

Street Railway Journal

Vol. XXI.

NEW YORK, SATURDAY, JUNE 20, 1903

No. 25.

PUBLISHED EVERY SATURDAY BY THE
McGRAW PUBLISHING COMPANY

MAIN OFFICE:

NEW YORK, ENGINEERING BUILDING, 114 LIBERTY STREET.

BRANCH OFFICES:

Chicago: Monadnock Block.

Philadelphia: 929 Chestnut Street.

Cleveland: Cuyahoga Building.

London: Hastings House, Norfolk Street, Strand.

Cable Address, "Stryjourn, New York,"—Lieber's Code used.

TERMS OF SUBSCRIPTION.

In the United States, Canada and Mexico.....\$4.00 per annum
Single copies, first issue of each month, 25 cents; other issues, 10 cents.

To all Countries outside of the United States, Canada and Mexico....

\$6.00
£1-5s
M 25
Fr. 31

Single copies, first issue of each month, 40 cents; other issues, 15 cents.

Subscriptions payable in advance, by check or money order. Remittances for foreign subscriptions may be made through our European office.

Entered as second-class matter at the New York Post Office.

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EDITORIAL NOTICE

Street railway news, and all information regarding changes of officers, new equipments, extensions, financial changes and new enterprises will be greatly appreciated for use in these columns.

All matter intended for publication must be received at our office not later than Tuesday morning of each week, in order to secure insertion in the current issue.

Address all communications to

THE STREET RAILWAY JOURNAL,
114 Liberty Street, New York.

Two Years of Elevated Operation in Boston

The second anniversary of the beginning of elevated train operation in Boston occurred on June 10, and so smoothly is the road running these days that we doubt if one in a thousand of its passengers realized that twenty-four months had passed away since the opening of the overhead lines for traffic. Although the experience of those strenuous days and nights are still fresh in the memories of those who had a hand in setting the revolutionized system in motion, it has long since come to pass that the timid Boston aunts and grandmothers who vowed never to risk their delicate constitutions in a subway train have yielded to the inevitable, and if the truth were told, would sorely miss the present service if it should be withdrawn.

Congratulations are certainly due to the officials and subordinates of the Boston Elevated Railway Company on account of the able manner in which they have attacked and solved many of the difficult transportation problems which the new service created. About 13,000,000 car-miles have been run off since the road started, and although it is impossible to estimate closely the total number of passengers carried, a conservative figure would be from 125,000,000 to 150,000,000, not one of whom has been killed through any fault of the company, and if our memory is correct the record of injuries received is equally gratifying. There are now 150 cars operating on the elevated division, over 16 miles of track, making about 20,000 car-miles per day. The record of the elevated road splendidly bears out

the testimony of the past in other cities as to the safety of such transportation.

The air brake and the block signal have shown themselves indispensable to the high speed and short-interval train movements operated. The company's experience with the automatic stops attached to the signal mechanism has shown conclusively the value of these devices in preventing over-running of the signals themselves. Over a quarter of a million round-trips are being made each year by the trains, and on each round-trip the motorman passes sixty-eight signals which have automatic stops. Experience has shown that at least two signals are likely to be found set at danger on each of these round trips, on account of the short blocks and close headway adopted. Probably but one signal failure occurs in 25,000 movements, and even these failures are on the side of operating safety.

The punctuality and regularity of the service has vastly improved in the two years, and the long gaps between trains, which were a source of annoyance in the early days of operation, have been almost entirely eliminated. Paralyzing breakdowns are seldom heard of in these days, and it is no exaggeration to say that the system is running like clockwork. The use of four-car trains, the adoption of loop runs from terminals around the Atlantic circuit and back, the increased machine and repair shop facilities, added skill in inspection, improved personnel in train service and better understanding of the despatching requirements have all contributed to the gratifying results. There is no doubt that, in a north and south direction, the people of Boston are being given real rapid transit.

From the standpoint of the transportation expert, however, there are several very formidable difficulties confronting both company and public. It is indisputable that the interests of each are largely held in common, and that neither can be injured without the other feeling the effects. Thus, it has been thus far found next to impossible to reduce the noise of the trains to a comfortable minimum. It remains for engineering science to show how trains weighing 240,000 lbs. can be run at 40 m. p. h. on a steel structure without announcing their passage pretty distinctly. This naturally means expense and trouble for both the road and the abutters, with little remedy in sight at present. Then, again, the depreciation and general wear and tear of rolling stock and roadbed is undoubtedly a source of enormous expense. We think that the operation of trains in a subway originally intended for surface cars only is largely responsible for this. Even multiple-unit trains cannot be economically operated, as regards depreciation, in such a labyrinth of grades and curves as may be found in the present Boston subway. Fortunately, the completion of the Washington Street tunnel will mean the transfer of elevated trains from the old underground precincts to the new, and it is most earnestly hoped that it will be possible to construct this new route more in line with that straight and narrow path which true rapid transit demands. The alignment and grade of the road also made a heavy power consumption. Acceleration is of prime importance, and in operating a three-car train, whose motors are able to draw more power from the line than many a locomotive on a high-speed steam express train develops, it is not surprising that the energy consumption reaches a high

figure, say 5-kw-hours per car-mile, or over 160-watt-hours per ton-mile.

The completion of the East Boston tunnel about Jan. 1 next will bring rapid transit to the inhabitants of that section, and the ultimate operation of three subways in the heart of Boston is certain to greatly improve the transportation facilities. Cambridge and the Back Bay regions are in crying need of better means of transit, and South Boston is yet to be supplied. There is small room to doubt that for some years to come Boston and its environs will be the scene of many striking transportation developments, worthy of the careful study of steam and electric railway experts, and it is a pleasure to record the experience of the first two years of elevated operation, which augurs so well for the success of future projects along the lines of high-speed service.

Special and Standard Apparatus

The relations of the purchaser and manufacturer to special and standard apparatus are of considerable interest in these days of ever-shifting operating conditions. If a careful study were made of the fitness of new electrical machinery and devices for the work encountered when a new or revised system is set in motion, there is little doubt that some remarkable discrepancies between predicted and obtained results would often be uncovered.

The selection of suitable apparatus is a matter of the highest importance in laying out or redesigning a railway or lighting property, and the proper adaptation of the plans to existing standards of manufacture reflects credit upon the engineers in charge. It is easy to adhere too closely to established practice, and to stifle originality because of the supposed certainty of favorable operation with standard types.

Special apparatus is always expensive to manufacture and develop, and consequently it is costly to the purchaser. Its selection frequently involves long delays in promised shipments, caused by its interference with or difference from the regular output of the factory, the experimental investigation and tests required and possible alterations needful in the design as the work proceeds. Prediction of its behavior in daily operation must, at best, be based upon the work of the manufacturer's testing department instead of upon months or years of working experience. Again, the question of renewals is likely to be complicated by expense and delays in the factory. Special types must not be made standard too quickly if progress is to be permanent. Off-hand, it would seem like a clear case in favor of the standard apparatus, but a little further consideration will show that some marked disadvantages are chargeable to the latter.

Conditions of operation often change so rapidly with the development of new systems that standard apparatus cannot keep pace with requirements. It is undoubtedly to the manufacturer's advantage to turn out as much stereotyped machinery as the market will take, since money once spent in developing fixed types of apparatus shrinks in importance relatively as the sales record grows. But we are here confronted with inelasticity to a marked degree, which fails to recognize that the most continuous and lasting profit to manufacturer and purchaser depends upon each being equally benefited. Although standard apparatus can generally be easily replaced and spare parts supplied, it may quite as readily fall short of the highest adaptation efficiency, and represent in its imperfect fitting to its assigned place a considerable annual financial outlay in excess of the interest on the extra cost of developing and making more spe-

cialized equipment. Then, too, the extended production of standard types discourages the commercial applications of special forms of apparatus, even if it does not lessen the appropriation for the testing department of the progressive manufacturer. The catalogued list of standard appliances and machines may readily be too large and too small in adjoining sizes to fulfil a particular service, and not come within hundreds of dollars of the proper design. Local conditions may demand the modification of standards as the price of reliable and economic service. Inferior workmanship and material stand a much better chance of being discovered in new and special types of apparatus than in established standards. The former are watched at every step of their manufacturing, test and operation, while the latter are rarely as rigidly inspected or tested after the type has become standard.

Thus, the choice of apparatus really depends upon the individual circumstances of the case in hand. We believe that each type has its proper place, and that careful consideration will generally show which, in the long run, is likely to give the better service. The engineer who always specifies standard apparatus runs no risk of being classed as original or revolutionary, while one who constantly calls for special apparatus is prone to create "freak" installations. The financial result should always be kept in view, as it has a direct bearing upon future plans. We have in mind one railway project which was along radically different lines from any previously undertaken, and could not be properly executed without the development of special apparatus, but it required constant care not to overdo this idea of specialization. Whether standard or special apparatus was to be purchased could be decided only after the most careful analysis of the conditions, with due regard to the requirements of present operation and possible extensions.

In general, it may be said that special apparatus should never be ordered for regular service until exhaustive tests have been made to establish its correctness in principle and design. After it has been placed in commercial operation it should be watched carefully and constantly until its reliability and economy have been established. Then, and not until then, should the new appliances be made standard, and permitted to exhibit that remarkable phenomenon upon which the progress of engineering science depends—the elimination of standard apparatus and the standardization of the special.

Interurban Roads in Iowa and Other States

Interurban railroad building has not progressed as far in Iowa as in Ohio, Michigan and Indiana, but there is probably no State where the interurban promotor is so active as in Iowa at the present time. Iowa is as yet a rather untried territory for interurban railway construction. It did not offer, in the early stages of the history of interurban building, the conditions which were apparently necessary for the success of an interurban road, namely, a number of cities and towns of considerable size located within a few miles of each other. Iowa is primarily and above all an agricultural community. It might almost be called the agricultural State of the Union, as it nets a greater value of farm products per acre than any other State. While there is considerable manufacturing in the cities, and this is on the increase, there is not enough of it yet to build up the large towns close together which are found further East. The few interurban roads which have been built in that State, however, seem to give considerable encouragement to such enterprises.

The principal city, Des Moines, is being made an interurban center to an extent somewhat surprising, when it is

considered that there are but few towns of any size near it within a radius of 50 miles. The notes on one of the interurban lines out of Des Moines, which appear elsewhere in this issue, give somewhat startling figures as to the population in towns and villages along the line. Not a few experienced interurban railway builders would turn down such a proposition at first glance, without going to the trouble of a thorough investigation, because of the low population. The backers of this line seem to have had much faith in the revenue to be derived from the farms along the line, as well as in the future development and increase in population. A town and village population of 100 per mile, even when coupled with a rural population of about 200 per mile, would not seem to be very attractive, yet the results appear to have surprised the builders of the road as well as many others. While the results of a full year of operation will tell more than those of the first few months, there is considerable cause for encouragement in the earnings so far, and this information is especially valuable at a time when there is need for data on actual earnings from roads built under Iowa conditions.

As we have before pointed out it is not safe to use earnings of an interurban road in one State as a criterion from which to judge the probable performance and earnings of a road serving a similar population in another State, for the conditions there are distinctly different from those in Illinois, and there is a still greater difference between them and conditions in Indiana, Michigan and Ohio. In the first place, the farms are larger in Iowa than in the other States mentioned. This, of itself, has a tendency to keep down the rural population per square mile. On the other hand, Iowa soil is capable of supporting as great, and probably a greater population, than any other soil to be found in the Middle Western States, and many times the population now living on it. For this reason it is but natural to expect that the population will increase, especially with the interurban railway and the telephone to make country life more desirable. If farming on a large scale with scientific methods keeps down the amount of labor required per acre considerably below that common in the Eastern States, and thus tends to keep down the population necessary to work the farms, there will at least be an increase in the value of farm products, more money among the farmers, and, as a natural result, an increase in the amount of money spent both for passenger and freight transportation. These facts make it certain that for any road which can at present make fair earnings in that State by serving a rural population, there is certainly a good future. There is some justification for the enthusiasm for interurban construction which is just now sweeping over that very fertile State, although, unfortunately in some cases, the enthusiasm is founded on ignorance.

The Hot Air Line

We do not in the least degree wish to dampen the ardor of those behind legitimate enterprises of this kind, but having spoken encouragingly regarding the earnings of the interurban roads already built in Iowa, we should also combine with it a warning against some of the ill-advised efforts that are being made at present to put through electric railway enterprises which cannot for many years prove profitable, or which are being promoted by unscrupulous promoters, whose chief assets are good clothes and glib tongues. The "hot-air line" interurban promoter, as he is familiarly called, is probably more active in Iowa than in any other State just now, and it is hardly necessary to warn electric railway managers in the larger towns against him. Indeed, some of our friends in that terri-

tory have had plenty of experience with promoters of this kind, and have become expert in handling them, although it is not always an easy job. The desirability of more interurban roads has been so thoroughly talked into the heads, not only of the farmers but of the merchants of some of the larger towns, that when a new interurban is projected it becomes easy for the "fake" promoter to find in the larger towns adherents to the idea which he so smoothly suggests, that the interurban road should have an entrance to the town independent of the local city line. And here is the point to the whole matter. There are numerous excuses which may be readily advanced in favor of this proposition; namely, the inability to maintain high speed through city streets over local railway lines, and the necessity for adequate terminal facilities independent of the local system, to permit the handling of freight. But these are not the real reasons.

The "fake" promoter knows that he can never float securities to build his interurban road, and that it will never get beyond the "hot-air" stage; but he does know that the city franchise, once secured, can make considerable trouble for the company already in possession in the city. His one hope and salvation lies in being able to find capital to aid him in his plans to hold up the city company. Of course, there are cases where city companies exact unreasonable terms of legitimate interurban enterprises, but it is not to such cases that we now refer.

The class of promoters to which we refer usually have several mammoth projects under way, and represent some mysterious Eastern syndicate, the members of which are kept a profound secret, for the obvious reason that they do not exist. These promoters belong to the same class as the lightning-rod man of old, except that their operations are carried on upon a somewhat larger scale, and extend not only to the farmers along the proposed interurban, but to the citizens of the larger towns. From these latter they expect aid in demanding and securing franchises "for the much-needed road," which franchises they will ultimately use as a club to extract money from the city companies. This class of promoter has been so active in some localities as almost to make the word "interurban" nauseating to the local electric railway men to whom it is mentioned.

Then, too, there is the honest enthusiast, who believes that by some mysterious process, equivalent to reversing the laws of gravitation, his particular interurban road will prove a bonanza to a territory so thinly populated that no steam road has ever dared to enter it.

An inspection of the lists of projected interurban railways in Iowa which have gone the rounds of some of the daily papers leads to the conclusion that the two classes of promoters just mentioned must, indeed, be numerous in Iowa. Nevertheless, in all seriousness, there is undoubtedly a great future for the well-planned and well-located interurban road in that State, and as present roads are gradually extended information will be available, which will, year by year, indicate how far it will pay to go with the building of interurban roads there. Iowa would seem to be the natural territory for the development of the less expensive types of interurban road—roads which will serve well a rural population and agricultural districts, bringing all parts of the country into better communication with the numerous steam trunk lines of the State. That steam road builders have realized the great resources of Iowa it needs only a glance at a railroad map of that State to show, and where the steam road prospers the electric should prosper also.

A REMARKABLE IOWA INTERURBAN

The Interurban Railway Company of Des Moines, Ia., has been operating since last December an interurban line between Des Moines and Colfax, which is of more than ordinary interest to interurban railway men, because of the remarkable

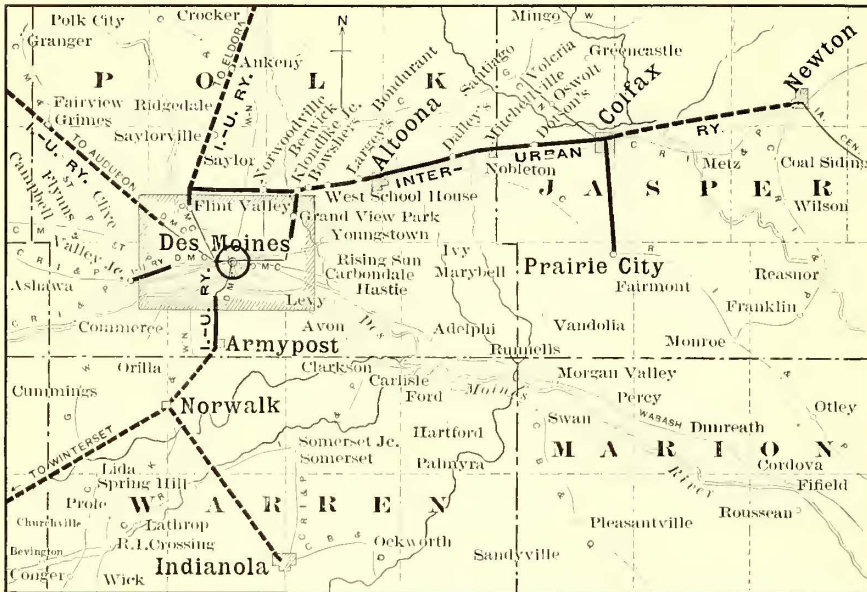
tion, according to the 1900 census, of 62,139. The population outside of Des Moines in towns and villages along the Colfax line is as follows:

Altoona.....	328
Mitchelville.....	768
Colfax.....	2,053

Total..... 3,149

The Colfax line has altogether about 30 miles of track to operate, so that the population outside of Des Moines per mile of track in towns and villages is only a little over 100, which is so small as to appear almost ridiculous to the conservative, experienced promoter. However, there is more to the proposition than appears from the town and village population. As is well known Iowa is one of the best agricultural States in the Union, and in some parts the rural population runs very high, although it does not approach that found in some of the fruit raising valleys of California or the semi-suburban territory in some of the Eastern States. Taking the population of townships from which this line operates, so as to give the population within 3 miles of the line, exclusive of that in towns and villages, it is found that the rural population is 6260, or about 200 per mile, which, added to the town and village population,

makes 313 per mile. As has been pointed out editorially in the STREET RAILWAY JOURNAL recently, a rural population yields much more revenue per capita than the population in towns



MAP OF INTERURBAN SYSTEM

amount of traffic it is obtaining in a territory which, at first inspection, would seem to be so sparsely populated as to make possible no adequate returns on an investment in an interurban line. The Interurban Railway Company at the present time operates three distinct lines out of the city of Des Moines. In addition to the one recently finished to Colfax there is one south to the United States army post, and one west to Valley Junction. These are comparatively short lines, however. The army post is but 2.5 miles beyond the terminus of the Des Moines City Railway tracks, or 5 miles all told. The Valley Junction line is only 3.39 miles, exclusive of the Des Moines City Railway mileage, or 5.89 miles, including the city tracks.

A map of the Interurban Railway Company's lines out of Des Moines is given herewith. The Colfax line is 23.5 miles long from Colfax to its junction with the Des Moines City Railway, and has also a belt line 5 miles from Klondike Junction to Flint. This company is closely allied with the Des Moines City Railway Company. In addition to the lines built, as shown in the map, surveys have been made for lines to Indianola, Winterset, Eldora and Audubon, and also for extensions of the Colfax line from Colfax to Newton and from Colfax to Prairie City. The extension from Colfax to Newton will probably be the first one completed. Altogether about 250 miles of interurban road is being considered by this company, although for the present, effort is being concentrated on the extension from Colfax to Newton. The line from Des Moines to Colfax, mentioned at the beginning of this article as showing a remarkable traffic for the population served, is the one to which most attention will be given, on account of its exceptional interest.

Des Moines, which is the capital of the State, has a popula-



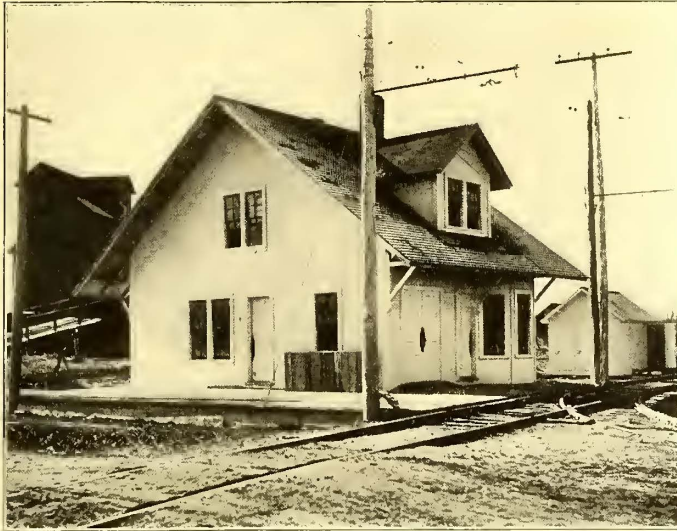
TYPICAL COUNTRY CROSSING

and villages, because the interurban road is of more importance to the rural population, and is used more by it than by the village population.

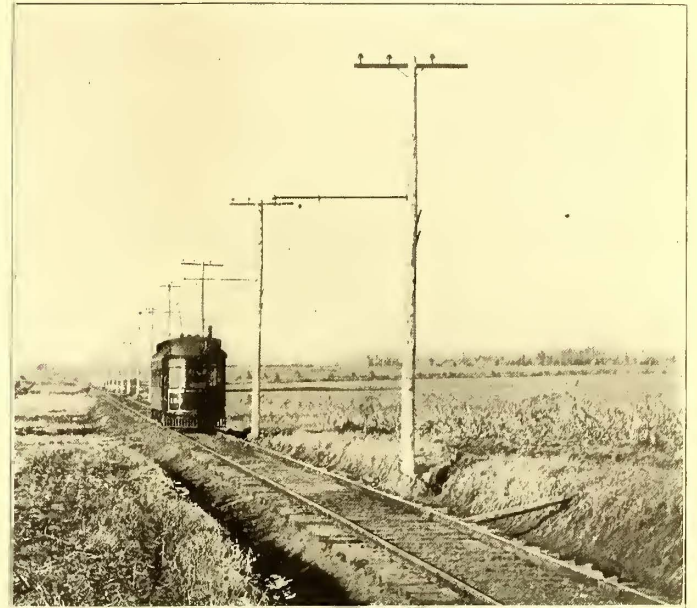
While the present gross earnings may be nothing very startling in amount as compared to interurban railway earnings elsewhere, they are remarkable considering the small population served. During the winter months the receipts have

been a pleasant surprise to the officers, and the belief is confidently expressed by the management, after considering the winter earnings, that with the increase in travel which always comes during the summer months to an interurban road, and which will come especially to this road because it will be the

States. The farms in Iowa are not as yet, and probably never will be, as small as those in the Eastern States, which fact



ALTOONA FREIGHT AND PASSENGER STATION



LINE VIEW, SHOWING OVERHEAD WORK

popular means of communication between the mineral spring resorts at Colfax and the city of Des Moines, that the gross earnings for the first year of operation will be as high as \$3,200 per mile of track. Such results would certainly be very grati-

tends to keep down the present passenger earnings per mile. But on the other hand Iowa soil is remarkably fertile, and probably yields more per acre to the farmer than any other land in the United States, with the exception of some of the Cali-



TRESTLE AND FILL

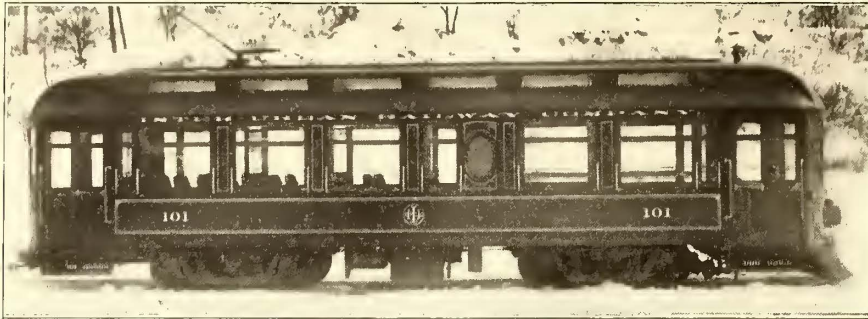
fyng and encouraging to the builders of interurban roads through rural districts of this character. At any rate, whatever may be said as to the financial value of the road under discussion it is evident that when considering proposed interurban roads in the State of Iowa earnings must be estimated upon a somewhat different basis than in other agricultural

fornia fruit valleys. Therefore, Iowa soil is capable of supporting either a very large rural population or a very rich one, from either of which there will be considerable revenue as the State grows older if interurban roads are built so as to afford easy communication with the larger towns. At least, this is the conviction of those who have financially backed the Inter-

urban Railway Company, and who have great confidence in the future and possibilities of the fertile country in the neighborhood of Des Moines.

FREIGHT BUSINESS

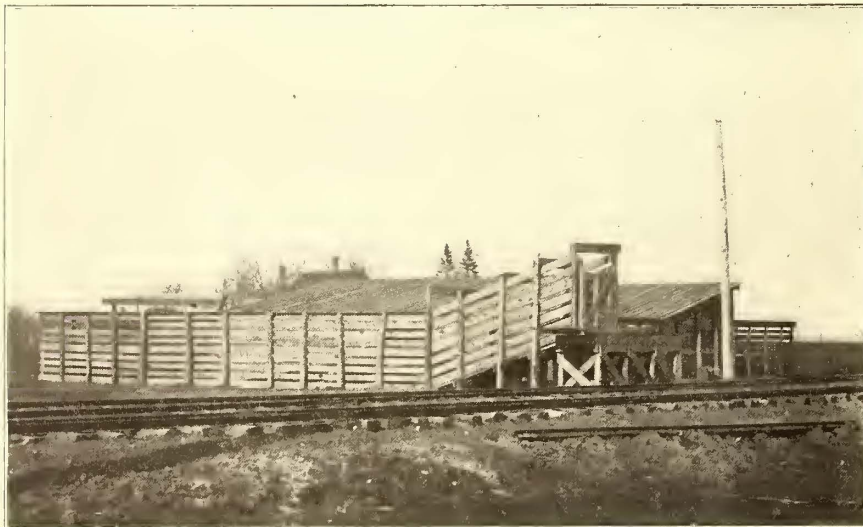
An inspection of the map shows a line completed between Klondike Junction, on the Colfax line, and Flint Valley, a dis-



STANDARD PASSENGER CAR

tance of 5 miles. This is operated at present entirely as a freight line, except between Klondike Junction and Norwoodville, and, in fact, serves the purpose of a kind of belt line connecting not only with the electric interurban line to Colfax but also with the steam railroads which it crosses. This line, in connection with one of the lines of the Des Moines City Railway, over which freight can be hauled by a provision in its franchise, gives an electric freight service to and through the heart of Des Moines. It is evident that this feature in itself will prove of considerable value, as the Des Moines City Railway franchise enables it to deliver freight directly to a number of manufacturing concerns. The Interurban Railway is also the only line by which freight can be delivered to the United States army post.

The Colfax line parallels the Chicago, Rock Island & Pacific Railway. Consequently, it to a certain extent competes with that road for freight traffic. Stock yards have been built at Dotsons, as shown in one of the illustrations. Similar yards are to be built at Mitchelville and at Colfax. By building stock yards at frequent intervals it is expected that much of the stock will be shipped by electric road that would otherwise



STOCK YARDS AT DOTSONS

go to the steam road. The stock, which is practically all for shipment to Chicago, is delivered to the Chicago Great Western Railway at Norwoodville, north of Des Moines. The natural route for stock to be shipped from points on the Interurban Railway for Chicago would be to deliver it to the Chicago, Rock Island & Pacific at Colfax. Since, however, the Chicago, Rock Island & Pacific has seen fit to oppose the

electric road as far as possible, the Great Western gets the business, all of which goes to show the advantage to a steam railroad company in co-operating with rather than fighting electric lines which are in a position to give the steam road business. Carload freight is hauled with the "Jim Brenton," an electric locomotive. This locomotive is equipped with four

General Electric 67-motors, and is weighted with pig-iron to give it extra traction. In the winter time it is used as a snow-plow to clear the road. This locomotive has pulled ten Baltimore & Ohio coal cars of 80,000 lbs. capacity, each loaded with 40 tons of steel. It has hauled two of these cars over as high as a 4 per cent grade, although this feat overloaded the motors. Package freight is taken by an express car, which makes two trips each day and some days three trips. The freight tariff is 85 per cent of the Iowa steam railroad distance tariff. Freight is exchanged with all steam roads. The company has

for freight purposes four flat cars, one box car and eight ballast cars. The large freight equipment of the Des Moines City



SUB-STATION AT MITCHELLVILLE

Railway is available, however, for use on the interurban lines, if required.

EQUIPMENT

The interurban passenger cars, one of which is illustrated, were built by the St. Louis Car Company. The trucks were made by the same makers, as were also the arc headlights. These cars are 46 ft. over all. In one end is a smoking compartment with side seats. The toilet room is between the compartments. The main compartment has regular cross-seats.

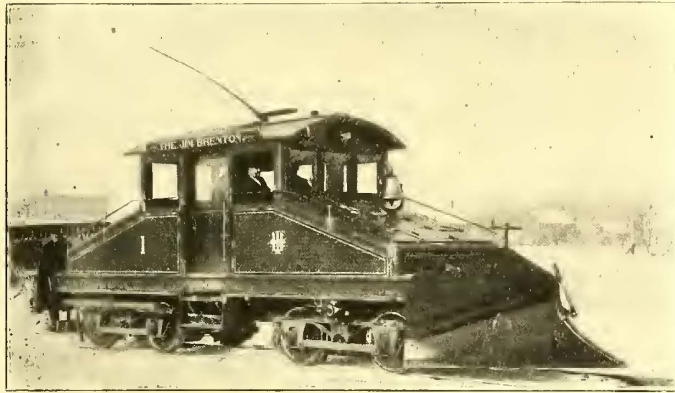
The rail is 60-lb. standard T from Des Moines to Altoona. The balance of the distance to Colfax is 70-lb. rail. Every third tie is oak, the balance being cedar, except that there are three oak ties in succession under each joint. A good idea of the nature of the country and the track and line construction is obtained from the accompanying illustrations. Bracket construction, using the Ohio Brass Company brackets with flexible suspension, is used for the most part. The trolley wire is a figure-8 section, equivalent to No. 0000. Gravel ballast is obtained from two gravel pits along the line. The maximum grade is

2½ per cent and the maximum curve 3 degs., except at one point in the city, near Grand View Park, where a grade of 4 per cent is encountered. Freight traffic, however, is taken round by way of Norwoodville and Flint Valley, so that this grade is avoided. Turnouts are provided every 2 miles. Oil switch lamps are maintained on all switches. Power is obtained from the Des Moines City Railway power house by an

alternating-current transmission at 13,000 volts. There is but one sub-station at present, and this is a brick structure. It is located at Mitchelville, combined with the freight and passenger office, as shown. At Altoona a frame building has been erected for a freight and passenger depot. The section foreman's family occupies the second story of this depot, and his wife is the freight and passenger agent.

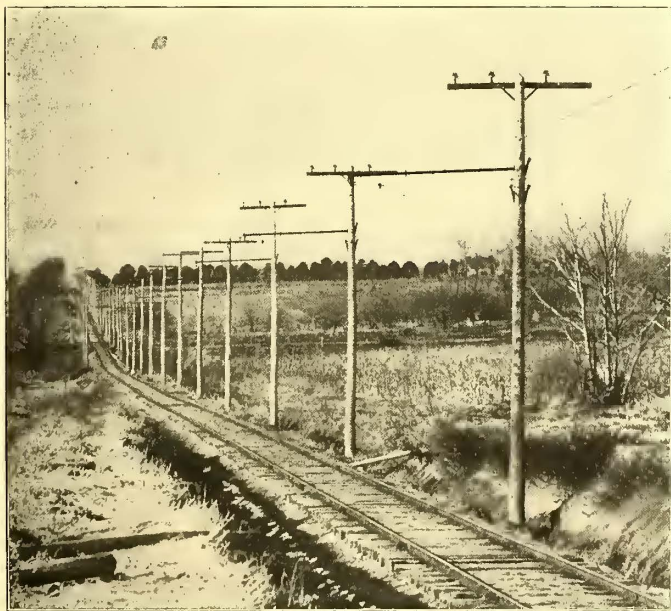
OPERATION

The running time from Des Moines to Colfax is one hour and thirty minutes, and there is one car every hour. The Des Moines City Railway maintains a despatcher, who also



FREIGHT LOCOMOTIVE

despatches the cars on the interurban from his office in Des Moines. Stromberg-Carlson portable telephone outfits are provided for each car, and spring jacks are placed at the turn-outs, so that car crews can plug in and talk with the despatcher. Written orders are required for all car movements, except when cars meet according to the time-table. The despatcher and each car crew is provided with a register on which the



LINE SCENE

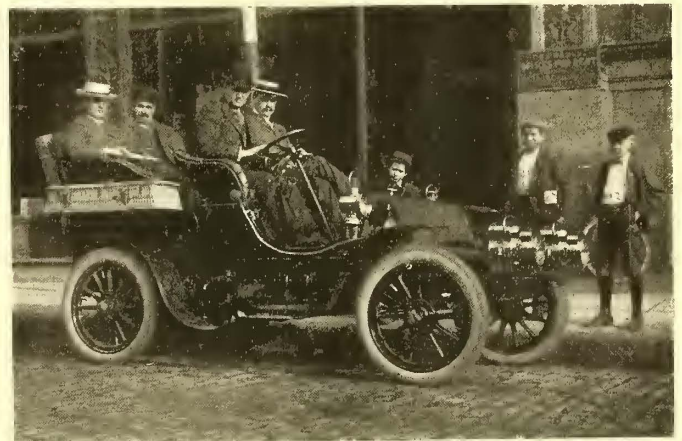
orders are written in triplicate. This is a register made by the Egry Automatic Register Company, of Dayton. It is a compact device, holding paper and carbons in a convenient form, so that orders can be written on an exposed order blank in the face of the register. After writing an order, by turning a crank the conductor can withdraw two of the copies of the order, one for the motorman and one for himself. The third copy remains in the register, and the register cannot be opened by anyone save the manager of the road, who has the key. In receiving orders the conductor writes the order and reads it

back to the despatcher for the despatcher's "complete." Interurban cars do not stop at every street crossing in the city, but only at places designated as interurban stopping places, which places are marked by signs about every four blocks.

The officers of the Interurban Railway Company are H. H. Polk, president and manager, Des Moines; A. W. Harris, vice-president, Chicago; George B. Hippee, treasurer, Des Moines; W. I. Haskett, secretary, Des Moines; J. F. Johnston, general freight agent; E. B. Beigler, general passenger agent; James E. Welch, master mechanic. N. W. Harris & Company, bankers, of Boston and Chicago, floated the bonds and are the financial backers of the undertaking.

AUTOMOBILES FOR INSPECTING

It may be a case of setting a bad example to the general public, but a number of prominent electric railway officials have discovered that when it comes to getting around a city quickly and comfortably the average street car is not in it with a speedy automobile.



AUTOMOBILE USED FOR INSPECTING IN CLEVELAND

The illustration herewith is from a snap shot taken in front of the headquarters of the Cleveland Electric Railway Company just as President Horace E. Andrews and General Manager John J. Stanley, with a couple of employees, were starting on a line inspection trip covering several outlying districts of the city. Mr. Stanley is at the wheel, while the president-to-be of the Cleveland consolidated system is on the right. Both gentlemen have recently purchased handsome Winton touring cars and use them frequently in trips about the city and surrounding country. For such work the automobile has the advantage over the private car in that it may traverse short routes, and is not held up by scheduled traffic, besides furnishing a pleasant outing not attainable under the old method.

On June 11 the Rapid Transit Commission of New York received from Leon Schmidt, representing Schmidt & Gallatin, the subway syndicate managers, an alternative proposition providing for moving platforms to connect the new Williamsburg Bridge with the Brooklyn Bridge and South Ferry. The proposition provides for the construction of the platform on the same terms as the subway, to run from the Williamsburg Bridge to Delancey Street, to the Bowery, to Park Row, to Nassau Street, to Broad Street, to South Ferry. The proposition includes 3-cent fares, with two tickets for 5 cents. It was referred to a committee. If the plan is accepted the contractors are to maintain the road under a fifty-year lease, with a renewal privilege of twenty-five years, paying an annual rental equal to the bond interest. At the end of the time the city is to acquire the entire property.

ELECTRICAL TRACTION ON THE NORTH-EASTERN RAILWAY OF ENGLAND

Of all the great English steam railway lines the North-Eastern Railway Company has been the first to grapple, on a really large scale, with the problem presented by the steady increase in working expenses and tramway competitions.

The proposal to electrify a portion of the suburban lines of this company in the neighborhood of Newcastle-upon-Tyne is, therefore, of considerable interest, more especially as the conditions prevailing on these lines are typical of those which must, sooner or later, be faced by every railway manager in Great Britain if they wish to increase or even to maintain the profits derived from suburban traffic.

Fig. 1 shows the lines which are now being electrically equipped and also indicates the position of the generating stations and sub-stations which will provide the necessary electrical energy.

The city of Newcastle is situated some 8 miles from the mouth of the Tyne, the intervening districts on both banks of

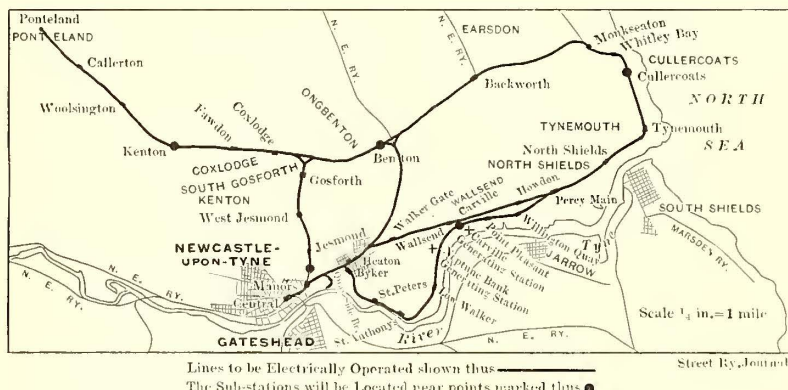


FIG. 1.—MAP SHOWING SYSTEM OF THE NORTH-EASTERN RAILWAY, NEAR NEWCASTLE, WITH PORTIONS TO BE ELECTRICALLY EQUIPPED

the river being densely populated and containing an almost continuous succession of shipbuilding yards and engineering and other works.

To the north of the mouth of the river lie Tynemouth and Whitley Bay, which are residential districts in addition to being the favorite holiday resorts for the whole of Northumberland. Between Newcastle and the sea there is, therefore, a large traffic the whole year round, and this is swelled to enormous proportions during the holiday seasons.

The lines which are now being electrically equipped for passenger service are at present operated by steam locomotives with the exception of the line from Gosforth to Ponteland, which is now under construction. The Quayside Branch Line, which is used for goods traffic only, is also being equipped for electrical operation, the object in this case being to overcome the ventilation difficulties which now prevent the line from being fully utilized owing to it being for the most part in tunnel and on a heavy grade.

The engineering conditions to be met present features differing essentially from those prevailing in the electrification of a London tube railway, because some 37 miles of single, double and four-line track are involved, and there are numerous junctions, cross-overs and other special track work. There is also a very heavy freight traffic to be provided for, which, except on the Quayside branch, will continue, at any rate for the present, to be dealt with by steam locomotives.

After careful examination of the advantages and cost of various systems it has been decided to operate the trains by continuous current obtained from a single collector rail placed in the 6-ft. roadway, with a return circuit through the track rails. The current will be derived from rotary converters and static transformers, which convert three-phase current at a

pressure of 5500 volts and periodicity of 40 into continuous current at a pressure of 600 volts.

The collector rail will be of special high conductivity steel T-rail, 80 lbs. per yard, carried on insulators composed of reconstructed granite placed outside the running rail, and distant 3 ft. 11½ ins. from center of the track. On double track the separate collector rails belonging to each track will be normally placed between the two tracks, but at junctions, crossings, etc., or wherever there is any obstruction in the 6-ft. way, they can be transferred to the outside of the track as required. At level crossings, stations, etc., the collector rail will be protected by two creosoted boards bolted against distance pieces on each side of the rails. Under normal conditions the collector rail will have no protection, but holes for fixing this are being punched in all the collector rails so that protecting boards may be readily applied at any place found desirable. Instead of adopting a second collector rail in the center of the track for the return current as has been done in some cases it was found that the Board of Trade requirements could be more economically met by bonding the running rails, but the position of the single collector rail has been so fixed that a return collector rail can be installed between the rails at any future time should this prove desirable in the event of great extension of the traffic on these lines.

The bond adopted is that of the General Electric Company of America, and is being supplied through the British Thomson-Houston Company. It consists of two flexible copper strands united in a head at each end, which is cast round a soft steel pin. In order to fix the bond the pin is compressed after slipping the bond in place and the copper is thus expanded tight into the hole.

It has been found that the railway company's standard fish-plate does not allow sufficient space between it and the web of the rail to admit of the use of protected bonds, so, since it was considered that this type of bond was essential, a new fish-plate

giving more room has been specially designed by Charles A. Harrison, the engineer of the line. As the bonding of the track proceeds, all the present fish-plates will be replaced by those of the new design, and those removed will be utilized on other parts of the railway company's system.

Current will be supplied to the collector rail from five sub-stations, located at Pandon Dene, Wallsend, Cullercoats, Benton and Kenton. The arrangement of all of these sub-stations is of a uniform design, and is similar to that shown in Fig. 2.

Fourteen 800-kw rotary converters will be installed, distributed among the various sub-stations so as to best meet the load. The sub-station containing the largest plant capacity will be Pandon Dene, where four of these rotaries will be installed. In order to meet the excessive fluctuations of the load each rotary has been specially designed to operate without serious sparking at an overload of 100 per cent for ten minutes and at an overload of 200 per cent momentarily. The main static transformers are of the single-phase, oil-insulated, self-cooling type.

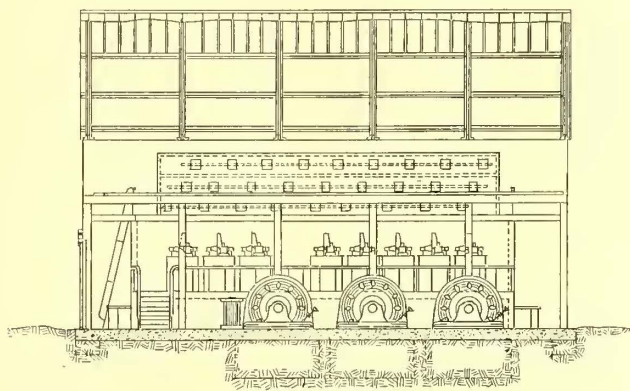
To each rotary converter is coupled a small induction motor, fed by a special transformer, and the rotary converter is started up by means of the induction motor until it attains the synchronous speed of the rotary, when it is switched onto the high-tension bus-bars in the usual way.

With a view of simplifying the arrangement of cables and loads inside the sub-station the high-tension switches have been placed along one side of the sub-station, while the low-tension switchboard will be placed on the opposite side of the building. Only the positive leads will be taken to the low-tension switchboard, the negative bus-bar running near the floor behind the switchboard and the equalizing switches being mounted close

to the rotaries. The high-tension switches will be of the "oil" type, the feeder switches being provided with an automatic reverse current release, and the converter switches with an overload time limit release, all being operated electrically by low-tension continuous-current, for which a small battery is provided in each sub-station. High-tension and low-tension

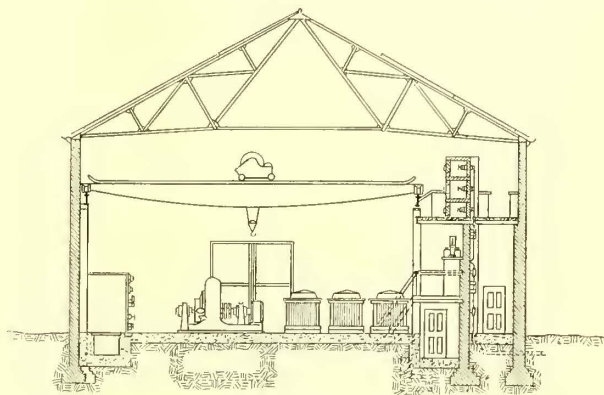
coaches, the bodies of which will be built by the North-Eastern Railway Company at its works at York, from the designs of Wilson Worsdell, the company's chief mechanical engineer. They will be of the open corridor type, lighted and heated by electricity.

Each car will be carried on two four-wheeled trucks, con-



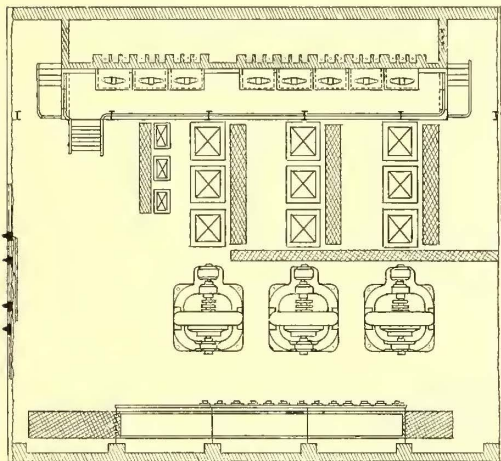
Sectional Elevation.

Scale 1 in. = 21 feet.



Cross Section.

FIG. 2.—SUB-STATION PLAN, ELEVATION AND SECTION



Street Ry. Journal

Plan.

structed by the Brush Electrical Engineering Company, to Mr. Worsdell's specification. Each motor car will be equipped with two General Electric 66-motors, each rated at 150 hp, both motors being carried on one truck.

As will be seen from the map the Central Station at Newcastle is a terminal station, as far as the lines to be electrically operated are concerned, the trains having to be taken in by one locomotive and out over the same lines by another. The difficulty of working the suburban traffic is, therefore, great, and, in considering the electrification of the line, there was never any question but that the multiple unit system of rolling stock was the correct one to adopt.

The unit train will be composed of two motor cars with one trailer between them, this being increased when necessary by the addition of another unit train. The motor car will have motormen's compartments at one end only, but a master controller will be fitted in the vestibule at the other end, also so that the coach may be driven from this end if necessary.

The cars will be fitted with the Westinghouse air brake, a motor-driven air compressor being provided for this purpose. In Fig. 3 is given a general view of the unit train, consisting of three cars.

For collecting the current each motor car will be provided with four contact-shoes, one at each side of each truck, with all of the contact-shoes of each train connected together.

wattmeters are provided for measuring the input and output of each sub-station.

The sub-stations are designed to facilitate extension in either direction, and the ends will be of galvanized iron arranged for easy removal. They will receive their supply of energy at a

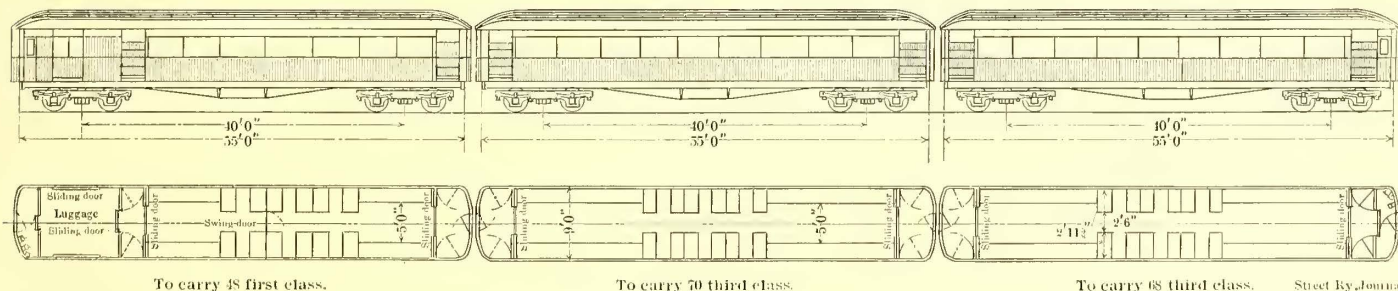


FIG. 3.—STANDARD UNIT TRAIN

pressure of 5500 volts, three-phase, through three-core, paper-insulated, lead-covered cables, laid solid in wooden troughs along the railways.

Cables will also be laid for the lighting of all the railway stations on these lines, but the exact manner of doing this is not yet decided upon.

The new rolling stock will comprise motor and trailer

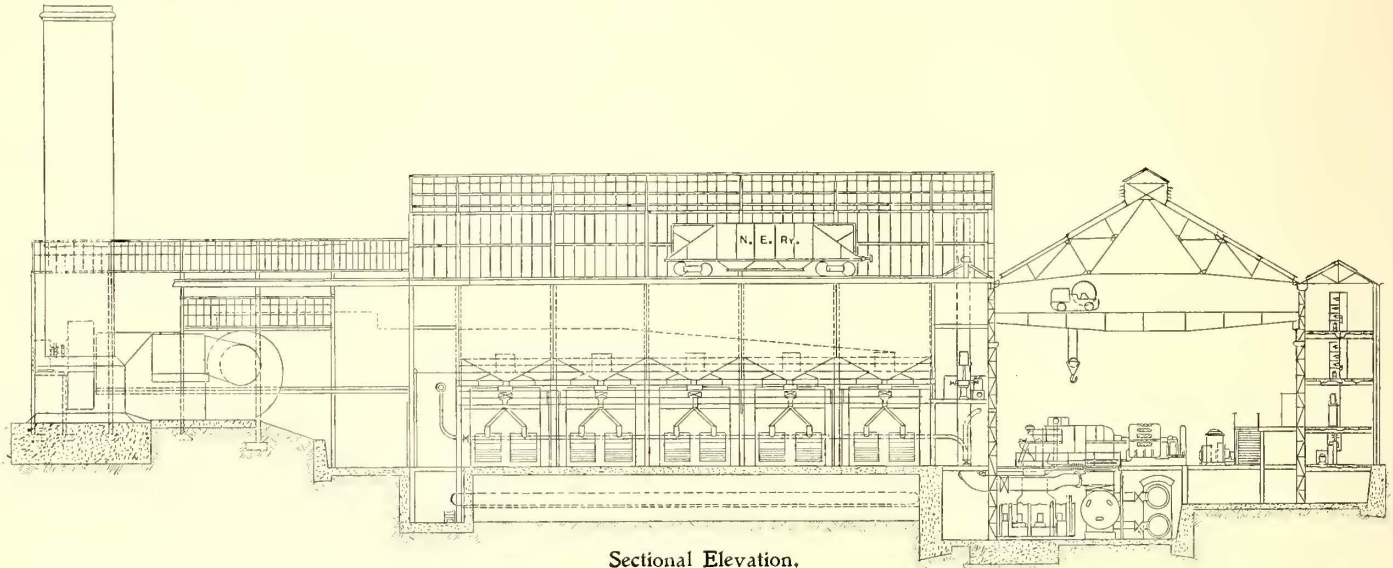
The ordinary way train will take about twenty-three minutes for the journey from Newcastle to Tynemouth, the average speed being about 22 m. p. h., including stops. Quick trains running through without stops will reduce this time to fifteen minutes.

There will be two electric locomotives for the Quayside branch, and these will be equipped in the same way as the motor

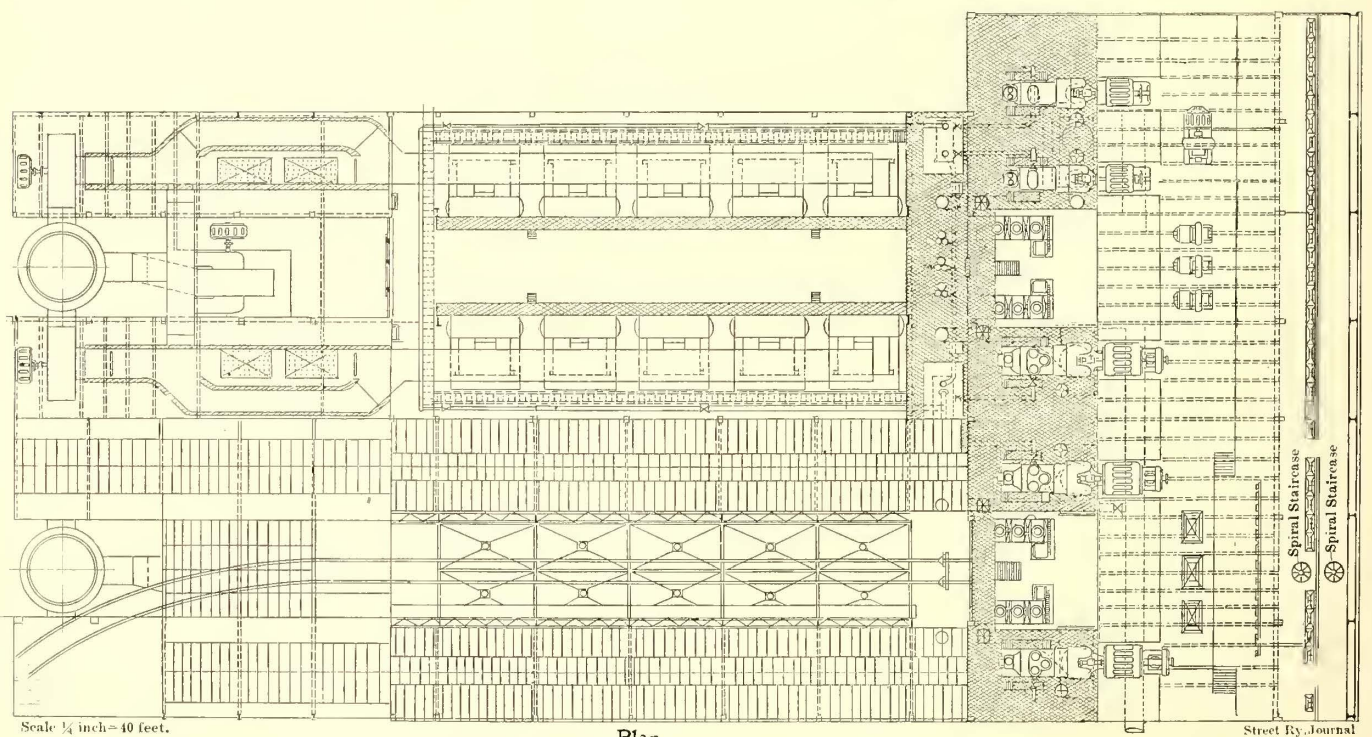
coaches with multiple-unit controller, Westinghouse air brakes, etc. Each locomotive will be capable of starting with and hauling a train weighing 150 tons up a grade of 1 in 27 at a speed from 9 miles to 10 m. p. h.

Instead of constructing a generating station of its own the railway company will purchase its current from the Newcastle-on-Tyne Electric Supply Company, Ltd. A portion of this current will be generated at the existing Neptune Bank Station at Wallsend, but this station is now nearly loaded up, and the Supply Company has in course of crection a larger

ft. 9 ins., to contain Green's economizers, designed to reduce the temperature of the flue gases to 350 degs., and to raise the temperature of the feed-water supply from 80 degs. F. to 212 degs. F., and a pump house on the bank of the river to contain centrifugal pumps capable of delivering 800,000 gals. of water per hour to the condensers, and the following smaller pumps: One 6-in. centrifugal pump for delivering river water into the tanks; one 2-in. centrifugal pump for delivering drain water into the hot-well; one three-throw pump for delivering water at 150 lbs. pressure; one bilge pump.



Sectional Elevation.



Plan.

FIG. 4.—PLAN OF CARVILLE POWER STATION

station, situated at Carville, about half a mile further down the river, and it is from this new generating station that the bulk of the supply to the railway company will eventually be obtained. The designs for this new station are now completed and the contracts let.

The power station, which is to be supplied and erected by Babcock & Wilcox, Ltd., consists of an engine house, 148 ft. 9 ins. x 65 ft. 6 ins., designed to contain five Parsons turbo-alternators, each of 3500 kw, with an overload capacity of 5000 kw for two hours, a boiler house, 115 ft. x 64 ft., intended to contain ten water-tube boilers of the Babcock & Wilcox marine type; a switch house, 148 ft. 9 ins. x 16 ft. 6 ins., adjacent to the engine room; two economizer houses, 80 ft. x 20

The boilers are fitted with solid drawn steel tubes and forged steel headers, and, as is usual in the Babcock & Wilcox type, are self-contained, requiring no brickwork construction or underground flues. The heating surface of each boiler is 4500 sq. ft., and each is provided with a superheater having a surface of 900 sq. ft. The grate surface of each boiler is 120 sq. ft., divided into two grates, each actuated by a Babcock & Wilcox chain grate stoker. The normal output of the boilers will be 200,000 lbs. of steam per hour, and they are capable at peak load of exceeding this by 50 per cent. The working pressure is 200 lbs. per square inch, and the steam will be superheated 150 degs.

Each boiler is provided with two spring safety valves, 3 1/2

ins. diameter, one steam-stop valve for saturated steam and one steam-stop valve for superheated steam, two feed check valves, two sets of blow-off valves, one steam pressure gage, two sets asbestos-packed water-gage mountings, one independent high-water and low-water alarm, and one $\frac{3}{4}$ -in. stop valve for tube cleaning, etc. All connections are made with flanged joints. Fixed tube sweeping jets are provided so that the boiler tubes may be swept with the minimum of labor and the maximum amount of facility.

The stokers are so arranged that the thickness of the fire and the speed of travel may easily be regulated between 10 ft. to 30 ft. per minute, so that any class of coal or any strength of draft may be arranged for.

The products of combustion are delivered into a single chimney, 14 ft. internal diameter, by means of induced draft fans, which draw the gases through the economizers. A bypass is also provided in the economizers so that the gases may pass direct to the chimney when required. The flues carrying the products of combustion from the boilers are overhead, and constructed of steel plate joining into the brickwork flues surrounding the economizers. These steel flues are protected by external lagging of magnesia, held in position by outer covering plates.

The induced draft fans, of which there are three in number, are 75 ins. in diameter, and are capable of producing a vacuum of 1 in. at the flue side of each boiler damper. Two of these fans are used for drawing the products of combustion when the economizers are in use, the third is worked in connection with the by-pass flue.

Three feed pumps of the direct type are provided, each capable of delivering 150,000 lbs. of water per hour against the boiler pressure of 200 lbs. per square inch. These pumps are driven by a special pipe system for saturated steam taken independently of the main steam system from two boilers in each section, and a connection is also provided from the main delivering superheated steam so that these pumps may also be worked with superheated steam when desired. The pump exhaust is carried in spiral pipes through the hot-well and there condensed.

Complete duplicate systems of steam and feed piping of solid drawn steel are provided, and the exhaust, circulating and water piping, drain and blow-off piping are also included in the contract. The exhaust piping will be of lap-welded steel or built up in the case of pipes over 10 ins. diameter. The water piping is of cast-iron with flanged joints.

Coal is conveyed into the boiler house building by a track running overhead and delivering direct into bunkers constructed above the stoke hoppers. These bunkers contain 950 tons, and are divided into separate compartments fitted with shoots feeding direct into the hoppers of the chain grate stokers, and coal weighing apparatus is provided.

A complete system of ash conveyors, operated by an electric motor, is also being supplied. There will also be a comprehensive system of water tanks.

The turbines, as stated, will be supplied with steam at a pressure of 200 lbs. per square inch, and superheated by 150 degs. F. A condenser will be placed directly under each turbine so as to secure the highest possible vacuum. The alternator will be of the rotating field type with direct-coupled exciter, and will generate three-phase current at a pressure of 6000 volts and a periodicity of 40 per second.

The North-Eastern Railway Company has placed the following electrical contracts:

The British Thomson-Houston Company, Ltd.: Electrical equipment of rolling stock and permanent way.

The British Westinghouse Electric & Manufacturing Company, Ltd.: Complete equipment of sub-stations.

Messrs. Siemens Brothers & Company, Ltd.: Three-phase high-tension telephone and pilot cables, etc.

THE ACCIDENT RECORD AND RESULTANT DISBURSEMENTS OF THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY

The old saw that accidents will occur, etc., is especially true with reference to street railway operation. They may be minimized by improved safety appliances and by proper discipline or training. But so long as men err and materials succumb railroads must keep accident records and maintain claim departments. The wonder is not that accidents take place, but that so few serious ones occur in proportion to the passengers carried. It is not generally so understood, but it is nevertheless true that by far the larger percentage of the total number of accidents are due to the ignorance or carelessness of the public. The dear public, however, is always loath to admit its own shortcomings. Its first thought is usually to see the company's claim adjuster, and by seemingly fair means, or otherwise, secure compensation, thus throwing the blame upon the company. Many claims are paid because the State laws do not give the railroads adequate protection. The policy of the claim department in any particular case is often shaped by the State laws. If, under the laws, there is placed upon the public a degree of responsibility requiring the exercise of ordinary care and prudence the payment of unjust claims may be refused and such refusal will be sustained in the courts. The State laws, therefore, have quite an influence upon the settlement of claims and the amount of money paid out through the claim departments.

In some States the laws are such that unless the company can prove its skirts to be absolutely clear it generally becomes a sufferer unjustly. In such States the public is not required to exercise what might be termed ordinary care, or such a degree of prudence as would be exercised by an ordinarily prudent person; but the company's employees are required, under all circumstances, to exercise the highest degree of skill and prudence. An exception to the general rule is the State of Wisconsin, in which the Supreme Court has interpreted the laws to mean that "It is not actionable negligence for the motorman in charge of a street car, when the car is in operation upon a street and approaching a street crossing, to fail to exercise the highest degree of care, or such care as a vigilant or prudent person would exercise under the same or similar circumstances. It is sufficient if he exercises the care of a person of average prudence in the same or similar circumstances."

A case in point is the summary of the decision of the highest court given below:

STAFFORD VS. CHIPPEWA VALLEY ELECTRIC RAILROAD CO.

(Supreme Court of Wisconsin. April 3, 1901.)

Street Cars—Crossing Accident—Care Required of Motorman—Municipal Ordinance—Sounding Gong—Rights at Crossing—Duty to Look and Listen—Contributory Negligence—Evidence—Directed Verdict.

1. Testimony of witnesses that, when approaching a street car track with a view of crossing it, they looked for an approaching car, and did not see one, though there was a car within plain sight, and so near as to render an attempt to cross dangerous, is inconsistent with all reasonable probabilities, and is not sufficient to authorize the submission of an issue as to the near approach of the car as a disputed question of fact.

2. Where plaintiff testifies that she looked as she was about to drive across a street car track, and did not see a car, though one was shown to have been in plain view, and about 100 ft. distant, and she then drove on the track, and was injured, it was error to refuse to direct a verdict for defendant on the ground of contributory negligence.

3. A motorman approaching a street crossing is required to use the care and prudence which ordinarily prudent persons would exercise under like circumstances.

4. The test of negligence in the rate of speed of a street car is the speed at which an ordinarily prudent man would have run the car under similar circumstances.

5. The violation of an ordinance requiring the continuous ringing of a bell on a street car while in motion does not render the company guilty of negligence per se in a crossing accident, even though the ordinance is a condition in the grant of a franchise to the company, since the condition is unreasonable.

6. Where a street car franchise requires the company to acquire the franchise of a former company, which contained regulations as to the manner of operating the cars, but does not refer to such old requirements, or make the

provisions of the old grant part of the new one, the new franchise is not subject to the old conditions and regulations.

7. Where the question of the reasonableness of a municipal ordinance is in issue, all reasonable doubts are to be resolved in favor of the municipality.

8. Where a street car, which is in good condition, with electric headlight, approaches a crossing on a clear, still night at a time when there is not much traffic, and there is no unusual obstruction preventing a view of the car by a person approaching on a cross street, the failure of the motorman to continuously sound the gong is not negligence.

9. A street car has a right at a crossing superior to that of an ordinary traveler, and a person attempting to cross a track is guilty of contributory negligence in failing to look and listen for an approaching car.

10. The mere operation of a street car at a street crossing in such a manner as to render it dangerous for a person to cross in front thereof is not negligence.

11. Plaintiff was injured by the wagon in which he was driving being struck by a street car at a crossing, which frightened the horses and caused them to run away. The accident did not result in any injury to the car, except a few scratches, and did not disturb the lights on the car nor the passengers, nor persons in charge of the car, other than by the jar caused by

TABLE NO. 1.—CLASSIFICATION OF ACCIDENTS BY MONTHS AND AMOUNTS PAID IN CONNECTION THEREWITH REPORT OF CLAIM DEPARTMENT 1902

Table with columns for months (A-Y), Total, Settled, and Expenditures. Rows include monthly accident counts, suits pending, and various expense categories like attorneys' salaries and medical expenses.

Note.—Thirty fatal accidents during year 1902, of which five were settled at a total cost of \$993.50.

KEY TO CLASS RECORD, AS SHOWN IN TABLE NO. 1

- A. Collision with vehicles. B. Collision with persons. C. Collision with animals. D. Collision with bicycles. E. Collision with cars. F. Cars leaving track. G. Employees injured while on duty. H. Center-pole accidents. I. Alighting or boarding moving cars. K. Alighting or boarding stationary cars. L. Fell in, on or off car. M. Fell off car on curve. N. Trouble on account of farc. O. Disturbance on car. P. Ejectment from car. Q. Frightened horses. R. Electric shock to persons. S. Electric shock to animals. T. Damage to company's property. V. Unusual occurrences. W. Miscellaneous. X. Power plant. Y. Lighting department.

application of the brake and the reversal of the current. The car stopped substantially at the place of the accident, and did not push the wagon any distance, nor break it at the point of contact. Held, sufficient to show as a matter of law that the car was not being operated at a negligent rate of speed.

To further illustrate the tendency of the Wisconsin laws another decision of the Supreme Court is summarized as follows:

McCLELLAN VS. CHIPPEWA VALLEY ELECTRIC RAILWAY CO. (Supreme Court of Wisconsin. April 30, 1901.)

Collision with Street Car—Contributory Negligence—Evidence.

1. Plaintiff, driving on a load of hay, turned onto a street used by an electric railway company, and passed upon the track without looking, and was struck by a car coming up from behind, and was injured. Held, that he was guilty of contributory negligence if the car was in sight and could have been seen when he turned upon the track.

2. If, when plaintiff drove upon the track, the car was not in sight, and he traveled about 300 ft. along the track without looking for the approach of a car, and was injured by a collision with one, he was guilty of contributory negligence.

3. Where, in an action for injuries by a collision with a street car, the complaint simply charges negligence, evidence of a wilful intent to injure, or reckless disregard of plaintiff's safety, is inadmissible.

These decisions of its highest court indicate that the laws of the State of Wisconsin are more careful of the just rights of railway companies than in some other States with which the JOURNAL readers are familiar. There can be no doubt that such an interpretation of the laws has a tendency to make the public more careful and enables the claim departments to settle many cases upon their actual merits.

Table No. 1, and the accompanying key, shows the classification of accidents under the different headings by months for the year 1902, and the resultant disbursements of the Milwaukee Electric Railway & Light Company.

It will be noticed that by far the greater number of accidents reported are classified under the heading of "Alighting or Boarding Moving Cars." Such accidents aggregate 346 per cent of the total. The item showing the next highest number

of accidents is classified as "Collisions With Vehicles," amounting to 21.3 per cent of the total. These two items combined make nearly 56 per cent of the total number reported. The statement shows that \$29,045.73 was paid to the public, and \$22,801.59 covered the claim department legal and other expenses in connection with the settlements, making a total expenditure of \$51,847.32. The column showing the expenditures by months should not be considered as an indication of the seriousness of the accidents occurring in any one month. The month of July, as an illustration, shows a greater number of accidents than in any other month of the year, but the expenditures on account of accidents were smaller in July than in any other month of the year. The falling off in the expenditures during the summer months would seem to show that the courts, not being in session, the settlement of many cases was deferred. The significant fact shown in Table No. 1 is that although there were 102 suits pending during 1902, thirteen of them were dismissed for want of prosecution, one was discon-

tinued by the plaintiff, two were tried and judgment rendered for defendant, sixteen were settled out of court, and not a single judgment was rendered against the company. This would seem to indicate that rare discrimination was exercised by the management in determining what cases should be settled and what should be permitted to go to suit.

The money expended during 1902 for each class of accidents is shown in Table No. 2, and the expenditures are distributed to the years in which the accidents occurred. The fact that the greater part of the disbursements cover current work of the

accidents and the average payments per case, and compares the year 1901 with 1902. From this it appears that the year 1902 made a considerably better showing than 1901. In the former year the accident payments were only 1.67 per cent of the gross earnings upon the railway and lighting systems combined, while in the latter year the percentage was 2.2. These percentages are remarkably low in comparison with other railways.

On many railways the disbursements on account of accidents have been as high as 6 per cent to 9 per cent of the gross earnings. On the Milwaukee railway system proper, as distin-

TABLE NO. II.—ACCIDENTS CLASSIFIED AND EXPENDITURES UNDER EACH CLASS DURING YEAR 1902 SHOWING YEAR IN WHICH THE ACCIDENTS OCCURRED

ACCIDENTS DURING YEAR 1902	Class Total	ACCIDENTS OCCURRING DURING THE YEARS						Total
		1895	1897	1899	1900	1901	1902	
Collision with vehicles	810	---	---	---	---	\$267.60	\$931.25	\$1,198.85
Collision with persons	148	---	---	---	---	10.00	663.48	673.48
Collision with animals	143	---	---	---	---	---	13.50	13.50
Collision with bicycles	55	---	---	---	---	---	5.00	5.00
Collision with cars	167	---	---	---	---	600.00	5,801.50	6,401.50
Cars leaving track	19	---	---	---	---	---	318.38	318.38
Employees injured while on duty	310	---	\$300.00	---	---	126.60	339.95	766.55
Center pole accidents	8	---	---	---	\$20.00	---	---	20.00
Alighting or boarding moving car	1,310	---	150.00	---	3,650.00	3,245.00	4,836.75	11,881.75
Alighting or boarding stationary car	112	---	---	---	---	1,000.00	2,190.00	3,190.00
Fell in, on or off car	88	---	---	---	---	2,000.00	803.00	2,803.00
Fell off car on curve	30	---	---	\$30.00	---	---	574.75	604.75
Trouble on account of fare	51	---	---	---	---	---	30.00	30.00
Disturbance on car	53	---	---	---	---	---	10.00	10.00
Ejection from car	117	---	---	---	---	---	15.00	15.00
Frightened horses	24	---	---	---	---	---	16.10	16.10
Electric shock to persons	1	---	---	---	---	---	30.00	30.00
Electric shock to animals	4	---	---	---	---	---	75.00	75.00
Damage to company's property	29	---	---	---	---	---	---	---
Unusual occurrences	137	---	---	150.00	---	---	441.70	591.70
Miscellaneous	85	---	---	---	---	---	112.50	112.50
Power plant	76	---	---	---	---	---	194.75	194.75
Lighting department	14	---	---	---	---	---	93.92	93.92
Total	3,791	---	\$450.00	\$180.00	\$3,670.00	\$7,249.20	\$17,496.53	\$29,045.73
Court fees and expenses	---	\$6.20	---	\$45.00	\$166.97	\$164.06	\$70.92	\$363.15
Witness fees and expenses	---	---	---	---	58.59	59.68	96.50	214.77
Expert testimony	---	---	---	---	103.50	---	---	103.50
Medical expenses, including hospital bills	---	---	---	---	62.50	365.20	4,337.19	4,764.89
Briefs and transcripts	---	---	---	---	17.87	13.50	225.40	256.77
Special services, arbitrators, &c.	---	---	---	---	---	250.00	25.00	275.00
Incidentals, office expenses, &c.	---	35	---	---	26.80	264.60	2,263.45	2,555.20
Claim department salaries	---	---	---	---	---	---	6,168.31	6,168.31
Attorneys' salaries	---	---	---	---	---	---	8,100.00	8,100.00
Total	---	\$6.55	---	\$45.00	\$436.23	\$1,117.04	\$21,286.77	\$22,801.59
Grand total	3,791	6.55	450.00	135.00	4,106.23	8,366.24	38,783.30	51,847.32

TABLE NO. 3.—GROSS EARNINGS, ACCIDENT PAYMENTS PER ACCIDENT, PER CENT. ACCIDENT PAYMENTS TO EARNINGS COMPARISON YEAR 1901-1902

YEAR	Gross Earnings	OLD CLAIMS SETTLED				CURRENT YEAR				TOTAL			
		Expended	Cases	Per Case	Per Cent. Earnings	Expended	Cases	Per Case	Per Cent. Earnings	Expended	Cases	Per Case	Per Cent. Earnings
1901	\$2,742,665.36	\$24,942.22	153	\$163.02	9/10	\$36,239.54	613	\$59.11	1 3/10	\$61,181.76	766	\$79.87	2 2/10
1902	3,092,083.28	13,064.02	51	251.16	.42	38,753.30	623	62.25	1.25	51,847.32	674	76.90	1.67

PERCENTAGE OF EXPENDITURES TO EARNINGS—1902

	Earnings	Amount Charged in Reserve for Injuries and Damages	Settlements	Expenses	Total Expenses
Railway	\$2,593,917.37	4 per cent. = 103,744.69	\$28,951.81 = 1.12 per cent.	\$22,801.59 = 0.88 per cent.	\$51,733.46 = 2 per cent.
Lighting	498,465.91	1/2 " = 2,481.79	93.32 = 0.02 "	---	93.92 = 0.02 "
Grand total	\$3,092,083.28	3.43 per cent. = 106,226.48	\$29,045.73 = 0.94 per cent.	\$22,801.59 = 0.73 per cent.	\$51,847.32 = 1.67 per cent.

year 1902 indicates the policy of the company to be the prompt settlement of all claims where liability is shown. The significant fact shown by Table No. 2 is that nearly 41 per cent of the money paid out was for cases classified as "Alighting or Boarding Moving Cars," and 22 per cent was for cases classified as "Collisions With Cars." These are the character of cases which, for reasons well understood, are the most delicate and difficult of adjustment. The number of car collisions, although comparatively small, were more expensive per case than any class of accidents, showing that such occurrences are usually acknowledged as clear liability on the company's part and requiring prompt settlement.

Table No. 3 shows the percentage of payments on old claims and current year claims to the gross earnings, the number of

guished from the lighting system, the accident payments in 1902 were only 2 per cent of the gross earnings.

It will be seen from Table No. 3 that the Milwaukee system charges off and carries into reserve 4 per cent of the gross earnings of the railway and one-half of 1 per cent of the earnings of the lighting to pay for accidents, making a total of 3.43 per cent of the entire gross earnings carried into reserve. During the year 1902, as previously stated, the railway actually paid out only 2 per cent, leaving a balance in reserve of 2 per cent for future liabilities. The management evidently believes, and wisely so, that the past or the present should not mortgage the future, but that the present should set aside a fund sufficient to take care of any liabilities created to-day that must be paid and canceled at some future time.

SUGGESTED COMPROMISE ON THE NINETY-NINE-YEAR ACT IN CHICAGO

The Chicago City Railway Company, which has been negotiating with the Council sub-committee on franchises, has made a formal announcement to that committee of the terms under which it would agree to waive any rights it may have under the ninety-nine-year act. The terms offered by the Chicago City Railway Company are that in exchange for the waiver of its rights under the ninety-nine-year act, the city will agree that full remuneration will be given for the company's tangible property at the end of a twenty-year franchise. That is, the city is to bind itself either to purchase the property of the company at the end of the twenty-year franchise, or to find a purchaser for it. If the city does neither it is to make a new grant to the company on terms then to be agreed upon. The sub-committee on franchises was told by the attorneys for the Chicago City Railway Company that this was absolutely as far as they were authorized to go in the matter of making concessions by a waiver of the ninety-nine-year act. The sub-committee on franchises has submitted this proposition without recommendation one way or another to the whole committee on local transportation. Together with this proposition there was submitted sections of a proposed ordinance drawn up by Edwin Burritt Smith and John C. Mathis, special counsel to the committee, relating to the proposed franchise grants for the Chicago City Railway Company. The main provisions of the sections submitted are:

That the city should have the right at the expiration of the franchise grant to either buy the tangible property of the company or authorize a new company to purchase it on the same terms at which the city could.

That the price to be paid shall be a fair cash value of the tangible property for street railway purposes, exclusive of earning power and franchise rights, to be determined upon by a board of three appraisers.

That the city agrees in case that it neither purchases the property itself or causes a new company to purchase it, to make a new grant to the old company, upon terms then to be agreed on, earning power on the value of the franchises not to be included in the basis of the new grant.

That the company, in consideration of these acts by the city, agrees to waive, in the acceptance of the ordinance, all claims under the ninety-nine-year act, as well as all other franchises it may now hold through city ordinances.

The committee on local transportation took no action on the proposed acceptance of the franchise ordinance at its meeting June 12. Consideration of this matter was made a special order for its meeting June 19.

TURBINES FOR PHILADELPHIA

Plans for the new power plant for the Philadelphia Rapid Transit Company have progressed sufficiently to warrant the statement that this equipment will be one of the most interesting installations in this country. The ultimate capacity of the station will be 50,000 kw, and the initial installation will comprise three units of 5000 kw each. Steam turbines have been decided upon for this plant and the order for the three units which will be first installed was placed last week with Westinghouse, Church, Kerr & Company. They will be of the Westinghouse type, and similar to the large turbines which the Westinghouse Machine Company is building for the London system. They will be somewhat larger, however, owing to the fact that a lower speed will be maintained. The turbines will be direct-connected to Westinghouse three-phase, 25-cycle generators, and the units will run at 750 r. p. m. with 175 lbs. of steam, 27½-in. vacuum and possibly 100 degs. to 150 degs.

of superheat. The three units will operate in multiple, and power will be distributed directly at a nominal potential of 13,000 volts from the station without the use of any intermediate transformers. Because of this fact the generators are wound for high potential.

The new power station will be located upon the Delaware River, and this location will secure excellent cooling facilities and an abundant supply of water for condensing purposes. The present equipment will furnish power for the subway and some reserve power for the surface traction system pending the execution of plans for centralizing the entire power system at the point selected as the site of the large generating station.

The contract also includes transforming and converting machinery to be installed in the several sub-stations which will be needed for the distribution system. The first installation will comprise fourteen 1000-kw and two 500-kw rotary converters; forty-two 375-kw step-down transformers for the 1000-kw rotaries; six 175-kw transformers of similar design for the 500-kw rotaries. The electrical equipment will be built by the Westinghouse Electric & Manufacturing Company.

At present the demand for power taxes the capacity of the company's generating plant, and with the opening of the subway and elevated systems there will be a large additional consumption.

The new rapid transit system, now under construction, will cover the entire business district of Philadelphia, and includes a two-track and four-track subway about 1¼ miles in length, extending from the Delaware River along Market Street to a point near Twenty-Third Street, a short distance from the Schuylkill River. At Broad Street a terminal station will be erected. In the meantime extensions and additions to the surface system will be most to care for the normal increase in traffic in the districts served by these lines. Consequently, the company is eager to secure the early completion of the new power station, and the contract calls for delivery of the apparatus in September, 1904. A temporary power plant of 2000-kw capacity is now nearing completion, and this will help the situation materially, it is believed.

DOUBLE-DECK CARS

London, May 19, 1903.

EDITORS STREET RAILWAY JOURNAL:

I have read the article in the issue of May 2 on the double-deck cars with interest, and think that the opinions quoted by you are well representative of the best sentiment on the subject of double-deck cars in this country. As far as America is concerned I think the whole story is told if you will compare the average temperature of London in January (38.7 degs.) with the average temperature in July (63.5 degs.), which are the maximum and minimum, and which show a total difference of average temperature in the year of 24.8 degs., with the average temperature in New York in February (25.6 degs.) and in July (78.1 degs.), which give an average difference of temperature in the course of the year of 56.6 degs. Although the statement from our Meteorological Bureau does not show the lowest temperature, it might be taken as 15 degs. (except in very exceptional winters), while in summer the thermometer rarely goes above 80 degs. The difference then between maximum and minimum would be about 65 degs., whereas in New York the thermometer frequently each year reaches zero and 100 degs., which is, of course, a much greater range.

The top-seat cars in America would be just as unpleasant in the summer time as in the winter with the hot summer weather that you have. Even in London the top of an omnibus in the months of July and August is anything but pleasant.

RAILWAY ENGINEER.

PRIVATE PARLOR CAR

The accompanying illustrations show a private parlor car which has been designed by the Denver City Tramway Company and built by the Woerber Brothers Carriage Company, of Denver, Col., for the use of the officers and directors of the tramway company, and for rental to pleasure parties desiring an exceptionally fine car.

The use of parlor cars of this kind is growing, as it is found that they are not only a convenience for the directors of the railway company, in their periodic inspection of the road and its equipment, but, by renting these cars to trolley parties of various kinds, they can be made quite a source of income. The Denver car possesses several novel features over similar cars illustrated in these columns.

Fig. 1 shows the exterior of the car, with vestibule doors open, and folding steps down ready for use. These folding steps, which are of special design, are operated by the motor-man or conductor in the vestibule.

Fig. 2 is a view of the car when running, the vestibule doors

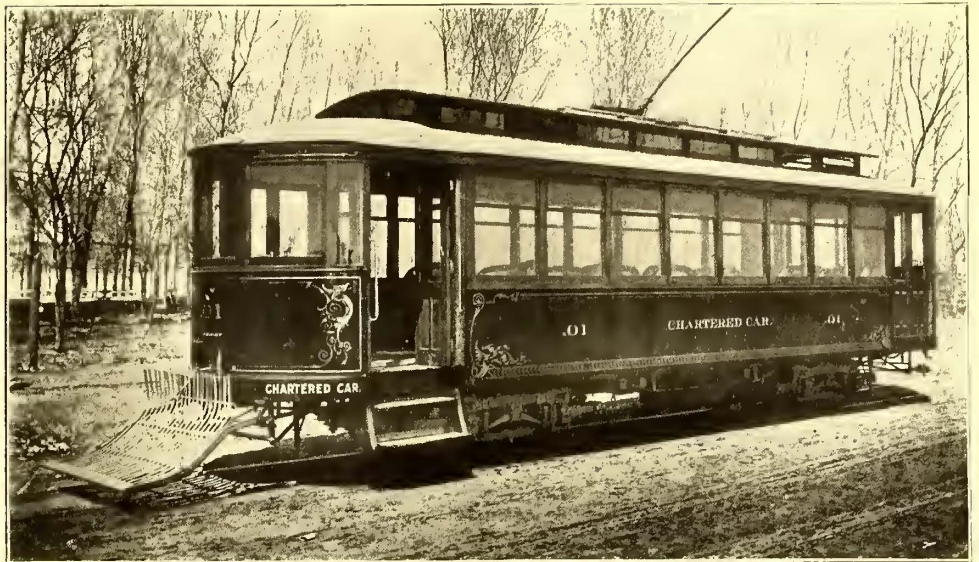


FIG. 1.—PARLOR CAR WITH STEPS DOWN

main compartment. The width over panels is 8 ft. 2 ins., and the height of the car, rail to roof canvas, is 12 ft.; rail to sill, 2 ft. 6 ins.; floor to ceiling, 8 ft. 4 ins.

The car floor is double, the lower floor being of yellow pine and the upper floor of polished maple. The upper floor is covered with Royal Wilton carpet, fastened as upon Pullman cars. The space between the floors is utilized for the wiring.

The ceiling in the main compartment is somewhat similar to the latest Pullman style. It is of three-ply veneer, handsomely decorated in modified paris green, with dark green border ornamented with gold. The vestibule ceiling is of oak, finished in natural color.

The eight plate-glass windows on either side of main compartment are 36 ins. from center to center of posts, and are fitted with mahogany sash. The transoms are of ornamented glass and are also fitted with mahogany sash. The deck glass is beveled plate. The pantasote curtains match the ceiling in color. The car contains sixteen rattan easy chairs, olive green, harmonizing with the interior finish.

The car is finished throughout with rich bronze mouldings, and is fitted with electric call bells. The Consolidated Car Heating Company's bronze panel heaters extend the full length of the interior on both sides. The 133 Imperial 8-cp and 10-cp incandescent lamps have frosted globes.

The main color of body is Valentine's onyx brown, relieved in light brown on letter board, the border of a darker shade

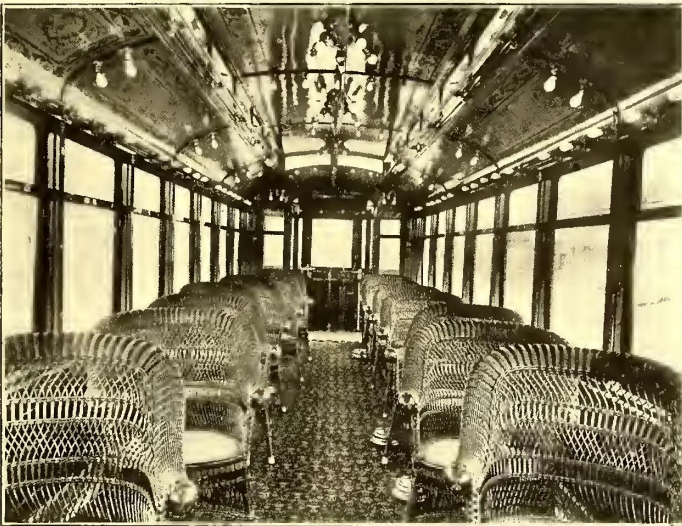


FIG. 3.—INTERIOR OF PARLOR CAR

being closed and the steps folded.

Fig. 3 is an illustration of the car interior with the curtains up.

The length over all is 37 ft. 6 ins. The sills run from nose piece to nose piece, and are according to the Denver City Tramway Company's standard design, of steel and wood. The steel section consists of 7-in. 15-lb. I-beams, and the wood section of Oregon fir, 5 ins. x 7 ins. A section of this composite sill was published on page 239 of the STREET RAILWAY JOURNAL for Feb. 7.

The main compartment is 24 ft. 6 ins. long, and is finished in highly polished Cuban mahogany. The vestibules are each 6 ft., and are finished in quarter-sawed oak, forming a pleasing contrast with the

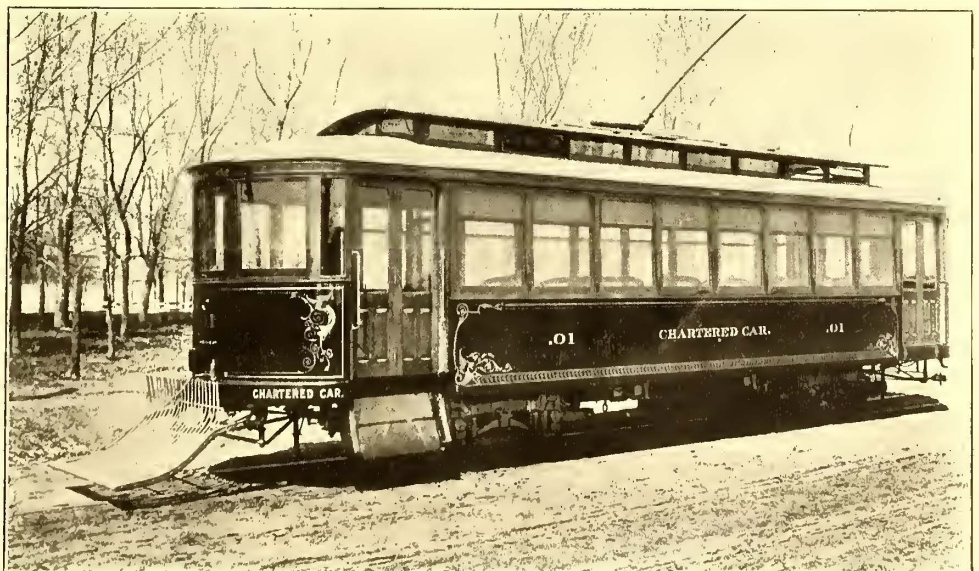


FIG. 2.—PARLOR CAR WITH STEPS UP

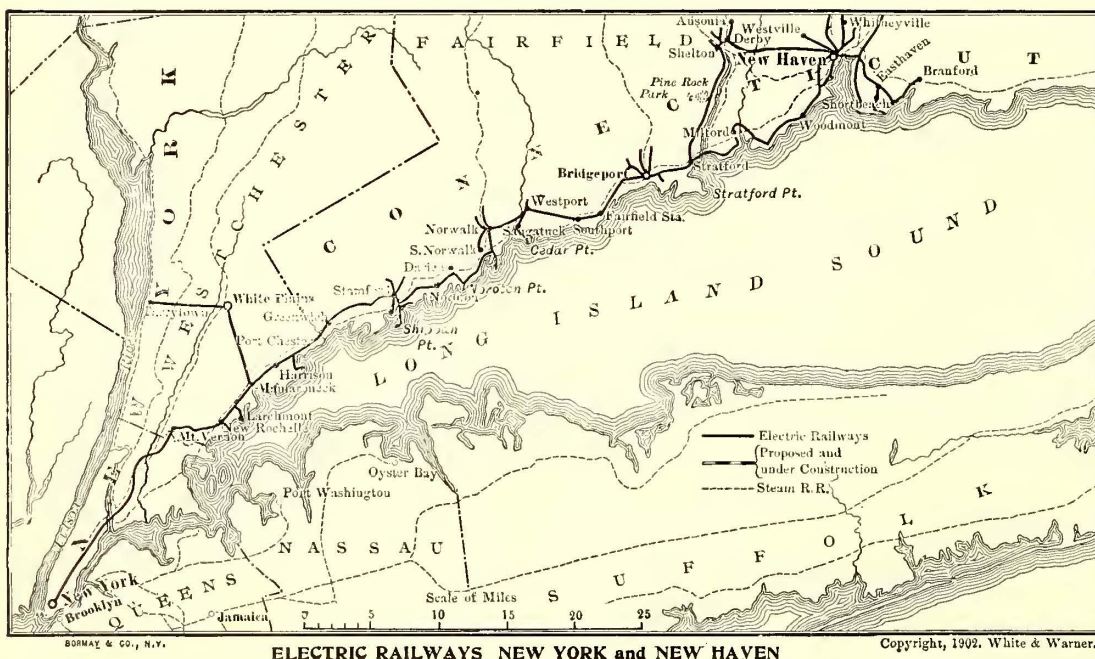
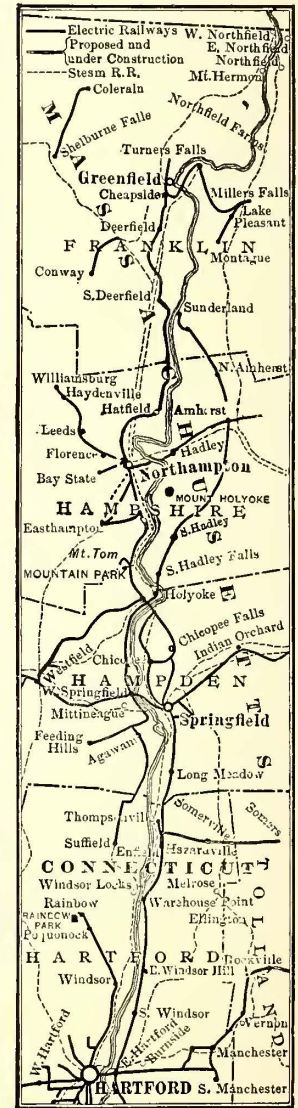
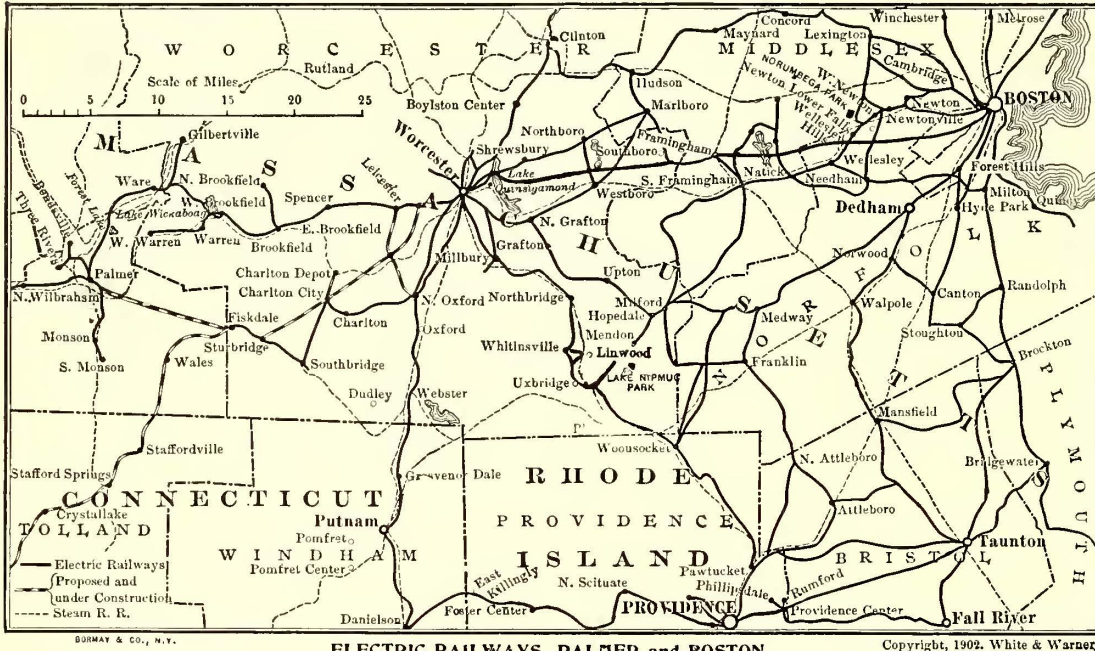
being filled in with heavy gold ornament and scroll. The car body is mounted on 27-G Brill trucks, having 4-ft. wheel base and 33-in. wheels.

The operating equipment consists of four General Electric-58 railway motors, geared for 30 miles an hour on level track, two K-6 General Electric controllers, one AA-1 Christensen double-end air brake, and Pullman style emergency hand brake.

FROM NEW YORK TO BOSTON BY TROLLEY

All of the gaps in the electric railway system between New York and Boston have been filled with the exception of one about 4 miles in length, between Cheshire and Milldale, in Connecticut, just north of New Haven. In making the trip the running time from New York City Hall to Park Street, in

Boston, is 20 hours and 5 minutes for the distance of 254 miles, or an average of about 12½ m. p. h. The fare, if the passenger takes full advantage of



The information and photographs for this article were furnished through the courtesy of John A. Beeler, vice-president and general manager of the Denver City Tramway Company.

the transfer ticket privileges along the route, is \$2.85, against \$5 by the steam railroad. In both of these calculations it is assumed that the passenger uses the steam cars of the New York, New Haven & Hartford Railroad between Cheshire and Southington, a distance of 6½ miles, for which a fare of 20 cents is charged.

The St. Louis Transit Company, of St. Louis, Mo., carried almost as many people Sunday, June 7, as on World's Fair Dedication Day. The records were: To the river front, 200,000; to Creve Coeur Lake, 20,000; to Shaws Garden, 30,000; to Forest Park Highlands, 20,000; to Delmar Garden, 20,000; to the baseball park, 12,000; to roping contest, 6000; along Broadway, north and south, 90,000; over other lines, 150,000. The traffic was constant during the day, and almost equally distributed over the city.

So much has been published in the daily papers and popular magazines of the possibilities of through traffic between New York and Boston and the adjoining sections that four maps are published herewith showing the electric railways in operation, those proposed and under construction and the steam railroads. The maps were compiled and are published in this paper through the courtesy of White & Warner, of Hartford, publishers of a manual, "Trolley Trips Through Southern New England," from which has been taken the information in re-

gard to fares and running time given here. The maps have been brought up to date and show the status of the different railways at the beginning of the present season.

A book of this kind must be of great assistance to trolley excursionists, and has undoubtedly had an influence in increasing this class of business on the roads in Southern New England. This paper recently called attention to the importance of giving through travelers information of this kind in case

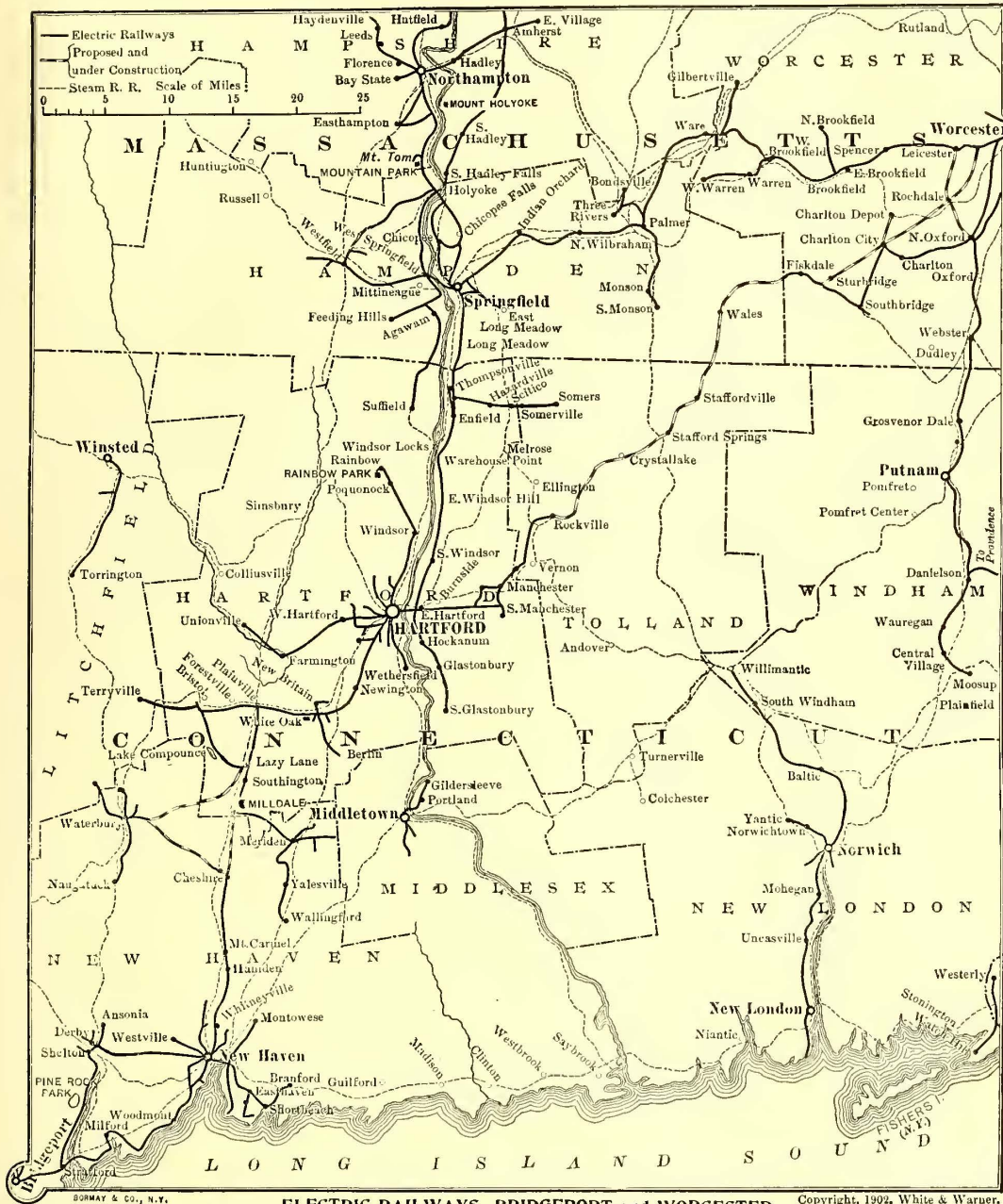
THE COST OF HIGH TENSION LINES

The cost of high-tension power transmission lines is a function of many variable quantities. Among these are locality, line potential, quantity of power to be transmitted and future growth of business considered, all more or less complex in their influence upon the investment per mile required. Again, the distribution of the power and necessity of providing for special construction at transformer or line transfer stations, which may exist between the various step-up and step-down points, does not add to the simplicity of the problem. The following estimate, however, made by a prominent engineer for a proposed transmission line in the Middle West, may be of interest as well as useful in other preliminary calculations.

The power to be transmitted was 15,000 kw, 30 miles at 40,000 volts. Continuous service being vitally important he decided to erect two separate pole lines to try to avoid all possible interruptions. The cost of the right of way, which is 75 ft. wide and 30 miles long, averages, say, \$10 per acre, if purchased before the communities through which it passes awake to the opportunities of money making which the power company's plans create. The total cost of the right of way is, then, \$2,720, or in round numbers \$90 per mile of double transmission line.

Assuming forty-five cedar poles per mile of single line, varying from 40 ft. to 60 ft. in length, they may be expected to cost not over \$10 on the ground, if the timber regions are not too far away. The total cost of getting all the poles for both lines on the ground will then be about \$27,000. Allowing fifty oiled white pine cross-arms, 8 ft. x 6 ins. x 6 ins., at 75 cents each, delivered on the ground per mile of each line, we have a cost of \$2,250 for the total of this item in the 30-mile run. For both lines a total of 300 iron pins and brackets per mile will be required, costing, at 25 cents each, \$2,250 in all. The line will require 150 insulators of the high-tension 14-in. pattern per line per mile, allowing the cost of each assembled to be \$1.75. In the 30 miles this item then runs up to \$15,750. Wooden braces allowed, at fifty per mile of single-transmission line, including bolts, at 40 cents apiece, amounts to \$1,200 in total.

Figuring on twenty-five struts, varying in length from 25 ft. to 30 ft., with bolts, per mile of single line at \$5 each, we have \$7,500 invested in this item. Guys and anchoring material, at \$100 per mile of double line, should be liberal, and will add \$3,000 to the estimate.



ELECTRIC RAILWAYS BRIDGEPORT and WORCESTER

any attempt was made to cater for through business, and it is, perhaps, somewhat strange that similar manuals descriptive of other sections of the country have not been published.

The uses to which abandoned street cars are put continue to multiply. Out in San Francisco there is a village, the principal residences of which are made up of street cars. In Kansas City the car on which Hugh J. McGowan, now of the Indianapolis Street Railway Company, acted as driver, has been converted into a lunch wagon. In St. Louis a cobbler uses a car as a shop. But a particularly novel use is being made of a car in New York, where one has been fitted up by an evangelist as a meeting house. The trucks of the car have been removed, the windows curtained and the floor carpeted. The car will hold 33 people in addition to a small organ, a piano and a concertina.

If the copper required is No. 00 B. & S. standard hard-drawn wire, the cost of 1 mile of three-phase circuit or 3 miles of wire, plus 4 per cent sag, is, at 16 cents per pound, \$1,070.40. The total wire cost for 30 miles of double three-phase line thus comes to \$64,224. Tie wire, No. 2 B. & S., may amount to \$24 per mile, or \$720 in all, if 30 ins. are allowed per insulator.

The labor cost of erecting forty-five poles and fixtures may be liberally estimated at \$6 per pole, or \$270 per mile of single line. The total labor cost on poles and fixtures in 30 miles double transmission reaches \$16,200. Allowing wire erection at \$1.12 per pound, or \$75 per mile of three-phase circuit, we

STEPPING-OFF SIGNS

The International Transit Company and Trans-St. Marys Traction Company, of Sault Ste. Marie, Mich., has put in use a novel method of protecting passengers and instructing them in getting on and off cars, as shown in the series of photographs herewith reproduced. One of these sets is placed in each car.

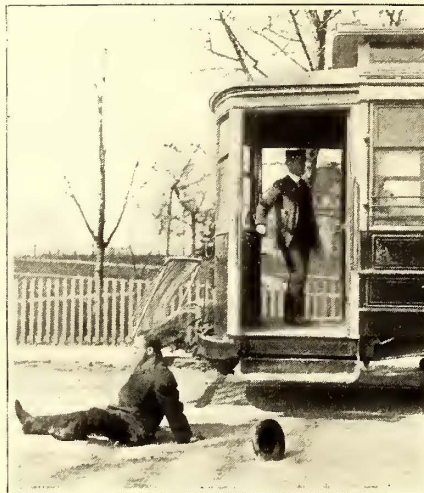
The particular failing of the public, even those in the large cities, in transgressing the well-known mechanical principles of stability in alighting from the cars is too well known by

NOTICE!

These Photographs Illustrate the Incorrect and Correct Way of Getting Off the Cars.
G. W. CHANCE, Manager.



INCORRECT--Very Dangerous!
GETTING OFF IN OPPOSITE DIRECTION CAR TRAVELS.



THE RESULT!
Wait Until the Car Stops!!



CORRECT WAY to Get Off!
FACE ABOUT HALF WAY TOWARD FRONT OF CAR AND SIDE.

CARD SHOWING RIGHT AND WRONG WAY OF LEAVING CAR

must write off \$4,500 for this in getting at the total cost. Tools may amount to \$25 per mile of single transmission, or \$1,500 in all.

Allowing 10 per cent for contingencies adds \$14,879 to the total cost of 30 miles double transmission, and, as the summary shows, the average cost per mile of single three-phase line works out as approximately \$2,728.

While these figures may appear large to builders of lower voltage lines they are believed to be representative of thoroughly substantial high-tension practice of the best character, and are on the safe side for preliminary estimates:

SUMMARY

	Cost per mile of double transmission.	Total cost.
Right of way.....	\$ 90.00	\$ 2,700
Poles	900.00	27,000
Cross arms.....	75.00	2,250
Pins and brackets.....	75.00	2,250
Insulators	525.00	15,750
Braces and bolts.....	40.00	1,200
Struts	250.00	7,500
Guys and anchorings.....	100.00	3,000
Copper wire.....	2,140.00	64,224
Tie wire.....	24.00	720
Pole erection.....	540.00	16,200
Wire erection.....	150.00	4,500
Tools	50.00	1,500
Miscellaneous, 10 per cent.....	496.00	14,879
Total	\$5,455.00	\$1,633.67

Approximate cost per mile of single three-phase transmission line, \$2,728.

railway managers and close observers to need further comment, but while two accidents happened to passengers getting off backwards before the illustrative method was used, none have happened since these signs were used.

A reproduction is also given of an advertising sign used by

TAKE THE POPULAR LINE BETWEEN THE 2 SOOS.

FERRY FORTUNE LEAVES POWER DOCK, SAULT, MICH., AND INTERNATIONAL DOCK, SAULT, ONTARIO.

EVERY 30 MINUTES.

Street Cars Connect with Ferry on Both Sides of the River.

FARE 10c INCLUDING STREET CAR FARE FROM ANY POINT BETWEEN SAULT, MICH., TO ANY POINT SAULT, ONTARIO, VIA "FORTUNE" **FARE 10c**

All Cars Connect With Ferry.



All Cars Connect With Ferry.

CARD ADVERTISING ROUTE

the company. Both signs are printed in red and black ink. The idea of the photographic method used is that of the manager of the above companies, G. W. Chance.

DATE OF THE NEW YORK STATE CONVENTION

The executive committee of the Street Railway Association of the State of New York has fixed Tuesday and Wednesday, Oct. 6 and 7, 1903, as the dates for holding its annual convention at the city of Syracuse, N. Y.

M. C. B. TRUCK FOR BROOKLYN ELEVATED RAILWAY

Announcement was made in a recent issue of the award of an order by the Brooklyn Rapid Transit Company to the

out of square. The bolsters are of forged steel, 8 ins. wide, and supported from the inside of the transoms by forged steel links made in one piece.

The motor suspension, which is especially well shown in the

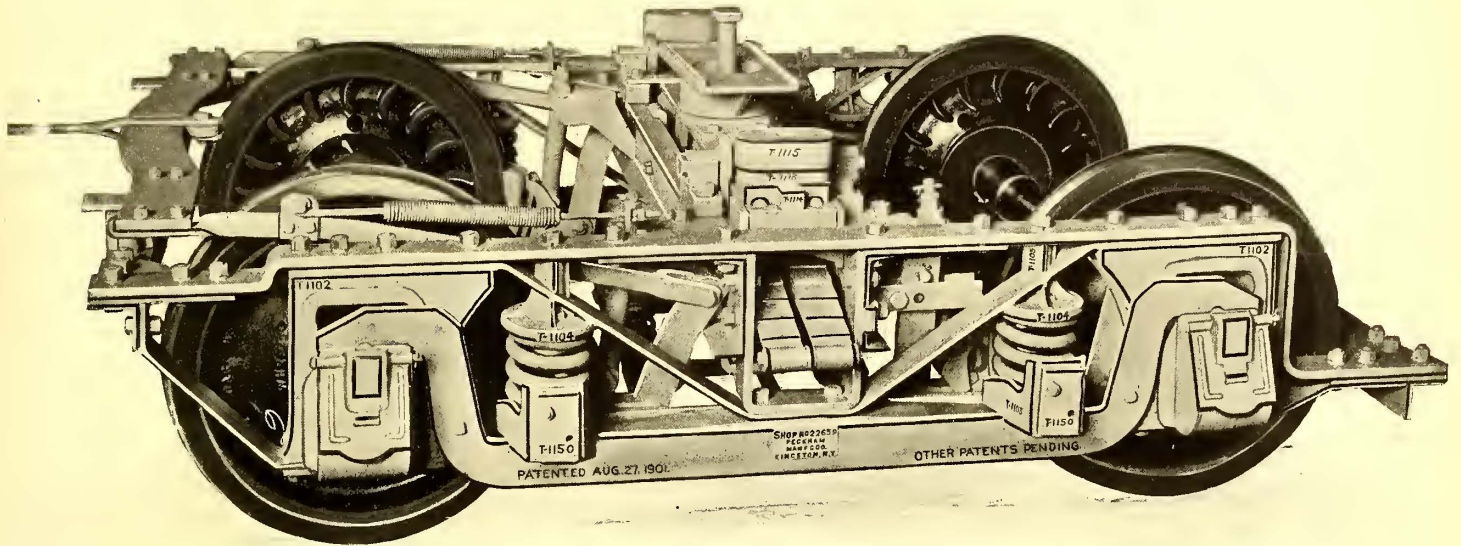


FIG. 1.—SIDE VIEW OF TRUCK

Peckham Manufacturing Company for all of the trucks to be used under the new convertible cars on the Brooklyn elevated lines. The car was described in the issue of May 30, and particulars will now be given of the truck. It is of a new type known as Peckham's High Speed M. C. B. "Brooklyn Special,"

end view, is suspended from the transom bars and is provided with spiral springs.

The sizes of the arch bars or truss members of this truck are regulated in size according to the weight of the car body and load to be carried. Its weight will depend upon the dimensions

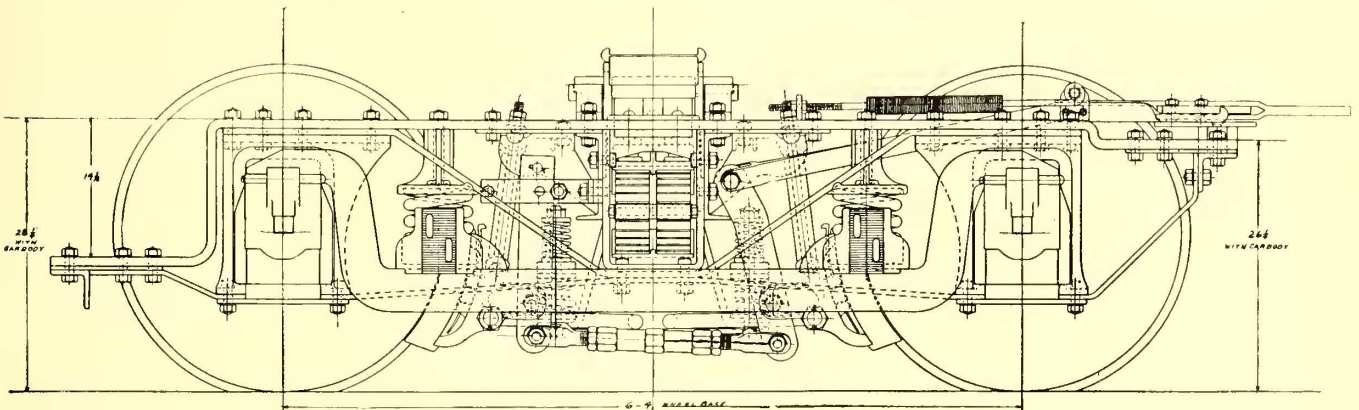


FIG. 2.—SIDE ELEVATION OF TRUCK

and contains several novel features which are worthy of attention.

The side frames are of the well-known Peckham combination type, and consist of a combination with two equalizing bars, of a center truss frame rigidly secured to the pedestals and top frames, forming an extra strong construction. This combination, it is claimed, gives a double factor of safety, as the center frame alone is sufficiently strong to carry the weight of the car without the aid of double equalizing bars which are arranged on each side of the pedestals.

The transom bars are steel, and of angle-bar shape, secured rigidly to the top frame and to the center arch bars. The top frames and transom bars are rigidly secured to each other by a center steel plate gusset which makes a rigid center brace that prevents the truck from getting out of alignment.

The top frames extend around the truck, but are depressed at the ends to accommodate the car steps. They are provided at the corners with gussets, firmly secured in place by machine-fitted bolts that keep the frames from getting

of the truss bars and wheels and axles, and will range from 7000 lbs. to 11,000 lbs.

The journal boxes are M. C. B. standard pattern with standard M. C. B. journal. The axles, 5 ins. to 7 ins. in diameter, as

- A - TRUCK TOP-FRAME CHANNEL
- B - TOP-FRAME GUSSET
- C - EQUILIBRATING BRAKE LINK
- D - ROLLER FOR MOVEMENT OF LINK
- E - BRAKE LINK FOR TAKING UP WEAR OF CASTING
- F - BRAKE LINK SLEEVE TO KEEP CHOE & HEAD IN POSITION
- G - BRAKE HEAD

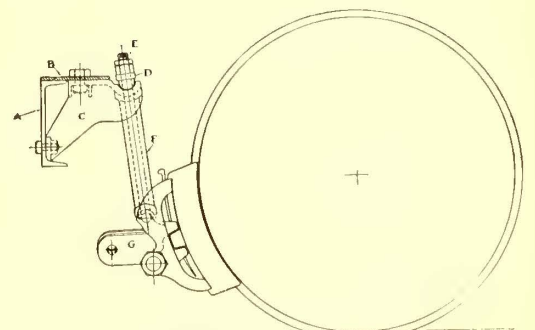


FIG. 3.—DETAIL OF BRAKE HANGER

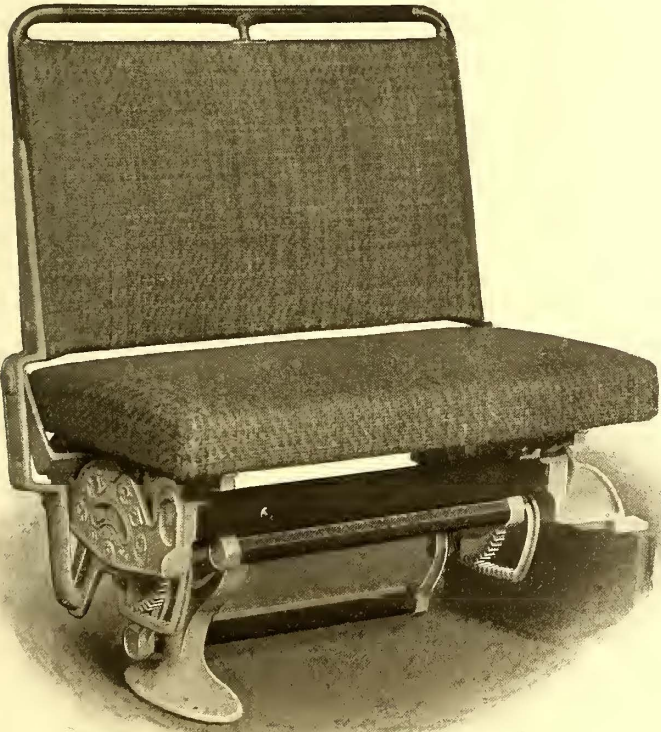
specified, and the wheels, from 33 ins. to 36 ins., as required. The pedestals are semi-steel and machine fitted where they

Anamori Railway, Mr. Wason saw an electric car of somewhat ancient type which greatly interested him on account of its excellent condition after so many years of service. He writes that the interior of the car is just as it left the car works—the varnish a little richer with age. The car was one of several built by the J. G. Brill Company for the Sprague Electric Company in 1888. The following year other cars, similar to that shown in Fig. 2, were purchased by the Tokyo Electric Light Company, and have been in operation ever since.

The photograph, which is reproduced, was sent from Tokyo by Mr. Wason. The gentleman whose hands are on the brake and controller handles is Mr. Fujioka, electrical engineer of the new electric road being built in Tokyo; on the step is Mr. Arita, general manager of same road; standing at the side of car is Mr. Tachikawa, president of the Anamori Railway. Mr. Wason expects to return to this country in September.

A REVERSIBLE SEAT WITH DOUBLE FOOT REST

A new reversible seat in which the manufacturers take considerable pride, and which seems to be proving extremely popular with street railway companies ordering new cars, is the reversible seat with double foot rest, made by the St. Louis



REVERSIBLE SEAT WITH DOUBLE FOOT REST

Car Company. The accompanying engraving from a photograph gives a clear idea both of the arrangement and the mechanism of this seat. The foot rest is connected by rack and pinion with movement of the back of the seat, so that the proper foot rest is always down and the other one lifted entirely clear of the floor, so that the floor is not unnecessarily obstructed. This has several advantages, among which may be mentioned the much greater ease with which the car floor can be swept, and the fact that there is room under the seat for small packages or baggage which a passenger may have, which room would not be available if the foot rests were fixed.

On June 3 three masked men boarded a suburban car running east from East St. Louis, robbed the motorman and killed the conductor, who went to the motorman's assistance. There were only a few passengers in the car. The robbers escaped.

IMPROVEMENTS ON THE PORTSMOUTH, KITTERY AND YORK STREET RAILWAY

In a few days through cars will be running between Dover, Me., and York Corner, by way of Eliot, and from Eliot to Kittery. The operating company will be the Portsmouth, Kittery & York Street Railway, and the schedule speed of the cars on the former line 20 m. p. h. The power station of this road is located at tidewater on Kittery Point, and it is now being extended by the addition of two 200-hp Hodge boilers, each 72 ins. diameter and 21 ft. 6 ins. long. The present boiler plant consists of three vertical Dillon boilers of 125 hp each. The generators are belted to horizontal engines as follows:

One General Electric six-pole, 225-kw, 425 r. p. m., 550-volt generator, to a 400-hp Erie City Iron Works four-valve, 21-in. x 21-in. engine; one General Electric six-pole, 110-kw, 600 r. p. m., 550-volt machine, to one 11-in. x 19-in. x 14-in. 150-hp engine; and another General Electric six-pole, 225-kw machine, belted to a 250-hp Ball & Wood 12-in. x 22-in. x 16-in. engine. There are three generator and two feeder panels in the switchboard, and the stack is 85 ft. high and of brick. The boiler feed pumps are 4-in. x 6-in. x 4-in. Worthington type, and a Worthington air pump and jet condenser is connected to the exhaust pipe of the compound engines. Coal costs about \$5.85 per ton delivered at this station, and the steam economy of the compound engines is about 20 lbs. per hp-hour. Complete records are kept daily by the engineer.

The opening of the new line from Dover to York Corner has called for the building of a new sub-station at the Corner, and the installation of a 250-kw Westinghouse, 60-cycle rotary converter. Foundations are ready for the machine, which will be supplied with current from a transformed 13,000-volt, three-phase line leading to the station of the Dover Light & Power Company, in Dover. The sub-station is a neat one-story little house with a green shingled roof.

A storage battery is located at the Long Beach car house in the basement, and consists of 220 cells of the Electric Storage Battery Company's type-"F-9" cells, rated at 160 amps., on the one-hour discharge basis. This battery floats upon the line and charges or discharges with light or heavy load respectively.

A new No. 0000 B. & S. feeder is to be run from the Kittery Point power station to Eliot via Greenacre, and the further development of traffic and new routes will probably call for a new sub-station near Eliot in the future. In that event alternating-current machinery may be installed at Kittery Point station for high-tension transmission.

The trolley ride from Kittery to York Beach is far-famed as one of the finest scenic marine routes in this country. The distance is about 16 miles, and it is covered in 1½ hours in summer and in 1¼ hours in winter. At present cars will run every half-hour from Kittery toward York, alternate cars stopping at Sea Point and returning. The summer schedule will soon be put in force, and calls for through cars every thirty minutes from Kittery to York Beach.

The rolling stock is liberally proportioned between open and closed cars, the former being mostly long double-truck equipments, with two side steps and a seating capacity of about sixty-five. The motor equipments are: Two General Electric "67" two-motor; seven Westinghouse No. 49 two-motor; one Westinghouse No. 69 four-motor, and five Westinghouse 12-A equipments. The road has four regular cars in service between Kittery and York, and a combination mail and express car, which makes four round trips daily between Kittery and York Beach. There are also three flat cars equipped with motors, for heavy material handling and general construction work, and two Taunton snow-plows.

W. G. Meloon is superintendent of the road, and S. E. Woodbury chief engineer of the Kittery Point power station.

THE RELATIONS WITH EMPLOYEES*

BY ARTHUR WILLIAMS

Faithful and continuous service has a quality of future value which cannot be immediately defined, and for which full compensation cannot always be given, in the usual acceptance of the term. The good-will of an establishment offers an illustration of this suggestion. Frequently good-will is a large percentage of the total assets; it is obtained only through considerate and faithful service; it cannot be secured where nothing more than perfunctory service is rendered.

Larger recognition is now given to this element of futurity than at any time in the past. This is evidenced by the increased extent to which employers are interesting themselves in the permanent welfare of their employees. Some aim to make their manufacturing plants attractive by comfortable surroundings, good sanitary arrangements, as much light and as little noise and vibration as possible, with recreation and assembly rooms, libraries and well-appointed dining-rooms. Oftentimes the dining-rooms are maintained without profit or with some loss. Healthy, cheerful, well-fed employees work better and faster, and in them the elements are absent which make for discontent and trouble. Some employers assist in building homes; some pay for life insurance, an excellent form of saving; some encourage part ownership—as indicated by the recent action of the United States Steel Corporation; some, like the Pennsylvania and B. & O. railroads, encourage the organization, and assist in the management, or relief and benefit associations; some, like the Pennsylvania Railroad, go a step further and, after a stated term of continuous service, provide pensions for life.

Of the methods examined, that seems to be the best under which the employees provided their own relief and benefit funds, and the employer the required pensions. It is proper to expect every one to save something to meet the contingencies of sickness, and carry some measure of life insurance, but the employer, as a rule, can fairly be asked to provide for those who have given in his service the best and greater part of their lives.

By contributing to a general fund approximately 3 per cent of his income, an employee can insure himself in illness to the extent of half his income for a considerable period of the year, and in addition he can carry approximately \$500 of life insurance. And, usually, it will be found that employees who have served continuously from twenty-five to thirty-five years can be pensioned to the extent of a quarter or a third of their salary at a net cost of less than 1 per cent of the usual pay-roll.

Insurance of \$300 or \$500 may not seem large, unless contrasted with the usual practice of, and I might add the usual receipts from, "passing the hat" on the death or illness of a fellow worker.

Existing systems designed for the relief and benefit of the employees of some of our American corporations may be of interest to the association:

THE METROPOLITAN STREET RAILWAY COMPANY, OF NEW YORK

The employees of the Metropolitan Street Railway Company pay into their own organization 50 cents monthly, and receive in the event of sickness \$1 daily for not more than ninety days in any year, and in the event of death the heirs are paid \$300; the company has recently agreed to retire on life pensions, at the age of 70, all employees who have been twenty-five years or longer in its service, and to give them optional retirement at the age of 65; the pension given is 25 per cent of the average salary or wages received during the preceding ten years, and increases at the rate of 1 per cent for each additional year of service until—I understand—it reaches a maximum of 35 per cent.

THE CONSOLIDATED GAS COMPANY OF NEW YORK

The Consolidated Gas Company, of New York City, through an organization of its employees, has two plans in operation—one relating to sick, the other to death benefits. An employee may take one or both, at his option. The sick benefits cost 30 cents monthly, and in the event of illness \$6 weekly are paid during a maximum period of twelve weeks, after which the medical attendance is continued without charge. The death benefit requires a monthly payment of 50 cents, and in the event of death, \$300 are paid to the family or legal heirs. The Consolidated Gas Company has recently agreed to contribute to each system 50 cents for each dollar contributed by the employees.

* Abstract of paper read at the convention of the National Electric Light Association at Chicago, May 26-28, 1903.

THE UNITED STATES STEEL CORPORATION

Forty-five thousand shares of preferred stock at the par value of \$100, now paying 7 per cent, were purchased by the corporation and sold to the employees at \$82.50 a share. One-sixth of the total of 168,000 employees subscribed for the stock twice over—showing the interest taken in this movement. The stock is to be paid for by instalments, and a bonus is to be paid to those still holding their stock and continuing in the service of the corporation during a period of five years. Arrangements are to be made for a second stock distribution of the same order, and a bonus is promised for the second five-year period, but the amount is not stated. In addition the directors have agreed to set apart yearly 1 per cent of the earnings in excess of \$80,000,000, and one-fifth of 1 per cent for each additional \$10,000,000 as a fund to be awarded to the officials and men, who, in the judgment of the directors, best deserve it. This sum is not to be distributed pro rata, but as a reward of individual merit.

THE ILLINOIS CENTRAL RAILROAD COMPANY

A somewhat similar method of interesting the employees of the Illinois Central Railroad was adopted some years ago. A short quotation from a circular letter of Stuyvesant Fish, president of the railroad company, will explain the method adopted:

"On the first day of each month the company will quote to employees, through the heads of their departments, a price at which their applications will be accepted for the purchase of Illinois Central shares during that month. An employee is offered the privilege of subscribing for one share at a time, payable by instalments in sums of \$5 or any multiple of \$5, on completion of which the company will deliver to him a certificate of the share registered in his name on the books of the company. He can then, if he wishes, begin the purchase of another share on the instalment plan. The certificate of stock is transferable on the company's books, and entitles the owner to such dividends as may be declared by the board of directors and to a vote in their election.

"Any officer or employee making payments on this plan will be entitled to receive interest on his deposits, at the rate of 4 per cent per annum, during the time he is paying for his share of stock, provided he does not allow twelve consecutive months to elapse without making any payment, at the expiration of which period interest will cease to accrue, and the sum at his credit will be returned to him on his application therefor."

On June 30, 1900, 3,090 shares of the company's stock had been purchased and paid for under this plan; the average cost to the purchaser being \$98.13, and the market price at the time being \$116 per share.

OTHER METHODS

I have been told that the Krupps, at Essen, Germany, in addition to very liberal provision for the comfort of their employees—one feature being a clubhouse splendidly equipped—guarantee that after reaching a certain age, with good record of service, they shall be retired with an annual pension and a small house in which to live. The pension and the use of the house are continued to the widow in the event of the decease of her husband. A firm in New York City, in addition to paying a high rental premium to secure abundant natural light and the use of modern apparatus of every nature, insures its principal employees at its own expense, and assists them in the purchase of homes. This is done in the belief that a man's expenses keep pace with his income, and, therefore, by giving income advances in the form of annual payments on insurance or property, a permanent saving to that extent is effected, and the interests of the employees are more surely identified with their work. For example, this firm paid \$500 last year on a house of one of their foremen, and expects to make a like payment this year and hereafter as long as the present relationship continues.

DISCIPLINE

Discipline is a question that has received a great deal of recent attention, and as one result the causes for instant dismissal have been largely reduced in number. Many of the steam railroads maintain Boards of Inquiry, to which appeals may be made by even those of the lowest ranks, though there are certain causes for instant dismissal, which proven, have no appeal, such as flagrant violation of rules, intoxication, insubordination, dishonesty and gross carelessness or negligence.

Promotion, if not entirely, largely depends upon previous record and the results of various examinations. So far as practicable, all of sentiment or of politics is eliminated. Discipline is administered usually in three ways: Instant dismissal; suspension from work and pay for a period of ten to sixty days; reprimand and record of deficiency. The third form, little known some years ago, has now almost superseded the other two.

THE BROWN SYSTEM OF DISCIPLINE

Discipline by reprimand and record is generally known as "The Brown System of Discipline," because it was first worked out by George R. Brown, general superintendent of the Fall Brook

Railway, of New York. This method has been referred to at length by A. D. Stickney, president of the Chicago & Great Western Railway, in a paper entitled "A Study of the Methods of Hiring, Discipling and Discharging Railway Employees," and some of his remarks may be of interest to the association. Mr. Stickney defends the Brown system, not from sentimental reasons nor chiefly as a promoter of the interests of labor—but in the interests of the companies. He states that the primary reason for discipline should be the improvement of the service, not the punishment or reformation of the man, nor primarily object lessons to other men; that the improper use of the discharge method has been "the vital spot of all brotherhood organizations."

Suspension from duty and pay by the immediate employing officer is also opposed. Mr. Stickney states that suspension without investigation and without any measure of the degree of culpability is almost always unfair, and is usually administered in a spirit of anger; the person administering the punishment is usually the sole judge of how to make the punishment fit the crime, and simply because of the momentary condition of the administrator the highest punishment is often inflicted for a petty disobedience, which resulted in no serious consequences.

The question of who shall administer discipline is of no less importance than the form the discipline is to take. The Brown system discards the idea of punishment and penalty, and maintains that it is no part of the directing forces of the employer to punish the employees; it maintains that those forces should be utilized solely for the purpose of planning and intelligently directing the work. Upon this Stickney makes the following observations:

The basic idea of the Brown system is the record book, in which a page is devoted to the personal record of every employee. The book itself is never shown. Any employee can get a copy of his personal record at any time. Of this record Mr. Brown makes the following observations:

"In it I write down a brief statement of every irregularity for which a man is responsible. This record takes the place of the 'lay-off' and is dreaded fully as much. The man goes to work at once, no one but himself suffers, and he only in reputation at headquarters.

"When a man commences to make a record in the book we call him in and talk to him. He is reminded that if this gets too long we shall have to consider him a failure for our service; show him his weakness, and give him another chance."

A second important feature of the Brown system is a bulletin which, with the record book, makes up the substance of the plan. The bulletin is a publicly posted record of every irregularity on the road; it gives no names, simply describes the accident or irregularity and then comments upon it from the company's point of view, suggesting how the accident might have been avoided or how injurious it was to the interests of the company.

Some of the objects of his method are stated by Mr. Brown to be as follows:

"First—To secure a higher state of efficiency. Strict discipline is essential to successful operation.

"Second—To avoid loss of time and wages of employees, which results in possible suffering to those dependent upon their earnings. There is also the chance of demoralization by enforced idleness.

"Third—To avoid unnecessary severity in the dismissal of an employee or in requiring him to serve a suspension for a single offense that does not reflect upon his reputation, conduct, capacity or future usefulness.

"Fourth—To remove the false, but too common, impression in the minds of employees that the amount lost to them in wages is a payment for the loss in trouble caused the company.

"Fifth—To avoid frequent change in the service.

"Sixth—To advance the education of employees through the medium of bulletin notes, thus enabling them to avoid mistakes made by others.

"Seventh—To establish a feeling of security and the confidence that faithful service will be recognized, and rewarded by uninterrupted employment and with the certainty that reward and promotion will not follow indifferent service."

AN INTERESTING EXAMPLE

An interesting example is given following the adoption of the Brown system on the Long Island Railroad. On a certain section, ten miles long, 116 flagmen or gatemen, each earning about \$40 monthly, are in service. The former practice was to suspend these men for delinquencies for periods ranging from three to fifteen days, and an average of eight men was required daily to replace those suspended. After the adoption of the discipline system without suspension, over a considerable period, there was but one failure to appear on time, and in this instance the employee overslept. With this method it became unnecessary to send a gang over the road each morning to replace the delinquents; the men seemed willing to accept occasional suspension, but not the risk of losing permanent employment.

On some roads the Brown system has been extended so as to include demerits to delinquents on the one hand, and on the other merits for acts of heroism and for even minor evidences of fidelity and intelligent interest to the work. An extension of this plan

also has been tried, allowing a certain period of clean record to cancel a certain period of bad record. For example, on one road suspension of fifteen days or less would be considered cancelled by a perfect record of one year; suspension for more than fifteen, but not exceeding thirty days, would be cancelled by a perfect record of two years; of thirty days, but not exceeding sixty days, by a clean record for three years. In some instances complimentary bulletins are issued every twelve months, stating the names of employees who have made a perfect record for the year.

THE PENNSYLVANIA RAILROAD COMPANY

Of our American corporations, the most marked progress in securing a method of caring for the interests of employees has been made by the Pennsylvania Railroad Company, through its "Voluntary Relief Department" and "Pension Department"—separate organizations. Since the organization of these departments there has been no serious labor trouble on this railroad, though previously there were a number of disturbances—wide in extent and serious in nature.

The Relief Department was organized in 1886, as the result of the evident need of more effective means for meeting distress incidental to sickness and death, than that of soliciting voluntary subscriptions from friends and associates, and is administered through a superintendent appointed by the board of directors. There is also an advisory committee composed of twelve members, of whom six represent the company, and six are chosen by the Relief Department members from among themselves. To this committee is charged the responsibility for seeing that the department is conducted in accordance with the regulations, which are in printed form, and of providing for the care and investment of the relief funds. The general manager of the company, by virtue of his office, is chairman of the committee. The superintendent of the department is the secretary of the committee, and the railroad company acts as the custodian of the relief funds.

RELIEF FUND REVENUES AND PAYMENTS

The revenues of these funds are derived from three sources: Dues from members; interest paid by the company on current balances; contributions by the company to make up deficiencies. The membership is entirely voluntary. During the year 1902 the average monthly membership was 63,916; at the close the aggregate membership was 70,307; the relief fund account was credited with \$1,297,187.61; the benefits paid amounted to \$1,034,820.98; the balance at the end of the year was \$262,366.63.

There are three additional funds or accounts in this department: the "relief fund liability account," which at the close of the year had a credit of \$120,319.89, the "relief fund surplus account" having a balance of \$751,256.25, and a "superannuation fund," which in the year of 1902 amounted to \$40,276.57, made up of a small balance and the interest on the relief fund surplus, all of which, with the exception of \$10.20, was paid to superannuated employees, during the year.

During the seventeen years' operation of the department there have been paid to the employees in sick, accident and death benefits the sum of \$9,884,909.19; in addition, the company has paid \$2,264,659.63, of which \$1,613,457.72 were expended for operating expenses—a total of \$12,149,568.82. The company, at its own expense, maintains the department, paying the salaries of those who direct it, the medical expenses, furnishes the necessary offices, stationery, etc. It is undoubtedly due to liberal policy and thorough organization that the success of the department has been so marked and the results so beneficial to the working forces of the Pennsylvania Railroad Company.

An analysis of the benefits paid during the year shows the following:

CONTRIBUTIONS TO RELIEF FUNDS

Deaths:	Number.	Insurance Paid.
By accident.....	313	\$158,585.17
From natural causes.....	546	283,956.81
Total	859	\$442,541.98
Disabilities:	Number.	Benefits Paid.
By accident	13,877	\$217,890.05
By sickness	37,975	374,388.95
Total	51,852	\$592,279.00
Total of both death and disablement payments	52,711	\$1,034,820.98

In disabilities the average duration is, accidents 19.6 days, sickness 18.1 days. It will be noted that of 859 deaths during the year, 313, or about 36 per cent, resulted from accident; of 51,852 disabilities, 13,877, or about 26 per cent, were from accident. In the electric light industry, the accident claims, while not entirely eliminated, would be largely reduced. The fact that in both death

and disablement benefits much the larger percentages result from natural causes, shows that, while railroading may be termed an extra-hazardous occupation, there is, with all classes of employees, every reason to provide for illness and other uncontrollable circumstances.

CONTRIBUTIONS TO RELIEF FUNDS

Contributions to the relief funds are made in accordance with a graduated scale, proportioned to the wages the members earn. There are five classes, the details of each being shown in the following tabulation, taken from the regulations of the Voluntary Relief Department, as amended to Jan. 1, 1900. The tabulation also shows the benefits received in the event of disablement or of death.

	1st Class	2d Class	3d Class	4th Class	5th Class
Monthly pay	Any Rate	\$35 or More	\$55 or More	\$75 or More	\$95 or More
Contribution per month—					
Class	\$0.75	\$1.50	\$2.25	\$3.00	\$3.75
Additional death benefit, equal to death benefits of class—					
Taken at not over 45 years of age.....	.30	.60	.90	1.20	1.50
Taken at over 45 years and not over 60 years of age .....	.45	.90	1.35	1.80	2.25
Taken at over 60 years of age .....	.60	1.20	1.80	2.40	3.00
Disablement benefits per day, including Sundays and holidays:					
Accident—					
First fifty-two weeks .....	.50	1.00	1.50	2.00	2.50
After fifty-two weeks .....	.25	.50	.75	1.00	1.25
Sickness—					
After first three days, and not longer than fifty-two weeks .....	.40	.80	1.20	1.60	2.00
After fifty-two weeks .....	.20	.40	.60	.80	1.00
Death benefits—					
For class	250.00	500.00	750.00	1,000.00	1,250.00
Additional that may be taken	250.00	500.00	750.00	1,000.00	1,250.00

The minimum contribution in each class averages about 3½ or 4 per cent of the wages of the employees—the percentage is highest where the employee receives the minimum wages of the class.

PENSIONS

But there comes a time when the employees cease to earn wages, and, therefore, are unable to pay monthly dues to the organization. It is then that ordinarily they must rely upon their savings, the assistance of relatives or of friends, or upon charity. The percentage of those who save enough to sustain them in old age is very small, probably largely because of thoughtless expenditure and failure to realize the ultimate value of accumulated savings, even though the individual savings be small. The Pennsylvania Railroad, not alone of the railroads or other corporations in this country, but referred to at greater length because of the extent to which the matter has been investigated, then took up the question of pensioning all of its aged employees, and in 1890 put a system into effect, of which the following are some of the features—quoting from the Pennsylvania Railroad Company's general notice of Dec. 18, 1899, and signed by the president, A. J. Cassatt:

"First—All officers and employees of the company who are required by the organization to give their entire time to the service of the company, who shall have attained the age of seventy years; or who, being between the ages of sixty-five and sixty-nine years, inclusive, shall have been thirty or more years in the service of the company, and shall then be physically disqualified, shall be relieved and placed on the pension roll.

"Second—Subject to ratable reduction, so that the entire annual expenditure for pension allowances shall not at any time exceed the aggregate sum of \$300,000, pensions shall be allowed upon the following basis:

"Third—For each year of service 1 per centum of the average regular monthly pay for the ten years preceding retirement. Thus, by way of illustration: If an employee has been in the service of the company for forty years and has received on an average for the last ten years \$40 per month in regular wages, his pension allowance would be 40 per cent of \$40, or \$16 per month.

"Fourth—Pension allowances shall be paid monthly, and shall terminate on the death of the beneficiary.

"Fifth—No pension allowance shall be paid to any officer or employee for a period during which he may be receiving accident or sick benefits from the relief department.

"Sixth—The acceptance of a pension allowance shall not debar the beneficiary from engaging in other business; but such person cannot re-enter the service.

"Seventh—The pension department shall, under the supervision of the president, be in charge of a board of officers, consisting, until otherwise ordered, of the vice-presidents, the general manager, and the assistant comptroller of the Pennsylvania Railroad Company. The board of officers shall be appointed annually by the boards of directors of the several companies, and shall, subject to the approval of the said boards, make and enforce regulations for the government of the department.

"Eighth—No action, which shall now or hereafter be taken in connection with the origin or furtherance of a pension department or plan, shall be held or construed to give any officer, agent, or employee a right to be retained in the service or become entitled to pension allowances, but, on the contrary, each company may discharge any officer, agent, or employee at any time, when in its judgment the interests of the company so require, without

liability for pension or for other allowances, save only salary or wages then earned and unpaid.

"No person shall be taken into the service of the company who is over thirty-five years of age, except that, with the approval of the board of directors—

"First—Former employees may be re-employed within a period of three years from the time of their leaving the service.

"Second—Persons may, irrespective of age limit, be employed where the service for which they are needed requires professional or other special qualifications; but,

"Third—Persons may be temporarily taken into the service, irrespective of age limit, for a period not exceeding six months, subject to extension, when necessary, to complete the work for which engaged."

The assistant comptroller of the Pennsylvania Railroad Company, Mr. Riebenack, stated in an address before the Economic Club, of Boston, at the annual dinner on Feb. 10, 1903, that a special committee, appointed to consider the pension question, examined into and reported upon the various pension systems in operation on more than seventy of the leading railroads of America, Europe, Asia, Africa and Australia. Even the enormous amount of data thus collected was not sufficient for the formulation of the pension plans of the directors, the scope not being sufficient, and, therefore, in adopting the present system, progress was made along lines original and more extensive than had before been undertaken by any corporation.

PENSION EXPENDITURES AND COST TO THE COMPANY

There were paid to retired employees during the three years of operation, beginning Jan. 1, 1900, pension allowances aggregating \$864,713.27. In the same years—1900, 1901 and 1902—1,851 employees were retired, of whom, in that period, 381 died. Three hundred and fifty-nine were between 65 and 70 years of age, physically incapacitated, and of this number, 261 were relieved by their own request, with the approval of the employing officers. The average age of the pensioners on the roll at the end of 1902 was 73 years, and the oldest pensioner was 91 years of age.

At the end of 1902 the percentage of pensioners to active employees was 1.47, the pensions paid then aggregating \$300,000, approximately \$3.24 per annum for each employee of the railroad company, and about 57-100 of 1 per cent of the annual pay-roll. When it is pointed out that this pension expense aggregates less than 1 cent per day for each employee, it would seem (a) that were employees to act jointly, they could themselves provide for old age at an expense not exceeding 1 cent a day; or (b) that any corporation by the same method could reach the same result—and that, for the influence upon employees, the corporation could well afford, entirely at its own expense, to take such a course.

Contrast with these figures the cost of a single labor disturbance, or the value relatively, of faster and better work, of better and closer attention to an employer's property and interests; of stimulating devoted and enthusiastic effort on the part of each employee. The cost of securing this fades into insignificance.

It will be noticed that the Pennsylvania Railroad Company has limited its liability to a stated annual amount; that it simply agrees to pay the defined percentages for pensions, provided that the sum allowed is sufficient for that purpose. If it is not, either a larger amount would have to be allowed by the directors—which would be optional—or some decrease in the pension rate would follow.

INVESTIGATIONS BY THE NEW YORK EDISON COMPANY

The New York Edison Company has given recent consideration to this subject, though the plans thus far outlined are not as yet beyond the stages of earliest consideration. Briefly stated they are as follows:

"First—The organization of a relief association, in which it is proposed that each member shall pay 3 per cent, and, in the event of accident or illness, receive half of his wages or salary; that in the event of death his heirs shall be paid \$350. The constitution of the association would be so drawn that the obligation to maintain these payments would continue only as long as they are justified by the income—it being the intent that while the company should meet the administration and medical expenses, the disability and insurance expenditures shall be entirely contributed by the membership.

"Second—That the company shall pay to all employees serving it continuously for a period of twenty-five year, for each year of active service, an annual pension for life of 7 per cent of the average salary or wages received during the preceding ten years. As with the Pennsylvania Railroad Company, the intent is to place a limit upon the total expenditure of approximately \$3.80 annually for each employee on the pay-roll. Beyond this the company would have no liability, so that, unless further action were taken, it would be necessary to scale down the percentage of pension payments were this allowance not sufficient for that purpose."

The plan suggests that no pressure whatsoever shall be brought upon the employees to join the association other than the fact that it will furnish an inexpensive way of providing for illness and for some insurance.

The constitution and by-laws are to be carefully drawn with legal advice; the fiscal officers of the department would be the fiscal

officers of the company holding corresponding relations; the chairman of the board of directors, by virtue of his office; the general manager or the associate general manager of the company. But otherwise this board, under constitutional provisions, would have control of the department and would be composed of equal representation on the part of the company and of the employees.

The company felt that several points involved, particularly legal, should be carefully considered by its attorneys, and the following opinion may be of interest to the association, and of value to any companies intending to take action on this subject:

EXTRACTS FROM AN OPINION RENDERED BY THE ATTORNEYS OF THE NEW YORK EDISON COMPANY

"We have carefully looked over the papers and pamphlets which we have in our possession bearing upon a similar (pension and relief) department, which has been conducted by the Pennsylvania Railroad Company, and have also considered the decisions of various courts upon questions which have arisen under this or similar schemes.

"As we have stated, the pension fund would be a direct charge upon the company, and as it is gratuitous, the company could not be attacked legally by reason thereof, as there would be no interest in that fund to which any of the employees would contribute. That branch of the proposition, therefore, would probably cause no trouble to the company.

"The relief and insurance branch, however, seemed at first to us to have some objections, but, after considering the system which has been adopted by the Pennsylvania Railroad, we do not think these objections are sustained.

"We had in mind an assessment system, which apparently is not such a system as is conducted by the railroad company. The insurance given under the Pennsylvania Railroad scheme is upon a firmer basis than insurance under the assessment plan, and with the guarantee of the railroad company for three years against deficiencies seems to be much more substantial.

"The cost of insurance under the Pennsylvania scheme seems to be about, or perhaps above, the average of insurance furnished by first-class insurance companies, and therefore cannot be compared with the assessment or benefit insurance, which certainly has not been successful, in this State at least.

"The liability of the company to attack by suits growing out of the relief and insurance scheme will not be great. The experience of the railroad company has demonstrated that proposition.

"The policies or contracts of insurance may be so drawn that the Edison Company would be fully protected. There are also some advantages which would accrue to the company by releases of claims for injury or death from negligence. The policies may contain a stipulation that if the insured accept the benefit of the insurance fund he or the beneficiary shall relieve the company from liability for injury or death by negligence. We understand that the railroad company has saved a large sum of money by inserting such a clause in its policies.

"We have looked over the cases which have arisen upon that point, and find that they have uniformly been decided by the higher courts in favor of the corporations. Some of these actions have been brought against the Pennsylvania Railroad Company and some against other railroad companies which have in operation similar schemes."

IN CONCLUSION

If the experience of other corporations has proven that there are material and mutual advantages in forming closer relations with their employees by the use of these or other means, it would seem that they should be adopted wherever practicable, and the methods should be as liberal as the local conditions will permit. While personally favoring the system of the Pennsylvania Railroad Company to any other, since it seems to be a system which can be adopted with but few modifications by corporations large and small, there may be features in some of the other methods which strongly commend themselves, and which therefore will be adopted in preference to this system. It is not the method or the system employed, but the result.

But it should not be considered that special provisions for the comfort, welfare and education of employees, or the maintenance of benefit or pension departments, or anything else of that nature, can be substituted in any part for the wages which the employees should receive. Whether such systems be employed or not, wages are dependent upon the law of supply and demand, and relatively upon the wages paid to others occupying similar positions and working under approximately like conditions. To secure right results, any expenditure for these purposes must be made additional to the normal labor costs. It might be considered that for the usual labor expenditure the return is a given amount of work secured in the normal manner; that the returns for the added voluntary expenditures are better employees, as a class, freedom from labor troubles and highly augmented labor efficiency—added to which would be perhaps greater individual effort in work and devotion to the employers' interests.

Negotiations are pending for the consolidation of the Cincinnati, Milford & Eastern Traction Company and the Cincinnati, Milford & Loveland Traction Company. Both companies are at work on lines between Cincinnati and Milford. George H. Chamberlain is at the head of the Cincinnati, Milford & Eastern Company, and B. H. Kroger is president of the Cincinnati, Milford & Loveland Company.

SUIT TO STOP METROPOLITAN LEASE

Trial of the suit brought several months ago by Isidor Wormser, Jr., against the Metropolitan Street Railway Company and the Interurban Street Railway Company, of New York, for an injunction restraining the two from carrying out the lease by the Metropolitan Company of all its property to the Interurban Company, began June 16 before Justice Scott of the Supreme Court.

It is the allegation of Mr. Wormser in his complaint that the execution of the lease and the operation of the Metropolitan Company by the Interurban Company would rob the Metropolitan stockholders of earnings which should be theirs and divert them to the stockholders in the Interurban. Mr. Wormser's contention is that the receipts and earnings of the Metropolitan will increase to much more than 7 per cent with the growth of population and the development of the service, and that this additional amount should go to the stockholders in the Metropolitan, whereas, as has just been stated, it will go, under the lease arrangement, to the stockholders of the Interurban.

Mr. Wormser asked the court to declare the lease to be illegal and void, and to compel the Interurban Company to return to the Metropolitan Company all the property which it acquired from the Metropolitan under the lease.

Former Supreme Court Justice Charles L. Brown, with W. B. Guthrie, of the firm of Guthrie, Cravath & Henderson, and Edward Lauterbach, of the firm of Hoadly, Lauterbach & Johnson, appeared for the defendants to the suit. Albert L. Stickney, of the firm of Stickney, Spencer & Ordway, and the law firm of Anderson, Pendleton & Anderson have charge of the case for the plaintiff.

A number of prominent street railway financiers and managers have been called upon to give their testimony in the suit, among others W. C. Whitney, H. H. Vreeland, Thomas F. Ryan, A. D. Julliard and Thomas P. Fowler. Both of the latter are directors in the Metropolitan Securities Company.

The reasons for the lease were brought out by the testimony of Messrs. Ryan and Whitney. Both of these gentlemen stated that the plans to lease the Metropolitan system began to be discussed early in 1901, when the necessities of the Metropolitan Street Railway Company for additional capital became pressing. In its efforts to secure a satisfactory motive power on the streets near the river and on the cross-town streets where the introduction of the conduit system was not advisable, the company had spent about \$1,000,000 in fruitless experiments with compressed air motors and storage battery cars. At about the time mentioned the Metropolitan Street Railway Company had an indebtedness of \$11,000,000 or \$12,000,000, and required about \$10,000,000 more to complete its improvements.

According to Mr. Whitney, in the early history of the company Mr. Vreeland had been largely assisted in the management of the affairs of the company by himself and by Messrs. Widener, Elkins, Ryan and Elihu Root, but at about this time all of these gentlemen found it impossible to devote much time to the property. Mr. Root had become Secretary of War. Mr. Whitney had retired from business. Mr. Ryan had become president of the Morton Trust Company, Mr. Widener had become interested in a great many other corporations, and Mr. Dolan's time was occupied with the United Gas & Improvement Company. The result was that Mr. Vreeland threatened to resign in 1901 unless he was better supported by the leading stockholders of the company, who, thereupon, decided that it was desirable to interest other strong financial interests in the corporation. Negotiations were then taken up with Kuhn, Loeb & Co.

It was understood that about \$30,000,000 additional capital would be required, and the first proposition of Kuhn, Loeb & Co. was that they would advance this entire amount and hold all of the stock of the Securities Company. Mr. Whitney testified that this proposition was declined by the leading stockholders of the Metropolitan Street Railway Company, who insisted that the stockholders of the Metropolitan Street Railway Company should be afforded an opportunity of subscribing to a portion of the stock of the Securities Company. This plan was carried out by allowing the stockholders of the Metropolitan Street Railway Company to subscribe at the rate of 45 per cent of their holdings in the company to \$23,400,000 of the Securities Company's stock, leaving a privilege of subscribing to \$6,600,000 of the Securities stock at par to Kuhn, Loeb & Co. Mr. Whitney further testified that he had no interest in the Metropolitan Securities Company other than that which he took as a stockholder in the Metropolitan Street Railway Company. He also stated that one of the original plans of the Metropolitan Securities Company was to secure control of the Manhattan Elevated Railway, but that owing to a number of obstacles, among them the suits brought by the minority stockholders, this object had not been effected.

FINANCIAL INTELLIGENCE

WALL STREET, June 17, 1903.

The Money Market

The money market has become a trifle easier during the week, partly owing to the stoppage of gold exports and partly to the lessened demands for credits, consignment upon the liquidation in the stock market. For the first time in a number of weeks a substantial reduction was reported in bank loans, the decrease amounting to \$11,000,000. This was not, however, altogether the result of Stock Exchange conditions. It was just as much due to the fact that money rates having risen well above the foreign level retransfers of credit from Europe to this country have stopped. It was this movement which, for several weeks past, prevented the local bank loan contraction that would have naturally occurred through the decline in securities. Two leading questions are suggested by the present situation. Will the European demands for gold be renewed? and what will the course of the money market be, provided further gold exports are held in check? In the first connection the latest developments in the German markets deserve particular notice. The Imperial Bank of Germany somewhat unexpectedly raised its discount rates last week, and it was given out that increasing home demands were the cause. This action has been followed by a rapid fall in Berlin exchange, which has now reached the lowest level of the season. A similar and apparently sympathetic decline has occurred in Paris exchange, which also is at its lowest point. The inevitable consequence of these movements must be either to force gold shipments from London or from New York, and, at this writing, opinion of local banking circles is uncertain as to which will happen. One thing is clear, that the money situation in Continental Europe makes for a continuance of fairly high money rates here; for if our market is to keep from shipping gold it must maintain its bids or capital, or if money were to become temporarily easier here gold would soon go out in such quantity as to compel the raising of rates again in order to maintain our bank reserves. High money must be the result in either case. As for the domestic factors in the situation, currency is flowing in from the interior rapidly enough to offset losses to the Treasury, and also to take care of any gold that we may lose abroad. Continuation of loan contraction is also probable, which will help the strength of the banking position. But with two months only remaining before the harvest demands begin to make themselves felt, the market is in no condition to permit any such heavy outgo of gold as took place last month. It is safe to predict, therefore, that no important reaction from the present level of money rates will occur. The easier tendency which we have noted in comparison with a week ago is confined principally to the call money market, where $2\frac{1}{2}$ per cent is the prevailing quotation. The rates for time money have been shaded to some extent, lenders asking $4\frac{1}{2}$ per cent instead of $4\frac{1}{4}$, for sixty days, but rates for the longer periods are stiffly maintained, on a basis of 5 per cent for six months.

The Stock Market

The stock market reached last Thursday what seemed to be a final turning point after its prolonged decline. On Wednesday demoralization had become acute, and a positive fear had developed that unless the selling were checked some failures could not be avoided. The crisis was suddenly and marvelously relieved by the appearance of investment purchases on an enormous scale, both from Europe and this country. These buying orders did not make themselves felt until Thursday morning; then a sharp rally set in, which, starting immediately at the opening, became very violent before the day was out. Recovering continued on Friday, and through part of Saturday's session, when the Stock Exchange witnessed something almost approaching a bear panic. It was natural that the first rebound would carry prices too far. Investors, stock buying and the market depended entirely upon the purchases of the frightened short interest. The demand from this source being satisfied, there was no longer any immediate sustaining power, and prices have since reacted very sharply. It now remains to be seen whether the real liquidation is actually over. The majority in Wall Street believe that it is, and that if the low prices of a week ago were to be reached again they would attract investment purchases in quantity sufficient to prevent any

further decline. Looking at the possibilities on the other side there seems to be a little likelihood of any very important advance. Uncertainty has been relieved effectually concerning the wheat crop, but the outlook for corn is not so clear, the planting season is almost unprecedentedly late, and inasmuch as the speculative spirit is dead, and the large financial interests extremely cautious, anything like a bull campaign is out of the question, at least until assurance is received regarding the corn crop. Perhaps, should things develop favorably in this quarter, we shall have some rise during the summer, but in the meantime a dull and steady market is the best that can be hoped for.

Nothing of a particular nature has arisen during the week in the market for local traction stocks. The only important development is the suit brought against the Metropolitan Street Railway by the same party of litigants who have opposed from the first the formation of the Metropolitan Securities Company. It cannot be said that this latest incident in the affairs of the harrassed company has had any special effect in the market; Wall Street has grown to be very skeptical of all this sort of litigation. Metropolitan shares suffered no worse than any of the others in the recent break, which carried all the traction stocks down to new low points for the season. Nor did Metropolitan recover any less rapidly than the rest. It is evident that in this stock, as well as in Brooklyn Rapid Transit and Manhattan, no efforts are being made by inside interests to support prices. All three stocks are simply being left to take their chances with the course of the general market.

Philadelphia

The lowest prices of the year were reached on the Philadelphia Exchange during the general market collapse of a week ago. Rapid Transit furnished the noteworthy exception; it did not sell below $12\frac{1}{4}$ at any time, which was a point and a quarter above the low record for the stock. It would appear that whatever small amount of this issue which had previously been distributed to the public has now found its way back to the hands of the syndicate. Union Traction struck bottom at $44\frac{3}{4}$; subsequently it recovered to $45\frac{1}{4}$. Philadelphia Traction after touching 96 came back to $96\frac{3}{4}$. Philadelphia Company common went as low as 40 under rather heavy liquidation, but rebounded sharply to $42\frac{1}{2}$. The preferred stock was steadier; it did not sell below 47, and later rose to $47\frac{1}{2}$. Consolidated Traction of New Jersey lost a point, from $68\frac{1}{2}$ to $67\frac{1}{2}$. Other sales for the week included American Railways between 45 and $45\frac{1}{2}$, Railways General at $43\frac{3}{8}$, Union Traction of Indiana preferred at 110, and Union Passenger Railway at 245.

Chicago

Dealings have been light during the week in the Chicago specialties, with irregular changes in prices. City Railway sold off to 190; on the other hand Union Traction preferred was steady, at 34, and West Chicago at 62. In the course of its negotiations with the city concerning the franchise extension, the City Railway has offered to waive its claim for a ninety-nine-year franchise, provided the city will guarantee to buy or to furnish a buyer of the property after twenty years. There are no new developments in the franchise matter, so far as the Union Traction is concerned. Among the elevated shares South Side broke to a new low level at 97, but recovered quickly to 100. Metropolitan common, on the execution of a few scattered purchases, rose from 21 to 25, and then recoiled to 23. The preferred gained 3 points, from 65 to 68. Lake Street was steady, at 5 and $5\frac{1}{8}$, and Northwestern common at 21. It is said that the Metropolitan is earning this month 10 per cent more than in June a year ago, most of the gain coming from the new Aurora, Elgin & Chicago line, the Sunday traffic of which is very heavy.

Other Traction Securities

The leading traction issues in Boston have followed the course of the general market closely. Massachusetts Electric common reached its low point at 25; it then recovered slowly to 28, fell back to 27, and moved up again yesterday to $27\frac{1}{2}$. The preferred sold as low as $81\frac{1}{2}$, then rallied to 85. Trading was light in both instances. Boston Elevated, after selling as low as $144\frac{1}{2}$, rose to 145; West End common dropped to $89\frac{1}{2}$, rallied to 91 and reacted to 90; and West End preferred lost a point from 111 to 110. In

Baltimore the United Railways securities also moved in pretty close conformity with the general list. The stock went as far down as 11, then rallied to 12, the income bonds fell to 64, and returned to 65, while the general mortgage 4s, after selling at 91¾, recovered to 92½. Other Baltimore sales include City and Suburban 5s at 113, Baltimore Traction 5s at 115, Traction Consolidated 5s at 100½, and Augusta Street Railway 5s at 102¼. Prices as a rule are higher among the traction specialties dealt in on the New York curb. American Light and Traction common rose nearly 4 points in quick order, from 75 to 78¾, while the preferred went from 95½ to 98 and back to 96¼. Fractional lots in both instances made up the bulk of the trading. Interborough Rapid Transit sold up from 100 to 102, and back to 101. St. Louis Transit, on evidences of better support, rallied from 23¾ to 24½, and United Railways, of St. Louis, preferred gained a half point, from 72 to 72½. New Orleans Street Railway securities were active; the common stock, which had fallen as low as 10¾, gained nearly 2 points to 12¼, the preferred rose from 41½ to 42½, and back to 42, and the 4½ per cent bonds went from 83½ to 85. Other sales for the week on the curb include Washington Traction and Electric at 105¾, Brooklyn City Railroad at 237, and Brooklyn Rapid Transit 4s at 83.

The securities of the Detroit United Railway and the Toledo Railways & Light Company were features on the Cincinnati Exchange last week. Sales in the former numbered about 3900 shares, and for the latter about 3000 shares. Detroit United opened the week at 74, and closed the week at about the same figure. The low mark was 65, and the greater proportion of the sales were between 65 and 70. Toledo opened at 28, several points below the prices prevailing, and declined steadily to 20, when the buying became spirited, and the price advanced steadily to 28½. The slumps were the result of similar movements on the New York Exchange, which undoubtedly were occasioned by the dumping of considerable stock by Canadian holders as the result of the failure of the large banking house of A. E. Ames & Co., of Toronto. Those familiar with these securities claim that Detroit will undoubtedly go on a 5 per cent basis within a year, and Toledo should go on a 3 per cent basis within fifteen months; hence the intrinsic values of these stocks are way out of proportion to the prices they are selling.

In Cleveland Detroit United sold to the extent of only 400 shares, but there was considerable bidding. It is evident that the Clevelanders who own this stock are holding it as an investment, and the few sales were brought about through forced liquidation. Northern Ohio Traction & Light gave way with the other popular issues, and sold at 20, but it soon recovered to 21, and will find plenty of support around these figures. Sales were 475 shares. Cleveland Electric sold at 75 and 75½ for 400 shares, and a small lot of Cleveland City sold at 97.

At the Columbus Exchange the new Columbus Railway & Light was active, at between 32½ and 37½, the latter the close. Columbus Railway common sold at 102¼, and the preferred at 104¾. There was considerable activity in East St. Louis at around 63, and in Rochester Railway at 82 and 84. At Toledo there were a number of sales of Toledo Railways & Light at the prevailing low figures.

Security Quotations

The following table shows the present bid quotations for the leading traction stocks, and the active bonds, as compared with last week:

	Closing Bid	
	June 9	June 16
American Railways	44½	45
Aurora, Elgin & Chicago	a25	a25
Boston Elevated	143	144
Brooklyn Rapid Transit	56¼	56½
Chicago City	*190	190
Chicago Union Traction (common).....	4¾	4¼
Chicago Union Traction (preferred)	33	30
Cleveland Electric	75	75
Columbus (common)	101	102
Columbus (preferred)	105	105
Consolidated Traction of New Jersey.....	68½	67
Consolidated Traction of New Jersey 5s.....	105¼	104½
Detroit United	69½	72½
Electric People's Traction (Philadelphia) 4s.....	99	99
Elgin, Aurora & Southern	a50	a49
Lake Shore Electric	10	a14½
Lake Street Elevated	5	4¾
Manhattan Railway	135½	*135¾
Massachusetts Electric Cos. (common).....	25½	26¾

	Closing Bid	
	June 9	June 16
Massachusetts Elec. Cos. (preferred)	81	84
Metropolitan Elevated, Chicago (common)	21	23
Metropolitan Elevated, Chicago (preferred)	67	67
Metropolitan Street	122¾	124½
New Orleans Railways (common).....	14	11¾
New Orleans Railways (preferred)	41	42½
North American	85½	85½
Northern Ohio Traction & Light.....	205¾	21
Northwestern Elevated, Chicago (common).....	20	20½
Philadelphia Rapid Transit	11	12½
Philadelphia Traction	96¼	96½
St. Louis Transit (common)	23	24¼
South Side Elevated (Chicago)	99	99
Syracuse Rapid Transit	—	a32
Syracuse Rapid Transit (preferred)	a79	70
Third Avenue	110	114
Toledo Railway & Light	23½	25
Twin City, Minneapolis (common)	90¾	95
Union Traction (Philadelphia).....	*45	44¾
United Railways, St. Louis (preferred)	71½	72¾
Union Traction (Philadelphia)	*45	44¾

a Asked. * Ex-dividend.

Iron and Steel

The tendency in the iron trade still seems to be toward lower prices. Further cuts of 50 cents a ton were announced yesterday in both Northern and Southern foundry pig. The reason for this is set forth in the "Iron Age" statistics, published last week. It appears from these that production increased 50,000 tons in May, as compared with April, and that the combined weekly output of the furnaces of the country is now close upon the stupendous aggregate of 400,000 tons. Stocks on hand increased last month 35,000 tons of coke iron and 5000 tons of charcoal iron, from which the "Iron Age" draws the deduction that the margin between production and consumption is "a perilously narrow one." The market for steel is reported easier, but nothing definite will be known in this fact of the situation before the official circular of the Steel Corporation appears, fixing prices for the ensuing year. This circular is expected very shortly. Quotations are as follows: Bessemer pig iron \$20 to \$20.10, Bessemer steel \$30.50, steel rails \$28.

Metals

Quotations for the leading metals are as follows: Copper 14½ to 14¾ cents, tin 28.80 to 29 cents, lead 4¾ cents, spelter 6¼ cents.

PROPOSED REORGANIZATION OF THE LEHIGH VALLEY TRACTION COMPANY

The affairs of the Lehigh Valley Traction Company, as outlined in the STREET RAILWAY JOURNAL of May 23, are now in a fair way of adjustment. A committee to prepare a plan of financial reorganization of the company and allied properties has been formed and deposits of securities are invited. The Girard Trust Company of Philadelphia and the Lehigh Valley Trust and Safe Deposit Company of Allentown will receive securities in accordance with the agreement which has been drafted. The committee consists of George H. Frazier, of Brown Brothers & Company, chairman; Edward B. Smith, of E. B. Smith & Company; Wm. F. Harrity, of Harrity, Lowery & Thompson; Col. Harry Trexler, of Allentown, and Tom L. Johnson, of Cleveland, Ohio. T. De Witt Cuyler is counsel for the committee.

A notice has been issued to the holders of common and preferred stock of the Lehigh Valley Traction Company, Philadelphia & Lehigh Valley Traction Company, Allentown & Slatington Street Railway Company, Bethlehem & Nazareth Passenger Railway Company, Slate Belt Electric Street Railway Company and the Easton Consolidated Electric Company, that deposits will be received after June 15, and receipts given in exchange.

It is also announced that interest payments on mortgages on the Lehigh Valley Traction system were paid on June 1, and rent due the Easton Consolidated Company, amounting to \$12,000, making a total expenditure of \$91,000.

The gross receipts from passengers on the Lehigh Valley Traction Company system, excluding the Philadelphia line for the month of May, 1903, were \$74,103.15, as against \$62,292.90 for the month of May, 1902. On the Philadelphia line the receipts for May of this year were \$17,091.90 as against \$9,097.45 for May, 1902.

STEEL WOOL AS AN AID IN LUBRICATION

One of the most important advances made in recent years in the lubrication of car and motor journals is the introduction of steel wool mixed with ordinary cotton waste in place of cotton or wool waste. The principle by which steel wool aids in lubrication is perhaps not apparent at first thought. The value of the steel wool lies in its heat-conducting properties, and in its ability to keep the cotton waste from packing. As soon as the journal becomes slightly warm it conducts its heat through the steel wool to the oil in the cotton waste, and so keeps the oil free to run and prevents the waste from becoming caked with thick oil.

Steel wool has been known for many years in various forms, but it is one thing to produce steel wool, and another to produce it cheaply enough for a commercial article. The Federal Supply Company of Chicago has perfected processes whereby the steel wool can be put upon the market at an exceedingly reasonable figure. This steel wool is in the shape of very fine shavings from mild steel of very low carbon.

By the use of steel wool mixed with cotton waste the cotton waste is deprived of its ordinary tendency to sag, cake and roll. Being much superior to wool waste as an absorbent, it is, of course, more desirable, when once its drawbacks are eliminated. In addition to its heat-conducting properties, the steel waste acts as a supporter for the cotton waste, so that it always stands up well against the journal, and at the same time does not become hard or caked. Steel wool journal packing is guaranteed to keep in good condition and position for fifteen months from the time it is applied.

Besides being used on car journals, it is also beginning to find favor for lubrication of armature bearings. The South Side Elevated in Chicago has replaced the wool waste with steel wool packing on some of its armature bearings, and other bearings which were arranged for felt wick feed have been changed for a wick feed made of steel wool packing.

Among the prominent electric railway companies using steel wool packing are all the elevated railroads in Chicago, the Manhattan Elevated in New York, the Grand Rapids, Grand Haven & Muskegon Railway, the Wilkesbarre Hazleton Railway, the Milwaukee Electric Railway & Light Company, the Chicago City Railway, and the Des Moines City Railway.

Steel wool also has an important use as a substitute for sandpaper in car painting shops. It does not clog as does sandpaper.

THE MONTHLY MEETING OF THE MASSACHUSETTS STREET RAILWAY ASSOCIATION BANQUET TO E. C. FOSTER

The regular monthly meeting of the Massachusetts Street Railway Association, held June 10, brought out the largest number of Massachusetts street railway men, and more old-time street railway men, than have attended any similar function for some time. The occasion was the presentation to E. C. Foster of a loving cup, previous to his departure for New Orleans, where he is to become president of the New Orleans Railway Company. Mr. Foster has been connected with the Lynn & Boston Railroad and its successor, the Boston & Northern Street Railway Company, for more than thirty-one years. Incidental to the banquet, which was presided over by F. H. Dewey, president of the Worcester Consolidated Street Railway Company, was the presentation of a massive loving cup, which bore this sentiment:

"In appreciation of one who never failed in any duty assigned to him; whose every effort was for the profit of his employers and the satisfaction of the public, the Massachusetts Street Railway Association presents Elwin Carter Foster, its president, this token of esteem. Boston, June 10, 1903."

In the remarks that followed the presentation there were many expressions of regret at the loss of Mr. Foster from Boston, and numerous wishes that he might be abundantly successful in his new field of duty. To all of these the recipient feelingly responded, saying that the severing of his connection with the members of the association was one of the saddest moments of his life. He realized the momentous duties that he was about to take upon himself, but he hoped by faithful application and thorough honesty of purpose to win his way to success and earn the appreciation of those who had entrusted to his care the great responsibilities he was about to assume.

Among those present, who spoke in flattering terms of Mr. Foster were: George W. Bishop, of Newton, of Massachusetts Board Railroad Commissioners; Charles Odell, of Salem, ex-president of the Massachusetts Street Railway Association; John H. Cunningham, of Boston, ex-president of the Massachusetts Street Railway Association; John R. Graham, of Bangor, formerly

of Quincy, Mass., and ex-president of the Massachusetts Street Railway Association; F. H. Monks, of Brookline, first secretary of the Massachusetts Street Railway Association, and formerly general manager of the West End Street Railway Company; Julius E. Rugg, of Boston, general superintendent Boston Elevated Railway Company—one time superintendent of the Lynn & Boston Railroad, and the first man to engage Mr. Foster in the street railway business; E. Francis Oliver, of Boston, formerly vice-president and treasurer of the Lynn & Boston Railroad; Hon. E. P. Shaw, of Newburyport, ex-treasurer of the Commonwealth.

The very enjoyable evening was concluded by singing "Auld Lang Syne."

MORE LINES IN PHILADELPHIA

There have just been chartered at Harrisburg four companies—all Philadelphia Rapid Transit adjuncts—to occupy 119 miles of street in Philadelphia, and with an aggregate capital of \$714,000. The companies are as follows: Glenwood Rapid Transit Street Railway Company, capital \$270,000; Moyamensing & Southwark Rapid Transit Street Railway Company, capital \$282,000; Parkside Rapid Transit Street Railway Company, capital \$442,000; Bustleton & Byberry Rapid Transit Street Railway Company, capital \$120,000. The officers, who are also the incorporators, are C. P. Weaver, of Philadelphia, president; A. D. Hallman, of Philadelphia; John B. Peddle, of Woodbury N. J.; Fred. G. Becker, of Philadelphia; J. Blaine MacMillan, of Philadelphia. The Glenwood Company will build from Thirty-Third Street and Girard Avenue to Manheim and Berkerly, a distance of 45 miles. The Moyamensing & Southwark Company will build from Twenty-Third and Fitzwater Streets to Twenty-Second and Wolf Streets, and to Thirty-Third and Tasker Streets, a line 47 miles long. The Parkside Railway Company will build from Parkside and Belmont Avenues to Parkside Avenue, a distance of 7 miles. The Bustleton & Byberry Company will build from the Frankford Avenue bridge to Byberry Turnpike, thence to County Line, returning on Byberry Turnpike to intersection with Bustleton and Somerton Turnpike, to County Line Road to the bridge, a distance of 20 miles.

A HOLDING COMPANY AT LOUISVILLE

Plans have been prepared by the directors of the Louisville Railway Company, of Louisville, Ky., for the organization of a holding company to acquire the whole or the greater part of the securities of the Louisville Company by the Louisville Traction Company be organized under the laws of New Jersey.

The Louisville Railway Company is capitalized at \$6,000,000, of which \$2,500,000 is 5 per cent cumulative preferred stock. There are outstanding against the company bonds to the amount of \$6,800,000. The plan is to capitalize the Louisville Traction Company at \$14,500,000, of which \$2,500,000 will be 5 per cent preferred stock. This issue of preferred stock is to be offered to the preferred stockholders of the old company in exchange at par. In addition, each holder of preferred stock in the Louisville Railway Company will get as a bonus 20 per cent of his holdings in the common stock of the new company. Each holder of common stock of the Louisville Railway Company will get two shares for one in the common stock of the new company, and for each share he has in the old company he will have the privilege of buying one share of the common stock of the new company at \$55. This plan leaves \$1,000,000 of common stock in the treasury to be sold to the common stockholders when the money is wanted, and the company will have from the sale of \$3,500,000 of common stock, \$1,925,000 cash for improvements, extensions, etc.

STREET RAILWAY PATENTS

UNITED STATES PATENTS ISSUED JUNE 9, 1903

[This department is conducted by W. A. Rosenbaum, patent attorney, Room No. 1203-7 Nassau-Beekman Building, New York.]
730,251. Electric Motor Car System of Mounting and Wiring Electrical Apparatus Thereon: George Gibbs, New York, N. Y. App. filed Dec. 1, 1902. Suitable insulating tubes in which the wiring of the car is inclosed, arc supported at some distance below the floor of the car and out of contact with inflammable parts.

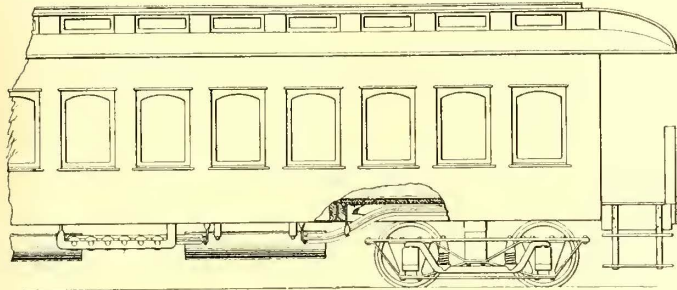
730,312. Railway; Edward Stiles, New York, N. Y. App. filed Sept. 29, 1902. A slotted conduit beside the rail is normally closed by a pivoted lip; the car wheel flange moves the lip to one side and makes contact with a conductor terminal carried by the lip.

730,334. Controller Apparatus; Patrick S. Barrett and John P. Durkin, Scranton, Pa. App. filed Aug. 21, 1902. Means for controlling the movement of the controller handle.

730,335. Street Car Fenders; Silas H. Barton, Enon, Ohio.

App. filed Oct. 13, 1902. Details of construction of a fender attached to the forward end of the truck.

730,342. System of Motor Control; Frank E. Case, Schenectady, N. Y. App. filed April 24, 1902. The motor circuit is permitted to be opened at the controller contacts on any car upon which an excessive flow of current occurs, without affecting the circuit connections on other cars of the train; it is at the same time permitted to again close the motor circuit as soon as the master controller has been moved to a position where a protecting resistance will be included in the motor circuit.



PATENT NO. 730,251

730,403. Bond for Railway Rails; John Bisbridger, Northeast, Pa. App. filed Oct. 17, 1902. The ends of the flexible bond are secured to studs having flaring arms, which prevent short bends of the bond.

730,481. Power Transmitting Device; Theodore Scheffler, Paterson, N. J. App. filed July 5, 1902. A friction clutch which is adapted to automatically lock the shaft against rotation in one direction, while it is permitted to turn in the opposite direction, and which is releasable to permit the shaft to perform a reverse revolution when desired.

730,536. Track Sanding Mechanism; Edward M. Hedley, Depew, N. Y. App. filed Feb. 26, 1903. A pneumatic sander, in which the sand in the trap is agitated by a blast of air therein, but in which the withdrawal of the sand from the trap is effected by an ejector located adjacent to the trap, and discharging into the upper portion of the delivery pipe.

730,667. Controller for Electric Motors; John B. Linn, Schenectady, N. Y. App. filed Dec. 28, 1900. An attachment fitting on top of a standard controller, and comprising connected mechanism to engage with the shafts of the contact cylinder and reversing switch to thereby enable both to be actuated by one handle.

730,668. Rigid Arch-Bar Truck; Arthur Lipschutz, St. Louis, Mo. App. filed Jan. 2, 1903. The arch-bar sides of the truck are rigidly connected by transoms that are Z-shaped in cross-section, and which have inwardly extending lower flanges, suitable means being provided between the transoms for supporting a bolster.

730,740. Safety Guard for Electric Tram Cars or Similarly Propelled Vehicles; Robinson S. Burn, Kingston-upon-Hull, England. App. filed Aug. 2, 1902. A guard located in advance of the fender allows the fender to fall by gravity to operative position when an obstruction is encountered.

730,810. Switch Especially Adapted for Third Rails for Electric Railways; William A. P. Willard, Jr., New York, N. Y. App. filed Nov. 11, 1901. Details.

730,853. Reversible Car Seat; Ferdinand Kohout, St. Louis, Mo. App. filed July 25, 1902. Details of construction of a reversible car seat.

PERSONAL MENTION

MR. E. W. BATCHELDER, general manager of the San Antonio Traction Company and the Electric Light Company, of San Antonio, Texas, has resigned from these companies to accept a position with the Erie Railroad in New York City.

MR. W. T. PORTER, secretary of the Fresno City Railroad Company, of Fresno, Cal., has resigned from the company, and will be succeeded by Mr. W. E. Durfey, of Visalia. Mr. Durfey has been secretary of the Mount Whitney Power Company.

MR. THOMAS C. RODERICK has tendered his resignation as superintendent of the Owensboro City Railway, of Owensboro, Ky., to take effect at once. Mr. Roderick will become connected with the Indianapolis, Shelbyville & Southeastern Traction Company, which operates out of Indianapolis.

MR. WILLIAM F. BREIDENBACH has resigned as manager of the contracting and installation department of the Ohmer Fare Register Company, of Dayton, Mr. Breidenbach has been associated with the company since it was organized. After several

weeks' rest Mr. Breidenbach, no doubt, will take up electric railway work.

MR. SAMUEL A. SPAULDING has resigned his position with the Brooklyn Heights Railroad Company to accept a place in the electrical engineering department of the New York Central & Hudson River Railroad. Mr. Spaulding is a graduate of Tufts College, class of 1894, and has been with the Brooklyn road since 1896. His work has been mainly in connection with the power stations and electrical distribution, and his familiarity with the transmission system in Brooklyn has given him an excellent preparation for his new work, where his duties will be along similar lines.

MR. H. A. CURRIE has been appointed to the electrical engineering staff of the New York Central & Hudson River Railroad. Mr. Currie has been employed by the Brooklyn Heights Railroad Company since 1894, and has an extensive practical knowledge of electric railroading. For a number of years he worked in the power stations of Brooklyn, but in 1900 he became the assistant of Mr. J. D. Keiley, now of the New York Central, in the electrical engineering department, where he devoted a large part of his time to the multiple-unit control of the elevated roads. He has, therefore, had much experience in the equipment and operation of heavy electric rolling stock, and makes a valuable addition to the force of the New York Central's Electric Traction Board.

SELDOM in the history of electric railroading has there been such rapid advancement as has fallen to the lot of Warren M. Bicknell, who has recently accepted the position of the president



WARREN M. BICKNELL.

of the Lake Shore Electric Railway, of Cleveland. Less than five years ago Mr. Bicknell was a clerk in the office of the Cincinnati & Miami Traction Company, of Cincinnati. When the road was merged with other lines in that section, forming the Southern Ohio Traction Company, he was made auditor of the road. In this capacity he attracted the attention of the Pomeroy-Mandelbaum syndicate, and when work was started on the Miami & Erie Canal Transportation line, popularly known as the "Electric Mule Scheme,"

he was made general manager of the company. A few months later the syndicate needed a manager for their now famous third-rail road, the Aurora, Elgin & Chicago, which was about to be opened, and Mr. Bicknell was selected. In his new capacity Mr. Bicknell will have charge of one of the most important systems in the country, including the city lines of Sandusky and Fremont, and the magnificent interurban road connecting Cleveland and Toledo. He will have a splendid opportunity of showing his ability to develop a property, since on account of the embarrassment and the consequent receivership the road had never had a fair opportunity of making a showing.

PRESIDENT H. H. VREELAND, of the Interurban Street Railway Company, of New York, has accepted an offer from Secretary Lyden McCassey, of the Royal Commission on London Traffic, to testify before that commission as an expert in urban railroading. He is, therefore, planning to sail from New York June 23, on the new steamer Kaiser Wilhelm II., and will probably improve the opportunity while visiting England to inspect a number of the city transportation systems of that country, and take some recreation. Mr. Vreeland's duties have been so continuous as president of the Metropolitan and Interurban Street Railway systems since his connection with them that this, it is said, will be the first time in which he has been absent from the city for thirty consecutive days.

The Royal Commission, before whom Mr. Vreeland will testify, was appointed by Parliament recently to inquire into the means of locomotion and transportation in London, and consists of fifteen members. They will recommend measures which they deem most effectual for the improvement of the transportation lines by the development and interconstruction of railways and trainways on or below the surface, and will make provision for better organization and regulation of vehicular and pedestrian traffic. They will pass, also, on the question of the desirability of the establishment of some authority or tribunal, to which all schemes of railway and tramway construction of a local character should be referred, and the powers which it would be advisable to confer upon such a body.

NEWS OF THE WEEK

CONSTRUCTION NOTES

MONTGOMERY, ALA.—A franchise has been granted to W. A. Henderson, Albert Wilson and others to open a road on Washington Street from Hall Street east to Vickers Street, and in the same direction to the intersection of the Mt. Meigs Road.

SALEM, ARK.—The Salem & Eastern Railroad Company, to which reference was made in a recent issue of the *STREET RAILWAY JOURNAL*, is incorporated under the laws of the State of Arkansas for the purpose of constructing a railroad from Poplar Bluff, Mo., to Fayetteville, Ark., passing through Butte and Ripley Counties, Missouri, and Randolph, Sharp, Fulton, Baxter, Boone, Newton, Madison and Washington Counties, in Arkansas, a distance of about 250 miles. For its entire length the line will traverse the celebrated Ozark fruit belt, the zinc and lead regions of North Arkansas, and will penetrate valuable oak, hard pine and red cedar forests that have hitherto been too far from shipping facilities to reach the markets. The road will be operated by electricity, and power will be generated from the water sources along the route of the road. The construction will be substantial throughout. It is planned to use 70-lb. rails. Passengers, freight, mail and express will be carried. Electric locomotives will be used in the freight service. The line will pass through the county seat towns of all the counties through which it runs, except Randolph, Sharp, Newton, and with its connections at the termini will be a connecting link between the East and Northeast and South and Southwest by a much shorter route than is now in existence. Right of way for the line has been guaranteed for the entire distance, and surveys are being made. It is expected that maps, profiles and estimates will be finished in the next thirty days, when the project will be financed. W. K. Palmer, of Kansas City, Mo., is chief engineer of the company, and R. A. Youngblood, a banker, of Salem, is president of the company.

LOS ANGELES, CAL.—For \$200 Alexander Culver has purchased a street railway franchise to enable the Los Angeles Railway Company to extend its Maple Avenue line about a mile to the southern limits of the city.

LOS ANGELES, CAL.—The Los Angeles Railway Company has just received thirty new cars from the St. Louis Car Company, and thirty-five more of the same large type for city use have been ordered for delivery about Aug. 1.

SAN JOSE, CAL.—J. F. Parkinson, of Palo Alto, has petitioned the Board of Supervisors for a franchise for an electric railway in the town of Palo Alto. The franchise will be sold to the highest bidder on July 7.

HEALDSBURG, CAL.—Articles of incorporation of a new electric railway company have been filed at Healdsburg. The company will be incorporated for \$1,000,000. Its purpose will be to build an electric railway from Santa Rosa to Sebastopol and Green Valley, and from Santa Rosa to Petaluma, and from that city on to a point on the bay, and thence by ferry steamers to San Francisco, and also to give Santa Rosa an electric street car system. The directors of the company will be Thomas Archer, Alfred D. Gowen, Charles Towne and Francis Cutting, of San Francisco, and Frank A. Brush, of Santa Rosa. Bonds have been placed for as many miles of railroad as it is desired to build. The company has all the money necessary for building. Eastern capital is interested. The work of securing franchises and rights of way is in progress. A party of surveyors is also in the field.

LOS ANGELES, CAL.—A sub-station and storage-battery plant that represents an expenditure of almost \$250,000 has just been put in operation by the Los Angeles Railway Company. The location of the station is at Agricultural Park. Work is now proceeding on two similar plants in other parts of the city—one on Knob Hill, and the other at the Plaza. The Plaza will be the largest of all. At Eastlake Park a large sub-station is being installed by the Pacific Electric Railway Company. At the opening of the present year the Huntington-Hellman lines here had a capacity for 8500 kw, but by Jan. 1, 1904, the total is expected to be in excess of 30,000 kw. The increased capacity will represent a cost for machinery, water-power and storage batteries of nearly \$1,000,000.

POMONA, CAL.—The City Trustees have authorized the sale of an electric railway franchise in Pomona, upon application of Stoddard Jess, representing the Board of Trade's electric railway committee. The Pacific Electric Railway Company has assured the city that it will bid for the franchise. The company proposes eventually to extend its Los Angeles-Monrovia line through Azusa and Glendora to Pomona, thence to Ontario and San Bernardino.

LOS ANGELES, CAL.—It is reported that the Pacific Electric Railway Company contemplates building a branch of the road now under construction to Whittier, through Olive and up the Santa Ana River to Riverside and Corona, a distance of over 30 miles.

LOS ANGELES, CAL.—It is officially announced that the Pacific Electric Railway Company will begin at once the erection of a new tourist hotel on Echo Mountain, a site at the top of the famous incline railway en route to Mt. Lowe. The structure will resemble the old mission type of architecture, and will be three stories high and fireproof. It will cost about \$100,000, and, barring labor troubles and other emergencies, it will be open for the coming winter season.

LOS ANGELES, CAL.—E. P. Clark, president of the Los Angeles-Pacific Railroad Company, has announced that the horse car line now operating between Santa Monica and the Soldiers' Home will be changed to an electric street railway.

COVINA, CAL.—The Pacific Electric Railway Company has made formal application for a franchise in this town, and bids will be opened for the same on July 21.

LOS ANGELES, CAL.—Two more street railway franchises have been sold by the City Council without competitive bidding. They give to the Los Angeles Railway Company two important outlets to the eastern boundary of the city over First Street and Stephenson Avenue. They brought \$200 each, and were purchased in the names of H. T. Hazard and M. T. Collins.

COLORADO SPRINGS, COL.—The directors of the Cripple Creek & Pike's Peak Railroad have voted to issue \$100,000 worth of bonds for the construction of the electric railway between Cripple Creek and Pike's Peak. The first amount received will be devoted toward the construction of the 5-mile section from Cripple Creek to Gillett. F. J. Wright, president, and the local law firm of McKesson & Little are interested in the project, together with Cripple Creek and Gillett people.

TRINIDAD, COL.—The City Council has granted a petition for a franchise for the construction of a street railway and lighting plant presented by Frank P. Read, of St. Louis, Mo., and as soon as the necessary time for publication has transpired it will become an ordinance. The franchise provides for a forfeiture in case the work of construction is not begun inside of ninety days and the line completed inside of one year. Steam as a motive power is prohibited. The franchise is for a term of fifty years, and the city grants the right of way over streets and alleys and a site for the power house. It is planned to construct 5½ miles of track in the city and to connect Sopris and Starkville and other coal camps in the vicinity, making a total of 12 miles of track for the first division. The electric light franchise is for a term of five years.

MIDDLETOWN, CONN.—The Middletown Street Railway Company has acquired franchises to build various additional lines within the city and its suburbs. The life of various unutilized rights to occupy streets has been extended to July 1, 1905.

HARTFORD, CONN.—The Hartford Street Railway Company is to erect a high trestle over the tracks of the Highland Division of the New York, New Haven & Hartford Railroad, in Main Street, East Hartford. The approaches will extend for about 200 ft. north and south of the tracks, while the span of the bridge will be 75 ft. in length, extending over the right of way of the steam road, the lower chord of the span being 21 ft. above the rails.

STONINGTON, CONN.—The Groton & Stonington Street Railway Company has begun to make preliminary surveys. The company has a charter to construct a street railway from New London, Conn., to Westerly, R. I. The proposed road will run through Groton, Noank, Mystic, Pawcatuck and Stonington. The route runs along the Connecticut shore, and it is expected that the road will develop a large pleasure travel. The company is authorized to issue a maximum capitalization of \$600,000. It is empowered to merge with any street railway corporation in Connecticut or with any trolley company operating between Westerly and Watch Hill in Rhode Island. In case the corporation takes over any other trolley properties it is authorized to issue capital stock in excess of \$600,000 to the amount of the capitalization of the corporation whose property is acquired.

COLUMBUS, GA.—A contract has been closed between the city and the Columbus Street Railroad Company, managed by Stone & Webster, of Boston, by which the company gains permission to run its cars across the new Fourteenth Street steel bridge into the adjoining city of Girard, Ala. The former wooden bridge was not large enough or strong enough to admit of a car line, and it was this fact that made separate systems of the Phenix-Girard and the Columbus car lines and prevented the original system in the suburbs from being successful. Now, however, the situation is entirely different, for the three cities are under a unified management. Extensions are being made in Phenix City and Girard wherever they are deemed necessary.

MOUNT VERNON, ILL.—The Southern Illinois Electric Railway Company has organized by electing John R. Piercy president and general manager, and Louis G. Pavey, secretary and treasurer.

MORRISON, ILL.—The Morrison & Denrock Electric Railway Company expects to begin the construction of its proposed line about Aug. 1. The line will extend from Morrison to Denrock, a distance of 15 miles, and three motor cars and six trailers will be operated. The officers of the company are: George Milne, president; A. D. Hill, secretary; A. M. Kidd, treasurer; P. A. Bent, manager, superintendent, purchasing agent and electrician.

SHELBYVILLE, ILL.—The construction of an electric railway connecting Springfield and Effingham is the purpose of the Springfield & Southwestern Railway Company, for which a charter has just been asked of the Secretary of State. The corporation is backed by local capital, and arrangements for a right of way are already being made. George D. Chaffee, John W. Yantes, F. F. Dove and Max Kleeman are to head the company.

CANTON, ILL.—The Fulton County Electric Railroad Company, Canton, has been incorporated, with a capital of \$10,000, to operate a street railway. The incorporators are: J. W. Lawrence, H. H. Fuller and H. J. Shannon.

MOLINE, ILL.—A twenty-year franchise has been granted by the Board of Supervisors of Moline to the East Moline Interurban Street Railway Company to build an extension from East Moline to Rock River. The line will be built this year.

GENESEO, ILL.—Geneseo, Sterling, Rock Falls and Prophetstown men have organized the Rock River Traction Company to build an electric railway from Rock Falls to Moline via Prophetstown and Geneseo. The officers are as follows: Levi Waterman, Geneseo, president; William McNeill, Prophetstown, treasurer; G. A. Stultz, Sterling, secretary. The company is capitalized at \$200,000, but it is estimated that the road will cost \$400,000.

OTTAWA, ILL.—The Illinois Valley Traction Company has awarded Kinzie & Sons, of Chicago, the contract for grading its line from Utica westward to Split Rock.

LIST OF EXHIBITORS

WITH LOCATION AND SPACE ALLOTTED FOR THE

ANNUAL CONVENTION

OF

AMERICAN STREET RAILWAY ASSOCIATION

Saratoga Springs, September 2, 3 and 4, 1903

	Square feet		Square feet
16 Adams & Westlake Company, Chicago.....	200	31 Lumen Bearing Company, Buffalo	100
30 American Automatic Switch Company, New York.....	100	76 Magann, G. P., Air-Brake Company, Detroit.....	1,000
36 American Brake-Shoe & Foundry Company, New York.....	200	55 National Carbon Company, Cleveland.....	300
68 American Car Seat Company, Brooklyn.....	250	69 National Electric Company, Milwaukee.....	400
33 American Railway Supply Company, New York.....	100	7 National Ticket Company, Cleveland.....	100
52 American Steel & Wire Company, Chicago.....	225	56 National Lock Washer Company, Newark.....	250
40 Atlas Railway Supply Company, Chicago.....	200	5 Ohio Brass Company, Mansfield	100
60 Baldwin Locomotive Works, Philadelphia.....	250	53 Nuttall, R. D., Company, Pittsburg.....	300
84 Bemis Car Truck Company, New York.....	850	49 Ohio Brass Company, Mansfield	875
70 Berry Brothers, Detroit.....	200	19 Ohmer Fare Register Company, Dayton.....	500
11 Bliss, E. W., Company, Brooklyn.....	150	15 Pantasote Company, New York.....	150
77 Brill, J. G., Company, Philadelphia.....	300	78 Peckham Manufacturing Company, New York.....	1,000
60 Brown, Harold P., New York.....	600	71 Pennsylvania Steel Company, Philadelphia.....	1,000
44 Bruck Solidified Oil Company, Boston.....	100	21 Pierce, T. Raymond, Boston.....	200
27 Brady Brass Company, New York.....	100	54 Pittsburg Reduction Company, Chicago.....	600
74 Chase, L. C., & Company, Boston.....	200	35 Pittsburg Switch & Signal Company, Pittsburg.....	100
69 Christensen Engineering Company, New York.....	400	26 Railway Appliance Company, Albany.....	100
32 Cook's, Adam, Sons, New York.....	100	28 Railway Appliances Company, Chicago.....	200
3 Conant, R. W., Cambridge.....	100	51 Root Track Scraper Company, Kalamazoo.....	200
61 Consolidated Car Fender Company, New York.....	1,000	85 Rossiter, MacGovern & Company, New York.....	700
66 Consolidated Car Heating Company, Albany.....	300	29 Railway Sander Company, Toronto, Canada.....	100
73 Continuous Rail-Joint Company, Chicago.....	200	20½ Sherwin-Williams Company, Cleveland.....	200
17 Curtain Supply Company, Chicago.....	300	62 Standard Paint Company, New York.....	400
6 Dearborn Drug & Chemical Works, Chicago.....	200	24 Standard Vitriified Conduit Company, New York.....	200
39 Detroit Trolley & Manufacturing Company, Detroit.....	200	10 Star Brass Works, Kalamazoo	100
41 Duff Manufacturing Company, Allegheny.....	100	T Stephenson, John, Company, Elizabeth	600
63 Electric Storage Battery Company, Philadelphia.....	400	13 Sterling-Meaker Company, Newark.....	250
82 Electric Railway Equipment Company, Cincinnati.....	1,000	38 Sterling Varnish Company, Pittsburg.....	150
9 Field, C. J., New York.....	100	48 St. Louis Car Company, St. Louis.....	200
50 General Electric Company, Schenectady	500	45 Stuart-Howland Company, Boston.....	100
14 Globe Ticket Company, Philadelphia	100	1 STREET RAILWAY JOURNAL, New York.....	300
57 Gold Car Heating & Lighting Company, New York.....	500	4 Street Railway Review, Chicago.....	300
18 Hale & Kilburn Manufacturing Company, Philadelphia.....	250	80 Taylor Electric Truck Company, Troy.....	1,500
12 Harrington, C. J., New York.....	200	46 Traction Equipment Company, Brooklyn.....	150
42 Heywood Bros. & Wakefield Company, Philadelphia.....	100	43 Uni Signal Company, Cambridge.....	100
79 Howe Manufacturing Company, Seranton.....	100	8 United States Curtain Company, Newark.....	100
20 International Register Company, Chicago.....	200	22 Van Dorn & Dutton Company, Cleveland.....	200
67 Johns, H. W., Manville Company, New York.....	600	37 Van Dorn, W. T., Company, Chicago.....	100
47 Kinnear Manufacturing Company, Columbus.....	100	75 Watson, Wm. T., Newark.....	150
58 Knowles, C. S., Boston	225	72 Weber Railway Joint Manufacturing Company, New York.....	200
25 LeValley Vitæ Carbon Brush Company, New York.....	200	2 Western Electrician, Chicago.....	100
64 Lorain Steel Company, Lorain	500	P Westinghouse Electric & Manufacturing Company, Pittsburg....	600
59 Ludlow Supply Company, Cleveland.....	200	65 Wharton, Wm., Jr., & Company, Philadelphia.....	500
		34 Wheel Truing Brake-Shoe Company, Detroit.....	100

INSTRUCTIONS TO EXHIBITORS

The exhibition will open Sept. 2, 1903.

Exhibits can be placed four days before the first day of the convention.

The local committee has made arrangements with Tooley Brothers, Saratoga Springs, to deliver all shipments to and from the grounds at low rates. Mark your goods to yourself, care of Tooley Brothers, Saratoga Springs, New York, sending them bill of lading or advice and prepay charges. Mark the number of your space on all boxes and cases.

The grounds will be planked, and exhibitors desiring platform or railing should make arrangements with the chairman of exhibits at once.

Signs should not exceed 2 ft. in height, and cannot be placed so as to obstruct any other exhibit.

Exhibitors must provide and ship all lamps needed for electric signs.

Cars and sweepers will be exhibited on side track within one-half block of grounds.

Exhibitors are requested to send the following information to the chairman of exhibits not later than July 15:

- First—Will your exhibit be of light or heavy material?
- Second—What amount of current will you require for power?
- Third—State whether you want direct or alternating current, and what kind?
- Fourth—What machinery will you have in operation? Give full description of same and power required.
- Fifth—Will you require extra lighting? If so, what amount?
- Sixth—Will you have electric signs for display? Give full particulars as to number of lights, etc.

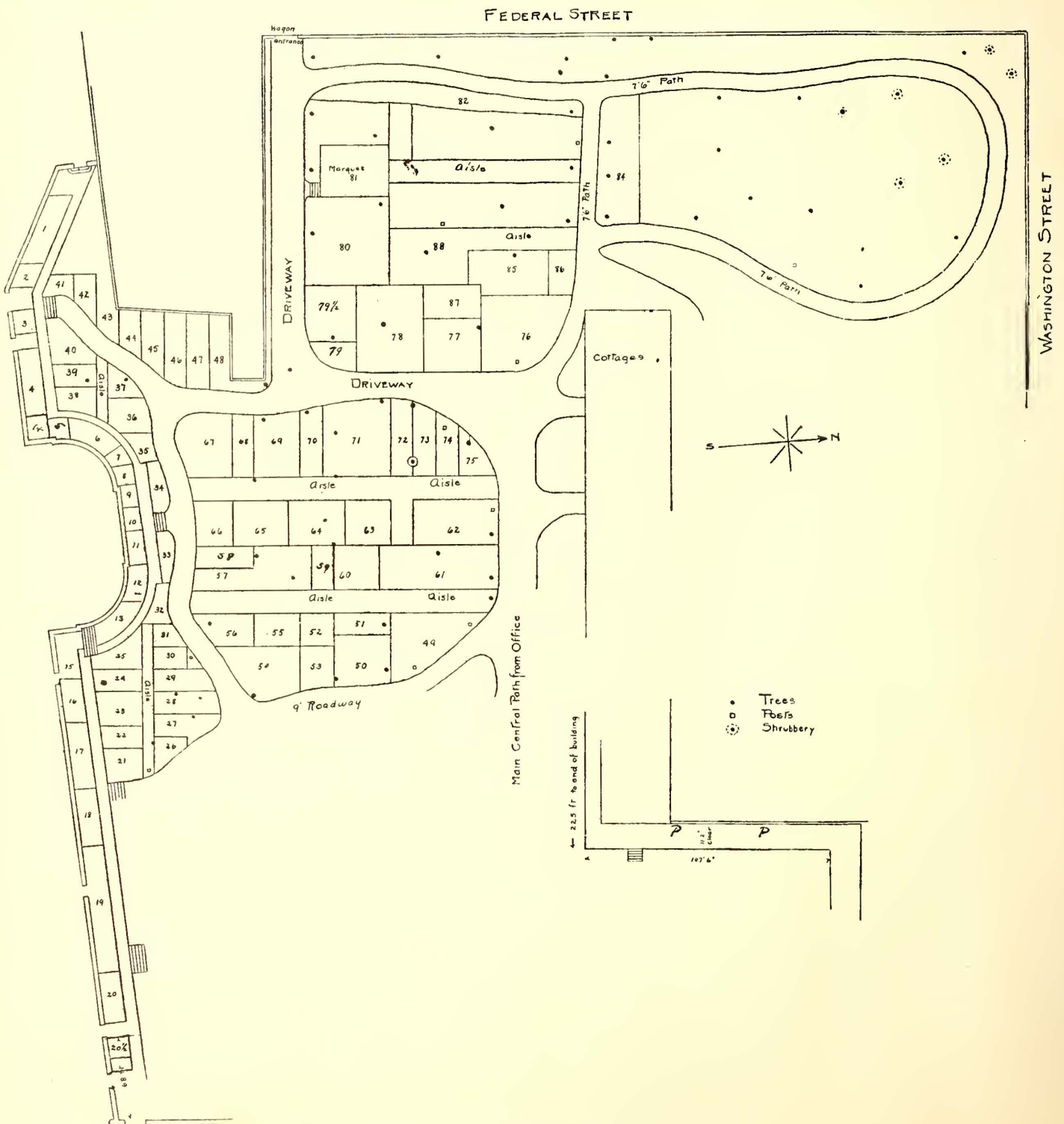
SUPPLEMENT TO STREET RAILWAY JOURNAL

[JUNE 20, 1903]

AMERICAN STREET RAILWAY ASSOCIATION

OFFICIAL DIAGRAM OF EXHIBIT SPACE

SARATOGA SPRINGS, NEW YORK, SEPTEMBER 2, 3 AND 4, 1903



Rear Court, South and West Side Piazzas

GRAND UNION HOTEL, SARATOGA SPRINGS, NEW YORK