommend themselves especially for their *Lightness, Cleanliness, Healthfulness and Beauty*, as also their *Cheapness and Durability*. For they are indestructible by moths (the great enemy of upholstering), and will not harbor vermin or insects, or carry or communicate contagion or disease. Our trade in this line has grown in thirteen years to vast proportions, which in itself is a sufficient guarantee of their merits. They are made either perforated or plain to suit customers. Birch is the wood most generally used. Today fully one-half the railroads in the country are using these seats and backs. We would also call attention to our *Veneer Ceiling* for cars. They are made either plain, perforated or decorated, and greatly add to the beauty of the car. For repairing cars they have no equal; for they are placed over the carlines and cover all the old paint and wood work. The woods generally used are *Birch, Birdseye Maple, Oak and Mahogany*.

GARDNER & CO.

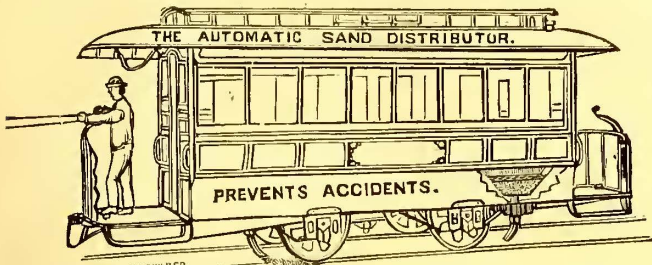
Manufacturers of Car Seats and Ceilings and Depot Seating,

OFFICE AND FACTORY: 643, 645, 647, 649, 651, 653, 655 and 657 West 48th St., New York.

Sample and Salesroom: 206 Canal St., cor. Mulberry.

Send for Catalogue.

Address all Communications to Office.



THE AUTOMATIC SAND DISTRIBUTOR,
For Horse, Cable, Electric and Steam Cars.
 Charges the Sand direct on top of rail, in front of wheel, in any quantity, whenever wanted. Acts instantaneously by foot pressure.
 Patented and manufactured by
The Jordan-Mills Manufacturing Co.,
 32 Nassau Street, New York.

Ayers' Anti Rattler,

FOR RAILROAD CAR WINDOWS.



The Best and Cheapest
 ANTI-RATTLER IN THE
 MARKET. ALSO,

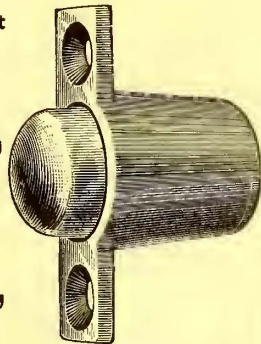
Ayers' Pat. Sash Holder,

FOR HOLDING CAR WINDOWS AT ANY
 HEIGHT.

Manufactured by the

AYERS' PAT. SASH HOLDER CO.,

Room 242, Broadway & Chambers St.
 STEWART BUILDING, NEW YORK.

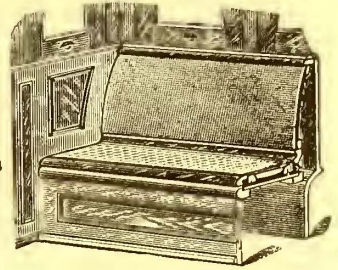


Send for Circulars.

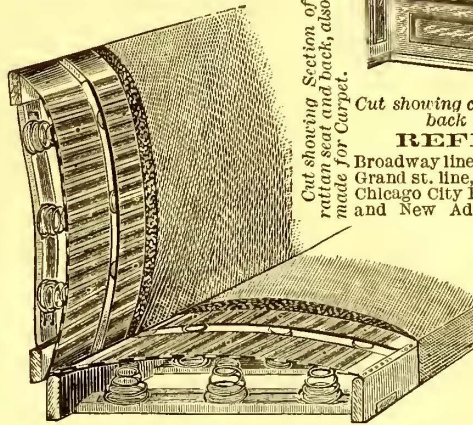
THE HALE & KILBURN MANFG. CO.,

Extensive makers of Patented
Street Car Seats
 of every description.

Our Patent Spring Seats covered with Rattan or Carpet are fast being adopted by the best railroads in the country. Seats for Steam Cars a Specialty. Owners and makers of all the Cobb patents



Cut showing car with rattan seat and back without springs.



Cut showing Section of rattan seat and back, also made for Carpet.

REFERENCES:

Broadway line (Pullman cars) New York
 Grand st. line, 3d and 4th ave lines, NY
 Chicago City RR. Chicago W. Div. line,
 and New Adams street line, Chicago;
 East Cleveland R. R. Co.
 and Woodland Ave. and
 West Side R. R. Co.
 Cleveland; Union Line,
 St. Louis; 2d & 3d St. R.
 R. Co., Frankford and
 Southwark R. R. Co.,
 Union Line, Chestnut &
 Walnut R. R., Ridge Ave
 R. R., or any other road
 in Phila.; and 100 others
 elsewhere.

Many R. R. Co's use our Rattan Pat. Canvas Lined Seats for Summer and cover the same with carpet for Winter. This method of seating we recommend as durable and economical, for the reason both a Summer and Winter seat is obtained in one.

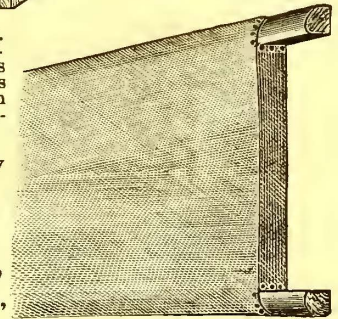
Estimates & Particulars cheerfully given (mention this paper), satisfaction guaranteed.

A TRIAL SOLICITED.

OFFICES: 48 & 50 NO. SIXTH ST.,

FACTORIES: 615 to 621 Filbert St.,

PHILADELPHIA, PA. Cut of section of cross for summer car.



STREET CAR SEATS & BACKS.

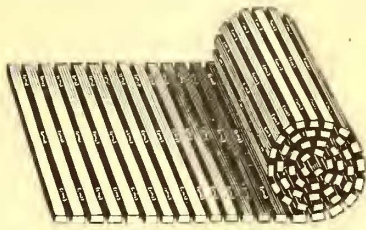


THREE-PLY CAR SIDES.

These seats and backs have been in use a number of years and have given universal satisfaction. They have received such a thorough test and are so well known that they show their good qualities and we need say nothing for them. Our facilities for doing this work are the largest in the world. We own the forest from which our lumber is cut. We cut our own veneer and do our own work in all its departments. We keep laid up in stock, seats and backs and can fill all orders promptly. Our 3-ply white wood car sides, ends and roof add fully 75 per cent to the strength of cars. We can also furnish car ceilings made of any kind of wood desired, plain or decorated. Send for Railroad Catalogue.

Frost & Peterson, 161 & 163 West 18th St., N.Y.

W. P. SEGUINE, Manager Railroad Department.
 PURDY & HUNTINGTON CO., Limited, Agents, 59 Shoe Lane, London, E.C.



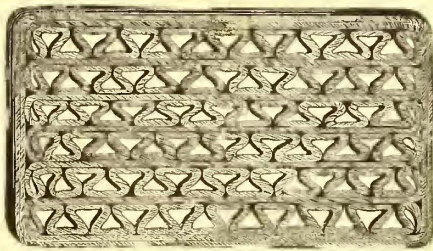
WARNECK & TOFFLER,
211 East 22d St., New York,
Sole Manufacturers and Patentees
of the only
"ROLLING WOOD MAT"
in the market. This matting, either
in round, square or flat slats, is the
most convenient one for horse cars, as
it is a self cleaner and can easily be
repaired.
Price, a running foot, 3 feet wide,
only 70c. Orders respectfully solicited.

LYNN & PETTIT,

MANUFACTURERS OF

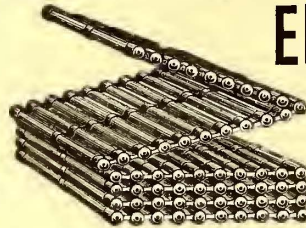
Machine Braided Cocoa Car Mats.

707 Market Street, Philadelphia.



A Sample
Order
Solicited.

EDWARD C. WHITE,
Brass & Bronze Works,
531 West 33rd St., New York.
Superior Quality Journal Bearings; Car, Loco-
motive and Machine Castings; Rail-
way Hardware & Supplies.



EDWARD BEADLE,

Sole Manufacturer

OF THE

Eureka Folding Mat.

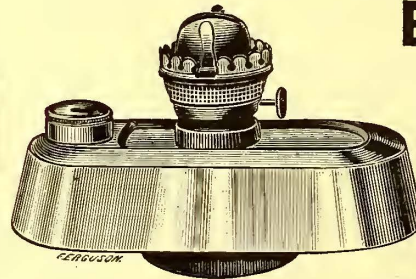
The Most Durable, Easiest Cleaned and Repaired Wood Mat
ever made.

I would respectfully call the attention of Managers of Street Railways to
my latest Improved Reversible Folding Mat, made to fit any size car. Sample
order solicited.

1193 Broadway, New York.

FACTORY—CRANFORD, N. J.

**Clute's Patent Double
Bottomed
Street Car
LAMP,**



Is one that assures safety,
durability, and is perfect
in regard to leakage.

GEORGE M. CLUTE, Sole Manufacturer;

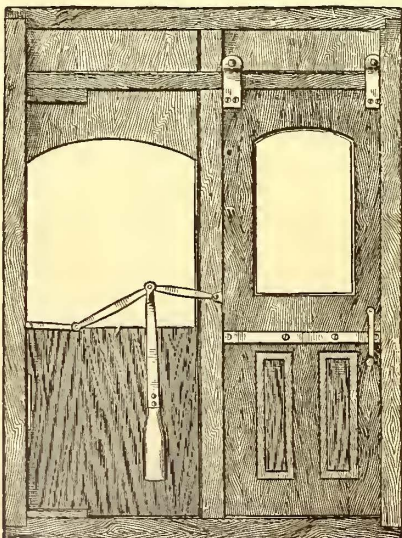
Also Dealer in Car Reflectors, Chimneys, Burners, Etc.

WEST TROY, N. Y.



**EVERIT'S
Patent Car Floor Rack.**
Cheap, durable, cleanly, firm,
labor saving, easily swept or
washed without removal.
Put down by any mechanic.
W. L. EVERIT,
New Haven, Conn.

THE STREET RAILWAY JOURNAL, ONLY \$2.00 PER YEAR.



Door closed, fastener in position, weight suspended from the toggle joint, holding it closed.

**THE HAYCOX
PATENT DOOR FASTENER.**

ADOPTED BY

All Cleveland Railway Companies.

Patented May 5, 1885.

Fastener detached, made of malleable iron,
weight about five pounds.

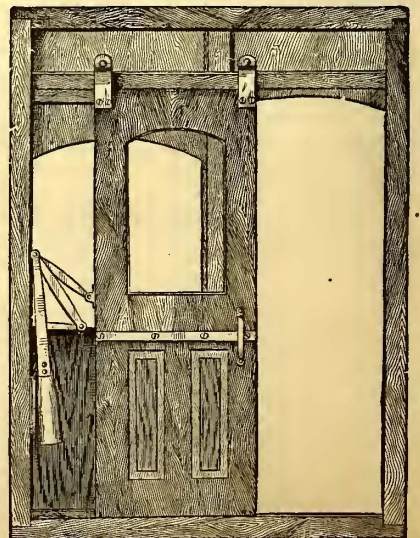
Especially adapted for Elevator Doors.

For further particulars, prices, circulars,
etc., address

Haycox Door Fastener Company,

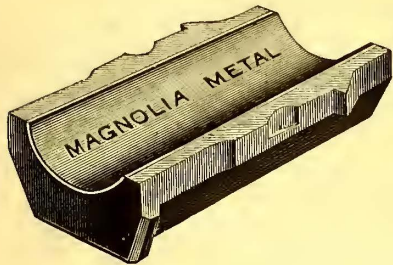
W. E. HAYCOX, Manager.

1,158 Euclid Avenue, Cleveland, O.



Door open, Fastener thrown back.

Magnolia Anti-Friction Metal.



TESTIMONIAL.

L. PFINGST, MASTER CAR BUILDER, THIRD AVENUE SURFACE ROAD, (NEW YORK, Jan. 21, 1887.)

CHARLES B. MILLER, Proprietor of Magnolia Anti Friction Metal, New York City.

SIR—I have taken out the metal given me by you, placed it under Car No. 85 on our road. I find yours as sound as when put in, and the others entirely gone. This is the invention of Samuel Singley. You can call and see the journal bearings if you so desire.

I am, yours truly, L. PFINGST,
Formerly with Pullman Car Works.

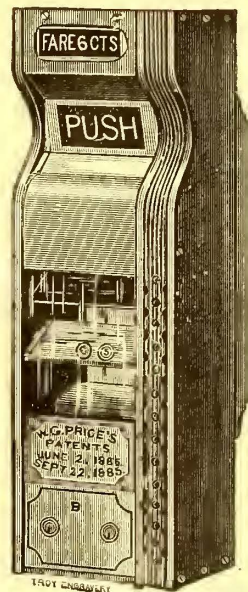
New York Depository, E. S. GREELEY & CO.,
F. JORDAN, 200 Broadway, State Agent, outside city.

CHARLES B. MILLER, Manufacturer,
541 West 32d Street, New York.

Horace A. Keefer & Co., KANSAS CITY, MO. St., Cable & Motor Road Track, Material & Equipment a Specialty.



PRICE'S IMPROVED FARE BOX.
THE BEST FARE COLLECTOR
NOW IN THE MARKET.



The ringing of a gong for each fare, checks the passenger as well as driver, and hence conductors' bell punch is unnecessary.

SEND FOR PRICES AND CIRCULARS BEFORE BUYING.

WESTERN AGENTS FOR
Hamilton-Corliss Engine. Bemis Car Box Co.
The A. French Spring Co., Ltd. Fulton Foundry Co.
Rails, Splices, Spikes, Bolts & Nuts of all Kinds.

CAR HEATING

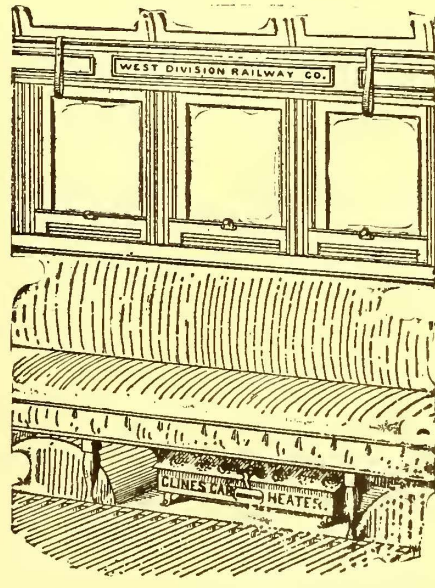
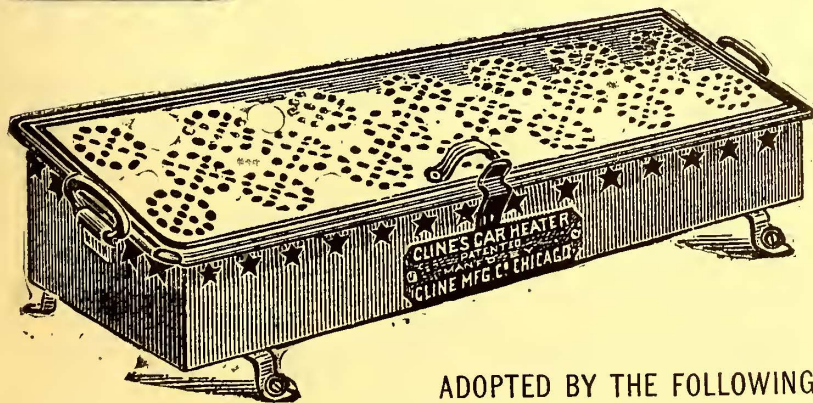
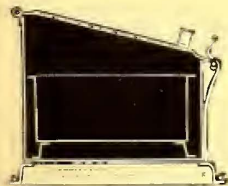
BY CLINE'S PATENT

Aromatic Carbonic Compound Fuel.

Cheap. Convenient. Safe.

Once Filling lasts 18 hours.

NO CUTTING OF CAR TO PUT IN.



ADOPTED BY THE FOLLOWING ROADS:

CHICAGO WEST DIVISION; CITY OMNIBUS CO., Chicago; SOUTH CHICAGO CITY RAILWAY CO.; PEOPLE'S PASSENGER, Philadelphia; PITTSBURG & BIRMINGHAM AND OTHERS.

CLINE MANUFG. CO., 277 and 279 South Canal Street, CHICAGO, ILL.
SOLE AGENCY FOR MISSOURI & KANSAS, 219 & 221 MARKET ST., ST. LOUIS, MO.

"PAY HERE."

Fare Boxes and Change Receptacles FOR STREET CARS.

OUR NEW FARE BOX NO. 3.

Is pronounced by the many Street Car Companies using it to be the best.

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

Simplicity of Construction, Quickness and Convenience of Cleaning, Security of Money Drawer, Beauty of Finish and Much Cheaper in Price.



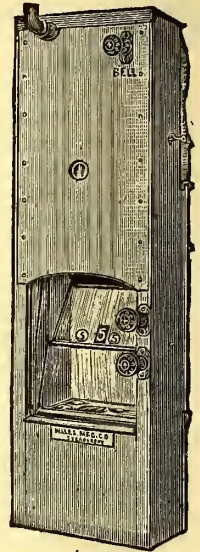
CHANGE RECEPTACLE.

Descriptive and Illustrated Circular on application.

Examine the merits of this box and get our prices before buying.



Box No. 3. Front or Passengers' View.



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

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

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

TOM L. JOHNSON'S IMPROVED FARE BOX.

NOW IN GENERAL USE IN CITIES THROUGHOUT THE U. S.

Patented Oct. 14, 1873.

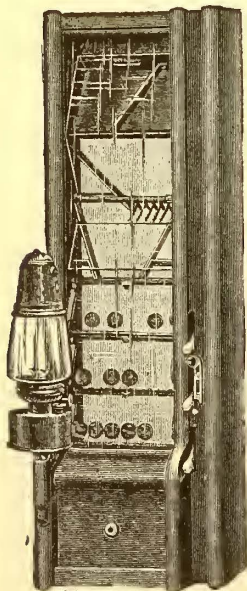
Fares Cannot be Extracted or boxes Robbed without violence.

Roads Equipped with Boxes on Trial, and if not satisfactory, returned without any expense to the company trying them.

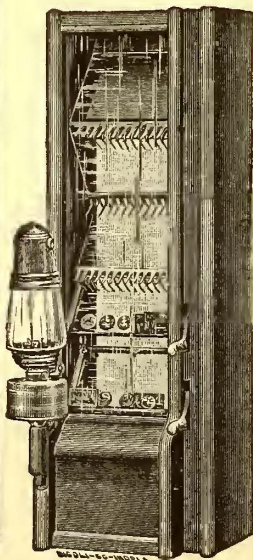
Ornamental to any Car.

Special Sizes built to order.

NOTICE.—All parties are cautioned against using fare boxes recently placed on the market which are direct infringements on our patents.



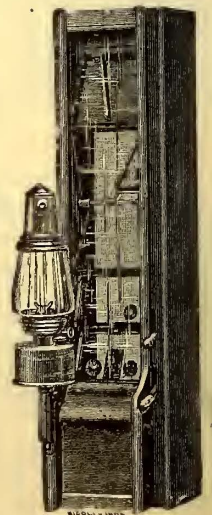
BOX NO. 1.



BOX NO. 2.



BOX NO. 3.



CHARIOT PATTERN.

REDUCED PRICES.

Write for Descriptive Circular and Price List. Address all correspondence to
A. A. ANDERSON, INDIANAPOLIS, IND.



THE BEAMAN FARE BOX.

MANUFACTURED UNDER TWO PATENTS OF FEB. 15th, 1887.

Absolutely Secure, Whether Fastened to the Car, or Not.

No Fares can Possibly be Turned Out or Abstracted by any Known Means.

EVERY CONVENIENCE PROVIDED FOR THE INSPECTION OF FARES.

Easily Cleaned, Simple and Durable in Construction.

The Smallest Detail has been Carefully Designed.

Its many New and Important Features, it is Conceded, place It Beyond Competitors.

For Full Particulars, Address,

T. L. BEAMAN, Knoxville, Tenn.

SLAWSON'S PATENT FARE BOXES

These Boxes are of the latest and most approved pattern, and contain a front door, by opening which all of the glass inside can be conveniently cleaned. This is a late patent, and is a very valuable improvement over the old method of taking the boxes apart for that purpose. They are well made and not liable to get out of order, cannot possibly be picked, and even if all the glass is broken no fare can be extracted from the drawer. The late J. B. Slawson originated the "FARE BOX SYS-

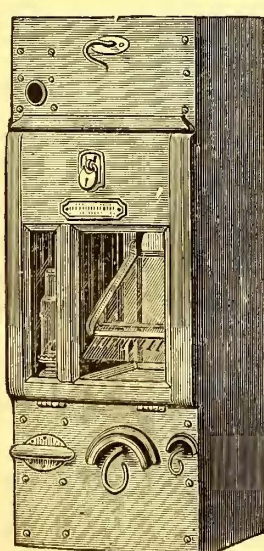


TEM," and all of his Boxes, Change Gates and Drivers' Change Box are protected by several patents, and parties using them are not liable to claims for infringements, as may be the case with some boxes which are now being offered for sale.

These Boxes, etc., are now in use not only in the United States and Canada, but in Mexico, South America, Europe, Asia, Africa and Australia—in fact, nearly all places where street cars are used.

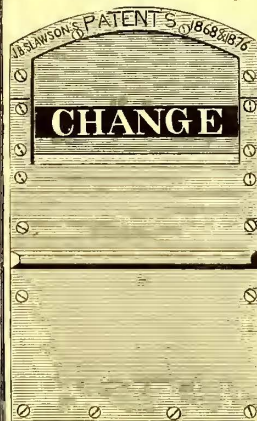


C. Front View.



C. Back View.

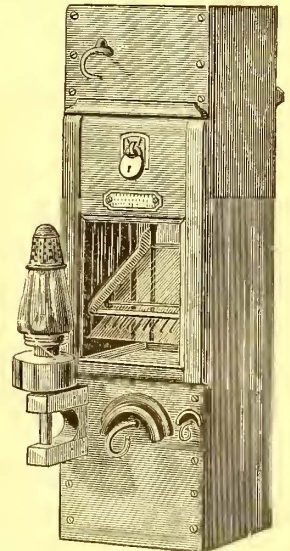
Change Slide. Outside View.



Change Gate. Outside View.



D Front View.

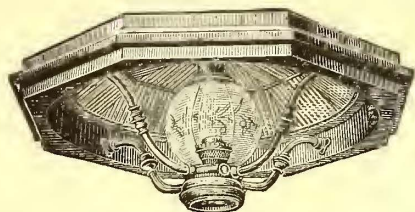


D Rear View.

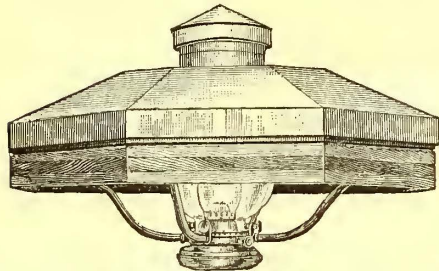
The prices have been greatly reduced, and are made to fit the times. Orders will be promptly filled by addressing,

MILTON I. MASSON, Agent, 365 AVENUE A, NEW YORK.

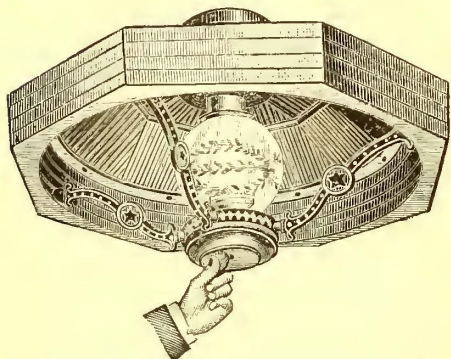
JOSEPHINE D. SMITH, Successor to the late WILLARD H. SMITH, 350 & 352 Pearl Street, New York.



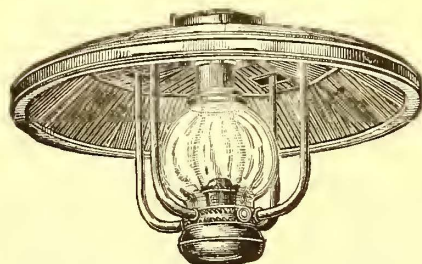
No. 3. Bombay Center Car Lamp, fancy arms, 25 in. corrugated glass reflector, with cover. Finished in brass or bronze.



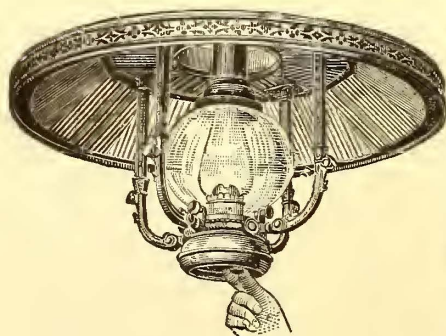
No. 1. Bombay Center Car Lamp, plain arms, 25 in. corrugated glass reflector, with cover. Finished in brass or bronze.



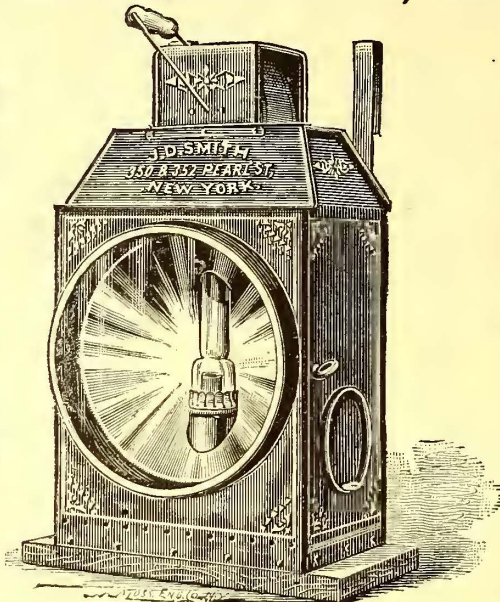
No. 4. Bombay Center Car Lamp, fancy arms, 25 in. corrugated glass reflector, with cover. Finished in brass or bronze.



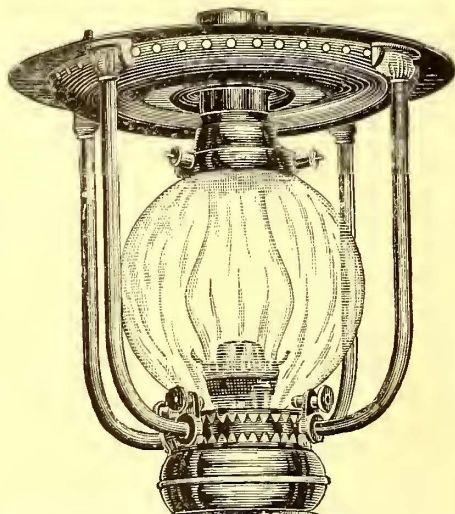
No. 1. Center Car Lamp, with 25 in. corrugated glass reflector; in general use on horse railways throughout United States and Canada.



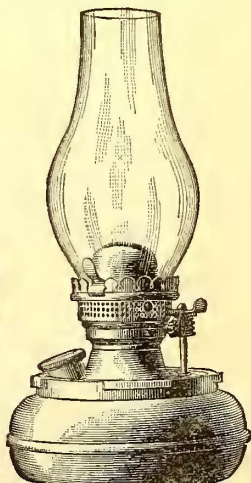
No. 3. Center Car Lamp, with 25 in. corrugated glass reflector.



No. 10. Head Light. As used on Tenth Avenue, New York, Cable Road. Throws a powerful light 100 feet. The best in the market for Cable Roads.



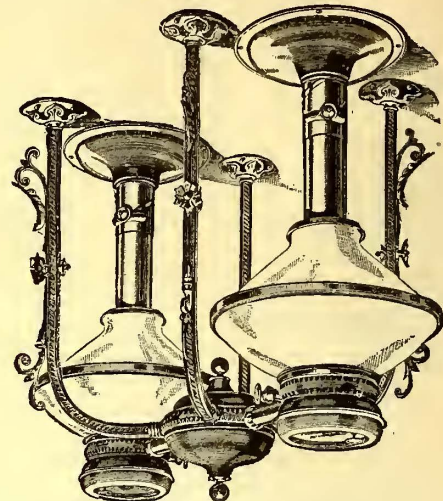
No. 2. Center Car Lamp, 14 in. Nickel Reflector. In general use throughout the United States and Canada.



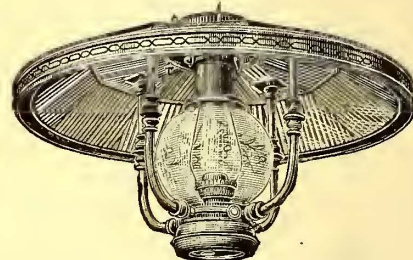
Center Car Lamp Oil Fount with J. B. M. Burner and patent wick raising attachment. This fount interchanges with all of my Center Car Lamps.



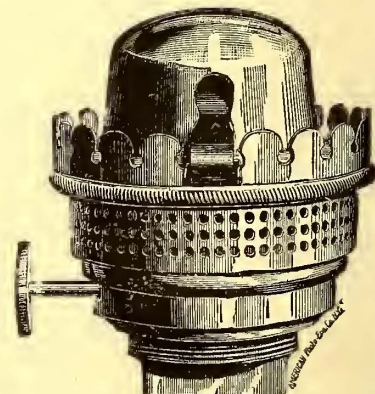
No. 3. Brass Box Lamp, with drip pan and J. B. M. Burner.



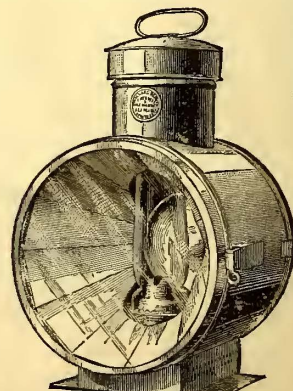
No. 10.—Two-light Car Lamp as used on Tenth Avenue (N. Y.) Cable Road.



No. 14. Center Car Lamp, with 25 in. corrugated glass reflector.



J. B. M. Two spring Burner. This is the best double-spring burner made. Universally used for Street Car Center and Box Lamps.



No. 20. Small Head-light, 16 in. high over all. 10 in. face.

Manufacturer of Smith Patent Center Car Lamps & Reflectors.

For Street Cars, Cable, Elevated & Steam Passenger Coaches. Also all kinds Trimmings pertaining to Car Lamps, Burners, Chimneys, Globes, Wicks, Corrugated Reflector Glass, etc., etc.

RICHARD VOSE,

13 Barclay Street, . New York,

PATENTEE AND MANUFACTURER OF

Graduated Street Car Springs.

RUBBER CONE.

Patented, April 15th, 1879.

ADAPTED TO THE

STEPHENSON,

BEMIS,

RANDALL,

HIGLEY,

BRILL,

JONES,

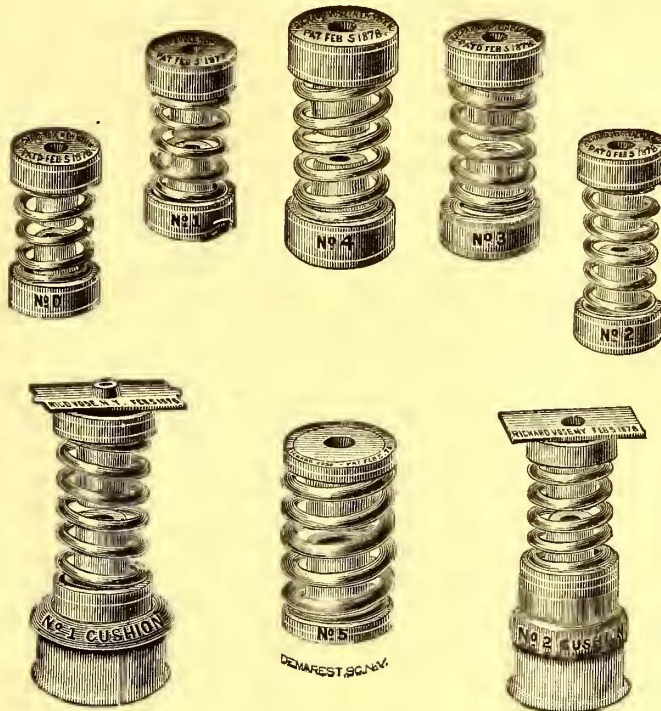
BALTIMORE,

VOLK,

CHAPLIN,

LACLEDE

And all other Boxes.



No. 0, for 10-ft. Light Cars.

No. 1, for 10-ft. Cars.

No. 2, for 12-ft. Cars.

No. 3, for 14-ft. Cars.

No. 4, for 16-ft. Cars.

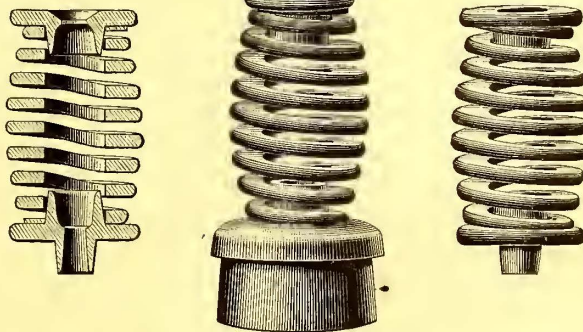
No. 5, for 16-ft. Cars.
(Single Pedestal.)

No. 1, Cushion, for 16-ft.
Cars.

No. 2, Cushion, for 12 and
14-ft. Cars.

Vose Graduated Taper Bar, Street Car Spring,
PATENTED JAN. 5, 1886.

Adapted to all
Pedestal AND Post
Gears.



Motion Soft and
Slow.

It has no Rapid
Vibrations.

This Spring is weakest on the ends, and strongest in the center. The bar is coiled on a mandril of equal diameter throughout. Thus where the greatest strength is needed the greatest amount of metal is found. The load first compresses the ends of the coils, and as the load is increased the center of the spring is brought into requisition.

**THE
ST. LOUIS CAR CO.,**

St. Louis, Mo.,
BUILDERS OF

Street Cars

OF EVERY DESCRIPTION.

Works among the most complete in this country.

KUHLMANN CAR CO.

CLEVELAND, O.

BUILDERS OF

Street Railway Cars,

—AND MANUFACTURERS OF—

ALL NECESSARY WOOD WORK for CONSTRUCTING SAME.

OFFICE—490 ST. CLAIR ST.

WORKS—488 & 590 ST. CLAIR STREET AND
221 & 223 OREGON STREET.

ROBERTS' PATENT WOVEN-WIRE

Car Seats and Backs.

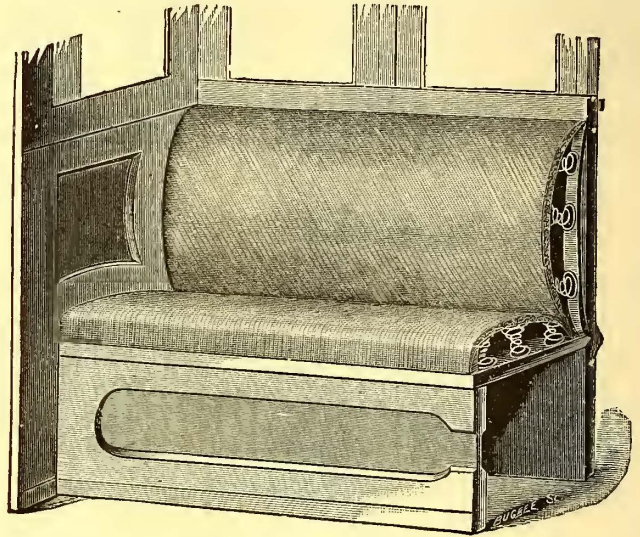
Especially adapted to Street Car use.

Cleanly, Durable, Economical, Cool, Comfortable.

Cannot be Cut, Injured or Defaced.

Being entirely of Metal will last indefinitely.

Can be covered in Rattan, Carpet, Leather or other material, with less labor in covering and less expense in material than any seat in the market.



Send for Catalogue with illustrations. Prices and estimates cheerfully given on application to

THE HARTFORD WOVEN-WIRE MATTRESS CO.,
P. O. BOX 363, HARTFORD, CONN.

Established,
1831.

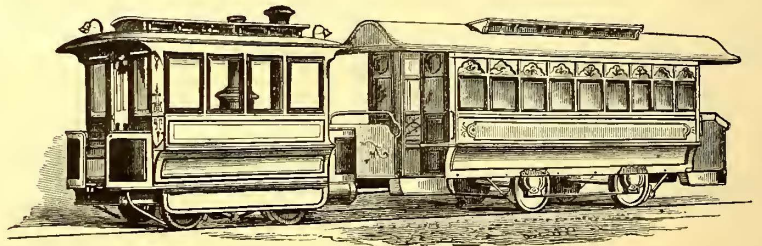
BALDWIN LOCOMOTIVE WORKS.

Annual Capacity,
600.

BURNHAM, PARRY, WILLIAMS & CO., Props.,
PHILADELPHIA, PA.

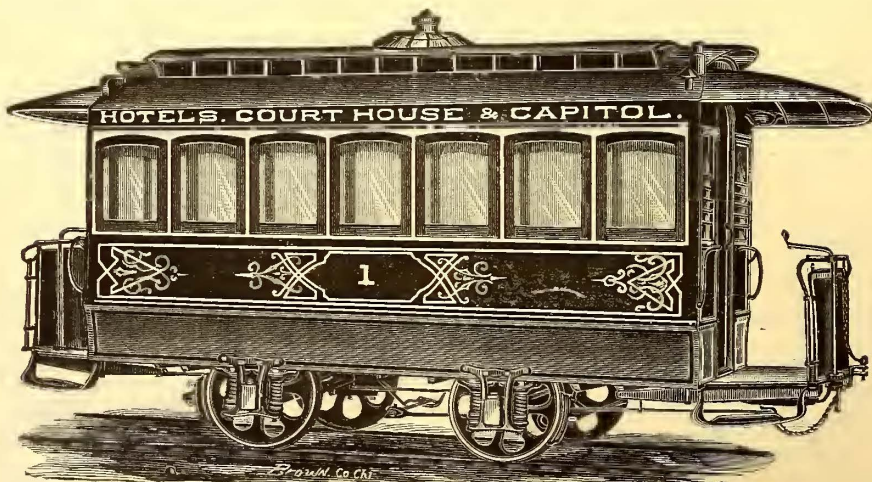
LOCOMOTIVE ENGINES,

Adapted to every variety of service, and built accurately to standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.



Noiseless Motors and Steam Cars for City and Suburban Railways.

Catalogue sent upon application of customers.



ROBINSON & HITT,

WATERLOO, IOWA,

Manufacturers of all kinds of

Street Cars

AND

OMNIBUSES.

Also Contractors for

Building and Furnishing Street Railways,

Pullman's Palace Car Co.,

Manufacturers
of

Make a Specialty of

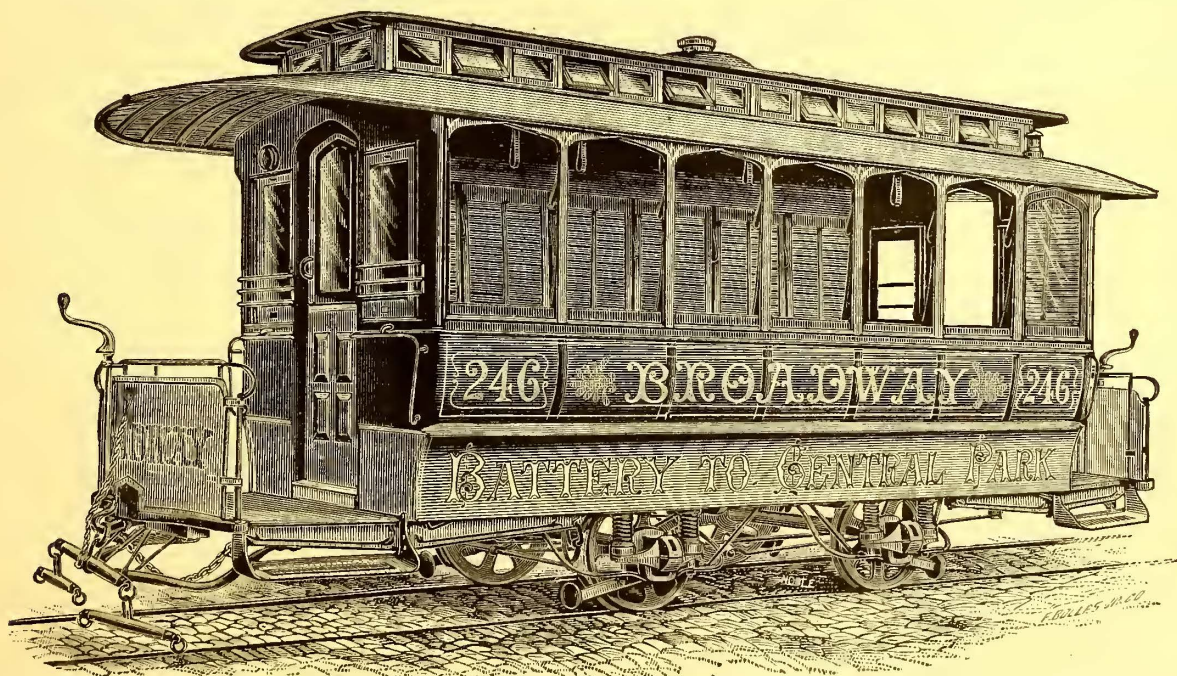
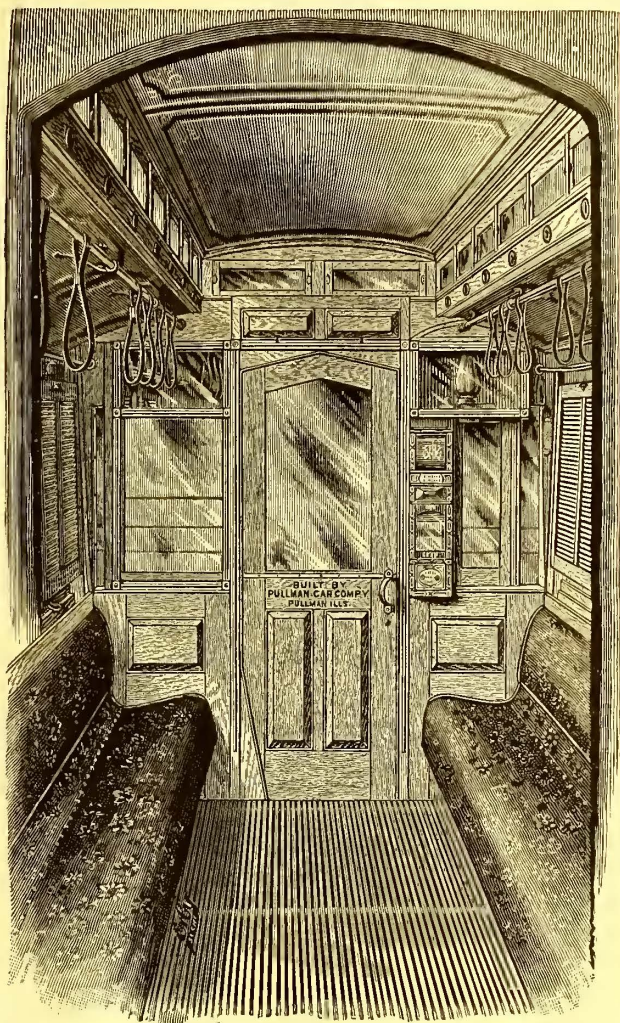
RAIL-
ROAD
CARS.

Street, Cable Grip
& Electric Motor

CARS.

Pullman, Illinois.

Detroit, Michigan.



Address all correspondence

PULLMAN'S PALACE CAR CO., Chicago, Ill.

ESTABLISHED 1857.

INCORPORATED 1875.

Brownell and Wight Car Company,
St. Louis, Mo.

BUILDERS OF

STREET CARS

OF EVERY STYLE AND SIZE FOR

Horse, Cable or Other Motive Power.

EXCLUSIVE MANUFACTURERS OF

BROWNELL'S PATENT COMBINATION CARS

FOR SUMMER AND WINTER SERVICE.

J. M. JONES' SONS,

AGENTS,

Street Railway Car Builders,

West Troy, New York.

*ESTABLISHED, 1856.**INCORPORATED, 1883.*

THE FEIGEL CAR COMPANY.

BUILDERS OF

CARS FOR STREET RAILWAYS.

TESTIMONIAL.

PATERSON, N. J., June 13, 1887.

MESSRS. FEIGEL CAR COMPANY.

GENTLEMEN: We have received your two Open Cars, which are now doing daily service on our lines in this city. It is but just to say to you that we have had these cars examined and we find nothing about them that does not meet our approval. In appearance they are such as to commend them to people who ride, and in workmanship they are entirely satisfactory in every detail.

You have our order for two exactly like them, which we ask you to hasten, and if they give us equally good satisfaction, we shall feel warranted in giving you our orders in the future.

Our intercourse with you gives us such satisfaction that we cheerfully testify to your promptness in filling our orders and supplying us with a class of car which is a credit to your Company, and at the same time a delight to our patrons.

Yours, very truly,

H. ROMAINE, Manager,
PATERSON CITY RAILWAY, CO.

HUTTON & SWAN, Managers,

FACTORY: New Utrecht, N. Y.

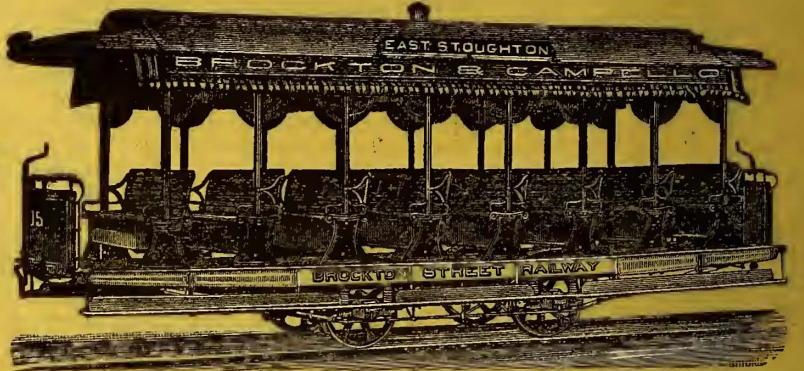
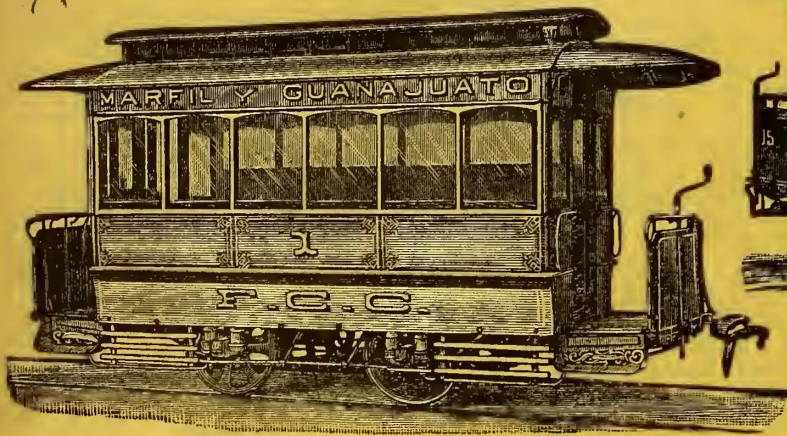
OFFICE: 108 Wall St., New York.

J. G. BRILL COMPANY,

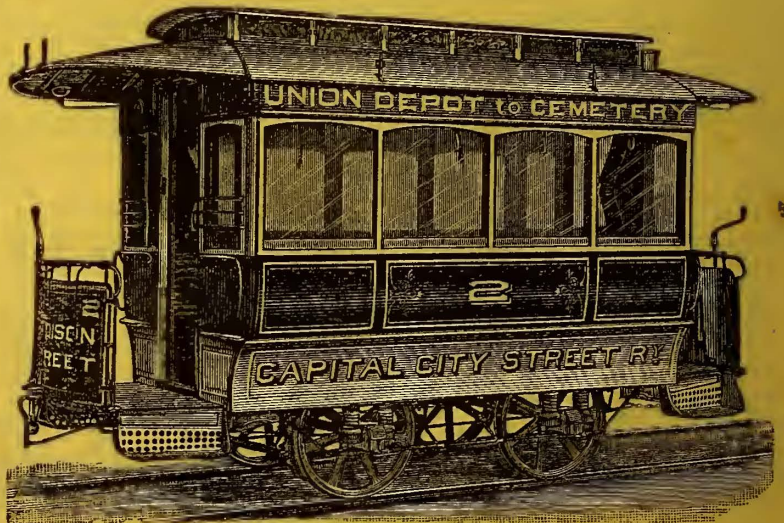
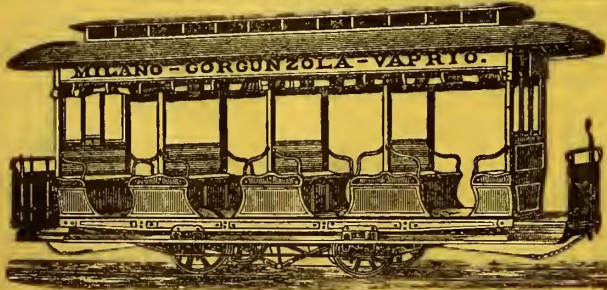
PHILADELPHIA,

BUILDERS OF

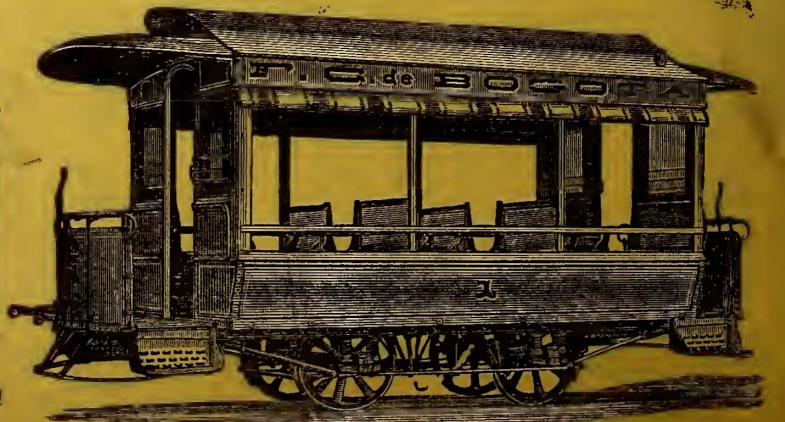
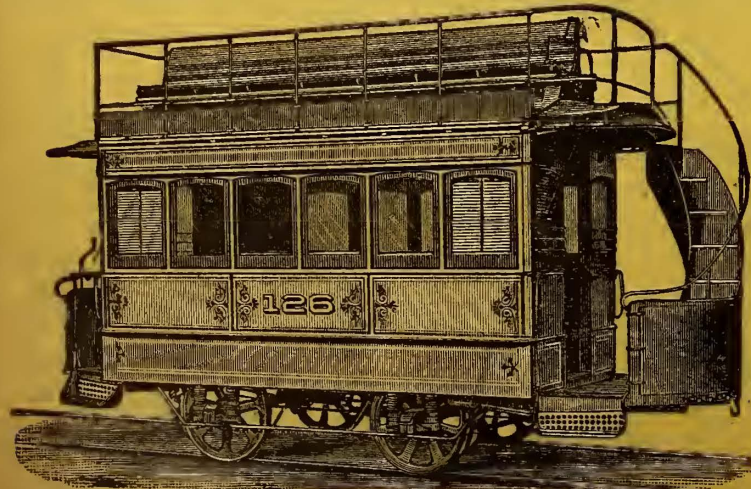
Railway and Tramway Cars



Gold Medal at Chicago Exhibition
OF
1883.



Gold Medal at New Orleans Exhibition of 1885, for Best Open Cars.

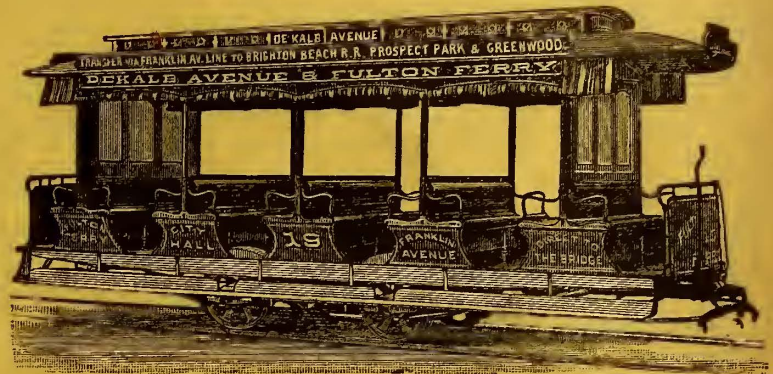


J. G. BRILL COMPANY,

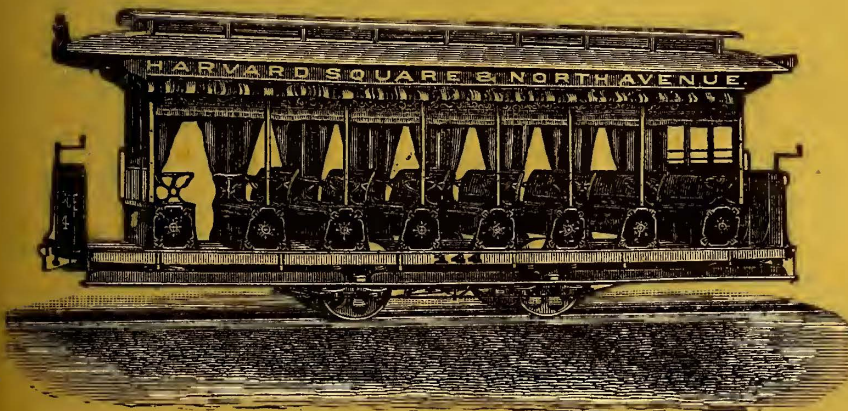
PHILADELPHIA,

BUILDERS OF

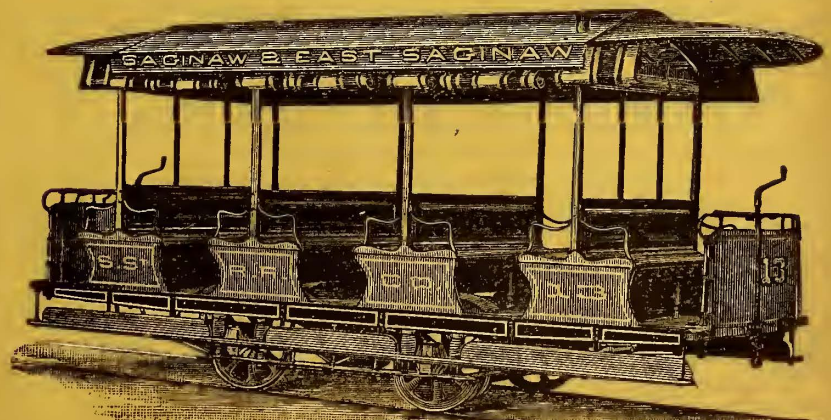
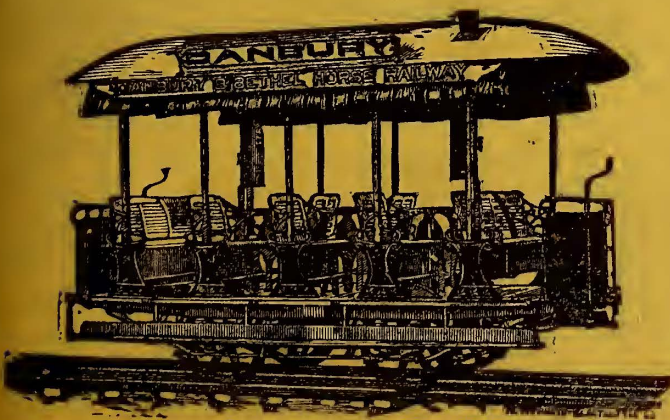
RAILWAY & TRAMWAY CARS



Passenger Cars of all Kinds.



Light Cars for Suburban Roads.



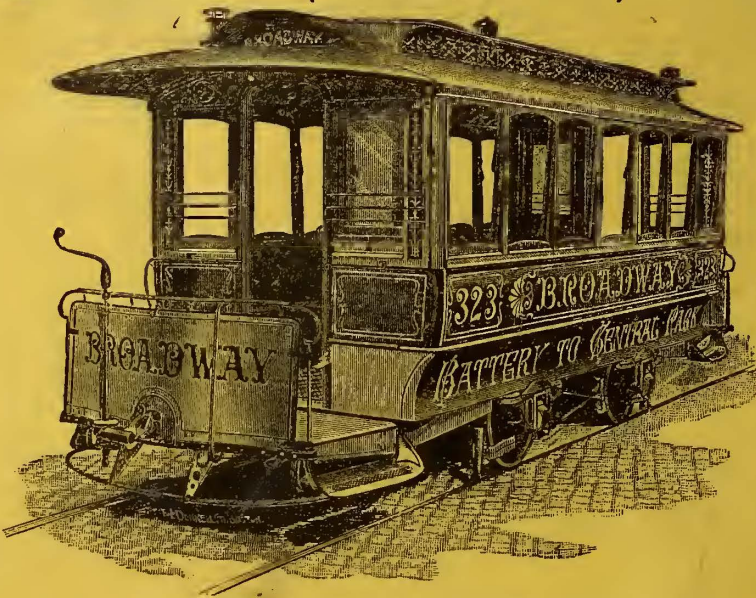
Construction Cars, Cane Cars, Power Hand Cars, Small Merchandise Cars.

ESTABLISHED 1831.

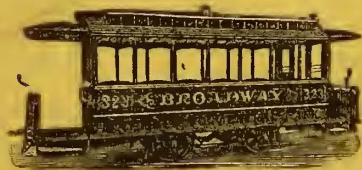
JOHN STEPHENSON COMPANY, (LIMITED), NEW YORK.

STREET (TRAMWAY) CARS

IN
Great Variety,
AND
Combining
ALL
Valuable
Improvements.



LEADING
"THE TIMES"
AND OF
—BEST—
Standards.



—SUPERIOR—
Elegance, Lightness, Durability,
THE RESULT OF
FIFTY-SIX YEARS EXPERIENCE.



ADAPTED
—TO ALL—
COUNTRIES
—AND—
CLIMATES.

PARTICULAR
ATTENTION
—TO—
SHIPMENTS.



Cable Cars.
—
Electric
Motor
Cars.
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STREET CAR
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OF EVERY
DESCRIPTION.



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