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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.

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The Chicago Problem

The signing of the Mueller bill by Governor Yates, of Illinois, on May 18, places the Chicago Traction problem on a new footing, and removes at once the last objection of Mayor Harrison to proceed with the negotiations for renewal of franchises. The bill in question limits the term of street railway franchises to twenty years, and provides for the acquirement by the city of the property at the expiration of that time on terms to be agreed upon when the franchises are granted. It is not expected that the city of Chicago will be in position to take over the traction system in the period mentioned, but, as has been pointed out before, the city officials desired to have the enabling act passed before taking up the question of franchise, as they believed it would give them an advantage in dealing with the companies and permit them to insist upon more concessions than the companies would otherwise grant. Whether this avowed hostility on the part of the city administration will result advantageously to the people remains to be seen, as it compels the companies to assume an entirely different attitude from that in which they would naturally desire to conduct the proceedings. It is greatly to be regretted that any unneces-

sary complications should be introduced into the problem at this time, as it is a most serious question, involving, as it does, the prosperity of the entire community and determining the measure of development of Chicago during the next quarter of a century at least. The Chicago transportation interests are prepared to furnish the city adequate facilities, and they stand ready to do so provided they receive the co-operation and support of the people and the city administration, but it is folly to expect satisfactory results without entire harmony. Heretofore the transportation committee has shown a disposition to take a broad view of the question, and it remains to be seen whether Mayor Harrison can be brought to take a similar view of the situation. If the transportation committee takes a determined stand for fair play we have no doubt that the people will support it and the problem will be satisfactorily solved.

German High Speed Projects

We feel that Herr Reichel's paper, abstracted in our last issue, is worthy of particular notice, as marking, perhaps, the present state of the high-speed problem with substantial precision. As we have many times pointed out, high-speed rail-roading is essentially a commercial question, for while extraordinary running time will certainly involve some unfamiliar considerations, it is even now, from the engineering standpoint, within the range of fair practicability. Since the Zossen tests further experiments have been conducted on high-voltage induction motors, with the result that it has been shown to be feasible to use directly in the motors far higher pressures than were used in the Zossen trials. Considering the ease with which the trolley-line voltage can be transformed on the motor car it is perhaps needless to deal with it directly in the motors, yet it is satisfactory to know that transformers can be dispensed with if necessary. We hope that the matter will not be allowed to rest until further track experiments are forthcoming, and on a far better track than that used in the Zossen runs. Herr Huber's plan should also be heard from, possessing, as it does, the very valuable property of using single-phase apparatus. The complication in overhead wiring entailed by the use of polyphase motors is, from the standpoint of American engineers, a much more serious matter than any question about the practicable voltage on the motors. Given a system with a single running contact, and much of the practical difficulty disappears. Herr Reichel seems to have made out a fairly good showing for the economy of the electrical system, and some road ought to feel encouraged to give it a careful trial. It is certain, at all events, that whatever the motors may be, the key to the situation lies in a high voltage on the working conductor, and unless this is available commercial considerations will stand in the way of success.

It is interesting to notice in this connection that after a difference in high-speed electric railway development in Continental Europe and America extending over six or eight years, the advanced work in both continents is following more common lines. American engineers have never taken kindly

to three-phase motors on the cars, but it is another story with single-phase motors. While Continental experimenters are endeavoring to perfect a single-phase system, American engineers on the Annapolis-Washington line and in Lansing are engaged in similar work, although on different lines, and between them a workable system will probably be developed.

A Superfluity of Wheels

Our esteemed but somewhat non-technical contemporary, "Harpers' Weekly," slipped its trolley the other day, and started down grade along the weirdest electric railway proposition that we ever have had the pleasure of examining. We remember the late lamented Portelectric road shooting magnetic cars through an endless solenoid at infinite speed; we recall the "chemin-de-fer glissante," slipping, space devouring and time annihilating, over a continuous water-step; we are not unmindful of the bicycle railway, which for a decade has given Bay State legislators the nightmare; and we lament the passing of the late Professor Keeley's motor, which would have been a suitable prime mover for them all, but for soul-inspiring queer-ness the Albertson magnetic railway is in a class altogether by itself. A train running at 300 miles per hour, drawn by a 1-hp locomotive, would be an inspiring sight in any age, and the learned Dane deserves our thanks merely for the joy of contemplating the conception.

Briefly, his plan is as follows: Convert the base of the rails into a continuous lubricated plane. Suspend by yokes from the cars powerful electromagnets, with their poles contiguous to this unlimited armature. Turn on the current until the weight of the car is reduced to zero or a negative quantity by the magnetic pull, then start the motors and you will be in Buffalo before you have time to knock the ashes off your cigar, in Chicago when the weed is half-burned, and in San Francisco just in time to throw the butt into the Golden Gate. Then you can walk over to Chinatown and get back home again in a single pipe of unadulterated dope.

Of course the plan is applicable to one motive power as well as to another. A small gasoline engine would furnish the single horse-power demanded in the project, or the storage battery used to supply current for the magnets could operate a few fan motors geared to the driving axles, but we fancy the Professor would find Odic Force about the right thing, or for experimental purposes he might dangle his legs over the rear platform and think. Thinks of this kind ought to have a high pressure per square inch. As for braking on this marvellous system it is accomplished just as easily as running. It is only necessary to cut off the magnet current and the car comes down upon its wheels, and can be stopped in the usual manner. This involves, in our opinion, a gross superfluity of wheels. Why not provide the car with brake-shoes only and let them settle down with any required force? If the rails were of hard steel and polarized, mere reversal of the magnet current would force the car down upon the track and enormously enhance the ease of braking, although, possibly, the Professor plans to gear dynamos to the wheels and use them for charging his storage battery.

But, seriously, why is this struggle to avoid the smallest item of resistance at high speeds? Has not the Professor ever heard of air resistance, or does he plan to run his train in vacuo? If rolling friction, due to weight on the wheels, and track resistance properly so-called, were the only obstacles to high speed, railroading would be a joy forever. The hundred-mile-an-hour-train would be a back number, and no up-to-date witch would ride anything so low as a broomstick.

A Suggestion for Through Travel

We have often stirred up the question of encouraging long trips over the many net works of interurban lines which are in existence, and now, at the opening of spring, seems a very appropriate time to return to the charge. It is now easy to make long trolley trips through an attractive country at very moderate cost, and every manager knows how the excursion spirit increases traffic. One thing, however, is conspicuously absent, and that is systematic effort on the part of connecting roads to increase long-distance travel. Of course, the greatest desideratum in long-distance trolley riding is the through car, which enables a passenger to plant himself quite comfortably for the journey. Considering the common use of through cars in railway service it seems to have taken an unconscionably long time for the idea to filter down to the trolley lines. To tell the truth, so far behind the railway standard are the schemes of passenger traffic on trolley networks that we wonder that some lines do not demand their fare in wampum.

To get a vivid idea of the crudity of the conditions, suppose we take an imaginary railroad journey together from New York to Boston, after the manner of passenger traffic on the trolley. We land at the Grand Central about 9:50 a. m., and on inquiry learn that no tickets are sold beyond New Haven, and no New York cars run beyond that point. Yes, the urban station master assures us, we can undoubtedly get through to Boston over his line, but we will have to take a light pink train opposite the station in New Haven. No, he hasn't a timetable of the line, but he thinks we will not have to wait more than half an hour if our cars reach New Haven on time. So we climb aboard, and stopping at Port Chester, to take on forty Italian laborers, in full working regalia, who fill the aisle and sit on the arms of our seats, we eventually reach the home of Yale and other industries. Here we get out and wait patiently for the pink train. Thirty-eight minutes later it shows up, and the conductor tells us that it goes through to Hartford. He b't'eves that some folks walk across the square when we get there and take a yellow train that runs to Springfield every other trip, but he aint sure, 'cause it's off his line, but we can find out by asking at the drug store. So we accompany our wise guide to the end of his route and hie to the drug store across the square, to learn that the Springfield train goes through on the next trip but one, in just thirty minutes. At the expiration of that time a train shows up, but it is marked "Special," and we find that the regular through cars will leave fifteen minutes later on the next trip. So we wait awhile more, and find our conductor is a new man, and doesn't know whether he connects with anything at Springfield or not, but he rather guesses so, and we can find out when we get there. This we accordingly attempt to do, and find that the blue train for Worcester has just left, but another one will be along in about half an hour. It duly arrives on time, and we learn that it connects at Worcester with a green train for Boston. So we pull through to Worcester, find the green train just ahead, full, and stand in the aisle as far as South Framingham, where we get seats, and ride proudly into the Hub. Now, does it seem likely that the average man, after an experience like this, would again hunt trouble on that particular route? Wouldn't he search for some line that now and then ran a through car or sold a through ticket or at least published a through timetable and stuck to it?

Yet this picture of what might happen, if the officials of the Consolidated all lost their minds, represents, we are sorry to say, the normal condition of things on electric roads. A few lines unite to run occasional through cars, but it is rare to find

any systematic attempt to make through travel convenient and easy. Sometimes it may be inconvenient to run regular through cars between distant points on a network, but it certainly does not take any great genius in railroading to devise a scheme for through connections and through tickets, the former being plainly printed on the back of the latter. The connecting roads may not be under the same management or even on good terms with each other, but in general railway work roads will make through connections most punctiliously, and sell through coupon tickets even when the respective managers are opposed to each other on other lines of policy. They find that it pays, and that settles it, whatever personal feeling may exist.

In a comparatively short time there will be a through electric road connection between New York and Boston, but the continuity of the track is of no account whatever unless systematic service goes with it. Even over shorter distances the mere fact that connections are possible does not insure that the connection will be of any commercial use. So long as a passenger has to wander from car to car making connections where he can, and unable to know definitely beforehand how he is going to manage it, he will hesitate to undertake long trips by trolley, however convenient it would otherwise be. The next step in the general development of electric roads ought to be a careful study of traffic management over interconnecting lines. If one cannot manage through cars he can, at least, devise through schedules and through tickets, and can keep the public well informed regarding the convenience of his routes. Every consolidation of roads makes the task of united operation easier, but even without this it is possible to make a great improvement in existing conditions.

The Rights of the Down-Trodden Employees

We trust that our readers have by this time perused and reflected upon the demands of the New Orleans Union as published in a recent issue. They are worth far more than a cursory glance, since they embody faithfully the arrogant spirit which has made recent street railway strikes so difficult of settlement. We have no desire to malign the honest workman nor cast aspersions upon his efforts to better himself through organization, but we have no hesitation in saying that for sheer impudence and cold-blooded effrontery the document referred to occupies a unique position. It is not a statement of grievances requiring redress, but a manifesto demanding unconditional surrender of the rights of the railway company and betrayal of the rights of the public. Taking up some of its suggestions in detail the first pleasant feature to strike our attention is the demand that promotion be made by seniority of service. This is truly delightful, for it implies that all men are equally capable of responsible positions. A corporation would get itself into the hands of a receiver in short order if it attempted such a programme. Given longevity and a certain minimum of capacity and a man's future would be assured. We thought that there had been sufficient experience in the army and navy to elucidate the essential foolishness of promotion by seniority even among thoroughly trained and picked men. But this exhibition of nerve pales into nothingness beside the following demand that the company force all its men into the union and suspend them if they fail to pay their union dues. The latter request is rubbing it in with a vengeance; not only must the company fatten the ranks of an organization devised to prey upon it, but it must see that the hostile treasury is kept filled.

Even more charming is the cool proposition that "knocking down" fares is a subject of special arbitration, instead of immediate discharge. Why would it not be a good idea to provide that the union should be kept in funds by a committee of members appointed to knock down the necessary amount? We make no claim of originality in this suggestion, which, perhaps, has already been put in force, but if petit larceny is a proper subject of arbitration why not grand larceny? Finally, the proposed agreement ends with the specification that it shall be binding on the parties concerned and remain in full force and effect for the term of one year. We had hitherto labored under the delusion that agreements set forth the obligations of both the contracting parties, but a careful examination of the scheme of salvation here considered fails to disclose the assumption of any obligations whatever on the part of the union save the agreement to a mild schedule of penalties for missing trips. Does the union provide any security, moral, legal or material, for its part of the programme? Does it bind its members, even on paper, to the proper discharge of their duties, or to any duties at all save showing up for work and drawing their pay? We fail to find any such provisions in the lovely agreement presented for consideration. To be sure, the party of the second part "continues the operation of the street railways of the said party of the first part," whatever that may mean, but what assurance has the unhappy party of the second part that it will do so any longer than it sees fit? Does the union agree to hold its men rigorously to their duty pending the settlement of disputes? Does it undertake to hold them from engaging in a sympathetic strike, or from striking if an arbitration goes against them? And if so how does it propose to hold them?

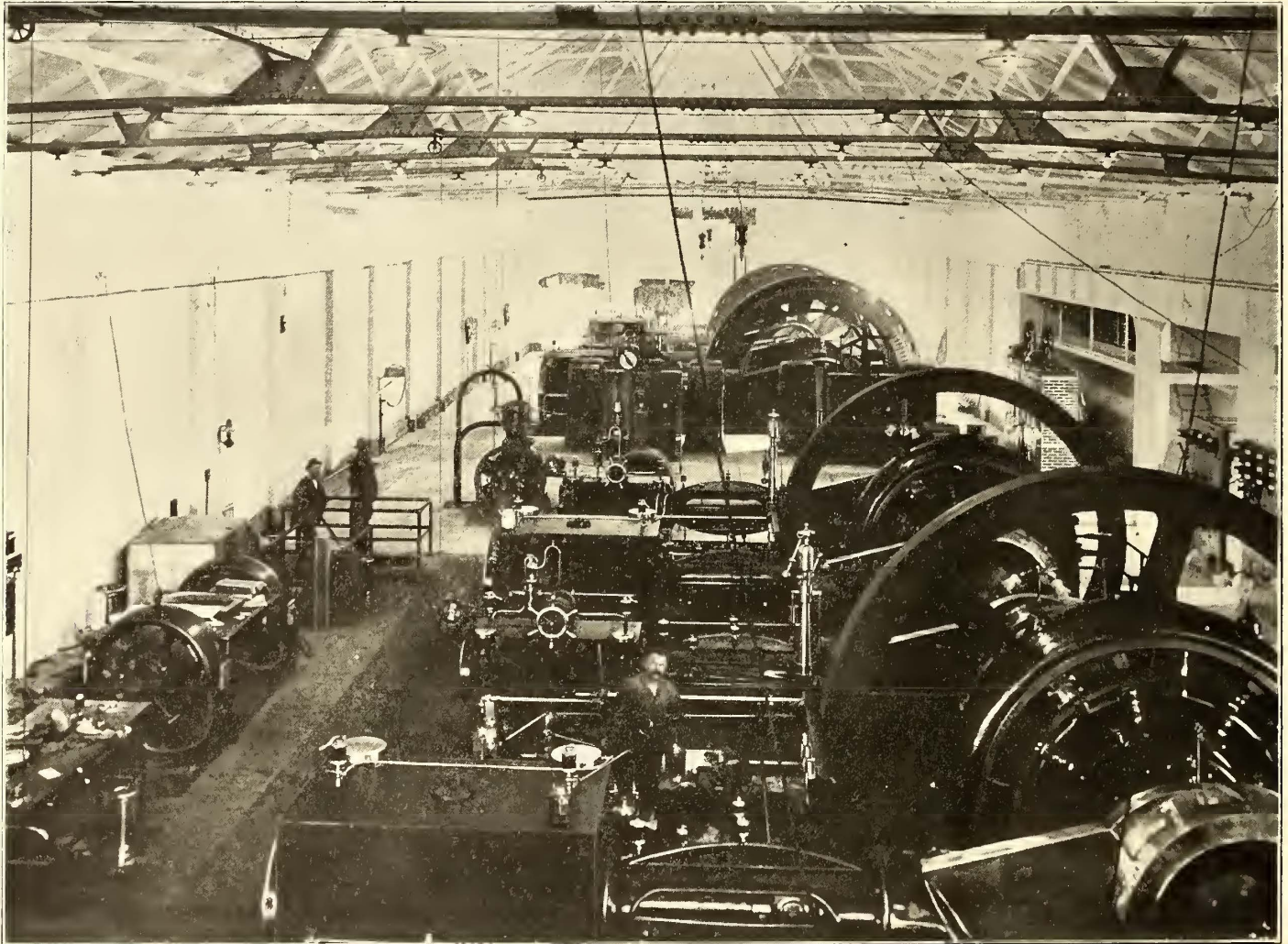
Now, in truth, the whole proposition is the most outrageous nonsense that has ever come to our attention. A street railway has grave public obligations to fulfil to which it is sternly held by statute law. It cannot transfer the responsibility of "continuing the operation of the street railways" to any body whatever that cannot similarly be held responsible for the proper discharge of its duties. We believe it could be enjoined from entering into a contract which would so seriously imperil the public service. Most of all, we object to any form of contract which abridges the right of peremptory discipline. The public, by whose consent the street railway companies use the public streets, has a right to demand that these companies shall establish and maintain a proper service, and it can hold the companies to account for the negligence of their servants. For this very reason we believe that the public will stand behind the street railways in resisting to the bitter end such an attempt at irresponsible domination on the part of an organization of employees. When men strike against real and tangible grievances they may have and will have, if they behave themselves, an amount of public sympathy that is sometimes quite out of proportion to their deserts, but when they strike to uproot discipline they strike against public order. It will be a sorry day for the street railway that accepts such an agreement as that promulgated by the New Orleans union, for by so doing it betrays the trust which it has received from the public. We have nothing against unions as such—we are glad to see street railway employees prosperous and successful and associated for mutual benefit, but the kind of unionism that would disqualify a public service company from living up to its public duties, and which resorts to or threatens lawlessness in case its fiats are refused, has no excuse for existence, and should be repressed by the law which it avowedly defies.

THE APPELYARD SYNDICATE'S INTERURBAN SYSTEM--II

The power equipment for the Appleyard system between Columbus and Cincinnati, with the extensions north, will be centralized at Medway power house on the Dayton, Springfield & Urbana line. The character and extent of the group of electric lines to be supplied and the equipment of the system were thoroughly described in the last issue. At present there are small direct-current stations at Summerfield, on the Columbus, London & Springfield; at Glen Echo, on the Dayton, Springfield & Urbana, and near Columbus on the Columbus, Grove City & Southwestern. The two first mentioned are at present closed down, but the small station near Columbus will probably be retained for some time, to take care of the heavy

being double the length of the old building. It is a substantial brick structure, having a truss steel roof with slate laid on tongued and grooved sheathing. Separated from it by a brick wall is the boiler room, which is 112 ft. x 56 ft.

The equipment of the Dayton, Springfield & Urbana side of the station was described in an article on this system published in the STREET RAILWAY JOURNAL of April 7, 1900. There are three 450-hp cross-compound condensing engines, built by the Slater Engine Company; the high-pressure cylinder is 16 ins., and the low-pressure cylinder 32 ins., with a 42-in. stroke. Engines are fitted with the Monarch safety engine stop, which closes down automatically at 108 r. p. m. Directly connected by shaft are three 325-kw Westinghouse direct-current generators of the compound-wound type, operating at 100 r. p. m.,



ENGINE ROOM, MEDWAY POWER STATION

loads near the city. This station is provided with a storage battery which will take care of the peak on the Central Market system in Columbus.

The Medway house has been for the last two years the chief station of the Dayton, Springfield & Urbana line. On account of its advantageous location and in order to secure economies from centralization, the syndicate decided to double the size of this station and install alternating-current equipment to take care of the greater portion of the system. The new equipment has recently been placed in operation, but at the present time the two sections of the station are operated entirely independent of each other, the old portion supplying the Dayton, Springfield & Urbana as heretofore, and the new portion taking care of the Columbus, London & Springfield, and feeding into the Columbus city system.

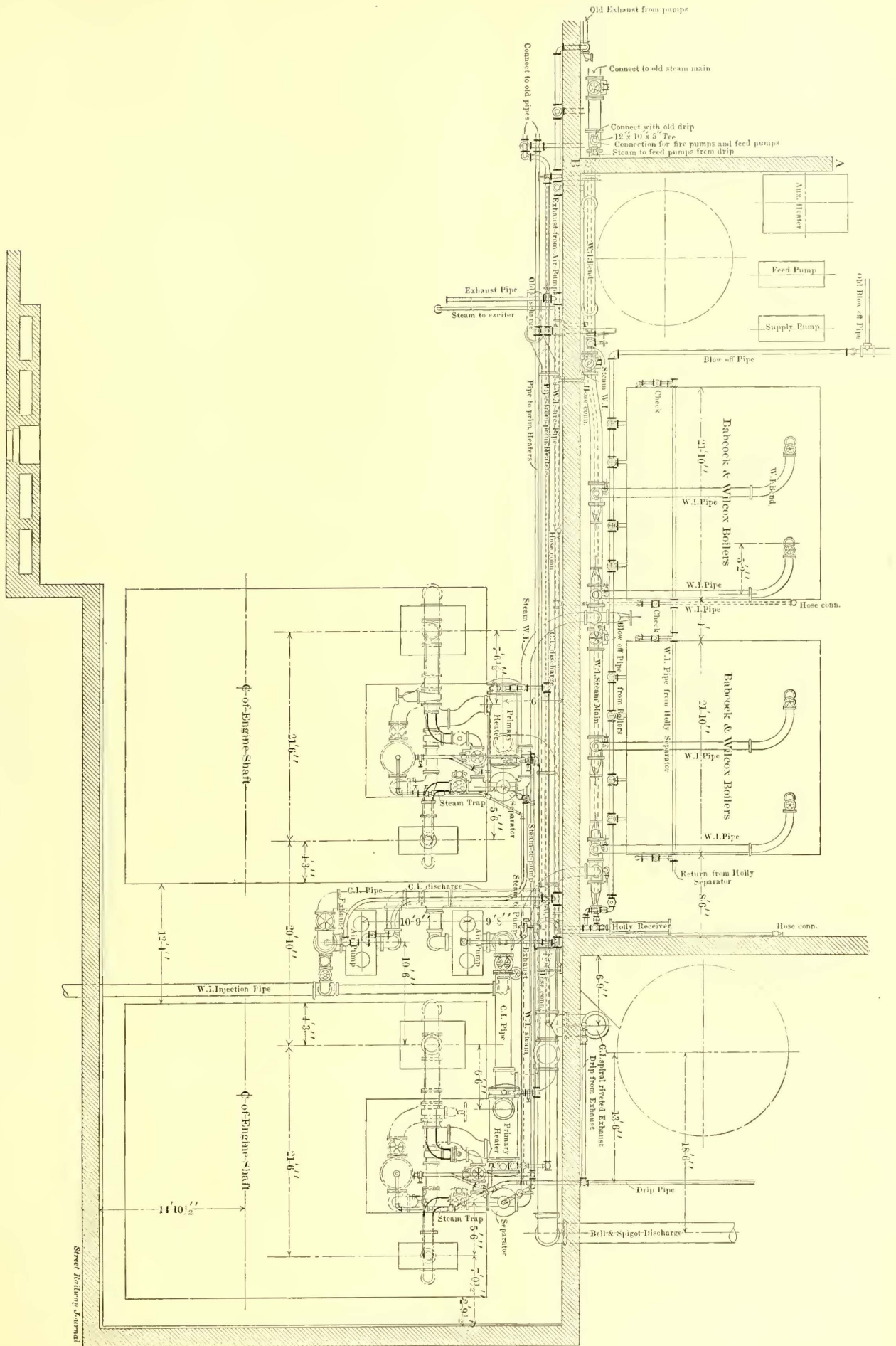
MAIN POWER HOUSE

The house, as it stands, is 194 ft. long by 48 ft. 6 ins. wide,

and supplying 600 volts. There is also a 150-kw booster set. The electrical equipment is controlled through an eight-panel switchboard, supplied with Westinghouse and Weston instruments. The first two panels are intended to control the booster set, but this at present is not used. The next two panels control the outgoing feeders, and they have a meter, a circuit breaker and switch on each outgoing feeder line. The fifth panel contains a total ammeter, total wattmeter and the station voltmeter. The remaining three panels are for the generators, and they have Westinghouse automatic circuit breakers and Monarch automatic circuit breakers for the engine stops, also equalizers for the positive side, the machines operating in parallel.

In the boiler room are three 250-hp Babcock & Wilcox boilers, a Cochrane heater and purifier and two Blake duplex boiler feed pumps, each 4½ ins. x 7½ ins. x 10 ins. In the auxiliary room below the engine room are two Blake vertical-type condensers and air pumps.

PIPING PLAN OF MAIN POWER HOUSE AT MEDWAY, FOR COLUMBUS, LONDON & SPRINGFIELD RAILWAY



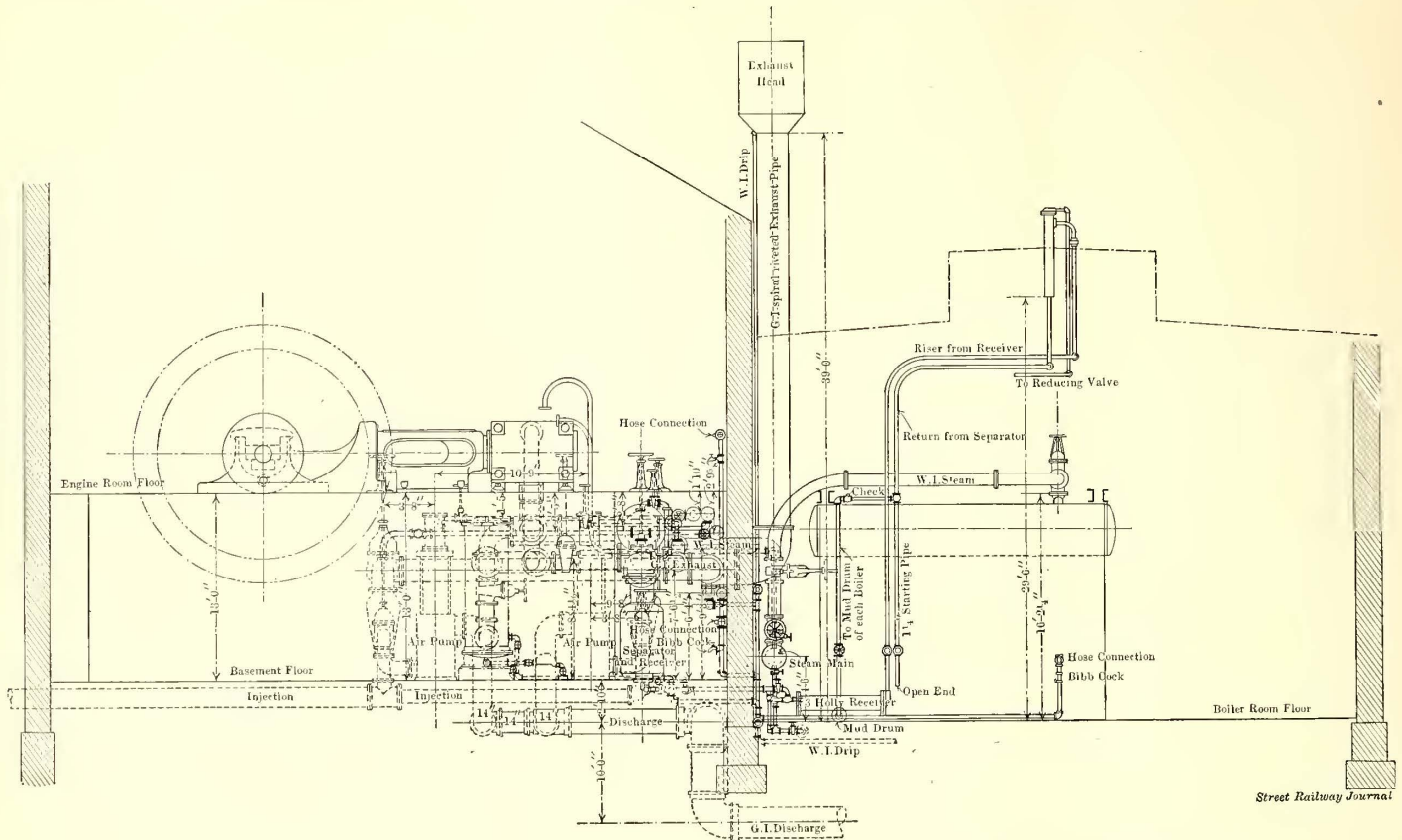
STEAM PLANT

In the boiler room of the new section of the house are four 250-hp boilers of the Babcock & Wilcox type, similar to those on the Dayton, Springfield & Urbana side. They have 126

4-in. tubes, 18 ft. long. Plane grates are used, giving 66 sq. ft. of heating surface. Boilers operate at 160 lbs. steam pressure, and they are fitted with the Holly steam loop and gravity return system for condensed water. the condenser for the

system being located on the roof, away from the heat of the boilers. Boiler tubes are cleaned by a Weinland hydraulic outfit, using water at 125 lbs. pressure. Coal bunkers are

12 ins. One pumps the feed water and the other pumps from the heater to the boilers, and they are arranged to work either way. Water is supplied to the boilers at 210 degs. Ordinarily



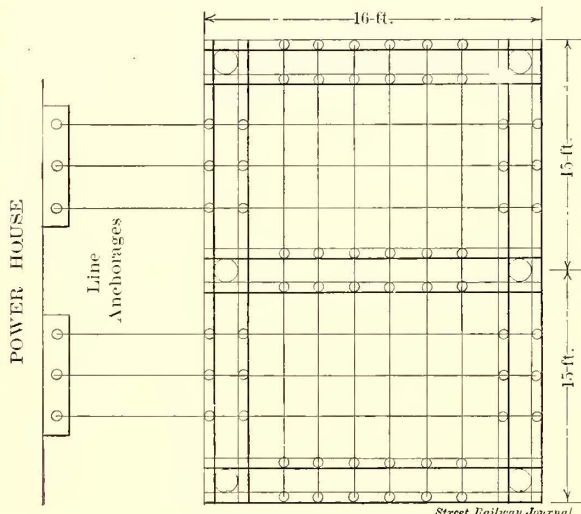
CROSS-SECTION OF COLUMBUS, LONDON & SPRINGFIELD STEAM PLANT AT MEDWAY POWER HOUSE

located at the side of the boiler room, and they have a capacity of 900 tons. Dump-bottom cars are hauled over the line by an electric locomotive from the Big Four Railway at Donaldsville, and are dumped into the bunkers from an overhead steel bridge. Jackson Hill run of mine coal is used, and plans have been completed for installing an industrial track system through the boiler room and bunkers, with connecting switches in both sections of the house. Side dump-cars, holding 2 tons and furnished by the C. W. Hunt Company, will be installed, and each car will be weighed as it crosses a Fairbanks scales, located between the two boiler rooms. On the Columbus,

water is pumped from a mill race at the side of the house. The race is 1½ miles long, and is provided with a bulkhead, so that it may be drained and cleaned. There is also a line to an adjoining creek and a third line to a deep well, which is supplied by a never-failing spring. The three lines are connected in the house, and water may be pumped from any of the three. The first stack is 125 ft. high with 6-ft. flue, while the stack recently erected is 150 ft. tall with 7-ft. flue. They are both built of perforated brick. The new stack rests on a square base, 14 ft. x 14 ft. outside of the building, and the breeching is connected to that of the other stack, and they may be operated singly or together. The steam loss and feed-water mains in both sections of the house are also connected to provide for possible parallel operation of all boilers and pumps.

ENGINES

The recently installed units, two in number, have horizontal cross-compound condensing engines of the Hamilton-Corliss



PLAN, END AND SIDE VIEW OF ARBOR

London & Springfield side there is a 1200-hp Cochrane heater and purifier and two Blake duplex feed-water pumps of the outside packed-valve type. Cylinders are 10 ins. x 6½ ins. x

type. They have Corliss rotary valves, and have cylinders 26-in. and 50-in. with 48-in. stroke. Total weight is 290,000 lbs. The fly-wheel alone weighs 100,000 lbs., being 18 ft. in diameter,

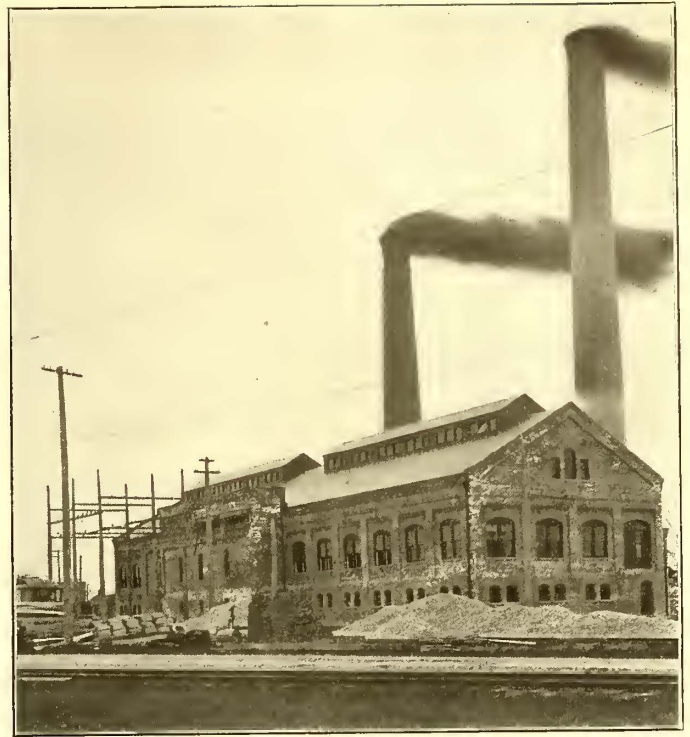
with web 18 ins. x 20 ins. The engines may be run either condensing or non-condensing, or it is possible to use either cylinder independent of the other. Steam from the high-pressure cylinder is exhausted into a receiver below, and then passes into the low-pressure cylinder and is exhausted through a primary heater into the condenser. From the condenser the steam goes through the exhaust line to the Cochrane heater, where it heats the feed water, and then passes through a vent into the atmosphere. The condensers are located in the auxiliary room below the engine room, and are of the Blake vertical type. They are fitted with the simplex valve gear and take water from the mill race. All piping is of wrought-iron, extra heavy, and bends are used instead of elbows. The steam header is 12 ins. in diameter, the mains from the boilers 8 ins., inlet to high-pressure cylinder 8 ins., to low-pressure cylinder 16 ins., and low-pressure exhaust 18 ins. There is a Stratton separator and a Nason trap connected to the receiver between the high and low-pressure cylinders.

GENERATORS

The generators are of the revolving field type, rated at 800 kw, 2300 volts, 201 amps. and 25 cycles, and they are designed for 94 r. p. m. Edgewise field winding is used, and the armature coils are conected with clips, so that in case one or more should burn out they may be unsoldered and replaced in a very short time. Current for exciting the fields is supplied by a 25-kw, 125-volt direct-current generator, connected to a small marine engine, and by a similar generator driven by a 2300-volt, three-phase 25-cycle induction motor. The first set is used in starting, and it is closed down and the motor-driven set switched on when the machines are up to normal voltage.

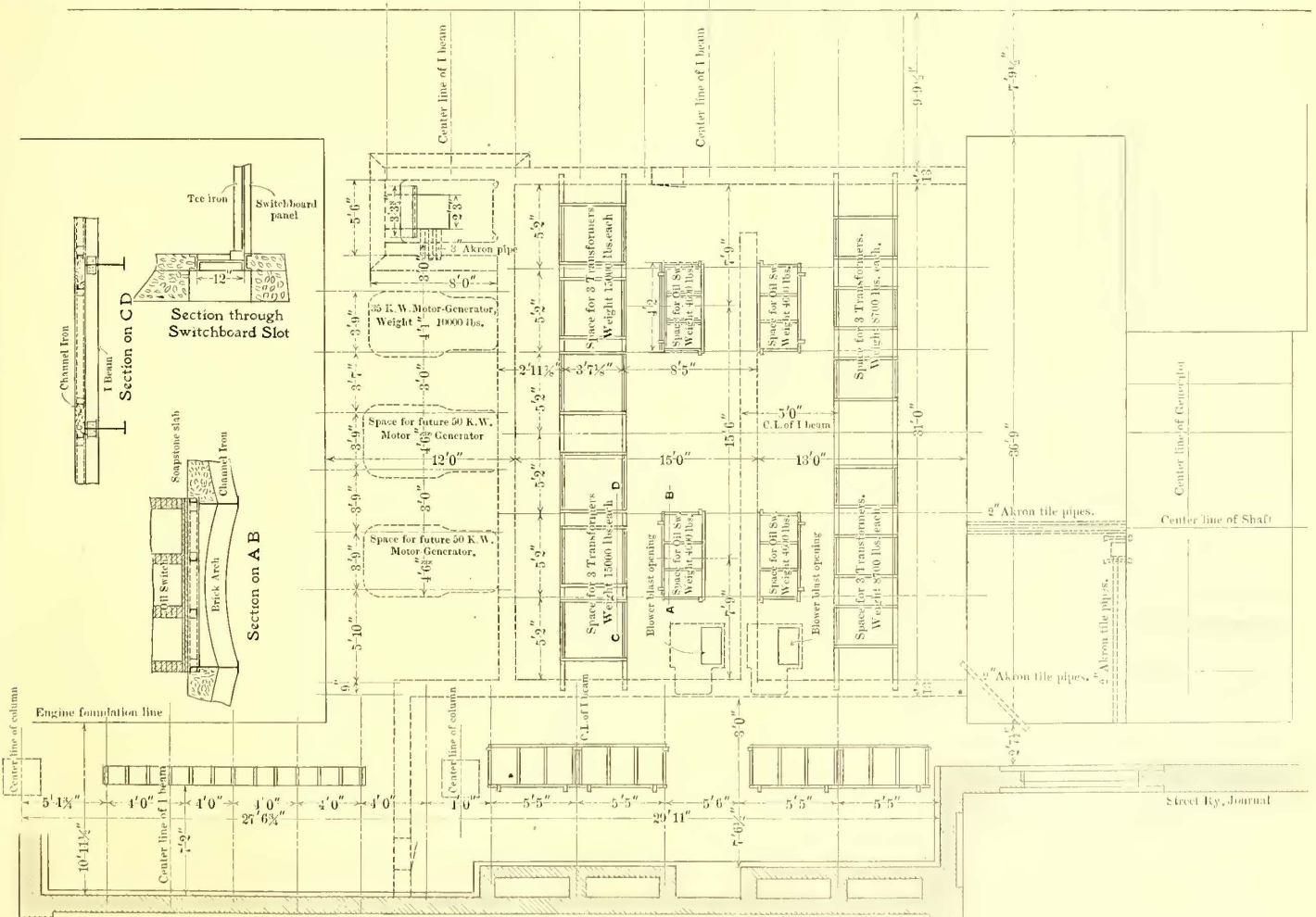
TRANSFORMERS AND AUXILIARIES

The current is stepped up by means of two banks of three single-phase air-cooled transformers, each rated at 275 kw,



MAIN POWER HOUSE AT MEDWAY, SHOWING ARBOR FOR DISTRIBUTION SYSTEM

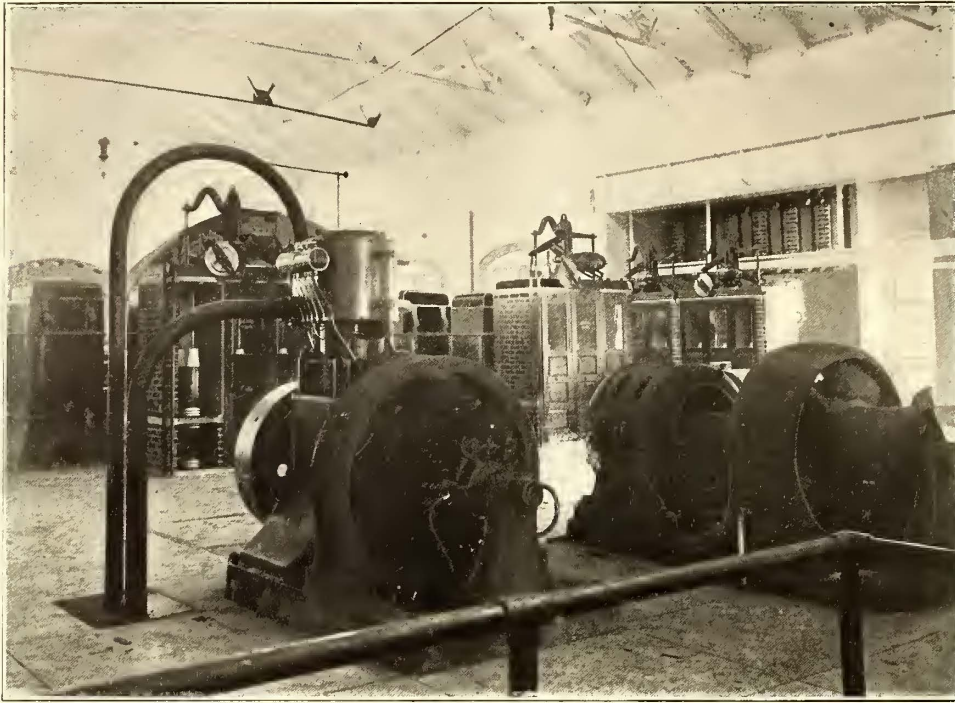
giving 26,400 volts on the secondary side. Each bank is connected without switches to the corresponding generator, thereby always giving a transformer capacity in service equal to the generating capacity. The transformers are cooled by two Buffalo Forge Company's blowers, each driven by a 3½-hp, 125-volt direct-current motor. These motors are supplied by



PLAN FOR ENGINE AND GENERATOR ROOM, COLUMBUS, LONDON & SPRINGFIELD SIDE OF MEDWAY POWER HOUSE

the excitors and controlled by circuit breakers, and starting boxes on small panels in front of the blower sets. The blowers

fireproof anchorage, to which they are secured by means of strain insulators. To carry out the lines and make a substantial right-angle turn in front of the building, the engineers were obliged to design a unique arbor for distributing the lines from the anchorage. The details of the arbor are shown on page 760. It is composed of 45-ft. poles with 4-in. x 8-in. arms. The lines from the anchorage pass directly across the arbor and are secured with dead ends to insulators on the opposite side. Other lines cross the arbor on other cross-arms, the six eastbound wires going above and the six westbound going below the station wires, and they are secured on the opposite sides with dead ends. The circuits are completed by means of short connecting wires attached with soldered points, the eastbound connections going up and the westbound connections down.



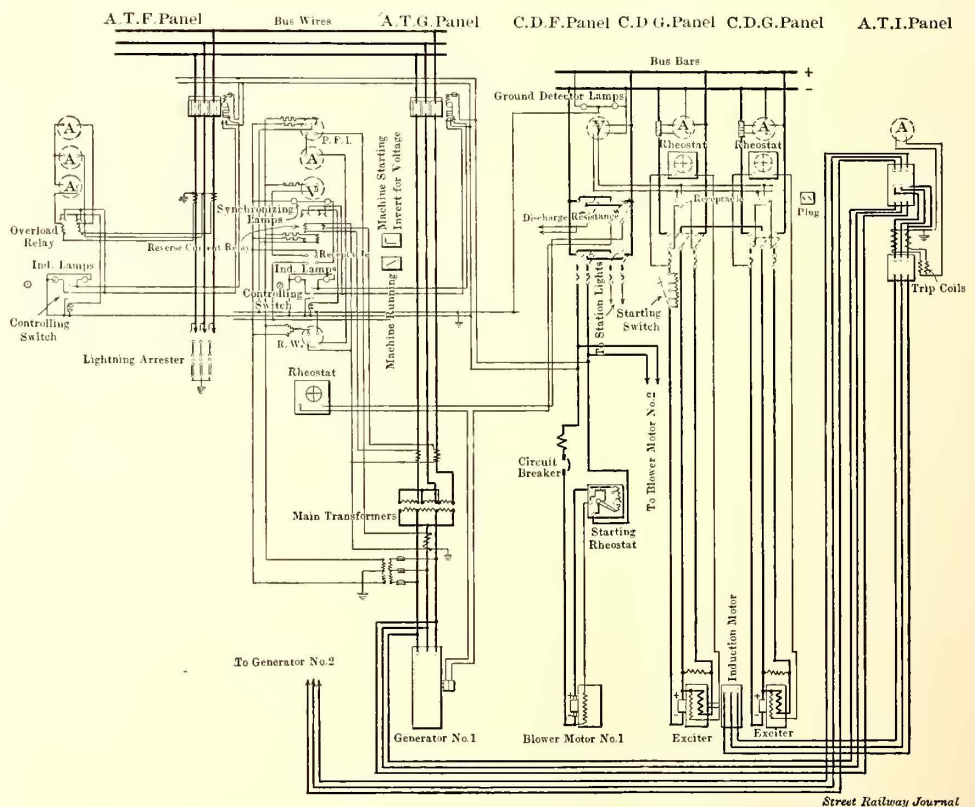
EXCITER SET, TRANSFORMERS AND OIL SWITCHES ON COLUMBUS, LONDON & SPRINGFIELD SIDE OF MEDWAY POWER HOUSE

stand on the main floor, and discharge downwardly into the air-blast compartment, which is made up of the basement below the transformers and blowers. This is kept under a pressure of $\frac{5}{8}$ of an ounce per square foot, and the air current passes up from this compartment through the transformers. Each transformer is provided with a damper so that only those in use are ventilated.

After being raised to 26,400 volts the current passes through the generator oil switches, two in number, located in front of the transformers. These are of the General Electric form H type, the same as are used in the Aurora, Elgin & Chicago plant. The oil switches are in brick compartments with barriers between the different phases. Each switch is operated by a 1-hp direct-current motor, which is controlled by a small switch on the corresponding panel. Red and green lamps on the generator panels indicate whether the switches are opened or closed.

From the generator oil switches the current passes to the station bus-bars, which are located for the most part in the air blast compartment mentioned. The high-tension wires in the bus-bar room are in separate compartments, having concrete partitions. They are secured on Locke No. 298 brown porcelain insulators, mounted on malleable iron pins screwed to bolts set in the concrete. From the bus-bars the current passes through a similar oil switch for each line. Each line is also equipped with a set of lightning arresters in a gallery of a bay to the main buildings; the bay is 6 ft. wide, 56 ft. long and 30 ft. high. The lightning arresters are the standard General Electric 2000-volt type, connected in series and mounted on insulated frames. In leaving the station the lines pass through a

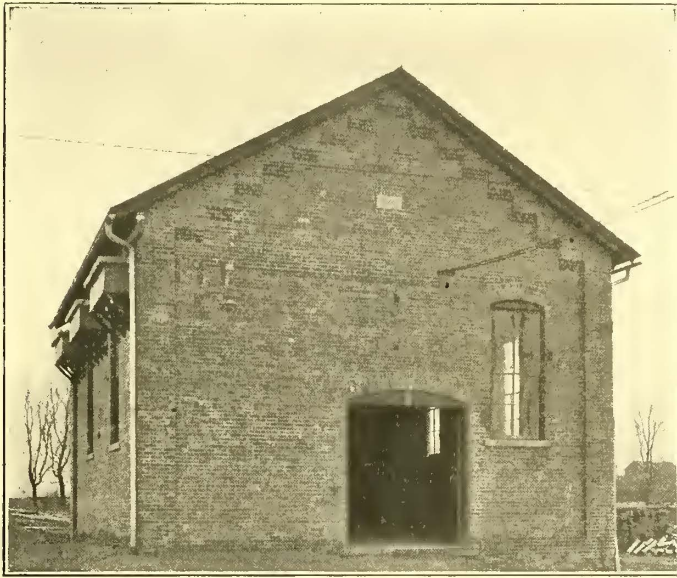
with. The board is of blue Vermont marble, and at present there are eight panels, each 16 ins. wide. The first is the 2300-volt panel for the motor-driven exciter. It con-



WIRING DIAGRAM FOR SWITCHBOARD OF COLUMBUS, LONDON & SPRINGFIELD RAILWAY, AT MEDWAY POWER HOUSE

tains an ammeter, a double-throw switch and an automatic oil switch. Current transformers on the back deliver secondary currents to the instruments on the panel. The second panel controls the direct-current end of the motor-driven exciter. There is a Thomson astatic 500-amp. meter, a rheostat, a 3-pole switch and a starting switch, so that the

motor-driven exciter may be started by direct-current. The third panel is the engine-driven exciter panel. It has an ammeter, a rheostat and a 3-pole switch. The rheostat hand wheels on these panels are connected by means of sprocket chains to the field rheostats located in the basement below. Current from the exciter sets is carried over bus-bars on the



STANDARD SUB-STATION FOR SMALL TOWNS ON COLUMBUS, LONDON & SPRINGFIELD RAILWAY

back of the exciter panels to the field panel. The fourth panel contains the generator field switches, the controlling switches for the blower motor circuits and oil switches, and space is also reserved for two generator field switches, which are to be installed later. The fifth and sixth panels control the two generators. They have power factor meters, ammeters, voltmeters, recording wattmeters, rheostat hand wheels and automatic controlling switches for generator oil-break switches. The seventh and eighth panels are for the line switches. Each contains three ammeters and an automatic controlling switch for the corresponding line oil-break switch. On the backs of the generator panels are overhead relays, which, in event of short circuit on the high-tension lines, automatically open the generator switches. The feeder switches are protected in a similar manner. The line switches are set to open at a lower current than the machine switches, so that in case of trouble on one line the line switch will open instead of the generator switches. Under the present arrangement of the board space is left for two generator panels, two outgoing line panels and two exciter panels. There are also spaces left in the house for oil switches, transformers, lightning arresters and exciter sets for 4000 kw additional equipment. Conduits are imbedded in the concrete flooring for the additional small wiring.

ADDITIONAL EQUIPMENT

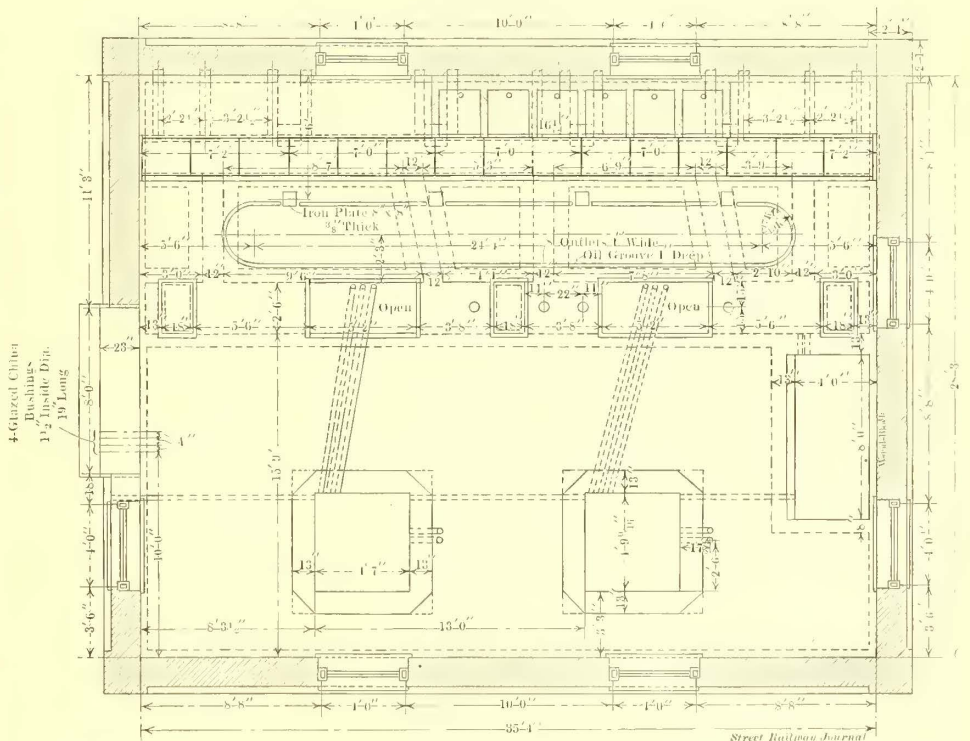
A contract has already been placed for one 2000-kw Curtis turbine generator set, and to accommodate this the west end of the building will be extended. The ultimate plans for the house provide for a westward extension of 200 per cent.

The station lighting is done by arc lights in multiple, current for which is supplied from the 600-volt line, but there is a double system of wiring with cut-out switches, which permits the use of the engine-driven exciter set when the station is shut down. In connection with the turbine unit there will be three 675-kw air-blast transformers and other necessary station equipment. The turbine will be run in multiple with the two present units.

SUB-STATIONS

Ultimately sub-stations will be located on an average of about 15 miles apart between Columbus and Cincinnati. Stations are now in operation at West Jefferson, Brighton and Springfield, and others are being erected at Columbus, Urbana, Bellefontaine, Dayton, Kenton and Lebanon. The stations at Springfield, Dayton and Columbus will each have two rotaries installed, with space for three, while the other stations will have one rotary each with space for a second. The smaller stations are of the type illustrated herewith. The stations at Urbana, Bellefontaine and Kenton will be combination sub-stations, freight and passenger station and residence for the attendant. The plans of this type are presented herewith. They were developed from similar plans adopted by the Toledo & Western system, which was described and illustrated in a recent issue of the STREET RAILWAY JOURNAL. The buildings will be of pressed brick and will have dining and living rooms below, in order that the attendant may be as close to his machines as possible. The stations will cost nearly \$6,000 each exclusive of equipment.

Each sub-station will have three 110-kw type-H oil-cooled transformers, together with one oil-cooled reactive coil for each rotary. The rotaries are of 300-kw capacity, of the 6-pole type, and operate at 500 r. p. m. The switchboard in the single stations will consist of a 16-in. panel for the direct-current side of each rotary, and two 1200-amp. direct-current feeder panels. Space is left to take in two more feeder boards and the direct-



PLAN OF SUB-STATION FOR COLUMBUS, LONDON & SPRINGFIELD RAILWAY

current panel for the second rotary. The alternating-current instruments and switches are not located on the switchboard, but are mounted on pedestals, which are placed on the floor directly in front of the transformers. The rotary pedestal contains a power factor meter, ammeter, voltmeter and synchronizing plug. The high-tension line enters the station through a fireproof anchorage and is connected directly to high-

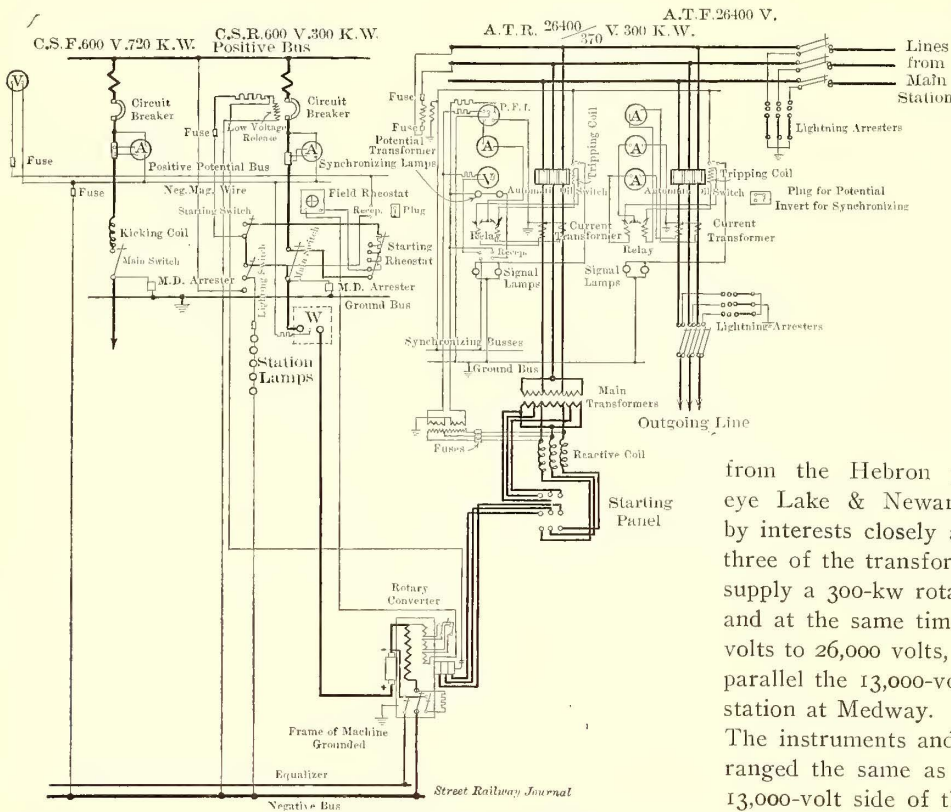
tension bus-bars and lightning arresters. The outgoing line to the next station is connected from bus-bars to the line through a hand-operated form-K switch, designed to break 50 amps. Outgoing lines are provided with an instrument pedestal having three ammeters. Switches are automatic and will open in case of short circuit on the line. All the stations are prac-

wall. This frame also supports the gallery, which is built just below the arresters. The connections from the oil switches to the bus-bars and transmission lines are carried on the iron frame work back of the lightning arresters.

The Springfield sub-station will be the general distributing point for the Urbana, Bellefontaine and Kenton sub-stations to the north, and the Brighton, West Jefferson and Columbus sub-stations to the east. Two outgoing high-tension lines leave the station, one going north and the other east, and there are duplicate incoming lines from Medway. Both incoming and outgoing lines will have oil switches and instrument pedestals provided with ammeters.

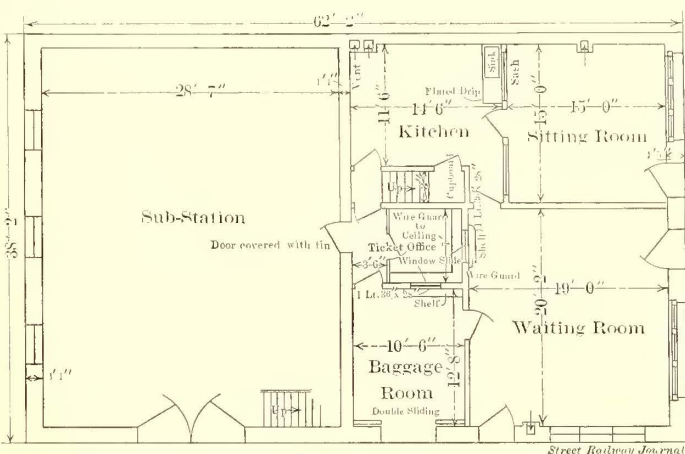
The Columbus sub-station will be a unique outfit in that it will have three 300-kw rotaries and nine 110-kw air-blast compensating transformers, wound for 26,400 volts and having taps brought out for 13,000 volts, making it possible to operate the station

from the Hebron power house of the Columbus, Buckeye Lake & Newark Traction Company, which is owned by interests closely allied to the Appleyard syndicate. With three of the transformers in this station it will be possible to supply a 300-kw rotary at either 26,000 volts or 13,000 volts, and at the same time 300 kw can be stepped up from 13,000 volts to 26,000 volts, or vice versa. It will also be possible to parallel the 13,000-volt station at Hebron with the 26,000-volt station at Medway. The two plants are about 95 miles apart. The instruments and switches on the 26,000-volt side are arranged the same as in other stations. The switches on the 13,000-volt side of the system are operated from the switchboard, and the instruments from the 13,000-volt circuits are also mounted on the switchboard. There will be lightning arresters for the 13,000-volt incoming lines as well as for the 26,000-volt lines. The two systems will be entirely independent of each other, yet both switches will be automatic. The 13,000-volt wiring from the switches to the transformers are lead-covered, triple conductor, paper insulated cable, while the 26,000-volt wiring is the same as in the other stations.

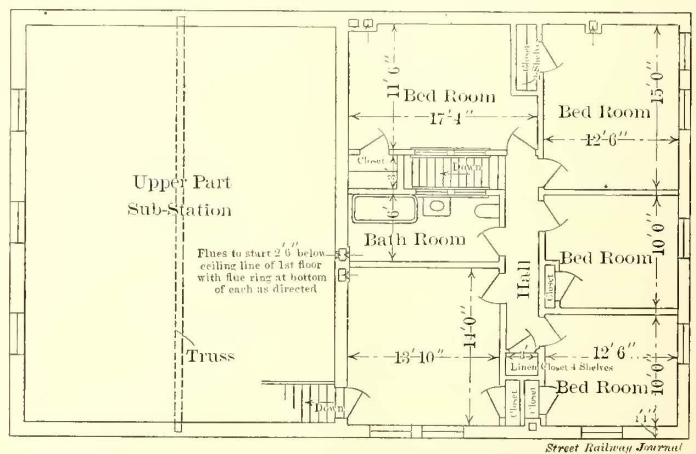


WIRING DIAGRAM OF SWITCHBOARD AT COLUMBUS, LONDON & SPRINGFIELD RAILWAY INTERMEDIATE SUB-STATION

tically alike except for the differences enumerated and for the additional fact that terminal station, of course, have no outgoing line switches. The high-tension wiring in stations is all bare No. 2 Brown & Sharpe wire, mounted on Loch 298 brown porcelain insulators and iron pins. The wiring is arranged so



First Floor. PLANS FOR THE COMBINATION RESIDENCE, SUB-STATION, PASSENGER AND FREIGHT DEPOT



Second Floor. PORTABLE SUB-STATION

that it is impossible for a man to fall against the high-tension lines. The bus-bars are 17 ft. above ground. Oil switches are mounted in fireproof compartments, the phases separated by 4-in. brick walls. The low-tension wiring is carried from the transformers to the rotaries and from the direct-current side of the rotaries to the switchboard in vitrified tile pipe under the floor. The cables for the low-tension circuits are 750,000 cm, insulated with asbestos and cotton braid. The high-tension lightning arresters are hung on an iron frame 3 ft. from the

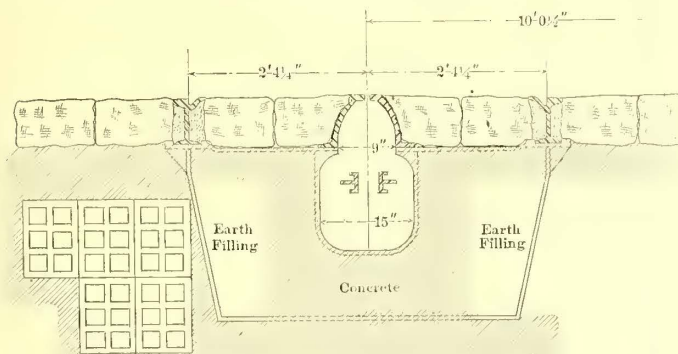
Another interesting feature of the equipment will be a portable sub-station, which will also be equipped to operate either from the Medway or the Hebron station. It will be equipped with one rotary and one three-phase air-blast transformer, with 26,000-volt windings and taps brought out to be run on 13,000 volts. The electrical equipment of the power house addition and of the sub-stations was installed by the General Electric Company, under the supervision of Egbert Douglas.

ASPHALT PAVEMENT AND STREET RAILWAY TRACKS

BY W. BOARDMAN REED

Since the very general adoption of asphalt for paving purposes street railway companies have had much trouble and much expense in keeping the surface of the street adjacent to the tracks in a safe condition. In cold weather asphalt is brittle, so that the vertical movement of rails resulting from the passage of cars causes it to break, generally on a line some 5 ins. or 6 ins. from both the inside and the outside of rails. In a short time ruts, dangerous to vehicles, are formed, and occurring in the winter season, when asphalt cannot be successfully laid, leave the pavement adjacent to the tracks continually in a dangerous condition.

In Manhattan, New York, all electric tracks are built on cast-iron yokes imbedded in concrete, so, generally speaking, the roadbed is quite rigid and there is but little movement to the rails. On the Third Avenue line, however, originally constructed for cable cars, the yokes were quite light and the fastening for rail not rigid. In fact, when new rails were laid for electric cars the superintendent, who had charge of all



Street Ry. Journal

FIG. 1.—THIRD AVENUE CONSTRUCTION FOR CABLE

branches of both operation and construction, noticing an appreciable wear on both the top of the yokes and the bottom of the rails, decided, in relaying the rails on the old yokes, to use flat springs on top of the yokes for the rails to bear upon. Shortly after the electric cars began to run about all of these springs broke, and owing to the peculiarities of construction it was impracticable to remove them and fasten the rails securely to the yokes, thus the rails have a vertical movement of about one-eighth of an inch, a condition similar to that which exists on about all tracks laid on ties.

The pavement laid on Third Avenue at the time of the construction of the cable line was granite block on concrete foundation, the joints being filled with Portland cement grout. This pavement wore exceedingly well except next the slot rail, where, owing to its shape, it was necessary to undercut the blocks (see Fig. 1). The portion, about 2 ins. thick, thus left next the slot rails soon broke off, leaving a bad rut, dangerous for light vehicles to get into and often injuring the feet of horses as well as tripping up unwary pedestrians.

When the power was changed to underground electric the original track construction was all left in except the rails. The city authorities, however, demanded asphalt in the tracks. Since that time the Maintenance of Way Department of the company has had no end of trouble on its hands, and the company has been burdened with much expense. With asphalt a result just opposite to that with granite occurred. Whereas it wore well next the slot rail it broke badly next the tram rails, causing very dangerous ruts, and though extensive repairs were made very frequently it has been impossible to maintain the pavement in a safe condition. This is especially so in the winter, when there are so many days on which asphalt cannot be

laid. In several instances when the pavement was very dangerous the asphalt company was unable to make repairs for several weeks after being ordered to do so. It was, therefore, necessary to employ men and carts to keep the ruts filled with broken stone, which at best was but a poor makeshift, and did not prevent several accidents. A photograph, taken March 15, 1903, where repairs had been made in October, 1902, and showing the effect of only five months' wear, is presented in



FIG. 2.—BROKEN ASPHALT PAVEMENT

Fig. 2. The first break always occurs at the rail, but if this is not promptly repaired it soon extends to the slot, as shown.

The cost for the maintenance of asphalt on Third Avenue from September, 1900, to May 1, 1902, averaged \$4,250 per mile of single track per annum. To reduce this cost various plans were tried. The laying of a dental course of granite blocks next the rail remedied, in a measure, the trouble, but caused a rough surface, which bicyclists and the city authorities objected to. In addition, the stone showed considerable wear in a few months and wheels dropping from the stones to the softer asphalt surface caused excessive wear on it.

In February, 1902, a cast-iron strip, patented by D. & A. A. Mullen, and known as the "Mullen Marginal Protecting Strip,"

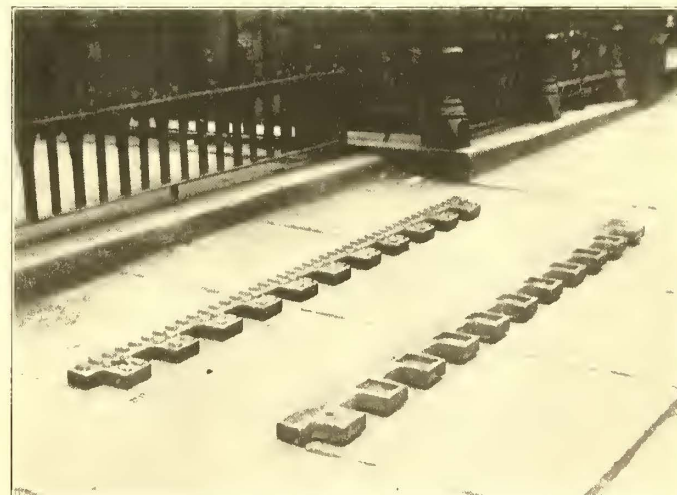


FIG. 3.—PROTECTING STRIPS TO BE LAID ALONGSIDE THE RAIL

was laid next the rail on that portion of Third Avenue where repairs had been most frequently needed and traffic the heaviest. This, after a few months' wear, promised such good results that more was ordered until it is now laid continuously from Twenty-Eighth Street to Sixty-Fifth Street, about 3 1/2 miles of single track, and the company intends to lay it on all that portion of this line where the traffic is at all heavy, and will also lay some on the other lines where maintenance contracts have

expired. The strip was laid from Forty-Second Street to Sixty-Fifth Street in September, 1902, and up to the present date, May 1, 1903, it has been necessary to repair only 4 yds. or 5 yds., and that where the strips were improperly laid, although during the same time extensive repairs have been made twice to pavement north and south of this section. An engraving of this strip is shown in Fig. 3.

The strip is, as stated, of cast-iron, $1\frac{3}{4}$ ins. thick, 7 ft. 6 ins. long, and has an extreme width of $5\frac{1}{2}$ ins., the side away from the rail being cast with projections forming, as it were, a dental course. Toe checks, to prevent slipping of horses, are cast on the upper surface, and the lower surface is recessed to give a better hold on the foundation. Near each end there is cast a counter-bored hole to receive the head of expansion bolt.

Asphalt next the rail of sufficient width to receive the iron strip is cut out. Holes are drilled in the paving foundation for the expansion bolts. A bed of Portland cement is then laid to receive the iron, which is securely bolted down before the mortar receives its initial set. Pieces of flat iron about $\frac{1}{4}$ in. x

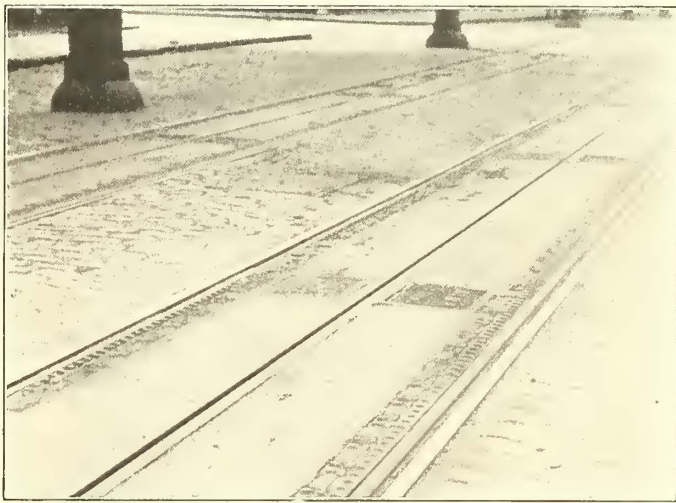


FIG. 4.—TRACK PROTECTED BY MARGINAL STRIPS

4 ins. x 6 ins. are placed under the strips at the joints. In laying the strip care is taken to have an open joint of about $\frac{1}{4}$ in. next the rail, thus leaving room for both vertical and horizontal movement without disturbing the iron strips, and the surface of the strips being even with head rail makes a smooth level surface for vehicles. After the strips are laid asphalt is repaired, and, as stated above, these strips, some of them laid fourteen months, have entirely prevented the breaking up of the asphalt.

Fig. 4 shows the appearance of the street surface in March, 1903. In the location shown in Fig. 4 the strips were laid in February, 1902. No repairs have been made at this or other places where they have been laid during this time.

Though the laying of the strips is somewhat expensive, yet in any place where the traffic is heavy and the rails not on a perfectly rigid bed the writer believes they will show much economy in maintenance charges.

H. E. Huntington, president of the Pacific Electric Railway Company and the Los Angeles Railway Company, has decided that he can make good use, on his interurban lines in the vicinity of Los Angeles, Cal., of a private coach of the sleeping-car type. He is willing to spend about \$25,000, and wants something very fine. Certain car companies knowing of Mr. Huntington's intentions have tried to have him accept a car adapted for use on both steam and electric roads, but he has grave doubts as to the success of such a car and does not care to venture upon the project.

CREATING TRAFFIC IN ATLANTA

BY THE RECENT DEPARTMENT OF PUBLICITY MANAGER

The Georgia Railway & Electric Company, which operates the street railway system of Atlanta, established last year a department of publicity, whose business it was to advertise the line and develop business. Although the department has since been discontinued it accomplished the results sought, and the experience secured may be of interest to other roads.

A brief review of the situation presented at the time of the establishment of the department was as follows: There was no competition in a city exceeding 100,000 population. The city park was almost the sole place of public entertainment, its attractions consisting of well-kept grounds, a small lake, a zoo and a cyclorama. There were four other parks of doubtful attraction. Each of these had a pavilion for dancing, two of them offered fair bathing, fishing and boating, and of the other two one was on the Chattahoochee River (10 miles out), and the other had a small, shallow lake without boats. There were three places of interest, viz.: The Federal Prison, the United States Barracks and Exposition Park, the site of the Cotton States Exposition. These and two baseball grounds constituted the sole material for entertainment, and while they catalogue well they were in fact very meager.

At the time of the establishment of the passenger department it was too late in the season to install modern park improvements, besides at that time it was impossible to secure a suitable site where the haul was short enough to make improvement profitable.

The first work undertaken was to make the public familiar with the car routes and schedules.

We published a time card, the first page of which is reproduced herewith. This time-card consisted of a folder of ten pages, size, $2\frac{1}{2}$ x $6\frac{1}{2}$ ins., and gave an easily understood schedule of eighteen car routes, by reference to which one could see which streets the cars traversed and accurately estimate when they could catch a car. It also gave information about Sunday schedules, transfers, etc. Five thousand of these time-cards were published and distributed from boxes in the street cars, in the hotels and cigar stores throughout the business section of the city.

The beneficial effect was immediately noticeable. Particularly was it apparent in short hauls and heavier travel early in morning and late at night.

In the meantime a system was put in operation by which everything of a "public attraction" nature was reported to the new department, and as much as possible concentrated at the parks. For instance, shooting galleries, side-shows, etc., then being operated in the center of the city were persuaded to move for the summer to the parks. The lessees of the parks were encouraged to exert themselves to make their parks more attractive, and on promise of free publicity and plenty of cars were induced to engage first-class orchestras to furnish music for dancing.

All this was accomplished without any expense to the company. The only actual expense incurred, with the exception of paying one-third of the cost of band music at the city park, was the salary of the publicity department manager.

On Saturday, May 24, the first issue of a little daily folder, termed "Daily Amusement Programme and Street Railway Bulletin," was printed, and 10,000 of them were distributed in the afternoon, beginning at about 3 o'clock, in the same manner as the schedules were distributed.

We left a bundle of fifty folders, a small rubber band being placed around each bundle, at about 100 cigar stands, hotels and restaurants. The balance we placed in metal boxes fastened to the side of the car near the windows. For the open cars we had holes punched in the folders and tied in bundles of about

twenty-five each. These bundles we tied inside the car in convenient places for the passengers to secure them.

On Monday, the second day of issue (none being issued Sunday) we gathered about 2500 of these folders that were not taken, leaving new ones in their place, on Tuesday about 3500. Thereafter the number gradually decreased, till in about four weeks more than 100 were seldom found, we having increased or decreased the numbers in the various places till we could accurately estimate the number distributed at each place. Some places distributing as many as 250 daily, while others were dropped entirely because the number did not warrant daily delivery.

The folder consisted of four pages, size 2 1/2 ins. x 5 3/4 ins., printed on the cheapest, rough finished white paper, costing about 5 cents per pound. The issue of June 18, reproduced herewith, gives a general idea of its character and aims.

On the first page is the day and date and "Where to Go To-night." Here is catalogued the attractions for that night.

Trolley riding is made prominent by being placed at the head of the list.

On page two is published the temperature. At first we published the weather forecast, but found that

But it's easy to start. You can go single or double, or with a crowd of your friends. Or if you belong to a club of any sort you can get the whole lot to go, or join a club, or organize a club. Any way, elub yourself into going. "It's good for what ails you."

On the third and fourth pages are "Where to Go To-morrow," and gives a complete list of amusements and places of interest. A suggestion for early morning trolley riding, or a before-breakfast visit to the park is placed first; also we suggest "going on a picnic," and tell where to go.

A few advertisements are run in the folder, but with the exception of the advertising on the second page all of them promote travel by pointing out either conveniences, bargain sales or places of entertainment for private gain. Advertisements of this kind are the only ones that it is advisable to insert, for the reason that when it is evident that the folder is run for profit it loses its force and influence with the public. The advertisements we saw fit to insert were charged for at the rate of 25 cents per line. The printing cost of the 10,000 folders were \$7.50 daily, and in the one reproduced shows twenty-one lines of advertisements, so more than two-thirds of the cost was saved to the company and the expense was slight, while the profits from increased travel, as nearly as we could judge as the direct result of the folder, was enormous.

TIME CARD No. 1, IN EFFECT MAY 16, 1902. Street Car Schedules

PUBLISHED BY "DEPARTMENT OF PUBLICITY," GEORGIA RAILWAY AND ELECTRIC CO., POST OFFICE BOX 750, ATLANTA, GA.

ROUTE 1.—Marietta and Decatur Sts.

Cars run on Decatur St. from corner Bradley and Decatur Sts. (Oakland Cemetery) to Broad and Marietta Sts., and on Marietta St. to Exposition Mills. (See Route No. 8 for Marietta St. service to Howell's.) Decatur Street Service.—First car from Broad and Marietta Sts. to Oakland at 4:30 a.m., second car at 4:50 a.m.; last car at 1:25 a.m. First car from Oakland at 4:40 a.m.; last car at 11:35 p.m. Service every 10 minutes between 5:30 a.m. and 8:40 p.m. Every 15 minutes after 8:40 p.m. till last car.

Route 1 and cars to Decatur, Ga., over Route 4 give average service to corner Grant St. every 7 1/2 minutes between 5:30 a.m. and 8:40 p.m. and every 10 minutes from 8:40 p.m. till last car. Marietta Street Service.—First car from Broad and Marietta Sts. to Exposition Mills at 4:20 a.m.; next cars at 4:50, 5:15 and 5:40 p.m.; last car at 12:00 night. First car from Exposition Mills at 4:35 a.m.; last car at 12:35 night. First car to Howell's 5:05 a.m.; last car 12:00 night. First car from Howell's at 5:15 a.m.; last car at 12:30 night. Service every 2 1/2 minutes between Broad St. and Jones Ave. between the hours of 5:15 a.m. and 9:05 a.m. in forenoon and 4:15 p.m. and 7:45 p.m. in afternoon. Service to Exposition Mills every 7 1/2 minutes between 5:12 a.m. and 8:25 p.m. and every 15 minutes between 8:25 p.m. and 11:35 p.m. Service to Howell's every 20 minutes from 5:05 a.m. to 8:25 p.m., with one later car leaving for Howell's at 12:00 night and returning leaving Howell's for city at 12:30 night.

ROUTE 2.—Boulevard, Jackson and Walker Sts., Ponce de Leon Springs to Westview Cemetery.

Cars starting at Broad and Marietta Sts. operate on Marietta to Peachtree and Edgewood Ave., Edgewood Ave. to Boulevard, Boulevard to Ponce de Leon Ave., Boulevard to St. Charles Ave. and Ponce de Leon Ave. to Ponce de Leon Springs. Both the Ponce de Leon Springs cars and the St. Charles Ave. cars return by way of Ponce de Leon Ave., Jackson St., Edgewood Ave. (OVER)

WEDNESDAY, JUNE 18TH.

DAILY AMUSEMENT PROGRAM AND STREET RAILWAY BULLETIN.

PUBLISHED BY "DEPARTMENT OF PUBLICITY," GEORGIA RAILWAY AND ELECTRIC CO., POST OFFICE BOX 750, ATLANTA, GA.

Managers and promoters of Entertainment, Public Meetings, Picnics, etc., where the attendance of the public is desired, are requested to send in advance information for publication in this daily folder, to P. O. Box 750.

WHERE TO GO TO-NIGHT.

- Trolley Ride—Over any of the suburban lines. Special private cars for trolley parties can be secured at 133 Edgewood Ave., Bell Telephone 106 Main. The Grand—8:30 p.m. The Bijou Musical Comedy Co. presents "My Friend From India" with new specialties. Lakewood—Music and dancing; fishing, boating, refreshments, ride and baseball targets. Cars every 10 minutes. East Lake—Frisco waltz, music and dancing; fishing, boating, fishing, refreshments; ride and baseball targets. Cars every 10 minutes, (15 minutes before and after the hour). Ponce de Leon Springs—Music and dancing, refreshments; fine spring water. River Park—Music and dancing; tarzanee and fish fry; pleasant, well lighted park. Cars every 20 minutes, (on the hour and half hour). Grant Park—Boating; cool, well lighted park. (Continued on Page Three).

STREET CAR REPORTEER.

"You needn't think," said the little motorman to the conductor's daughter, "that just because your father has a chair car you can join the Daughters of the American Revolution."

"And you needn't think," replied the daughter of the conductor, "because your father runs the car that he is the 'whole push.'"

A lady testifying in a damage suit against the street car company stated the cars would not stop for her at the corner upon which she stood. The counsel for the company said: "Your honor, I move the ladies testimony be stricken from the record and the case dismissed; she is biased—she stands on the wrong side." (Cars now stop for receiving and letting off passengers at the far crossings.)

"You needn't think," said one passenger to another, "that you are in the lime-light just because you have credit at a jeweler's." Kelley, 28 Whitehall St., sells for cash at about half what you pay—you're in your own light."

Highest temperature yesterday, 90; lowest last night, 72; 5 a.m. today, 72; 7 a.m., 75; 9 a.m., 81.



- Teat Meeting—Park Ave., entrance to Grant Park, Rev. Dr. J. C. Robinson, pastor of the Woodward Ave. Baptist church. Head Ball Tourney—Y. M. C. A.—Corner Pryor St. and Auburn Ave. A. P. M. Admission free. WHERE TO GO TOMORROW (THURSDAY): A Before Breakfast Trolley Ride is so healthy and will do you a world of good. Take a trip to Ponce de Leon Springs, Grant Park, Lakewood or over any of the suburban lines. After Your Ride—Have breakfast at Kampers' Lunch Room, 48 Whitehall St. Fishing—Chatahoochee River, Piedmont Park, Ponce de Leon, Lakewood or East Lake. Swimming—Natastadium, Ponce de Leon, Pearta Pond, (near Ponce de Leon) Lakewood or East Lake. Grant Park—Boating, 100, cylinders, order cylinders; Music by 5th Regiment Band 9 p.m. United States Barracks—Parade 20 A. M. Visitors' hours 8 a.m. to 9 p.m. Federal Prison—Visitors' hours, 9 to 12 A. M. and 1 to 4 P. M. LOOK OUT for the "RED SALE." See Friday's Journal. 'Twill be the biggest event of the season. All cars transfer to 'BASS'. Lakewood—Music and dancing, 4 to 8 P. M. and 8 to 11 P. M.; fishing, bathing, rifle and baseball practice; refreshments. East Lake—Fishing, boating, fishing, refreshments; rifle and baseball practice. River Park—Music and free dancing in afternoon and evening; tarzanee and fish fry. Piedmont Park—Fishing in Clara Mers, golf in afternoon. Ponce de Leon Springs—Fishing; bathing, cool, shaded park, fine spring water. (Continued on next page.)

- The Grand—The Bijou Musical Comedy Co. presents "My Friend From India" with new specialties, 8:30 P. M. Natatorium—10 Capital Ave. 8 A. M. to 8 P. M., week days; Sunday 9 A. M. to 6 P. M. Ladies' days, Tuesday and Friday, 10 to 12 A. M. Special parties in evening. Teat Meeting—Park avenue entrance to Grant Park, Rev. Dr. J. C. Robinson, pastor of the Woodward Avenue Baptist church. College Mail—Peschere and 137 S. S. 8:15 P. M., "Alice in Wonderland," dramatized; beautifully staged. Benefit of Hospital for incurables. Ga. School of Technology—Commencement exercises. Public Inspection of shops and shops work 8 to 10 A. M.; graduation exercises 10:30 A. M. Ice Cream Festival—100 to 6 P. M. and 8 to 10 P. M. given by the Council of Jewish Women in the vestry of the Temple, benefits of the church. Delicious refreshments served and a brilliant musical programme presented. Picnic—At Grant Park, River Park, Lakewood, East Lake or Ponce de Leon Springs. All orderly and well polished. Special private cars if desired. Picnic Quarters are easily gotten up at FAIRMINGERS' 324 Peachtree St. SPECIAL CARS Can be secured at 133 Edgewood Ave., Bell Telephone Main 106, for Trolley Parties, Picnics or Sight-seeing around Atlanta. Charges very moderate. Want to Buy a Home? If so, write the "Department of Publicity" for list of properties taken from owner's real estate register. P. O. Box 765. Want to buy a lot to build on? Many attractive lots on easy terms. Address P. O. Box 750.

PAGE FROM TIME TABLE

SAMPLE PAGES FROM THE DAILY ADVERTISING FOLDER OF THE ATLANTA COMPANY

many people besides the weather man took it seriously, and when rain was predicted stayed at home. We retained the temperature record because we found that it alone interested hundreds of people and we wanted to interest all.

The balance of the matter on page two is the life of the whole folder. These little articles, of about sixty words, always told a story either humorous or interesting, and were the means of impressing facts very beneficial to the railway management to have the public know. In fact, it is wonderful what a vast amount of influence favorable to the company these little stories can be made to yield. The following selected articles, taken from the issues, will tell the story better than I can explain:

The management is trying hard to keep passengers from riding on the bumpers, steps and other places of danger on the cars. Finds it difficult but intends to keep at it. This fact reminds me of a satirical article that appeared recently in "Everything," which said: "A father who has not sued a railway company, at least once in his life, ought to be ashamed to look his child in the face."

Let no man lose sight of the fact that while this is summer time, hot time, and outing time it is also "trolley time."

Do you ride of evenings? If you don't you ought to. Also, if you don't you are out of fashion.

If you would see just how out of fashion you are you might observe the passing cars, particularly of the suburban lines. You'll probably find that every passing car has anywhere from a dozen to twenty "trolley-riders" on it; further, that certain cars are engaged by jolly parties for their sole use and that they're serving refreshments en route, and that it isn't the easiest thing in the world for you to "break in."

On the last page was printed information relative to temporary or permanent change of schedule, extension notices and company notices of a public nature; also suggestions to passengers as follows:

Do NOT try to get on or off a car while it is moving. Wait until ear stops.

ALWAYS face the front when getting off car—most ladies face the other way.

CARS now stop for receiving and letting off passengers at the far crossings.

ALWAYS enter and leave cars by rear platform.

SMOKING is allowed on the four rear seats (two on each side) of closed ears and on two rear benches of open ears.

THE THIRD SEAT from the rear is reserved for colored people.

WHEN A TRANSFER is desired ask the conductor for it at time of paying fare.

ALWAYS signal conductor in plenty of time before reaching your destination—it saves carrying you by.

THE COMPANY desires its men to be polite, courteous, and attentive to passengers. The general manager requests that ear men not observing this rule be reported to him.

On page four is also printed two little notices relative to list of vacant lots and properties for sale along the railway lines.

These notices are suggestive of the vast results possible from a live "Publicity Department." Lists of properties for sale, vacant lots on which owners are willing to build houses and sell on the installment plan; acreage suitable for sub-division, etc., are easily obtained from the owners or real estate dealers, and are catalogued in a manner for easy reference.

STANDARD RULES FOR EMPLOYEES IN NEW YORK

In the STREET RAILWAY JOURNAL for Sept. 27, 1902, a preliminary draft of a set of rules proposed for adoption by the New York Street Railway Association was published. This set of rules has been revised by the committee in charge, viz., E. G. Connette, Edgar S. Fassett, T. E. Mitten, J. P. E. Clark and Oren Root, Jr., and has now been adopted by the executive committee of the association.

The rules, which are published below, are being forwarded to members of the association, accompanied by a letter of transmittal as follows:

THE STREET RAILWAY ASSOCIATION OF THE STATE OF NEW YORK
NEW YORK, May 9, 1903.

Dear Sir—A standard code of rules for the operation of steam railroads was for many years the subject of consultation and discussion by prominent officers of such companies, and their efforts resulted in the adoption of a code which has been accepted as a standard by all of the important steam railroads of the United States. The executive committee of the Street Railway Association of the State of New York, appreciating the success of the steam railroad code, at the earnest solicitation of the Railroad Commissioners of the State of New York, has for several years last past caused the appointment of a committee of operating surface railroad men, to discuss and formulate a proposed form of code. Their efforts have been reported to the association at its annual meetings from year to year.

The last report of the members of the committee, Messrs. E. G. Connette, T. E. Mitten, Edgar S. Fassett, J. P. E. Clarks and Oren Root, Jr., has been found by the executive committee to be eminently satisfactory; was adopted by resolution of the executive committee, and the rules were declared to be the standards for the operation of the roads of the members of the association.

Since the adoption of that resolution on Dec. 19, 1902, the report has been in the hands of the Railroad Commissioners, and was but lately returned with an expression of opinion by the board that it saw no objection to the rules as printed. Accompanying the Commissioners' letter is a copy of the report of the electrical expert, to the effect that the rules are not, however, all that are required for the safe operation of the interurban and suburban railroads. The committee appreciates the force of the criticism thus made, but considers the situation one which should be taken care of by special rules formulated in localities of such interurban and suburban operation, and should not be included within the strict scope of the standard rules. It has been the opinion of members of the executive committee that the specified numbers should be retained for the standard rules, with such local rule as might be adopted should be distinguished by a letter attached to such number; to wit, I-a, I-b, I-c, &c.

The committee unhesitatingly advise the promulgation and speedy adoption of the standard rules or such practical local rule in substitution of a standard rule in case the standard rule may be found impracticable.

The committee trusts that the substitution of a local rule will only be made when the conditions are imperative, and then with a view of maintaining the integrity of the standard rules as a body.

Enclosed are copies for your use. By order of the committee,
HENRY A. ROBINSON, Secretary.

RULES

All employees whose duties are prescribed by these rules will be furnished with a copy, for which they will sign receipt, and will be required to have the same in their possession at all times while on duty.

GENERAL RULES

1. Knowledge of Rules.—Conductors and motormen are required to be familiar with the rules, and with every special order issued. The bulletin board must be examined daily for special orders. Employment by the company binds the employee to comply with its rules and regulations, and ignorance thereof will not be accepted as an excuse for negligence or omission of duty. If in doubt as to the exact meaning of any rule or special order, application must be made to the proper authority for information and instruction.

2. Report for Duty.—Regular conductors and motormen must report for duty ten minutes before leaving time for their first trip, or, if for any good reason unable to so report, must give notice at least ten minutes before such leaving time.

Extra men must report at such time as ordered, or must give notice at least ten minutes before such time. They must not absent themselves after answering roll-call without permission.

3. Personal Appearance.—Conductors and motormen must report for duty clothed in full regulation uniform, and must be clean and neat in appearance.

4. Politeness.—Conductors and motormen must treat all passengers with politeness; avoid difficulty, and exercise patience, forbearance, and self-control, under all conditions. They must not make threatening gestures or use loud, uncivil, indecent, or profane language, even under the greatest provocation.

5. Habits and Personal Conduct.—The following acts are prohibited:

(a) Drinking intoxicating liquors of any kind while on duty.
(b) Entering any place where the same is sold as a beverage while in uniform or while on duty, except in a case of necessity.
(c) Constant frequenting of drinking places.
(d) Carrying any intoxicating drink about the person while on duty.

(e) Carrying intoxicating drink on the company's premises at any time.

(f) Indulging to excess in intoxicating liquors at any time.
(g) Gambling in any form, including the laying of bets (and playing raffles) while upon the premises of the company.

(h) Smoking tobacco while on duty.
(i) Smoking tobacco while off duty in any part of the company's building, except in the conductors' or motormen's room.

6. Riding on Front Platform.—The general officers, superintendents and inspectors will, when occasion demands, occupy position on front platform. No other persons are allowed to ride on the front platform of car with motorman, excepting employees put on by inspector or his representative for the purpose of receiving instructions in operation.

7. Talking to Motorman.—Motormen while operating cars are permitted to answer questions of superior officers, and to give proper instructions to students only. All other conversation with motormen while car is in motion is forbidden.

8. Run on Time.—Cars must never be run ahead of schedule time, but must pass time points and leave terminals promptly on time, unless unavoidably delayed.

9. Railroad Crossings.—Cars must be brought to a full stop, at a safe distance, approaching steam railroad crossings at grade, and motormen must not proceed until conductor has gone ahead to the center of crossing, looked both ways, and given the "Come ahead" signal. Before starting, the motorman will look back to see that no passengers are getting on or off; and in no case proceed, even after conductor's signal, until he has also examined the crossing and satisfied himself that steam cars are not approaching.

When there is more than one track the conductor must remain in advance of the car until the last track is reached.

Where crossing is protected by derail, interlocking plant or flagman (employed by the company), this rule does not apply, special instructions being issued to govern.

10. Starting Cars after Blockade.—In the event of a blockade of cars from any cause, all cars in such blockade must not be started at one time, but only singly and at such intervals as will not burden the feeder line.

11. Reporting Defects.—Conductors and motormen will report to foreman or inspector any defect in car, track, or wire which needs immediate attention, and make written report of same to superintendent at end of run.

12. Hearing by Superintendent.—A hearing will be given by the superintendent of every employee who desires to complain. Reports or suggestions for the betterment of the service will always receive consideration.

RULES FOR CONDUCTORS

13. Be on Rear Platform.—Remain on rear platform when not collecting fares, keeping a lookout for persons desiring to board car.

Keep careful watch of passengers to observe requests to stop car. Passengers requesting to be let off at a point ahead should be requested to signal conductor when the desired street is announced.

When stops are made at principal streets, places of amusement, churches, or at any point where a considerable number of passengers enter or leave the car, conductors must be on rear platform until such point is passed.

14. Announcements.—Announce distinctly the names of streets, public places and transfer points when approaching the same.

15. Removing Trolley.—Do not remove trolley from wire at end of run, or elsewhere at night, until passengers have alighted from car.

16. Route Signs.—See that route signs are properly displayed on each half trip.

17. Carrying Packages.—Passengers must not be allowed to carry bulky or dangerous packages aboard cars.

Do not in any way take possession of, or assume responsibility

for any package which a passenger may bring upon a car, excepting such articles as are to be turned into the lost article department.

18. **Watching the Trolley.**—Keep your hand upon the trolley rope when passing over switches, crossings, or going around curves. Should the trolley leave the wire, the conductor must at once pull down the trolley and signal the motorman to stop. After the car has stopped replace the trolley on the wire, look around and through the car to see if any persons are boarding or leaving same; ring two bells for the motorman to start. See that passengers keep their hands off the trolley rope.

19. **Keeping Gates Closed.**—Front and rear gates on closed cars on the side between the tracks must always be kept closed and securely fastened (when running on the road). On open cars the guard chains and guard rails must be kept fastened on the side between the tracks. When gates or chains or their fastenings are broken or out of order, prompt report must be made to foreman, inspector or starter.

20. **Housing Cars.**—When car is run in the house, either day or night, always shut off lights, remove trolley from the wire and turn to position ready for leaving, and turn up longitudinal seats of closed cars.

21. **Moving Forward.**—On closed cars, when standing passengers crowd the rear door, request them to "PLEASE STEP FORWARD IN CAR."

22. **Seating Passengers.**—Standing passengers should be directed to vacant seats; and an effort made to provide them with seats where possible.

23. **Assisting Passengers.**—Elderly and feeble persons, and women and children, should be given assistance getting on and off car, when possible.

24. **Dogs in Cars.**—No dogs should be allowed on a car except such small dogs as can be carried in the laps of passengers.

RULES FOR MOTORMEN

25. **Stopping for Passengers.**—Keep a careful lookout on both sides of the street and bring the car to a full stop for every person who signals, except that when a car has considerable headway, is overcrowded, and another car with more room follows within the same block (or 200 feet), passengers should be requested to take the following car.

Cars will stop on signal only at farther corners; at car stations; transfer points, and at points as provided in special orders.

Do not stop cars so as to block cross streets or crosswalks.

26. **Churches and Hospitals.**—When passing a church during the hours of service, and, at all times, when passing a hospital, do not use the current and do not ring the gong, unless necessary.

27. **Reversing Car.**—Never use the reversing lever to stop car except to avoid a collision or injuring a person or animal, or when the brake rigging is disabled.

Do not reverse the power when brake is set, but release the brake and reverse the power simultaneously, and, when the reverse lever is thrown to position, apply the current one point at a time, otherwise the fuse will melt or the breaker will release. Sand should be used when making an emergency stop.

28. **Passing Cars.**—Never run against a switch point when meeting a car, but slacken speed sufficiently to allow the car moving in opposite direction to pass before striking switch point.

This rule refers particularly to all crossovers and curves having switch points facing opposite to the direction in which car is moving.

29. **Leaving Car.**—Never leave platform of car without taking controller handle, throwing off the overhead switch and applying brake. Be careful to see that the hands point to the "off" mark before taking off controller handle.

30. **Economical Use of Current.**—In order to effect an economical use of the electric current, it is necessary that the continuous movements of starting and increasing speed should be made gradually.

In starting a car let it run until the maximum speed of each notch has been attained before moving handle to the next notch.

Do not apply brakes when the current is on.

Do not apply current when brakes are applied.

Do not allow the current to remain on when car is going down grade, or when passing over section breakers. Endeavor to run car with the least amount of current, allowing the car to drift without the use of the current when it can be done without falling behind time.

A great amount of power can be saved by using judgment and discretion in approaching stopping-places and switches by shutting off the power so as to allow the car to drift to the stopping-place or switch without a too vigorous use of the brake.

31. **Throwing Overhead Switch.**—An overhead switch must never be thrown until power is turned entirely off, except in case controller cylinder fails to turn when power is on. It must be thrown by hand only.

32. **Power Off Line.**—When the power leaves the line the controller must be shut off and the overhead switch thrown, the light switch turned on, and the car started only when the lamps burn brightly.

33. **Release Brakes Before Stop.**—When brakes are set to make a stop they should always be released, or nearly so, just before the car comes to a standstill.

34. **Water on Track.**—When there is water on the track run car very slowly, drifting without use of power whenever possible, otherwise there is danger of burning out the motors.

35. **Sanded Rails.**—Never run on freshly sanded rails with brakes full on, except to prevent an accident, as the wheels are liable to be flattened when this is done. On cars provided with sand boxes, in case of slippery rail, always sand the track for a short distance before applying the brakes.

36. **"Spinning" of Wheels.**—Care must be taken, particularly during snow storms, to avoid "Spinning" of the wheels with no forward or backward movement of the car.

37. **Don't Slide Wheels.**—On a slippery rail do not allow wheels to slide; as soon as the wheels commence to slide the brake must be released and reset.

38. **Don't Oil Car.**—Do not oil or grease any part of a car.

SIGNALS AND THEIR APPLICATION

The following code of bell signals will be used in the operation of cars.

39. **Bell Signals.**—From conductor to motorman, to be given on motorman's signal bell:

1 Bell—"Stop at next crossing or station."

2 Bells—"Go ahead."

3 Bells—"Stop immediately."

4 Bells—Given when car is standing—"Back car slowly."

From motorman to conductor, to be given on conductor's signal bell:

1 Bell—"Come ahead."

2 Bells—"Watch the trolley and danger signal to the conductor."

3 Bells—"Set rear brake."

4 Bells—Signal to conductor that motorman desires to back the car.

5 Bells—Warning—"Pull trolley down to roof."

Whenever a car in service is stopped, the motorman will, as soon as he is ready to go forward, give two taps of the gong; after which, if the conductor is ready to proceed, he will give the regular "Go ahead" signal—two bells.

The motorman will answer the signal to stop from conductor by one loud tap of gong; and two loud taps of gong after receiving the signal to go ahead. If unable to proceed immediately upon receipt of signal, motorman will wait for another "Go ahead" signal before starting the car.

When the car is standing, and motorman desires to back, for any reason, he will give the conductor four bells, but must not move the car until the conductor has answered with four bells to signify—"All is clear behind."

40. **Danger Signals.**—Red lights or flags indicate danger, and when they are placed alongside the track cars must be run slowly and with caution. When placed on the track, cars must come to a full stop until such signal is removed.

41. **Signals Before Passing Obstructions Near Track.**—Before passing any vehicle or obstruction close to the track, where passengers or conductor are liable to be injured while standing on the step of an open car, motorman must give two taps of signal bell as warning, reduce speed, and assure himself that all is clear before proceeding.

42. **Starting.**—Motorman must never move car (whether stopped on signal or any other reason) without signal from conductor, and then only when assured that no one is getting on or off front platform.

Conductor must never give signal to start when passengers are getting on or off.

Conductor must never give signal to back a car unless he is on rear platform and knows track is clear behind the car.

PRECAUTIONARY RULES—ACCIDENTS

43. **Safety.**—The safety of passengers is the first consideration. All employees are required to exercise constant care to prevent injury to persons or property, and in all cases of doubt take the safe side.

44. **Persons Between Cars.**—Cars moving in opposite directions must not pass at points where persons are standing between the tracks, but must be operated so as not to occupy both tracks at such points simultaneously.

45. **Patrols.**—When any police, fire department vehicle, or company patrol, is observed approaching (from any direction), cars must be stopped until such vehicle has passed.

46. **Ambulances.**—Ambulances must be allowed right of way.

and when approaching or passing, cars must be kept under control to avoid collision.

47. Warning to Passengers.—Conductors and motormen must (in a polite way) endeavor to keep people from jumping on and off the cars while in motion.

If such people attempt to get on or off the car while it is in motion, notify them politely to wait until the car stops. If passengers are leaving car while another car is approaching from the opposite direction, notify them politely to look out for car on other track.

48. Standing on Steps.—Do not permit any one to stand on the steps or buffers, and never, under any circumstances, permit a woman or child to ride on the steps. They should be fully inside of the car before the signal is given to start.

49. Leaving Car.—When necessary for conductor to leave his car he must notify the motorman to protect passengers and car. Should passengers board car during absence of conductor, motorman will notify conductor of the number and location of such passengers upon his return.

Cars in commission must not be left unprotected; either conductor or motorman always remaining in charge.

50. Exercise Care.—Motormen are cautioned to exercise great care when a vehicle is passing alongside of track ahead of car. Ring the gong vigorously to attract the attention of the person driving, as a warning not to pull in ahead of car; and run cautiously until the vehicle is passed in safety.

51. Passing Cars.—When passing standing cars gong must be rung and car brought to slow speed.

52. Render Assistance.—In case of accident, however slight, to persons or property, in connection with or near any car, the motorman and conductor in charge of the same will render all assistance necessary and practicable. In no case will they leave injured persons without first having seen that they are cared for.

53. Medical Attendance.—Motormen or conductors are directed not to employ medical attendance to injured persons, except for the first visit, in cases of personal injury; nor will they visit such persons at any other time afterward, unless specially instructed so to do by an officer of the company.

54. Fatal Accidents.—In the event of a fatal accident, it will not be necessary to blockade the line awaiting the arrival of the coroner or any other official. If any accident occurs where it is impossible to carry the body to a place of shelter and security, motorman and conductor will put the body on the car and convey it to some suitable place.

55. Reports to be Full and Complete.—A full and complete report of every accident, no matter how trivial, and whether occurring on or near the car, must be made by the conductor. Accidents sometimes considered as not worth reporting are often the most serious, troublesome and expensive.

The conductor will obtain the name and residence in full of all witnesses on or near the car. The motorman will assist the conductor in securing names of witnesses whenever practicable, and he will be held responsible for any neglect to render assistance.

In all cases full facts must be obtained and stated in the reports as follows:

The date, exact time, exact place, run and car number, and the direction in which the car was moving, the nature of the accident or collision, and the cause of its occurrence.

The full name and address of the party injured or whose vehicle was in collision (giving the name of both the driver and the owner of the vehicle).

Ascertain the extent of injuries or damage, if any, before leaving the spot.

In case there has been an accident on the car, and the conductors change ahead, the conductor taking car on which the accident happened must secure the name of witnesses as above.

In case a person is struck by a car after passing around the rear of a standing car, the numbers of both cars must be obtained. If an accident is caused by any defect or damaged condition of car, conductor must report the same and its cause.

Accidents to employees will be reported the same as accidents to passengers. Any trouble or disturbance of a boisterous or quarrelsome character which occurs on a car, or the ejection of a person from a car, will be reported as an accident.

57. Report Accidents to Inspectors.—Conductors and motormen will make a verbal report to the first inspector or official of the company they meet of any accident, blockade or mishap of any kind.

57. Give Information to Proper Persons.—No employee shall, under any circumstances, give any information whatever concerning any accident, delay, blockade or mishap of any kind to any person except to a properly authorized representative of the company.

58. Telephone Information.—In case of a serious blockade,

where assistance is required to get cars moving, conductor of car first in block must, in absence of any inspector or official, telephone at once to nearest depot and give notice and particulars of detention. Expense of telephone message will be refunded upon application at office.

59. Responsibility for Damages.—Employees will be held strictly accountable for any damages caused by their neglect or carelessness or by disobedience of rules.

60. Disabled Cars.—The motorman or conductor of any disabled car, withdrawn from the track, must remain with the car until relieved by proper authority or until car reaches depot.

EJECTIONS

61. Ejections.—No passenger shall be forcibly ejected from a car for any cause whatsoever without order of an inspector, starter or official of the company, unless the conduct of the passenger is dangerous or grossly offensive. In such case the ejection must be made by the conductor with the assistance of the motorman after the car has been brought to a stop, using "Only such force as is sufficient to expel the offending passenger with a reasonable regard for his personal safety."

62. Refusing to Pay Fares—Transfers.—When a passenger refuses to pay fare or presents a defective transfer, or ticket, upon which, in the judgment of the conductor, the passenger is not entitled to ride, the conductor must secure the names of as many witnesses to the facts as is possible, whereupon the car must be stopped and the passenger requested to leave. If the passenger fails to comply with such request, the facts of the case must be brought to the attention of the first inspector, starter, or official of the company, who is met, and the conductor must act according to instructions received from such inspector, starter or official. In all cases the passenger must be given the benefit of any doubt.

When a passenger who refuses to pay fare requests to be allowed to leave the car, the car must be stopped and the person permitted to alight.

63. Intoxication.—No passenger will be ejected from a car for mere intoxication, unless said passenger becomes dangerous or offensive; such passenger must be then ejected with great care and must be guided until free from probable injury.

64. Stealing Rides.—Any person caught stealing a ride on a car must never be pushed therefrom while it is in motion.

65. Spitting on Floor.—No passenger will be ejected from a car for spitting on the floor. If a passenger violates the rule of law prohibiting spitting, the conductor will call the attention of the passenger to the law prohibiting such conduct, and endeavor to persuade passenger to desist.

66. Get Witnesses.—In case of ejection, always get names of witnesses, and make report showing all the circumstances, the same as in case of accident.

67. Where to Eject.—Any person ejected from a car must be put off at a regular stopping place.

No passenger will be put off at a point where likely to be exposed to danger.

Particular attention must be paid to this rule during bad and inclement weather, late at night, or when a passenger is intoxicated.

FARES AND TRANSFERS

68. Collection of Fare.—As soon as a passenger is seated, conductor must collect fare. When more than one passenger or party enters at a time the fares must be rung up on the register in the presence of the party who paid it, before any more fares are collected. Conductor must ring each fare from the place where he collects it. Thus, a fare paid inside of car must be rung up from the inside, or from the platform, if collected thereon.

69. Change.—When necessary to give change, conductors must first register fare, and immediately thereafter give change.

70. Register Rings.—Conductors must be careful to see that register rings each fare and that dial shows it.

71. Register out of Order.—In case the register gets out of order the conductor must stop using it, make memorandum of fares on back of trip report, and report the fact to the first inspector, or starter, met on the road, and subsequently report to superintendent.

72. Transfers in Blockades.—In case any line is blocked, it is the desire of the company to carry passengers to their destination on other lines. Under such circumstances conductors of parallel or intersecting lines will accept transfer tickets accordingly and will issue a transfer on a transfer if necessary. They will also accept transfer passengers without tickets on orders from any inspector or authorized representative of the company, making report of same on back of trip report.

73. Transfer Point Meetings.—Motormen and conductors will be held equally responsible for leaving a transfer point so quickly as to prevent the transfer of passengers from an approaching car on a connecting line.

FREIGHT BUSINESS ON ELECTRIC RAILWAYS

BY J. D. HAWKS

For the purpose of this discussion it is advisable to dismiss from consideration electrified steam roads as having no bearing, and also to eliminate electric roads running through a country not already supplied with steam road facilities. Such roads will be built, but the fact that steam road facilities are not already supplied is an indication that the country is sparsely settled, and that it is not attractive to the steam roads, and, moreover, that it has too few inhabitants to furnish enough passengers to make a first-class electric railroad profitable.

This narrows the problem down to the consideration of the class which includes the majority of electric railroads which have been built, practically in competition to steam roads between populous cities and villages, and through thickly-settled country. It is true that many of these roads carry what is called freight, but this is a misnomer, as they carry what should more properly be classified as express matter or package freight. There is not enough of this high-class freight to congest the electric road, which enjoys the same advantages in handling it as it has in passenger traffic, namely, quick delivery. The usual practice is to adopt the same classification as the steam railroad, down to and including fifth class, with some special commodity rates, and to charge about the same rate as the steam road. I have in mind an instance where a steam road became disgusted and cut the rate in two, because the electric road took the package business. This was done expecting that the electric would cut its rate and continue to get the business, but at a reduction of one-half of its gross earnings, a very neighborly performance. There was a slight loss of business on the electric road for perhaps a week, and after that, although no reduction was made, there was a steady increase, because the shippers understood that the steam road was endeavoring to drive the electric road out of the freight business, and, this accomplished, it would then put up its rates to the old figure, with all of the old disadvantages.

The commanding advantage which suburban electric roads have constitutes the fact that their main business is done on city roads, with no expense to them for terminals. The general practice is to turn the suburban cars over to the city company within the corporate limits, the suburban company getting compensation by taking all the city fares in some cases and a percentage of the city fares in others. A new condition confronts them as soon as they depart from their original purpose, for the moment electric roads undertake to haul cheap freight they will have to provide terminals. This would be practically an impossibility in the larger cities. The experience of hundreds of smaller roads has been that it is better to be absorbed by the larger road than to undertake the enormous expense of providing terminals. If there were only a few freight cars a day to move there is still the initial expense of providing a freight locomotive to move them and a power house to furnish current, that would be out of all proportion to the revenue, and on the other hand if many cars are to be moved the electric road must become a competitor and take freight away from the steam road.

The situation in the passenger department is entirely different. Electric roads carry an immense number of passengers, only a small proportion of which are taken from the steam road, as the great bulk of this travel originates by reason of the frequency of trains and cheap service on the electric road. While passenger travel can be increased immensely, freight movement practically cannot be increased at all. It would be impossible to go into the market to-day and get money to build steam roads paralleling existing lines; then why should it be any easier to get money to build electric lines paralleling steam roads if it is known that the electric roads are expected to get the freight away from the steam roads.

There is also a grave question as to whether electricity is a cheaper motive power for hauling freight than a steam locomotive, and it certainly has not been proved so far. It is no advantage for an electric road to have level grades, or rather no disadvantage to build electric roads over the surface of a country which is undulating. Electric machinery lasts much longer when it is given a rest by coasting down grade, and a much steeper up-grade could be surmounted than on a steam road, because of the probability that there will only be one car out of many on the up-grade at once, and the demand on the power house, consequently, is only slightly increased by reason of the steep grade, whereas on a steam road every locomotive has to be rated according to the ruling grade.

Many electric railroad men cannot bear to see steam roads doing any business, either in passenger or freight. One of these was superintendent of one of the electric roads in Michigan, and he insisted upon cutting passenger rates from \$1.20 for a certain round-trip to 50 cents, because the steam road made the 50-cent rate. He was quieted by being told that a 50-cent rate would not be made until he could show that all the passengers the steam road carried, plus his own passengers, at a 50-cent rate between the two points under discussion, would bring in more gross revenue than his own passengers alone at the \$1.20 rate, and this he was not able to do. Another case was where the electric road had a 2-mile 'bus transfer to reach the center of the city by reason of delay in the building of a draw-bridge, and notwithstanding this 'bus transfer, and a one-way fare of 55 cents, as against the steam-road fare of 50 cents, carried many more passengers than the steam road. These instances show the advantages of quick and frequent service. Instances are not wanting to prove that passengers on electric roads are willing to pay the same fare that steam roads charge, the best evidence being that steam roads have reduced their fares in an unsuccessful effort to compete with the electric roads. The fact is, other things being equal, passengers prefer electric roads, and this preference is shown many times where other things are not equal. No one ever heard of a person asking visitors to take a ride on a steam road for fun, but thousands of dollars are spent every year by people riding on electric roads for pleasure. But these advantages of an electric road in passenger transportation do not extend to hauling low-class freight, and besides there are specific arguments against the latter business. The very life of an electric road depends on the cars going through the busy parts of the cities and villages on its line, and it is almost the universal custom for the Councils in cities and villages to insist on a girder tram rail or a girder groove rail where streets are paved. This makes the adoption of a special wheel necessary, and suburban roads are driven to use a small flange and a narrow tread. It was only by working a small flange that was on a wheel, and finding it much safer than the large flange half worn, that the electric roads could persuade themselves that the small flange was the proper thing for high-speed suburban cars. Most of the suburban roads are laid with T-rail outside of the cities, but there would be very little freight to be hauled between the outskirts of one city and the outskirts of the next one.

While it is believed that the package freight has gone to the electric road to stay, it can be readily seen that if there was enough of it to produce congestion the great advantage of quick handling might be lost. It will be many years before the well-located suburban roads can work up the legitimate passenger business that is in sight. Most of them have so far been contented with such business as comes to them, but by proper effort this business can be increased many fold, especially in the summer time. It will require, however, undivided attention to the needs of the people and attractions in the way of parks and resorts. The quicker the suburban roads quit talking about hauling low-class freight the better for them.

GUARANTEE OF PRINCIPAL

BUFFALO, N. Y. May 15, 1903.

EDITORS STREET RAILWAY JOURNAL:

Will you let me know whether any of the New York trust companies have a practice of guaranteeing the bond issue of railway and other securities on the plan of companies which go surety for individuals.

JOHN M. TOMPKINS.

Various plans have been devised to improve the marketability of securities, but the particular plan you inquire about, while unquestionably honest and theoretically safe, is not considered by most Eastern financiers and bankers as being wise or desirable. It is a practice, however, which has been followed to some extent in mining undertakings, where, on account of the greater difficulty of investors judging as to the future earnings of the property, there is more reason for a plan of this kind. The method is for the trust company to guarantee either the interest on a bond or stock issue for a period of years or guarantee the payment of the principal at a definite time. It does not investigate the proposition at all, as the charge is such a proportion of the total amount as will produce the required guarantee. For example, if it is proposed to guarantee interest on bonds or dividends on stock for a period of ten years the trust company requires the deposit of such a sum as will equal the ten payments less the interest earned by the money paid for the averaged time it is in the control of the guaranteeing corporation, plus a profit for doing the business. On exactly the same lines the principal of a bond or mortgage is guaranteed. For example, a mortgage of \$100,000, due in twenty years, will be guaranteed for a cash payment of slightly less than \$50,000. The theory of this class of transaction is that a bond of \$100,000 can be sold for \$100,000 when it has this company's guarantee, and then the corporation or individual making the mortgage will receive approximately half the cash and the guaranteeing corporation the other half. There is no question but that guarantees of this description when worked out on the basis of compound interest or compound discount are safe, honest and right, and just as proper as endowment insurance or specific endowment. The weakness in the business proposition, however, is that the actual borrower of the money receives but 50 per cent of the amount of his indebtedness, and if his proposition is good or the security underlying the mortgage sufficient he should either be able to obtain the full amount of his loan or conversely create an indebtedness of only the amount of cash received.

This particular proposition has been frequently suggested, and we know of some instances where it has worked out to the advantage of all parties concerned. For example, a promoter of a mining company, who recently came to New York, desired to have the dividends which he promised on stock which he is selling guaranteed by a large trust company, and he offered to deposit sufficient cash with them which, at the averaged rate of interest, would equal the total payments to be made by the trust company. It was desired to guarantee payments of 5 per cent per annum on \$100,000 par value stock for twenty years. This would make total payments of \$100,000. The question then arose as to the amount of interest the trust company would be willing to guarantee that the money on deposit with it would earn. On a basis of 2 per cent per annum, deducting \$5,000 dividends paid each year, the amount to be paid to the trust company would be \$81,757. On a 2½ per cent basis, \$77,946; on a 3 per cent basis, \$74,387, and on a 4 per cent basis, \$67,991.

These are the exact figures as worked out jointly by the secretary of one of the large trust companies in New York city and the statistician of one of the three largest insurance companies in the world. The executive committee of the trust company finally decided that the company could not, with safety, guar-

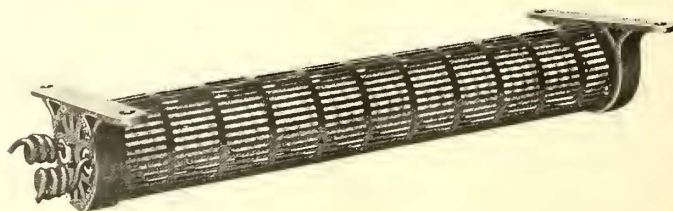
antee more than 2 per cent interest for the entire period of twenty years. It will be noted that this proposition has nothing to do as far as the trust company is concerned with the merit or value of the security guarantee, but depends exclusively upon the interest-earning power of invested funds.

Another form of indirect financing which has been attempted, and in some cases been carried to a more or less satisfactory conclusion, is what is known as the insurance or endowment guarantee. In this case five gentlemen desired to build a railroad in a Western State; they went to one of the smaller insurance companies and each purchased endowment life insurance to the amount of \$100,000. They then took the five policies and used them as collateral to their notes in friendly banks, and with the money thus secured began the construction of the railroad. After a portion of the railroad was completed and in operation they issued bonds thereon, and with the proceeds resulting from the sale of these bonds completed the railroad. At this point they again issued bonds on the last extension, and with the proceeds paid off the loans in bank. The net result of the operation in this particular instance was that they received about sufficient money from the sale of the bonds to pay for the construction of the railroad, and had the stock therein and their life insurance at a profit.

Unquestionably such methods are extremely expensive and should only be resorted to when it is impossible to finance a given proposition directly. This brings up the question of merit or value, and it must not be forgotten that value depends upon certain continuous earning power. A steam railroad which has demonstrated its capacity to pay all of its operating expenses, taxes, renewals and depreciations and still have \$5,000 or \$6,000 surplus in poor years, is worth on the New York market to-day \$100,000. In the same way an electric railway proposition, which has demonstrated an earning capacity of \$6,000 or \$7,000 after providing for working expenses, taxes and proper renewals, is worth on the New York market an equal sum. Industrial enterprises or manufacturing propositions must show, as a rule, from 10 per cent to 20 per cent, depending in each case upon the nature and permanency of the business.

NEW TYPE OF HEATERS FOR PHILADELPHIA

The Philadelphia Rapid Transit Company has just placed an order with the Consolidated Car Heating Company, of Albany, for electric heaters for 515 cross-seat cars. The heater adopted is of a new type just brought out by the Consolidated Company and illustrated herewith. It is longer and narrower than the heater usually built for cross-seat cars and is intended to be operated at comparatively low temperatures, so that there is



ELECTRIC HEATER FOR PHILADELPHIA

no overheating of the seats. The casing has a length of 20¼ ins. and a diameter of 3¼ ins. Another feature of the heater is that both lead wires of the heater, as shown in the engraving, are brought out at one end and are then carried in mouldings along the side of the car. The order was secured by C. S. Hawley, the company's general Eastern agent in New York, who has closed contracts with the Interborough Rapid Transit Company and the Manhattan Elevated Railway Company during the last two months for over 15,000 electric heaters.

NEW OPEN CARS FOR BROOKLYN ELEVATED RAILWAY SYSTEM

The John Stephenson Company has begun making weekly shipments in lots of twenty on the order of 120 new open

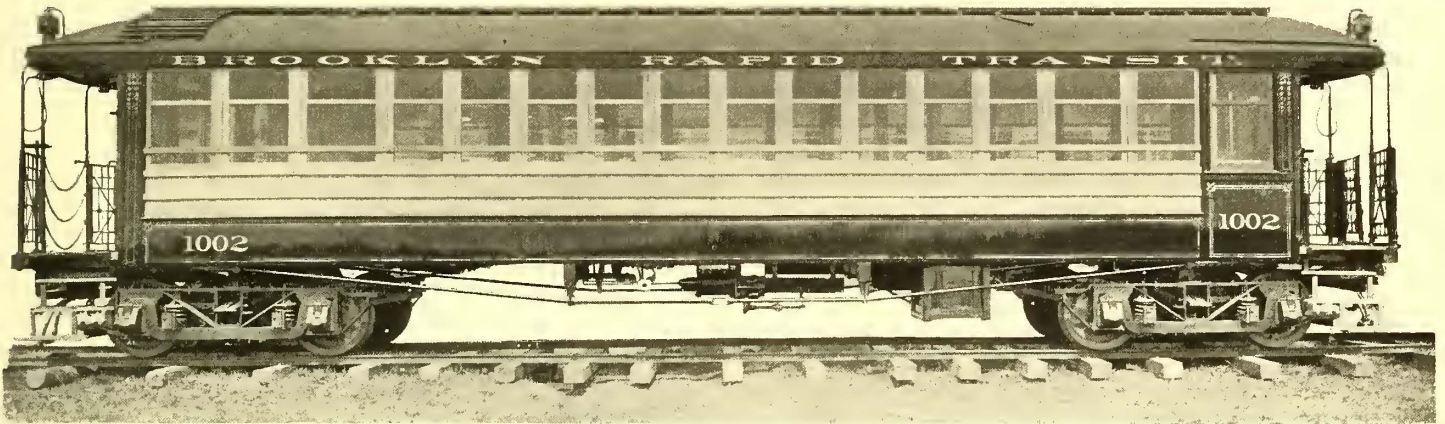
annealed copper, soldered together at the feet. The manufacturer says that this form gives the most enduring flexibility, and that no breakage can result from expansion and contraction. The bond is not concealed, and is, therefore, always in sight for inspection. It may be attached to the bottom of the



AN IMPOSING SHIPMENT OF CARS FOR BROOKLYN

cars for the Brooklyn Rapid Transit Company for the elevated lines. The accompanying cut shows twenty of these cars, making a train about 1000 ft. long, exclusive of the two loco-

motives, where joints are suspended. Where patent rail joints are used two bonds may be attached, connecting the plate to the rails. In old construction, where there are angle or splice-bars,



NEW CAR FOR BROOKLYN

motives. These cars were shipped to Brooklyn on their own trucks, and required the services of two heavy freight locomotives on curves and grades.

The second illustration shows one of these cars fitted with side panels. The cars are arranged for end entrance only, and have a central aisle, with cross-seats on each side. The seating capacity is fifty-eight, and side rails are provided to prevent passengers from falling out. One 60-hp motor is mounted on each of the four car axles. These cars were built for Brooklyn service from designs of the Brooklyn Rapid Transit engineers, and were described in detail in the STREET RAILWAY JOURNAL of Dec. 20, 1902.

Last week one of these cars was given a trial trip from New York to Coney Island, with highly satisfactory results to officials of the Brooklyn Rapid Transit Company. The company expects to have all the new cars in use by June 1.

THE CHASE-SHAWMUT FLEXIBLE RAIL-BOND

The accompanying illustration shows a flexible rail-bond made by the Chase-Shawmut Company, of Boston, Mass.



FLEXIBLE RAIL BOND

This bond is in the form of an arch, with a pair of flat feet, which are soldered to the rails. It is composed of strips of

annealed copper, soldered together at the feet. The manufacturer says that this form gives the most enduring flexibility, and that no breakage can result from expansion and contraction. The bond is not concealed, and is, therefore, always in sight for inspection. It may be attached to the bottom of the

rails, where joints are suspended. Where patent rail joints are used two bonds may be attached, connecting the plate to the rails. In old construction, where there are angle or splice-bars, the bonds may be attached to the top of the base of the rails, thus avoiding the necessity and expense of removing the plates. The developed length of the bond is but 8 ins.

STREET RAILWAY RISKS

Representatives of the larger fire insurance companies operating in the West have decided to introduce a special system of inspection for street railway properties. The work will be along the same lines as that which is now carried on in the East, and the organization will be similar to that for the Middle and Southern States, which now has headquarters in New York city. The work in Chicago will be placed in charge of a competent electrical engineer, who has had special training for this class of inspection. It is the purpose of the fire underwriters eventually to establish standards of construction for all classes of buildings of railway properties and for the electrical wiring of these structures. Especial attention will also be given to the equipment, construction and wiring of cars.

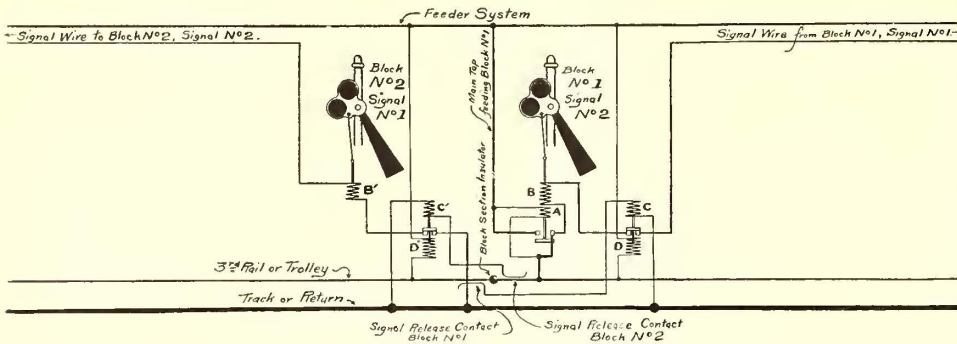
BLOCK SIGNAL SYSTEM

The accompanying diagram illustrates a single-track or double-track block signal system in which semaphores are used,

operated automatically by the car, and which has been devised by J. H. Shurman, of Boston.

Assume that a car enters block No. 1, to the right in the diagram. The current for the car, the feeder tap energizes

yellow pine filling. The ends of the I-beams and side sills are connected with main-end sills, with "U"-shaped wrought-iron forgings, $\frac{5}{8}$ in. x 5 ins., running full length of end sills, and continuing along side sills and intermediate sills about 12 ins.



BLOCK SIGNAL SYSTEM FOR ELECTRIC RAILWAYS

magnet A, closing the main feeder tap to main feeding tap to block No. 1, also the signal circuit, consisting of coil B and its duplicate B'. It should be noted that the near end of block No. 2, which is the left of the diagram, is identical with the far end of block No. 1—not shown. The coil A is now short-circuited, and the full current for the car is supplied through the circuit it has closed. The coil B is so constructed in connection with A as to replace it when A becomes short circuited. The semaphores are now raised from their gravity positions, and protect the block at either end, and the current reaches ground at the far end of the block.

When the car leaves block No. 1 and enters block No. 2 it first sets its signals in block No. 2, and then by signal release contact opens the signal circuit of block No. 1; by grounding a momentary current through solenoid C. This solenoid breaks the signal circuit and restores the block to its normal condition. If, however, a second car should follow the first car, the solenoid D will be magnetized more or less, according to the amount of current being used by our special car.

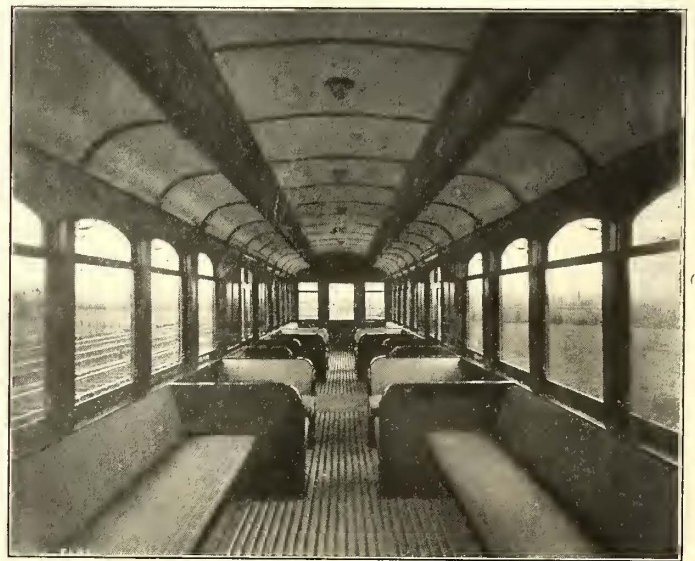
The result is that if block No. 1 is thus in use the solenoid D acts as an equalizer and prevents the signal circuit opening and thus prevents the arc which would result in the main tap relay.

As some current must always pass through the motor car to set the signal, a lamp circuit can be used if the heaters are not in use, or a special circuit can be opened when the motors are not taking current.

also building trail cars for this company.

STANDARD CARS FOR YERKES' UNDERGROUND RAILWAYS

In the STREET RAILWAY JOURNAL of May 9, 1903, a description was given on page 699 of the cars to be used on the Yerkes London Underground Railways. The accompanying engraving, which arrived too late for use in that issue, shows the interior

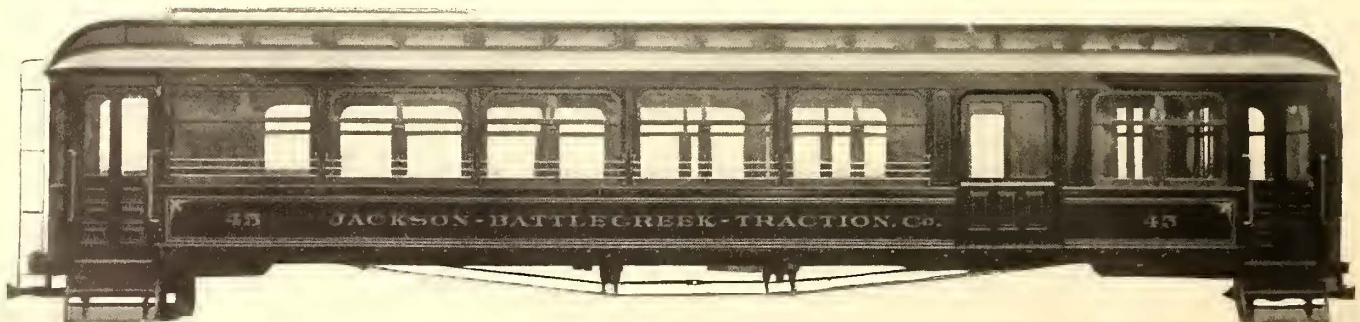


INTERIOR OF CAR, LONDON UNDERGROUND

BAGGAGE AND PASSENGER CAR

The accompanying cut shows the body of a baggage and passenger car combined, which was built for the Jackson & Battle Creek Traction Company, by the G. C. Kuhlman Car Company. The car body is 40 ft. long and 50 ft. over the buffers. The bottom framing consists of 4 $\frac{3}{4}$ -in. x 7 $\frac{1}{2}$ -in. yellow pine sills, faced with continuous 7-in. x $\frac{5}{8}$ -in. steel plates. The end sills are of white oak, 5 $\frac{3}{4}$ ins. x 7 $\frac{3}{4}$ ins. In addition to this there are two intermediate sills of 5-in. I-beams filled with

of one of these cars. This view is particularly interesting owing to the novel seating arrangements and the use of an entrance door on each side. There are four cross-seats on each side of the car, and longitudinal seats from the cross-seats to the end doors. There is also a short longitudinal seat on each side from the side door to the transverse seat. The rattan seats, which were supplied by G. D. Peters & Company, of London, are of the Hale & Kilburn pattern.



BAGGAGE AND PASSENGER CAR

FINANCIAL INTELLIGENCE

WALL STREET, May 20, 1903.

The Money Market

Interest in the immediate money situation centers in gold exports and their effect. An additional \$2,300,000 was engaged on Monday for shipment to Europe. This had been preceded by another \$1,250,000 sent out to South America at the close of last week. The total so far this season now reaches over \$6,000,000. The direct consequences of these exportations is, of course, a heavy draft upon cash holdings of the local banks. But this is not the only way in which the transfer of capital to foreign countries affects the market. Specie shipments are in fact only a small part of the general process now going on of returning credits formerly borrowed from abroad and carried more or less continuously for the past twelve months in foreign markets. As these loans are taken up at home their main result is to expand our own bank loan accounts, and the accompanying enlargement of liabilities produces a shrinkage of the surplus reserve. It is this process which has shown itself in the increase of \$28,000,000 in loans of the New York banks during the last three weeks. This increase in loans and the direct losses in cash caused a further fall in the surplus last Saturday of over \$1,000,000, reducing that item to less than \$9,000,000, which is barely more than the exceptionally low figure of a year ago. In all probability these influences will continue to operate for some little time yet. One of the most serious features of the situation is the check upon our foreign trade totals due to the diminished exports of cotton, which in turn is referable to the wild manipulation now in progress in the cotton market. This makes it so much more difficult for settlement of foreign debt balances to be made in other ways save by the shipment of gold, and it is hard to see where relief is to come during the immediate future. Sterling rates have not eased from the export level, despite the heavy gold engagements that have been made, and the conclusion is that gold exports will keep on and will reach a larger sum than seemed probable a short while ago. It must not be forgotten, of course, that in proportion as bank reserves are being weakened at home the position in the foreign exchange is being strengthened. Surplus reserve may be kept down abnormally low during the next few months, but the effect will be that when autumn comes, with its trying financial requirements, this market will be in a position to borrow from Europe much more freely and safely than it was a year ago. Meanwhile money rates on the week are scarcely changed. Call money touched 3 per cent yesterday and the day before, but renewals of call loans were made at 2½ per cent. Time money is firmer, with rates at 4 for sixty to ninety days and 4½ for six months.

The Stock Market

The atmosphere of gloom and despondency has deepened about the Stock Exchange this week. Looking simply at immediate outside conditions it is impossible to find an adequate explanation for the decline that has occurred in prices. Professional sellers of stocks have had a good deal to say about the labor troubles, the gold exports and the unwholesome effect of the manipulated rise in cotton. But, putting these considerations beside the country's prosperity, the magnificent railroad earnings and the comparatively low price level, they are plainly of far less importance. Wall Street is now seeing simply in an exaggerated form the same sort of paralysis of the buying power which it has had occasion to remark so frequently since the beginning of the year. Whether or not the real trouble lies in the much-discussed "undigested securities," is a debatable point. At all events the larger financial interests are displaying no activity at all on the buying side, and it is this more than anything else which discourages purchases of stocks by speculators and by capitalists large and small who would ordinarily at such a time be buying for a rise. There seems to be only one outcome for this situation, and that is for stocks to sell at prices where they will be attractive simply on their investment merits. That many of the standard issues have already reached the required level is pretty evident. Pennsylvania and St. Paul in particular are down almost to a 5 per cent basis. Missouri Pacific and Union Pacific yield close to 4¾ per cent, while among the stocks of a lower class Atchison common may be especially mentioned as yielding nearly 5 per cent. It will take

time for purely investment purchases, even on these inviting terms, to absorb the floating supply of stocks; consequently the market is likely to continue unsettled, with more or less weakness, for some little time, but when equilibrium is finally restored it is hard to see how it will be on any lower level than the present.

All the local traction stocks have weakened along with the rest of the market. Metropolitan has shown signs of special pressure in the interest of speculators who had sold short at the time the company's affairs were being aired in the law courts. A similar demonstration has been made against Brooklyn Rapid Transit, apparently to facilitate the covering of a short interest of long standing which based its position on the serious effects likely to follow the payment by the company of the heavy franchise tax assessment. The decline in Manhattan no doubt reflects liquidation of speculative holdings recently acquired on the idea that the stock was worth intrinsically considerably higher prices.

Chicago

The Chicago traction market has moved with considerable irregularity during the week. Recoveries have occurred in some quarters, as, for instance, in North Chicago, which went up two points to 122, and West Chicago, which rose from 62 to 65. But in other directions prices have weakened again. Metropolitan Elevated common dropped from 25 to 23½, and the preferred from 73 to 69½; Northwestern sold at 21, and Lake Street from 5½ down to 5. Union Traction common was unchanged at 5, but the preferred rallied three points to 35. City Railway (one odd lot) sold at 204. Now that the Mueller municipal ownership bill has been approved, it is stated that the companies concerned will at once begin negotiations with the city, and that they will press their demands for long-term franchises. The South Side Elevated Company has received all the signatures necessary from the abutting propertyowners, which will enable it to go ahead with its plans for improvements and extensions. This work will be started next August, and will cost in the neighborhood of \$5,000,000. A third track will be built for express service, and branches will be built to Englewood, the Stock Yards and to the lake in the vicinity of Fortieth Street. It is expected that the work will be completed within three years.

Philadelphia

Dealings in the local Philadelphia traction market this week have had no particular significance except as they have reflected the depressed feeling in speculative circles generally. Prices have gone lower in all cases, but only on a very small volume of business. The most important incident of the week was the meeting of the Philadelphia Rapid Transit Company directors on Monday, at which a call was issued for an additional \$5 assessment on the stock. The sum involved is \$3,600,000, which will be expended on construction work in the subway and on suburban lines. Although this announcement has been expected for some time, the price of the shares was offered down a half point from a week ago to 11¼. Union Traction lost also a half a point to 46, but Philadelphia Traction gained a half to 97. The weakness in Philadelphia Company stock continued, with an extreme loss of a point to 43. No other reason is assigned for this except the speculators' pretext, that on further consideration the recent annual statement was not as favorable as was thought at first. Quite a little has been done in Rochester Passenger around 71, the buying coming apparently from inside quarters. American Railways was rather heavy at 47½ and Consolidated Traction of New Jersey was offered down on small sales from 69 to 67½. In the bond department the features were Electric People's Traction 4s at 99¼ and 99, People's Passenger 4s at 104, Union Traction of Indiana 5s at 100⅞ down to 100¼, Consolidated Traction of New Jersey 5s at 108 and Newark Passenger 5s at 116.

Other Traction Securities

General speculative weakness has affected all the outside traction markets during the week. All save high-grade investment issues have reflected steady, selling chiefly, however, on the part of speculators who had bought for a rise. In Boston the Massachusetts Electric shares have suffered the most of any. The common stock dropped from 32 to 28½, and the preferred from 88 to 85, on fairly large transactions. Boston Elevated has held comparatively steady around 145¼, and so have West End stocks, the common at 97¼

and the preferred at 112. In Baltimore the United Railway securities have withstood the decline better, perhaps, than might have been expected. The last sales recorded were at 127 $\frac{7}{8}$ for the stock, 68 $\frac{3}{4}$ for the income bonds, and 93 $\frac{3}{8}$ for the general mortgage 4s, all of which prices are but slightly changed from a week ago. Other Baltimore sales for the week include Atlanta Consolidated 5s at 107, Knoxville Traction 5s at 101, and Norfolk Street Railway 5s at 110. Sales reported on the New York curb are as follows: American Light & Traction common up as high as 81 $\frac{1}{2}$, and from there selling down to 79, the preferred at 99 to 97 $\frac{5}{8}$, and the rights at 1 $\frac{1}{4}$ and 1 $\frac{1}{8}$, Interborough Rapid Transit (full paid) at 100 and 101, Washington Traction & Electric at 12, and New Orleans 4 $\frac{1}{2}$ s at 81 and 81 $\frac{1}{4}$.

Cincinnati Street Railway again held the center of the stage in Cincinnati. It opened the week at 135 and reached a low mark of 133 $\frac{1}{2}$ the middle of the week, then strengthened to 134 $\frac{1}{2}$. Sales were 1317 shares. Toledo Railway & Light sold to extent of 550 shares ranging from 33 to 34 $\frac{1}{2}$. Cincinnati, Dayton & Toledo ranged from 34 to 35 on sales of 479 shares. About 200 shares of Detroit United sold at from 81 to 81 $\frac{1}{2}$. There was a sale of Dayton, Springfield & Urbana preferred at 82 $\frac{1}{2}$, and one of Columbus, London & Springfield at 72 $\frac{7}{8}$, being the first sales in some time for the Appleyard interurbans. Bond market was active, total sales being about \$86,000 worth. Northern Ohio Traction 4s are again attracting attention and \$21,000 worth sold at 62 $\frac{1}{2}$ and 63. Cincinnati, Dayton & Toledo 5s ranged from 84 $\frac{1}{2}$ to 86; \$9,000 worth selling. Zanesville 5s and Columbus, Delaware & Marion 5s continued in good demand at 101. Miami & Erie canal bonds showed a decline, \$12,000 worth selling at 57 and 58.

Miami & Erie bonds featured in Cleveland, two blocks selling at 56 to 58. Western Ohio 5s brought 80, several points lower than usual. Western Ohio stock declined to 22, the lowest in many months. Lack of news relative to consolidation of through Cincinnati-Toledo system seems to account for declines in Western Ohio and Cincinnati, Dayton & Toledo. Northern Ohio Traction & Light sold at 23 $\frac{7}{8}$, a fraction lower than last sales. Detroit United brought 81 and Lake Shore preferred 50 $\frac{1}{4}$, which is a pronounced decline. There were declines in offerings for Aurora, Elgin & Chicago preferred, due to the report that the semi-annual interest will be passed. Large blocks of this stock sold at \$91 a short time ago, but last week it was offered at \$80 with one lot offered at \$75.

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	
	May 14	May 21
American Railways	48	47 $\frac{1}{2}$
Aurora, Elgin & Chicago.....	a29	a29
Boston Elevated	145	145
Brooklyn Rapid Transit	65 $\frac{5}{8}$	64 $\frac{3}{4}$
Chicago City	205	200
Chicago Union Traction (common)	4 $\frac{1}{2}$	4 $\frac{1}{2}$
Chicago Union Traction (preferred)	32	32
Cleveland Electric	a79	82 $\frac{1}{2}$
Columbus (common)	85 $\frac{1}{2}$	100
Columbus (preferred)	104	105 $\frac{1}{2}$
Consolidated Traction of New Jersey.....	68 $\frac{3}{4}$	67
Consolidated Traction of New Jersey 5s.....	108	108
Detroit United	79 $\frac{1}{2}$	a81
Electric People's Traction (Philadelphia) 4s.....	99	99
Elgin, Aurora & Southern	a55	a56
Lake Shore Electric	a15	10
Lake Street Elevated	5 $\frac{5}{8}$	5
Manhattan Railway	141 $\frac{1}{2}$	138 $\frac{1}{4}$
Massachusetts Electric Cos. (common).....	31 $\frac{1}{2}$	28 $\frac{1}{2}$
Massachusetts Electric Cos. (preferred)	87 $\frac{1}{2}$	85 $\frac{1}{2}$
Metropolitan Elevated, Chicago (common).....	25	23 $\frac{3}{4}$
Metropolitan Elevated, Chicago (preferred)	74	70
Metropolitan Street	131	130
New Orleans Railways (common).....	14 $\frac{3}{4}$	—
New Orleans Railways (preferred)	40 $\frac{1}{4}$	—
North American	96	95
Northern Ohio Traction & Light.....	23	23 $\frac{3}{4}$
Northwestern Elevated, Chicago (common).....	21 $\frac{1}{2}$	21
Philadelphia Rapid Transit	12 $\frac{3}{4}$	11
Philadelphia Traction	96 $\frac{3}{8}$	97
St. Louis Transit (common)	26 $\frac{3}{8}$	26
South Side Elevated (Chicago)	102	103
Syracuse Rapid Transit	a31	—
Syracuse Rapid Transit (preferred)	a78 $\frac{1}{4}$	—
Third Avenue	120	120

	Closing Bid	
	May 14	May 21
Toledo Railway & Light	a35	a30
Twin City, Minneapolis (common)	112 $\frac{1}{2}$	109
United Railways, St. Louis, 4s.....	85	84 $\frac{1}{4}$
United Railways, St. Louis (preferred)	78	77
Union Traction (Philadelphia).....	46 $\frac{1}{2}$	45 $\frac{7}{8}$

a Asked.

Iron and Steel

Although last week's reports of a cut in steel billets were promptly and effectually denied, there is no doubt that conditions in the lower branches of the industry are less satisfactory from the standpoint of the seller than in some time past. It is not so much the reduction in pig-iron prices that has already occurred, but rather a fear that a still further reaction is impending, which now occasions solicitude. The pig-iron market will probably continue unsettled until the Steel Corporation, which is the principal consuming interest, places its order for the second half year's requirements. Whatever terms are fixed in this order will doubtless determine the true price level for the future. It is expected that the bids from this quarter will be announced very shortly. The "Iron Age" sums up the situation by saying that, while there is no ground for uneasiness, a general readjustment of prices is necessary to take account of the fact that production has now pretty well reached the utmost limits of consumptive demands. Quotations are as follows: Bessemer pig-iron \$20.85, Bessemer Steel \$36.50, and steel rails \$28.

Metals

Quotations for the leading metals are as follows: Copper 14 $\frac{3}{4}$ to 15 cents, tin 29 $\frac{5}{8}$ cents, lead 4 $\frac{3}{8}$ cents, and spelter 5 $\frac{1}{2}$ cents.

REPORTS OF THE MANHATTAN COMPANY FOR THE QUARTER AND NINE MONTHS

The report of the Manhattan Elevated Railway Company for the quarter ending March 31, 1903, was filed with the Railroad Commissioners on May 15. It shows gross earnings of \$3,230,064, an increase of \$351,826 as compared with the same period last year; operating expenses of \$1,464,128, an increase of \$63,750, leaving net earnings of \$1,765,936, an increase of \$288,078. After payment of interest on bonds, taxes, &c., there was left a net income of \$1,132,461. The dividend this quarter was \$966,000, an increase of \$486,000 over last year, and after it was paid there was a surplus for the three months of \$166,461, a decrease of \$294,999 from last year. The figures in detail follow:

	1903	1902
Quarter ended March 31		
Gross receipts.....	\$3,230,064	\$2,878,236
Operating expenses	1,464,128	1,400,378
Earnings from operations.....	\$1,765,936	\$1,477,858
Receipts from other sources.....	110,097	121,937
Gross income.....	\$1,876,033	\$1,599,795
Interest and taxes.....	743,572	658,335
Net earnings.....	1,132,461	\$941,460
Dividend	966,000	480,000
Surplus	\$166,461	\$461,460
Passengers carried.....	65,193,975	58,037,249
Nine months		
Gross receipts.....	\$8,936,549	\$7,808,661
Operating expenses.....	4,158,704	4,117,479
Earnings from operation.....	\$4,777,845	\$3,691,182
Receipts from other sources.....	256,672	514,513
Gross income.....	\$5,034,517	\$4,205,695
Interest and taxes.....	2,136,295	2,043,821
Net earnings.....	\$2,898,222	\$2,161,874
Dividends	2,718,000	1,440,000
Surplus	\$180,222	\$721,874
Passengers carried.....	180,481,586	157,560,097

AFFAIRS OF THE LEHIGH VALLEY TRACTION COMPANY

The appointment of receivers for the Lehigh Valley Traction Company, which was announced in the *STREET RAILWAY JOURNAL* of May 9, will make it possible to adjust the affairs of that property and enable those interested in its development to make arrangements for carrying on the business to better advantage. The company has been visited with a series of disasters during the last three years, any one of which was sufficient to cripple an ordinary organization, but the fact that it has survived the ordeal and is reported by the receivers to be in really good condition, is accepted as evidence that the system has elements of great value.

The first serious trouble encountered was in the loss of the services of Albert Johnson, whose death occurred in July, 1901. At that time the common stock of that company was paying annually 4 per cent. The following fall the power house was flooded and the road had to cease operation for a week. Then came another flood, and the power houses were not only disabled, but three bridges across the Lehigh River were washed out, which practically cut the system in two. Shortly after this, the electric light power house was destroyed by fire. The coal strike during the last year raised the price of coal for the company from 90 cents to \$9 per ton. All of these catastrophes came on the company within the last eighteen months, and it has, moreover, contracted an unfunded debt of about \$1,000,000.

To prevent hostile creditors from making application for a receiver and causing the company embarrassment, application was made on May 2, by A. I. DuPont, John B. Hoefgen and Tom L. Johnson, through their attorney, John G. Johnson, of Philadelphia, for a receiver, and on May 4 Judge McPherson appointed Robert E. Wright, C. M. Bates and George W. Norris receivers for the Lehigh Valley Traction Company, and Robert E. Wright, C. M. Bates and Robert W. Leslie for the Philadelphia & Lehigh Valley Traction Company. The latter company operates the line between Allentown and Philadelphia.

The books show that the Lehigh Valley Traction Company, up to April 1, not only earned operating expenses, rental and fixed charges, but that 5 per cent was earned on the \$1,000,000 of unfunded debt, and 2 per cent on the common stock. A stockholder who has been interested in the property from the beginning, and is therefore familiar with the situation, said:

"Taking into consideration that May, June, July, August and September are the best months in the year for all street railways, it is a conservative estimate that the company will earn by Dec. 1, 1903, between 4 per cent and 5 per cent on the common stock, after paying operating expenses, rentals and fixed charges; in other words, the company is absolutely solvent, and the reason for appointing receivers and selecting gentlemen who are friendly to the company, is to give them time to have the \$1,000,000 debt funded and place the affairs of the company in proper condition."

CONSOLIDATION OF CLEVELAND COMPANIES

The long-talked-of consolidation of the Cleveland Electric Railway Company and the Cleveland City Railway Company, which control all the city lines at Cleveland, Ohio, appears close at hand. Meetings of the directors of both companies have been held within the past week and semi-official statement has been made that articles of agreement for the consolidation will be signed at once by directors of both companies. Absolutely nothing of an official nature has been given out, but on high authority it is said that the basis of consolidation will be at 100 for Cleveland Electric shares and 130 for Cleveland City shares, and that the consolidated company will be capitalized at \$23,500,000 and will issue universal transfers, but there will probably be no reduction in fare as originally proposed by the promoters of the consolidation. The latter desired to sell seven tickets for 25 cents, instead of eleven for 50 cents, the present rate, in order to discourage the construction of a system of 3-cent-fare lines, in which Mayor Johnson is credited with being largely interested. Senator Hanna, president of the Cleveland City Company, opposed a reduction of fare at this time, in order that the companies might have lower fares to offer in return for a renewal of franchises when the latter expire.

The Cleveland Electric Railway Company was organized in 1893, and was the consolidation of the Broadway & Newburg Street Railroad Company, East Cleveland Railroad Company, Brooklyn Street Railroad, and the South Side Street Railroad. It owns 136 miles of track, and its authorized capital is \$13,000,000. It has a funded debt of \$4,350,000. The directors and officers are: Horace E. Andrews, president; R. A. Harman, vice-president; J. H. Davies, secretary; George S. Russell, treasurer; John J.

Stanley, general manager; Myron T. Herrick, Calvary Morris, Charles L. Peck and James Parmalee.

The Cleveland City Railway Company was also formed under the laws of Ohio in 1893. It owns 84 miles of track. It was formed by the consolidation of the Cleveland City Cable Company and the Woodland Avenue & West Side Railway Company. It has an authorized capital stock of \$9,000,000, of which \$7,600,000 has been issued, and has a funded debt of \$2,000,000 on Cleveland City Cable Railway mortgages. The directors and officers are: Marcus A. Hanna, president; Christopher F. Emery, vice-president; John Ehrhardt, secretary and treasurer; Leland W. Prior, Robert R. Rhodes, William B. Sanders, Charles A. Otis, Jr., J. Homer Wade, George G. Mulhern and Horace E. Andrews.

IMPROVEMENTS IN JAMESTOWN, N. Y.

Plans for electric railway development in the vicinity of Jamestown, N. Y., finely situated in the beautiful Lake Chautauqua district, are rapidly being perfected. The city, according to present plans, is to be connected with Warren and Youngville, Pa., and Celeron and Lakewood, N. Y., by the construction of new lines, and the conversion to electricity of an existing steam railroad will furnish an extremely attractive connection with Lake Chautauqua. In addition, the Jamestown Street Railway, which controls the local lines, is completing improvements that will give additional facilities for travel within the city limits.

The Jamestown Company has relaid its north side loop with heavy steel rails, and now has well under way the construction of a new south side loop. This loop will open up a new part of the city, which has long needed street car facilities.

The Jamestown & Chautauqua Electric Railway Company, which is under the same management as the Jamestown Street Railway Company, began on May 11, the construction of its proposed road between Celeron and Lakewood. Celeron, situated on the shore of Chautauqua Lake, is a pleasure ground which the railway company conducts. The new road, it is understood, will use the tracks of the Jamestown Street Railway Company to Celeron. The plan is eventually to extend the road to "Later On," a summer resort, where it will connect with the present railway to Lakewood. This will give the company a line to Lakewood by the way of Celeron, and will form a loop with the Ashville Avenue line. The cars from Lakewood and Chautauqua will be run by the way of Celeron, and the loop will be used for city traffic. The company experienced considerable difficulty in securing a franchise through Lakewood, but as a result of the granting of the franchise the road will now be rushed through to Chautauqua, about 14 miles further up the lake.

It is stated that the Jamestown, Chautauqua & Lake Erie Railway Company, whose tracks skirt the eastern side of Lake Chautauqua for the distance of about twenty-two miles, its entire length, will adopt electricity as motive power for its passenger trains, reserving steam as the motive power for its freight business. The rumor is that the electric cars will run to Chautauqua, but as this would necessitate the building of quite a stretch of road, it is more than likely that the tracks would only be used to Point Chautauqua, and that the passengers would be carried across the lake to Chautauqua by boat, as the railway company also controls a line of steamers.

The Warren-Jamestown Electric Railway is another project that is now well under way. It is connected with the Warren, Pa., street railway system, and will be built from the termination of the tracks of that company at North Warren to Jamestown, following the valley of Conewango for the greater part of the way. It will enter the city on Foote Avenue, thence to Brooklyn Square, forming a loop with the end of the line in front of the Humphrey House. Work on the Warren-Jamestown line has been commenced at the Warren end.

Another important electric railway enterprise which is incubating, is what is known as the Warren & Youngsville road. It is backed by Warren capital, and is intended primarily to connect Warren with the thriving inland borough of Sugar Grove. It is not thought for a moment, however, that Youngsville or Sugar Grove will be the terminus of the line. It is known that the company has surveyed a line from Sugar Grove to Panama, and thence to Chautauqua. It is also rumored that the road will be extended to North East to connect with the line to Erie and other points in Pennsylvania. This road will run through one of the richest farming dairying sections of Western New York and Pennsylvania.

Owing to the many races which have taken place recently between the cars of the Aurora, Elgin & Chicago Electric Railway and the trains of the steam railroads which are paralleled by it the latter companies have issued strict orders to their engineers forbidding them to indulge in racing hereafter. It is said that the electric cars frequently outran the steam trains.

STRIKE AT BRIDGEPORT

The lines of the Connecticut Railway & Lighting Company in Bridgeport, Derby, Woodmont, Fairfield, Stratford, Southport and Westport are tied up through a strike of the employes which was declared on May 15. The strike had been threatening for months, and its declaration seems to be merely the result of the machinations of the representatives of the Amalgamated Association of Street Railway Employees of America. The representatives of that body, thoroughly incensed at the turn affairs took shortly after the declaration of the strike on the company's lines in Waterbury and vicinity, threatened at the time the strike was on there to tie up all of the company's lines in Connecticut. But realizing that even Connecticut public opinion—if there is such a thing—would revolt at such a proceeding, or feeling that its hands were full, the association has waited until now to carry out its threat.

Six weeks ago the employees of the company submitted to J. E. Sewell, the company's general manager, a demand for recognition of the union, a flat wage rate of 22½ cents an hour, abolishment of "swing" runs, a maximum work day of ten hours, the employment of a sufficient number of extra men to allow each regular man a day off each week, a choice of runs by the men, according to seniority, and a few other unimportant privileges. These demands the company considered carefully, and after some deliberation agreed to meet a committee at any time in reference to grievances and agreed to increase the pay of the men. The company flatly refused, however, to yield to the demand for recognition of the union.

No reply was made by the men to the overtures of the company until May 14, when the previous request was converted into a demand, with an added condition for the reinstatement of a discharged motorman. It was at 4 o'clock in the afternoon that General Manager Sewell received the communication of the men, the threat being made that unless a favorable reply was received by 7 o'clock the same evening a strike would be declared. Mr. Sewell replied at once that the company would stand upon the proposition it had already made, but would agree to investigate the case of the discharged motorman for whom the men demanded reinstatement. Early the next morning a strike was declared.

From the beginning the company did everything reasonable to avert trouble, and the fairness with which it dealt with the men can be realized from the fact that it made no effort to run any cars on Friday, May 15, although it had applications from twenty-five of the strikers for reinstatement. The company even went so far as to inform a committee of the strikers that it would make no effort to run any cars until after a conference arranged for the afternoon had been held.

When the strikers' committee met General Manager Sewell of the company at his office that afternoon the men declared that they represented the Bridgeport branch of the Amalgamated Association of Street Railway Employees of America. Mr. Sewell informed the men that he would do no business with the representatives of the Amalgamated Association, but that he was willing to deal with the men as a committee of employees and talk the situation over with a view toward a settlement. The committee insisted upon recognition, but Mr. Sewell remained firm and all further negotiations ceased.

Within an hour after the conference the company had six cars running between Bridgeport and Stratford, the nearest suburb on the east of the city. The presence of former members of the union on the cars was a surprise to the strikers. The men who returned to work say that at the last meeting they voted against a strike because they are satisfied with their treatment at the hands of the company.

The service started on Friday was extended and continued on Saturday without any disturbance, but on Sunday the city was the scene of violent disorder. In a riot at the Barnum Avenue car houses, precipitated by sympathizers of the striking trolley-men, twelve strike breakers were injured severely by being struck by cobblestones, and several spectators, including Mayor Mulvihill, were more or less bruised. The eastern part of the city was in a state of riot for several hours. There was no show of violence until noon. As each car reached the car houses near the end of the line volleys of stones were showered upon it. The non-union workmen were routed and the peace officers assembled and made a vain effort to disperse the crowd without force of arms. The Mayor arrived on the scene an hour after the rioting had begun, and he was greeted with cheers. Availing himself of the opportunity he boarded a car and made a plea for order. The rioters listened to him but did not heed his advice, and they attacked the next car that came along. General confusion followed, and during the disorder several pistol shots were fired. It was at

this juncture that the Mayor was struck on the head with a stone. A feature of the disturbances was a clash of authority between the Mayor and the Sheriff's deputies, in consequence of which the Sheriff threatened to supersede the Mayor in control of the city. The Mayor interfered with the deputies who were arresting a stone thrower, demanding that the offender be released.

Monday was a day of quiet and interest shifted to the attitude of Dennis Mulvihill, the city's union labor Mayor. Mr. Mulvihill has been forced to promise to keep hands off and let the police department assume full charge of mobs in future. The service on Monday morning was limited, but in the afternoon operations were resumed on nearly all the lines. During the day, though there was no casualty, between fifteen and twenty arrests were made on minor offenses.

PRICE PAID FOR A FRANCHISE IN LOS ANGELES

An electric railway franchise for about 2 miles of street through a hilly residence district of Los Angeles, Cal., has been sold by the City Council for the startling sum of \$110,000. The purchaser was G. G. Johnson, supposed at the time to represent Senator W. A. Clark, of Montana, who recently bought the Los Angeles Traction Company, and announces that he will compete with the Huntington-Hellman syndicate on the basis of a 3-cent fare, provided his extensive schemes are in no way blocked. Senator Clark acknowledges that it was his money that bought the \$110,000 franchise, but persistently denies that E. H. Harriman, of the Southern Pacific, is in any way associated with him. The struggle over the franchise was a contest for supremacy in which H. E. Huntington was at any rate temporarily worsted.

Beginning at Sixth Street and Figueroa Street, the franchise covers Figueroa Street to Fifth Street, to Bixel Street, to Sixth Street, to Benton Boulevard, and is for thirty-seven years. It contains a third-rail privilege, requires not less than 60-lb. rail, provides for a fare not exceeding 5 cents and stipulates that the entire road must be completed in three years, one-third of the work to be done in one year. Such is the franchise that sold at the rate of \$55,000 a mile. When the franchise was offered for sale at the request of Mr. Huntington, the opening of bids disclosed the fact that the Los Angeles Railway Company bid \$2,500. G. G. Johnson bid \$2,500, and W. S. Hook, of the Los Angeles Traction Company, bid \$5,000. Then they began to raise their bids at least 10 per cent., according to law, until Mr. Hook dropped out at \$10,000. Thereupon Mr. Huntington and Mr. Johnson kept raising each other's bid until Mr. Johnson made it \$82,500; then Mr. Huntington bid \$100,000. This was Mr. Huntington's last bid, and Johnson had to take the franchise at \$110,000.

Now Mr. Huntington openly asserts that the franchise cannot be worth more than \$10,000, and that his own lofty bidding was due to excitement and eagerness not to be defeated. Not to be entirely undone, he has applied to the Council for a franchise along Orange Street, paralleling the Johnson franchise.

On May 11 Mr. Johnson filed a \$20,000 bond for the specific performance of the franchise, having paid the entire amount of \$110,000 into the city treasury within twenty-four hours after his final bid. On the day the bond was filed and approved a longer and more valuable franchise was offered on Twelfth Street, but Mr. Johnson occasioned much surprise by not bidding. Mr. Huntington's solitary bid of \$2,500 was rejected as being too low.

THE STRIKE ON THE SUBWAY IN NEW YORK

The strike of the laborers at work on the New York Subway has been broken. On Monday, May 11, John B. McDonald, the subway contractor, delivered his ultimatum to the men, that unless the excavators and rockmen returned to work by Tuesday morning, May 12, their places would be filled at once. The men decided not to return to work pending arbitration, and Mr. McDonald, true to his word, immediately secured other help. At first the force to resume work was very small, but it has been steadily increased until on Monday, May 16, the announcement was made that 60 per cent of the regular force was at work. The entire route of the subway is protected by the police, and the reserves are held in readiness for sudden call. There has been some disorder, but the police have promptly quelled all disturbances. Fear was entertained at one time that the strike would seriously delay the completion of the subway, but Mr. McDonald says "the opening of the tunnel will not be delayed a minute by the strike." Asked about the condition of the main power house of the subway, at Eleventh Avenue and Fifty-Ninth Street, the contractor said the building had been delayed a good deal by the ironworkers' strike, but he expected it to be easily completed on time.

ATTEMPT TO REPEAL CONNECTICUT LAW FAILS

The attempt to repeal the general railroad law of Connecticut has been abandoned. The struggle was between the steam and electric railroads combined against steam and electrics combined, thus making the fight different from those heretofore waged at Hartford. The plan was to repeal the law so as to close the door to any further extension of facilities for travel and transportation, except such as might be especially authorized by act of the Legislature. Ever since March, when the bill to repeal the law went before the joint judiciary committee, the lobbyists have been at work. It is said that the Senate had been successfully won over, but the House, more directly representing the people of the State, and especially the farmers, would not consent to the proposed change. As previously stated in the STREET RAILWAY JOURNAL, in this struggle the resident steam and electric railways were arrayed against the Middletown & New Haven Railroad, Middletown & Hartford Railroad, Vermont Central Railroad and some of the smaller electric interests. The struggle was really precipitated by the Middletown & New Haven and Middletown & Hartford companies, which, promoted by the same interests, plan to build a third-rail line between Middletown and New Haven and Middletown and Hartford, respectively. Under the present laws these companies have the right to condemn land and build the proposed lines. By some it was claimed that the measure simply was one of protection to restrain undue development. But other ways than complete restraint probably will be found for checking "undue" development, if such measures really are needed.

AN OHIO LAW DECLARED UNCONSTITUTIONAL

The Superior Court has declared unconstitutional the curative act in the municipal code law passed at the recent special session of the Ohio Legislature. The court also held the one-year statute of limitations for suits to test public franchises and contracts as invalid. The decision was rendered in the case of Theodore Horstman as a taxpayer to enjoin the Cincinnati Street Railway Company from operating one of its lines. The curative act was passed to strengthen the fifty-year franchise under which the lines of the Cincinnati Street Railway Company, now leased to the Cincinnati Traction Company, were constructed. The court holds the curative clause, which was intended to cure the constitutional defects of the Rogers law, to be unconstitutional. Before the special session of the Legislature, the Rogers law was held unconstitutional by the Superior Court. An amended petition was filed which was demurred to by Horstman. Then the Legislature passed the curative clause, which is now knocked out by the court. The court says: "Streets, municipalities, and street railway franchises are all subjects of a general nature. Such a grant must be by law which operates uniformly throughout the State. Otherwise it would be in violation of article 2, section 26, of the Constitution of the State, which declares all laws of a general nature shall be uniform in their operation throughout the State."

The case is to be taken to the Supreme Court for final adjustment.

AN IMPORTANT DECISION IN PENNSYLVANIA

The Supreme Court of Pennsylvania has just decided that when a street railway company is incorporated under the Focht-Emory law of 1901 it has absolute control and possession of all streets and highways set forth in its articles of association or in subsequent extensions until two years after the date of its incorporation, and for a much longer period, if, in the meantime, it has obtained the consent of local authorities.

The Coatesville & Downingtown Street Railway Company was incorporated June 10, 1901, to construct and operate over certain streets in Downingtown and West Chester and between Coatesville and Downingtown. About eleven months afterward the West Chester Street Railway Company adopted certain extensions, a large portion of which were over the roads or portions of the roads laid out by the Coatesville & Downingtown Company and its allied roads. Before the West Chester Street Railway Company had procured local consents in the boroughs of Downingtown and Coatesville the Coatesville & Downingtown Street Railway Company applied to the Court of Common Pleas to prevent its procuring these consents and further prevent the West Chester Street Railway Company from being built. A preliminary injunction was granted by the Court of Common Pleas, and, subsequently, by an opinion of Judge Ralston, the injunction was dissolved upon the ground that "the plaintiff, not having obtained the consent of local authorities to construct their road, were not in a position to obtain an injunction against the defendant."

THE THREE-CENT FARE BUBBLE IN CLEVELAND AGAIN

Mayor Tom L. Johnson, of Cleveland, has started on a second campaign for the establishment of three-cent fare lines in Cleveland. Eleven communications were submitted to the Council at a late meeting, asking the city to establish eleven street railway routes in the city. All of the communications were from representatives of the People's Street Railway Company, of which J. B. Hoefgen is the promoter. This is the company which endeavored to obtain franchises for a three-cent fare system over a year ago. Mayor Johnson's message to the new City Council contained a strong recommendation for immediate legislation looking toward municipal ownership of an electric lighting system, and recommended that such an establishment be conducted under a strict merit system. The message also touched on the ultimate municipal ownership of street railways.

AN ATTACK ON NEW JERSEY COMPANIES—NEW FRANCHISE LAW WANTED

Mayor Fagan, of Jersey City, N. J., has instructed the Corporation Counsel to apply to the Attorney General for permission to bring suit against the Jersey City & Bergen Railroad Company to test the validity of the franchise by which it operates in Jersey City. The Jersey City & Bergen Railroad was the original company, which subsequently leased its lines to the Consolidated Traction Company. This company was later merged in the North Jersey Street Railway Company, and that, in its turn, has now been merged in the Public Service Corporation, which has acquired all the electric railways of Northern New Jersey.

Mayor Fagan proposes to proceed by quo warranto, with three objects. The first is to test the right of the North Jersey Street Railway Company to operate through Jersey City. The second is to enforce the collection of a license fee of \$10 per annum for each car run, which fee the Jersey City & Bergen Railroad Company paid from 1859 to 1867, when the Legislature passed a law forbidding the city to interfere in any way with the company's right to run cars through the city streets. It is alleged that, owing to the increased number of cars, there is now due the city on this account about \$250,000.

The Mayor's third contention is that the Voorhees franchise tax act, under which all such companies now pay, is unconstitutional. This act takes the collection of taxes from street railway corporations from the local tax boards and vests it in the State board. Mayor Fagan and the Corporation Counsel say the act is unconstitutional because it is based on the gross receipts of the companies and not on the value of the property held by them. The Corporation Counsel also holds that the charter of the Jersey City & Bergen Railroad Company expired in 1884, and that it was a non-existent corporation at the time the lease of its lines to the North Jersey Street Railway Company was made. Assuming this to be true, he further alleges that the present company cannot operate in Jersey City until it gets a new franchise.

OTHER UNION TRACTION PURCHASES IN INDIANA

Interests identified with the Union Traction Company and the Indianapolis & Northern Traction Company, of Indiana, are reported to be in another deal for the purchase of an electric railway system that will finally be absorbed by the Union and Indianapolis & Northern Companies. The systems reported to have been purchased are the Logansport City Railway and the Wabash River Traction Company. The Logansport Company operates the local lines in Logansport and the Wabash Company operates an inter-urban line between Logansport and Wabash, a distance of 43 miles. The deal is reported to have been put through by J. Levering Jones and Bayard Henry, of Philadelphia; Senator Stephen B. Fleming, of Ft. Wayne, and George F. McCulloch, president of the Union Traction and Indianapolis & Northern Companies. The same men with the Murdocks, of Lafayette, and other capitalists, own the Ft. Wayne city electric railway system and the Lafayette lines, and Senator Fleming is building an electric railway between Ft. Wayne and Lima, Ohio. With the closing of the big deal Indianapolis will be connected with Ft. Wayne and Lima by continuous electric railway within the next few months, when the Indianapolis & Northern line, now building, shall have been completed. All of these lines will be owned by the one set of interests with the exception of the 53 miles between Wabash and Ft. Wayne, known as the Ft. Wayne & Southwestern, owned by the Boyd syndicate.

THE ELECTRIC RAILWAY IN HAVANA

According to a daily newspaper correspondent at Havana the conductors on the street cars ring up fares by clamping a wrench on the fare register rod, instead of handles fastened to the rods. The register rods have no handles as in New York street cars.

An idea of the character of the natives and their attitude toward modern innovations may be gained from the statement made by the same correspondent that "although the electric cars offer a quicker, smoother and much more pleasant way of moving about, the residents of Havana cling to the old-fashioned 'buses which were once the only public conveyances in the streets, and the bus patronage is apparently as good as ever it was. The 'buses take advantage of the car tracks for a road, however, and their passengers benefit from the electric line indirectly, if they do scorn the cars. The fare is the same in both." There are no open trolley cars in Havana yet, but they are coming and when they are in operation the Vedado line will be as attractive a ride as can be imagined. Along the seashore the cars make eighteen or twenty miles an hour, creating a breeze on the stillest days, and the view, with the old Spanish houses on one side and the sea on the other, is beautiful.

BRITISH STREET RAILWAY STATISTICS

The annual returns taken under Parliamentary enactment of the British tramway properties for the year ending June 30, 1902, has just been made public. The totals are contained in the subjoined table.

	England and Wales	Scotland	Ireland	Total United Kingdom
Capital stock issued.....	£7,261,649	£314,839	£1,688,322	£9,264,810
Funded debt issued.....	16,363,095	3,879,558	389,330	20,631,983
Total capital liabilities.....	23,624,744	4,194,397	2,077,652	29,896,793
Length of track—miles.....	1,187	134	163	1,484
Number of cars.....	6,173	983	596	7,752
Passengers carried.....	1,082,192,712	230,702,794	81,557,477	1,394,452,983
Gross receipts.....	£5,333,798	£905,324	£439,569	£6,678,291
Operating expenses.....	4,023,014	500,666	294,193	4,817,873
Net receipts.....	1,310,784	405,258	145,376	1,861,418

The amount of capital expended is £31,562,267, or £1,665,474 in excess of the outstanding capitalization. Of the total the properties belonging to local authorities represent £18,910,467 or 118 undertakings, while those in private hands are £12,651,800, or 115 undertakings. Of the 1484 miles of track 871 are equipped with electric power, 156 with steam, 25 with cable, 10 with gas motors, 384 with horses and 38 with mixed systems.

NON-STRIKERS' LOYALTY REWARDED IN LOS ANGELES

Union agitation among the 1400 trainmen of Los Angeles, Cal., finally resulted in an abortive strike on the evening of April 29, when seven motormen and five conductors of the Los Angeles Railway Company abandoned their cars in the business center and attempted a blockade of all the city car lines to compel H. E. Huntington, president of the Huntington-Hellman roads, to recognize the union and reinstate all discharged men.

Division 203 of the Amalgamated Association of Street Railway Employees of America was recently organized, but while it claims a membership of over 600 the railways are confident that its members number less than 100. The recently attempted strike seems to prove the union's weakness. Although the twelve disloyal men made off with the controller handles, other men with monkey-wrenches for improvised handles had the delayed cars in motion within 15 minutes.

Prior to the strike General Manager John A. Muir, of the Los Angeles Railway Company, had discharged about thirty trainmen for known affiliation with the union.

On the night of the strike over half of the day shifts were on hand and offered their unlimited services in case of an emergency. So well pleased was President Huntington with the loyalty of the hundreds of men who refused to strike that on May 1 he ordered every trainman employed by the Los Angeles Railway Company and the Pacific Electric Railway Company—about 1000 men—advanced in the service two years. The present scale of wages is 22 cents an hour for extras, while regulars receive 22½ cents an hour for the first five years; 23½ cents after the fifth year, up to ten years; 24½ cents after the tenth year, up to fifteen years, and 25½ cents after the fifteenth year.

THE COST OF LUBRICATION

G. B. Kirkbride, president of the Standard Automatic Lubricator Company, of Philadelphia, has recently been making some investigations as to the cost of car lubrication and brasses on electric railways, and has found an enormous difference in recorded cost per car mile of oil and brasses. On some lines the figures given are as high as 23 cents per thousand miles, while on others they are as low as 12 cents; while the life of brasses ranges from 6000 to 19,000 miles. In rare cases a bearing is reported as having run 22,000 miles under the old system of lubrication.

The Standard Automatic Lubricator Company manufactures a special bearing for cars, and one road which has been using it since Nov. 19, 1901, reports that a bearing made 98,670 miles; when it was then examined it was found that the lead lining of the bearing was only about half worn through, so that it is thought that the bearing will make about 200,000 miles. At the end of this time the bearing can be re-lined at an expense of about 12 cents, giving a new bearing at 12 cents as against \$1.65 first cost. The cost of oil per thousand miles has been less than three-tenths of a cent, although it has been used over again for a year without a single case of hot journals or the necessity of removing the car on account of lubrication. The Philadelphia & West Chester Traction Company has been using these bearings on one of its cars for about a year and a half, and reports that they are giving good service.

THE ROOF STORAGE SEMI-CONVERTIBLE CAR

The semi-convertible car has gained a recognized place in street railway operation, and the question for those roads on which this class of car is applicable, is not now the question of whether to adopt this type but which form of car to use. In the self-contained cars there are three systems of window storage; wall pockets in which both upper and lower sashes are dropped; wall and roof pockets, one for the lower and the other for the upper sash; and roof pockets for both sashes. As the claims made for the two former methods have recently been mentioned in these columns it is worth while to consider also the advantages claimed for the latter method.

The J. G. Brill Company is the builder of the cars in which both sashes are stored in the roof. This company claims that the roof storage system is without the objections attached to the other systems; namely, the space taken by the wall pockets, the condition that wall pockets are often in by becoming receptacles for refuse, and the inability to open the windows a short distance at the bottom to admit a small amount of air.

John A. Brill, vice-president of the Brill Company, was one of the first to recognize the need of such a car, and the large place it must ultimately occupy, and having patents covering the roof storage system of his convertible car, was free to choose between roof and wall pockets. It was a comparatively easy matter to adapt the system of the convertible to the semi-convertible car, as the main questions as to structural strength of roof and posts had long been settled by actual demonstration under severe conditions. If the roof weight of the convertible car were too heavy, so that the posts would get out of plumb, the runways of the sashes and panels in the posts would also get out of alignment, and sashes and panels would bind and stick. As this has never occurred, the firmness of the roof cannot be questioned. Reference to the full convertible car has been made because that car carries more weight in the roof, and has not the longitudinal support to the posts of the solid sides of the semi-convertible. As to being top heavy, the English double-deckers, and the Pullman sleepers, are cited by the company as examples that a large amount of weight may be carried high with perfect safety.

The windows of this semi-convertible car are guided from their lower position into the roof-pockets by a single runway in each post composed for the entire length of metal. The lower sash has small round metal projections or trunnions, one at each corner, which move in the runways. The lower sash may be raised but a short distance or the entire way, at the option of the passenger. The raising of a pair of sashes is a single operation, as the lower is being lifted, the upper becomes automatically attached to it.

The builders consider the absence of wall window pockets an important feature of the semi-convertible car, since there is no restriction as to the lowness of the window-sill, and the sides being narrow, additional space is available for the aisle by bringing the ends of the seats against the side lining, which is set several inches inside the line of the posts.

REPORT OF THE GENERAL OMNIBUS CO. OF PARIS

The report of the General Omnibus Company of Paris for 1902 is just at hand, and is of interest, as the company is not only the owner of practically all of the omnibus lines in Paris, but also of the greater part of the street railway lines. On the latter 7,808,300 car km (4,880,200 car miles) were run with horse cars and 13,073,866 car km (8,241,165 car miles) with mechanical traction. The report for the year was as follows:

	Total	fr. per car km	Cents per car mile
Receipts from passengers. F.	46,843,240	\$9,368,648	1.0325 33.04
Receipts from other sources.	1,450,522	310,104	.0242 .77
Total F.	48,393,762	\$9,678,752	1.0567 33.81
Operating expenses.	44,097,940	8,819,588	.9719 31.09
Corporation tax	48,893	9,778	.0011 .93
Interest on funded debt.	2,554,310	510,862	.0562 1.79
Sinking fund.	6,637,000	1,327,400	.1463 4.89
Deficit for year	4,944,381	988,876	.1089 3.47

The different motive powers used showed the following operating expenses "for motive power," which, according to the classification of accounts used, includes all power station (or stable) expenses, wages of motormen or drivers (but not conductors), repair shop expenses, and all maintenance of machinery, harness, etc., but not of car bodies:

	fr. per car km	Cents per car mile
Compressed air	0.4764	16.24
Steam, Serpollet system	0.4689	15.00
Steam, Purrey system	0.4650	14.89
Steam, Rowan system	0.4766	15.25
Storage batteries	0.5479	17.52
Average mechanical	0.4814	15.40
Horse	0.5331	17.17

The gross receipts show a loss of fr. 890,843, or \$176,169 from last year. Nevertheless the authorities increased the taxes, which amounted during the year to fr. 5,366,911, or \$1,073,382.

CONSOLIDATION AT KANSAS CITY

Blair & Company, and Kuhn, Loeb & Company, of New York, have formed a syndicate for \$25,000,000 to finance the combination of Kansas City light and street railway companies. The chief components of the combine will be the Metropolitan Street Railway Company, which controls about all the street railway lines in Kansas City, and the Kansas City Electric Light Company. The former has a capital stock of \$8,500,000 and the capital of the latter is \$2,500,000. Besides the street railway company has a funded debt of \$16,000,000. The new company will be known as the Kansas City Railway & Light Company. Its capital will be \$25,000,000, of which one-half will be preferred stock. The charter will be taken out in New Jersey within a few days. It is understood that the stockholders of the Metropolitan Company are to receive for each 100 shares of their stock 100 shares of the preferred stock and 60 shares of common stock in the new company, and that the stockholders of the Kansas City Electric Light Company receive for each 100 shares 80 shares of the preferred and 100 shares of common stock in the new company.

WORCESTER CONSOLIDATED FAVORABLY REPORTED

The Massachusetts Railroad Commissioners have issued a report upon the service of the Worcester Consolidated Street Railway Company, since the present management took charge of the system, on March 1, 1901. The report gives much credit to the road for the extensive improvements which its officers have effected, and states that these changes for the better have been greater in Worcester than in any other city in the State during that period. The board states that the present system embraces the old Worcester Consolidated Street Railway, the Worcester & Marlboro, the Worcester & Suburban and the Leominster & Clinton Street Railways. At the time of the consolidation the Worcester lines were in a very unsatisfactory condition, the track being generally out of surface, joints low and the crossings of steam railroads, frogs and switches were badly worn. The Worcester & Suburban Railway was in better condition, though in places rails were light and the roadbed poorly constructed. The Worcester & Marlboro, and the

Leominster & Clinton properties were in fair condition, although below the accepted modern standard.

Since the present management took charge much of the roadbed has been reconstructed, old girder rail replaced with new, double-track connections made at various points, new steam railroad crossings put in, and frogs and switches generally renewed. New extensions have been built, telephone system established upon the suburban lines, and electric block signal installed on single-track city lines, and on the suburban line to North Grafton.

In March, 1901, the total car equipment was 309 cars, 247 being single-truck and sixty-two double-truck. But twenty-one cars were equipped with power brakes. The cars were generally dirty, uncomfortable and poorly lighted, while flat wheels and broken seats were common. There are now in use 349 cars, of which 142 are double-truck and equipped with air brakes, eighty-five modern, comfortably cushioned and well lighted double-truck cars have been bought.

The power station of the company was inadequate and frequently in a crippled condition. The capacity of this station, which is located at Fremont Street in Worcester, has been much increased.

The board's criticisms of the service relate chiefly to troubles experienced from lack of good coal in the past winter, and the annoying delays to cars caused by long freight trains and switching of steam roads at grade crossings. The abolition of these crossings appears to be the remedy for the latter trouble, and the increased power capacity of the road the insurance against delays caused by station breakdowns.

CONSOLIDATION AT COLUMBUS, OHIO

It is proved that the rumors of a consolidation of the Columbus Railway Company and the Columbus Edison Company, of Columbus, Ohio, were not without foundation in fact, for articles of incorporation have been filed for the Columbus Railway & Light Company, capitalized at \$5,000,000, with a view to consolidating the properties. Unofficial reports say that the proposition to lease the properties is on a basis of 3 per cent the first year, 4 per cent the second year, and 5 per cent the remaining years; also, to give the common stockholders of the old companies the opportunity to subscribe to the stock of the new company at \$20 per share. Similar propositions, it is stated, will also shortly be made to the Columbus Gas, Light & Heating Company.

TOPICS OF THE WEEK

The interurban railways of Indiana are watching a case pending in Dearborn Circuit Court against the Cincinnati, Lawrenceburg & Aurora Traction Company. A property owner is suing the company for damages because the company's line has been placed in the center of the highway passing his property. He bases his suit on the fact that abutting property owners own the fee to the center of the adjacent highway. In the cities it has been held that the street railways are aids to local passenger transportation, for which streets are constructed, and that, as such, are no additional burden on the street, and so not liable for damages to the abutting property. Railroads, however, are held to be an additional burden and damages are assessed against them. The position of the interurban lines in this matter is yet to be determined by the Indiana Courts. If the courts allow damages in this case it is likely to be followed by a flood of similar suits in every county where interurban roads have been built in the highways, under franchises from the county commissioners, and without securing consent of the property owners.

Through the filing a few days ago of the completed appraisement of the estate left by Henry Hart, for forty years president of the Third Avenue Railroad Company, of New York, it was learned that the net personal property amounted to less than \$100,000, and no real estate was mentioned. This reveals the immense shrinkage in the property of the man who, in 1897, at the high tide of his prosperity, was reputed to be worth between \$15,000,000 and \$20,000,000. Mr. Hart was one of the most picturesque men in New York right up to the time of his death on Nov. 7, 1901. He was born on July 27, 1811, in New York city, and his first independent business venture was in 1835, when he opened a pawnshop at 27 Chatlam Street. Here he did business until 1853, when his Third Avenue Railroad plans first were put in execution. Although in later life Mr. Hart had many other important interests, his best energies were always devoted to the Third Avenue Railroad. Mr. Hart was a bachelor, and at no time during his entire ninety years of life is there any known period when romance entered into his strictly

business career. Mr. Hart's death was ascribed to old age, but it is believed that the trying ordeal incident to the reorganization of the Third Avenue Railroad hastened his demise.

NATIONAL ELECTRIC COMPANY

The constantly increasing demand for Christensen air brakes and "Ceco" electrical machinery has made a change necessary in the organization of the Christensen Engineering Company. To accomplish this result the owners of the stock of the latter company have organized the National Electric Company, and the assets, good will, etc., of this company have been transferred to the National Electric Company, the purposes, ownership, management and control of the new company being identical with those of the old.

NEW CAR BUILDING PLANT AT PEORIA

What will be one of the most modern and thoroughly up-to-date car building plants in the country is to be built at Peoria, Ill., during the next few months, under the name of the Peoria Car Company. The company has recently been incorporated for \$1,000,000. A. L. Jacobs, who is well known through his 20 years' experience in the car building industry, is general manager of the company. The other officers and directors are men of high standing, and the organization as a whole will be composed of men of practical experience and excellent business ability.

The location at Peoria is an ideal one, from the fact that it is nearly in the center of the United States, and possesses almost unrivalled shipping and transportation facilities. Peoria is reached by no less than fifteen railroads, and also has the advantage of the river transportation. The low commodity rates on raw materials, the cheap fuel, and the large available amount of skilled labor secured at reasonable rates, will all combine to give the company advantages that would not be obtained in many other sections of the country.

The company has already been assured of a large number of orders, which will keep the works busy from the start. This is due to the confidence placed in Mr. Jacobs by many leading railway managers through their familiarity with his past experience and reputation. It will be remembered that Mr. Jacobs, at that time connected with the Pullman Company, built the original electric car equipped with Vandepole motors set on front platform and operated by sprocket wheel and chain. From that time, Mr. Jacobs has been constantly identified with the building of electric cars, one of his latest achievements being the designing and building of some of the Aurora, Elgin & Chicago Railway cars, which have been pronounced as among the best constructed electric railway rolling stock in operation. Among other cars with the designing and building of which Mr. Jacobs has been connected were the cars for the Rockford, Beloit & Janesville Railway Co., the Trenton & New Brunswick Fast Line, the Louisville, Anchorage & Pewee Valley Railway Co., of Louisville, Ky., the Interurban Construction Co., of Alliance, Ohio, and the Western Ohio Railway Co., of Lima, Ohio, all of which have been recognized as representative of the most modern practice in car building. Mr. Jacobs' ability to design and build cars of this character, coupled with the excellent manufacturing and shipping facilities which this new company will possess, will, it is believed, assure an even higher grade of work when the new plant is in operation. The works will be completed and delivering equipments after January, 1904.

SELF-COOLING TRANSFORMERS

Westinghouse transformer practice is discussed in a document recently issued by the manufacturers, in which they say:

The amount of heat developed in a transformer depends upon its capacity and efficiency. In a 500-kw transformer of 98.5 per cent efficiency there is a loss at full load of $7\frac{1}{2}$ kw, or 10 hp. Since this loss appears as heat, it must be disposed of, to prevent a dangerously high temperature.

This heat may be dissipated by simple radiation from the surface of the containing case; by the circulation of water through pipes immersed in oil, or by the constant removal of heated oil and its return after having been cooled. The advantages of the first method are obvious.

To dispel the heat generated in a transformer of the self-cooling type a case with a large surface area exposed to the air is required. The greater the radiating surface, the lower the temperature. The Westinghouse transformers are mounted in heavy sheet-iron cases

protected by an outer framework of angle-iron. The surface area of the case is increased by corrugations, and is capable of radiating an immense amount of heat.

The high tension terminals are mounted on a marble slab at one end of the transformer, the leads being brought out through bushings. The low tension terminals are mounted at the opposite end of the transformer on a steel bar heavily insulated with mica, making an entirely safe construction.

In a transformer the losses are of two kinds; first, iron loss, due to magnetic reversals in the iron; second, copper loss, resulting from the passage of current through the conductors.

In large transformers for long distance transmission, close regulation is of even greater importance than in the ordinary small transformer for lighting circuits, as the drop in the line is often of considerable magnitude, and with raising and lowering transformers the transformer drop occurs twice between the generator and the load.

Oil-insulated, self-cooling transformers may be wound for practically any voltage desired. The following high-tension voltages, however, have been adopted as standard: 2200, 6600, 11000, 16500, 22000, 33000 and 44000. Taps are brought out from the high-tension winding for three lower voltages. This provision makes it possible to use duplicate transformers at both ends of the transmission line, the taps on the lowering transformers accommodating them to the reduced line voltage. The following table shows the exact voltages for which Westinghouse standard transformers are wound:

2200	6600	11000	16500	22000	33000	44000
2100	6300	10500	15750	21000	31500	42000
2000	6000	10000	15000	20000	30000	40000
1900	5700	9500	14250	19000	28500	38000

Transformers of a capacity not exceeding 150 kw may be wound for voltages as low as 50, and the larger transformers for voltages as low as 100.

Where rotary converters are employed, it is often required that the e. m. f. of the direct current vary over a wide range. This variation is obtained by a corresponding variation in the e. m. f. of alternating current supplied.

In connection with either a two-phase or three-phase rotary, the oil-insulated, self-cooling transformers which supply the rotary may be arranged for three-wire direct-current distribution.

The Westinghouse Electric & Manufacturing Company manufactures a standard line of these transformers in sizes from 10 to 500 kw, and for voltages up to 44000.

MILAN-GALLARATE-VARESE RAILWAY, ITALY

It is reported that during the first year's operation of the Milan-Gallarate-Varese Railway by electricity 7,000,000 car miles have been run by the electric trains against 3,000,000 train miles by steam in 1897. The passenger receipts from Dec. 1, 1901, to Aug. 31, 1902, amount to 993,150 lire, against 663,000 lire for the same period of the preceding year, notwithstanding a reduction in fares.

STREET RAILWAY PATENTS

UNITED STATES PATENTS ISSUED MAY 12, 1903

727,593. Ice Scraper; Fred B. Corey and B. Corey, Schenectady, N. Y. App. filed Sept. 13, 1902. A wheel provided with circumferential cutting edges is held in contact with the rail and at an axis oblique thereto.

727,608. Contact Device for Trolleys; Charles L. Fitch, Grand Rapids, Mich. App. filed July 1, 1902. A small roller or ball mounted under the trolley wheel is adapted to take current therefrom.

727,649. Trolley Catcher; Eugene Limaige, Brussels, Belgium. App. filed Dec. 3, 1902. Details.

727,684. Electric Motor System; William B. Potter, Schenectady, N. Y. App. filed Oct. 31, 1900. The car is started with battery current, and maintained at speed from the trolley, the battery being charged meanwhile.

727,918. Radial Car Truck; Robert L. Ellery, Portsmouth, N. H. App. filed June 7, 1902. Consists of two bogies pivoted one to the other at a common point there between, each of the bogies consisting of a truck frame supported upon an axle and a pair of wheels and a king bolt center bar pivoted at each end to one of the bogies.

727,919. Radial Car Truck; Robert L. Ellery, Portsmouth, N. H. App. filed June 7, 1902. The invention consists in a car truck of the combination of a frame, a slide arranged to move verti-

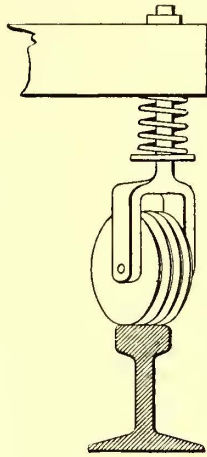
cally in the frame and an axle journal box arranged to move horizontally in the slide.

727,953. Car Fender; Albert L. Igou, Cleveland, O. App. filed Sept. 2, 1902. A cross bar carried by the front of the fender is arranged so that whenever an object is struck it will pull a trigger which will free the fender and permit it to drop upon the track.

728,094. Sand Box and Mechanism for Actuating Same; John William Endean, Davenport, England. App. filed Aug. 29, 1902. Details.

728,130. Combination Wheel and Rail Brake; John Redmond, Fairchance, Pa. App. filed July 25, 1902. Consists of a rail brake which is hinged to the wheel brake, whereby as the rail is lowered into engagement with the rails it will automatically force the wheel brake into engagement with the wheel.

728,164. Signal Controlling System for Electric Railways; George Hibbs, New York, N. Y. App. filed May 22, 1902. To prevent excessive demands for power upon a power station due to the simultaneous movement of an abnormal number of trains which have been held up or delayed, the clearing of the signals is made dependent upon the amount of current drawn by the trains, thereby properly spacing the trains.



PATENT NO. 727,593

PERSONAL MENTION

MR. J. N. SHANAHAN has been appointed general superintendent of the Fonda, Johnstown & Gloversville Railroad Company, of Gloversville, N. Y.

MR. GEORGE E. MOFFATT, formerly with the Philadelphia Rapid Transit Company, has just accepted the position of general manager of the Conneaut & Erie Traction Company.

MR. JOSEPH B. HALL has severed his connection with the General Electric Company, Chicago, as sales representative, and is now chief engineer of the McGuire Manufacturing Company, of Chicago.

MR. E. C. FOSTER has resigned as vice-president and general manager of the Massachusetts Electric Companies, of Boston, Mass., to accept the position of president and manager of the New Orleans Railways Company, of New Orleans, La.

MR. F. E. TOBE, who has been acting superintendent of the Michigan Traction Company, of Kalamazoo, Mich., has been appointed superintendent of the company in charge of the lines in Kalamazoo and Battle Creek, as well as the interurban line between those cities.

MR. LOYAL R. ALDEN, for two years superintendent of the electric department of the Roland Park Company, of Baltimore, Md., has severed his connection with that company and has accepted the position of chief engineer with the Conestoga Traction Company, of Lancaster, Pa.

MR. EDWARD G. CONNETTE, general manager of the Syracuse Rapid Transit Company, of Syracuse, is made the subject of a page article in the Syracuse Herald for May 10, under the title of "Men of Achievement." A biographical sketch of Mr. Connette is given from his connection with the Louisville, Cincinnati & Western Railroad, now the Louisville & Nashville Railroad, to the present time, and several excellent characteristic views of him are given.

MR. ALBERT EASTMAN has been appointed division superintendent of the Fort Street and Wyandotte line of the Detroit United Railways in place of Mr. Robert Johnson, who has been assigned to other duties. Mr. Eastman is a practical railway man of much experience. He entered the employ of the Detroit United some years ago, coming from the Grand Trunk Railroad System. A few months ago, however, he left Detroit for Utica, N. Y., where he was passenger and express agent of the Utica city and suburban lines.

MR. ROBERT S. GOFF, general superintendent of the Old Colony Street Railway Company, of Boston, has been appointed vice-president and general manager of the Massachusetts Electric Companies, to succeed Mr. E. C. Foster, resigned. Mr. Goff was born in Fall River, Mass., and was educated in the public schools of that city. For a time he was engaged in the insurance busi-

ness, and in 1880 secured a position with the Globe Street Railway, of Fall River, as clerk. In 1889 he was made treasurer of the company. In 1898 he was elected president and general manager of the company. In 1901 he became general superintendent of the Old Colony System.

MR. DAVID YOUNG, announcement of whose retirement as general manager of the North Jersey Street Railway Company to accept a position as expert street railway adviser with Brown Brothers & Company, of New York, was made in the STREET RAILWAY JOURNAL for May 16, was visited at his residence in Jersey City last Saturday night and presented with a handsomely engrossed set of resolutions. Mr. Young was also presented with a handsome gold fountain pen as a token of appreciation by the men. Mr. Young was deeply affected, for while in severing his connection with the company he does not entirely break off his many friendships, yet the opportunity for frequent intercourse with many beloved associates will be gone.

MR. GEORGE R. FOLDS, assistant to the general attorney department of the Brooklyn Rapid Transit Company, has been appointed assistant to Vice-President and General Manager J. F. Calderwood, of that company. Mr. Folds has been with the Brooklyn road for about a year. He came from the Twin City Rapid Transit Company, Minneapolis, shortly after Mr. Calderwood, and, although holding a position in the legal department, he has familiarized himself with all the details of the system's operation. Mr. Folds has spent a greater part of his life in street railway work, having pursued his law studies while in the operating department of the Twin City Rapid Transit Company. Since coming to Brooklyn he has made many friends among the personnel of the company by his pleasant manners and his appreciative understanding of their work, and they are greatly pleased at his recent appointment.

MR. H. E. O'BRIEN, chief of the mechanical engineering department of the Lancashire & Yorkville Railway, one of the important English railroads, recently made an inspection of the Toledo & Western Railway, with headquarters at Toledo, Ohio. Mr. O'Brien is making a trip through the country and is going over a number of leading electric lines. Speaking of his trip over the Toledo & Western, Mr. O'Brien said: "I am more surprised at the results obtained on the Toledo & Western than any other line in this country. The way the road is handling freight is a revelation to me, and such good time is made with the passenger cars, too. By a stop watch I caught several runs that were better than 40 miles an hour. Our shareholders are thinking of changing our power from steam to electric, and if we do I think we will follow the ideas of the Toledo & Western more closely than any other line I have inspected. Our road is 90 miles in length, and we have an immense business requiring frequent and rapid service."

MR. FRANK S. GANNON has just been elected first vice-president of the Interurban Street Railway Company, of New York, a place made vacant by the resignation of Mr. D. B. Hasbrouck. Mr. Gannon is a lifelong friend of Mr. Vreeland, the president of the Metropolitan Street Railway Company, and has occupied a number of very responsible positions with different steam railroad companies. His last connection with steam railroad work was that of first vice-president and general manager of the Southern Railway Company. While in this office Mr. Gannon had direct supervision of the fiscal operation of this extensive corporation, and during his connection with the company, which began in 1896, the net receipts of the road were practically doubled, increasing from \$5,630,799 in 1896 to \$10,865,411 in 1901. Mr. Gannon was born in Spring Valley, Rockland County, New York, in 1851, and has been engaged in railway service since November, 1868, when he started as a telegraph operator on the Erie Railroad. He was later associated with the Long Island Railroad, whose service he entered in April, 1875, and from which he resigned when master of transportation in January, 1881, and the New York City & Northern Railroad, another railroad with which Mr. Vreeland was connected, and of which he was general superintendent from 1881 to 1886. In the latter year he was appointed general superintendent of the Staten Island Rapid Transit Company, and subsequently president of the railroad and general superintendent of the New York Division of the Baltimore & Ohio Railroad. Mr. Gannon resigned these positions in 1896 to accept the office which he has recently held with the Southern Railway Company. Like Mr. Vreeland, he has a robust constitution and an attractive personality and has been very popular not only with his associates in office but also with the large number of employees over whom he has had supervision. The Interurban System is to be congratulated upon having secured the services of such a capable, efficient and experienced railroad official.

NEWS OF THE WEEK

CONSTRUCTION NOTES

LOS ANGELES, CAL.—Active work has begun on the Pacific Electric Railway Company's proposed line to Whittier. The amount of track to be laid is 24.6 miles. The route will be double-tracked most of the way.

LOS ANGELES, CAL.—The Pacific Electric Company has applied to the Santa Ana Valley Irrigation Company for right of way over the company's lands near Rincon, in the Santa Ana Canon. It is understood that this action means the building of an electric railway to Corona and Riverside, possibly as an extension of the Whittier branch, in the near future.

MARTINEZ, CAL.—An application has been filed by Robert N. Frick for an electric railway franchise to the top of Mt. Diablo. The proposed line is to pass through various towns between Martinez and Mt. Diablo.

LOS ANGELES, CAL.—The Los Angeles & Glendale Electric Railway Company has been incorporated, with a capital stock of \$1,000,000. Of this \$25,000 has been subscribed. The directors are R. H. Howell, E. T. Simpson, W. H. Holliday, George F. Cope and L. C. Brand.

FRESNO, CAL.—The Pacific Light & Power Company, of Los Angeles, a corporation in which Henry E. Huntington is heavily interested, has absorbed all the street railway companies of this city. Henceforth they will be run under one management, and many improvements are in contemplation. The Fresno City Railway Company, operative also of the Fresno, Belmont & Yosemite Railroad Company, has about a dozen miles of tracks, eight or ten electric cars, a power plant and a repair shop. The rights of the Fresno Railroad Company comprise 4.52 miles of track, seven horse cars and some valuable franchises. The lines of the former company reach a park.

HARTFORD, CONN.—The Hartford & Springfield Street Railway Company is building about three miles of double track between East Windsor and Warehouse Point. The double-tracking will make possible some improvements in the interurban service between Hartford and Springfield.

WALLINGFORD, CONN.—The Wallingford Tramway Company has begun work on its proposed line between New Haven and Wallingford. About 8 miles of line are to be built, and six double-truck cars are to be operated. A power station is to be built, and a feature of its equipment will be two steam turbines. Two 500-kw generators and three 200-hp water-tube boilers will also make up part of the station equipment.

DENVER, COL.—One of the plans of the Denver Tramway for the coming summer is to extend the South Broadway line 3 miles, so as to reach Littleton, 10 miles south of the center of the city. Agents of the company are already securing the right of way. This road will not be built, however, according to the officers, until the work of building into Boulder is under way.

VICTOR, COL.—The Council has ordered that the ordinance granting right of way to the Colorado Springs & Cripple Creek Electric Railway through the business streets be ordered printed. When the road is completed it will make connection with the company's lines from Cripple Creek through this city and to the city of Goldfield.

WASHINGTON, D. C.—The Old Dominion & Great Falls Electric Railway is said to have obtained all the rights of way to the Great Falls. It is also said that plans are practically completed for building the line, and that contracts for construction will be let in the near future. Senator Stephen B. Elkins and John R. McLean are interested.

ATLANTA, GA.—A charter has been granted to the Piedmont Electric Railway Company to build an electric railway about 40 miles in length from Atlanta through Roswell, in Cobb County, through Alpharetta, in Milton County, to Cumming, in Forsyth County. The capital stock of the new company will be \$500,000, with the privilege of increasing it to \$1,000,000. The company has been granted privileges to haul both passengers and freight.

COEUR D'ALENE, IDAHO.—Surveys are now being made by the Coeur d'Alene & Suburban Railway Company for the construction of its proposed line between Coeur d'Alene and Spokane, a distance of 34 miles.

IDAHO FALLS, IDAHO.—The application of Mark Austin, who asks for a franchise to construct an electric railway in Idaho Falls, is under consideration by the City Council. The opinion prevails that the petition will be granted.

FREEMPORT, ILL.—The City Council has passed an ordinance granting a railway and lighting franchise for twenty years to the Freeport Electric Company.

DIXON, ILL.—The Dixon, Rock Falls & Southwestern Electric Railway has been granted a franchise through Coloma Township to Hume Township.

DECATUR, ILL.—Surveys are being made of the route of the Corn Belt Interurban system, which is to run from Decatur or Bloomington, thence to Pekin and Peoria. Preliminary surveys were made early in the spring. The plans for a central electric station to cost \$175,000 have been made, and it is understood the contract has been let for its construction at Clinton, between Decatur and Bloomington.

BELLEVILLE, ILL.—The Belleville & Smithton Electric Railway Company has been incorporated, with a capital stock of \$300,000. The incorporators are: G. G. Bock, E. Thomas, Fred L. Geissler, G. A. Koerner, Jr., and Lilburn G. McNair.

BELLEVILLE, ILL.—The Illinois Transit Company has been incorporated, with a capital of \$1,000,000. The incorporators are: Charles E. Thomas, B. H. Portuondo, Charles W. Thomas, Lilburn G. McNair and Fletcher R. Harris. The company proposes to build electric railways between Belle-

ville and O'Fallon Streets; between the National Stock Yards and Eads Bridge, and also from the Stock Yards on Bowman Avenue to the city limits and East St. Louis.

CHICAGO, ILL.—The branch of the South Side Elevated, the branch to the stock yards, a third track for express trains between Twelfth Street and Forty-third Street, and the lifting of the rails of the Chicago Junction along Fortieth Street from the lake to the stock yards, are assured by the attaching of the remaining signatures to the ordinance providing for this work. The cost of the entire undertaking is estimated at \$4,950,000. Construction will be begun in August, and it is expected that the new branches will be ready within three years. As compensation to the city for the third track the South Side Elevated will pave the alleys from Twelfth Street to Forty-third Street with asphalt, so as to relieve traffic on State Street and Wabash Avenue.

RICHMOND, IND.—Senator Foraker and Messrs. Duhme and Caldwell, of Cincinnati, have asked the Richmond City Council for a franchise in Richmond for their interurban line to connect Richmond and Hamilton, Ohio. The line will be a connecting link in one of the Indianapolis-Cincinnati lines.

JEFFERSONVILLE, IND.—The Southern Indiana Interurban Railway Company has placed in operation its line between Jeffersonville and New Albany.

EVANSVILLE, IND.—The County Commissioners and City Council have granted the right of way to the Evansville & Henderson Traction Company. The road will extend from Evansville to Henderson, and later will be built to Uniontown, Ky. Work will commence within a year. An Eastern company has promised to finance the road.

PORTLAND, IND.—The Eastern Indiana Traction Company has been granted a renewal of its franchise in Portland for a line to connect with the Ohio Southern at Hamilton and to run to Portland and Marion by way of Richmond.

EVANSVILLE, IND.—A franchise has been granted to the Evansville, Booneville & Rockport Traction Company. The road will be 50 miles long.

KENDALVILLE, IND.—The City Council has granted the Toledo & Western Electric Railroad a franchise through the city.

INDIANAPOLIS, IND.—The Chicago, Indiana & Michigan Traction Company, capital \$500,000, has been incorporated by Hugh J. McGowan, president of the Indianapolis Interurban & Terminal Company; Edward L. McKee, John F. Wild, Lyn B. Martindale and Major Russell B. Harrison, of Indianapolis. The company will have a Chicago connection, and will build a line through Hammond to Michigan City, Laporte, Valparaiso and South Bend. Work is now being done on the grade near Michigan City.

INDIANAPOLIS, IND.—Interests identified with the Indianapolis & Martinsville Traction Company plan to build an electric railway from Martinsville to Bloomington, a distance of 23 miles, to connect with the Indianapolis and Martinsville company's road. Unofficially it is said that it has not been decided whether a new company will be organized to do the work or whether the Indianapolis company will build the road.

EVANSVILLE, IND.—The right of way has been granted to the Evansville & Henderson Traction Company. The road will extend from Evansville to Henderson, and later will be built to Uniontown, Ky. Work will commence within a year. An Eastern company has promised to finance the road.

INDIANAPOLIS, IND.—Franchises have been granted to W. B. Hubbard, H. D. Yoder and other Indianapolis men for the construction of an interurban line from Madison through Jefferson, Jennings and Bartholomew counties to Columbus. At Columbus, according to the plans that have been made, the line will connect with the Indianapolis, Columbus & Southern and will thus give Madison direct electric railway connection with Indianapolis.

DES MOINES, IA.—It is reported that the Rapid Transit Company, of Waterloo, will extend its line to Charles City.

BURLINGTON, IA.—The Burlington & Keosauqua Railway & Power Company is to be organized to build an inter-urban electric line from Burlington to Keosauqua by one of the three routes which they have surveyed. Royal H. Holbrook, formerly general manager of the Ottumwa Traction & Light Company, is connected with the scheme, and did much of the preliminary work.

SIoux CITY, IA.—A syndicate of Sioux City and Chicago capitalists has asked the City Council for franchise rights for a line of electric railway to be extended to Le Mars, Iowa.

DES MOINES, IA.—The Western Iowa Interurban Railway Company has been formed to build an electric railway between Des Moines and Council Bluffs. It is capitalized for \$1,000,000. The plan of the company is to build an electric railway through Polk, Dallas, Guthrie, Audubon, Shelby, Harrison and Pottawattamie Counties. It will start from Des Moines. It will run through Panora, Guthrie Center, Audubon and Harlan. A board of directors has been selected as follows: H. H. Polk, of Des Moines; Clyde Brenton, of Dallas Center; E. W. Weeks, of Guthrie Center; J. A. Nash, of Audubon; G. W. Cullison, of Harlan; J. W. Davis, of Council Bluffs. The company is to organize on June 1.

WICHITA, KAN.—The franchise of the Wichita Electric Street Railway Company has been extended by the City Council from twenty to thirty years. If this extension had not been granted the franchise would have expired in 1902.