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THE STREET RAILWAY JOURNAL

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{ 32 Liberty Street. }

JANUARY, 1885

{ CHICAGO: } No. 3.
{ 8 Lakeside Building. }

Small's Automatic Fare-Collector.

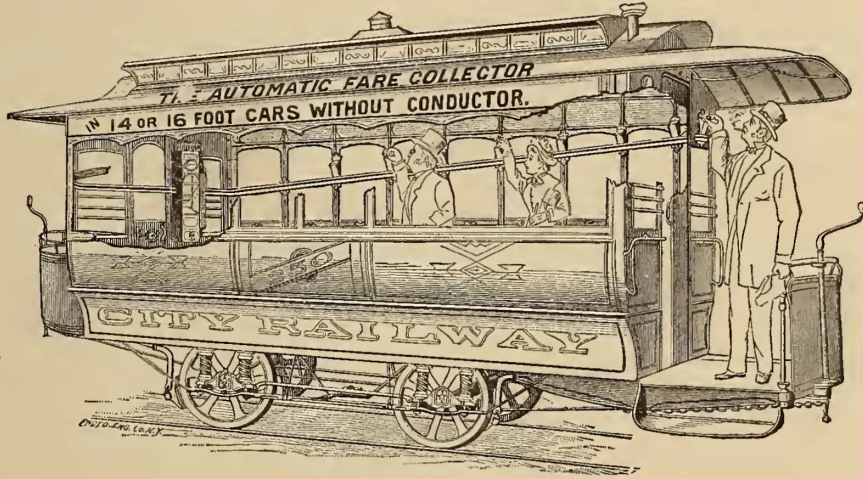
This device,* intended for fare box cars, consists of a flat brass channel about an inch wide and one-quarter inch thick, placed on its edge, and running from the rear to the front end of the car at a slight inclination, and terminating in the money box. The tube is so constructed that the money or disk-shaped checks dropped into it are kept in sight, roll readily, and cannot be extracted until they are taken out of the locked box. Whatever is placed in it is visible to all who may be in the car. The ways, or "collectors," pass from the rear platform along each side of and around the corners of the car into the money box. The money passes into the collectors through boxes placed on each stanchion of the car, so that the passenger is enabled to pay the fare without leaving the place where he may be sitting or standing. In New York, Baltimore, Minneapolis, Louisville and other places where this system is in operation, we learn that the regular patrons of the cars make it a point to come

usually much cheaper than paper tickets. By the use of such "Automatic Collectors" cars sixteen feet in length can be operated by one man at least as easily as those of ten feet under the old money box system. Several open cars equipped with this invention have been running for the last three summers, on the One Hundred and Twenty-fifth Street branch of the

avoidance of sudden changes in temperature therein.

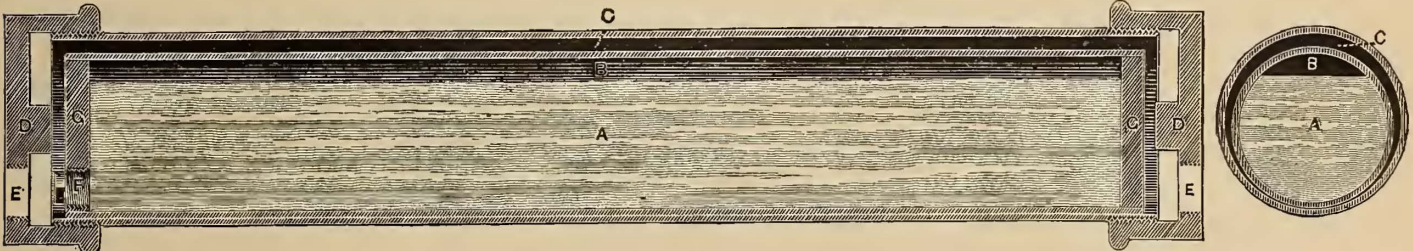
It consists of two wrought iron cylinders, one placed within the other. The inner one is four inches in diameter, filled four-fifths full of water strongly impregnated with salt to prevent freezing when the heater is not in use, it is closed at both ends and hermetically sealed. The outer cylinder is four and one-half inches in diameter, and the ends are closed with cast iron caps; each cap tapped to receive a one inch pipe, one for steam supply and the other to allow the water condensed to escape.

When steam is applied to the outer cylinder, the inner one absorbs and stores all the heat in the steam that is not radiated through the outer cylinder, and gradually gives it out for hours after the steam is shut off.



Third Avenue Line, New York. They were managed entirely by the driver, and frequently carried over fifty passengers at a time, the fares being paid and collected without the least inconvenience or trouble. On account of the difficulty of getting to the

The economy of such heaters is apparent in their capacity to store heat where there is waste steam from any cause, and on railroads when running on down grades, stopping at stations, etc., or when there is an extra pressure in the boiler.



provided with the exact fare, to save themselves the trouble and annoyance of going to the front end of the car to deposit the fare, or of asking others to do so for them, thus relieving the driver to a great extent from the troublesome and dangerous duty of making change. Hard rubber or celluloid checks are substituted for paper where tickets are used. They claim it to be more secure from counterfeiting, and event-

fare box it would hardly be possible to work these cars without a conductor, were it not for the "automatic fare collector." This system makes the open car entirely practicable without the aid of a conductor.

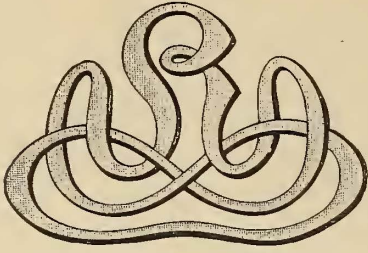
* Lewis & Fowler Mfg. Co., 8 Columbia Heights, Brooklyn, N.Y.

Gold's Heat Storing Apparatus.

This device * has for its principal objects the prevention of fire in cars, and the

For heating horse cars, a small stationary boiler at one end of the trip (when it does not exceed two and one-half hours duration) is all that is required; the cylinders are placed under the seats, thus saving the space occupied by a stove, and diffusing the heat more equally through the car.

* E. E. Gold & Co., 14 Vandewater St., N. Y.



American Street Railway Association.

OFFICERS, 1884-5.

President.—Calvin A. Richards, President Metropolitan Railroad Co., Boston, Mass.

First Vice-president.—Julius S. Walsh, President Citizens' Railway Co., St. Louis, Mo.

Second Vice-president.—Henry M. Watson, President the Buffalo Street Railway Co., Buffalo, N. Y.

Third Vice-president.—Edward Lusher, Secretary and Treasurer the Montreal City Passenger Railway Co., Montreal, Canada.

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

Executive Committee.—President, Vice-presidents and William H. Hazzard, President Brooklyn City Railroad Co., Brooklyn, N. Y.; James K. Lake, Superintendent Chicago West-Division Railway, Chicago, Ill.; Charles J. Harrah, President the People's Passenger Railway Co., Philadelphia, Pa.; William White, President Dry Dock, East B & B. R. R. Co., New York, N. Y.; B. Du Pont, President Central Passenger Railroad Co., Louisville, Ky.

The October Convention, A. S. R. W. A.

We are at last able, through the courtesy of Secretary Richardson, to present an abstract of the official meeting of the Fifth Annual Convention.

WEDNESDAY'S SESSION.

FIFTH AVENUE HOTEL, }
NEW YORK CITY, N. Y., October 15, 1884. }

The meeting was called to order at 10:25 A. M., by the President, Mr. William H. Hazzard, of Brooklyn, who announced the first business in order to be the reading of the minutes of the last meeting.

On motion of Mr. Thurston, of Jersey City, the reading of the minutes was dispensed with, inasmuch as each member had received a printed copy.

The President said: It becomes my duty to make a short speech to you. I will do it, however, by reading a brief address.

ADDRESS OF THE PRESIDENT.

The President then read the following address:

THE AMERICAN STREET RAILWAY ASSOCIATION:

Gentlemen: It is with pleasure I again meet so many of the representatives of the members, and the friends of this Association.

It is with deep regret we have learned that one of the gentlemen whom so many of us have had the pleasure of meeting at the two former meetings, Mr. L. Brayton, the President of the Union Railroad Company of Providence, has been taken from us by death.

This Association was organized in the city of Boston, December 13th, 1882, and held its second annual meeting in the city of Chicago, October 9th, 1883. We have come together to hold its third regular meeting. It is believed that this meeting will fully develop the value of the Association, to the street railroads of the United States and Canada. If the first two meetings have proved as beneficial to all the representatives of the association, as they

have to myself, I think that they will not regard as lost, the time or money they will have spent in attending this meeting. It is well for those who represent this important interest to meet together, and interchange thoughts regarding the management of our business. We, who are young in the business, will thereby learn from those who have been street railroad men for many years, what their experiences are as to the best way of operating street railroads in all their various parts and phases. We shall learn how their roads are run for the best accommodation of their patrons, both in the United States and Canada.

It seems as though we should all be able to gather some knowledge that will better fit us to fill the various positions we hold, whatever they may be in our respective companies.

As we progress with the business which may be brought before the convention, we hope that all will be brief in discussing the various subjects that may be introduced, taking care to give all who may desire to speak, a chance to be heard; for, no doubt, there will be many subjects brought before the meeting of great interest to us all.

I have not attempted to give you any statistics, for you will, undoubtedly, obtain them in the report of the Executive Committee.

The Secretary then called the roll. There were 76 delegates, representing 50 companies, and 35 cities and towns.

There were then added to the list — delegates, representing — companies in — cities.

Letters and telegrams were read from companies that were members and could not be present at the meeting—also from companies that were not members.

The Secretary then read the report of the Executive Committee, as follows:

NEW YORK, October 15th, 1884.

THE AMERICAN STREET RAILWAY ASSOCIATION.

Gentlemen:—Your Executive Committee would respectfully offer, as its report, the following *resumé* of the work of the Association during the past fiscal year:

SPECIAL COMMITTEES.

The selection of the titles of the Special Committees was deferred to the President, who, after consultation with members of the Executive Committee, determined on the following, viz.:

Completed Construction of New Road;
Repairs of Track;
Track Cleaning and Removal of Snow and Ice: Is Salt necessary! If so, is its Use Detrimental to the Public Health; and Especially, is it Injurious to Horses?
Stables and Care of Horses;
Electricity as a Motive Power;
The Cable System of Motive Power;
A Uniform System of Accounts;
Labor and the Graduated System of Compensation;
Ventilation, Lighting and Care of Cars, and
Taxation and License.

The committees were duly appointed, and, with one or two exceptions, will, doubtless, be prepared with reports. Cov-

ering, as the subjects do, a very wide range of vital questions regarding the street railway business, the reports and discussions arising therefrom should be very helpful to even the wisest of railroad men.

The street railway business requires of its managers knowledge concerning a greater number of distinct and separate lines of business than almost any other that can be mentioned. No man, however versatile his talents; however gifted in intellectual endowments, can ever hope to know this business so thoroughly, that he need concern himself to learn no more about it. Practical and experienced street railway men from widely separated sections of this great country will tell us their experiences in the management of their roads; and we shall be well repaid for our attention thereto.

NEW MEMBERS.

The Association left Chicago with a membership of sixty-two companies. During the year twelve companies have joined, as follows:

Niagara Falls and Suspension Bridge Railway Co., of Niagara Falls, N. Y.

Jersey City and Bergen Railroad Company, of Jersey City, N. J.

Citizens' Passenger Railway Company, of Philadelphia, Pa.

Richmond City Railway Company, of Richmond, Va.

The Brooklyn Street Railroad Company, of Cleveland, O.

Wilkes-Barre and Kingston Passenger Railway Co., of Wilkes-Barre, Pa.

Pittsburgh and Birmingham Passenger Railroad Company, of Pittsburgh, Pa.

The Fort Wayne and Elmwood Railway Company, of Detroit, Mich.

The Baltimore Union Passenger Railway Company, of Baltimore, Md.

Washington Street and State Asylum R. R. Co., of Binghamton, N. Y., and

The Springfield Street Railway Company, of Springfield, Mass.

The total membership, therefore, is seventy-four companies, many of which are among the largest in the country, and represent in the aggregate about one-half of the entire street railway wealth and business of America.

The Secretary has received notices from quite a number of companies that are not members, stating that they will be represented at this meeting and join the Association. The indications are, that the accessions at the New York meeting will nearly, if not quite, bring the membership up to one hundred companies. That the nucleus of thirty-one companies from amongst the number represented in Boston should have, in two years' time, increased over one hundred and fifty per cent., evidences very remarkable growth.

FREE PRINTED MATTER.

That the gain has been so considerable has, doubtless, very largely, been the result of the generous course adopted by your Committee in the circulation of the annual reports of the Association, and its other printed matter, copies of all of which, up to the present time, have been issued to all the street railroads in the United States and Canada—as well to those

companies that are not members, as to those that are.

It was considered advisable for the Association to do a certain amount of advertising of its objects and its work, that thereby the companies not members would see, not only the desirability of joining, but the necessity for so doing. It was believed that in no way could this advertising be done so satisfactorily and effectively as by the issue of this printed matter direct to the companies. The wisdom of this course is apparent.

The letter sent with the annual reports to companies not members, reads as follows:

OFFICE OF THE
AMERICAN STREET RAILWAY ASS'N, }
BROOKLYN, N. Y., Jan. 8th, 1884. }

Dear Sir:—A year ago a copy of the proceedings of the convention, which resulted in the organization of this Association, was sent to you. In this mail is sent a copy of the Report of the recent annual meeting, held in Chicago.

It has been deemed advisable to circulate this report as freely as was the former, believing that when the character of the work, which the Association is doing among and for its members, had become thoroughly known, the large majority of the street railway companies of America would join the Association.

You will, undoubtedly, carefully peruse its pages. They contain considerable valuable information concerning the street railway business. It is sent to you, confidently believing that you will find it to your interest to become associated with us. The unanimous desire of the members is that the Association shall embrace every street railway company in America—that it might be, indeed, as comprehensive as its name. It is needless to say that we should be pleased to welcome your company to membership. Will you kindly acknowledge the receipt of the Report, and oblige,

Yours truly,

W. J. RICHARDSON,

Secretary.

It would seem, however, as if the time had now come when the companies that do not contribute to the support of the Association should not be treated with the same consideration as those that do. Surely the management of the Association cannot be charged with illiberality, if, after two years of free distribution of its knowledge, it should decide that, for the future, the benefits arising from membership should be enjoyed by members exclusively, so far as the annual reports of the meetings of the Association and its other printed matter is concerned.

STATE RAILROAD REPORTS.

The following letter was sent to all the Secretaries of State of all the States in the Union:

OFFICE OF THE
AMERICAN STREET RAILWAY ASS'N, }
BROOKLYN, N. Y., Jan. 14th, 1884. }

TO THE HONORABLE THE SECRETARY OF STATE OF ———

Dear Sir:—I send you in this mail a copy of the Report of the Second Annual Meeting of this Association, held in Chicago, Ill., October 9th and 10th, 1883. You will

find that its pages contain considerable valuable information concerning the street railway business.

May I ask you to favor me with a copy of the last published State Engineer's Report, providing your State has such an officer, or, as in the State of New York, the Report of Railroad Commissioners, in order that I may be informed of the names and officers of the companies in your State, as well as the laws which may affect the same; provided, of course, that the latter are in compact printed form.

I do not desire to put you to unnecessary trouble, but should highly esteem the information asked for. It is our wish that this Association shall be a power for good in America, and in this connection refer you to Article II. of the Constitution, found on page 138, setting forth the objects of the Association.

I remain, very respectfully,

Your obedient servant,

W. J. RICHARDSON, Secretary.

In reply, copies of valuable reports were received from fifteen States, some of which are of service in ascertaining the operating companies.

INTERNATIONAL ASSOCIATION.

The following letter was sent to the General Manager of every tramway in operation in Great Britain and Ireland.

OFFICE OF THE
AMERICAN STREET RAILWAY ASS'N, }
BROOKLYN, N. Y., Feb. 15, 1884. }

Dear Sir:—I have the honor to be the Secretary and Treasurer of the American Street Railway Association, and take pleasure in forwarding you, in the accompanying mail, a copy of the Report of the Second Annual Meeting of this Association, recently held in Chicago, Ill. It will be found to contain considerable information that will be valuable to you.

I have noticed, with considerable interest, the preliminary proceedings in regard to the formation of the proposed "Tramways Institute." This organization will, doubtless, have a local significance, similar to kindred organizations, as in the individual States of New York and Ohio. It has occurred to me—and, indeed, the matter has been on my mind for over a year past—to correspond with the managers of tramways in Great Britain and Ireland, with a view to solicit opinions as to the practicability (of which I have no question), of your union with us, in an International Association.

I believe our members would be very glad to amend Article I. of the Constitution, so as to change the word "American" to "International." I see no reason why the Association should not be international in its scope. It now embraces Canada and the United States, and may enter any tramway in either North or South America. We have already a member, one company, in the State of Texas (which is as far away as England); and will, doubtless, soon have members from California, which is further away, both in distance and time, than some parts of Great Britain.

The circular-letter is, therefore, sent to the managers of all operative tramways

throughout Great Britain and Ireland, in the hope that the proposition will be considered favorably. Of course, it is well known that the United States is the great tramway country of the world, having upwards of four hundred and fifty street railways in actual operation, with an investment of one hundred and fifty million dollars. One feature of our work, just developing, is the publication of legal opinions regarding suits against the companies, and which can be gathered only through the medium of such an Association as this. Hoping to receive from your corporation a favorable reply, I remain.

Very respectfully and truly yours,

W. J. RICHARDSON,

Secretary.

(To be Continued.)

Jumping off Moving Cars.

The fools are not all dead yet, and the supply is not likely to be exhausted. Street Railway Companies get blamed, and mulcted, for many injuries which result solely from haste, ignorance, awkwardness and bullheadedness on the part of passengers. In this age of rush, people may have a right to risk their limbs and lives, jumping off rapidly moving cars, but the companies should not "pay the piper."

Track Salting.

[The following is the conclusion of the matter relative to the Track Salting question, which has been made public by the American Street Railway Association in advance of the discussions upon the other reports, and of the minutes of the meetings at the Fifth Avenue Hotel.]

REPORT OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

The names attached to the following report will be at once recognized as those of men of the highest rank in their profession:

The Committee to which was referred the communication addressed to the College by a Committee of the Select Council of the City of Philadelphia, "requesting the views of the College of Physicians in regard to the influence upon the public health of the practice of salting the railway tracks," respectfully report:

That in pursuance of the wishes of the College, they held repeated meetings, at which the subject was fully discussed. Two points especially claimed attention.

First—Could any appreciable physical phenomena, which would be capable of producing disease, result from the practice?

Second—Was there any evidence that could connect the prevalence of disease or increase of mortality with this mode of cleaning the railroad tracks from snow or ice?

The fall of snow and its accumulation in the streets being beyond human control, its removal by melting and evaporation is equally so. The question, therefore, is narrowed to the single point whether the rapid removal by chemical agents of a small portion of the snow in a few streets of the city can produce such a change in

the atmosphere, either in its temperature or hygrometric relations, as would give rise to new diseases, give greater intensity to those already known, or diminish the amount of vital resistance to lethal influences already operating.

Your Committee learned with great satisfaction, that a series of experiments had been performed by a Fellow of the College, to test these very points, and conscious of want of time in which to pursue similar investigations, as well as confident in the skill and faithfulness of the gentleman who had manifested his qualifications for the service, and interest in the cause, by his spontaneous investigations, your Committee solicited from him a statement of the result of his observations.

In compliance with this request, Dr. Rogers, Professor of Chemistry in the University of Pennsylvania, attended a meeting of the Committee, and made a detailed statement of the elaborate experiments conducted by him. It is certain that no influence can be exerted upon the atmosphere by its impregnation with saline matter, the chloride of sodium employed, not being volatilized at the temperature which prevails at the time it is employed for the purpose of melting the snow. It must be carried immediately off with the fluid as it runs away.

The only remaining influence is that caused by the reduction of temperature, consequent upon the rendering latent a certain amount of heat.

While it is evident, that at the moment of solution, a considerable change must be produced in the air, and snow and pavement, contiguous to the point at which the solution is being made, it is equally evident that this influence must be limited to a very small space, and can continue but a very short time, and is not greater than is often produced by purely natural causes. Your Committee believe it may be dismissed from consideration as an element of causation of disease. There is indeed one point of view, from which it might be determined that the influence of the application of salt is advantageous. The snow which has fallen must be melted; a given quantity of snow in a given temperature will be dissolved five times as quickly when salt is added to it, as without; thus diminishing in the same ratio, the duration of the impression of the melting snow. Nor is this all. When melted by the natural influences, much of the liquid becomes again congealed by the falling temperature to be again the agent in rendering latent the same amount of heat when again dissolved by a rising temperature, and this process is often repeated during many days and even weeks. Whereas the saline solution, not being again congealed, flows slowly and immediately off, so that if a free outlet can be maintained by keeping open the gutters and inlets to the sewers, those streets over which the railways pass and on which salt is applied, will be kept drier than those where no salt is used. If, therefore, an ordinance were passed, providing for the flow of melted snow and ice into the sewers without delay, a decided increase of the comfort, at least, of pedestrians would result. Having thus disposed

of the question of atmospheric influences, the attention of the Committee was next directed to the inquiry as to the effect of the application to the feet of the saline solution. It will be seen by reference to the experiments of Dr. Rogers, that the saline solution, of the density made by the railroad companies does not penetrate leather more quickly than simple water, nor does it produce a much greater degree of cold to the feet, when applied to the shoe, than is caused by the application of snow itself, melting as it does rapidly and constantly at every step. The argument offered primarily, as to the comparative rapidity with which the snow and ice are removed, diminishing the amount of exposure, is equally as applicable here. The number of days in which the feet of pedestrians are subjected to the wet, being only as one to five, while the opportunity for avoiding this influence almost entirely, afforded by the passenger-cars, diminishes still more this influence on health. The quantity of salt left in the leather of the shoes after drying, is so small to produce any appreciable influence in attracting the moisture from the air, as is done by those and other garments soaked in the water of the sea, which, moreover, contains other saline ingredients, in addition to the chloride of sodium. In order to ascertain by personal and practical observation, the influence of constant exposure of the feet and hands to solutions of salt water under circumstances very similar to those produced by the application of it to the railway tracks, a member of your committee made a visit to one of the extensive packing establishments, in which a large number of men are constantly engaged during the entire working hours of the day, with their hands in the melting salt, their feet wet, and their clothing more or less moistened by it. We found the floors of the various apartments covered with matter closely resembling the slush of the streets, while the temperature differed but little from that of the outer air. The cases might, therefore, be considered as nearly parallel.

The proprietor of the establishment not only gave his own testimony to the absence of any disease peculiar to the occupation, but put direct inquiries on the subject to the men, as we passed among them. They were healthy in appearance, and professed an entire exemption from disease of any kind, and, especially of the throat. Several of them had been many years in the establishment, and some spoke of the enjoyment of better health since they had entered it than they had previously. It is very certain that no deleterious influence emanates from the floors which are perfectly saturated with brine, and on which there is in many places a thick coating of half-dissolved salt mingled with animal fluid.

The second question is one much more difficult and requiring a much more extended inquiry. The statistics of disease and mortality have been of late years attracting the attention of the guardians of public health, in a degree even yet only partially commensurate with the importance of the interest committed to their care; and every one who has paid any at-

tention to the subject, must be impressed with the conviction, that we have not yet reached a point which enables us to prepare any exposition of the laws which govern disease and death. It is certainly true, as regards Philadelphia, that while the record of deaths in 1859 were only 9,742, in 1860 the number rose to 11,568, and in 1861, to 14,468, while the increase of population bore no relation at all corresponding. It was during this period that the new registration laws went into operation, and as the old were so confessedly imperfect as to require change, and the new are still liable to the uncertainty which must attend all changes, it would be evidently unfair to draw any positive deductions from these statistics. The great variation in the rates of disease and mortality caused by epidemic influences is familiar to us all, and so numerous and inscrutable are the causes which operate upon them, that it would be unjust to assign to any one the causation until the power of others had been detected and measured.

Your Committee is indebted to the kindness of a Fellow of the College, who has long been engaged in pursuits which render him familiar with the statistics of disease and death of this city, Dr. W. Jewell, for the accompanying statement, by which it will be seen that the relative mortality of the winter months to that of the entire year, has been varied greatly during the last decade, the extremes being 20.83 per cent. for the lowest, and 30.64 for the highest. The highest mortality being in the years of 1856-7, before the application of salt to the melting of snow was resorted to, while that of 1857-8, in which the salt was used, was the lowest in the entire period, with the exception of 1853-4 :

December, January, February.	Mortality. Three Months.	Mortality for Year.	Percentage to Total Mortality.
1851-52	2,594	10,258	25.28
1852-53	2,365	9,744	24.22
1853-54	2,455	11,784	20.83
1854-55	2,276	10,458	21.76
1855-56	2,684	12,334	21.76
1856-57	3,338	10,895	30.64
1857-58	2,315	10,697	21.64
1858-59	2,414	9,742	24.77
1859-60	2,614	11,568	22.59
1860-61	3,382	14,468	23.37
Mean, -	2,643.	11,194 8-10.	23.69.

It is perfectly clear that the increased mortality of even those years in which it has been greatest, depends on influences operating during the summer as well as winter months; and even during the winter months, on some other cause than the application of salt to railway tracks—the mortality during the winter months having fallen from 30.64 per cent. in 1856-7 to 22.59 in 1859-60. Indeed, if we deduct from the entire mortality of 1861, the number 2,448 reported as dying from small-pox, scarlet fever and diphtheria, the increased mortality of that year is reduced to less than four per cent.

Such variations have been recurring at all times and in all places, which have been subject to observation. Neither of the diseases is new; and all have, at several periods, assumed the epidemic form with varying degrees of malignity, at times almost disappearing from observation, but only to return with renewed violence under

the influence of unknown and unappreciable causes.

To go no further back than the experience of many of the fellows now participating actively in the practice of medicine, we may refer to the sudden, unlooked-for and unaccountable epidemic of small-pox which commenced about thirty years ago, shaking the confidence of the community in the protective power of vaccination, and arousing the attention of the profession to the necessity of a more careful and active resort to it. Scarlet fever, which, during the years intervening between 1807 and 1827, had caused only 102 deaths out of 53,000, and only one death in 1827, nine in 1828, and only nine in 1829, at the time broke out upon us with a malignancy and wide-spread prevalence, which carried dismay into the community. The deaths from that disease in 1832 rose as high as 307.

Still confining our attention to our own city, though with a retrospective view, putrid sore throat or malignant angina (doubtless, identical with the disease now known as diphtheria), in the year 1735, raised the mortality of the city, as shown by the records of interment in the burial grounds of Christ Church, about 50 per cent. It were a work of supererogation to present facts to the College of Physicians, in proof of the absurdity of attributing to the practice of salting the railroad track, the prevalence of small-pox, scarlet fever or diphtheria, the diseases by which the great increase of mortality in the last few years has been induced. Yet, it may not be uninteresting nor inappropriate to present to the notice of the Fellows, the record of a fatal prevalence of one or both of these diseases of scarlet fever and diphtheria in this city in the year 1746. There is in the possession of our Fellow, G. W. Norris, a MS. tract by Dr. J. Kearsley (the liberal founder of the Asylum for widows and single women, known as Christ Church Hospital), describing the symptoms and treatment. So extensively did it prevail and so numerous were the fatal cases, that Dr. Kearsley says, "It baffled every attempt to stop its progress and seemed, by its dire effects, to be more like the drawn sword of vengeance to stop the growth of the Colonies than the real progress of the disease." This epidemic certainly could not be attributed to any influence under human control. It commenced in an inland village in the New England Colonies, where, according to Dr. Kearsley, "villages were almost depopulated."

While it is beyond doubt a duty owed by every citizen to the community in which he dwells, and by which he is protected and supported, to aid in every effort for the preservation of the health of the people, this duty presses with especial claims upon us as members of a profession to whose keeping are entrusted the health and lives of our fellow-citizens. Still stronger is the obligation which rests upon us in our corporate capacity, as the College Physicians of Philadelphia, since we find mentioned among other inducements to our originators, that "the objects of this College are to advance the science of medicine, and thereby to lessen human misery by investigating the diseases and remedies which

are peculiar to this country, by observing the effect of different seasons, climates and situation upon the body," etc., etc.

Your Committee, therefore, in closing this report, present the following resolutions:

First.—That in the opinion of the College of Physicians there is no evidence that "the practice of salting the railway tracks" passing over the streets of the city exerts any injurious influences on the health of the citizens.

Second.—That the College of Physicians respectfully suggest to the City Council the necessity of making provision by ordinance for keeping open the gutters and inlets to the same, in the period when the snow is melting, and keeping the footways at the intersections of the railways free from the melting snow and ice, or, of enforcing such ordinances, if already existing.

CASPER MORRIS, *Chairman.*
FRANKLIN BACHE.
EDWARD HARTSHORN.
J. M. DE COSTA.
D. FRANCIS CONDIE.

[*Letter from Messrs. Haller, Beck & Co.*]

The following letter (supported by affidavit) speaks for itself:

UNION SALT WORKS.
OFFICE OF
HALLER, BECK & CO.
ALLEGHENY CITY, Pa., Aug. 16, 1884.

MR. HARVEY N. ROWE,
Secretary of the P. O. & E. L. Passenger Railway Co., Pittsburgh, Pa.

DEAR SIR—As we have been asked time and again by many parties, whether or not salt had any bad effect on our horses' feet, on account of their being in it more than any others, we would simply say that we have been in the salt business for over twenty years, and so far have never had any trouble with our horses' feet being injured from salt. We work from twenty five to thirty horses, and claim to have the best stock in the city, to which we can get most merchants to testify. In twenty years we have never had a horse troubled with thrush; never any troubled with "scratches;" and our stable is open for inspection by any one, the agents of the Humane Society preferred. If salt were detrimental to horses' feet, we surely think ours are the first it would tell on, as they are in it about the works, and then in the car-tracks as much as car-horses.

Respectfully yours,
HALLER, BECK & Co.

OFFICE OF
THE AMERICAN STREET R'Y ASSOCIATION,
Corner Atlantic and Third Avenues,
BROOKLYN, N. Y., Nov. 6, 1884.
JAMES WATT, M.D.,

DEAR DOCTOR—In the year 1874, while you were Registrar of Vital Statistics of the City of Brooklyn, a resolution was introduced in the Common Council of this city, prohibiting the use of salt by the Street Railway Companies for the removal of snow and ice from the tracks.

The resolution was referred to a committee, before which you appeared, and, I believe, gave evidence to show that the use of salt for the removal of snow and ice was not detrimental to the public health,

and especially was not a causation of disease, particularly diphtheria, which, at that time, was prevalent in a very malignant form.

The American Street Railway Association, at its recent meeting in New York City, requested me to have printed in pamphlet form, certain attainable information, in reference to the subject of the removal of snow and ice. It is now in course of preparation, and will be issued within a day or two. I desire, for the purpose of its publication therein, that you will give me a statement of the facts in connection with your appearance before the Committee, and you will oblige,

Very truly yours,
WM. J. RICHARDSON,
Secretary.

[*Letter from James Watt, M. D., Registrar of Vital Statistics of Brooklyn, 1875.*]

384 COURT STREET,
BROOKLYN, Nov. 8th, 1884.

WM. J. RICHARDSON, Esq.,
Sec. American Street Railway Association.

DEAR SIR—In reply to yours of the 6th inst., I would say that I appeared before the Health Committee of the Common Council during the winter of 1875, and laid before them such statistics as I had in my possession, in regard to the cause of the disease of diphtheria. This disease at the time prevailed to an alarming extent in this city, more than five per cent. of the death-rate being due to it; and the public mind was greatly exercised in relation thereto.

It was desired especially to ascertain whether the use of salt by the railroad companies on their tracks for the removal of snow and ice had any influence in the production and spread of the disease. The salting of the tracks was one of the causes assigned for the increased mortality by diphtheria. A number of other causes were given, such as sewer gas, the filling of low lauds with ashes, garbage, and street sweepings, etc.

I prepared a map showing the location of every case of diphtheria in the city. This was carefully examined by the committee, and showed that the majority of the cases did not occur upon the line of any railroad, or in its immediate vicinity.

So far as statistics were concerned, the use of salt by the railroad companies showed that it did not in any way contribute to the cause of the disease, for on those streets occupied by railroad tracks, and where salt was used for the removal of snow and ice, the death-rate was not increased in the least.

Very respectfully yours,
JAMES WATT, M.D.

[The lithographic map attached to this letter of Dr. Watt's, is of great interest. We should give an analysis of it in this issue of the STREET RAILWAY JOURNAL, but that there are other data which we should prefer to see before making any deductions, or expressing any opinion. In this connection, we may say that the map would have been even more convincing had it shown in some way the density of population, the location of sewers, and the elevation above tide-water; also, the cases of diphtheritic disease not resulting in death. We shall endeavor to obtain some, if not all of these data, and to work them up for the benefit of the Association—and the encouragement of track salting.]

Personal.

— James G. Speer, Vice-president of the P. M. & A. Railroad, Pittsburgh, has returned from New York very much improved in health.

— John G. Brill, of J. G. Brill & Co., Phila., is about making his annual trip through Mexico, taking in New Orleans and various other cities.

— Mr. Hildebrand, Supt., has severed his connection with the Union Line, Pittsburgh.

— Mr. Eberhard, Supt. of the Pittsburg, Oakland & East Liberty R. R., Pittsburg, has resigned.

— The following have been elected officers for the Brooklyn City Railroad for the ensuing year: Wm. H. Hazzard, Pres.; Wm. M. Thomas, Vice-pres.; Daniel F. Lewis, Sec'y and Treas.; Francis E. Wrigley, Asst. Sec'y. Directors: Seymour L. Husted, James How, George N. Curtis, Alexander Studwell, Wm. H. Husted, Crowell Haden, Wm. M. Thomas, Wm. H. Hazzard, George W. Bergen, John C. Barron, Abraham B. Baylis, Daniel F. Lewis, Edwin Packark.

Notes.

— At the annual meeting of the stockholders of the West Division Railway Co. of Chicago, held January 15, the following directors were elected for the ensuing year: B. H. Campbell, John A. Tyrrell, Jerome Bucher, S. B. Cobb, Nathan Corwith, J. R. Jones, and Wm. H. Bradley. Officers: Pres., J. R. Jones; Supt., James K. Lake; Sec'y, George L. Webb.

— The Bushwick R. R., Wm. N. Morrison, Supt., Brooklyn, is extending its line about a mile, double track, on Knickerbocker avenue.

— Another line of cable road, it is said, will probably be laid in one of the principal avenues of New York before the close of the present year. The details are not yet made public.

— M. Verner, Supt. of the Central R. R. of Pittsburg, has patented a device for carrying cars over a line of hose across the track without hindrance to the car or damage to the hose.

— The Central Park, North & East River Railroad has added to its depot, a building 75 ft. wide, and three stories, extending from 54th to 55th street, to accommodate the addition of a hundred or more horses and seventeen new cars. Of the latter, fifteen are smoking cars, two one-horse cars, all built by Stephenson. This road usually lays a hundred tons of new steel rails every year to replace old ones; last year a hundred and fifty were laid. A new eighty-horse engine has just been put in by them.

— The Ninth Avenue R. R. has extended its track to 126th street; is now running to 110th street. Eight new cars are added.

— The Broadway & Seventh Avenue R. R. is rebuilding a number of cars, and contemplates various improvements in the spring, but has not yet made definite plans.

— Supt. Bidgood, of the Sixth Avenue road, New York, speaking of the elegant new cars recently put on to that road to replace old ones, said in reply to an inquiry made by a representative of the JOURNAL: "Yes, I am very sure it pays to run nice cars. No, I have not any exact data on the subject; but have, no doubt, that our earnings have been very materially increased on account of substituting these new cars for the old ones formerly run. The people want a nice car; and while, of course, the fare is fixed at the same time they will pay for it." Mr. Bidgood here showed some of the new cars, which are of Stephenson's most approved pattern, fitted with super springs, ventilated ceiling, telephone signal, etc., nicely decorated and finished in every way. "I would not," said he, "run a car inferior to these. No, we have no new drivers on trial on our road at present; we adopt as a rule, however, most of the improvements brought out by Stephenson."

— The Brocton Horse Railroad Co. of Brocton, Mass., has, during the last year, extended its line from North End to Stoughton. The stock is all taken in a new Company, formed to build a line from Brocton to North Easton, five miles, and a line from Brocton to South Abington is under discussion. These new lines are discussing the feasibility of the Daft electric motor system, instead of horse-flesh as motive power.

— L. O. Crocker, of East Braintree, Mass., manufacturer of conductor's railway ticket-punches, among other work, is filling orders for punches from the Atchinson, Topeka & Santa Fe, Union Pacific, Delaware, Lackawanna & Western, Old Colony, Boston and Maine, Maine Central, Intercolonial and other companies.

— The New Bedford & Fairhaven Street Railway Co., New Bedford, Mass., operates 688 miles single track, 14 cars, 136 horses, 51 employees, with conductors for extra train and mill trips. For ordinary service the Carey fare box is used. This box "rings up" as each fare is deposited, and has glass side only visible to the driver. The October report shows operation of 313,415 miles, 60,226 round trips, carrying 1,591,890 passengers; 5 cent fares.

— The Oriental Metal Manufacturing Co., 48 Congress Street, Boston, commenced business October last, and has now leased the Atlantic works foundry at East Boston. This company makes a specialty of car journal bearings made from new process of hardened copper. It has orders for 184,000 pounds of metal, and is receiving orders for tons of metal in ingots from several roads that have been making tests. One test of street car journal bearing weighing 33½ lbs., after running 17 months, showed loss in wear of one-half an ounce by weight.

— The Baltimore Union Passenger Railway Co. has ordered its entire line equipped with the automatic fare collector.

— The People's Passenger Railway Co., Philadelphia, has ordered its Morris Street branch equipped with Lewis & Fowler's improved 12-inch alarm passenger register.

CAMBRIDGE R. R., BOSTON.—Mr. A. L. Richards has resigned as General Manager; remains a director. Mr. W. W. Hapgood, resigns as Superintendent, to take charge of his ranch in Nebraska. Mr. E. M. Bancroft, the new Superintendent, is a Harvard graduate of 1879, a lawyer, and a member of the Massachusetts legislature.

SOUTH BROOKLYN CENTRAL.—Mr. Wm. Richardson (President Atlantic Avenue Line), has purchased a controlling interest in the S. B. Price said to be \$125 per share. (A few years ago it could have been bought for 30 cents.)

ST. PAUL, MINN.—Mr. H. M. Littell has resigned as Superintendent of the St. Paul City Railway; succeeded by Mr. Goodrich, Superintendent of the Minneapolis Co., assisted by Mr. Scott, of Minneapolis.

Frauds on the Fare-box Cars.

HOW TO PREVENT THEM.

ED. STREET RAILWAY JOURNAL:—

A short time ago notices were prominently displayed in the Broadway stages to the effect that a reward of \$50 would be paid for information which would secure the conviction of any person taking fares under the pretense of passing them to the box and keeping them. This notice served to call public attention to one of the ways in which the Omnibus Co. was being swindled; but did no good otherwise; as no person has ever been known to give the desired information and claim the promised reward. It is fair to presume that this swindle is still going on. About a year ago a conspiracy was broken up on the Twenty-third Street line by the arrest and conviction of a number of persons engaged in defrauding the Company in the following manner: A confederate of the driver would seat himself in the forward end of the car and make himself useful by receiving fares to be passed into the box. About every third nickel, however, found its way into his pocket instead of the box, and the proceeds of his speculations were divided daily between himself and the driver. Public attention having been called to this system of fraud, it is not practiced so much as formerly, but has been superseded to a certain extent by another method not so likely to attract attention, and more difficult to detect.

The person who "works this racket" is not necessarily "in cahoot" with the driver. He may simply be a "shover of the queer" in a small way; and being provided with a quantity of small counterfeit coin, takes his seat near the money box, when the car is likely to be crowded, and as the fares are passed to him, adroitly slips a counterfeit into the box and retains the genuine coin of the passenger. As the base coin cannot be detected until the box has been opened and the money counted in the office, the swindle is a pretty safe one, and the innocent passenger who has been at so much trouble to see that his fare was passed to the box, is set down by the management as the perpetrator of the fraud.

It seems to me that the most effectual way to prevent these frauds, and at the same time please the patrons of the money-

box cars, would be to adopt the system now in use in this city, by which each passenger may deposit his own fare and see it go into the box, no matter where he may be sitting or standing—Gentlemen managers of the fare-box cars, try and make things a little more pleasant for your passengers and you will find it to pay better than damning the public.

JNO. H. VIRGIL.

Baltimore, Md., Jan. 15.

[We have taken the pains to get an illustration and description of this device, and present it on another page.—Eds.]

Extent of the Cable Road System.

Andrew S. Halliday, of San Francisco, who invented the system of cable railways in 1869, in a recent interview in the *N. Y. Tribune*, speaks as follows: "I invented my system in 1869, but the first cable street railway was not built and ready for use until September, 1873. The first bit of road was built in Clay Street, San Francisco, which was forty-nine feet from house to house, and was full of gas and water mains. People laughed at me and were afraid to invest in the scheme, the grade of the street was one in five, pretty steep, and the line was 2,800 feet long. The road soon became a success. It made money and carried passengers at a low rate. It was cleaner than a horse railroad. There were less delays upon it, and it was able to carry as many people as an almost continuous line of cars could carry.

"Soon afterward a horse railway company converted their line into a cable road and the shares of the company advanced in a short time from \$22 to \$102. A year later a cable road was built through California street. To-day there are thirty miles of single track cable roads in that city. More than half of this length of road has been converted from horse railways. There are over twenty miles of cable road in Chicago, and they worked last winter without losing a day, even when the ground was frozen to a depth of two and a half feet. The streets are kept clean with far less trouble with a cable road than a horse railway. Dunedin, New Zealand, a city of 30,000 inhabitants, has two cable roads. A company in Melbourne has just obtained a franchise for sixty miles, and will put stock to the amount of £1,500,000 on the market. Sidney, New South Wales, has adopted the system. The Premier of New South Wales visited San Francisco eighteen months ago to inspect it. Edinburgh, Scotland, has decided to adopt the system, and Birmingham and Manchester, England, are considering the advisability of following suit. Roads will shortly be built in Pachuca and Guanajuato, Mexico.

"Seven millions of dollars have been spent in San Francisco in the construction of cable roads, and that sum is paying large interest. A well-equipped road will cost from \$75,000 to \$200,000 a mile. This includes power and equipment. I will go to London, England, to look after my interests. I have a short road there, which I built after a hard fight with the various carrying companies. From England I go to Australia."

Electric Motors for the Elevated Railroad.

The following report on this subject is extracted in a somewhat condensed form from the *Engineering and Mining Journal*:

Prof. Moses G. Farmer has furnished to Mr. Cyrus W. Field an estimate of the cost of operating the Second Avenue Elevated Railroad of this city by electric motors, as compared with locomotives.

The estimate is based on the following assumptions:

A stationary plant can be erected near the middle of the line, consisting of one or more stationary steam-engines of the best type, capable of developing one horse-power by the combustion of 1 3/4 lbs. of coal per hour per horse-power, the coal costing \$2.50 per ton of 2,240 lbs.

Each of the 20 locomotives in use on this line, at the busiest part of the day, indicates 110 horse-power, with a consumption of 5 lbs. of coal per hour per 1 H. P., the coal costing \$4 per ton of 2,240 lbs.

The present steel rails weigh 70 lbs. per yard, and a similar central rail will be laid to convey the electric current.

One mile of central rail will offer about 1/20 of an ohm's resistance, and the aggregate internal resistance of the dynamos concerned in producing the current will not exceed 1/20 of an ohm.

Sufficient current will be supplied from the central stations to both tracks to energize at the same instant all of the 20 electric locomotives, no matter on what part of the tracks these motors may be situated.

One horse-power is the equivalent of 746 ampere volts, and 20 by 110 by 746=1,641,200 ampere volts in the aggregate will reach these motors.

The dynamos can convert 90 per cent. of the mechanical power applied to them into current electricity, and electric motors can convert 90 per cent. of the electricity that they receive into power used to draw the trains.

The Second Avenue Railroad is 6 1/2 miles long.

The following table is calculated on the above assumptions:

	No. volts.		
	500	1,000	2,000
Indicated horse-power.....	500	1,000	2,000
Locomotive.....	2,200	2,200	2,000
Electric.....	3,369	2,879	2,757
Pounds coal consumed per hour:			
Locomotive.....	11,000	11,000	11,000
Electric.....	5,895	5,039	4,825
Saving by electricity.....	5,905	5,961	6,175
Cost of fuel per hour:			
Locomotive.....	\$19.65	\$19.65	\$19.65
Electric.....	6.58	5.62	5.38
Saving.....	\$13.07	\$14.03	\$14.27

This indicates that the lower and safer electro-motive force of 500 volts is only about 9 per cent. more expensive than 2,000 volts, and about 7 per cent. more expensive than 1,000 volts.

Fare Collecting.

ED. STREET RAILWAY JOURNAL:—

You asked my opinion about Fare Collecting. I should prefer to give it about Turning in Fares. There's not much trouble about collecting them. The greenest man

gets alive to the tricks of passengers, and takes a pride or satisfaction in not being "beaten" by the man with a newspaper, who holds his nickel in his hands for half an hour, and fobs it after he leaves the car. I would guarantee that any old hand would not miss collecting one fare in five hundred. In fact, I would like to bet that a sharp conductor would, out of five hundred passengers, collect five or six fares twice.

I think that conductors should not be appointed on the recommendation of politicians. That will save "leaks." Men with too large families should not be chosen. Those who have drifted around the country or the world, and have no family ties, have not as much incentive to turning in all the fares collected, as long residents of one locality. A man who drinks has his expenses raised and perhaps his sense of honesty blunted, and is in more risk of "knocking down," (as it is called by many. I prefer to call it stealing). The bell-punch can be beaten, and is beaten. The register in full sight is somewhat better, but nobody is going to count forty-two passengers and see that forty-two fares are registered, at starting.

The Slawson Box is a nuisance to passengers, and can be dickered with so that the last lot of coins or tickets deposited can be abstracted. Then it offers a good field for counterfeiters. In Philadelphia, a good many 3c. ferry tickets were put in for 6 1/4c. car tickets.

I haven't seen a really good system yet; and I don't know what would be a good one.

'OSCAR.

ED. STREET RAILWAY JOURNAL:—

What do we think about Fare Collecting? All sorts of things; mostly unpleasant, and calculated to ruin our faith in human nature—particularly when on wheels. Perhaps the iron rails exert a magnetic influence—but don't publish this, or some crank will be along wanting to re-metal our whole lines with copper or hard rubber; or to insulate the track, or something like that.

The bell punch is no good, by itself. Too easy to steal or counterfeit. These little private punches have earned a good deal of money for their owners or holders. The royalty on the legitimate ones is too high. We class the whole lot of tingling registers with the bell punch. Perhaps, a ringing dial-register suspended to the conductor's neck, could be better than the plain punch or ringing register, that does not show the number of fares collected. The clock-face register is all right enough after the car has started, to register an occasional jumper-on; but it gives opportunities in starting.

We tried the Slawson business, and found plenty of people paid all in pennies and the driver could't count them. Besides, there was always wrangling as to who had not paid his fare.

We do not wish our company's name mentioned, at least on this occasion; but shall probably take a hand in the fare-collecting discussion later on, over our company's proper title and address.

* * *

— THE —
STREET RAILWAY
JOURNAL.

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E. P. HARRIS, General Manager.
 P. G. MONROE, General Western Manager.
 ROBERT GRIMSHAW, M. E., Editor in Chief.
 G. B. HECKEL, Associate Editor.

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S. L. K. MONROE, Sec'y and Treas.

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 E. V. CAVELL, Manager.
South-Western District, 504 TEMPLE BUILDING, St. Louis, Mo.
 W. E. ROSE, Manager.

Comments of Our Kicker.

— Buffalo east side cars contain clocks. They are posted on a circular board which bears the advertisement of an enterprising jeweler. I don't know whether he pays the company for his ad., or the company pays him for the clock, nor if so, how much.

— In Syracuse the mysterious wisdom of a Board of Aldermen is manifested by keeping all the four or five lines of street roads about a block from the centre of the town, so that go what way you will you must walk a block or two to get a car to continue your journey in the same direction. I suspect this is a scheme to make people stop in town.

— No, I don't suppose the cold trains on the Sixth Avenue Elevated Road can be accounted for on the ground that the company has an interest in the sale of cough remedies, which are kept by the news stands on the line.

— At the supper table the other night, our little girl said: "Mamma, when I was down town to-day a very old lady got on the car, and when the car started, it nearly jerked her down. Shouldn't you think the conductor would let old folks get sat down before he starts the car?"

— The Central City Railroad, Syracuse, has no check of any sort on its conductors.

— The *Tribune* thinks certain New York street railroads make money by a questionable system of collecting two fares from the passengers who get into the wrong line of cars by mistake. I wonder if the *Tribune* has any idea of the persistency manifested by a certain class of women in taking the wrong street, the wrong direction on the street, and the wrong car every time when it is possible?

— The Fulton Avenue Line, Brooklyn, has some cars—I think one of them is No. 49, on the night line—which "teeter" enough to make a sensitive person sea-sick.

— The night line cars on some lines are a disgrace to the community. Some of the

horses are so old, weak, poor and pitiful, and so covered with sores and blemishes, that the companies would not dare send them out in day time, lest the Society for the Prevention of Cruelty to Animals should get after them.

— How many horses do we see with galled shoulders, owing to the use of imperfectly fitting collars?

— Why is it that women are so discourteous to those of their own sex? I scarcely ever make a trip that I do not see a woman sitting cat-a-corner and taking up room for two, while some other woman is standing—perhaps carrying a baby, or with her arms full of packages.

— The Brooklyn City Road has a stringent regulation against carrying bundles and other articles in the cars. This is particularly to the effect that such articles must be carried in the hand or lap, and not put upon the seat or floor. It is generally carried out by conductors serving a notice upon mild-mannered people, and letting cheeky or tough-looking customers go unnotified.

— Wyckoff Street, Brooklyn, has had its name changed to St. Mark's Place, from Third Avenue upwards. It just happens that if a stranger is seeking a house above Third Avenue, and has got the address St. Mark's Place, the Third Avenue Line conductor always calls out Wyckoff Street, and by an equally unfortunate fatality, if the address has been given Wyckoff Street, the conductor calls out St. Mark's Place. As the cars pass both St. Mark's Place and Wyckoff Street, at this crossing, conductors should call both names. The other evening, a would-be obliging conductor got the names mixed, and amused the passengers by calling out, "Walkoff."

— The two double tracks at the intersection of Tompkins Avenue and Halsey Street, Brooklyn, are so much below grade that during a heavy rain passengers getting out there, have to wade through from one to three small brooks, according to which side of the street they live on.

— The meanest man in the world has been found by Mr. Small, formerly Managing Director of the London Tramway Company, and the inventor of the bell-punch, the automatic fare collector, etc. This meanest man is not, thank God, in this country, but in London; and he steals and sells the car horses' food.

— In some cities the spaces between the window sash and the car framing are used as umbrella racks by standing passengers. Once in a while some one gets his face wiped by a wet "Gamp."

— I hear "curses loud and deep" against the "latest wrinkle" of putting car stoves under the seats.

— Brooklyn conductors have a deservedly high reputation for patience, politeness and obliging dispositions.

— The lost property office of the Brooklyn City Passenger Railroad Company is managed with exceptional satisfaction to the traveling public.

— I should like to see added to the prohibitory notices in cars, an embargo against

passengers enveloped in dripping water-proofs and rubber coats, sitting down along side of clean, dry passengers, and on clean, dry seats.

— Passengers should consider that every time they stop a car unnecessarily, they are straining the horses and perhaps making fellow-passengers miss their boats or trains.

— Delays from patent coal carts are a specialty on the Sansom Street Line, Philadelphia.

— Philadelphia has a larger proportion of her car conductors appointed through politicians than any other city.

— The arrangement, or lack of arrangement, at the starting point at Fulton Ferry, Brooklyn, is confusing to passengers and dangerous to pedestrians.

— Has the driver of a bobtail car a right to make four passengers who have paid their fare miss their train, because of a difference of opinion between a fifth passenger and himself as to the latter's fare?

— There is too much swearing in the cars (of certain lines I could name. If it is not stopped by next month I shall give the name of the line, and the numbers of the cars in the Kicker's Column.

Resistance to Traction on Tramways.

EDITOR STREET RAILWAY JOURNAL:

Mr. Jos. S. Paxton, on page 27 of the *STREET RAILWAY JOURNAL*, quotes a paper of mine and asks, "Will you or any of your correspondents be kind enough to explain the cause of the increased resistance on the steel track over iron track, viz., 4.1 iron and 7.1 times steel." If your readers will peruse the quoted article carefully, they will notice that I found the average force required to keep the said car in motion on the worn iron rail to be 32.3 lbs. per ton, while on the steel rail it was 15.6 lbs. per ton. The average force exerted to start on the old track was 134.6 lbs. per ton; on the new steel track, 116.5 lbs. per ton. A little consideration would have convinced Mr. Paxton that these results should have been expected. The resistance of the iron rail, worn with low joints, etc., was 32.3 lbs. per ton, as against 15.6 lbs. per ton on the new track with perfect joints, or more than double. This proves by practical experiment the loss street railway companies suffer in working poor tracks with bad joints. As your December number contained an article from my pen on the question of joints, I will simply refer to it. Now, the power exerted to start the same car on the iron track was found to be 134.6 lbs. per ton. On the new steel, 116.5 lbs. per ton. The resistance on the old iron track was, therefore, 16 per cent. greater than upon the new track. Dividing

$$\frac{134.6}{32.3} = 4.1 \text{ and } \frac{116.5}{15.6} = 7.1.$$

This means that whereas the actual force exerted per ton to keep the car in motion was really doubled on the old iron track over that force on the new track, yet it was only 4.1 times the force required to be exerted to keep the car in motion, while the good track, although it required less power to

start, required so *much* less to keep the car in motion, that it was 7.1 times the force exerted in starting. In other words, the *better* the track, the greater the percentage is the power required to *start* in proportion to the power exerted in maintaining the car in motion. I trust the above will explain the matter and answer Mr. P. He is mistaken, when he quotes me as saying the absolute resistance on the new steel rail was greater than upon the worn iron rail, for it was 50 per cent. less in maintaining the car's motion.

AUGUSTINE W. WRIGHT.

Chicago, Ill.

Accidents on Cable Railways.

The best constructed cable railways are liable to accident. These accidents, however, are usually slight, confined generally to breakage of cable, or ineffective working of the grip or the brake, imposing delays varying from half an hour to a couple of hours.

Accidents to individuals have been, as a rule, limited to the loss of a hand or a crushed foot, now and then, but on the whole there are less accidents from the cable railways than from the steam tramways.

A short time ago a very serious accident occurred on the Highgate cable road, London. The car was on a steep grade, and the grip failing to clutch the cable, notwithstanding the brake was shut down hard, the car ran down the hill into the car waiting at the bottom of the grade, completely demolishing both cars and injuring four people. The occupants of the waiting car perceiving their danger, having alighted, only those in the runaway car were injured.

Cases of this kind are of very rare occurrence, and although accidents to the brake or grip are not by any means uncommon, they do not usually result in more serious inconvenience than the failure to stop and start when desired.

ROTCIV.

Heating Cars.

"I am heartily in favor of anything that will tend to make the temperature in the street cars agreeable so long as it will not become a nuisance in itself," said Mr. C. B. Holmes, President of the South Side Railway Company, to a reporter for the *Tribune*.

"What is the real difficulty?" he was asked.

"Why, to get some sort of an apparatus that will heat the cars evenly, and not make it so warm for any one person or half a dozen that they are thrown into a sweat while the others are half frozen. There are many persons who ride on the cars who do not care to have them heated at all, but I would very much like to see them heated."

"What is the objection to stoves?"

"They do not distribute the heat sufficiently, and then there seems to be no way to get rid of the gas and flying cinders. I have talked with people from Minneapolis, New York, Brooklyn, and Cincinnati, where stoves have been tried, and I find that the people are dissatisfied with

them, and have been informed by the officers that they are sorry they adopted them, and that they would be glad to dispose of them if they could get back their investment. One man told me that during a visit to Minneapolis he rode on one of the cars, and that when the door was open for another passenger he was so completely covered with fine white ashes he looked like a miller, and that at the same time the air was charged with a suffocating odor of burning coal. In these cars, as in all others where stoves are now used, the stoves are placed in the end and take up the room of one passenger. All those who are seated near it are overheated, and those furthest off are about as cold as if there was no fire in the car at all. From what I have heard of the plan I consider it a failure. Other kinds of stoves have been suggested, but as yet none of them have proved satisfactory."

"Then you consider that there is at present no practical means of heating cars?" said the reporter.

"O, no; not that. We are experimenting all the while and hope to find some means of satisfying the demand. The cars certainly ought to be heated, and they will be if the proper thing can be found to create the heat. We have tried four or five different inventions, but there seemed to be some objection to all."

"What seems to have been the best of these?"

"It was a stove under the floor of the car, but it did not work as we thought it would, and proved a failure. It was located under the floor in the centre of the car. The stove was nearly flat and it was not necessary to raise the floor to make room for it."

"How about gas and oil stoves?"

"We have tried both with ill success. The trouble with them is that they emit an objectionable odor, especially if much heat is required."

"Do you not think it is possible to provide something which will take off so much of the chill in extremely cold weather that the danger of freezing one's nose and ears in a street car may be avoided? Could you not increase the temperature in extremely cold weather to something like 20° above zero?"

"O, we expect to do better than that. That would be too cold. We are trying everything, and I have no doubt we will soon discover something that will meet all the requirements."

"Is it likely to be a gas or oil stove?"

"I can't say yet. The gas we tried was generated from a mixture of oil and water placed in a tank. It heated tolerably well at times, but the odor was strong and disgusting. We are constantly examining new inventions, and it is only a question of time when the demand will be met, on the cable road at least."

Superintendent Lake of the West Side line, when approached on the subject last evening, said: "I have nothing to say concerning the matter. I have my own opinion about it and will not express it." Upon a suggestion that he might be said to be in favor of heating the cars, he replied that he had expressed his views, and that it was not worth while to exchange words on the subject.—*Chicago Tribune*.

Appreciation.

PUBS. STREET RAILWAY JOURNAL:—

I have received the first number of your publication, and think it is just what Street Railway Companies have been in need of for some time. You can put my name down with the many others which, no doubt, you will receive. Any officer connected with any Street Railway Co., after reading your Journal, who does not subscribe for it at least one year, is not doing justice to his profession.

GEORGE W. GRAETER,
Sec'y and Supt. Vincennes Citizens S. R'y Co.,
Vincennes, Ind., Dec. 24, 1884.

Mems.

THE capital stock of the Greenpoint (L. I.) and Lorimer Street Railroad Company, which has filed its articles of incorporation, is placed at \$120,000. The proposed road is to run through Broadway to Fifth Street, to Division Avenue, to Lee Avenue, to Gwinnett Street, to Broadway, to Lorimer Street, to Van Cott Avenue, to Manhattan, to Meserole, to Franklin Street, to Greenpoint Avenue, and thence to the Tenth and Twenty-third Street Ferries.

THE South Bend (Ind.) and Mishawaka Street Railway Company, which has a capital of \$100,000, has filed articles of incorporation. The directors of the company are Edward B. Dikeman, Perley H. Brown, Jeremiah W. Boynton, J. H. Knight and John Lyons.

BROCTON and North Easton, Mass., are to be connected with a street railway six and a half miles long.

TWO new street railways are reported in Texas; one in Fort Worth and one in Brenham.

A STREET RAILWAY is about to be constructed in Montgomery, Ala.

DAVENPORT, IOWA.—At a "canal and street car" meeting, Hon J. H. Murphy is quoted by the *Gazette*:

"The Hennepin canal subject was then taken up, and Congressman Murphy was called upon to make a statement of its status. He began by saying that while in Congress he had three objects in view—first, the Hennepin canal; second, the horse cars across the bridge; third, a new bridge across the Mississippi."

EDINBURGH, SCOTLAND.—The construction of the first street cable tramway in Scotland is about to be begun on the north side of Edinburgh.

THE Minneapolis Street Railroad is having built by the John Stephenson Co. and Brownell & Wight thirty 16-foot cars, to be equipped with Small's automatic fare collector. The company now has the collector on twenty cars.

THE Third Avenue R. R. Co. (N. Y.) has just closed a contract with Andrews & Clooney to furnish and lay the curves, switches and castings connected with the cable road depot to be built at Tenth Avenue and 125th Street.

— Richard Vose, New York, reports a large number of orders on his books for springs to be filled during the next 30 days.

— The Harlem Bridge, Morrisania and Fordham Ry. is building new car stables at 170th Street, where its offices are now located.

— Andrews & Clooney (N. Y.) report among other orders a number for wheels from South America, some 75 sets for John Stephenson Co., also a number for J. G. Brill & Co. and J. M. Jones' Sons. They have just completed some elevating sheaves for the Kansas City Cable Railway.

— The Third Avenue Railroad Co. has work on road bed nearly completed on about three miles of double track line on 10th Avenue, and about 1,600 feet on 125th Street. This experimental line of cable road is to run from the Harlem to the Hudson on 125th Street and from 125th Street north to the end of Tenth Avenue, which is above 225th Street. It is probable that cars will be running on a large portion

of the line by the first of April. If this trial of the cable system is satisfactory to the company and popular with the public, cable power will doubtless soon supersede horses on the old line of the company.

— President Lyon, of the Third Avenue Co., has spared neither pains nor expense in building cars for the new cable line of the company. The most noticeable features of the cars are a very high clear story, which carries the centre lamp well up out of the way and gives a very nice roomy appearance; the platforms are provided with two gates, only one on each being allowed to be opened, thus compelling passengers to get on and off the car on side nearest the walk; a woven wire screen on sides and wooden frame at ends prevent persons from slipping under the car; doors are hung from the top; six windows on a side.

— Superintendent Robertson, of the Third Avenue Co., N. Y., has designed and built an open car having two rows of reversible cane seats similar to an ordinary smoking car. The sides are closed, compelling

passengers to get on and off only at the end of car. It is probable that their new Tenth Avenue cable line will have a large summer traffic, and the company seems bound to deserve it.

— The Second Avenue R. R. Co. is completing its double track line from 59th Street to Harlem River. Forty super-gear, ventilated ceiling cars are building for the new line by the John Stephenson Co. The large stables on Second Avenue will be extended (185 × 201 feet, 3 storey) to First Avenue.

— The Paterson (N. J.) and Passaic Railway has been extended some three quarters of a mile during the past season.

— The Paterson (N. J.) City Railway Co. has added five new cars built by Jones, Schenectady, and will in the spring extend its track about five miles.

PRATT & LETCHWORTH, Buffalo, have recently filled orders for their Street Railway Hames for the Brooklyn City, and the Dry Dock, East Broadway & Battery railways.

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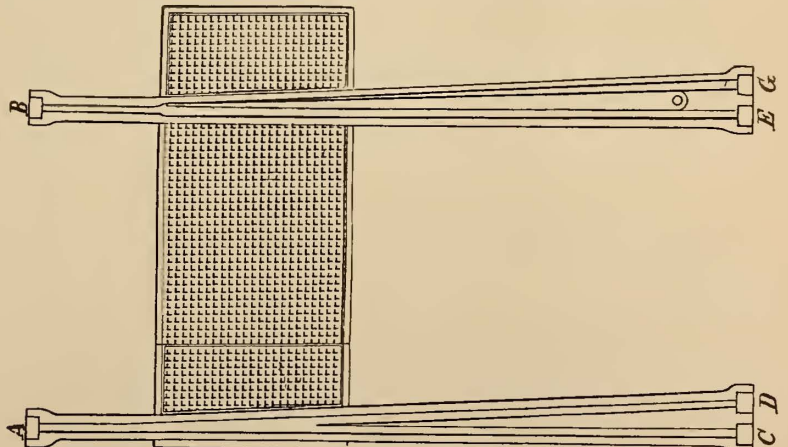
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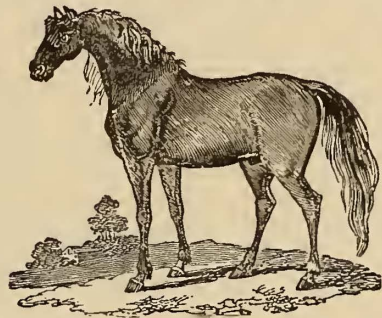
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It gives relief in a short time after it is
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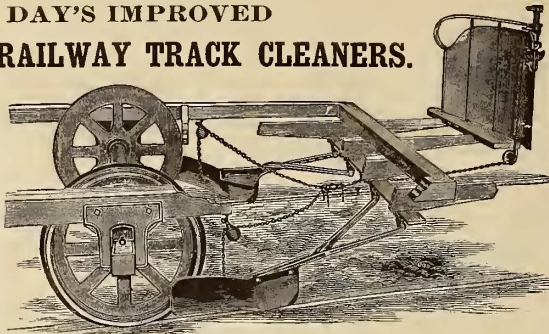
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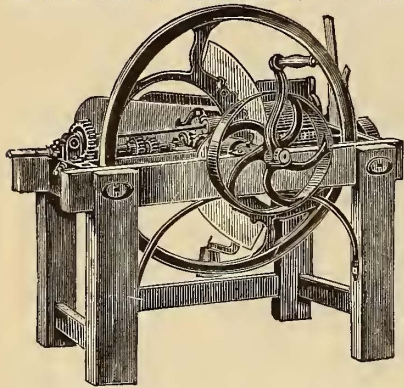
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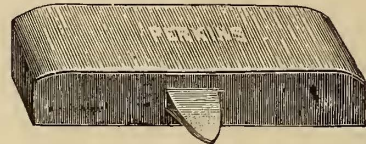
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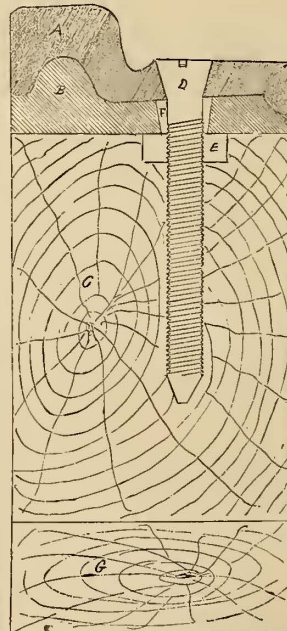
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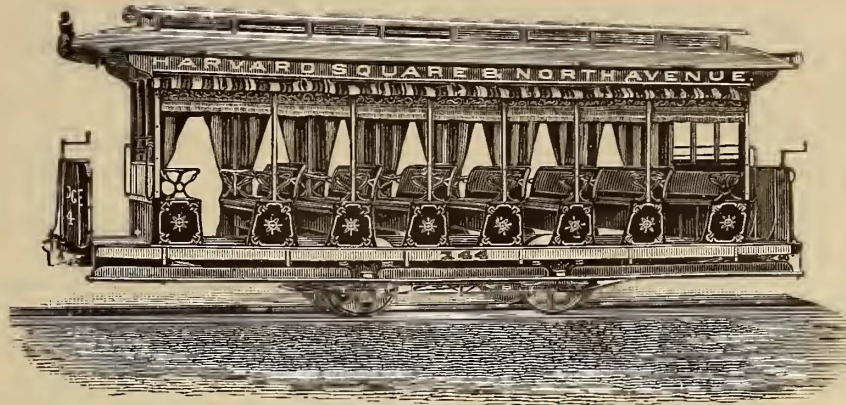
The accompanying cut shows a cross section through joint. *A* is the rail, *B* the joint chair, *C* the stringer, *D* the patent screw fastening, *E* the nut, *F* a slot in chair allowing rails to contract and expand. The chair cannot settle and the rail ends are held level with each other, preventing the many evils of ordinary construction.

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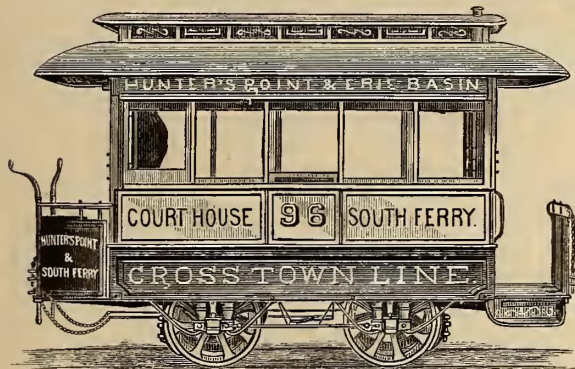
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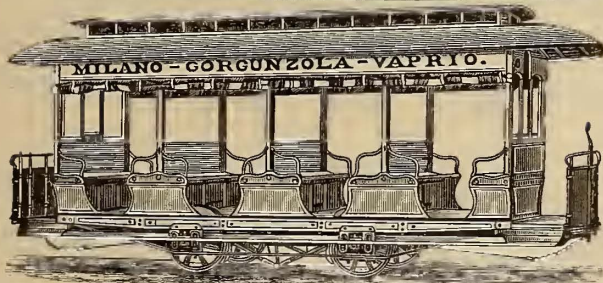
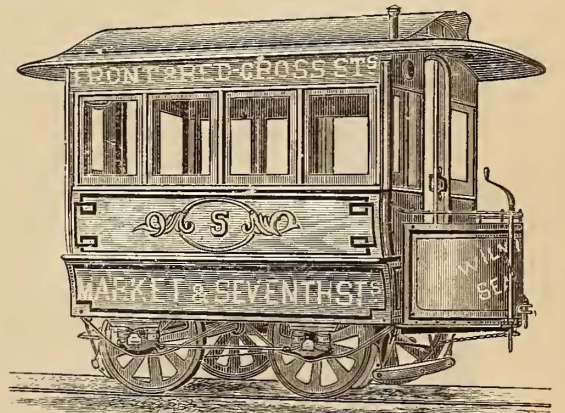
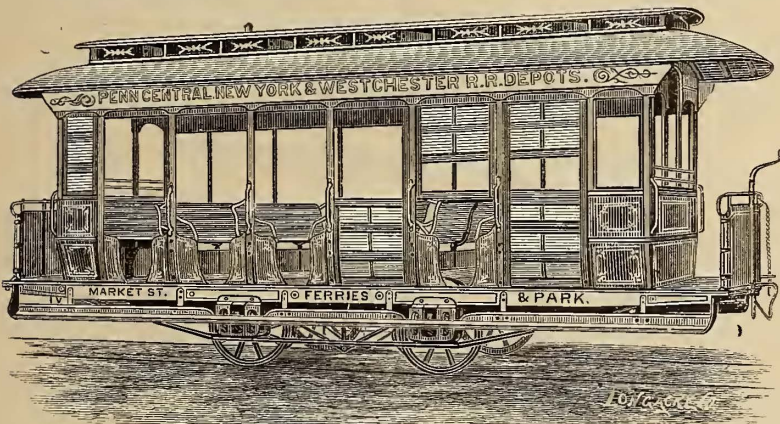
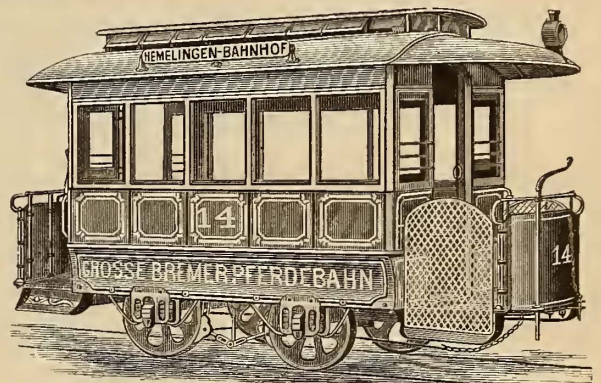
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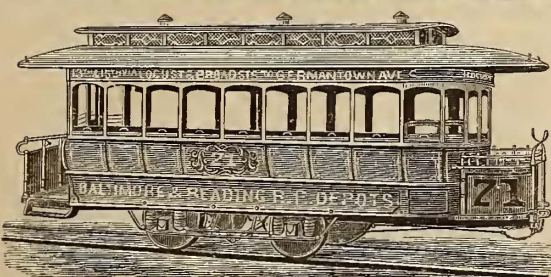
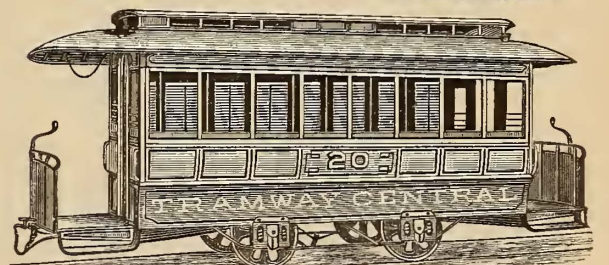
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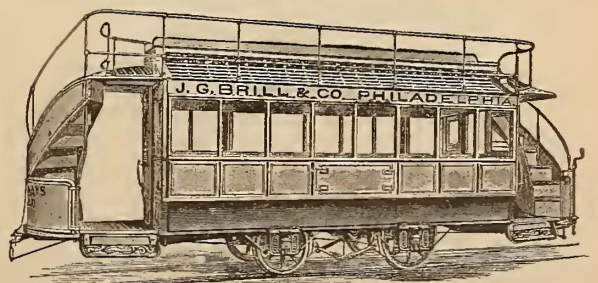
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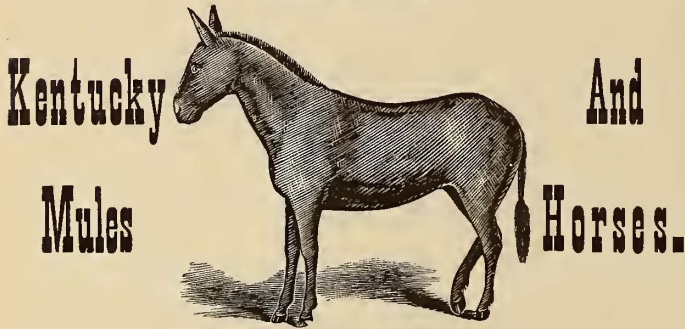
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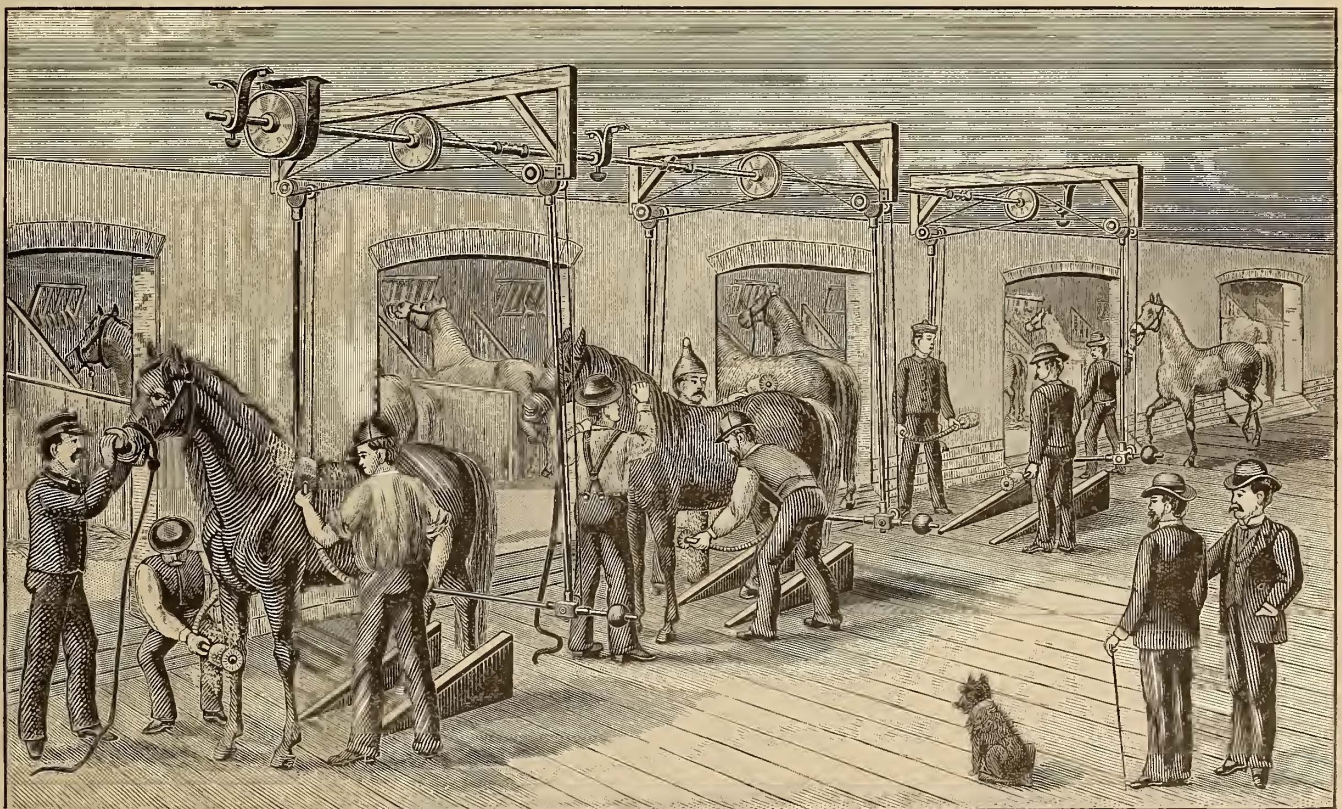


Patent No. 171,282, December 21, 1875.

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This Grooming Machine is in daily use in some of the largest Street Railway Companies' stables, and has always given perfect satisfaction. Among those using it are the City R'y Co., Chicago, Ill.; Detroit City R'y Co., Detroit, Mich.; Central City R'y, Peoria, Ill.; M. W. Dunham, Wayne, Ill.; West Division Street R'y Co., Chicago, Ill.; Lindell Street R'y Co., St. Louis, Mo.; Pleasant Valley R'y Co., Allegheny City, Pa.; Marshall, Field & Co., Chicago, Ill.; Leroy Payn, Chicago, Ill.; Saginaw City R'y, Saginaw, Mich.; Pittsburg and Birmingham R'y Co., Pittsburg, Pa.; and a number of others who have given testimonials as to the perfect working of the machine. For prices, circular and other information apply to

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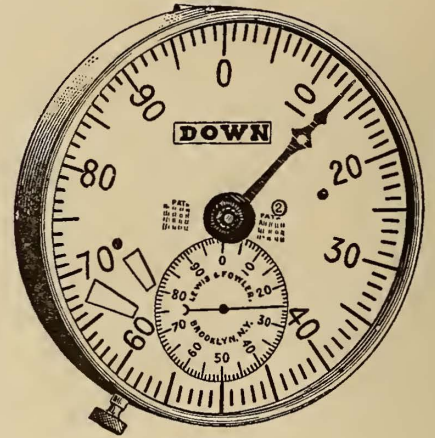
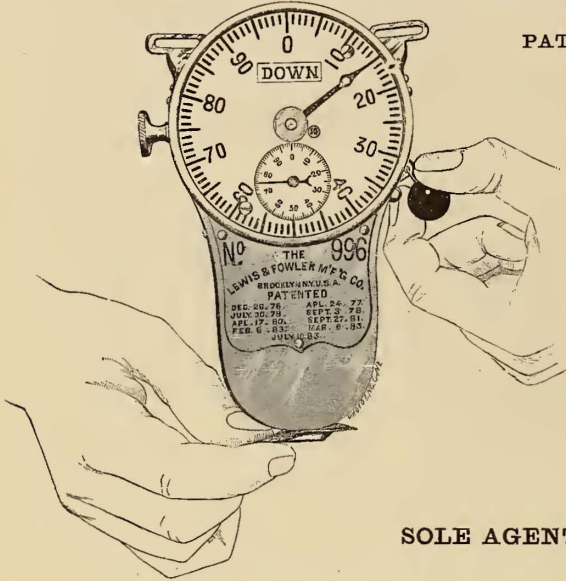
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PATENTEES AND MANUFACTURERS OF

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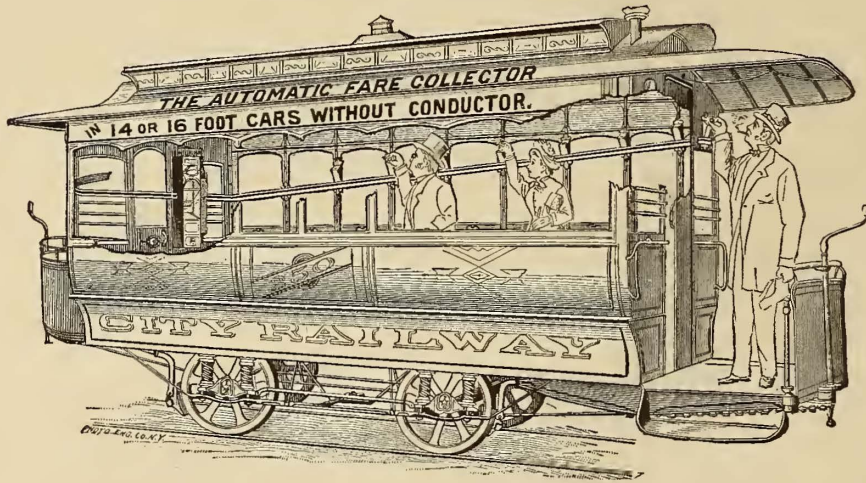
"ALARM"
Passenger Register,
STATIONARY
OR
PORTABLE.



SOLE AGENTS AND MANUFACTURERS OF

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FOR
FARE

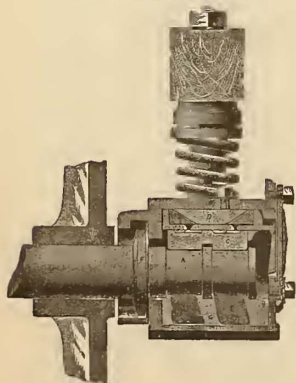


BOX
CARS.

ALSO

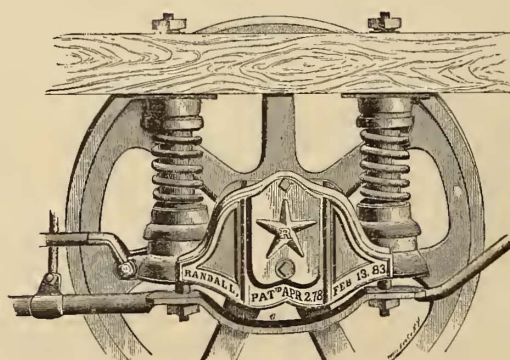
"RANDALL'S" PATENT CAR AXLE AND BOX.

Sectional View.



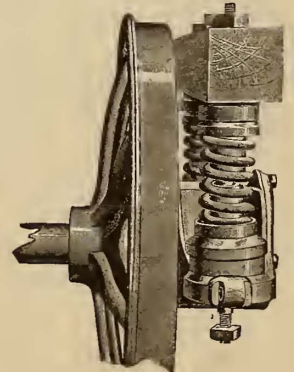
DUST TIGHT.

Front View.



ANTI-FRICTION.

End View.



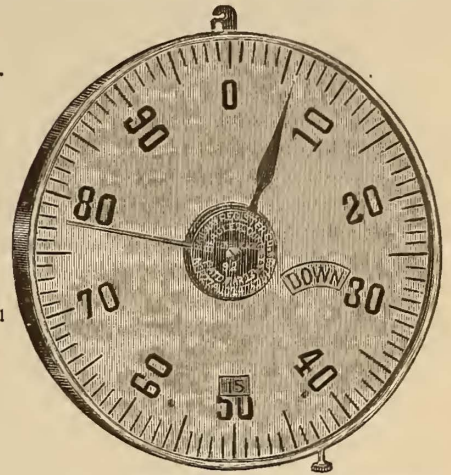
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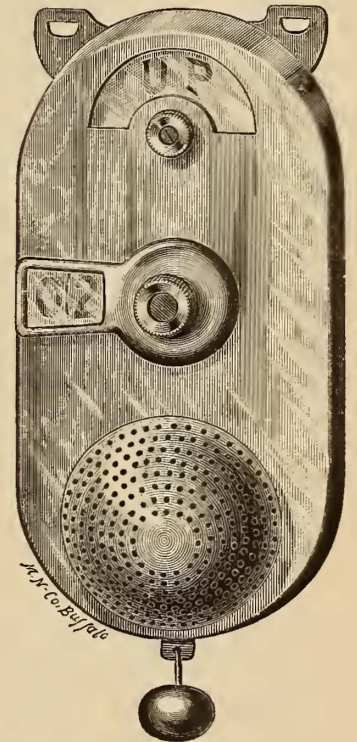
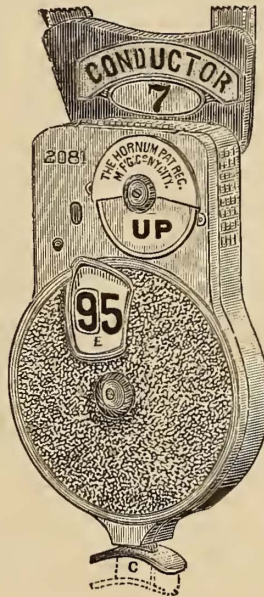
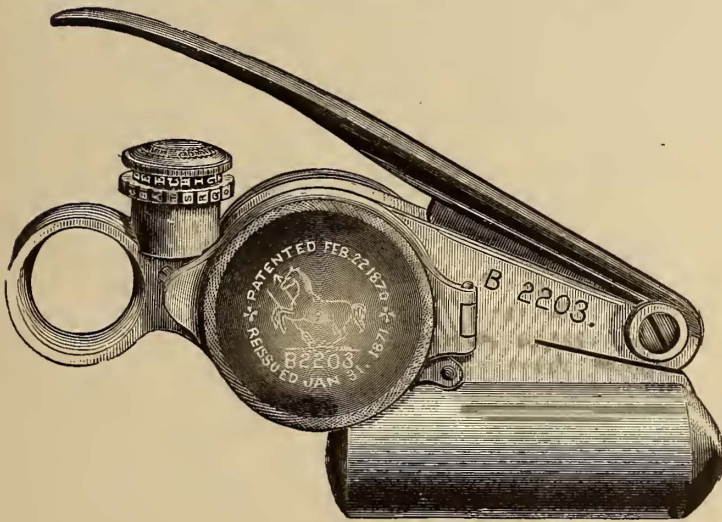
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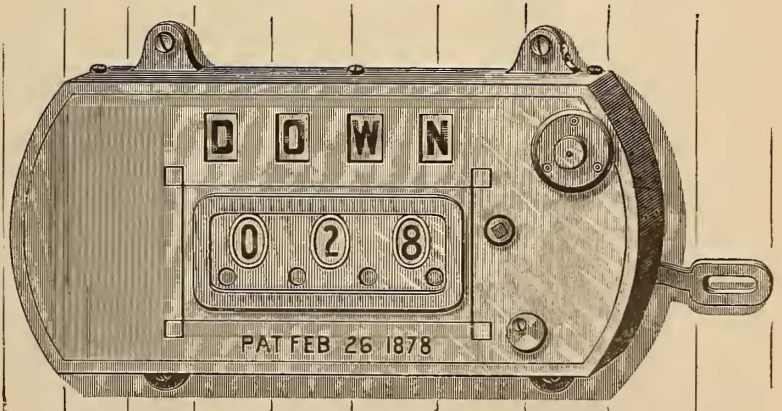
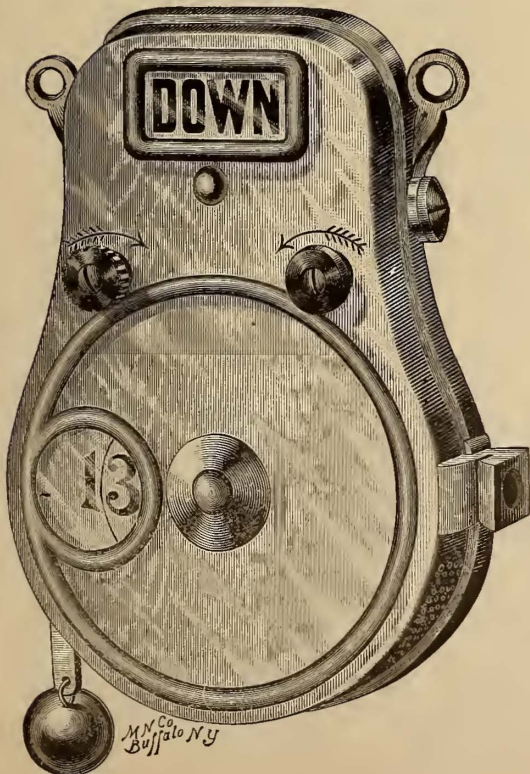
THE ALARM REGISTERING PUNCH.

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Combines Simplicity, Efficiency and Absolute Accuracy.

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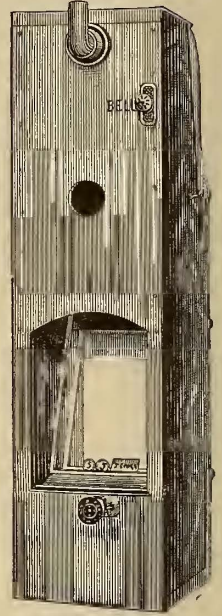
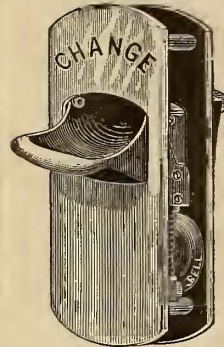
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Front View. No. 3.



Back View. No. 3.

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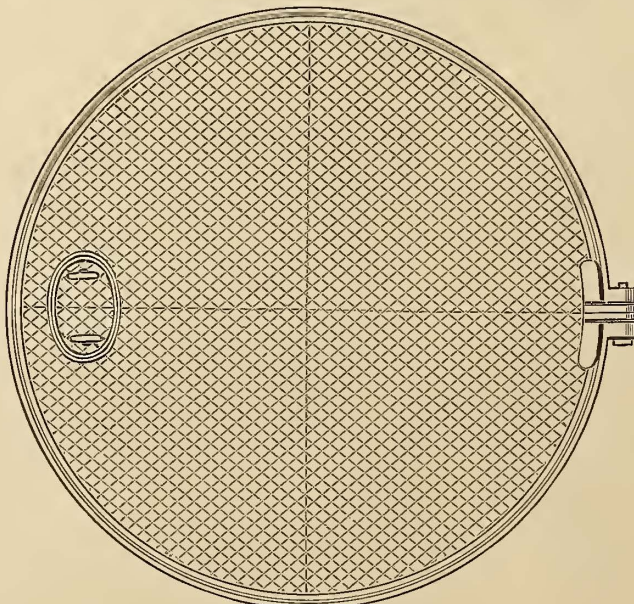
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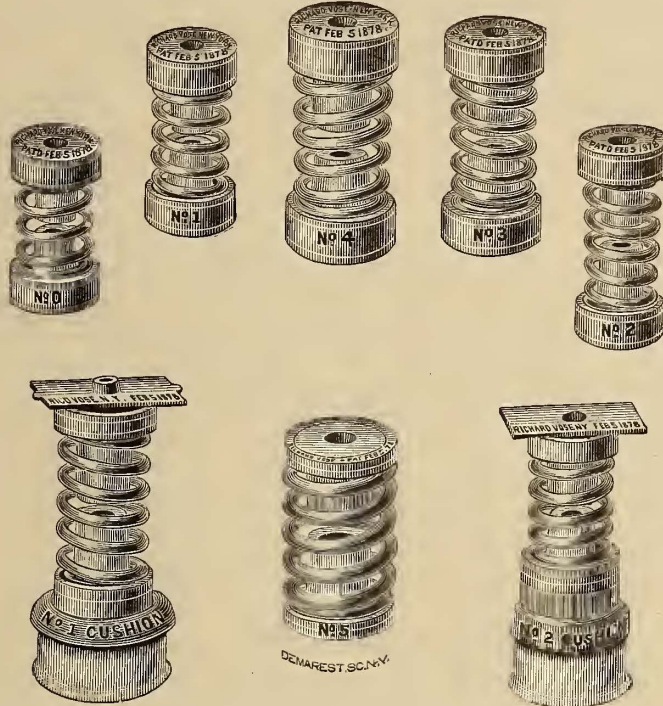
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 No. 5, for 16-ft. Cars.
 (Single Pedestal.)
 No. 1, Cushion, for 16-ft. Cars.
 No. 2, Cushion, for 12 and 14-ft. Cars.

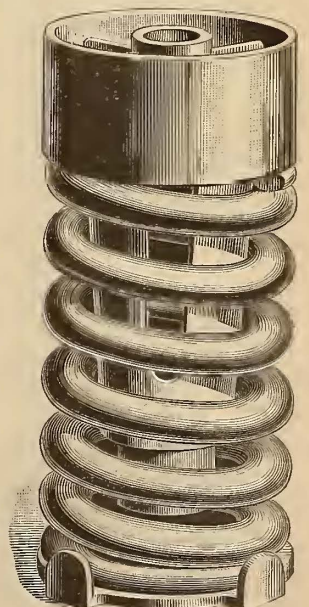
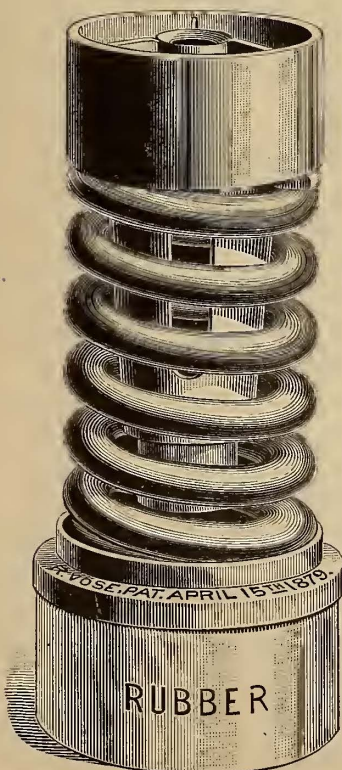
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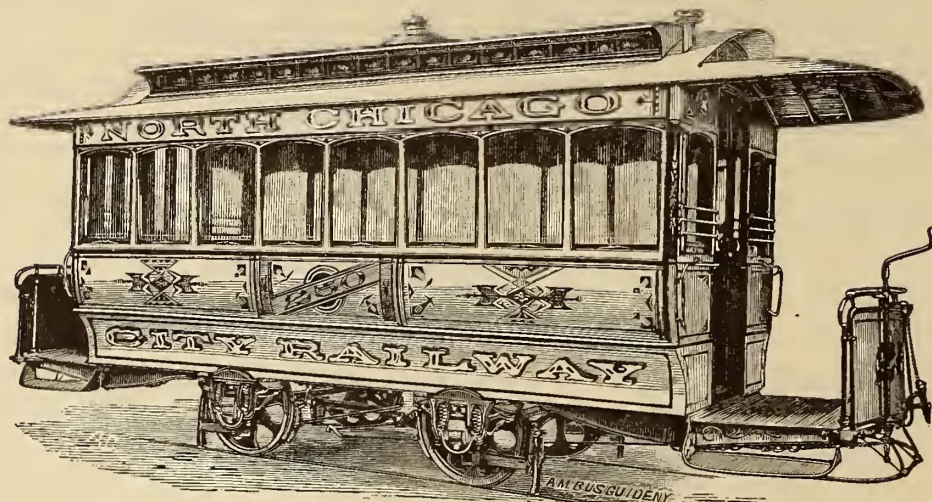


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