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THE DECLINE OF THE JITNEY

As we predicted some time ago, the jitney wave is receding. It is settling down from its original stage of mad enthusiasm to one of sober second thought, the inevitable result of which will be fewer jitneys. As one looks over the motley crew in any city where the craze has been active, he notices that the vehicles are getting to look more and more disreputable, the drivers less cheerful and the public less enthusiastic over this new mode of transit. Moreover, we are approaching a time of the year, certainly in the Northern States, when this condition is bound to increase. With the advent of real cold weather it is safe to say that the average person would very much rather ride in a warm street car than in a dilapidated touring car of the vintage of 1910 with an extemporized cover. The jitney was never intended to contend against snow, and the first real storm will probably send most of those remaining on the streets to winter quarters. Whether they will reappear next spring in the same numbers as during the spring of 1915, we consider very doubtful. The experience of the past year has shown that repairs cannot be postponed indefinitely, and that the average patronage was not what was expected. Moreover, in most cities adverse legislation has been passed to protect the public against irresponsible jitney drivers and decrepit cars, and there should be more this winter to discourage the reappearance of jitneys in the spring.

THE EFFECT OF THE JITNEY

Although the jitney is on the decline it will leave its effect behind. One of these is that the railway companies will be less able to make needed extensions and improvements because of the losses which they have experienced from jitney competition. This is a lesson to the public. It ought to have realized that the main work of urban transportation would have to be undertaken by the local electric railway system, and that the more its revenues were depleted by pirate competition the less able was it to maintain its growth equally with that of the city. To the railway company it has also brought some lessons. One is in favor of lighter cars and more of them, so as to increase the frequency of service. The other is to emphasize the desirability of a light motor bus for certain classes of service for which the electric car is not suited, because the traffic to be obtained could not support the larger investment which would be required in permanent fixtures. For service of this kind the motor bus, at a fairly high charge per mile, would occupy a field which is not filled now by any other public means of transportation except the horse-drawn stage, as, for instance, in handling strictly summer business at ocean and mountain resorts. A motor bus is certainly a vast improvement over the ramshackle "depot wagon," familiar at shore stations all along the seaboard. What was good and useful in the jitney bus idea is due to survive, but the disappearance of the wandering jitney, prowling around on rickety wheels and waiting for trusting passengers, will have no mourners.

THE REPULSION-STARTING SERIES MOTOR

The single-phase electrification on the main line of the Pennsylvania Railroad out of Philadelphia, described in last week's issue of this paper, brings this system into the focus of interest once more. On the technical side a most interesting feature of this installation is the departure from the familiar design of a.c. series motors which was adopted. The usual high resistance leads inserted between the armature winding and the commutator bars to limit the transformer currents in the coils short-circuited by the brushes have been omitted. Instead, during the starting period, when the transformer currents in the coils short-circuited by the brushes are maximum, the short-circuit voltages are kept down to the values at which the brushes, through their resistance, can prevent the formation of serious sparking. Information as to just how this is done is not yet available for publication, but an important element is the use of the "repulsion" starting principle commonly employed with single-phase induction motors of moderate size. Up to 15 m.p.h. the armatures of the motors are short-circuited, reducing the armature voltage to a very low value. By suitable proportioning of the windings it is possible to produce an armature current in this way for starting which is much larger than that drawn from the transformer secondaries. Returning to the short-circuited coils and the usual resistance leads it is obvious that the latter are a source of construction cost and originally were the cause of some operating trouble. They are also the source of heat, to offset which the active armature conductors must be made large and a liberal supply of armature iron provided. The successful omission of these leads would therefore be desirable, as the a.c. motor armature would then not differ essentially from the d.c. motor armature. As the resistance is needed only at starting, it follows that if the armature can be brought up to speed with good commutation by any other means such commutation can be maintained without difficulty thereafter. The significance, therefore, of the choice of the repulsion-starting type of motor by

the Pennsylvania Railroad, rather than the usual series type, is that it secures thereby a cheaper and lighter motor, one with an armature not radically different from that of a direct-current motor.

ORIGINAL COST IN VALUATION WORK

When commissioners, lawyers, economists, engineers and accountants assemble, as they did in Philadelphia last week, to discuss moot topics in the still undeveloped field of public utility valuation, a marked unanimity of opinion as to detailed theories and practices is not to be expected. Yet varied as were the opinions expressed at Philadelphia there was a marked tendency among many of those present to emphasize the importance of original cost in valuations for rate making rather than reproduction cost. The principal reason for this attitude, not always openly expressed but ascertainable by reading between the lines, is the thought that such a plan would give a lower valuation in most cases of steam railroad valuation than reproduction cost, owing to the increase in land values and present higher costs of material and labor. This, of course, is no reason at all and has no foundation in ethics. The choice of either original cost or reproduction cost as a sole basis of valuation or the determination of the comparative weight of these two costs as factors in present value are questions that are dependent for their solution upon equity and not upon the mere belief that one method or another will give a higher figure.

It is probably true that where original cost can be completely ascertained and properly compiled, it is of more value in showing the sacrifice of the investors than the fluctuating reproduction cost based on present conditions. As long as courts have to act upon this question, however, the point of practicability will undoubtedly have to be largely the guiding principle. On account of missing records and undeveloped accounting methods in the past it is doubtful whether in most cases a just finding of original cost can be made, and the theory of reproduction cost will by virtue of necessity in such cases have a greater weight. Indeed, in the decisions of the courts up to this time, original cost and reproduction cost have been recognized as the two most important factors in the present value of a utility, but the greater ease of applying the reproduction cost theory has led to its acquiring a predominating influence in most valuations. Even where the original cost is to a large extent sufficiently determinable for fair use, the reproduction cost must be used in supplying secondary evidence as to the part of the original cost where the primary evidence is lacking.

While we believe that much can be said in favor of the theoretical equity of the original cost basis, especially in the case of a company which has been through many vicissitudes and changes in equipment, we are opposed to the agency theory in its support as was advanced at Philadelphia. Under this theory, the utility is supposed to have been simply the agent of the municipality in developing the service and should be credited only with the sums actually expended, while being required to return to the public all large profits. There are two vital objections to this theory. One is that it presupposes a guarantee of the agent by the principal against loss. This was never the case with public utilities and cities in the past. If the public claims a right to all past large profits of the successful utilities it should recompense the stockholders of those which were not profitable for their losses of both return and investment. Actually, the successful utilities at the present day are a part only of those which were launched with seemingly equally bright prospects, and as the stockholders in the successful utilities took the risks they are entitled to the profits earned. The other answer to the agency theory is a legal one. The title to the property has always been with the utility, showing it was the principal and not the agent.

After all, equitable considerations must govern the treatment of old companies on all points. In valuation matters the original cost need not be and in many cases can not be the sole basis of valuation for such companies, but it must be considered a prime factor in according to the investor the treatment which he has a right lawfully to expect—in other words, in fixing the valuation basis and rate of return which would have induced the investment, could it have been known in advance. Above all, the combination of the valuation figure and the rate of return constitutes the important figure to be used in judging fairness, and until these are both settled for each particular case the question is largely academic.

The question of a rate basis for the future is not so difficult, for there seems to be no doubt even on the part of public representatives that the real criterion for a rate basis must be the actual legitimate investment honestly made, and on this basis a return must be allowed which the investor is willing to accept, as long as his co-operation is to be secured in utility development.

GREATER SAFETY ON THE STREETS

A marked tendency of the times is the increased attention being given to the promotion of safety on the streets by means of street traffic regulations. It is not many years ago that such regulations were enforced only in the cities of the larger class, and in them only at a few congested corners. Now the marking of safety zones for the guidance of pedestrians when they are crossing the street and the erection of traffic guide posts for the direction of vehicles when turning corners are becoming more common now in even the smaller cities. This is partly due to the fact that there is a larger number of street vehicles now than formerly. In part it is caused by a more general awakening to the necessity of taking precautions and to the activities of the safety-first societies, which have been organized in many cities. Whatever the cause, the electric railway companies are benefited. In congested streets the pedestrian who cuts corners or crosses the street between the regular crossings now does so largely at his own risk and so is more apt to be considered guilty of contributory negligence in case of accident, and vehicles which do not comply with the growing number of rules

of the road which govern them are equally out of the pale of legal protection in case of injury.

While these reforms are being made we believe that it would be very desirable to provide for greater protection of passengers during their journeys between the cars and the sidewalk when they are leaving and entering the cars. One way to do this is to provide a penalty for automobiles which pass a car while it is loading and unloading passengers, and where this rule has been enforced it has proved very helpful. As the electric car is confined to its tracks, its passengers are entitled to adequate protection while moving between car and curb.

Still another plan to help in this matter was introduced recently on Broad Street, Newark, N. J., and has been in use for a longer time on Market Street in San Francisco. This is a series of raised boarding and alighting platforms, installed in the street by the municipality, to introduce a safety isle just where passengers enter and leave a car. The operation of these island platforms in San Francisco was watched with the greatest interest by many of the delegates at the recent railway convention in that city, and we understand that the results there and in Newark have been very satisfactory. They are suitable, of course, particularly to broad streets with large traffic, but in all such places are worthy of consideration by municipal engineers.

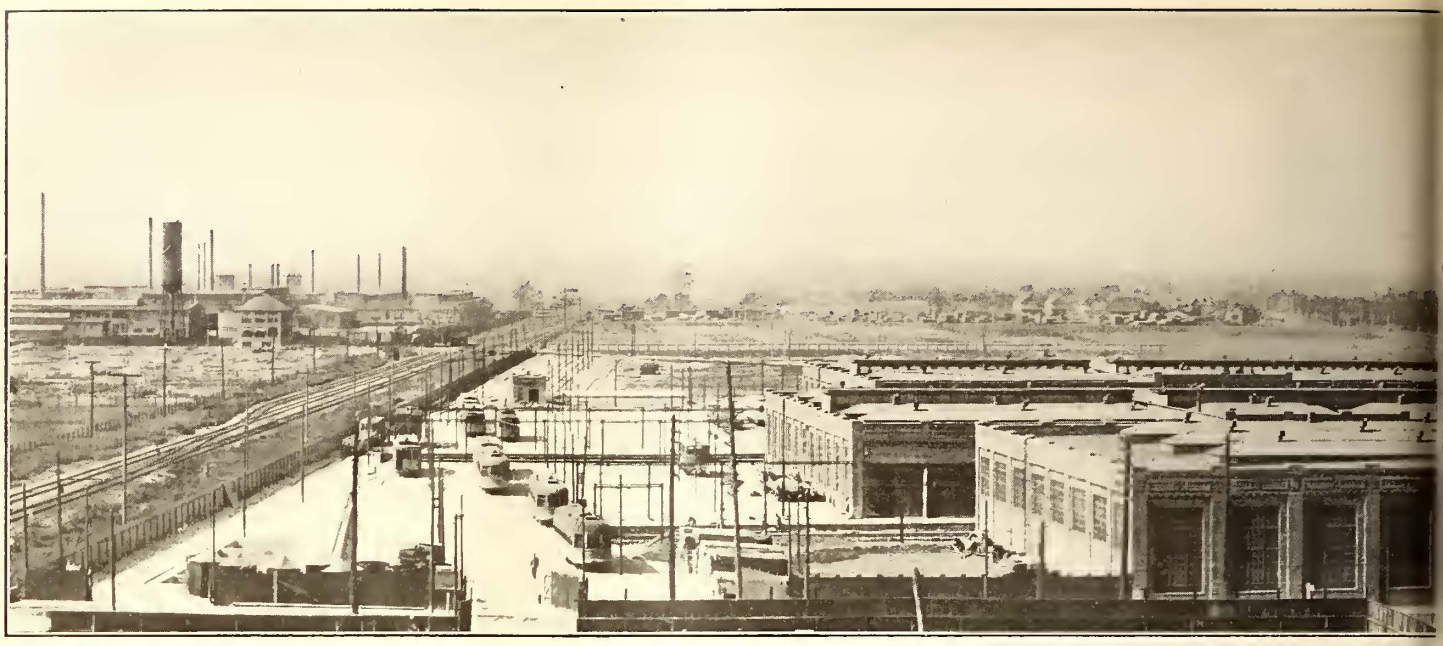
PREPAREDNESS IN TRANSPORTATION

However unsuspicious one may be, the fact stands out with sinister prominence that war is likely to come unannounced even in times apparently pacific. In the great movement for preparedness to insure peace which is sweeping the country, it behooves the electric railway interests to play a patriotic part. Their share in the work is in the main of most pacific form, tending not only to help the country but by active co-operation to help each other. Whether or not the employees are interested in military training, a good thing in itself for efficiency and discipline, makes comparatively little difference, since it is the great problem of transportation in time of necessity that most concerns us. This country is peculiarly weak in railways of strategic importance. Although we have enormous railway mileage we also have a prodigious area of country, and the railways, steam and electric, have been built for definite purposes of inter-communication, without the slightest reference to military affairs. Germany owes an enormous debt in the present war to the carefully planned lines of communication between the eastern and western frontiers and their ability to permit the rapid distribution of men and supplies. If the United States should unhappily get into trouble, the transportation situation would be a very serious one, as was shown only too plainly during our little brush with Spain.

Now the electric railways of the country are in a position, if they will but plan to co-operate, to give very vital assistance in case of need. They run not only from city to city but penetrate the country in all directions, often furnishing parallel lines of transportation to help out an over-burdened railroad, and in particular running to and along the sea coast in a fashion that has a great military value. For instance, along the coast, from Portland, Me., to Norfolk, Va., electric lines run along the shore most of the way, crossing the railroad lines which lead seaward from the trunk systems further inland. There is hardly a spot on the coast to which men and munitions could not be quickly brought, if a suitable system of unified transportation for strategic purposes were properly worked out. Moreover, the transportation managers of electric roads have special training in handling crowds in an emergency. A regiment under arms is a good deal easier, by reason of its discipline, to manage than a baseball or circus crowd, and electric railway men will understand the art of massing cars and sending them out in quick and orderly succession.

The one thing most needful is organization for interconnection, as between one electric road and another, and as between the main line railways and the electric lines. One can pick out, off hand, many spots on the coast which are, so far as main transportation is concerned, very inaccessible but where, by the organized service of electric systems, not one but two or three trunk lines could be utilized for the massing of forces to be distributed as need requires. It would be immensely helpful in the organization of national defense by the general staff if the electric roads through their associations or otherwise could simply schedule their routes, running times, interconnections and supply of rolling stock so as to place the information in orderly fashion before the general staff to aid in its work. Thus fortified, the staff would be put in possession of information such as, for example, the following:

At a given point on the coast two electric railway systems are available, both reaching a trunk line within a running time of an hour. Each has fifteen cars but has power supply of its own, or borrowed from interconnections, able to handle forty. The additional rolling stock could if necessary be borrowed from roads connecting further inland, and everything could be made available on short notice before railway trains could reach the points of intersection. With the electric roads properly organized for co-operation a few telegrams to the men responsible would result in the massing of cars ready to throw a considerable force to the point threatened in very short order. Undoubtedly the general staff tries to acquire more or less information of the character necessary, but it can be furnished so readily by a little patriotic co-operation among street railway managers that the duty of getting together is obvious. Incidentally, the accumulating of this information is a permanent asset for the railways themselves in time of peace, for it enables them to organize through traffic for ordinary purposes with an efficiency which now is conspicuous by its absence. Few people in this country are anxious for trouble, but the chance of its coming quite unasked is sufficient to justify immediate activity, particularly when the steps to be taken are advantageous in themselves.



CLEVELAND REPAIR SHOPS—PANORAMIC VIEW O

Cleveland Railway Occupies New Repair Shops

Outline of How the Cleveland Railway Operates Its New Repair Shops, the General Features of Which Were Described in the ELECTRIC RAILWAY JOURNAL of Jan. 23, 1915—This Article Also Describes Special Equipment and Unique Crane Installations

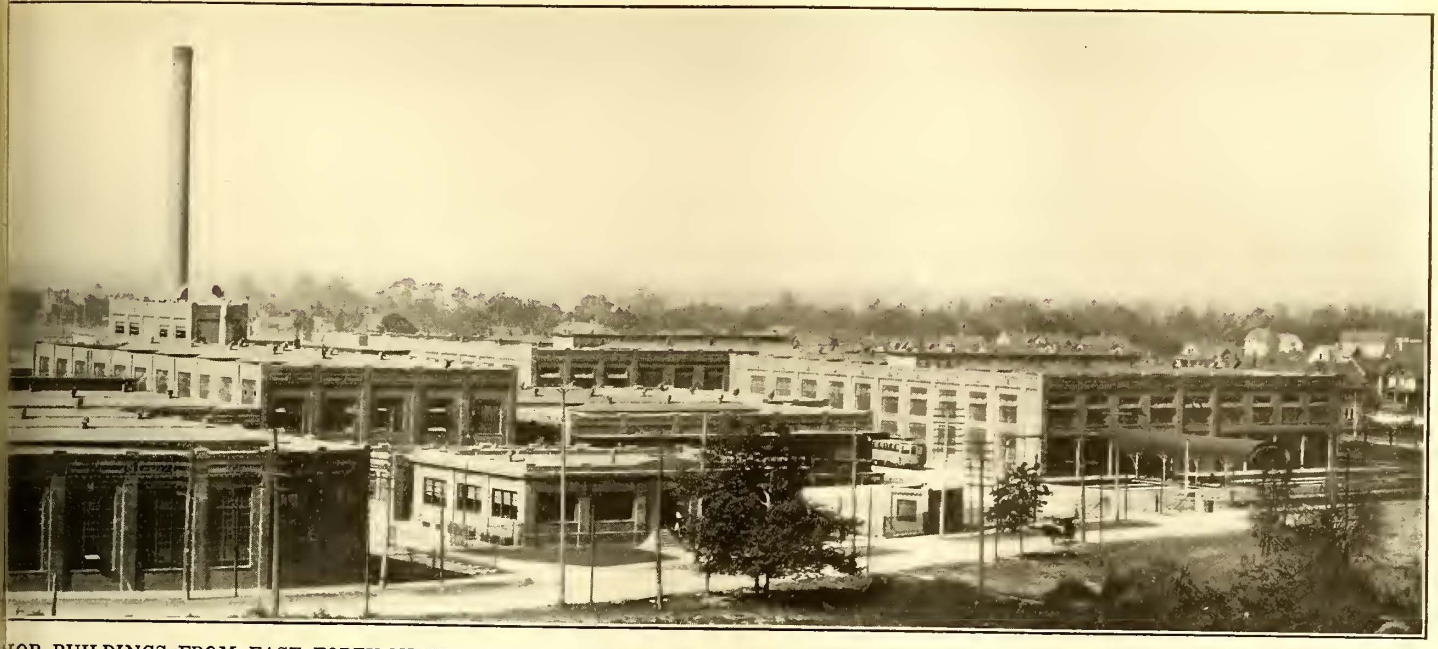
To plan and build one of the most complete street railway repair shop layouts in this country was in itself a big undertaking for the mechanical department of the Cleveland Railway, but to continue repairs while the shop equipment was being moved 6 miles across the city from the old to the new shops was an even greater task. Both of these were accomplished, however, without perceptible delay in the progress of repairs, and the mechanical department, after about six months in transit, is now housed in its new quarters. Although it is scarcely settled, organization and shop procedure have been put in perfect running order. Larger areas devoted to the entire layout as well as increased space assigned to the various shop departments naturally simplified the problems for each department, but at first complicated those of the complete shop operation. The men had to be familiarized with new machine tools and the means of transferring materials and repair parts between departments, but this has been done, and the entire shop organization and equipment move forward practically automatically.

RECEIVING AND DISMANTLING CARS

The essential features of this general shop layout were described on page 168 of the ELECTRIC RAILWAY JOURNAL of Jan. 23, 1915. It is the purpose of this article to deal with the methods of operating this large shop layout and describe the special equipment which has been introduced to simplify shop operations. Because the level of the shop property at the corner of Harvard Avenue and East Forty-ninth Street was more than 6 ft. above the street, track entrances which naturally belonged at that point could not be provided. All cars in need of repairs or overhauling, therefore, must enter the shop yard by the two-track leads from Forty-ninth Street, just south of the wood-working shop building. Track outlet from the shop buildings and yards is by way of a ladder track and leads into Harvard Avenue on the opposite side of the property. Unless there is track space in the motor or truck shop bad-order cars are stored in the open yard between Forty-ninth Street and the intersecting transfer-table pit beyond the erecting shop. As space is made available for them, these cars are switched to the transfer table and moved either to the truck or the motor shop, preferably the truck shop, but either serves when cars are to be dismantled.

As shown on the general layout plan, eight tracks in groups of four each pass through these two buildings, and an assembling and dismantling aisle is provided between the two sets of tracks. The truck shop is 157 ft. 11 in. wide by 184 ft. long, and the motor shop is 209 ft. wide by 184 ft. long. Three of the tracks in each group pass over repair pits extending practically the full length of each building. Over the center line of each of these tracks is a monorail crane runway. As shown in one of the accompanying illustrations, two of these monorail cranes, each equipped with a yoke, will raise a body clear of the trucks which are rolled from beneath and dummy trucks are substituted for them. On these dummy trucks the body is again moved to the transfer table and taken to the erecting shop at the other end of the transfer-table pit. While the trucks remain on the track where they were when the body was removed, the monorail picks up the motors one at a time and transfers them to the motor shop. Afterward the trucks are also picked up and transferred to the truck-dismantling and assembling aisle, which is served by a 7½-ton Toledo bridge crane.

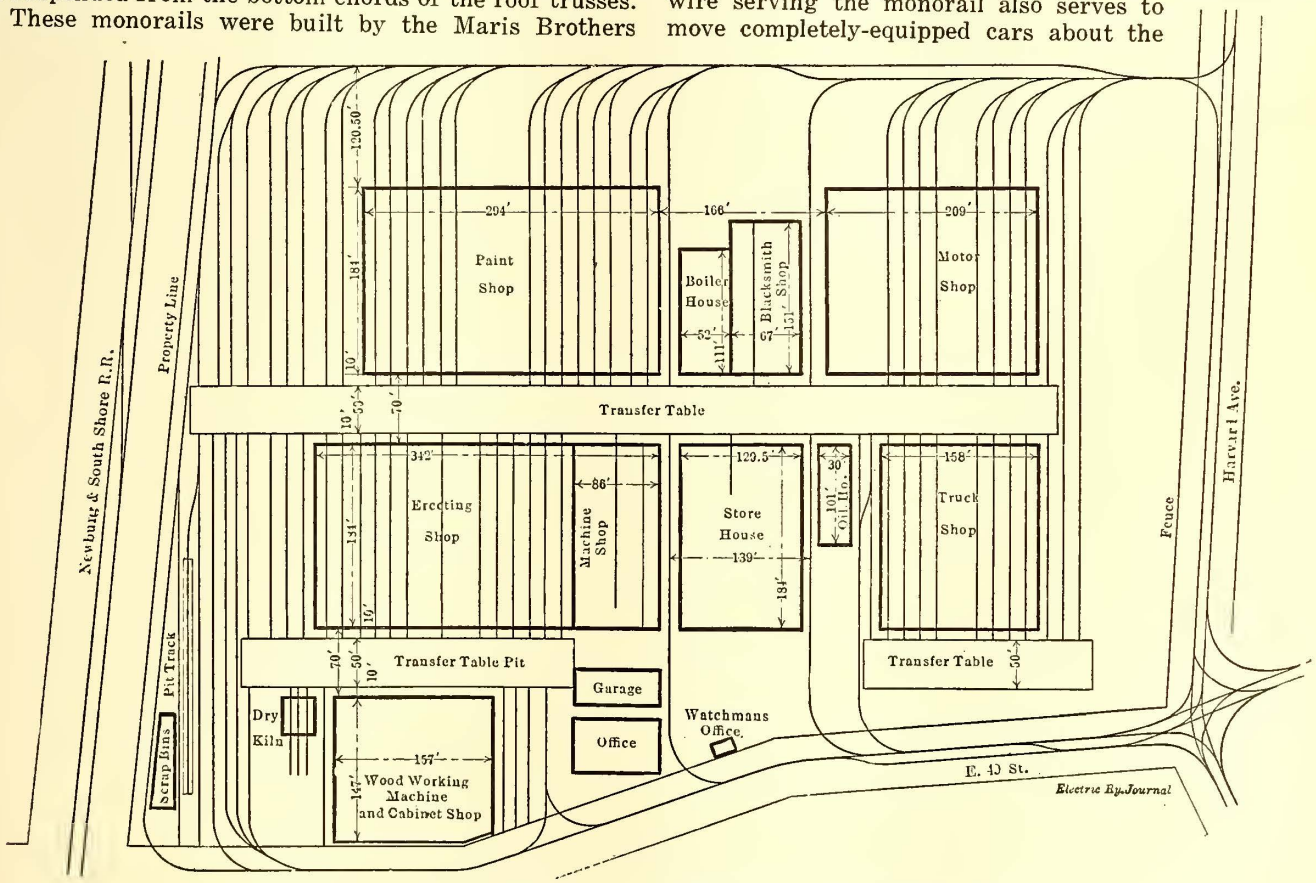
Transverse movement of the monorails in both shops is made possible by overhead transfer bridges at each end of the building. The operator moves the monorail to a transfer bridge, which in turn is unlocked from the runway from which the monorail has just moved. A set of switches under the control of the operator permits this bridge to be moved transversely with the shop,



HOP BUILDINGS FROM EAST FORTY-NINTH STREET SIDE

just like a bridge crane. Through his control and locking device the operator may move the bridge to any other parallel runway, lock it in position and move the monorail from the bridge. The entire runway system is suspended from the bottom chords of the roof trusses.

These monorails were built by the Maris Brothers Company, Philadelphia, Pa., and have a capacity of 7½ tons each. This is ample to pick up and transfer the heaviest completely-equipped trucks in the service of the Cleveland Railway. The general layout of the monorail runways and transfer bridges is shown in one of the accompanying illustrations. It must be noted that these monorails pass through automatically-operated doors and across the transfer aisle into the motor shop. The monorail runway and overhead transfer-bridge arrangement is the same in the motor shop as in the truck shop. It will also be noted that the trolley wire serving the monorail also serves to move completely-equipped cars about the shop. The live trolley through each of these two shop buildings is intercepted at the monorail-transfer-bridge aisle, which has a width of 15 ft. Across this bay the trolley-wire clearance is reduced from 22 ft. 6 in. to 15 ft.



CLEVELAND SHOPS—GENERAL ARRANGEMENT OF BUILDINGS AND TRACKS

In addition to the monorail-overhead-crane system in the motor shop, overhead traveling jib cranes were in-

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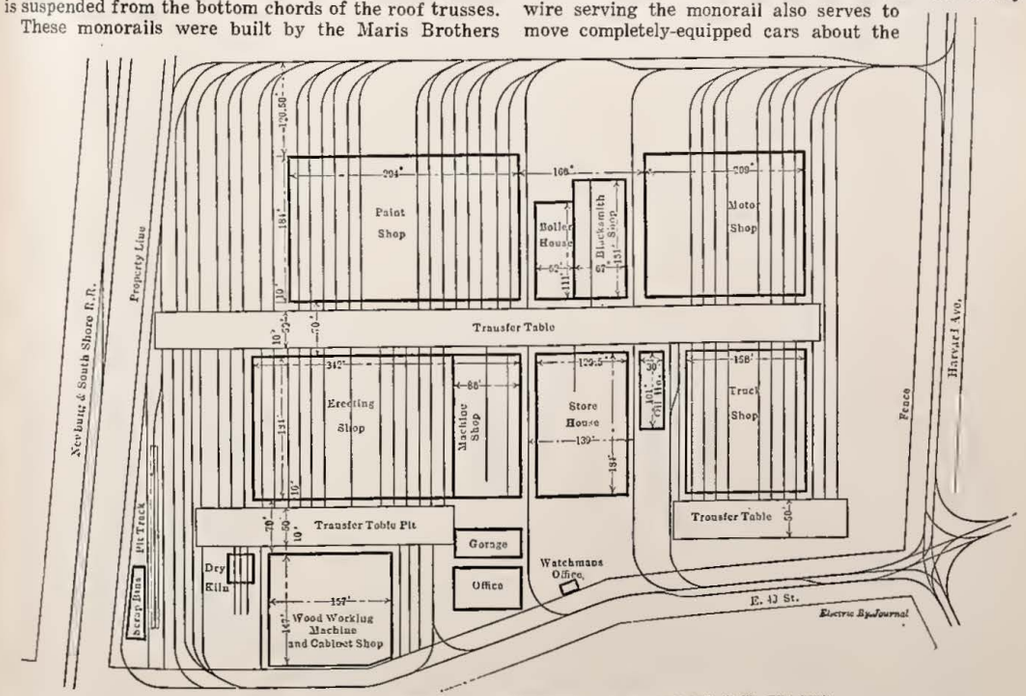

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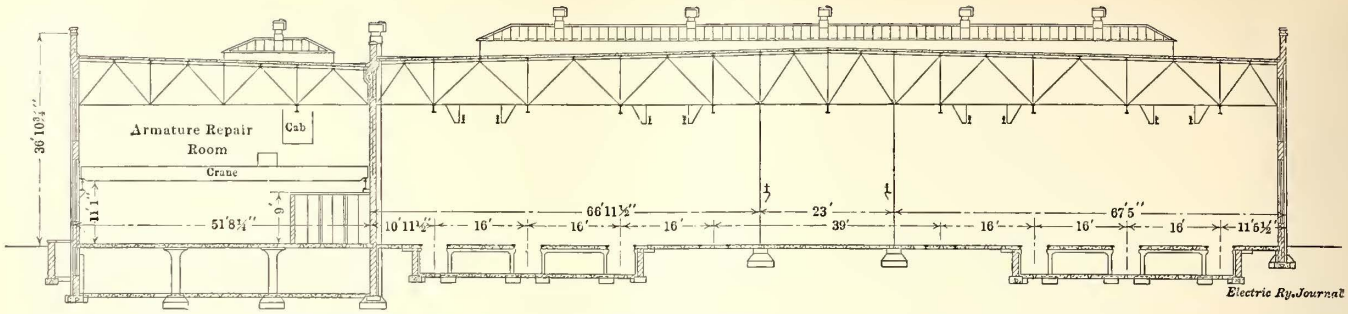
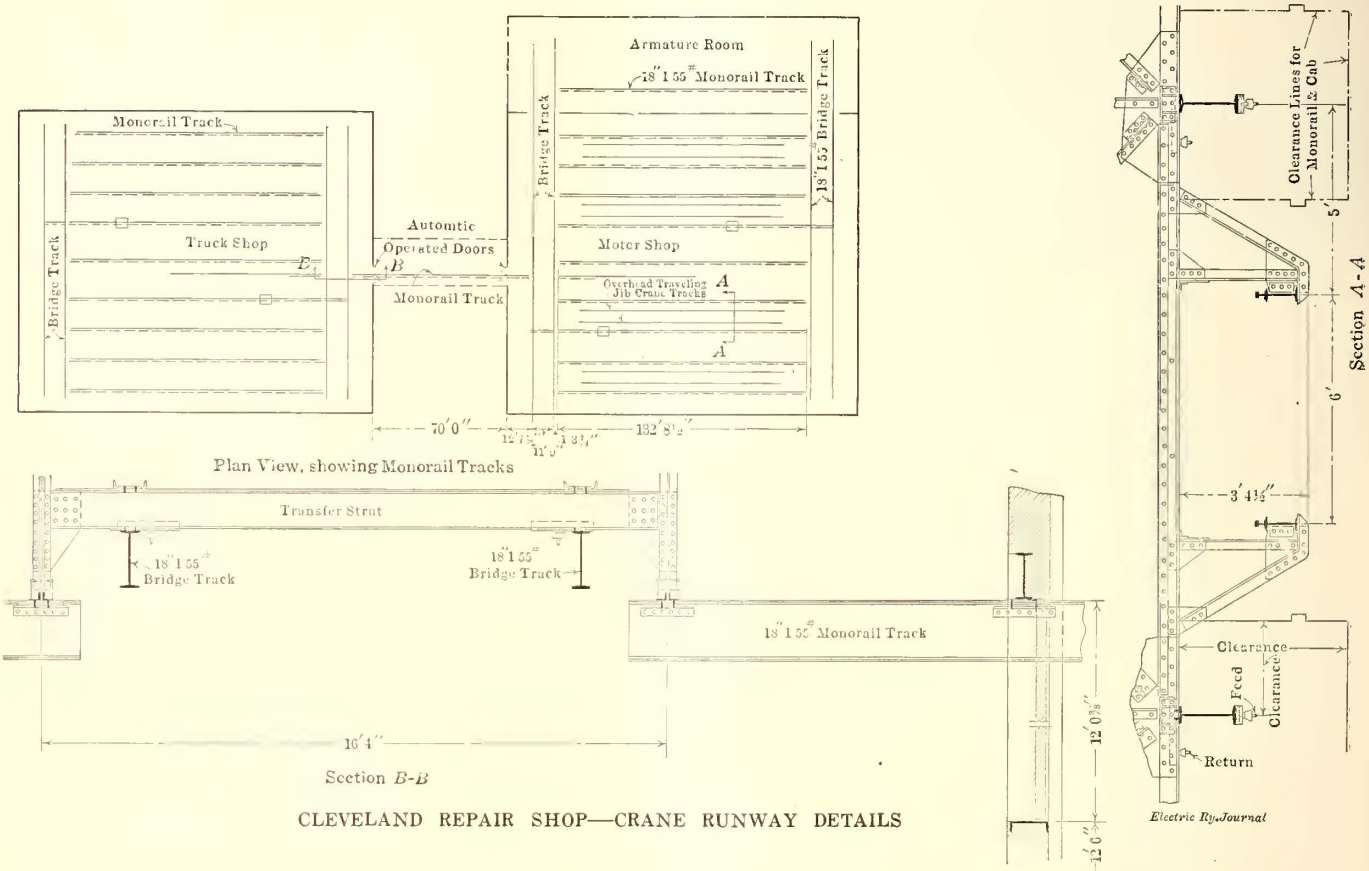
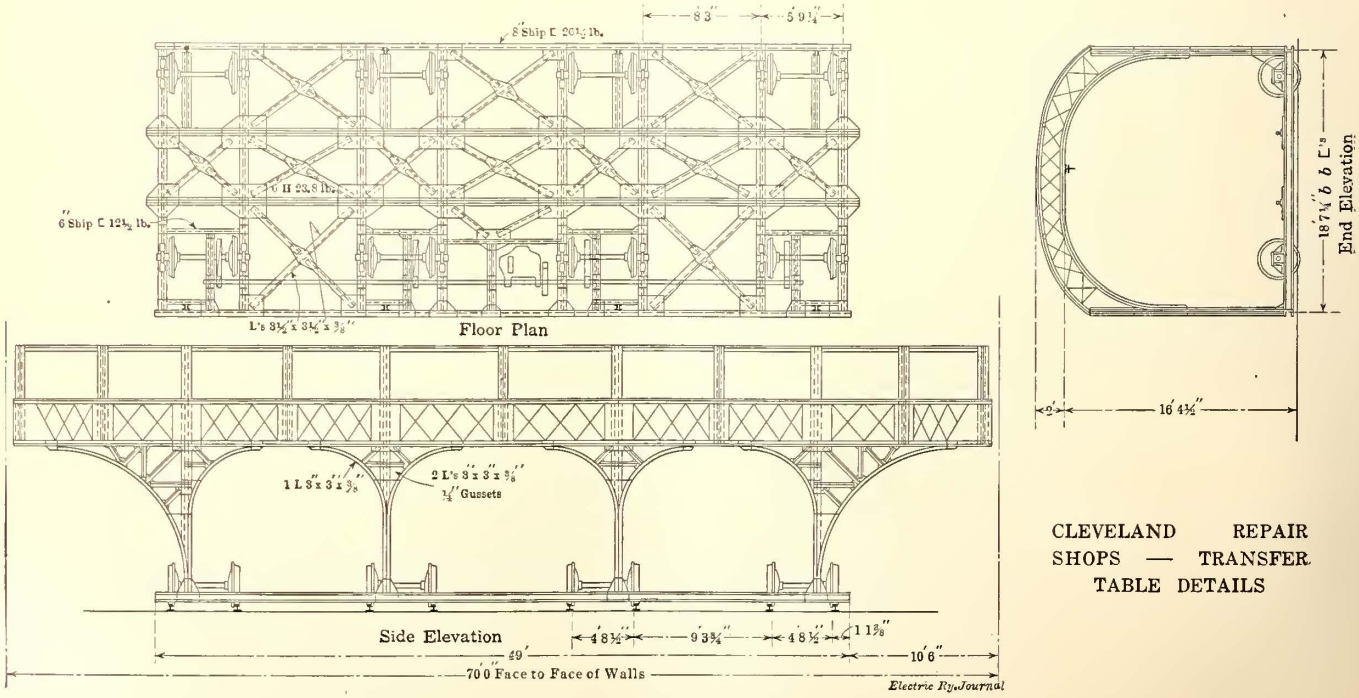


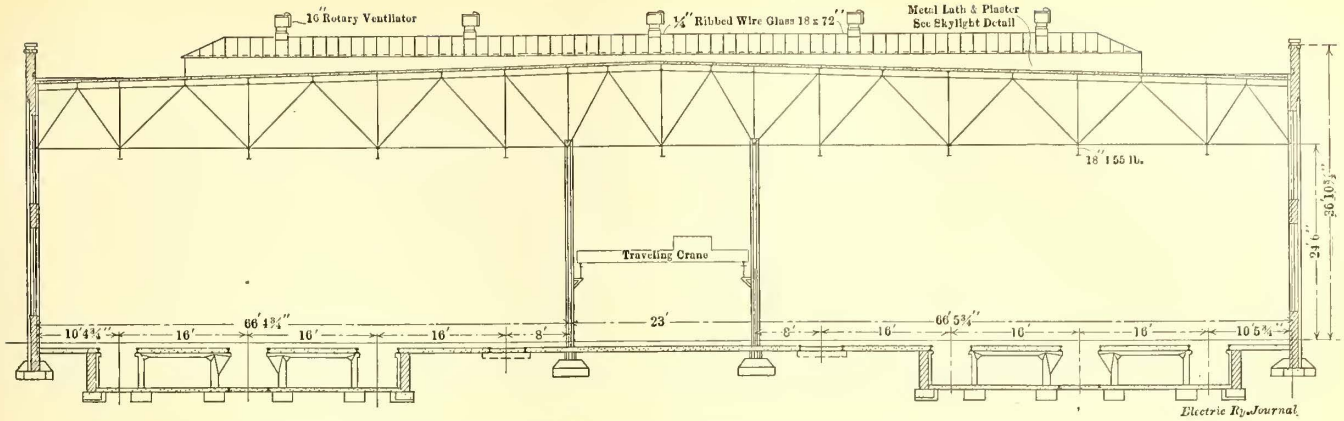
CLEVELAND REPAIR SHOPS—SECTION THROUGH TRUCK REPAIR SHOP



CLEVELAND REPAIR SHOP—CRANE RUNWAY DETAILS



CLEVELAND REPAIR SHOPS — TRANSFER TABLE DETAILS



CLEVELAND REPAIR SHOPS—SECTION THROUGH TRUCK REPAIR SHOP

stalled in the four aisles between the tracks passing over the repair pits. One of these cranes is shown in one of the accompanying illustrations. While this crane cannot be moved about the shop with the same facility as the monorails, it has the advantage of an 8-ft. revolving-jib arm which may be used to pick up a motor in one track and set it in the aisle or in the next parallel track. This crane has a capacity for 3000 lb., the maximum weight of the railway's heaviest motor. It is operated by pendant switches and requires a two-beam runway instead of a single beam as is the case of the monorail. Four of these traveling jib cranes were installed in the motor shop, and they were built by the Euclid Crane Company of Cleveland. Each repair pit in the motor shop is also equipped with portable hydraulic pit jacks for removing armatures.

In connection with the monorail installation it is interesting to note that besides permitting the installation of live trolley wires, four of these monorail cranes took the place of eight bridge cranes. They move much faster and, when two are not required to lift a car body, each with its separate operator is available for general shop use. Over the assembling and dismantling aisle in the motor shop a small bridge crane, operated by pendant switches, was also installed. Energy at 600 volts is supplied from one feeder for the cranes and the energy for the trolley wires is furnished from another feeder.

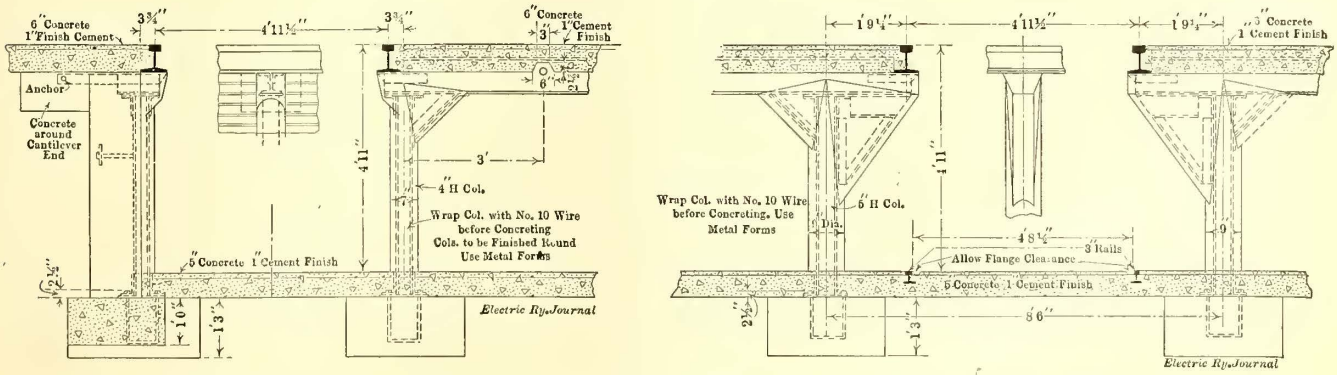
It is also interesting to note that the steel bridge structure necessary to support the monorail runway across the transfer aisle also afforded, with slight alterations, a place for well-lighted locker, lunch and toilet rooms. By building these rooms over the transfer-table aisle the company was able to make the entire floor areas of both the motor and truck shops available for shop use. At the same time if the plan followed in other buildings of the shop group had been adopted, or that of having these facilities on a second floor over the office, it would have complicated the monorail-transfer-bridge installations.

Another interesting feature in these two shop buildings is the repair-pit construction. This is shown in detail in one of the accompanying illustrations. Special attention, however, is directed to the wheel-changing pit and jack in the truck shop. The central pit in each three-track group was designed especially to facilitate wheel changing. In this pit the track rail is supported on a triangular reinforced-concrete cantilever, which extends 24 in. out from the center line of the supporting columns. This permitted a standard-gage track to be laid in the bottom of the pit to which car wheels may be lowered by the pit jack and then rolled from beneath the truck or car body. Wheels are raised to the floor level, set on the track by the monorail cranes, and when a number have accumulated, they are rolled to the transfer table and moved to the machine shop for wheel renewals or turning.

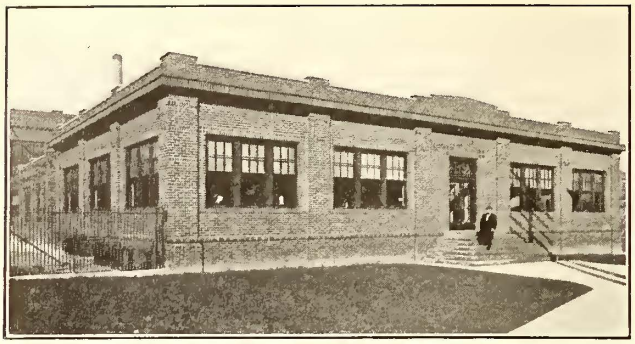
In connection with the wheel-changing facilities a special jack was provided. This is a unique installation in that the drop-pit portion of the track is supported on structural-steel columns. In the elevated position these close the gaps in the track rail, and in the lowered position they close similar gaps in the track in the pit. The lifting capacity of these is 10 tons which is sufficient to raise the end of a car and truck so that they can be blocked to remove the wheels. The two sections of the jack are mounted on the piston of a large air cylinder installed in a sub-basement 20 ft. 6 in. below the shop floor. The locking and control levers for this jack are operated from the pit.

TRANSFER TABLE

Especially-designed transfer tables embodying several unique features were selected for this shop layout. In the 862-ft. aisle between the two main groups of buildings a 25-ton capacity table for handling street-



CLEVELAND REPAIR SHOPS—SECTION OF STANDARD REPAIR PIT; WHEEL-CHANGING REPAIR PIT AT RIGHT



CLEVELAND REPAIR SHOPS—VIEW OF FRONT OF OFFICE BUILDING

CLEVELAND REPAIR SHOPS—VIEW OF FRONT OF STOREROOM BUILDING

railway equipment and a 75-ton capacity table for transferring loaded steam railroad cars were provided. The other two transfer tables in the two smaller pits are also of 25-ton capacity. The transfer table proper is 49 ft. long, while the roof projects over the pit walls approximately 10 ft. to within 6 in. of the faces of the buildings. An overhead structure was necessary to support the live trolley wire on the table, and a roof over the table was considered desirable to afford protection from all kinds of weather.

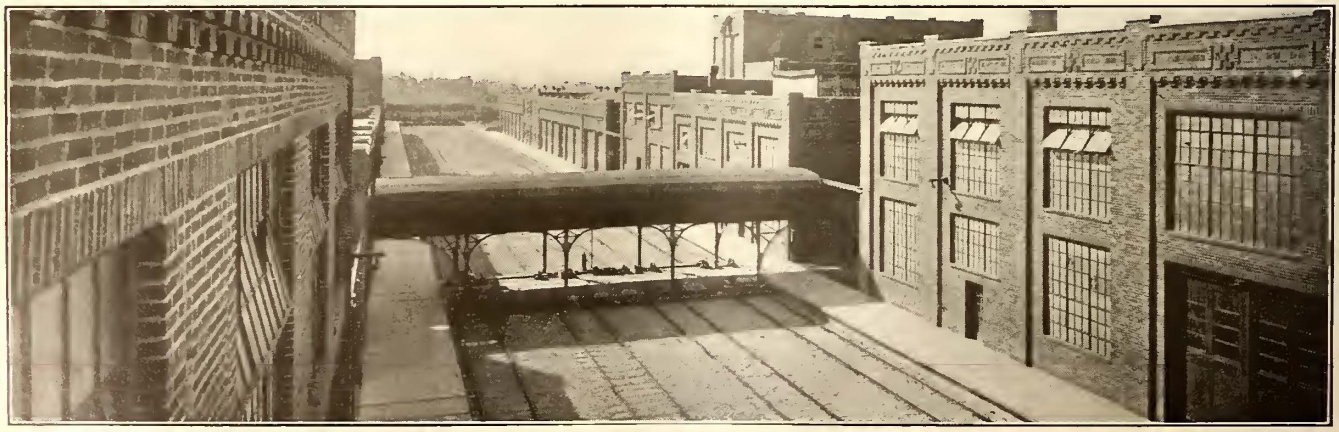
The transfer-table construction is somewhat unusual in that it is of the shallow-pit type and supported on eight pairs of standard car wheels which move over four standard-gage tracks. Four pairs of car wheels on one side of the table are geared through a line shaft to a single 101-B Westinghouse railway motor. This is controlled by a standard railway controller, and a low gear ratio was selected so that the table can be moved at a speed not to exceed 7 m.p.h. Energy is supplied to this motor from a trolley wire installed beneath the overhang of the 10-ft. concrete walkway on one side of the transfer-table aisle. This is also the source of energy for the overhead trolley wire on the transfer table. Details of the transfer table and a view of one of the tables in the long pit are shown in two of the accompanying illustrations.

Facilities for Handling Materials

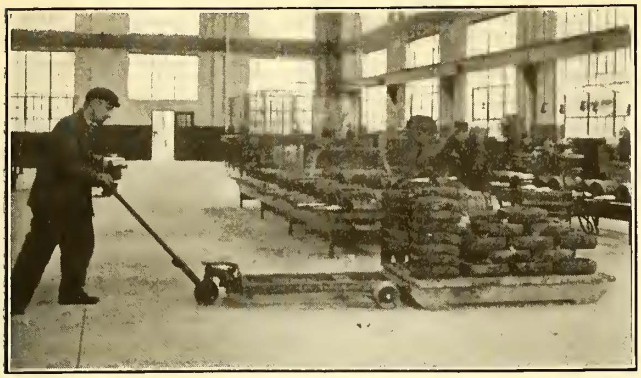
Aside from yard tracks, a steam railroad connection, overhead cranes and transfer tables for handling materials, it was necessary to afford a means of transporting light repair parts and materials between the different shop departments. This is done by three 2-ton, electric storage-battery Buda trucks. One of these trucks is assigned to the store room and two to general shop use. Each has a platform 37 in. wide by 9 ft. 6 in. long, and each motor is of sufficient capacity to pull two trailers. The truck platform is low and equipped with an elevating device so that it may be run under a rack or platform upon which material has been deposited, raise it from the floor and transfer it to any part of the shop. Ten-foot walkways between the buildings and the transfer-table pits were provided to afford a roadway over which these trucks could be operated. Movement across the transfer pits is either by way of the tables or at the ends.

These storage-battery trucks will also be used for moving 1½-yd. dump cars which are used in transporting scrap to the scrap bins or trash to a depressed track where it is unloaded to larger dump cars. As will be noted in the general plan of the shop layout, the scrap bins and the depressed track are beside the track entrances from Forty-ninth Street at the extreme southeast corner of the shop layout. Concrete bins below the yard level are provided for five classes of scrap and when full contain a carload. Steam railroad cars are set on a track beside these bins, and the scrap is loaded into them with a magnet crane.

Another means of transporting material short distances within the shop departments is afforded by small material trucks or transveyors. These have a capacity of 2 tons and were furnished by the Cowan Truck Company, Holyoke, Mass. These transveyors are three-wheeled trucks fitted with steel platforms not more than 6 in. in height. As shown in one of the accompanying illustrations, these trucks may be backed under a wooden platform or steel rack. In this position the truck handle is connected to a small air-pumping mechanism, and when the handle is moved back and forth this mechanism raises the rack or platform clear of the floor. The handle is then released, and the transveyor with its load is moved by hand. Pressure on a foot pedal releases the air from the cylinder and lowers the load to the floor. In the erecting shop, car bodies are stripped of the sashes and doors, which are set in steel racks. These when full are transferred to the sash-washing and re-

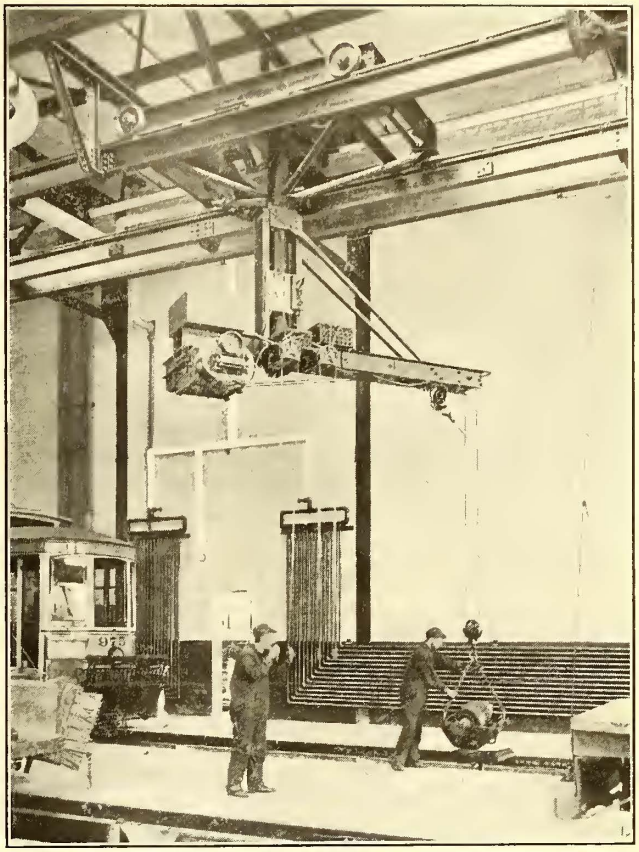


CLEVELAND REPAIR SHOPS—VIEW DOWN 862-FT. TRANSFER-TABLE AISLE



CLEVELAND REPAIR SHOPS—VIEW OF TRANSVEYOR AND LOAD ON RACK

CLEVELAND REPAIR SHOPS—VIEW OF LOADED TRANSVEYOR



CLEVELAND REPAIR SHOPS—VIEW OF TRAVELING CRANE

pairing department by the transveyors. Material in the wood shop and elsewhere in the various shop departments is moved in this manner.

In connection with material-handling facilities it must also be noted that a depressed track for the receipt of steam railroad cars enters the storeroom building. With the aid of steel aprons and a 1-ton capacity overhead traveling monorail crane operated by pendant switches, material may be loaded or unloaded readily. As shown in one of the accompanying illustrations, an elevated platform for receiving and delivering materials to teams or auto trucks was provided across the front of the storeroom building. An awning over this platform also supports an extension of the monorail crane runway and permits it to be used in handling materials at this point. A monorail runway system in the basement of the storeroom building and an incline to permit the electric trucks to descend to the basement level from the concrete platform beside the transfer-table pit also simplify the handling of materials.

Incidentally, all materials exclusive of lumber, car wheels, oil and paint are placed in this storeroom. Car wheels are stored in the basement beneath the machine shop where manhole openings in the floor permit the 5-ton capacity overhead bridge crane to lower wheels to the basement floor from a steam railroad car which may be run into the building. Paint and oil for mixing it are stored in tanks and barrels in a room partitioned off of the paint shop. Lumber is stored in the wood mill, where special racks have been installed for it.

CLEVELAND REPAIR SHOPS—GENERAL VIEW OF MACHINE SHOP

CLEVELAND REPAIR SHOPS—VIEW OF BABBITTING EQUIPMENT

Tracks on each side of the storeroom, as well as of the oil house and the heating plant, permit steam railroad cars to be unloaded directly into these buildings.

Armature-Room Features

Special equipment in the armature room, which occupies a 50-ft. completely-inclosed bay on one side of the motor shop, includes an overhead bridge crane spanning the entire room and one monorail runway. For the present a 5-ton bridge crane originally intended for one aisle in the erection shop has been installed in the armature room. The monorail runway permits cranes from the motor and truck shops to enter this department through openings in the partition wall. These openings are equipped with automatically-operated fire doors.

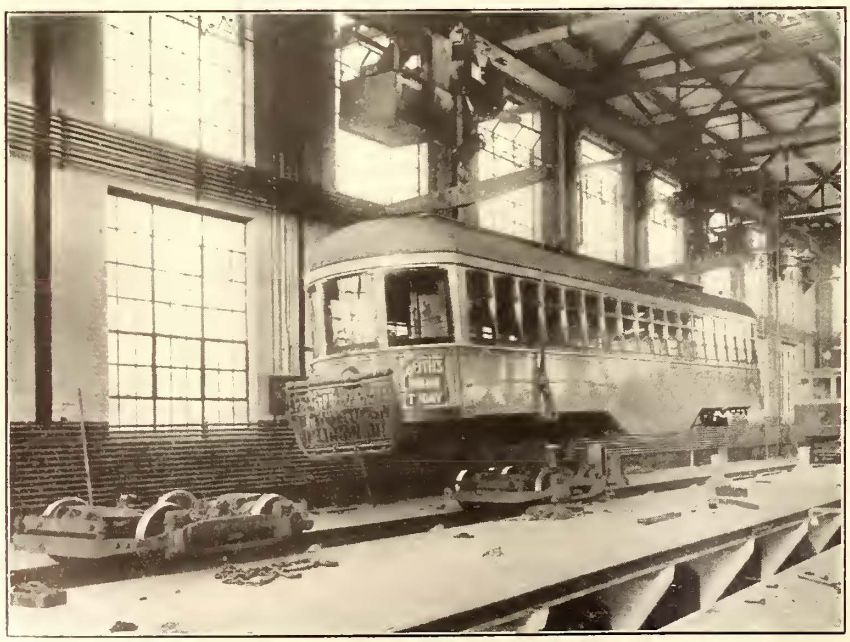
A baking oven, occupying a space 13 ft. wide by 36 ft. long and 9 ft. high, was installed beside the partition wall at one end of the armature room. This oven is divided into two rooms; in one the coils are dipped and allowed to drain and in the other they are baked. A complete equipment of draining and baking racks as well as tanks was provided for this purpose. Armatures held in storage in this department are set on steel racks fitted with wooden bearing blocks to protect the armature-shaft bearings. All work of the armature department is done on contract and must pass the test of a company inspector, who occupies a testing room partitioned off from the rest of the armature room. The usual potential and current tests are applied to ascertain the quality of the work.

Equipment in the forge shop, which is 67 ft. x 151 ft. in size, includes the usual bulldozers, forges and trip hammers conveniently arranged. One special hammer was provided, however, which is worthy of mention. This is a self-contained machine which compresses its own air. In other words, a motor-driven compressor mounted on the hammer bedplate automatically supplies the air with which it is operated. This hammer is of 1500-lb. capacity and was furnished by the Nazel Engine Works, Philadelphia, Pa. Another feature of the forge shop is an electric-welding room completely inclosed with asbestos curtains. Considerable space is devoted to this department, and the curtains protect the remainder of the forge-shop force from the light rays given off during welding operations.

Another portion of the forge shop is given over to the bearing-babbitting department. A view of this room is shown in one of the accompanying illustrations. The steel tables and racks conform to the permanent character of construction used throughout the shop. A unique feature in the babbitting equipment is the kettle-type melting pots suspended in furnaces, the fronts of which may be lowered. When bearings are poured the melting kettle is tilted by means of a goose-neck handle, and the metal flows from the bottom of the pot, thus eliminating skimming and assuring clean metal. The mandrel method of babbitting bearings is employed, and the mandrels are driven out of the finished bearing by an air cylinder mounted on the frame which supports the hood over the furnaces. After the mandrel has been removed, air pressure and a special U-shaped wedge are used to split the halves of the mold. All babbitted bearings are machine broached before being put in stock ready for service.

Special Equipment in the Machine Shop

The machine shop is, perhaps, one of the most complete of its kind in the country. It occupies a space 86 ft. 9 in. x 184 ft. in size at one end of the erecting shop building. In addition to the ground-floor space, as will be noted in the general view, a balcony along one side



CLEVELAND REPAIR SHOPS—VIEW OF MONORAIL LIFTING CAR CLEAR OF TRUCKS; WHEEL-CHARGING JACK AT RIGHT

affords space for the sheet-metal and fare-box departments. Special equipment in this machine shop includes a cornice brake for sheet metals up to ¼ in. thick and 12 ft. long. The size of this brake makes it possible to manufacture many of the special pressings employed in steel-car construction. It also eliminates riveted connections where it is possible to supply a flange to the sheet metal.

A set of six Reed-Prentice lathes, motor driven and equipped with a push-button stop and start and with a full-geared head, are arranged along one side of the shop. These are served by four jib cranes pivoted to the columns supporting the machine-shop gallery, and each jib-crane arm is equipped with a Dake chain and wire-rope hoist furnished by the Dake Engineering Company, Grand Haven, Mich. While the entire machine shop is served by a 5-ton Toledo bridge crane, jib cranes serve most of the individual machines. One of these is a traveling wall jib which serves two wheel presses, an axle straightener and a lathe, all arranged along one of the shop walls. This crane is controlled by pendant switches and travels along the building wall. A 1-ton motor-driven hoist, which travels horizontally the length of the 16-ft. jib arm, gives a wide range to this equipment. This crane and the tools it serves are shown in the general view of the machine shop.

In another part of the machine shop a Putnam wheel-turning lathe of the most modern type has been installed in a pit provided for it in the shop floor. A sheet-steel apron resting on the lathe bed and the shop floor permits wheels to be rolled between the mandrels. An elevating and lowering device at the lathe end of this apron permits it to be set to accommodate wheels of any size. This lathe installation is shown in one of the accompanying illustrations. In connection with the motor-driven tools it is of interest to note that all the automatic-control equipment is installed in the basement below the shop floor. Although the machine tools were installed at the most convenient points on the shop floor, the control sets are concentrated in two groups, one beside each of the two building walls.

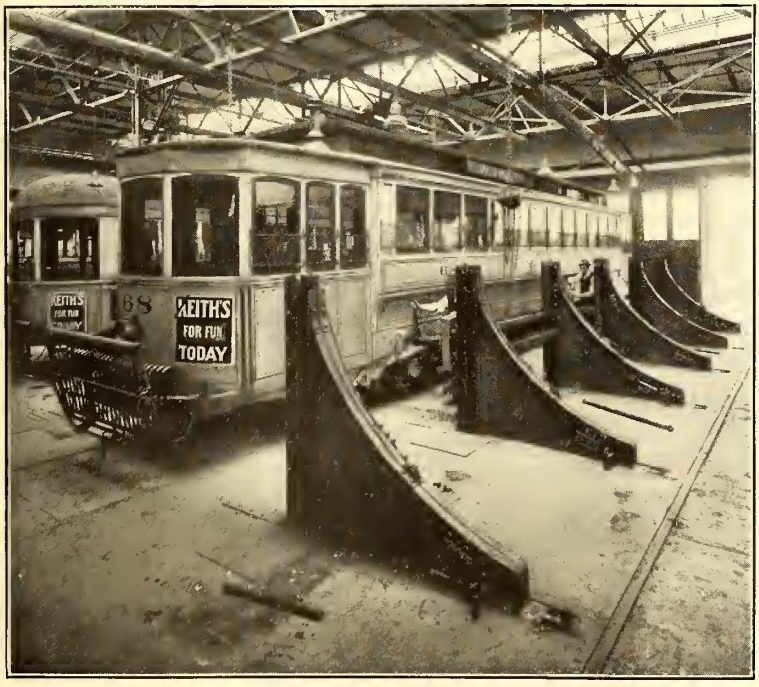
STEEL CAR STRAIGHTENER

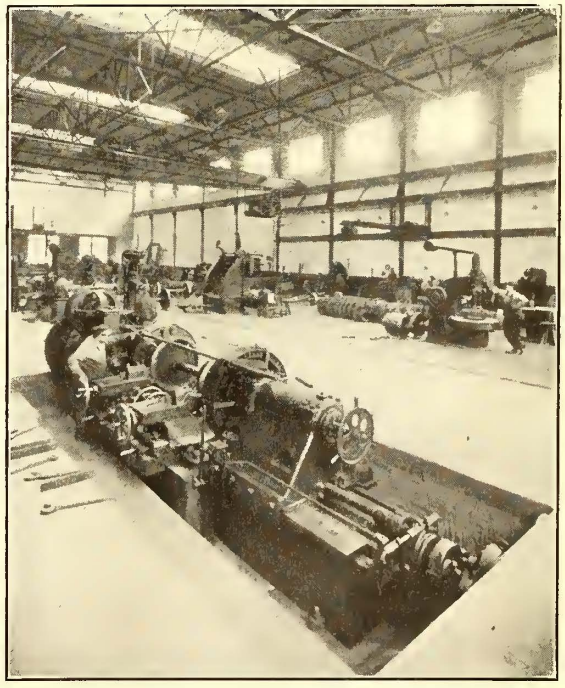
Undoubtedly the most unique feature in the erecting shop is the steel car straightener. Occasionally a steel

CLEVELAND REPAIR SHOPS—VIEW OF CABINET SHOP

underframe or a steel car body is bent out of square or buckled in a collision, and in cases of this kind the car straightener is employed. It consists of six structural-steel angle bearings on each side of a car track with adjustable bearing beams which rest in a horizontal position on the vertical legs of these angles. Against this bearing beam as many screw jacks may be set as are required to straighten the bent members. Each bearing angle is designed to take a load of 15 tons, and the set of six of these bearing angles on each side of the track permits the jacks to bear against each other on the two sides of the car body. Since the erecting shop has been in service several cars have been straightened with most satisfactory results. Incidentally, these angle bearings are pivoted at their right angles, so that they may be dropped beneath the floor when out of service, or raised and locked in the position shown in the illustrations. Small differential chain hoists mounted on a trolley above each set of bearings are employed in handling the bearing beams and jacks.

Large shop areas devoted to different operations may, if facilities are not provided, result in much lost motion. To meet this condition each department of these shops





CLEVELAND REPAIR SHOPS—VIEW OF CAR STRAIGHTENER IN SERVICE; WHEEL-TURNING LATHE IN PIT

has its tool room and foreman's office. Within the departments numerous portable work benches, punches, shears, compressed-air tools, riveting furnaces, grindstones and pipe threaders are supplied to increase efficiency. The necessity for portable equipment is particularly apparent in the erecting and paint shops. One of the handiest tools in the former is a combined punch and shear. This will punch four sizes of holes and shear sheet steel up to ⅛ in. in thickness. This tool was furnished by the Union Manufacturing Company, New Britain, Conn.

In the wood-working shop and the cabinet shop adjoining it, adjustable pipe, lumber and cabinet racks form an important part of the equipment. These are shown in the general view of the wood-working shop and in the view of the cabinet shop. Material deposited on these racks is classified and tagged accordingly. In the view of the cabinet shop the structural-steel gluing racks and the standard work benches used throughout the shops are also shown. The work benches are 33 in. in height, 30 in. wide and 14 ft. long. Each bench is fitted with two large drawers and a 2½-in. hard maple top. The legs of the benches are of cast steel with diagonal bracing.

Heating Plant, Office and Garage

A heating plant, 52 ft. x 111 ft. in size, adjoins the blacksmith shop and serves the entire shop group. This plant is equipped with stokers, coal bunkers and coal and refuse conveyors. Underground tunnels leading from this plant to the various buildings in the group carry the steam-heat, feed and return pipe systems, as well as the shavings and refuse exhaust system from the wood-working shop.

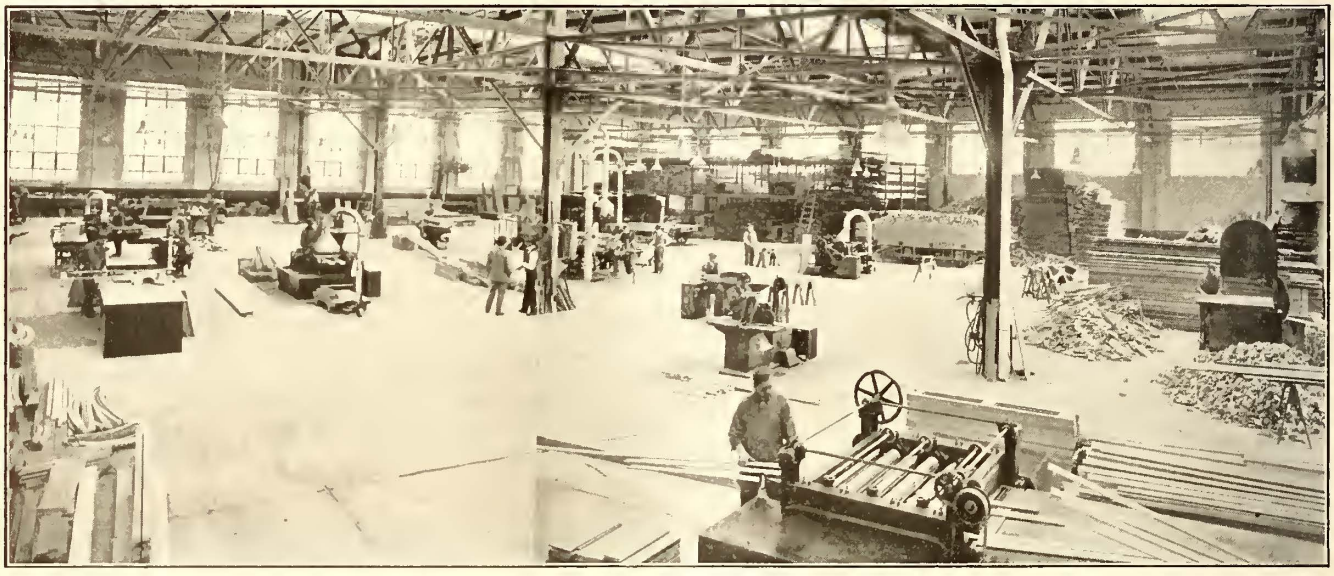
The supervisory and designing forces of the mechanical department are housed in a separate office building, 57 ft. x 87 ft. in plan, situated beside the employees' entrance to the shop property. Occupying one corner of this building is a company surgery where a trained nurse is regularly on duty. A view of this office building is shown in one of the accompanying illustrations. An interesting feature in connection with the system of communication between the various shop departments is a Tele-Call system furnished by the Mead Electric Signal Company, Cleveland, Ohio. Large gongs in each shop department and as many as are required to be audible in any part of the shop are under the control of the telephone operator in the office building. These gongs, through a code of signals, summon the different department heads to the nearest telephone. Immediately back of the office building is the garage, 40 ft. x 86 ft. in plan, where all the company automobiles are repaired. The Cleveland Railway operates three auto buses as suburban feeders, and they are also maintained at this point.

Fire Protection

While all the buildings in the shop group are constructed of non-combustible material, a complete sprinkler system served by city water pressure has been installed in all the buildings. Supplementary to this and affording a reserve water supply is a 1,500,000-gal. underground reservoir and an underwriters' specification motor-driven centrifugal pump of 1500-gal. per minute capacity. In case of fire this pump is cut in automatically by a certain decrease in the water pressure in the city mains.

Every detail necessary to make shop operation efficient and appearance neat and orderly has been carefully planned and executed. A concrete retaining wall along East Forty-ninth Street and Harvard Avenue, where the shop property is above the street level, has been constructed, and surmounting this is an ornamental iron picket fence. At the track and employees' entrances hinged gates are provided, and along the inside property lines is an 8-ft. board fence on concrete fence posts which makes it possible completely to inclose the railway company's property. Open spaces have been made into attractive lawns, the tracks have all been filled rail level with stone screenings, and concrete walks and driveways have been provided wherever needed.

Terrance Scullin, master mechanic, is responsible for the arrangement and complete equipment of this shop. It is the result of an exhaustive study of repair shops and a collection of the best ideas in repair-shop arrangement and equipment to be had in this country. Charles H. Clark, engineer maintenance of way, supervised the track installation, and L. P. Crecelius, electrical engineer, the electrical features. The actual design and supervision of construction was done by David W. Morrow, formerly an engineer of the company and now of the firm of Morrow & Cross, civil and architectural engineers, Cleveland, Ohio.



CLEVELAND REPAIR SHOPS—GENERAL VIEW OF WOOD-WORKING SHOP

Conference on Valuation

The Final Sessions of the Conference in Philadelphia Were Devoted to Papers and Discussions on the Subjects of Depreciation, Going Value, and the Relation of Valuation to the Future of Public Utilities

The Conference on Valuation in Philadelphia, the proceedings of which on Nov. 10 and 11 were reported in brief in the ELECTRIC RAILWAY JOURNAL of Nov. 13, was continued on Friday, Nov. 12. The three sessions on this day dealt with the topics of depreciation, going value, and valuation and the future of public utilities, as shown in the following report. The Utilities Bureau, under whose auspices the conference was held, is planning to publish the proceedings in full in the January issue of *The Utilities Magazine.*

DEPRECIATION

The chairman for the morning session on depreciation was Frederic P. Stearns, consulting engineer, Boston, Mass., who made some introductory remarks regarding a diversity of understanding rather than of opinion between speakers on depreciation topics and their hearers. Two addresses were then made, one on court decisions on depreciation by J. H. Goetz, of counsel for the Public Service Commission for the First District of New York, and the other on the relation of depreciation to fair value by Halford Erickson, member Wisconsin Railroad Commission.

Court Decisions on Depreciation

Mr. Goetz stated that while the decisions already promulgated have helped in delimiting the excursions of legislators, regulators and judges in this field, they have also contributed in no small degree to the contention and confusion which usually characterize a fresh attempt to deal with the question. The analysis and comparison of the decisions made by the speaker hardly disclosed any marked passion for uniformity. To his mind, the importance of distinguishing between the various purposes of depreciation has not been grasped. In the earlier rate cases, growing out of state or local legislation or out of determination by supervising officials, usually without adequate investigation of relevant data, the public utilities were obliged to invoke the aid of the courts to prevent the confiscation of their property rights, and in the decision of that question the first inquiry was, what are the property rights? As property which by expiration had ceased to exist could not be the subject of confiscation, the courts, with the object only of determining what property rights were affected, soon adopted the method of reproduction-cost-less-depreciation for ascertaining what the property was.

The depreciation deduction, said Mr. Goetz, was therefore confined to actual depreciation. Yet when the question of earnings came to be considered, a new light was cast upon the subject. The duty and importance of providing out of earnings against the impairment of the capital invested, and for the maintenance of the integrity of the plant for continuous and efficient service, was already realized. In this relation functional depreciation and accrued depreciation received recognition. A failure to distinguish between the different purposes of depreciation, however, soon brought about a confusion as to the measure of depreciation which should be applied to the different purposes, and the expression used in the case of one was applied to the other. Mr. Goetz then endeavored to show the underlying differences connected with depreciation when a particular case involved a valuation for a rate-making basis, a calculation of earnings attributable to the return under a specific rate, a condemnation or purchase, a tax levy, an accounting or capitalization.

Depreciation and Its Relation to Fair Value

Mr. Erickson was of the opinion that if the treatment of depreciation in valuation largely depends on whether depreciation was provided for in the rates and whether the funds so provided were paid out to stockholders, it would seem to follow that where the amounts provided were used for necessary and proper renewals and for the accumulation of a reserve to cover the accrued but unmatured depreciation of the property still in use, no reduction from the cost new, because of depreciation, should be made in determining the fair value for rate-making and certain other purposes. He felt, however, that the situation might be different when the reserves for accrued depreciation which were provided by the customers had been appropriated by the investors for their own private use. In such cases as this, a situation was created under which justice might demand that the accrued depreciation be deducted from the cost new, and that the cost new less such accrued depreciation be used as the controlling evidence of value in the appraisals. In general, therefore, he considered that the most equitable basis of fair value would be determined by the formula—cost new minus depreciation plus depreciation reserve. Then if the latter had been dissipated in dividends, the company would be penalized accordingly in its valuation. Yet in the case of old companies like railroads, where only maintenance charges were covered by the rates, and there was no collection of accrued depreciation, he believed that the stockholders could have withdrawn nothing from the business and no deduction for depreciation should be made.

In regard to the continuing unexpended balance in the depreciation reserve, which may vary from 10 per cent to 50 per cent of the value of plant, Mr. Erickson thought that if conditions remained above normal, and if all the estimates upon which the balance rested were about accurate, it would seem that at least a part of the balance could with safety be paid over to the investors as a return of that much of their investment without greatly endangering the service. He was not certain, however, that it would be to the best interests of either the investors or the customers to follow this course. Because of its usefulness in meeting sudden or extraordinary requirements, and for other reasons, he considered that it might not be in line with the best policy to place too many restrictions upon the balance in the depreciation reserve.

Discussion on Depreciation

The discussion on depreciation was opened by James E. Allison, consulting engineer, St. Louis, Mo., who criticised the unreliability and speculative character of estimates of expected life. He pointed out that averages are not justly applicable to individual items, and that the composite remainder of life of a plant is an erroneous factor inasmuch as the life of a plant extends indeterminately into the future if renewals are made as necessary.

In connection with the desire of the public that a

continuing unexpended balance in the depreciation account be deducted from the valuation as a part purchase of the plant, Mr. Allison felt that such a procedure would perhaps be ethical for the future if the consumers understood the accumulation to be made for this purpose and the resulting reduction to the investor were fully compensated for by the amount collected from the consumer. It was wrong now to assume, however, that if a theoretical depreciation balance existed as part of surplus not needed above replacements, this had been contributed in the past by the consumer for the setting up of a part-purchase sum. Mr. Allison considered that past profits legally accumulated were the property of the utility, whether or not they are now considered legal.

Prof. John Bauer of Cornell University said that if the basis of valuation were exchange value, no accrued depreciation should be deducted, for present exchange value cannot be depreciated. But for existing utilties the problem is not to find the exchange value but to clear up a confusion of ideas. The reasonable policy for the future is to use for the rate basis the actual investment put into the property through the issuance of securities, but for most existing utilities it is impossible to find out from securities or capital accounts the money invested. In such cases to consider the net sacrifice of the investor and to evaluate earnings that should have been made and were not might produce a total fair value upon which the company simply could not earn a reasonable return, while in other cases the deduction from value of exorbitant past earnings might reduce fair value to nothing or even an actual liability.

The best plan, therefore, Professor Bauer said, is to draw a curtain on the past, and make an appraisal of the physical property on the basis of actual cost or reproduction cost. A deduction from either of these for depreciation constitutes a question of policy. The public is not entirely justified now in making a deduction, but if such is not made the investor may have a rate basis that is filled with junk. The deduction is merely a safeguard in the interests of broad justice. The main thing is to determine now a definite basis for judging existing companies in the future.

Prof. Allyn Young of Cornell University said that in the future the public has a right to set any valuation basis if it grant the proper rate of return thereon. He did not believe, however, in any retroactive rules. It should not be assumed that in the past it was necessary or according to ordinary business practice to accrue depreciation. Most railroad depreciation has been adequately cared for in the past by the maintenance charges to operating expenses. Professor Bauer then in reply to a question by A. Sakolski of the Delaware & Hudson Railroad valuation committee as to whether he would limit losses as well as profits under the agency theory, said that the reasonable return could always be earned if the existence of the utility were justified and the company properly managed. Furthermore, the non-guaranteeing of a reasonable return would be justly covered by the investor's risk when this lack of protection was known in advance.

John M. Eshleman, Lieutenant-Governor of California and former president California Railroad Commission, stated that an investor must be assured of two things—the return of his investment and a fair payment for its use. This payment, however, must be restricted by the cost for which the public could supply the service, or government ownership would be inevitable. He felt that depreciation was a common-sense question, and future rules should be limited in application to the past by the public acquiescence in certain practices. He urged both utility and public experts to stop trying to secure the greatest possible return to each side and to unite in establishing an honest basis sufficient to induce future investments.

GOING VALUE

In opening the afternoon session on going value, the chairman, General Morris Schaff, member Massachusetts Board of Gas & Electric Light Commissioners, stated in a brief address that the four fundamentals upon which Massachusetts had secured sound and satisfactory regulatory results in a pioneer field were these: Insistence upon freedom of utilities from political exploitation; payment of liberal dividends to capital honestly invested; requirement of as low a capitalization as possible, and insistence upon sound and efficient management. Moreover, the policy of providing abundantly for depreciation, of allowing for uncontrollable contingencies and of countenancing even generous dividends in the case of excellent management had resulted in few disputes. He believed that the financial history of a utility should be carefully studied in order to determine whence came the property values—from the investors, from the consumers in addition to dividends or through creation by the state—such information to be used so as to secure to both the investor and the consumer his every right. Furthermore, he suggested that when commissions were summoned before the courts in rate cases under the Fourteenth Amendment, they should plead for a distinction in the application of the law to properties in competition and to properties under protected monopoly.

Mr. Thorne on Going Value

The first address of the afternoon was that on going value as an element in fair value, by Clifford Thorne, chairman Iowa Board of Railroad Commissioners. Mr. Thorne described the various conceptions as to the meaning and inclusiveness of the term "going value." If one construed going value as meaning the actual deficits or early losses suffered during the experimental or developmental stage, he believed that an allowance therefor as development costs should be made in the rate of return or in the valuation basis. Such losses, however, must be actually proved. On the other hand, if one looked upon going value as that value accruing from losses incurred after the property had passed through its development life of the first few years, or from the enhancement in its value caused by its operation as a profitable concern after it had reached a paying basis, then such a value should not be included as a factor in a rate basis.

In other words, as Mr. Thorne summed up in regard to going value, justice to the owners, as well as the best interests of the public, demands that reasonable expenses incurred in the construction and establishment, on a paying basis, of a public utility, reasonably necessary for public use, should either be returned to the owners or should constitute a part of the value upon which the owners are entitled to an adequate return. In his opinion, the public is willing to pay these development costs in order to obtain service, and there is money awaiting investment, on reasonable terms, where they and nothing more are desired instead of the larger amount under the misleading title of "going value."

In connection with his address Mr. Thorne remarked that he looked upon neither reproduction cost nor original cost as the proper sole basis for fair value, which is only in the process of being defined. Both of these are now important. Reproduction cost will, in his opinion, always be considered as a prime factor when original cost is not ascertainable, but in the broadest

sense original cost will prove the most important factor when properly compiled and presented. This view, Mr. Thorne maintained, will be supported by the court of last resort.

A. M. Fox, Detroit, Mich., agreed generally with Mr. Thorne's theory regarding the propriety of allowing for early development losses but not for the late-deficit or good-will factors of "going value." William J. Hagenah, public utility expert, Chicago, Ill., did not agree with Mr. Thorne that only the early experimental stages should be considered. He held that with the general extravagance of the last generation, going value was a constantly increasing item extending in some cases even up to the present day. He cited the case of a utility in a fast growing Western city which was constantly compelled to extend its facilities into undeveloped sections and never caught up so as to be in a position to prosper with the community.

Financial Aspects of Regulation

The following speaker was Robert C. Wood, member Public Service Commission for the First District of New York, who discussed the financial aspects of regulation. Mr. Wood averred that the three objects to be attained by regulation of utilities are (1) a fair rate to the public, (2) a fair return on the capital invested, and (3) the obtaining from time to time of the capital needed to provide for additional facilities that are demanded by the public. He believed that under public service commission regulation the securities of a corporation having an established earning capacity, a capitalization within the limits of a fair and reasonable valuation of property and under specific requirements for setting aside annually from operating revenues proper allowances for renewals and replacements, should prove safe and desirable investments. Mr. Wood also discussed the influence of utilities on city development and the mutual interest of the public and the corporation in making the latter's securities attractive.

VALUATION AND THE FUTURE OF PUBLIC UTILITIES

The concluding session of the conference was the dinner on Friday evening, over which presided Charles R. Van Hise, president University of Wisconsin. The four addresses at this meeting were as follows: "The Meaning of the Constitutional Protection in Valuation," by both Charles A. Prouty, director of valuation Interstate Commerce Commission, and William D. Kerr, attorney at law, Chicago, Ill.; "Opinion Testimony," by Prof. John H. Gray, University of Minnesota, and "Valuation and the Future in Public Utilities," by Milo R. Maltbie, member advisory board to division of valuation Interstate Commerce Commission.

Constitutional Protection

Mr. Prouty said that there is a twilight zone between the maximum rate that may be fixed by legislative authority and the minimum rate which would not be declared confiscatory by the courts, and in this zone the rate-making power of commissions is supreme. No rate, however, can be properly or justly established until the value of the property is known. It seemed to Mr. Prouty that it may finally be held that the action of commissions in fixing value will be conclusive to the same extent and within the same limits as in the case of fixing rates. The courts will correct all legal errors made in the process of valuation, but they will not review conclusions of fact. Apparently the rate of return and the valuation must be considered together. Courts will not interfere unless the result accomplished by combining these discloses confiscation. This will follow whether it be finally held that the determination by the commissions of questions of fact are within certain limits conclusive or whether the valuation is simply treated as *prima facie* correct. The courts, it is believed, will not set aside a valuation simply because the judges think the amount too small, unless there is palpable or gross error. Hence, concluded Mr. Prouty, the welfare of public utilities is largely under the control of the public service commissioners, and it is of prime importance that the utilities and the public should unite in securing men of the highest grade for these positions and then inform and support them.

Mr. Kerr was of the opinion that the Fourteenth Amendment creates no property rights, but merely prevents invasion by the state of property rights which are vested under general law. There is no property right in things dedicated to a public use that is entirely exclusive, for rate and service regulations necessarily imply some limitation of the right of free enjoyment. The limitation is voluntarily assumed by the corporation as a matter of contract. Mr. Kerr believed that value may be taken as an expression of the intention of the parties to a contract, as such intention is derived from the contract itself and the subsequent conduct of the parties. This view of value, he said, is not far removed from the results reached by the Supreme Court.

Opinion Testimony

Professor Gray, in discussing opinion testimony, first reviewed the evolution of the rules of evidence which resulted in the admission, about 1800, of the opinions of scientists if based on facts testified to by others. As applied to valuation, he said that the so-called expert testimony of engineers was incompetent, that engineers were not trained to a knowledge of wealth or value, and that their expert testimony along these lines was universally regarded by economists as unscientific. Moreover, he held that engineers were not disinterested witnesses, being in effect paid assistant counsel testifying. While the main objection to opinion testimony prior to its first acceptance was held to be the danger of emotions affecting opinion, Professor Gray thought the present effects of cold calculation more dangerous.

Professor Gray also felt that the public was always at a disadvantage in securing opinion testimony in railroad rate cases, because the railroads could combine and pay more for the testimony and because eminent engineers feared to testify for the public because of its effect on their futures. He declared that if the railroads should succeed in foisting their views on valuation on the Interstate Commerce Commission, government ownership would be inevitable.

The Future of Utilities

Mr. Maltbie in the concluding address before the conference said that the future of public utilities and the attitude of the public toward utilities under private management will depend in a large measure upon the principles followed in determining fair value. If commissions, legislatures and courts decide that a utility can legally require the public to pay rates sufficiently high to yield a return not only upon the actual investment in the enterprise but also upon property, tangible or intangible, which the public has donated, the public will decide that under such circumstances it would be better to give no donation to the utility, or, if such is necessary, to control and manage the utility itself. If the public must stand all shrinkage in values due to depreciation of property and may not share in gains due to land and other appreciation, but must even pay a return upon such appreciation, all will pause to consider whether private ownership and operation are not so un-

fair and burdensome that communities cannot afford to allow utilities to get into private hands. Moreover, in regard to depreciation, if it is finally determined that utility property does not thus decrease in value, then it follows that public utilities cannot collect in operating expenses anything for depreciation from the public through rates. In Mr. Maltbie's opinion, however, the utility which opposes proper depreciation funds or uses them, when accumulated, for other purposes, has not only broken faith with the public but invited retaliatory methods which it would be the first to decry. Furthermore, Mr. Maltbie said that if fair value is based on contemporary unit prices instead of investment or original cost, the stockholders will gain or lose according to economic conditions over which they have no control, development being stimulated in a time of rising prices and retarded in the case of falling prices. In conclusion he said that public confidence is one of the greatest assets that any corporation can have, and those who destroy it through their extravagant claims in valuation matters must face an enormous responsibility.

Lancaster's Experience with Time-Inspection System

BY R. B. HULL, GENERAL MANAGER CONESTOGA TRACTION COMPANY

For some time before we adopted our time-inspection system we were somewhat skeptical as to its efficiency and the need for it on our lines, for we felt that we had always maintained a fairly accurate schedule and, fortunately for us, had done so without any severe accident at any time. Our property, known as the Conestoga Traction Company, includes the street railways of Lancaster, a city of 50,000 population, and a network of lines covering the county branching out from Lancaster, which is the county seat and almost the geographic center of the county. Our lines feed through a splendid territory and bring a population of approximately 150,000 into the city.

In May, 1914, we inaugurated a watch-inspection service under the supervision of our superintendent of trans-

No..... **Form 4**

Conestoga Traction Co.

TIME INSPECTION SERVICE.
EMPLOYE'S CARD CERTIFICATE.

.....191.....

This is to Certify, that the watch of.....
employed as.....in the.....Dept.
Movement No.....Brand.....
has been inspected and is up to the standard of excellence required by the **Conestoga Traction Company,** *and is performing as per record on the back of this certificate.*
Who repaired by.....Date.....191.....
Work done, condition, etc.....
.....Watch Inspector
Address.....

Employe must preserve this card and not soil or deface the comparison records.

TIME-INSPECTION SYSTEM—CARD CERTIFICATE, FACE

Form 5

STANDARD LOANER CARD.
CONESTOGA TRACTION CO.
TIME INSPECTION SERVICE.

.....191.....

This is to Certify, that the Loaner Watch of.....
employed as.....in the.....Department
Movement No.....Grade.....is up to the standard of excellence required by the Conestoga Traction Co. (Rule 11 Circular "Rules of Watch Inspection Service"), and is performing as per record on the back of this Card.
Furnished by.....Date.....191.....
Conditions, etc.....
.....Watch Inspector.

Preserve this Card. See Instructions on reverse side. All "Loaner Cards" taken up by Inspector must be forwarded to S. T. Charles, Supt. of Transportation.

TIME-INSPECTION SYSTEM—STANDARD LOANER CARD, FACE

CONESTOGA TRACTION COMPANY

OFFICE OF THE GENERAL MANAGER

NOTICE

LANCASTER, PA., May 7, 1914.

Effective this day the watch-inspection service of this company under the supervision of S. T. Charles, superintendent of transportation, will be maintained for the purpose of furnishing a careful system of watch inspection for the employees engaged in the operation of cars.

All employees in the transportation department, those in charge of the overhead emergency cars, maintenance of way cars, and such other employees as may from time to time be designated by the superintendent of transportation, will receive orders for watch inspection (Form No. 1) from the general manager, which orders must be delivered promptly to the local watch inspector, from whom will be received an "employee's card certificate" (Form No. 4). These card certificates must be carefully preserved and presented every four weeks to the local watch inspector, on which to enter record and watch comparison.

The following are the rules relative to the time-inspection service:

1. When watches are presented for inspection, care should be exercised not to impose any hardship or annoyance on the employees, and in case of any doubt give the employee the benefit, if it can be done with safety to the service, but safety and reliability must first be considered.

2. The minimum standard of excellence for old watches now in service shall be of American make and a grade equal to what is known among American movements as "15 jewels, Breguet hairspring, patent regulator, adjusted," in such repair as will enable them to meet the time requirement, not more than thirty seconds per week variation. All watches put up in open face cases must wind at figure "12," except such open-face watches as have heretofore passed inspection.

3. The minimum standard of excellence for new watches purchased and going into the service shall be of Hamilton make, 18 or 16 size, 17 jewels, three positions adjusted, open face, lever-set movement, known as grades No. 948 and No. 978 respectively. All new watches going into service must be equipped with safety numerical dial.

4. The designated makes or grades and American watches bearing names of jewelers or other names not standard trade makes or trade numbers, will not be accepted as new watches. Twelve-size watches are not considered standard and, therefore, will not be accepted.

5. Employees having watches which are in good condition and fully up to the previous standard and running regularly within the prescribed limit of error (thirty seconds per week), will not be required to get new watches at present, but when new watches are bought, and in case of employees entering the service, the watches carried must be equal to the present standard.

6. Each employee designated will on May 7, 1914, be furnished with a blank certificate for an order for watch inspection, which he must take, together with his watch, to the local inspector who will, if the watch is satisfactory, sign the certificate and return the same to the company. If the watch is below the standard it will be rejected and the company promptly advised.

7. Each employee coming under the inspection order will be required to present his watch once every four weeks to the company's inspector for the determination of its rate and error. This is of special importance and must be complied with. The maximum amount of variation permitted shall be thirty seconds per week or two minutes in the four weeks elapsing between inspections.

8. Inspector should in all cases see the watches rated and record the error on form at the time and not afterward from memory or memorandum.

9. Every watch must be carefully tested for magnetism, and if it is charged to more than its normal degree must be demagnetized.

10. When employees leave their watches with jewelers for cleaning, repairs or inspection "loaner watches" must be furnished them free of charge, to be used in service for a period not exceeding fifteen days, excepting by mutual agreement for a longer term between employee and jeweler.

11. The standard "loaner watches" must have the same careful attention as the employees' watches and be fully up to the standard for new watches according to Rule No. 3, as their correct rating fills a most important requirement of the time service.

12. When watches are cleaned and repaired by the jeweler, the employee should obtain a certificate from the jeweler making the repair, to be submitted to the company's inspector as evidence of the good condition of the watch.

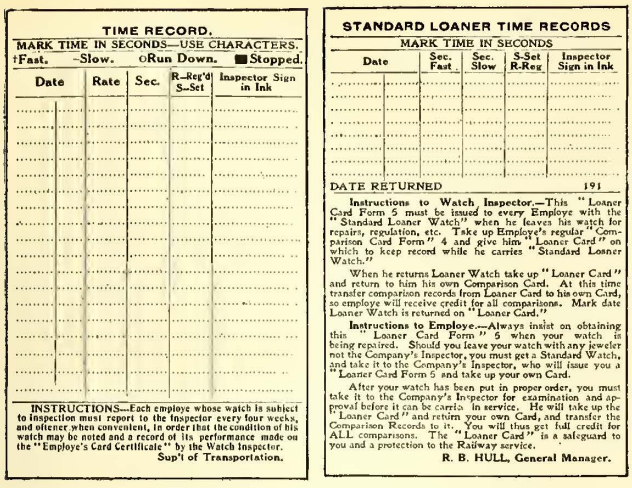
13. The clock at the carhouse in the office of the time inspector will be known as the official standard clock. This clock only must be used in comparing time.

14. Inquiries or complaints in regard to matters arising in the watch inspection service should be addressed to the company.

15. The printed instructions and blank forms provided for this service constitute rules, and will be obeyed the same as though contained in the foregoing.

Signed and approved by
R. B. HULL, General Manager.

TIME-INSPECTION SYSTEM—NOTICE ANNOUNCING INAUGURATION OF SYSTEM



TIME RECORD.

MARK TIME IN SECONDS—USE CHARACTERS.

†Fast. –Slow. oRun Down. ■Stopped.

Date	Rate	Sec.	R–Reg'd S–Set	Inspector Sign in Ink

INSTRUCTIONS—Each employe whose watch is subject to inspection must report to the Inspector every four weeks, and oftener when convenient, in order that the condition of his watch may be noted and a record of its performance made on the "Employe's Card Certificate" by the Watch Inspector.

Sup't of Transportation.

STANDARD LONER TIME RECORDS

MARK TIME IN SECONDS

Date	Sec. Fast	Sec. Slow	S–Set R–Reg	Inspector Sign in Ink

DATE RETURNED 191

Instructions to Watch Inspector.—This "Loaner Card Form 5 must be issued to every Employe with the "Standard Loaner Watch" when he leaves his watch for repairs, regulation, etc. Take up Employe's regular "Comparison Card Form" 4 and give him "Loaner Card" on which to keep record while he carries "Standard Loaner Watch."

When he returns Loaner Watch take up "Loaner Card" and return to him his own Comparison Card. At this time transfer comparison records from Loaner Card to his own Card, so employe will receive credit for all comparisons. Mark date Loaner Watch is returned on "Loaner Card."

Instructions to Employe.—Always insist on obtaining this "Loaner Card Form 5 when your watch is being repaired. Should you leave your watch with any jeweler not the Company's Inspector, you must get a Standard Watch, and take it to the Company's Inspector, who will issue you a "Loaner Card Form 5 and take up your own Card.

After your watch has been put in proper order, you must take it to the Company's Inspector for examination and approval before it can be carried in service. He will take up the "Loaner Card" and return your 5 Card, and transfer the Comparison Records to it., You will thus get full credit for ALL comparisons. The "Loaner Card" is a safeguard to you and a protection to the Railway service.

R. B. HULL, General Manager.

TIME-INSPECTION SYSTEM—REVERSE SIDES OF CARD CERTIFICATE AND STANDARD LOANER CARD

portation, for the purpose of furnishing a careful system of watch inspection for the employees engaged in the operation of cars, namely, the employees in the transportation department, those in charge of the overhead emergency cars and maintenance of way cars, and any other employees who were from time to time designated by the superintendent of transportation to receive orders for watch inspection and an employees' card certificate.

The accompanying copies of our forms show the itemized detail of the system now in use. They include the card certificate, the standard loaner card and our printed rules covering the inauguration of the system.

I want to emphasize particularly the fact that one of the rules of the inspection service is that when watches are presented for inspection care shall be exercised not to impose any hardship or annoyance on the employees. In case of any doubt, we give the employee the benefit, if it can be done with safety to the service; but safety and reliability must be considered first. This rule is particularly important in the successful working out of the system, for without a clear understanding of the rule on the part of the employees there is a tendency to imagine that this is something that is being forced upon them. In reality this time-inspection system is one of the best possible safeguards of the employee's life, and it contributes to the more accurate timing of the cars.

For old watches in service we took as a minimum standard of excellence the conditions that they should be of American made, of a grade equal to what is known among American movements as 15 jewels, Breguet hairspring, patent regulator, adjusted and in such repair as to meet the time requirements of not more than thirty seconds per week variation.

In view of the great predominance of Hamilton watches on the steam and electric railways in America, we specified that the minimum standard of excellence for new watches purchased and going into the service should be Hamilton make, 18 or 16 size, 17 jewels, three-position adjusted, open face, lever set, known as grade Nos. 948 and 978 respectively. All new watches going into the service must be equipped with safety numerical dials. This latter feature is one which has been very successfully used by the men on steam railways, for it tells at a glance the minutes after the hour.

The time-inspection system has worked out to our entire satisfaction and at a minimum of expense to this company. It has not caused any friction among our employees. In fact, I think it has worked just the reverse, that is to say, our employees are well pleased. This company would not hesitate to recommend the adoption of the time-inspection system by any other railway.

One-Man Cars*

All Closed Cars in the City of Anniston Have Been Rebuilt for One-Man Operation

BY A. L. KENYON, LOCAL MANAGER ALABAMA POWER COMPANY, ANNISTON, ALA.

Given the right conditions there is no question as to the advantages of the single-truck, pay-as-you-enter car for the smaller cities, especially those of from 15,000 to 75,000 population. The light car, giving quick service at short intervals, furnishes the solution of many railway problems in such cities when the street car company is barely meeting its fixed charges, and in many instances doing this only by "skimping" maintenance. This reacts on the company through the public, which is quick to notice poor roadbeds and illy-kept cars, preferring to walk rather than to ride in such vehicles.

To provide a rapid, frequent service without a prohibitive increase in cost of operation, platform costs must not be increased. Hence one-man operated cars seem to promise a partial solution of the question. But there are several problems involved in one-man service. One is the negro problem. Another is that of steam railroad crossings. Where the steam road does not maintain a flagman, safety regulations require the electric railway conductor to go ahead and flag the car across.

The only way to overcome this is to employ a regular crossing flagman, paid for jointly by the steam and electric roads, or to install an automatic signal system operated by the electric car. On a large system the employment of the flagman is warranted. On a small system, when two to four cars are operating on a fifteen-minute or thirty-minute headway, the expense of keeping two flagmen at each crossing nearly offsets the saving in one-man operation. The remedy for this is to install an absolutely reliable signal system, approved by the State railroad commission. We are now experimenting with the Nachod signal system at a proposed cost of about $400 per double-track crossing.

All of our cars are electrically heated, and Johnson fare boxes are employed on all, so that except in rush hours one-man operation is easy and possible, but is not as yet practised on all lines. We have one line operating two cars, with a fifteen-minute schedule, running through the heart of the city and with the aristocratic section at one end, that has a light traffic and no difficulty is experienced with it. This line is free from railroad crossings, and it is equipped with pay-as-you-enter, one-man cars. These are new cars, built by the Southern Car Company. They seat thirty-six passengers, are mounted on Brill 21-E trucks with 8-ft. wheelbase and 30-in. wheels, and are furnished with air brakes and folding doors and steps.

All cars operated in Anniston, except the open cars, have been rebuilt this year for one-man operation. All bulkheads were removed, and folding doors and steps were added. The mechanism was arranged for normal operation by one man, but provision has been made for opening the front and rear doors on one side by the motorman if desired. The one-man plan has been of great advantage in reducing petty accidents, due to the impossibility of passengers getting on and off before the cars came to a full stop. While this service has been given for but a short time, so far the public is well pleased. Strict attention to cleanliness and courtesy in all dealings with the public are absolutely insisted upon, and the efforts of the company to please the public are appreciated.

*Abstract of paper presented before the Alabama Light & Traction Association at the meeting held Oct. 20 and 21, 1915.

Exhibition of St. Paul Locomotives

The First 3000-Volt St. Paul Locomotive Was Taken from Erie to Seattle and Shown at Many Cities to Interested Visitors—Tests of Regenerative Features of Another Locomotive Made Last Week in Montana

A decided novelty in methods of publicity was recently carried out by the Chicago, Milwaukee & St. Paul Railway Company in connection with its 440-mile electrification across the Continental Divide, one of the electric locomotives having been hauled across the continent and exhibited at every important city on the route, finally being placed in trial operation on the Butte, Anaconda & Pacific Railway, which joins the St. Paul System at Butte, Mont. That the exhibitions were an unqualified success is shown by an article by E. S. Johnson in the forthcoming issue of the *General Electric Review*, wherein it is indicated that some 60,000 people took advantage of the opportunity to inspect the machine.

The railway company's contract, which was made on Nov. 25, 1914, called for the delivery of the first locomotive in ten months, and shipment was made on Sept. 25, 1915, a delivery that is unusual in view of the fact that the design is entirely new, that the capacity exceeds that of any steam or electric locomotive ever built, that the voltage of the system is higher than that of any direct-current system for commercial operation, and that the important feature of regenerative control, which is included in the design, was entirely untried for direct-current railways. Since the first delivery several additional locomotives have been shipped, so that electrical operation of the first division between Deer Lodge and Three Forks is expected to begin about Dec. 1.

The first public inspection of the exhibition locomotive was held in Chicago at Fulton Street near the Union Station on Oct. 6, from 12 o'clock noon to 4 p. m. It was estimated that 10,000 people gathered to see the great machine and 5000 visitors actually passed through the interior. So great was the popular interest that several "movie" operators were on hand and made films at different points which are now being exhibited throughout the country.

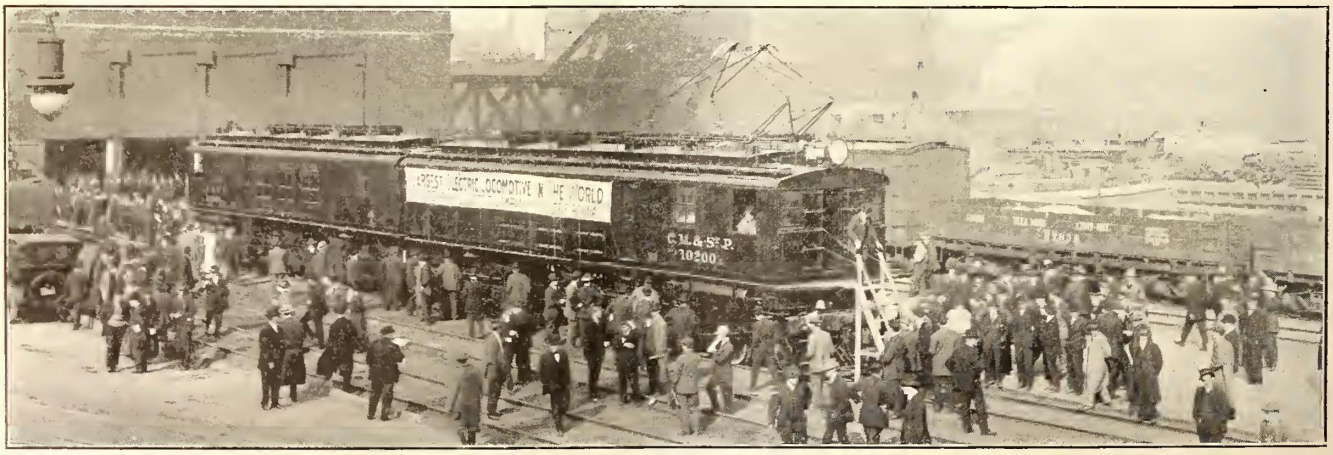
Prominent among these visitors were many railroad officials located in Chicago and university professors; particularly those interested in engineering work at the University of Chicago and at Northwestern University. A number of students were dismissed from class work in order to give them an opportunity to examine the locomotive. Superintendents of motive power, street and steam railway officials, consulting engineers and city officials from Chicago and points within 200 miles took advantage of the opportunity to inspect the first transcontinental locomotive. Public men of every profession and city officials were especially interested on account of the agitation in favor of electrification of the railway terminals of Chicago.

The feature that evoked the greatest interest was, naturally, the regenerative braking which enables the locomotive to hold back the heaviest trains on long descending grades—at the same time returning power to the line. The air brakes are thus used only for emergency service or in making the final stop. Regeneration is controlled by the engineer through an auxiliary handle on the master controller which causes the motors to return power to the trolley in the proper amount to maintain any desired speed. This feature, it may be said, was very thoroughly tested on the General Electric Company's experimental track at the Erie Works before the locomotive was shipped.

The general public showed much interest in the fact that cold weather offers no obstacles to electric locomotive operation as is the case with steam. It was pointed out that steam locomotives are usually in difficulties in the winter time, necessitating extra leeway in the time-table to take care of delays. With electric operation there will be no delays for fuel or water or cleaning fires and the electric engine will always be ready at a moment's notice. Trains will move exactly as scheduled so the meeting and passing points may be figured to the minute. Fuel trains will be eliminated in the mountain districts, thus giving track-room for additional trains handling revenue freight.

During the inspection at Milwaukee an accurate count was kept, and it was found that 5010 people went through the locomotive. As many more inspected the locomotive from the outside and either did not have the time or the opportunity to make an examination of the interior. Especial interest was displayed by the employees of the railway company, practically the entire office and shop force taking occasion to visit the machine.

In St. Paul 2550 visitors passed through the locomotive, and in Minneapolis nearly 6000. Opportunity



CHICAGO, MILWAUKEE & ST. PAUL LOCOMOTIVE ON PUBLIC EXHIBITION NEAR UNION STATION, CHICAGO, DURING SPECTACULAR TRANS-CONTINENTAL TRIP

was also afforded the faculty and students of the railway engineering course of the University of Minnesota to make a careful examination at a special hour. On the trip west over the Chicago, Milwaukee & St. Paul lines stops were made at Aberdeen, Miles City, Butte and Missoula, an average of 2000 to 3000 visitors inspecting the locomotive at each stop.

At Butte, the president's special car was attached and a trip made over the lines of the Butte, Anaconda & Pacific Railway to Durant and return. It is noteworthy that the locomotive was operated under its own power as a demonstration to these officials the day it arrived at Butte after being hauled more than 2000 miles. Among the officials on the trip to Durant were President A. J. Earling, Vice-President H. B. Earling, Assistant to the President C. A. Goodnow in charge of electrification work, R. M. Calkins, traffic engineer at Seattle; A. M. Ingersoll, assistant to the vice-president; R. Beeuwkes, engineer in charge of electrification; H. A. Gallwey, general manager of the Butte, Anaconda & Pacific Railway, and many others.

Final exhibitions were made at Ellensburg, Spokane, where there were 10,000 visitors on the first day, Seattle and Tacoma. The number desiring to inspect the locomotive at both Spokane and Seattle was so large that it was necessary to allow two days at each place for the exhibition. From Tacoma the locomotive was sent back to Butte to be placed in trial operation. Most of the tests now being conducted on the Butte, Anaconda & Pacific Railway with the new St. Paul electric locomotives received there have applied to the power regenerative feature. The results of one of these tests, conducted on Nov. 13 with locomotive No. 10,201, show the severity of the trials to which the locomotives are being subjected.

TEST OF REGENERATIVE BRAKING

The weight of the train tested was as shown in the following table:

Sixty-five ore cars at 70 tons each	4,550 tons
One caboose	15 tons
One business car	94 tons
Total, excluding locomotive	4,659 tons
Total including locomotive	4,943 tons

This load was hauled from Rocker to Anaconda yards without the use of air brakes except to stop at Durant and Anaconda yards, electric braking being used to hold the train on the 1 per cent down grade with the current averaging at times as high as 880 amp. at the locomotive, corresponding to approximately 2100 kw. returned to the line at substation voltage. The train was allowed to speed up to approximately 25 m.p.h. on the down grade, and the train was brought to as low as 7 m.p.h. with the electric brakes in order to demonstrate the wide field of application of this method of braking. The braking was very smooth, and the reduction of speed from 25 m.p.h. to 7 m.p.h. was made without the slightest jar to the train. As the braking was done entirely by the engine, the slack between cars was bunched, and at no time was there any danger of breaking the train in two.

The tests were witnessed by the following representatives of the Chicago, Milwaukee & St. Paul Railroad: C. A. Goodnow, assistant to the president; E. H. Barrett, assistant general superintendent; R. Beeuwkes, electrical engineer; George Spaulding, traveling engineer, and H. A. Gallwey, general manager Butte, Anaconda & Pacific Railway. A. H. Armstrong, chairman of the electrification committee General Electric Company, and P. P. Spaulding of the same company were also present.

Australian Railways to Be Electrified

According to a recent commerce report from Sydney, Australia, to the bureau of foreign and domestic commerce, Washington, D. C., two schemes for electrifying existing lines of urban and suburban railways of Sydney are engaging the attention of the local transportation departments. The railway service, known as the North Shore Lines, running from Milson's Point, the traffic center immediately opposite the city proper, to Hornsby, 13 miles away on the main line from Sydney to the north, is about to be electrified. Already a tunnel under the harbor for carrying the necessary feeder cable is being driven, and but for an unexpected interruption, owing to a fault in the rock, would have been nearly completed by this time. The plan is to supply energy for this service from the existing power stations at White Bay on the Sydney side of the harbor. The work is being carried on by the Railway Department of the New South Wales government.

The second project, for the construction of a metropolitan railway, is much more extensive in conception. Parliamentary sanction for the expenditure of $32,000,000 has just been obtained. J. J. C. Bradfield, who is chief engineer of metropolitan railway construction, is in full charge of the preliminary arrangements.

The electric railways about to be constructed in the metropolitan area of Sydney include: (a) The immediate electrification of the inner zone suburban railways, comprising 64 route-miles or 200 track-miles, and in the near future the electrification of the outer zone suburban railways radiating some 36 miles from Sydney, and additional length of 200 track-miles. (b) The construction of a 16-mile, double-track loop railway around the city of Sydney. (c) The construction of double-track railways to the eastern, western and northern suburbs, connecting with the existing railways and with the city railway, a length of 37 miles of single track. The ruling grades will be about 3½ per cent with the load and 2½ per cent against the load, while the sharpest curve is 11½ deg. All platforms will be 520 ft. long and will be placed in shallow subways; access will be generally by steps. Energy will be supplied from overhead wires to the train motors at 1500 volts.

The railways to the northern and western suburbs necessitate long-span cantilever bridges across the harbor, without piers in the fairway; the bridge to North Sydney is to be 1600 ft. long, center span, accommodating four tracks, and having a main roadway 35 ft. wide, a motor roadway 18 ft. wide and a footway 15 ft. wide. A bill for the construction of this bridge is shortly to be submitted to Parliament, and though the European war may postpone its commencement it is hoped that a beginning will soon be made. The bridge to Balmain is to be 1350 ft. center span, accommodating double-track and the same roadways and footways as the North Sydney bridge. The clear headway for shipping under the bridges is to be 170 ft. at high water. The total cost of the scheme is approximately $97,330,000.

The construction of the Sydney City Railway, Sydney, Australia, will be begun as soon as the scheme has received the sanction of Parliament. Electric traction will be used, and it is intended to connect the lines with North Sydney and the Nelson's Point Railway. The estimated cost of wiring from the present Nelson's Point terminus to Hornsby is $526,500; in addition further expenditure will be necessary to provide rolling stock, transmission lines and substations. The question of funds for the electrification of the Nelson's Point-Hornsby Railway will be considered in connection with the next loan estimate.

C. E. R. A. Meets in Indianapolis

Ways and Means of Increasing Electric Interurban Railway Revenue, the Question Raised in the Paper by G. K. Jeffries, Was the Principal Topic Discussed at the Opening Session on Nov. 18

The November meeting of the Central Electric Railway Association was held at the Claypool Hotel, Indianapolis, on Thursday and Friday of this week. More than eighty members were in attendance when the meeting was called to order on Thursday morning, and President Henry presided. The first order of business was the report of the standards committee, which was presented by R. N. Hemming, superintendent of motive power Union Traction Company of Indiana. This committee is collecting and putting in proper form all the standards adopted by this association, with a view of having them printed and distributed in loose-leaf form. Mr. Hemming reported progress and requested the permission of the association to make certain minor changes and corrections before putting these standards into final form. This was granted.

In the absence of S. W. Greenland, general manager Fort Wayne & Northern Indiana Traction Company, and chairman of the committee on uniform charges for repairs to foreign equipment, Secretary Neereamer read the report of this committee. Its recommendations were adopted by the association without change.

President Henry then advised the association of the death of two of its members, George Parker, general freight and express agent Detroit United Railways, and C. M. Witt, storekeeper Union Traction Company of Indiana. Upon motion a committee was appointed to draft suitable resolutions to be sent to the families of the deceased.

Under the heading of new business Mr. Hemming called attention to the difference of opinion among interurban roads regarding the manner of applying the locking pawl on hand brakes. Some roads specify that the operator must hold his foot on the lever which engages the pawl in applying the brakes and must keep his foot on the lever as long as he desires the brakes to be applied. Other roads specify that the automatic pawl, after it has engaged with the ratchet, must stay in that position, and that it may be released only by the operator's foot again being placed on the releasing lever. He said the second method was better practice because it was safer. He said that two types of hand brakes also created an additional hazard, particularly where cars were subject to interchange, because all operators would not be familiar with the peculiarities of the two types of brakes, and accidents might result.

Accordingly Mr. Hemming recommended that this matter be referred to the standards committee for consideration. His suggestion was adopted.

President Henry then called attention to the plan of the Bureau of Standards of preparing standard rules for overhead lines. He said that he understood a number of roads did not agree with the tentative rules and that the bureau would send out revised copies of them for further consideration. Prompt action on the part of those not agreeing with the standards, in submitting their criticisms, would aid in bringing about the desired changes.

The president also announced that the annual meeting of the association would be held at Dayton, Ohio, Feb. 24 and 25. He appointed a nominating committee composed of E. B. Peck, Terre Haute, Indianapolis & Eastern Traction Company; W. H. Bloss, Ohio Brass Company; E. F. Schneider, Cleveland, Southwestern & Columbus Railway; W. S. Whitney, Ohio Electric Railway, and S. D. Hutchins, Westinghouse Traction Brake Company.

Methods of Increasing Revenue

The president then announced that the next matter on the program was the presentation of a paper by G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern Traction Company. This paper, which was called in the program "The Question," was devoted to a discussion of the best means of increasing the revenue. An abstract is published on the opposite page. A lively discussion followed the reading of this paper.

W. A. Carson, general manager Evansville Railways, said that his road was not suffering greatly from automobile competition because there were but few good roads in its territory. He was seriously considering the question of buying some automobiles to serve as feeders to his line. These would be operated between small towns in adjoining territory to his line. Mr. Carson said he was now operating boat lines where he could not get private parties to handle the traffic because they considered it unprofitable.

After the first year, these boat lines have succeeded and in addition have increased the railway revenue more than $100 a month. He expected the automobile lines to be unprofitable at first but to pay after service had been established. C. A. Baldwin, superintendent of transportation Union Traction Company of Indiana, recommended fast through cars that are comfortable and clean to increase passenger travel.

C. N. Wilcoxon, president Chicago, Lake Shore & South Bend Railway, thought that electric interurban lines should branch out and away from the lines followed in the past to increase earnings. He suggested getting into the freight business on an extensive scale. It should equal that of steam railroads and include particularly car-load freight. He said he was satisfied that if electric railways would correct some of their physical errors a general freight business would prove to be profitable.

W. S. Whitney, general freight and passenger agent Ohio Electric Railway, agreed that car-load freight was very desirable for electric railways. He said that it must be borne in mind, however, that this business originated and was delivered on side tracks and at terminals and not on the main line. John F. Keys, general passenger agent Detroit United Railway, was of the opinion that the increase in the number of automobiles would work to the ultimate advantage of electric railways. They created the travel habit, and all people could not own automobiles nor could automobiles travel everywhere and during the entire year. Mr. Keys also told of the advantages of advertising posters within and on cars. He said his road was using posters successfully to stimulate passenger traffic. He urged all railways to use their advertising opportunities to develop the passenger business.

J. H. Drew, Drew Electric & Manufacturing Company, and L. G. Parker, Cleveland Frog & Crossing Company, brought out the importance of systematic advertising and urged using the association as a medium for developing business. Their idea was to operate all

roads in the association as one big system and advertise the service and connections to the general public. Others taking part in the discussion brought out the possibilities of selling light and power and making connections with the trains of steam roads.

OTHER BUSINESS

Hon. J. F. McClure, member Public Service Commission of Indiana, then read his paper entitled "The Interurban." At the afternoon session the members heard an interesting lecture by W. A. Phillips on the complete process of manufacturing steel pipe. This was accompanied by motion pictures showing all the important processes.

A report of Friday's session will appear in next week's issue.

METHODS OF INCREASING REVENUE

BY G. K. JEFFRIES, GENERAL SUPERINTENDENT TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY

I think the subject foremost in the minds of all interurban men at the present time is the development of the best method to increase revenues. We all know that the increased use of the automobile has become a factor which has seriously affected the revenues of practically all the companies. The larger amount of this loss of business is in the short distance travel. There is no indication that the farmer and small town storekeeper and all others who can raise $450 or $500 are going to abandon the use of the automobile and return to the electric road for transportation whenever they want to go 3 miles or 4 miles to town or country or even to the principal towns or cities 20 miles or 30 miles away. There is no use injuring ourselves by butting against this wall. We must look to other things to take the place of this lost travel. An editorial in a trade publication recently suggested, as one method of partially eliminating automobile competition, the advocacy by railway officials of a higher license for automobiles, the thought being that the license fee should be about ten times as much as it is now. I am afraid that this would prove a boomerang. It would antagonize the hundreds and thousands of automobile owners and drivers, and they would be even more ready and willing than they now are to take their neighbors and friends with them on their journey.

The principal other source of passenger revenue is the long-haul business, where the use of the automobile is only occasional instead of being the rule, as it is for comparatively short distances. The development of attractive service over long divisions, or between points on different divisions of one system, and more particularly, good service over the lines of two or more connecting companies, should bring good results. We cannot expect to compete in running time with parallel steam roads, but we can, by making the service attractive, secure much of the business that now goes to these competitors. One of the principal items of attraction is through service without change of cars. Another is the elimination of stops. A through service is ruined if the train stops at all the towns. This kind of a train does not equal the peddling locals of steam lines, as the service stops on electric lines are greatly in excess of those on steam roads.

Of two trains making the same time between terminals, one making all town stops and the other those only at the principal cities, the latter would be much more popular with the traveling public. The traveler does not notice the time consumed if the train keeps on the move. It will not be necessary to increase the speed of our motors to give this faster service. All we will have to do is to eliminate some of the delays, of which stops are the largest item. Of course, regularity and reliability of the service are large factors. Trains arriving at terminals on time are the best advertisement a road can have.

The possibility of long trips via connecting interurbans or interurban and steam roads should be called to the attention of the public in advertisements, and these schedules should be worked out by traffic departments and shown in folders. Very few people know the possibilities of this through travel which, among other things, enables them to save money on interstate journeys as compared with the trip entirely on steam lines. On our own lines we carry quite a number of passengers for Illinois points and St. Louis via Paris, Ill., the passenger getting through for 2 cents per mile. If he goes all the way on steam lines he pays 2½ cents.

Ask the managers of any lines which have originated through fast service and you will find that these trains are the most profitable ones on their lines. I have in mind some fast schedules with Indianapolis as one of the terminals made by trains which have been running for some time and which have been extensively advertised. These trains are so popular that they are always filled, a trailer often being necessary to take care of the travel. I know of others which are just as well advertised and would be equally popular if they were not spoiled by doing local work over a portion of the run. The criticism heard from passengers on these trains is not good advertising, and it injures not only that particular line but it reflects on all electric roads which advertise limited service and then do not give it.

In every interurban district there are points between which travel is heavy, particularly during the summer season, and where the steam road service and connections are poor and where electric lines, either alone or in connection with some steam road, can give superior service. More attention should be given to attracting this travel to the electric road. Many of the steam lines are antagonistic, but none of them will refuse business handed to them or to handle passengers for an interurban connection, and some of the more broad-minded traffic departments are glad to enter into traffic arrangements with us.

The establishment of sleeping car service between cities of from 50,000 to 250,000 population would, I think, be a paying proposition. In many cases the steam road competition would not be serious because the sleepers on the steam lines are on through trains and the passenger can board a sleeper only when the train arrives, and he must leave it when the train gets to his destination. He probably must either remain up until midnight to get his sleeper or rise at a very early hour in the morning to leave it. Where sleepers on electric lines are in operation they are paying well. The fare is less than on Pullman cars, and as the schedule need not be fast, the trip is comfortable and void of dust and cinders and smoke.

If we can get the managers of connecting lines together and have them talk over the possibilities of developing business which now goes to our competitors, I believe much good will come of it.

The *Electrical Review*, calling attention to the growing importance of railway electrification in England, states that the aggregate length of single track now under, or being equipped for, electrical operation in that country is nearly 1000 miles.

COMMUNICATIONS

Wider Use of Public Libraries

Free Public Library
New Haven, Conn., Nov. 8, 1915.

To the Editors:

It is with great interest that I note the step of The Connecticut Company in making the beginnings of a company library in connection with the Accountants' Association correspondence course, as described in the in the issue of the Journal for Nov. 6, page 953, and commented upon editorially in the same issue.

It is very possible that no railway company, large or small, will purchase enough books for all employees. This thought entered my mind as soon as I read the list of books published in the article referred to. I at once made a list of the books in this library that duplicated The Connecticut Company's list and mailed a copy to the company, requesting that copies be placed in prominent locations in order that their employees might reap the benefit of the city library. It has since occurred to me that as this correspondence idea is big enough to start a company like The Connecticut Company in establishing a library, perhaps other companies would follow suit, and thereby afford a chance for the public libraries to lend a hand.

The above is merely the view I get from my side of the matter. I shall be interested to learn the viewpoint of the electric railway industry.

Kenneth C. Walker,
Head Department of Technology.

Indexing Car Equipment Data

The Southwestern Electrical & Gas Association
Dallas, Tex., Nov. 9, 1915.

To the Editors:

With reference to the classification suggested by Mr. Litchfield in his article on "Indexing Car Equipment Data" in the Oct. 2 issue of the Journal, I would primarily suggest a considerable modification of his main divisions. In the first place Mr. Litchfield's suggested main heads seem to duplicate certain items while they leave out certain others. As a matter of principle in filing there should never be any such thing as a "miscellaneous" file. In practice it will be found that such a file will simply become a dumping-ground for negligence and carelessness in nomenclature. Such a thing is a misnomer, as a portion of a file; to use it violates the very principle of exactitude that is the vital portion of proper filing. If it is really considered necessary to have such a collection of miscellaneous matter, it had better be kept out of the file and in the basket or folder on the desk where it may be "pawed over" at will, for that is exactly what will have to be done with that portion of the file if a "miscellaneous" folder or section is allowed. Every piece of it will have to be "pawed over" to find what is desired. With a little thought and care given to the matter, there is hardly any item that will not naturally fall under some head or subhead or sub-subhead, and if this is found not to be the case it is decidedly better to give it a fixed arbitrary location and index it in such position than to put it into a "miscellaneous" scrapheap with a lot of other anonymous orphans.

As I understand Mr. Litchfield's article he is suggesting a method of indexing and filing all the data that may be desired with reference to car equipment—meaning thereby, according to his classification, the whole of the car and including the body and everything connected with it. If the information desired is strictly with reference to such, it is necessary to know exactly what information will be desired from such a file. If that information relates only to the physical features of the different portions of the equipment—to their weights, dimensions, the materials of which they are made and the process of making them—in short, their "specifications"—then the plan of making these records and indexing and filing them would be in a certain way and would be a most simple matter.

If, however, as seems to be the case from the classifications shown, there ensue the further matters of costs, progress, mileage, together with the outside matters of the "office" and "transportation and traffic," then the problem becomes a very complicated one, and the suggestion of the writer would be that instead of trying to crowd all this unconnected and irrelevant matter into one file, it would be much more simple and tend to less work and time and to greater accuracy and facility of reference, to separate these sources of information into separate files and indexes. One of the early mistakes that is often made in the beginning of any system of "filing" is to have each file cover too much. While it has been urged that it is wise to have all the possible information with reference to one item, object or subject in one place, this needs the necessary modification of departments; otherwise there would be complication instead of simplification. If the file suggested by Mr. Litchfield were such as to give the car-shop foreman every bit of information with reference to the car equipment—direct as well as indirect—he would have in that file information that was really the property of the accounting, the purchasing, the stockroom, the track, the line and transportation departments. And, in such case, there would either be an enormous duplication of information with its attendant expenditure of time and money if these other departments kept similar files, or if they did not do so they would have to come to the shop files to obtain information needed by them. In a very small railway property where neither the size nor the earnings of the property permitted any great amount of departmentizing, where the manager or superintendent was either the whole of most departments or their technical head, the idea of such a general file might be permissible.

In any railway property which is sufficiently large or prosperous enough fairly and fully to departmentize itself, it would be the wisest and most economical method to have each department keep in its departmental files that detailed information only of which it was the originator. Under such an arrangement there would be a much greater likelihood of accuracy and "up to dateness" in the records of each, and, for general inquiry or information, it would be much easier and tend to greater accuracy to combine the information from the several departments in the main office than to have this partially done by each separate department. This suggestion is in line with the latest practice of "efficiency," the principle of "the economic division of labor" and "the largest results with the least expenditure," and the writer would strongly suggest to those interested in the article by Mr. Litchfield that, when their railway property has separate and distinct departments, their "department files" consist only of their proper departmental statistical forms or data properly collected, collated and integrated and that the "data and statistics" of all the departments as a whole are better handled by one person or department that makes a specialty of so doing.

It is doubtless pleasing to a foreman or superintendent to have under his hand and eye all the detail relating to the subject of his department and the results attained by that department, but, in actual practice, it is better that any "outside" data and statistics be pre-

pared by others who have all the basic information at hand, whose specialty is such work and who neglect no other work while so doing. Such others will not use the method of classification suggested by Mr. Litchfield if they desire the best and most easily accomplished results. The best results to be obtained from the proper use of "filing" are not by making the files complex or trying to make any one file cover everything.

H. S. COOPER, Secretary.

Association News

On Nov. 18 the committee on subjects of the Transportation and Traffic Association met in New York with the following in attendance: J. K. Choate, New York, N. Y.; L. H. Palmer, Baltimore, Md., and H. A. Nicholl, Anderson, Ind. The committee prepared its report for submission to the executive committee on the following day. The subjects selected by this and the other subjects committees will be announced as soon as they have been submitted to the respective committees concerned.

The executive committee convened at 8.30 o'clock Friday morning and is in session as this issue of the ELECTRIC RAILWAY JOURNAL goes to press. The following members are in attendance: H. A. Nicholl, Anderson, Ind., president; R. E. Danforth, Newark, N. J., second vice-president; W. H. Collins, third vice-president; M. C. Brush, Boston, past-president; L. H. Palmer, Baltimore, Md.; J. J. Dempsey, Brooklyn, N. Y.; R. P. Stevens, Youngstown, Ohio, and E. B. Burritt, New York, N. Y., secretary. J. K. Choate, New York, N. Y., and H. C. Donecker, Newark, N. J., also attended part of the session.

Higher Temperature Limits for Electrical Apparatus

At the A. I. E. E. meeting held in New York on Nov. 12, F. D. Newbury of the Westinghouse Electric & Manufacturing Company presented a paper in which the statement was made that the mica-insulated generators installed in the power plant of the Niagara Falls Power Company twenty years ago had operated at temperatures as high as 285 deg. C. His paper brought out a number of comments in favor of more liberal temperature-rise allowances in some classes of electrical machinery.

In a written discussion Philip Torchio of the New York Edison Company called attention to the conditions which resulted in the A. I. E. E. standards committee adopting the present allowable temperature limit of 125 deg. C. for class B insulations. He also referred to temperature guarantees which he had accepted on two 20,000-kva., three-phase generators employed by the United Electric Light & Power Company for supplying single-phase energy to the New York, New Haven & Hartford Railroad. In referring to the data presented by Mr. Newbury, he pointed out that if the temperature obtaining in the Niagara generators were permitted in the United company's machines they would carry continuous single-phase loads of 16,000 kva. and overloads of over 25,000 kva. at 60 per cent power factor. Mr. Torchio declared that on account of the high speeds required for high steam economy the diameter of rotors must be minimized and the radiation sacrificed so that insulating materials capable of withstanding high temperatures must be employed. Again, turbo-generators for carrying single-phase loads must have large overload capacities at low power factors. In this case it is doubly necessary that generator dimensions be minimized so as not to sacrifice steam economy, for in an unduly large machine carrying low power-factor overloads iron and field losses are likely to be relatively large. Special guarantees on built-up mica insulated machines might be allowed, he suggested, but a special protective apparatus should be provided to minimize stresses on the machine in case this is done. In closing, he questioned the value of applying the data obtained from the Niagara machines to higher voltage generators and those machines in which the windings consist of several wires instead of rigid bars.

Power Station Extension Near Youngstown

The Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, is installing a 15,000-kw., 60-cycle, 2300-volt General Electric turbo-generator at its power station at Lowellville, thereby practically doubling its size. The power station is being extended to house the new machine, and a reinforced concrete and brick-lined stack, 202 ft. high, and 12 ft. 6 in. in diameter, is being erected. Attached to this turbo-generator will be a Worthington surface condenser with 35,000 sq. ft. of cooling surface. A Worthington volute circulating pump, driven by a Terry steam turbine, a Laidlaw-Dunn-Gordon Corliss dry vacuum pump and two Worthington hot well pumps, one driven by a Terry steam turbine, and the other by electric motor, will be used. The boiler feed pump will be of the three-stage Jeansville type, direct connected to a two-stage Terry turbine.

The boiler room equipment will consist of 5400-hp. Babcock & Wilcox boilers in nine units of 600 hp. each. Five of these will be installed at the present time and four will follow later. These boilers will be equipped with Foster superheaters and Taylor underfeed stokers. The latter will be able to drive the boilers under peak load conditions to 300 per cent of their rating.

The engineering and installation of this work is being carried out by the Stone & Webster Engineering Corporation, and it is hoped that the extension will be ready for service by the first of next year.

Swedish Hydroelectric Power Station Nearing Completion

Construction will soon be completed on the new Swedish State hydroelectric power station at Porjus, which will generate electrical power on a large scale for railway and industrial use. The generator equipment is divided into five large units: Two of 12,500 hp. maximum each, intended for the railway load; one of normally 12,500 hp., maximum about 14,000 hp. for supplying power to the iron mines; and a reserve unit. The fifth will only be installed when the requisite demand for power has materialized. The units consist of twin turbines, placed in closed plate cases with horizontal shafts and direct-coupled electric generators, constructed so as to supply single-phase alternating current for the railway traction purposes and three-phase current for the other power distribution. The turbines operate at 225 r.p.m. for the single-phase units and 250 r.p.m. for the three-phase unit.

According to a statistical table recently compiled by the *Commonwealth Engineer*, the total trackage of tramways in Australia amounted to 357 miles. The total capital cost of the properties was $51,350,424. The number of car-miles run was 44,000,000. Gross revenue amounted to $13,875,132. There were 12,498 employees in the tramways' service. The track mileage and control are as follows: Government, 284.5; municipal, 110.25; privately-owned, 146.75.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

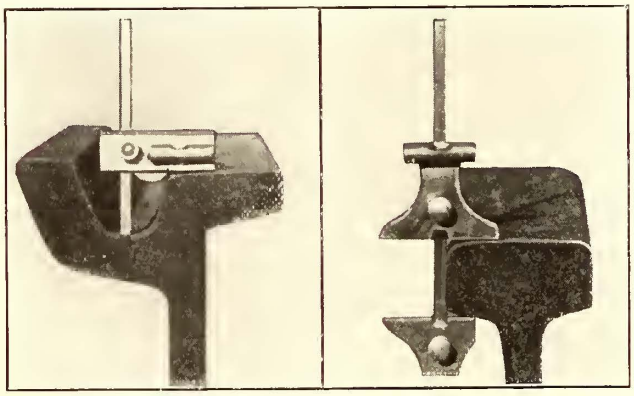
(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Gages for Measuring Rail Wear

BY A. R. BAILEY, ASSISTANT PROFESSOR OF CIVIL ENGINEERING UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.

During the last few years a large amount of appraisal work has been done on steam and electric railway lines. In order to arrive at the value to be assigned to rails that have been in service for any length of time it is necessary to determine the amount of wear that has taken place on the head of the rail. Much of this has depended entirely on the judgment of the field inspector.

The best device for use on T-rails is a railograph machine, which gives an exact profile of the railhead. From this it is easy to determine the area of the worn section, which can be deducted from the area of the section when new, leaving the area worn away. The railograph machine so far has not been constructed so that it can be used on girder grooved or tram rails,



RAIL WEAR GAGES—GAGE FOR GIRDER, GROOVED AND TRAM RAILS—GAGE FOR T-RAILS

so that some other method must be used to determine the amount of wear of these rails.

Following is a description of two types of gage, one used on T-rail and the other on rails of the girder type of section. These have both been used during the last six months for measuring rail wear on a large street railway property, and the results secured have been very satisfactory. The T-rail gage was used on several lines where railographs had previously been taken at the same points, and a very careful comparison was made of the results of the two methods. In all of this work the gage readings were an aid to the inspector's judgment in estimating the per cent condition. The tables which were used in connection with the estimates were not followed blindly, but when necessary allowance was made for such items as cupping of joints, corrugations, side wear and condition of track as to line and surface.

As shown in one of the accompanying illustrations, the gage for girder grooved and tram rails is a Starrett depth gage, No. 46-A, with a portion of the horizontal bar cut off and a level tube fastened to the other end of the bar. The length of bar was decided upon only after considerable study had been made on different rail sections under different conditions of wear. The other end of the bar was shortened so that readings could be taken on sections of girder guard rails. It was left the length shown in the illustration, about ½ in., to allow the finger to be held under it, in order to change the setting of the scale. The gage was first used without the level bubble, but a few trials showed that only a slight inclination would change the reading by 1/64 in., which is the least reading of the scale.

Each inspector carried with him a table showing the depth of groove for each section of rail used by the company, also the per cent condition of the rail, corresponding to a variation of 1/64 in. of vertical wear. These figures were adopted after making a study of the different wheel flanges used.

The second gage shown, which was used on T-rail sections, was devised when it was found that openings could not be made in the pavements on certain streets owing to the time and expense required for removing pavement and concrete to allow the placing of a railograph machine. It was a development from the first gage used on girder rails. The principle is the same in that the horizontal bar reaches far enough across the rail head to get the wear at a corresponding point on each type of section.

As shown in the illustration, this instrument is made by using the heads of two Starrett depth gages, No. 237, and placing them on one scale. A level bubble is added for the same reason as given for the other gage.

A portion of the lower head was cut away to make it easy to insert the gage in the joint between two paving bricks without removing the latter. It will also be observed that a portion of the side of the same head has been removed to allow the corner to bear against the under side of the rail head at a fixed distance from the vertical edge.

A table was prepared similar to the one mentioned above, so that gage readings could be quickly transposed into per cent condition.

Trolley Wire on Double-Leaf Bascule Bridge

BY S. L. FOSTER, CHIEF ELECTRICIAN UNITED RAILROADS OF SAN FRANCISCO

In San Francisco the problem recently arose of installing trolley wire for an electric railway line over a double leaf Page-Schnable bascule bridge erected in 1905. The problem was a new one for the local men and help was sought from the designers of the bridge and then from the builders, but nothing of practical value was received. Information as to how this subject had been treated on later bascule bridges in other cities was obtained from several obliging engineers, but none of it seemed to apply to this particular bridge.

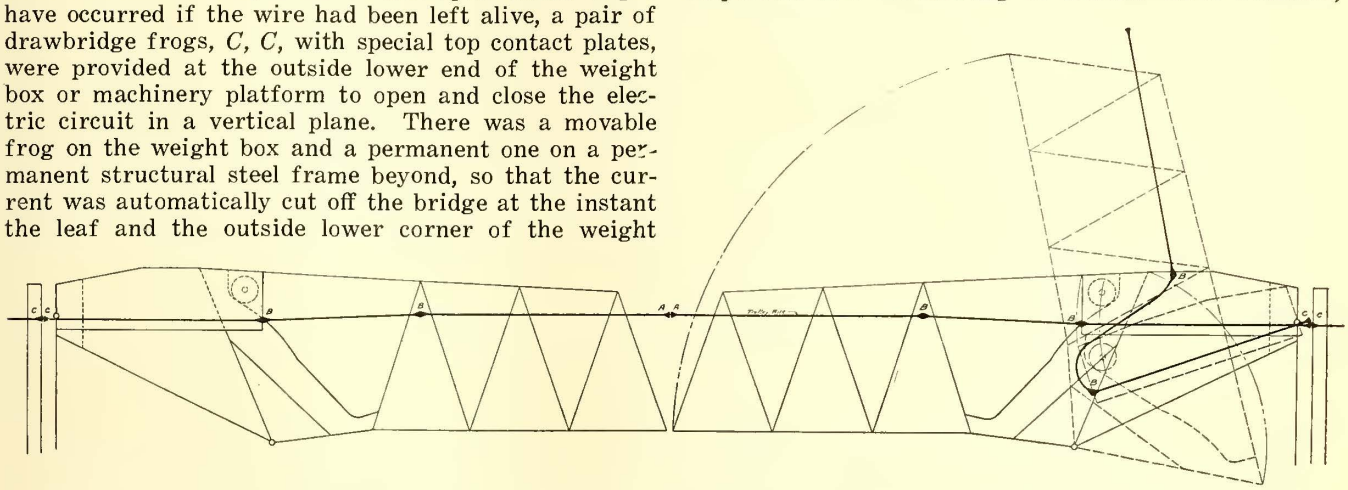
The final solution decided on is simple and satisfactory, and as it was unheard of before locally it seems worth describing briefly. It involves no pulleys, tighteners, counterweights or other usual bascule-bridge supplementary complications, and has been in perfect operation now for several months.

The diagram makes the plan clear. It was found that by selecting the points of support for the trolley wire there could be exactly the right amount of slack

thrown into the trolley span at the hinge in the bridge when the leaf was lifted to suffice for this complicated movement of the bascule-bridge mechanism without straining the trolley wire attachments at the terminals of this span.

To prevent the trolley wire from becoming crystallized or broken from repeated up and down flexures that would occur at the openings of the bridge, hinged frogs, *B, B,* were installed at each end of the particular span referred to.

To prevent any injury to the trolley wire, to the bridge structure, or to persons coming into contact with the loose trolley wire of this span which might have occurred if the wire had been left alive, a pair of drawbridge frogs, *C, C,* with special top contact plates, were provided at the outside lower end of the weight box or machinery platform to open and close the electric circuit in a vertical plane. There was a movable frog on the weight box and a permanent one on a permanent structural steel frame beyond, so that the current was automatically cut off the bridge at the instant the leaf and the outside lower corner of the weight box began to rise, the latter being slightly beyond the trunnion center of the weight box.



SKELETON OUTLINE OF DOUBLE LEAF BASCULE BRIDGE, SHOWING LOCATION OF TROLLEY WIRE AND SPECIAL OVERHEAD PARTS FOR CLOSED AND OPEN POSITIONS OF BRIDGE LEAVES

To secure durability in the trolley wire, solid round No. 00 phono-electric wire was selected in preference to stranded or hard-drawn solid copper wire in spite of the smaller conductivity of the first-named wire. To provide for possible emergencies, a section insulator was installed in the trolley wire just beyond the bridge at each end with a fuse and knife switch around it.

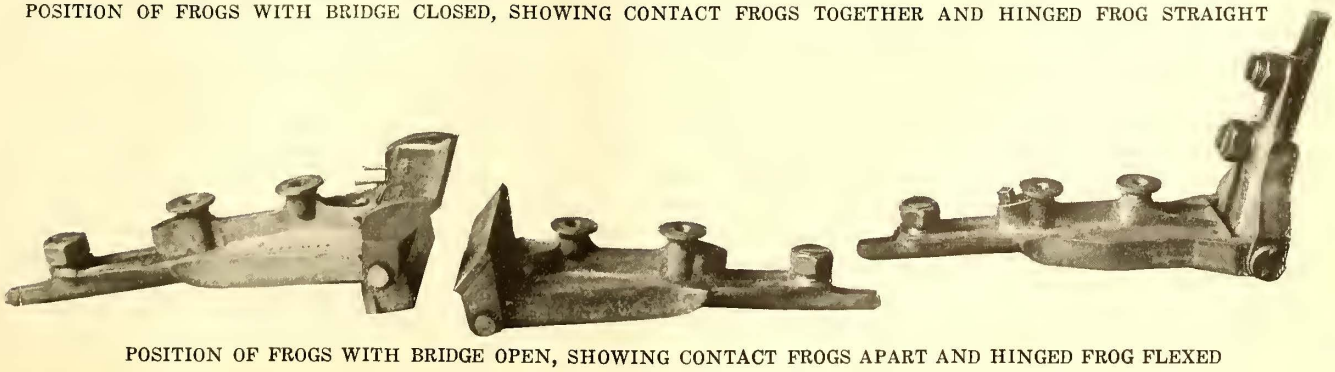
As each side of this bridge was fed by different feeder cables there was no necessity for a current-carrying contact device in the trolley wire at the middle of the bridge and a pair of ordinary drawbridge frogs, *A, A,* without contact plates, sufficed.

Thus when the bridge leaf rose, the inside face of the weight box descended and the lower corner of the outside face of the weight box ascended, opening the circuit several inches and making the trolley wire on the bridge dead as it slackened off and began to lie loosely though harmlessly about on the top of the weight box. As the bridge leaf descended, the lower corner of the outside face of the weight box descended and as the trolley wire in the hinge span tautened up to its original condition, the drawbridge frogs at the outside face of the weight box closed the electric circuit and made the trolley wire alive once more and ready for the passing cars to draw power from it.

As the hard-drawn No. 00 trolley wire on a near-by swing bridge lasted fourteen years without renewal, longer life is expected of this tougher phono-electric wire and, with monthly examinations at the time of inspection and overhauling of electric track switches, block signals, sectionalizing switches, etc., on the system, with re-earing of the clinched ears every five years or so, and with perhaps the replacement of an occasional frog, the whole installation is confidently looked upon as likely to require a minimum of attention and maintenance expense. All frogs were provided with case-hardened steel wearing plates.

The electric road over this bridge is a double-track line, but the description and illustrations were made to apply to but a single trolley wire for simplicity. The two trolley wires were cross-connected at each end of each leaf of the bridge, and elsewhere than at the hinge spans were provided overhead with flat 2 in. x 10 in. untroughed wooden guards with 4 in. x 4 in. wooden parallel stiffeners on top to prevent a possible wild trolley pole from coming into contact with the live trolley wire and the grounded steel superstructure of the bridge at the same time, a protection that proved entirely satisfactory on a near-by bridge for fourteen

POSITION OF FROGS WITH BRIDGE CLOSED, SHOWING CONTACT FROGS TOGETHER AND HINGED FROG STRAIGHT



POSITION OF FROGS WITH BRIDGE OPEN, SHOWING CONTACT FROGS APART AND HINGED FROG FLEXED

years. All supporting rods, bolts and other metal parts of these trolley guards and overhead supports combined were hot-dip galvanized, and thoroughly painted after installation.

The electric motors that operate the bridge mechanism and all the lights on the bridge receive their current from the local electric light company so that the railway company's trolley wires are used only for furnishing power to the passing cars. As the bridge opens, there being no cars on it, there is no current to be broken at the switch surfaces on the weight box devices and these switches are likely to require no repairs.

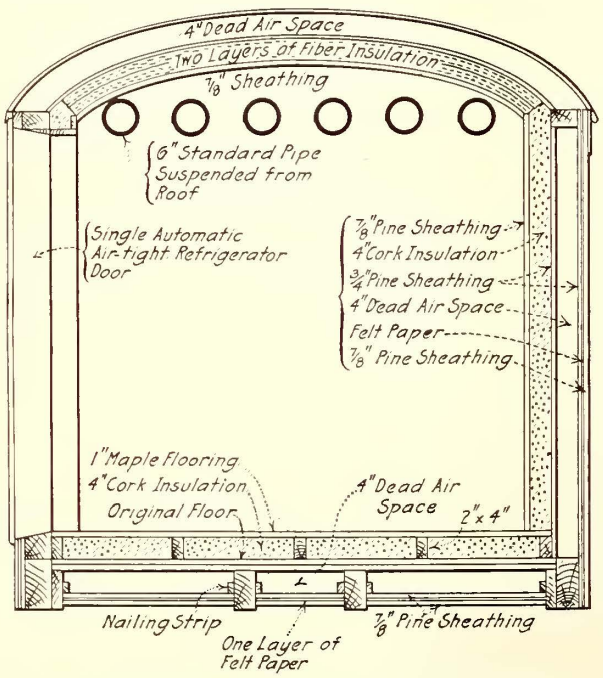
The double trolley line with the two parallel wires cross-connected assures a factor of safety of two in the contact-making devices at the weight boxes providing against the possibility of corrosion of their parts from exposure to the influences of the salt water and the sewage gases of the channel below.

The illustrations show the general layout of the bridge and the contact and hinged frogs in two positions depending on whether the bridge is closed or open.

Detroit United Builds Refrigerator Car

BY C. L. KELLER, ASSISTANT MASTER MECHANIC DETROIT UNITED RAILWAY

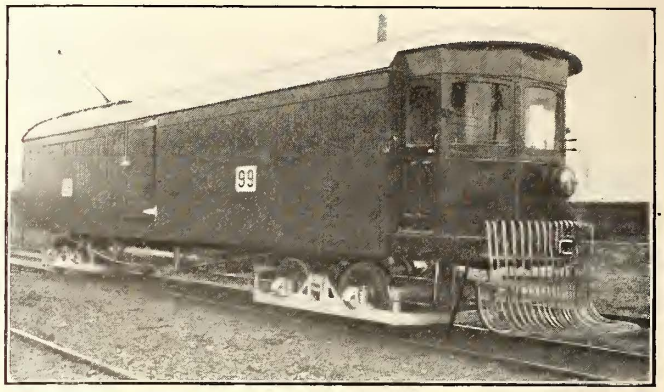
As the result of an agreement entered into between the Detroit (Mich.) United Railway and one of its patrons, a refrigerator car was recently built at the company's shops and placed in service to transport milk in cans and cases. This car was one of the company's 50-ft. freight cars, rebuilt with a large refrigerator compartment, a small front vestibule for the motorman and a large rear vestibule inclosed on three sides for the transportation of



DETROIT UNITED REFRIGERATOR CAR—CROSS-SECTION OF BODY

perishable freight which does not require refrigeration. As shown in the accompanying cross-section of the car body, the sides, ends, floor and roof of the refrigerator compartment are blocked to provide a 4-in. dead-air space. Owing to the construction of the body underframe, portions of the car floor are protected by a space greater than 4 in. Some difficulty was experienced at the body bolsters in locating nailing strips for the sheathing, but this was overcome and no portion of the floor was left uninsulated.

The floor of the refrigerator compartment was laid on 2-in. x 4-in. scantlings placed edgewise on the old body floor. The 4-in. space between these scantlings was filled with sheets of pressed ground cork. Large



DETROIT UNITED REFRIGERATOR CAR—SIDE VIEW

slabs of cork insulation were also used to line the sides and ends of the car body. Pine sheathing 7/8 in. thick was laid on top of the cork in such a manner that no metal conductors extend from the inside sheathing to outside car walls except at doors and corner posts.

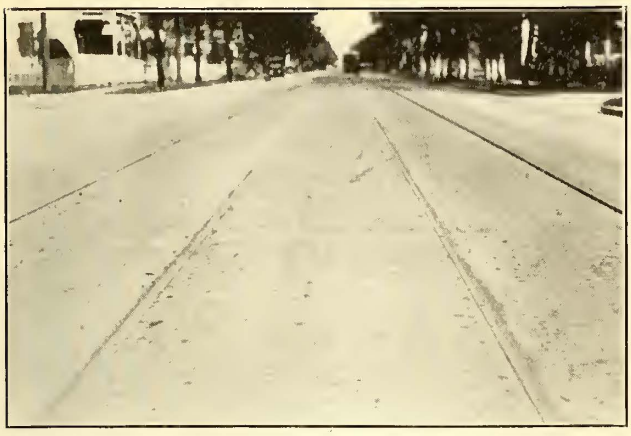
Two layers of flexible fiber insulation were used in the roof above this compartment because it was impossible to bend the ground cork to the roof contour. The car body walls were formed of two thicknesses of pine sheathing between which felt paper was laid to furnish additional insulation. At the center of the body and on each side are single, automatic, air-tight refrigerator doors weighing 300 lb. each. The front end of the car, back of the motorman's stand is also fitted with a smaller door of the same type.

The refrigeration equipment was furnished by the York (Pa.) Manufacturing Company. The principle of this is a distinct departure from the usual methods of car refrigeration, in that the piping system includes 180 ft. of 6-in. pipe suspended from the roof of the refrigerator compartment. These pipes perform the work of a brine storage as well as that of a circulating system. When the car is first loaded with freight the piping system is connected to a pump at the freight house, the car doors closed and the brine solution kept circulating through the pipes until the interior of the car and its contents are at a temperature of 35 deg. Fahr. when it is ready for the road. In this condition the compartment will remain at a refrigerating temperature for twenty-four hours provided the doors are kept closed. The initial trips of this new car indicate that there will be an increased demand for this class of service which will necessitate additional refrigerator cars in the near future.

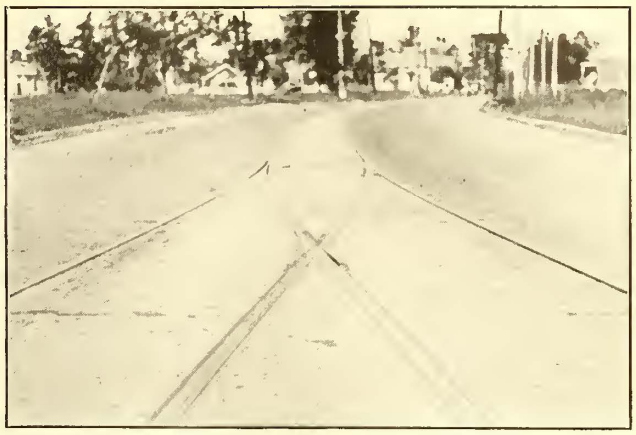
Four Years of Maintenance of a Track Crossing on Steel Substructure

BY C. A. PRENTICE, DIVISION ENGINEER UNION TRACTION COMPANY OF INDIANA, MUNCIE, IND.

In view of the satisfactory results obtained the readers of the Electric Railway Journal may be interested in the further history of the International steel tie substructure placed under the two Big Four crossings on Ohio Avenue, Muncie, Ind., on Dec. 3 and 4, 1912. A description and maintenance record of this crossing was published in the issue for Jan. 2, 1915. On Oct. 6, 1913, we spent ninety-two hours in labor at a



HOUSTON PAVEMENT—BRICK ON MORTAR WITH GROUT FILLER LAID IN 1913, 7-IN. T-RAIL



HOUSTON PAVEMENT—BRICK ON MORTAR WITH GROUT FILLER LAID IN 1914

cost of $16.51 for surfacing; in 1914 we spent 158 hours in labor at a cost of $29.86 for surfacing, and in 1915 up to Oct. 19 we had spent $10.38 for filling up crossings with crushed stone and tightening bolts. This year is the first time it has been necessary to use bolts in these two crossings since the steel crossing ties were installed. The total cost in labor for maintaining these two crossings up to the present time is $56.81, and we have used thirty-four crossing bolts and twenty steel wedges for the steel ties.

I consider this a splendid record considering the amount of traffic that goes over these two crossings every twenty-four hours.

Before the steel ties were installed it was necessary to do something on these crossings nearly all the time. In fact, they were a constant source of worry to me as well as to my section men, but now, in so far as these two crossings are concerned, we can take life easy.

The crossing frogs are nearly as good as the day we put them in, while the L. E. & W. crossing, put in on wooden ties just five days later not 30 ft. from these two, is nearly worn out.

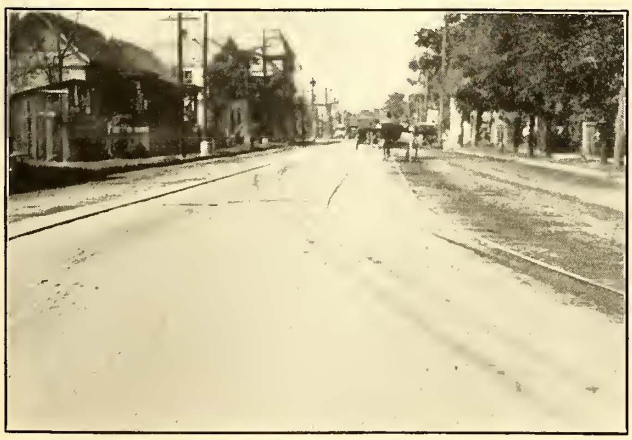
Mortar Cushion in Houston Eliminates Pavement Maintenance

BY W. M. ARCHIBALD, ENGINEER MAINTENANCE OF WAY HOUSTON (TEX.) ELECTRIC COMPANY

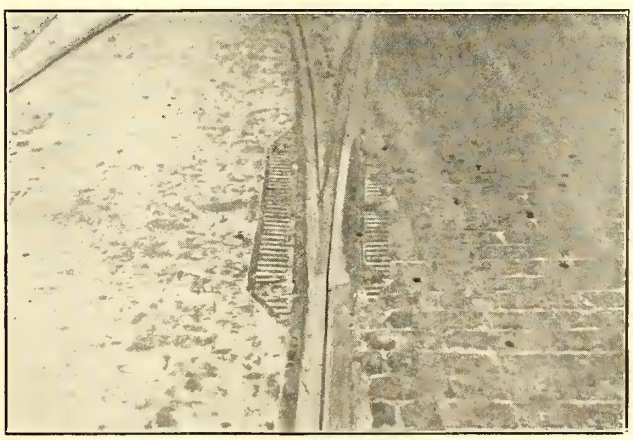
Prior to four years ago considerable difficulty was experienced with brick pavement laid on an ordinary sand cushion. In order to obviate this, it occurred to me that if a mortar cushion was used and the brick pavement grouted with cement, it would make a much more satisfactory pavement and one that would stay in place better between the rails. Experiments along this line, extending over a period of eight months, indicated that the mortar cushion would solve the difficulty. Many small pieces of maintenance work were installed under the heaviest vehicular traffic obtaining in Houston. In every case these experimental patches proved very satisfactory, and about three years ago I adopted a sand and cement cushion for all brick and wood-block pavements for both new work and repair work. Grout and pitch fillers have proved equally satisfactory in pavements laid in this manner. Every piece of pavement which the Houston Electric Company has laid in the past three years has been constructed in this way.

As evidence of the results being obtained by the substitution of a mortar cushion for the sand cushion, pavements built in this manner under different traffic conditions are shown in the accompanying illustrations. Some of our pavement has now been down four years, and during that period no money has been expended on it in maintenance. As will be noted in these illustrations the pavement surface is perfect and shows no appreciable wear even where this type of pavement is laid along T-rail.

The *Electric Railway & Tramway Journal*, in commenting upon a recent article published in the ELECTRIC RAILWAY JOURNAL regarding the method used by the United Railroads of San Francisco to grind out rail corrugation, wherein the blocks for wooden track brake-shoes are replaced by carborundum blocks, states that at least a dozen systems in Great Britain have been using this method for several years past.



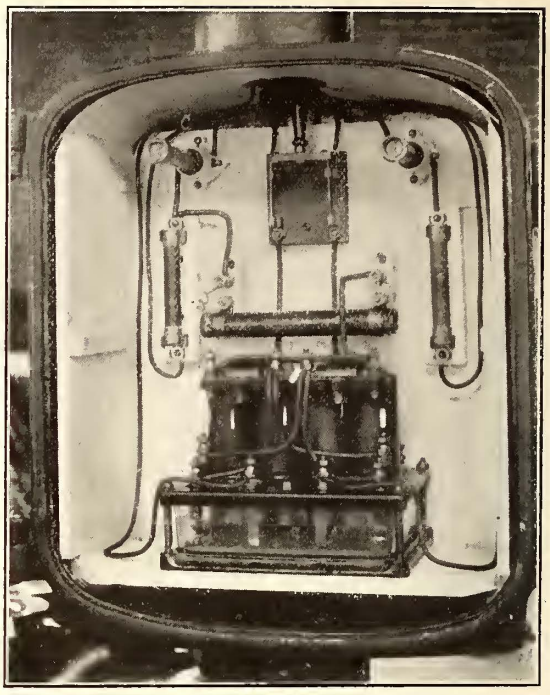
HOUSTON PAVEMENT—BRICK ON MORTAR WITH GROUT FILLER LAID JANUARY, 1912, 7-IN. T-RAIL



HOUSTON PAVEMENT—PAVEMENT LAID IN 1914, CLOSE VIEW

Highway Crossing Signal with Indicators

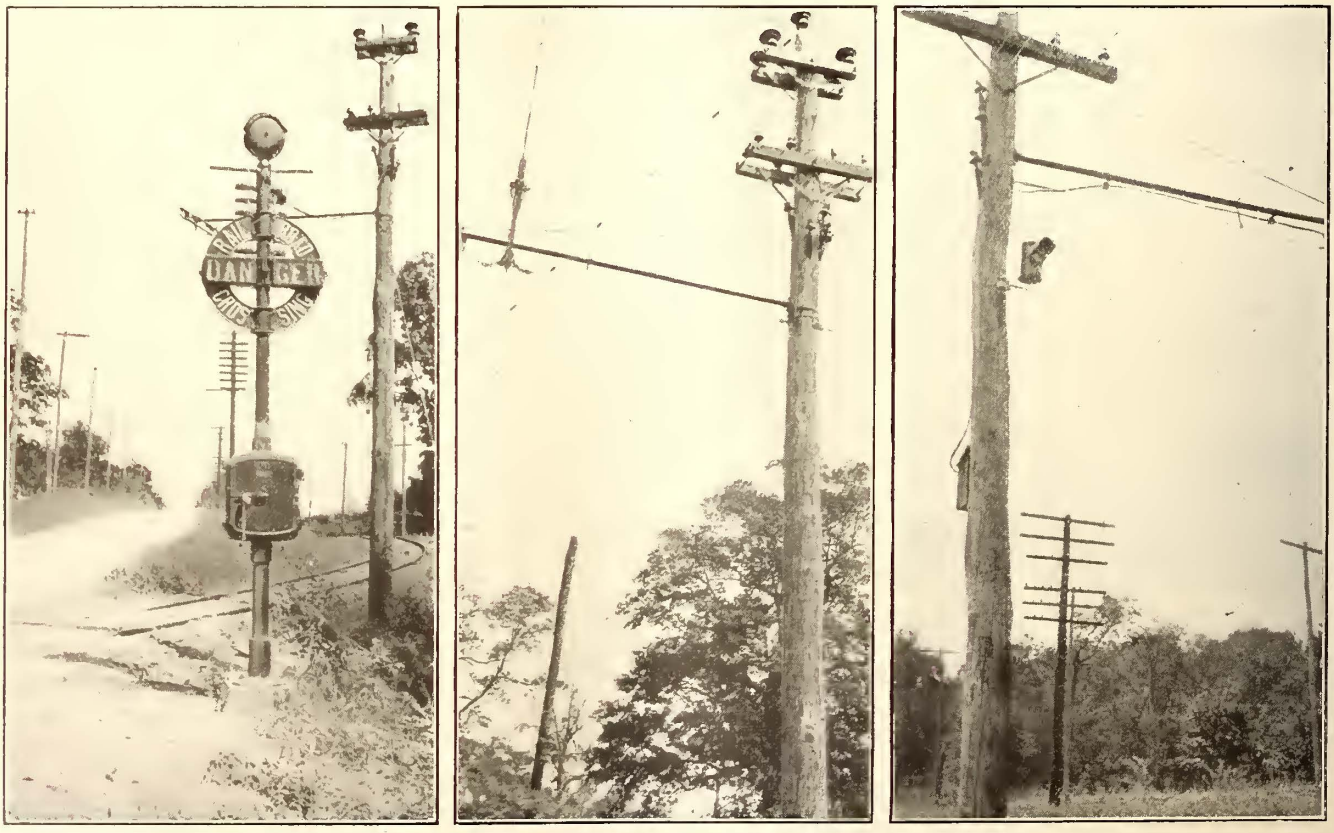
The line of the Nashville (Tenn.) Interurban Railway crosses an important highway 9.6 miles out of Nashville. This crossing is at a reverse curve in the line, and cars approach the highway around a curve and on a down grade from both directions. In addition, the view of the motormen on southbound cars is limited by the sides of a cut. At this point a Nachod highway crossing signal has been installed, the general aspect of which is shown in one of the accompanying illustrations. A 12-in. bell forms the top of the pipe standard, and below are attached in succession a railroad crossing sign, a danger transparency, an iron relay box and the base, and all are mounted on a concrete foundation. The control mechanism consists of a special "last-position" relay, with resistances, which is shown in one of the accompanying illustrations. This box also contains fuses and disconnecting switches. The "last-position" relay is similar to the standard track relay and is constructed of Norway iron throughout its magnetic circuit. It has a Bakelite molded top with glass-inclosed contacts, and the windings are of enameled wire. Complete access to the parts is obtained through the door, which is gasketed and fitted with a compression lock. The danger transparency is hinged so that the lamps and shunts are easily reached.



HIGHWAY CROSSING SIGNAL—RELAY AND FUSE BOX

A starting contactor is located about nine poles on each side of this highway crossing, and the stopping contactor is at the crossing. The contactors are of the wiping type and are fastened by the usual trolley ears, so that the wire is neither cut nor bent. The stopping contactor is shown in one of the illustrations. A southbound car passing the starting contactor at full speed sets the bell in operation and lights the lamps in the danger transparency, thus giving both audible and visible signals. A hooded light signal or motormen's indicator is mounted on one of the trolley poles about four spans from the highway and faces the motorman as he approaches the crossing. This indicator lights up when the crossing bell rings and shows to the motorman that the warning is being given, when he can neither see nor hear the crossing signal. When the car reaches the crossing the alarm is automatically cut out. As the car passes under the contactor beyond the crossing no change is made in the control circuit. An opposing car, however, would operate the crossing alarm in exactly the reverse manner.

Two line wires are required between the starting con-

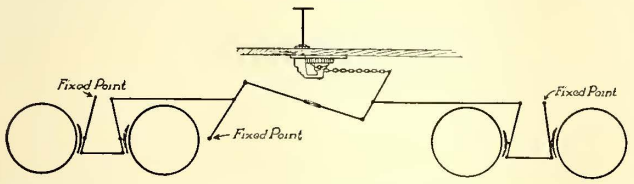


HIGHWAY CROSSING SIGNAL—SIGNAL INSTALLED ON CONCRETE FOUNDATION; STOPPING CONTACTOR; MOTORMEN'S INDICATOR

tactors and one between the motormen's indicators. The lamps in the danger transparency and motormen's indicators are in series with the bell. Each is individually shunted by a resistance so that the burning out of a lamp will not interrupt the circuit, but only slightly dim the brilliance of the remainder. The bell is rung, the lamps are lighted and the relay is operated by the 600-volt trolley current, so that batteries are not required and no changes are necessary in the track return. The control is based on a space interval and not on a time interval. Bells depending on a timer give false indications at times and, therefore, may be disregarded at a critical moment.

Heavy Duty on a Geared Brake

W. O. Hay, vice-president and general manager Northampton Traction Company, Easton, Pa., reports the successful operation of a home-made flat car under unusual conditions. This car is 8 ft. 9 in. wide and 30 ft. long over all and it is used to carry loads up to 20 tons. It is used on lines where grades of 12½ per cent and curves of 50-ft. radius are encountered. In spite of predictions to the contrary there has been no difficulty



SKETCH OF BRAKE RIGGING OPERATED FROM HAND BRAKE IN CENTER OF FLAT CAR

in controlling the car by means of a hand-brake rigging like that shown in the accompanying diagram. In this the brake spindle was placed in the middle of the car for simplicity, and a "Peacock" eccentric drum was used to give the necessary brake-chain pull. During three years of use the rigging has given no trouble.

Metal Ticket and Fare Box Effect Saving

The substitution of metal tokens for paper tickets and the installation of a fare box and registering device especially designed to receive and register pennies, nickels, dimes and metal tickets has effected a tangible saving for the Lincoln Traction Company, Lincoln, Neb. The metal tickets and the registering fare box were put in service on April 1, 1915. Coins of the denominations of 1 cent, 5 cents and 10 cents, and metal tickets are dropped into one hopper. The registrations of the coins are made on one dial and show on a separate trip and totalizer. Metal tickets or tokens are registered on another dial with a separate trip and totalizer, and complimentary tickets, transfers and all classes of paper tickets are registered on a third dial having a trip and totalizer. With the three registers an excellent check on the work of conductors is obtained. The combined coin, metal ticket and transfer register was manufactured by the International Register Company, Chicago.

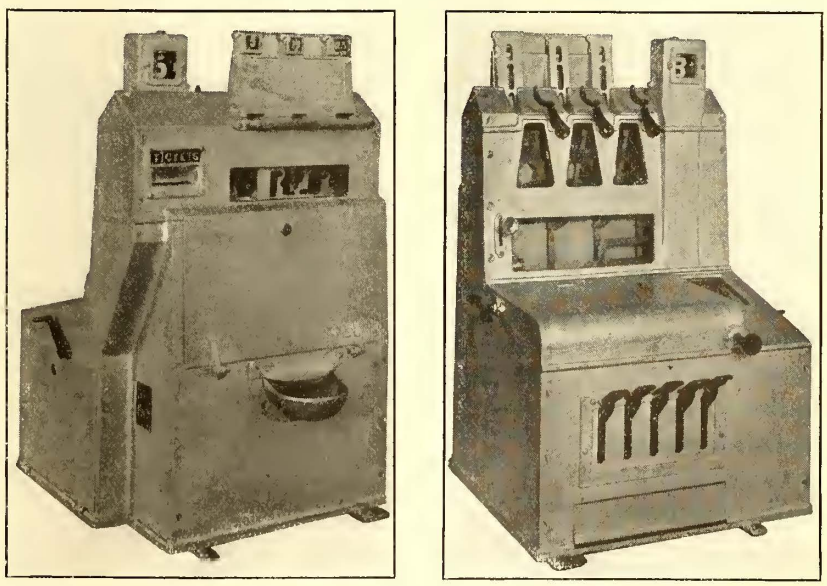
Before the installation of the registering fare box the company was paying a monthly rental of approximately $200 for registers. It was also spending about $60 per month for paper tickets, and it is estimated that about $25 per month was spent for work in the auditor's office, which has also been made unnecessary. After charging off interest and depreciation on the present fare-collection system, the savings effected by its adoption show a considerable financial gain. Aside from these savings, however, and more important, is an increase of 9.07 per cent in the cash fares collected for the months of April, May, June and July, 1915, over the same period in 1914. Ticket fares increased during this period 1.44 per cent and revenue increased 4.79 per cent.

Another important advantage brought out by experience with this fare-collection system was that on lines where schedules were very difficult and almost impossible to maintain, no trouble has been experienced since the new system was installed. This improvement is attributed to the fact that passengers when boarding the car, now usually have the correct change ready, deposit it in the fare box and pass immediately into the car. Under the old system the delay occurred when each passenger stopped to pay his fare to the conductor.

Automatic Fare Collector and Change-Making Machine

A device of very unusual character has just been brought out under the name of "automatic cashier." Of greatest interest is a mechanical change-making feature, which not only assures the owner that every cent deposited in the machine is charged to the operator, but also removes all cause for contention between those who have to do with its operation. This makes the device especially suitable for use on one-man cars, or in ticket booths as a means for replacing the ticket sellers ordinarily employed there. When it is used upon a street car it relieves the conductor of the worry of making and carrying change in his pockets and likewise eliminates all of his responsibility after the fare is paid. The only requirement of the conductor is that he must insist upon the payment of all fares to the machine. In fact, when it is in use there is absolutely no occasion for the handling of fares by the conductor.

The device measures 12 in. x 13½ in. x 17½ in. It is fitted with four slots designed to receive coins of the respective denominations of 5 cents, 10 cents, 25 cents and 50 cents. When the coin is inserted in the machine, the operator presses what is termed the coin lever, and the change mechanism is automatically set to change a



FRONT AND REAR VIEWS OF "AUTOMATIC CASHIER"

coin of the denomination that is inserted. However, the mechanism only opens to the extent of the coin deposited. That is to say, it is impossible to register more than the coin inserted and it is impossible to change a coin without deducting at least one fare. After pressing the coin lever, which allows the coin to drop to a point where it is visible within the machine, the operator presses a second lever, termed the "delivery lever," which instantly records, indicates and delivers change.

There are five levers that serve for delivery and these are numbered from one to five, enabling the operator to register at one stroke any number of fares from one to five. Each one is interlocked, so that if a second passenger inserts a coin in the slot before the delivery of change to the previous passenger the second transaction cannot be recorded nor can change be given until the first transaction is completed. An interlocking arrangement applies also to the coin levers and this makes it impossible for errors to take place which are at the expense of the company.

The machines are so constructed that only the coin of the proper denomination can be inserted in the slot. If any attempt is made to do otherwise the coin passes through the slot and comes back to the passenger's hand. There is also a device which permits ejection of "slugs" or other spurious or non-acceptable coins. The ejector, however, does not throw the spurious coin back to the passenger's hand, but confiscates it. However, before confiscation the coin is visible through a glass cover so that it can be readily shown to the passenger.

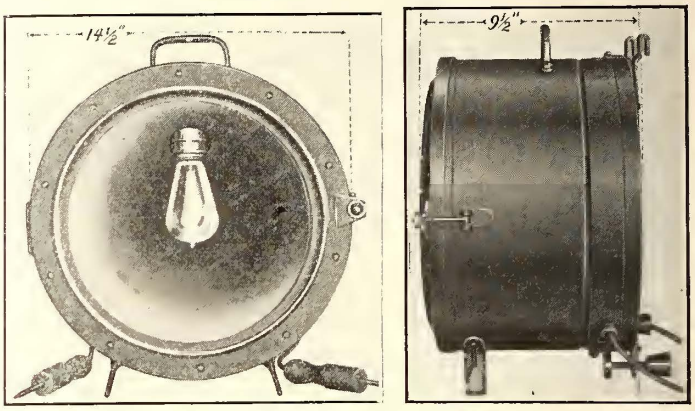
Although the machine changes coins only up to the denomination of 50 cents it is possible for the operator, by the use of a Yale key to deliver into the passenger's hand as many 50-cent pieces as may be desired. However, each time that one of these coins comes out of the machine an automatic record is made of it so that it is properly charged to the operator. When the machines are started on a run the magazines are usually loaded with $3 in 25-cent and 50-cent pieces, $1.50 in dimes, and 50 cents in nickels. This has been found to be sufficient for all requirements, as each coin, after it is deposited in the machine, immediately enters the magazine or change tube and thus becomes available for change. There is a small till which opens from the back of the machine automatically when the key for expelling the 50-cent pieces is inserted. When the run begins this till is empty, and as soon as a coin or bill is presented which requires change beyond 50 cents, the operator inserts the key and automatically puts change in the passenger's hand, retaining the bill or larger coin which is offered and placing it in the till.

The machines are equipped with four registers, one denoting the total amount of cash fares, and another the amount of ticket fares. A third records operations of the coin ejector, and a fourth serves the device for changing bills. In another form the machine delivers tickets and change simultaneously, this being especially advantageous for elevated or subway railroad operation. The machines have been placed on the market by Henry C. Ebert, Rochester, N. Y., and they are to be sold at a price that is materially less than that of some of the registering fare boxes now in common use.

The work of extending the Saigon-Binhtay line of the Compagnie Francaise de Tramways in Indo-China and of electrifying that portion has been carried on as far as possible. The transformers and traction apparatus could not be delivered, the manufacturing plants which were to furnish them having been captured since the outbreak of hostilities. Electrical operation, therefore, could not be begun on Jan. 1, 1915, as anticipated.

Pressed-Steel Headlight for Interurban Cars

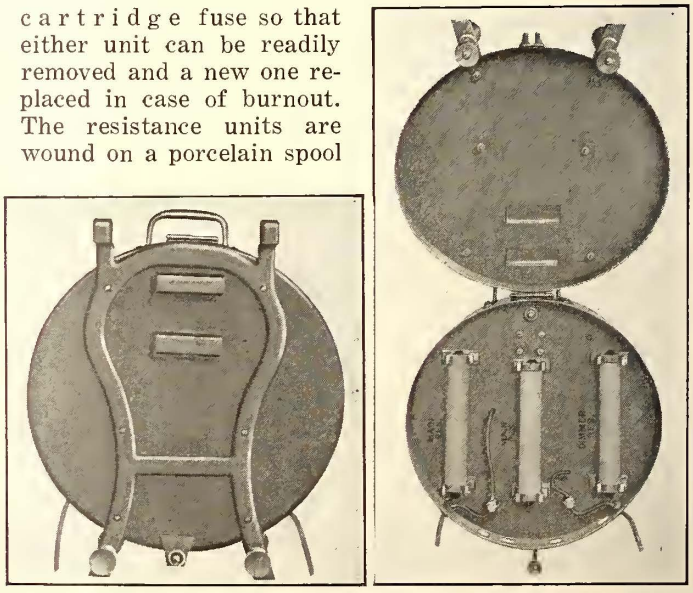
A new type of pressed-steel headlight for interurban cars, known as the "perfect headlight," has recently been put on the market by the Trolley Supply Company of Canton, Ohio. The frame is entirely of No. 20 gage pressed steel. It is 9¾ in. deep and 14½ in. in diameter, and the weight, including lamp, resistance, etc., is 25 lb. The reflector is 12 in. in diameter at the front and 6 in. deep. It is made from No. 18 gage brass, double nickel plated and highly polished. The headlight



FRONT AND SIDE VIEW OF HEADLIGHT

is equipped with a 100-watt concentrated filament lamp on a resistance similar to the arc lamp.

At the back of the reflector there is a partition of sheet steel, and the space between the partition and the front of the lamp, 6½ in., is perfectly airtight, so that dust and dirt will not accumulate on the reflector. On the back of the partition and of the lamp proper is a resistance in three units. Two of these units are the main resistance and one is an auxiliary to dim the light while the car is within the city limits. The method used of fastening the resistance units to the partition plate is similar to that used on a cartridge fuse so that either unit can be readily removed and a new one replaced in case of burnout. The resistance units are wound on a porcelain spool



REAR OF HEADLIGHT—RESISTANCE AT BACK

8½ in. long, threaded twenty-four threads to the inch, and the wire is wound on this thread so that it is impossible for the wire to sag or get out of place. The headlight is said to throw a light a distance of from 800 ft. to 1000 ft. ahead of the car, and the consumption is only 1 amp.

One advantage claimed for this lamp over the arc lamp is that when it is installed on the car and focused properly it will always throw the light directly at the point intended and not change its position if the trolley goes off or passes over a section insulator. Then, of course, no trimming is required.

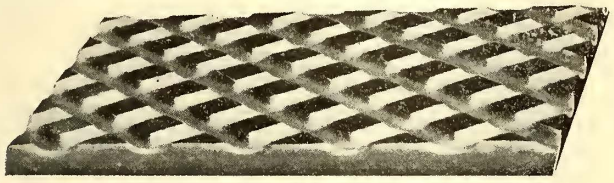
The method of hanging the lamp to the car is similar to the ordinary arc headlight, and it can be carried from end to end.

New Form of Safety Tread

The American Mason Safety Tread Company, Lowell, Mass., has recently brought out a new form of safety tread called the "Black Diamond," which includes a deformed surface for catching foreign substances and open-end grooves for drainage, thus obviating the annoying pools of water which are sometimes found on flat treads in wet weather. The abrasive mixture used in the tread base is composed of asphaltum and carborundum, and over this is placed a skeleton metal frame, the surface of which presents a series of raised

CBOSS-SECTION OF "BLACK DIAMOND" SAFETY TREAD

diamond-shaped openings. As the base is substantially of a mineral-rubber composition it has a tendency to be elastic. Actual tests prove that traffic causes the bearing frame to press slightly downward into the mixture, forcing it gradually upward through the diamond-shaped perforations, so that an even contact surface of both metal and abrasive mixture is insured throughout the life of the tread.



"BLACK DIAMOND" SAFETY TREAD

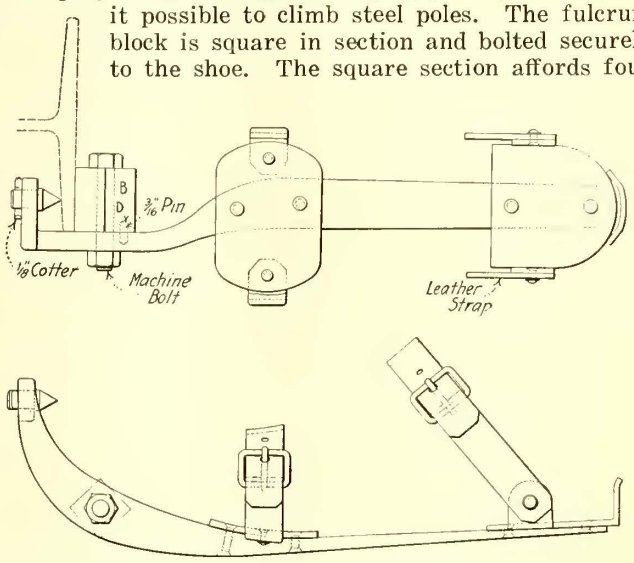
Each non-slip diamond-shaped unit is surrounded by a frame of metal on edge, thus assuring durability, and as the tread has no metal baseplate, even when it is worn down through the metal frame on the top, a non-slip abrasive surface still presents itself for surface until the tread is entirely worn out. The tread is light in weight and the beveled edges with which it is equipped make it especially adapted for exposed positions owing to the attractive appearance. It is furnished in either steel or brass in lengths up to 8 ft. and in a number of standard widths.

Cleaning Circulating Water Screens

A contributor to *The Engineer* of London outlines a method of cleaning the screens for circulating water that are installed at power houses. In this a high-pressure jet of water is sprayed against the inside of the screen after it rises above the water level in the circulating tunnel, the method being especially adapted to screens that take the form of an endless band which is kept in constant movement by the rotation of a drum at the top, well above water level. The jet washes the screen perfectly clean, regardless of the fineness of the mesh used, and the wash water serves as a carrier for the material that is picked up by the screen, which can thus be discharged along troughs or pipes back into the river on the down-stream side of the intake.

Climbers for Structural-Steel Poles

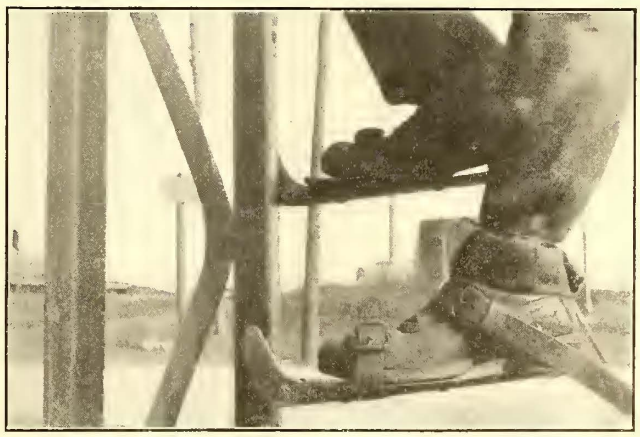
With the introduction of steel poles originated the joke among linemen that "sky-hooks" were necessary in order to climb them. That was sufficient reason for the Bates Expanded Steel Truss Company, Chicago, Ill., to design a climber especially for its expanded steel poles, an illustrated description of which was published in the ELECTRIC RAILWAY JOURNAL of Aug. 28, 1915. This climber consists of a forged steel shoe with large comfortable bearing area for the foot. The toe of the shoe, as shown in one of the accompanying illustrations, curves upward, and is provided with two hardened tool-steel projecting bearing or clamping points, which make it possible to climb steel poles. The fulcrum block is square in section and bolted securely to the shoe. The square section affords four



TOP AND SIDE VIEWS OF POLE CLIMBER FOR LEFT SHOE, SHOWING CLAMPING POINTS

cutting edges which makes sharpening unnecessary until the four edges become dull.

This fulcrum block bears on the outside of the steel pole and a point near the end of the shoe bears on the opposite side. This point is fastened to the shoe with a cotter pin, which permits it to be readily removed and renewed in the field. The clamping action of



STEEL POLE CLIMBERS IN ACTUAL OPERATION

the shoe on the vertical flange of the steel pole is obtained by the pressure of the lineman's weight on the heel end of the climber. Weight naturally comes at this point when a lineman climbs a pole, and when he raises his foot for the step upward the natural move of raising the heel first releases the grip of the climbing shoe. The shoe is strapped to the foot, and weighs about the same as a climber for wooden poles.

News of Electric Railways

CHICAGO TRACTION PROBLEMS CONSIDERED

Consolidation of Surface and Elevated Lines and Construction of Subway Discussed—Commission of Engineers Authorized to Report on Operating, Engineering and Financial Problems Involved

Improved transportation for Chicago was discussed at a recent meeting of the local transportation committee of the Chicago City Council, to which Samuel Insull, L. A. Busby and B. I. Budd were invited. It was the consensus of opinion that a consolidation of the surface and elevated railways, bringing the latter into a contract with the city similar to that of the surface lines, was important to any plan of improved transportation. Contingent upon this consolidation, however, the terms must be decided upon which universal transfers between the surface and the elevated lines will be granted, and a decision must be reached as to the type and extent of a subway system to give both surface and elevated lines additional downtown terminal capacity.

Mr. Busby spoke for the surface lines. He stated that they desired to consolidate with the elevated roads upon some equitable basis. No other city matter was so important at the present time as the proper solution of Chicago's transportation problem. Many plans for unified operation of the local transportation facilities and for the construction of a subway had been offered, but he was of the opinion that the only way to arrive at a plan satisfactory to all parties concerned was to employ the advice of high-grade, independent experts experienced in making investigations of the kind presented in Chicago.

Mr. Insull, president of the Commonwealth Edison Company and chairman of the executive committee of the associated elevated railway companies, expressed the opinion that the whole question of improved transportation including consolidation, operating arrangements and a passenger subway should be considered as one problem. On the question of legislation necessary to bring about a consolidation of the surface and elevated lines, Mr. Insull said that such legislation was desirable but not absolutely necessary. The consolidation could be brought about by action of the City Council and approved in a referendum by the public, after which legislation authorizing it could be obtained.

The question of the valuation of the elevated roads was then brought up. Attention was directed more particularly to the wide difference between the figures presented by the city's experts and by the experts employed by the elevated railway companies. Members of the committee asked Mr. Insull if he thought that this difference could be reconciled. In reply he said that negotiations at the time the two valuations were presented had never reached the point where the elevated railways were asked to trade. He did not believe that the question of agreeing on a valuation would offer any great obstacle to the consolidation of the properties. Any valuation agreement, however, would have to be based upon the actual cost of the property or very near that. Mr. Insull said that the $60,000,000 figure placed upon the property by the city's experts was very much too low. In explanation he advised the committee that the companies were earning interest on considerably more than that amount. So long as the companies were solvent and earning interest on their original cost, they could not be bought for less than that amount. Mr. Insull agreed with Mr. Busby's suggestion concerning a plan for bringing about improved transportation for Chicago. He was of the opinion that the experts should be selected by the city.

The local transportation committee of the City Council at a meeting on Nov. 17 adopted a resolution authorizing the chairman to submit a list of engineers from which three are to be selected to investigate and submit a plan for improved local transportation. These engineers must be of high standing with broad experience in solving transportation questions. One must be from Chicago and two must be familiar with the efforts to solve the transportation problems of New York, Philadelphia and Boston. These engineers will be authorized by an ordinance which is now in preparation to submit a report providing for a unified and comprehensive system of transportation including the present surface and elevated lines and the proposed subway. Specific provisions of this ordinance require that the engineers recommend a plan for unified operation of the surface and elevated lines; value the elevated properties using as far as possible information contained in previous valuations; submit a location and a general plan without detailed specifications for the construction of a subway system to be operated in connection with the surface and elevated lines with a provision for extensions to take care of future traffic needs; present an operating plan which shall provide for the surface and elevated lines in the proposed subway and for a uniform system of transfers between all lines; suggest necessary extensions to the elevated lines and a financial plan covering the investments in the surface and elevated lines as well as methods for securing the additional capital required by the city over and above its accrued traction fund, for subway purposes and for extensions to the elevated lines. This report is to point out specifically the benefits to be derived by any plan recommended and is to be completed by March 1, 1916. The ordinance embodying these features and authorizing that the engineers be compensated from the traction fund will be submitted on Nov. 24.

NORTHERN OHIO FRANCHISE DECISION

The Northern Ohio Traction & Light Company, Akron, Ohio, has issued a statement in regard to the recent decision of the Supreme Court of Ohio with respect to that portion of the railway between Canton and Massillon. The company says in part:

"It should be understood that the rights in dispute have nothing to do with any part of the system excepting only the line between the boundaries of Canton and Massillon—about 4½ miles. The grant to build and to operate an electric railway along the roadway at this point was made by the Stark County Commissioners, to the original Canton-Massillon Railway, the property of which was bought by the Northern Ohio Traction & Light Company. This grant was in the form of a resolution spread on the records of the County Commisioners and no time was specified through which the grant was to run. Two or three years ago the question of the duration of this grant came up in connection with a number of improvements and also a lower fare which were desired and contemplated. The company offered to join in all the improvements and to give a 10-cent fare between Canton and Massillon, with transfers to local cars in both Canton and Massillon, also to extend the 5-cent fare zone, etc., all of which were to be provided in a new twenty-five-year contract. The negotiations came to a standstill, however, because the company would not take entirely upon itself an unforeseen item of $50,000 for unexpectedly large cost in the proposed widening of the highway. The ouster suit, which was then started by the prosecuting attorney, was based on the contention that the county was at liberty to terminate the grant it had originally given.

"The contention of the company was that the resolution or grant, not limiting the time, was purely because of the very necessities of such a grant, involving the building of an extensive railway and the operation thereof, and the rights of property holders along the line; that for these reasons it was not the intention of either of the parties to the original grant that it could be terminated at any time by either party, and that such a contention would be unfair to both parties and unfair to the property owners along the line. The Supreme Court in its recent opinion, by a fair majority, decided that the grant was not perpetual, but that it was such a resolution and grant that the county or company could at will terminate it. The vote of the judges stood four for and three against the company.

"Although this decision does not in any way affect any of its other property, the company believes that it is of such vital interest and the question involved of such great importance that the Supreme Court of the United States should review the State Court's decision, and to that end the necessary papers will be prepared and filed."

McCALL'S DISMISSAL RECOMMENDED

Legislative Investigating Committee Files Report with Governor of New York

On Nov. 13 the report of the Thompson legislative committee embodying a recommendation to Governor Whitman of New York for the summary dismissal of Chairman Edward E. McCall of the Public Service Commission for the First District was filed at Albany. A summary of the charges against Mr. McCall follows:

Misconduct in office:

First: That at the time of his appointment to office he was the owner and is still the owner of stock in a corporation subject to his official regulation and supervision, which act is in violation of the statutes.

Second: By officially aiding and abetting in procuring approval of the order permitting the acquisition of the outstanding stock of the Amsterdam Electric Light, Heat & Power Company by the Edison Electric Illuminating Company, Brooklyn, while having a financial interest in the subject of such order as a stockholder in an allied company.

Third: In participating in dealings of the commission where matters were under consideration affecting corporations in which he had a financial interest as a stockholder.

Fourth: That while owner of stock in such corporations he knowingly and willfully performed the duties and exercised the prerogative of a public service commissioner.

Neglect of duty:

First: That upon the application of the Edison Electric Illuminating Company, Brooklyn, to acquire outstanding stock of the Amsterdam Electric Light, Heat & Power Company he neglected to perform his official duties by failing to give the application proper consideration; procured the approval of the application against the interests of the city of New York and over its protest and to the irreparable injury of the city of New York and its inhabitants.

Second: In procuring the issuance by the commission of an improper and inadequate certificate of authority for the construction of the third tracks in Manhattan, whereby the city of New York and its inhabitants and the stockholders of the company suffered irreparable injury and whereby extravagance in contracting and in construction was permitted.

Third: That he personally voted and exercised his official power and influence to defeat a resolution introduced at a meeting of the commission to procure the enforcement of an order of the commission directing the repair, improvement and alteration of defective and inadequate construction of the Third Avenue Railway and the Forty-second Street, Manhattanville & St. Nicholas Avenue Railroad.

Fourth: That he failed as a commissioner to protect and safeguard the interest of the city, of its inhabitants, and of stockholders and corporations subject to his official regulation; that he has exercised his official power and influence for the particular advantage and benefit of certain stock interests, and that he has failed properly or adequately to supervise corporations subject to supervision by the commission of which he was a member.

Fifth: With misconduct in office, neglect of duty and inefficiency, in failing to attend the meetings of the commission, improper official action at meetings which he did attend; that he used time required in official business in private law practice for hire; failed to give adequate service as a commissioner in the supervision and regulation of corporations; failed to maintain a proper, efficient, and economical organization of the Public Service Commission, and of inefficiency in the supervision, control, and disposition of the funds entrusted to his charge as public service commissioner for the purpose of creating rapid transit facilities in the city of New York, and had delayed proper action in divers and sundry matters properly the subject of disposition by the commission.

Chairman McCall is allowed ten days by law to answer the allegations, after which a hearing on the charges, either by the Governor himself or by a commissioner designated by him, will begin. The ten days will expire on Thanksgiving Day, and the hearing consequently could begin on Friday, Nov. 26, unless the Governor should find it advisable to set a later date.

NEW YORK BUS FRANCHISE ARGUED

Bainbridge Colby argued on Nov. 15 before the Board of Estimate and Apportionment of New York City the case of the New York Motor Bus Company, which is awaiting the city's approval of a motor-bus franchise practically agreed upon. This was the third of the public hearings held by the board on the advisability of motor buses in Manhattan streets, first proposed in December, 1912.

Mr. Colby answered the arguments of William D. Guthrie and James L. Quackenbush of the Interborough Rapid Transit Company, John M. Bowers of the Third Avenue Railway and George D. Yeomans of the Brooklyn Rapid Transit Company, who, at the two previous hearings, contended that the city would risk its big investment in the dual subway system if it permitted motor-bus competition. He said that the counsel for the existing lines would have it appear as though there was a "traffic famine" in this city. In the course of his remarks Mr. Colby said:

"The Borough of Manhattan is declining in population; its taxable values are shrinking. There is one reason for this, and only one, namely, that it is easier to get from any outlying borough to Manhattan than it is to get from point to point in Manhattan. The conditions in Manhattan are an unanswerable argument in favor of the bus. This borough is suffering from a complete lack of adequate local transportation. This the existing surface lines cannot supply. The bus alone can supply it.

"The opposition is dictated by the Fifth Avenue Coach Company. It filed bids for these routes before we did. It filed two bids to our one, and is now seeking to file a third. The whole purpose of this opposition is to throw the city back three years, undo all its careful progress in that time toward the development of new transit means, in order that the Fifth Avenue Coach Company, which has been outbid, may wipe off the slate and begin all over again.

"The proposed routes are not competitive with the existing surface and subway lines. The purpose of the Board of Estimate, skillfully worked out, has been to devise a supplementary service that will relieve the lack of local transportation in great populous districts now wholly unserved. Transportation in this city has always been ten years behind its needs. The possibilities of a new system are at once swallowed up in the steady and colossal increase of travel."

COMMITTEES AT WORK ON NEW TOLEDO MEASURE

What is known as the sub-committee of the general committee named by Mayor-elect Milroy of Toledo, Ohio, to formulate some plan of settling the street railway question has selected as advisers forty-three men, known to have been opposed to the Dotson franchise ordinance. This sub-committee came into existence through a division of the original committee into factions for and against the Dotson franchise. Its members hope to secure from these advisers the views of those opposed to the franchise to aid them in formulating a plan of settlement. Members of the sub-committee believe that these men represent all the factions of the opponents. This sub-committee has held several meetings to discuss various matters connected with the selection of the advisers. Other members of the original committee have remained inactive in order to give the sub-committee full time to secure information and select its advisers.

At a session of the sub-committee on Nov. 10 Charles S. Ashley suggested that the provisions relating to the rate of fare remain as they are and that all passengers who cannot secure seats be carried at a fare of 1 cent each.

At the regular meeting of the City Council on Nov. 10 legislation was introduced which was intended to force the company to a settlement of what the city claims is its portion of the pavement on several sections of street on which it has no franchise. It is said that this amounts to $125,000. The city owes the company almost that amount for light service. A sub-committee of the committee on railroads and telegraphs was named to confer with officers of the company on this subject and make a report.

At a meeting of the sub-committee of the general committee named by Mayor-elect Milroy on the evening of Nov. 16,

the men selected as advisers of the committee were asked to express their opinions in regard to the street railway situation and the kind of settlement they desire. This was done by the sub-committee in an effort to secure ideas from those who opposed the Dotson ordinance at the election. Warren L. Smith insisted that the committee stop at nothing less than municipal ownership. Gus Granger suggested that a valuation of the property be determined and the company allowed a return of 6 per cent on this. He would then fix the fares at a sum sufficient to yield an additional 2 or 3 per cent and require that this sum be paid to the city to create a fund with which the property shall be taken over by the city. Many other suggestions were also advanced.

A meeting of the sub-committee of the committee on railways and telegraphs of the City Council was held on Nov. 15 to discuss the claim of the city against the company for pavements laid between its tracks on certain sections of streets. The city auditor reported that the company would owe the city $6,091.69, after the city debt for lighting is deducted. It was finally decided to await the return of Henry L. Doherty before taking any further steps.

ALL WILKES-BARRE LINES IN OPERATION

Practically all lines of the Wilkes-Barre (Pa.) Railway, the employees of which have been on strike for four weeks, have been opened for traffic. One hundred or more of the troopers of the State Constabulary are now scattered over the lines of the company with strict orders to break up riots and protect the property of the company. This they are doing in salutary fashion. Beyond the slight damage inflicted on the rolling stock the greatest hindrance to the running of the cars has occurred in the outlying districts, where signal boxes have been demolished or switches and tracks damaged.

T. A. Wright, general manager of the company, has notified all municipal authorities that the company will look to them for protection of its property. The notice emphatically declares that the company intends to hold each municipality to strict accountability for any damage done to the company's property. The burgess of Nanticoke, a suburb, informed company officials that the Borough Council had passed an ordinance prohibiting cars from operating in that town. He declared that he intended to enforce the ordinance, and the company prepared to enjoin him from interfering in any way with the service.

HOLYOKE ARBITRATION HEARINGS

Hearings in the wage arbitration case of the Holyoke (Mass.) Street Railway were resumed on Nov. 15 in the aldermanic chamber at Holyoke.

Arthur Sturgis, Boston, who was retained as an electric railway engineer and economic investigator by the employees' union, occupied the witness stand for a large part of the day. Testimony was presented leading to the conclusion that the average increase in the cost of living in Massachusetts in the past fifteen years has been about 42 per cent. Since 1900 the increase in wages on the Holyoke system has been about 42 per cent in maximum rate, 26 per cent of this having been since 1901. Attorney T. D. O'Brien, for the company, announced that cross-examination of Mr. Sturgis on statistics, tables and quotations from various economic authorities included in the testimony would occur later. On Nov. 15 Attorney Vahey, representative of the union on the arbitration board, said that it was hoped that all the evidence on behalf of the union would be presented by Nov. 18.

Thomas Y. Weir, representing the employees, testified on Nov. 16 as to the difficulties of platform work. The witness contended that the double running boards ordered by the Public Service Commission were inconvenient and produced extra work. He acknowledged that the men expected full pay whether or not they worked nine hours a day and extra pay for work beyond nine hours. The witness admitted that if it could be proved that the $60,000 loss sustained by the company in the recent strikes was caused by the unjustified acts of the men, this should be taken into consideration in the settlement of the contract. He conceded that with the small present margin allowed on the runs there is a temptation for the men to run late in order to get the extra pay.

Chicago Electrification Report Again Postponed.—There has been another postponement of the time at which the report of the Commission on Smoke Abatement and Railway Terminal Electrification is to be presented to the Chamber of Commerce in Chicago. It is now thought that the report may be presented early in December.

Albany Safety Conference Postponed.—The conference over greater safety at grade crossings of electric railroads which was to have been held on Nov. 17 at the offices of the Public Service Commission for the Second District of New York in Albany among representatives of the railroads, the automobilists and public officials forming an executive committee recently appointed by Seymour Van Santvoord, chairman of the commission, has been postponed indefinitely.

Kansas City Franchise Election Protest.—Attorneys for J. D. Wilson, who is the plaintiff in a suit which is being contested to recover damages from certain election judges on account of alleged fraud in the Metropolitan Street Railway franchise election of last July, have filed a protest and brief in support of the objection they have raised before the commission against the approval of the franchise. The protest has been referred to the board in accordance with State laws.

American Employers' Profit Sharing Plans.—The National Civic Federation will have ready for distribution about Dec. 1 the results of its investigation of the subject of profit sharing between employer and employee. The report will contain an analysis of more than 100 plans now in operation in this country, as well as a description of many abandoned ones and the causes of their failure. The views of employees and the attitude of labor unions will be set forth.

Bay State Fare Case Adjourned.—Upon request of counsel for opponents to the proposed fare increase on the Bay State Street Railway, the Massachusetts Public Service Commission has continued the case until Feb. 1, 1916, to give ample time for the study of evidence submitted by the company. On Nov. 29 the board will hear counsel on the contention that the commission has no jurisdiction in the case in view of the interstate service rendered on some of the company's lines.

Indictment for Failure to Comply with Commission Order.—County Judge Lewis in Brooklyn, N. Y., has overruled the demurrer entered by John J. Dempsey, superintendent of the elevated lines of the Brooklyn Rapid Transit Company, to the indictment charging him with failing to comply with an order issued by the Public Service Commission. As a result Mr. Dempsey will be obliged to stand trial in the County Court. The indictment against the superintendent charges a misdemeanor.

Toronto Rapid Transit Report Promised for Dec. 1.—Transportation matters claimed considerable attention at the City Hall, Toronto, Ont., on Nov. 12. Mayor Church announced that the rapid transit report would be issued about Dec. 1. The engineers who have been engaged in the preparation of the report have nearly completed their labors. The Mayor stated that the report would provide for the entrance of the radial lines. After it has been presented to the Council, the Mayor will urge that a traffic commission be appointed to carry out the scheme recommended and to supervise all transportation affairs of the city.

Right of City to Inspect Books Decided.—The Supreme Court of Kansas holds that the legislative act of 1907, giving cities access to the books of utilities holding franchises, does not apply to utilities holding franchises of date prior to the enactment. The city of Wichita had asked a writ of mandamus to examine the books of the Wichita Railroad & Light Company, and compare them with the annual statement filed by the company. The company's franchise in Wichita was granted in 1903, and provides for an annual statement of earnings and expenses. The city was refused access to the company's books and brought mandamus proceedings.

New Haven to Spend $25,000,000.—Plans for spending $25,000,000 in the next five years were announced on Nov. 15 by Edward Buckland, vice-president of the New Haven Railroad. The new bridge across the Thames River at New

London will cost about $2,500,000. Another $1,500,000 must be spent in electrical facilities in order to get the full benefit of the electrification between New Haven and New York, and diminish, if not abolish, the smoke nuisance in New Haven, so far as the railroad is responsible for it. Three million dollars must be spent for trackage, yards and sidings. Regularity and safety are to be assured by improved and added signals, at an estimated cost of $1,000,000. Passenger cars, steam engines and freight cars must be supplied, at an estimated cost of more than $9,000,000.

Further Discussion of Pittsburgh Subway.—Following a hearing on Nov. 11, W. B. Ainey of the State Public Service Commission of Pennsylvania indicated that the commission would not attempt to approve or disapprove a proposed ordinance of the Pittsburgh Subway Company for an underground railway in Pittsburgh. A discussion arose as to whether it was not the duty of Council, instead of the commission, to handle the subway matter. It was explained that Council would be glad if the commission would point a way to a reasonable ordinance. After a statement regarding the history of the subway by A. O. Fording, attorney for the Pittsburgh Subway Company, Chairman Ainey said: "It is self-evident that a subway would be a good thing for the city. For the commission, it seems to me, it is a question of the commission's jurisdiction—what we can lawfully do."

Chicago Investigates Railway's Advertising Campaign.—At a meeting of the Chicago City Council on Nov. 15, an order was passed directing the local transportation committee to investigate how the advertisements are being paid for that are being run in the local newspapers by the Chicago Surface Lines. It was stated that the railway company had spent approximately $30,000 and that a contract had been made with the Lord & Thomas agency for $75,000 worth of advertising space. The Alderman who introduced the order said that the purpose was to determine whether the advertising was being paid for out of operation or out of the company's profits. City Comptroller Pike has instructed E. J. Bemis, city representative on the Board of Supervising Engineers, to protest the expenditure if it is being taken from operation, as all charges to operating expenses affect the return to the city under the participation plan.

Officials Study Condition of United Railroads.—Mason B. Starring, New York, president of the United Railroads Investment Company of New Jersey, is in San Francisco with a group of his associates studying the present condition of the United Railroads of that city. With Mr. Starring are J. H. Reed, Pittsburgh; B. S. Guiness, George W. Bacon and Moritz Rosenthal, New York, all officials or stockholders in the holding company. In explanation of the purpose of the present study of conditions first hand, it is pointed out that $1,800,000 of the Market Street Cable Railway first mortgage 6 per cent bonds, which have been extended, will become due and payable with interest on Dec. 15 of this year. It is also stated that mainly on account of the Municipal Railway and the jitney buses, the number of passengers carried during the twelve months ending June 30 fell off 9,500,000 as compared with the preceding year. The decrease in passengers carried for the calendar year 1915 has not yet been calculated, but has been estimated to be as much as 22,500,000 below normal.

Plans for Extensions in Detroit.—Following the rejection of the plan to have the city purchase the city lines of the Detroit (Mich.) United Railway, Mayor Marx has intimated that within a short time he will take up with the Street Railway Commission the formulation of a plan which will secure several miles of needed extensions in Detroit. He recently informed the Common Council that a plan of some sort would be prepared for submission to the Aldermen at an early date. It is understood that Mayor Marx will ask the Detroit United Railway to build and operate these extensions. The company has previously indicated its willingness to build several miles of track if authorized to do so by the city. Among some of the members of the Municipal Ownership League there is an agitation to have the city build the extensions under their proposal for starting by piecemeal the construction of a municipal system. Inasmuch as the Mayor and the Street Railway Commission opposed this plan as too costly and confusing in the recent street railway campaign, it is not regarded as likely that they will recommend such a procedure at this time.

Forty-five Operating Railroads in Greater New York.—The Public Service Commission for the First District of New York has issued a 1500-page volume entitled "Documentary History of Railroad Companies," which contains the corporate and franchise history of all railroad and street railroad corporations incorporated at any time to do business within Greater New York. The book summarizes the record of not less than 726 companies that have been organized to operate routes within the present limits of New York City. Of these 455 are now dead, dormant, or inchoate. In other words, there are some 271 companies that are now represented in the existing operated routes. Of these 195 have lost their identity by merger, foreclosure, or change of name, thus leaving seventy-six distinct companies in the present operated systems. Of these thirty-one are operated under lease or agreement by other companies, so that there are actually forty-five companies now engaged in the operation of railroad routes in the city of New York. The general complexity with respect to corporate relationship is well shown by that of the Brooklyn Rapid Transit System. In that system no fewer than eighty-three companies are represented. Of these sixty-seven have lost their identity through absorption. Of the remaining sixteen companies, nine are operated under lease or agreement, so that there are actually seven operating companies in the system, all of which are subject to stock control through the Brooklyn Rapid Transit Company, which is a business corporation and not a transportation company.

PROGRAM OF ASSOCIATION MEETING

Pennsylvania Street Railways Association

The annual meeting of the Pennsylvania Street Railways Association will be held at Scranton, Pa., on Dec. 14 and 15. During the morning of Dec. 14 delegates, representatives and guests will register at the Board of Trade Building. The meeting will be called to order at 2 p. m. The program for the meeting as at present drawn is subject to change. The tentative program for the session on Dec. 14 is as follows:

Address, C. L. S. Tingley, president of the association.

Paper, "Railway Electrification," by N. W. Storer, Westinghouse Electric & Manufacturing Company.

Presentation of problems presented to the "Question Box," in charge of W. A. Heindel.

Paper, "Carhouse Methods," by J. F. Layng of the General Electric Company.

Report of committee on proposed safety rules and code of Bureau of Standards, Gordon Campbell, chairman.

Paper, "Efficiency Through Conservation in Time in Interurban Traffic," by E. C. Spring of the Lehigh Valley Transit Company.

On the evening of Dec. 14 there will be a dinner of those in attendance at the meeting.

The tentative program of the session of Dec. 15, which will be called at 9.30 a. m., is as follows:

Presentation of illustrations of safety devices by H. P. Megargee of the American Railways.

Paper, "State Insurance Against Workmen's Compensation Liability," by H. A. Mackey, chairman Workmen's Compensation Board of Pennsylvania.

Paper, "Mutual Insurance Against Workmen's Compensation," by Walter S. Bucklin, president Massachusetts Employees' Insurance Association.

Paper, "Stock Company Insurance Against Workmen's Compensation Liability," by Walter G. Cowles, vice-president Travelers Insurance Company.

Paper, "Some Practical Questions Arising Under Workmen's Compensation Laws," by Lefferts S. Hoffman, general attorney Public Service Corporation of New Jersey.

The general discussion will follow, after which the "Question Box" problems will be considered. The meeting will conclude with the presentation of the reports of committees, consideration of new business and the election of officers.

Financial and Corporate

ANNUAL REPORT

Virginia Railway & Power Company

The comparative statement of income, profit and loss of the Virginia Railway & Power Company, Richmond, Va., for the years ended June 30, 1914 and 1915, follows:

	1915	1914	Change
Operating revenues:			
Railways	$2,838,370	$2,982,065	—$143,695
Electric light and power and gas	2,271,252	2,173,983	+ 97,260
Total operating revenues	$5,109,622	$5,156,048	—$ 46,426
Operating expenses:			
Railway:			
Maintenance of way and structures	$ 268,560	$ 289,752	—$ 21,192
Maintenance of equipment	173,136	187,571	— 14,434
Traffic expenses	6,741	9,436	— 2,694
Transportation expenses	901,005	903,518	— 2,513
General expenses	293,156	280,306	+ 12,850
Total	$1,642,601	$1,670,585	—$ 27,983
Light and power and gas	826,473	795,323	+ 31,149
Total operating expenses	$2,469,074	$2,465,908	+$ 3,166
Operating income	$2,640,548	$2,690,140	—$ 49,592
Other income	80,919	80,909	+ 9
Gross income	$2,721,467	$2,771,049	—$ 49,583
Taxes and licenses:			
Railways	$ 205,537	$ 217,122	—$ 11,585
Electric light and power	80,070	78,163	+ 1,907
Gas	12,944	12,825	+ 117
Total taxes and licenses	$ 298,551	$ 308,111	—$ 9,561
Income applicable to fixed charges	$2,422,916	$2,462,938	—$ 40,022
Total fixed charges	1,337,867	1,307,347	+ 30,520
Surplus	$1,085,049	$1,155,591	—$ 70,542
Other charges:			
Depreciation charged direct	$ 100,000	$ 100,000	.....
Proportion of discount	29,262	25,768	+ 3,494
Net miscellaneous charges	33,284	57,918	— 24,634
Total other charges	$ 162,546	$ 183,686	—$ 21,139
Surplus over fixed and other charges	$ 922,503	$ 971,905	—$ 49,402

When the general business conditions and the very considerable losses from jitney bus competition, as indicated in the reduction of railway receipts compared with the preceding year, were all considered, the management felt gratified that the gross income of the company from all sources for the fiscal year showed a decrease of only $49,583 as compared with the preceding year, or less than 1 per cent. While the management undertook to conserve its resources and reduce expenses as much as practicable to meet the adverse conditions existing, this was not done at the expense of the property. Expenditures for maintenance of way and equipment during the year amounted to 15.56 per cent of the gross railway revenues as compared to 16.01 per cent for the fiscal year ended June 30, 1914, and 14.99 per cent for the fiscal year ended June 30, 1913. Moreover, in addition to the regular charges for maintenance of way and equipment, the sum of $100,000 was set aside in cash in monthly instalments during the year and carried to the depreciation reserve, half for the railway property and half for the light and power property. An additional sum of $105,821 was credited to the depreciation reserve and charged against surplus as of Dec. 31, 1914. The balance to the credit of depreciation reserve on June 30, 1915, was $960.572, as compared to $856,639 at the close of the preceding fiscal year. The capital expenditures for the year totaled $336,898, the sum of $137,570 being in the railway department.

In July, 1914, there was a distressing accident on the Ocean View division of the Norfolk Railway & Light Company in which a loaded two-car train ran into a freight train on the Virginian Railway at a crossing, owing to the motorman losing consciousness just before reaching the crossing and failing to see the signals or the train ahead of him. Several persons were killed and more than 130 were injured. Settlements were made, without serious litigation, at an aggregate cost of $107,816, including expenses. Mostly as a result of this accident the payments and expenses on account of injuries and damages for the fiscal year ended June 30, 1915, amounted to $235,267, as compared to $115,577 for the preceding fiscal year. The payments for the current year amounted to $91,122 in excess of the amount reserved, and, after absorbing the surplus accumulated, left a deficit of $42,402 against this reserve. The board of directors therefore increased the amount of the reserve on the Norfolk and Portsmouth divisions from 6 per cent to 8 per cent of the gross transportation receipts and this increased reserve is rapidly absorbing the deficit thus created. On account of a much smaller accident on the Richmond division the reserve for injuries and damages here was increased from 3.5 per cent to 5 per cent.

In November, 1914, the property of the Richmond & Henrico Railway, a small competing line in Richmond which had been in the hands of receivers for more than a year, was sold under foreclosure. The purchasers organized the Richmond Railway & Viaduct Company to operate this property, and the Virginia Railway & Power Company, under arrangement with the purchasers, acquired the securities of the Richmond Railway & Viaduct Company under an arrangement effective on July 1, 1915.

In relating the experiences of the company with the jitney bus, the report states that in order to test the profitableness of such service the company organized a subsidiary company known as the Motor Transit Corporation, which acquired forty cars in April, 1915, and operated these on regular schedules in that section of the city of Richmond where jitney service was being rendered. The result of these operations demonstrated that the business could not be conducted without a loss, and while the operation was being conducted at the close of the fiscal year it was discontinued in September. In the meantime, the independent operators who started the business in March gradually dropped out until at the close of the fiscal year very few of those who originally started were still in the business. Like other fads in the transportation business, it is believed that the jitney bus will soon pass out of business.

The following table shows some of the more important operating and traffic statistics:

	1915	1914	Change
Revenue passengers carried	62,271,603	65,695,197	—3,423,594
Transfer and free passengers carried	14,706,115	15,676,096	— 969,981
Total passengers carried	76,977,718	81,371,293	—4,393,575
Percentage of passengers using transfers	18.10	18.13	— 0.03
Average fare per passenger including transfers	$0.037	$0.036	+ $0.001
Car mileage	12,439,758	12,478,058	— 38,300
Car hours	1,513,612	1,515,016	— 1,404
Total revenue per car mile	$0.228	$0.239	— $0.013
Total revenue per car hour	1.87	1.97	— 0.10
Operating expenses per car mile	0.132	0.134	— 0.02
Operating expenses per car hour	1.09	1.10	— 0.01

KANSAS CITY SUPPLEMENTAL PLAN

Further Details of Arrangement for Distributing Railway and Lighting Equities to Stockholders

Further details are now available in regard to Judge Hook's supplemental plan for the stockholders in the Kansas City Railway & Light Company reorganization, described briefly in the ELECTRIC RAILWAY JOURNAL of Nov. 13. Of the authorized capital stock of this company $9,407,500 of preferred and $9,543,080 of common stock is outstanding in the hands of the public. These are the amounts entitled to participate in the distribution of the equities involved in the complete separation of the railway property and the lighting property. The remaining $5,672,000 of stock pledged as collateral is to be cancelled. The representatives of about 90 per cent of each class of this $18,950,580 of stock now say that no law of any state can be found authorizing the formation of a corporation with both preferred and common shares having no specified par value. They have therefore suggested that the equities be conveyed to trustees who shall distribute among the stockholders preferred and common participating beneficial certificates of no specified par value. The concurrence of the holders of 80 per cent severally of the existing preferred and common stock shall determine the division of equities between the properties.

All the stock of the new railway company representing the equity in its property except that necessary for organization purposes shall be conveyed to three trustees. One trustee shall be chosen by the holders of a majority in amount of the preferred stock allotted to the street railway properties; another by the like holders of the common stock, and the two trustees so chosen shall select the third. A similar course shall be pursued with respect to the stock of the light company, but there shall be no common trustee in the two trusts.

The principal laid down in the plan of preserving, as far as practicable, the relative rights of each class of interests shall apply among the stockholders under the reorganization, and the differential qualities of the preferred stock as between it and the common will be carried into the beneficial certificates, provided, however, that after Jan. 1, 1919, the dividends upon the preferred beneficial certificates shall be cumulative. The reasons for this change are first that the net earnings of the street railway and electric properties have constituted a common source of dividends for the existing preferred stock. In future each class of beneficial certificates of the new railway company or the light company will have to rely for dividends upon the earnings of its particular business without aid from the other in case of deficiency. This is materially to the disadvantage of the rights of the preferred certificates. Again, during the receivership no dividends have been paid upon the preferred stock, though substantial earnings otherwise applicable thereto have been used for permanent improvements and betterments.

While a direct assessment upon the stockholders has been avoided by provisions for new mortgage bonds for the expenses of reorganization, and for payments into sinking funds to discharge new second mortgage bonds from net earnings, there are other costs and expenses which all participating stockholders should bear proportionately. The plan requires the stockholders (a) to take or cause to be taken at par sufficient first and refunding mortgage bonds of the new railway company to pay certain expenses and liabilities chargeable to the street railways and to supply that company with $1,000,000 in cash for new capital expenditures presently available; (b) to form a syndicate to underwrite the exchange of the old funded debt (excepting the bonds of the Elevated and Westport lines) for bonds of the new railway company and the light company. A responsible depositing stockholder has guaranteed both obligations.

The trustees in either trust may issue and sell first preferred beneficial certificates to raise funds for the purposes of the business of the new railway company or the light company if the holders of two-thirds in amount of each class of beneficial certificates so authorize. Nothing in this plan prevents either new company from issuing and selling preferred stock to the public whenever duly authorized by law and by the vote of the holders of the beneficial certificates. Whenever a corporation can be lawfully formed with preferred and common shares of no specified par value with authority to take over the stock of another corporation as its assets, each set of trustees shall cause one to be organized and shall turn over to it the stock in their custody.

A formal statement has been filed with the court by the receivers of the subsidiary Metropolitan Street Railway declaring the reorganization plan operative for bondholders. The following amounts were deposited with the reorganization committee: Kansas City Railway & Light Company first lien refunding 5 per cent bonds, 96.6 per cent; 6 per cent collateral gold notes of this company, 96.5 per cent; notes to Kansas City banks, 93.3 per cent; Metropolitan Street Railway consolidated mortgage 5 per cent gold bonds, 99.3 per cent; Central Electric Railway 5 per cent mortgage bonds, 97.7 per cent, and East Side Railway first mortgage 5 per cent gold bonds, 100 per cent. As stated in last week's issue the stockholders' committee, which has already secured deposits of 90 per cent of all stock, has set the limit of participation for stockholders at Dec. 20. The entire reorganization is now to be completed by Feb. 7.

STATISTICS FROM NEW JERSEY COMMISSION

The Board of Public Utility Commissioners of New Jersey has just issued a report containing statistics of public utilities in the State for the year ended Dec. 31, 1913. Among the abstracts of reports for 561 utilities there are reports for twenty-six operating and thirty-eight non-operating electric railways. On account of the lack of reports concerning intra-state revenue, no gross revenue is stated for steam railways, but for the other classes of utilities the amount of such revenue was as follows: Electric railways, $18,923,587; gas companies, $12,504,344; electric light and power companies, $10,530,188; municipal electric light plants, $145,187; private water utilities, $4,545,684; municipal water utilities, $4,771,361; sewer companies, $185,440, and telephone companies, $8,863,372—total, $60,469,163. On account of its interstate traffic, the Hudson & Manhattan Railroad is not included in the electric railway total.

The report presents a short description of the organization of all electric railways, with statements showing the capital stock and funded debt of the non-operating companies and, in addition to these, the income figures for the operating lines. A separate tabulation shows the gross amounts for the various subdivisions of operating expenses and the corresponding average amount per car-mile. Other mileage, traffic and miscellaneous statistics for the different operating companies as calculated by the commission are published in the accompanying table.

	Miles of Track Owned	Capitalization Per Mile of Track	Miles of Road Operated	Operating Revenues Per Mile of Road	Revenues Car-Miles Per Mile of Road	Revenue Car-Miles Per Car-Hour	Average Fare Per Revenue Passenger (Cents)	Transportation Revenue Per Car-Mile (Cents)	Transportation Revenue Per Car (Hour)	Total Operating Revenues Per Car-Mile (Cents)	Operating Expenses Per Car-Mile (Cents)	Operating Ratio (Per Cent)
Atlantic & Suburban Railway	17.0	$49,442	16.0	$5,650	30,601	11.8	4.77	18.4	$2.18	18.5	12.3	66.9
Atlantic City & Shore Railroad	7.7	254,237	24.5	25,279	71,902	10.8	4.76	34.6	3.73	35.2	18.2	51.8
Atlantic Coast Electric Railway	35.6	84,246	20.3	21,527	64,837	9.4	5.00	25.9	2.43	33.2	18.0	54.1
Bridgeton & Millville Traction Company	37.9	26,406	36.2	3,833	16,258	9.5	4.29	23.4	2.22	23.6	16.5	70.1
Burlington County Transit Company	14.8	8,122	15.8	4,631	23,698	2.1	5.00	19.2	0.39	19.5	15.3	78.2
Cape May, Delaware Bay & Sewell's Point Railroad	7.1	42,253	8.5	2,958	17,538	...	5.00	16.7	...	16.7	18.9	113.3
Central Passenger Railway	3.0	96,346	4.0	8,337	41,899	6.4	2.06	15.2	0.98	19.9	14.7	74.0
Five Mile Beach Electric Railway	5.7	44,859	4.9	12,085	44,115	5.3	5.00	26.9	1.43	27.4	14.3	52.1
Hudson & Manhattan Railroad	18.8	.....	8.5	434,500	936,192	18.3	5.86	43.3	7.86	46.4	17.1	36.9
Jersey Central Traction Company	39.9	75,188	35.1	6,386	25,457	11.0	4.98	23.3	2.56	25.1	15.4	61.4
Millville Traction Company	12.5	30,542	12.5	4,205	25,471	9.4	4.82	16.4	1.54	16.5	21.7	131.4
Monmouth County Electric Company	17.7	46,584	15.0	6,700	36,147	10.2	5.00	18.0	1.83	18.5	14.2	76.5
Morris County Traction Company	59.5	55,481	47.8	5,901	25,895	10.1	4.95	22.6	2.28	22.8	15.9	69.7
New Jersey & Pennsylvania Traction Company	15.0	106,667	13.3	8,608	31,522	13.4	4.98	25.0	3.34	27.3	16.7	61.2
New Jersey Rapid Transit Company	6.0	53,333	6.0	786	9,312	12.0	5.00	7.6	0.91	7.6	5.9	77.6
Northampton, Easton & Washington Traction Company	18.0	110,703	18.0	3,534	12,111	16.6	5.00	28.5	4.74	29.2	13.7	46.9
North Jersey Rapid Transit Company	14.5	110,192	15.2	4,171	20,167	15.1	9.18	20.3	3.06	20.7	12.8	61.7
Ocean City Electric Railroad	10.0	17,500	10.0	2,466	16,051	9.1	4.99	15.3	1.40	15.4	12.8	83.6
Phillipsburg Horse Car Railroad	7.1	4,240	6.9	15,542	72,118	7.9	5.00	21.4	1.68	21.6	14.9	69.3
Point Pleasant Traction Company	3.2	124,224	3.1	3,327	16,872	7.7	5.00	19.6	1.51	19.7	18.6	94.6
Public Service Railroad	*41.8	†49,956	36.7	2,310	11,435	20.9	22.48	20.0	4.17	20.2	19.1	94.6
Public Service Railway	*823.4	†163,916	488.2	31,814	101,241	8.7	4.96	31.1	2.71	31.4	17.6	55.9
Trenton & Mercer County Traction Corporation	*74.2	†108,570	53.3	14,410	63,125	8.8	4.32	22.5	1.97	22.8	12.1	53.2

*Miles of track operated.
†Capitalization per mile of track operated, including capitalization of lessor companies.

American Cities Company, New York, N. Y.—D. H. Cantrell, president Little Rock Railway & Electric Company, Little Rock, Ark., has been elected a director of the controlling corporation, the American Cities Company, to succeed the late W. M. Kavanaugh.

Ardmore (Okla.) Electric Railway.—The property of the Ardmore Electric Railway is advertised to be sold at public sale on Jan. 1, 1916. The receiver, whose appointment was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 14, has made arrangements to resume operations until the date of sale.

Boston (Mass.) Elevated Railway.—The Public Service Commission for Massachusetts has approved an issue of $3,286,000 of thirty-year 5 per cent bonds by the Boston Elevated Railway. The proceeds of the new issue as set forth in the petition are to be used "for construction and equipment, for funding its floating debt and also for the purchase of such real and personal estate as may be necessary or convenient for the operation of the road."

Buffalo & Williamsville Electric Railway, Williamsville, N. Y.—The Buffalo & Williamsville Electric Railway has been authorized by the Public Service Commission for the Second District of New York to issue $49,000 of 5 per cent forty-year first mortgage bonds. The bonds are to be sold at not less than 95.

Cities Service Company, New York, N. Y.—At a special meeting of the board of directors of the Cities Service Company on Nov. 10, the officers were authorized to sell $5,000,000 of preferred and $2,500,000 of common stock to a syndicate, for $5,000,000 cash. The syndicate will take over the stock at once, and the proceeds will enable the company to retire its entire floating debt and give ample working capital in addition. Arrangements with the syndicate provide that the stock will not be offered to the public at present, and purchasers may withdraw their stock only on condition that the preferred is sold at not less than 85, and the common at 125. Holders of preferred stock as of record on Dec. 15 will have the right to receive on Jan. 1 5 per cent convertible debenture bonds of the company for the 9 per cent of accumulated dividends to Jan. 1, 1916. These debentures may be converted at any time into stock upon a basis of $100 of preferred and $25 of common stock for each $100 in debentures. The holders of common stock as of record on Dec. 15 will on Jan. 1 have 9 per cent of these debentures set aside for them to be distributed when all holders of preferred stock have received their deferred dividends in full. Regular monthly cash dividends of one-half of 1 per cent will be resumed on the preferred stock on Feb. 1, 1916, payment being made to holders that are of record on Jan. 15.

Cleveland & Eastern Traction Company, Cleveland, Ohio.—An initial dividend of one-half of 1 per cent has been declared on the $468,865 of 5 per cent non-cumulative preferred stock of the Cleveland & Eastern Traction Company.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—The Consumers' Power Company of Michigan, principal generating subsidiary of the Commonwealth Power, Railway & Light Company, has filed in Michigan a mortgage securing an authorized bond issue of $35,000,000 with the Harris Trust & Savings Bank, Chicago, Ill., as trustee. The new mortgage and the bonds under it are secured by liens on the entire property of the company, and takes the place of the present collateral mortgage. The filing of the new mortgage is one of the final details in the plans of the company by which the Consumers' Power Company holds all its properties in fee, instead of through ownership of underlying stocks and bonds.

Detroit (Mich.) United Railway.—First mortgage 5 per cent gold bonds of the Detroit Railway numbered from 151 to 200, both inclusive, and due on Dec. 1 will be paid at par and interest at the People's State Bank, Detroit, at maturity.

Empire United Railways, Inc., Syracuse, N. Y.—A bondholders' protective committee is asking the holders of the first mortgage 5 per cent gold bonds of the Rochester, Syracuse & Eastern Railroad due on May 1, 1945, to deposit their bonds with the Trust & Deposit Company of Onondaga, Syracuse, N. Y., or the Old Colony Trust Company, Boston, Mass. The members of the committee are Arthur W. Loasby, president of the Trust & Deposit Company of Onondaga, Syracuse, N. Y.; Elbert A. Harvey, representing Lee, Higginson & Company, Boston, and Deforest Settle, of Bentley, Settle & Company, Syracuse, N. Y. Mr. Loasby is chairman of the committee and Mercer V. White, 100 North Salina Street, Syracuse, N. Y., is secretary.

Fostoria & Fremont Railway, Fostoria, Ohio.—The Ohio Public Utilities Commission has authorized the Fostoria & Fremont Railway to sell for the highest price obtainable, and for not less than 87½ per cent, $200,000 of its first mortgage 5 per cent gold bonds, now pledged as security for a loan made by the Cleveland Trust Company. The proceeds are to be used to discharge the indebtedness of $165,870 and accrued interest thereon unpaid to the trust company, any balance being available for corporate purposes.

Memphis (Tenn.) Street Railway.—The Memphis Street Railway has filed for record at Memphis a mortgage to the Guaranty Trust Company, New York, to secure $30,000,000 of bonds, which are to be issued when necessary in different amounts from time to time to refund maturing securities or to provide for any extension or additions which may be necessary, but only in the proportion of 80 per cent of the cost of such betterments. Moreover, the bonds may be retired by the company at stated periods if desirable to take advantage of any lower interest rates that may at such times be prevailing.

New York (N. Y.) Railways.—A preliminary decision favorable to the plaintiff bondholders has been handed down in the Appellate Division of the New York Supreme Court in the suit of the New York Railways adjustment income 5 per cent bondholders against the New York Railways to recover back interest amounting to about $50 a share. The Supreme Court has decided, thereby overruling the decision of a lower court, that George B. Leighton, holder of the New York Railway adjustment income 5 per cent bonds, could continue the suit brought by the New York Life Insurance Company against the New York Railways, alleging violation of the terms of the mortgage securing the adjustment income bonds in regard to the payment made as interest for the last three years. The New York Life Insurance Company has discontinued its connection with the case.

Republic Railway & Light Company, New York, N. Y.—A syndicate composed of Lee, Higginson & Company, Boston, Mass.; Drexel & Company, Philadelphia, Pa., and Reilly, Brock & Company, Philadelphia, Pa., has purchased from the Republic Railway & Light Company an issue of $7,000,000 of five-year 5 per cent bonds of the Mahoning & Shenango Railway & Light Company; and Reilly, Brock & Company have purchased an issue of $3,000,000 of three-year notes of the Republic Railway & Light Company. The proceeds of the sale of these securities will be used to pay off the $3,000,000 of 5 per cent notes of the Republic Railway & Light Company, maturing on Jan. 1, 1916, and the $4,844,000 of Mahoning & Shenango Railway & Light Company first consolidated refunding mortgage 5 per cent bonds also maturing on Jan. 1, 1916, to pay off all floating indebtedness of the Republic Railway & Light and the Mahoning & Shenango Railway & Light and their subsidiaries, and to furnish funds for construction requirements well into 1916.

Seattle, Renton & Southern Railway, Seattle, Wash.—Judge Kauffman in the King Superior Court at Seattle has ordered Scott Calhoun and Joseph Parkin as receivers to wind up immediately the affairs of the Seattle, Renton & Southern Railway and to sell the property. Judge Kauffman found that the company has been hopelessly insolvent since May, 1912. One of the largest creditors is the Puget Sound Traction, Light & Power Company, which has a claim of more than $100,000 for power furnished. The estimated total indebtedness is $1,600,000. The appointment of the receivers was noted in the ELECTRIC RAILWAY JOURNAL of April 12, 1913.

Toronto (Ont.) Civic Railway.—A by-law to issue twenty-year debentures to the amount of $108,696 for new cars for the Toronto Civic Railway has been carried by the City Council.

DIVIDENDS DECLARED

Central Mississippi Valley Electric Properties, Keokuk, Iowa, quarterly, 1½ per cent, preferred.

Citizens' Traction Company, Pittsburgh, Pa., $1.50.

Cleveland & Eastern Traction Company, Cleveland, Ohio, one-half of 1 per cent, preferred.

Northern Texas Electric Company, Fort Worth, Tex., quarterly, 1 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period			Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Sept.,	'15	$88,743	*$62,455	$26,288	$16,909	‡$9,559
1 "	"	'14	87,236	*82,577	4,659	17,129	†‡12,277
3 "	"	'15	271,606	*191,754	79,852	50,895	‡29,398
3 "	"	'14	285,320	*237,342	47,978	51,235	†‡2,669

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m.,	Sept.,	'15	$94,588	*$61,079	$33,509	$30,121	$3,388
1 "	"	'14	87,086	*55,095	31,991	28,456	3,535
12 "	"	'15	1,047,202	*719,406	327,796	355,230	†27,434
12 "	"	'14	1,119,695	*702,784	416,911	330,335	86,576

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO.

1m.,	Sept.,	'15	$266,435	*$154,383	$112,052	$40,200	$71,852
1 "	"	'14	256,125	*148,485	107,640	39,239	68,401
12 "	"	'15	3,066,603	*1,819,624	1,246,979	471,860	775,119
12 "	"	'14	3,063,698	*1,935,396	1,128,312	477,012	651,290

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m.,	Sept.,	'15	$1,211,588	*$660,915	$550,673	$372,360	$178,313
1 "	"	'14	1,175,031	*678,116	496,915	352,245	144,670
12 "	"	'15	14,116,576	*7,527,018	6,589,558	4,366,950	2,222,608
12 "	"	'14	14,088,426	*7,733,072	6,355,354	4,122,756	2,232,598

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m.,	Sept.,	'15	$754,081	*$518,518	$235,563	$98,015	‡$161,289
1 "	"	'14	704,175	*532,281	171,894	98,887	‡94,570
3 "	"	'15	2,356,785	*1,500,087	856,698	294,425	‡631,821
3 "	"	'14	2,305,359	*1,675,040	630,319	295,106	‡399,941

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

1m.,	Sept.,	'15	$249,418	*$133,406	$116,012	$65,433	$50,579
1 "	"	'14	230,663	*122,671	107,992	63,711	44,281
12 "	"	'15	2,586,678	*1,475,987	1,110,691	781,995	328,696
12 "	"	'15	2,503,949	*1,429,718	1,074,231	762,788	311,443

EAST ST. LOUIS & SUBURBAN RAILWAY, EAST ST. LOUIS, ILL.

1m.,	Sept.,	'15	$206,405	*$122,453	$83,952	$62,904	$21,048
1 "	"	'14	216,514	*130,542	85,972	63,992	21,980
12 "	"	'15	2,424,763	*1,441,513	983,250	759,927	223,323
12 "	"	'14	2,718,761	*1,699,872	1,018,889	655,766	363,123

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

1m.,	Sept.,	'15	$73,130	*$42,571	$30,559	$15,956	$14,603
1 "	"	'14	67,326	*40,914	25,412	15,550	10,862
12 "	"	'15	715,579	*467,213	248,366	188,860	59,506
12 "	"	'14	673,618	*462,414	211,204	184,676	26,528

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m.,	Sept.,	'15	$184,243	*$114,182	$70,061	$43,526	$26,535
1 "	"	'14	196,155	*109,267	86,888	41,858	45,030
12 "	"	'15	2,137,894	*1,286,864	850,970	496,497	354,473
12 "	"	'14	2,258,848	*1,380,280	870,568	493,467	385,101

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

1m.,	Sept.,	'15	$37,310	*$26,014	$11,296	$8,000	‡$3,364
1 "	"	'14	37,175	*27,132	10,043	7,876	‡2,223
3 "	"	'15	133,352	*86,752	46,600	24,000	‡22,808
3 "	"	'14	139,233	*90,557	48,676	23,627	‡25,222

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m.,	Sept.,	'15	$41,652	*$40,840	$812	$6,355	††$3,829
1 "	"	'14	36,811	*42,864	†6,053	5,283	††9,803
3 "	"	'15	124,885	*125,455	†570	20,543	††15,542
3 "	"	'14	119,149	*128,188	†18,039	17,821	††30,937

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1m.,	Sept.,	'15	$340,918	*$212,824	$128,094	$53,081	$73,013
1 "	"	'14	311,656	*195,367	116,289	51,426	64,863
9 "	"	'15	2,829,360	*1,748,732	1,080,628	466,670	613,958
9 "	"	'14	2,728,559	*1,663,018	1,065,541	455,246	610,295

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m.,	Sept.,	'15	$474,919	*$352,574	$122,345	$120,822	‡$3,082
1 "	"	'14	467,400	*338,755	128,645	118,649	‡12,195
3 "	"	'15	1,458,560	*1,021,732	436,828	361,390	‡79,683
3 "	"	'14	1,538,795	*1,043,989	494,806	355,948	‡145,494

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m.,	Sept.,	'15	$23,397	*$21,172	$2,225	$1,598	‡$656
1 "	"	'14	25,705	*23,701	2,004	1,215	‡803
3 "	"	'15	74,132	*66,072	8,060	4,787	‡3,364
3 "	"	'14	80,637	*71,006	9,631	3,612	‡6,055

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

JITNEY AS STATE AND CITY ISSUES

Four Jitney Cases Before the Illinois Commission—Atlantic City Bill Killed

In four cases now before the Illinois Public Utilities Commission, the question of the right of jitney buses to operate without a certificate of necessity and convenience is squarely before that body for decision. The cases are from Springfield, Rock Island, Quincy and Hillsboro. Interest centers in these cases from the fact that the commission in its decision in the recent Jacksonville case did not take jurisdiction over all classes of jitneys. In Jacksonville, the jitneys were operating over specified routes and on schedules. The commission held that they were, therefore, common carriers and subject to regulation under the utilities act. In the pending cases the situation is different, for the buses in Springfield, Rock Island, Quincy and Hillsboro do not adhere to certain routes and schedules. In the answers filed by all the defendants, except those in Springfield, the jitney bus owners contend that they are no more subject to regulation than cab drivers. The same defense probably will be made by the Springfield men when they file their answer to the petition of the Springfield Consolidated Railway. Another mistaken impression regarding the rules prescribed by the commission for the operation of jitneys is that in the Jacksonville case the commission held that no permit for the operation of jitneys along streets on which street cars operate would be issued. Such is not the case. Commissioner Thompson, who heard the case, issued a statement in which he expressed the belief that this should be the attitude of the commission, but this statement was not written into the commission's ruling. The Rock Island jitney bus case has been before the commission some time, but is not likely that there will be any early decision. A court fight is expected on the question of jurisdiction, it being contended that the operation of jitneys between Rock Island and Davenport, Iowa, makes the jitney company an interstate concern. In all the pending cases complaints were made by the street railways.

The bill introduced before the City Commission of Atlantic City by W. H. Bartlett, director of public safety, and designed to drive the jitneys from Atlantic Avenue, the principal business street, has been killed. Even the sponsor of the bill himself voted for its defeat. J. B. Thompson, director of public highways, alone registered a negative vote. Members of the business men's delegation declared the fight to drive the jitneys from Atlantic Avenue, or to so restrict them as properly to protect the Atlantic City & Shore Railroad, has not been abandoned by any means. Charles Evans, president of the Atlantic City National Bank and vice-president of the railway, said that apparently the members of the commission were willing to permit a corporation which has helped Atlantic City to prosperity, to be ruined by guerilla competition.

Provisions of the jitney ordinance approved some time ago by the Board of Works of Newark, N. J., were discussed on Nov. 10 at a meeting of the license committee of the Common Council. Several changes in the measure were suggested. A scale of license fees, with $75 as the maximum charge, was approved. One of the suggested insertions to be passed on by the law department would require jitney men operating in Newark to prove at least one year's residence and to present references from at least three reputable citizens. The changes will be presented to the Board of Works when the measure, as revised on Nov. 10, comes before that body, preceding a joint conference.

The Supreme Court of California has upheld the recent finding of the Railroad Commission in that State, which decided that it has no jurisdiction over motor-bus lines, auto trucks or auto stages engaged in the business of transportation. The case was the result of an appeal by the Western Association of Short Line Railroads, asking that the commission be instructed to assume this jurisdiction.

The jitney fleet of the Motor Transit Corporation, a subsidiary of the Virginia Railway & Power Company, Richmond, Va., has been sold at public auction. There were

thirty-three Briscoe and seven Ford cars, and they brought an average of $216 per car.

A proposition by which the Memphis (Tenn.) Street Railway would receive the exclusive rights to operate over certain streets free from competition of jitney buses, provided the company agrees to sell tickets at the rate of twelve for 50 cents, with transfer privileges, is being considered by the City Commission of Memphis. Commissioner Dies is sponsor for the proposition. A meeting of jitney owners, members of the commission and representatives of the street railway has been called, at which the proposal will be considered and perhaps some action taken. No expression of opinion has been made by the company or the jitney owners.

TRENTON FARE HEARING CONTINUED

An Outline of the Trend of the Hearing in Which It Is Sought to Prevent Elimination of Six-for-a-Quarter Tickets

At the hearing on Nov. 4 in the Trenton fare case counsel for the city sought to prove that all recent changes and improvements made by the Trenton & Mercer County Traction Corporation had been charged to capital account and that in this way the patrons of the company had not obtained the full benefit of the increase in the capital liabilities of the company allowed some time ago by the Board of Public Utility Commissioners. Rankin Johnson, vice-president of the company, contended that at the time the system was being rehabilitated the earnings would not permit of any large charges for renewals or replacements being made against current earnings. On Nov. 5 Frank R. Ford of Ford, Bacon & Davis, was cross-examined by George L. Record, special counsel for the city. On Nov. 8 Mr. Record delved into the intercorporate relations of the Trenton & Mercer County Traction Corporation and the United Power & Transportation Company, which latter company leased the Trenton system. Mr. Johnson insisted that the lessees and the lessors were entirely separate. The testimony on Nov. 9 was concerned largely with the obligations of the company to the city with respect to paving, etc., and with how well the company had lived up to its contractual obligations in this respect. On the same day answer was filed in the United States Court at Trenton by the city of Trenton and the State Board of Public Utility Commissioners to the equity suit brought against them by the Trenton & Mercer County Traction Corporation as a result of the action against the company's desire to increase the rate of fare. The answer denies that the statutes and ordinances referred to in the bill of complaint, in which it was provided that the rate of fare should be a sum not greater than 5 cents for the carrying of each passenger more than five years of age for any distance within the limits of the city of Trenton, constituted contracts; and deny that these ordinances give any right to the complainants to charge and receive the sum of 5 cents for the carrying of each passenger more than five years of age within the limits of the city of Trenton. Similar denials are made regarding like subsidiary corporations of the company.

In the absence of the books of original entry of the Trenton & Mercer County Traction Corporation and its predecessors, President Donges of the Board of Public Utility Commissioners permitted E. C. M. Rand, connected with the late Russell Sage for seventeen years as an expert on property investments and security buying, retained by the city, to testify in regard to the capitalization of the company, adding that the board "would receive the testimony for what it purports to be in the circumstances." On the same day, Nov. 10, the city called as an expert John C. Brackenridge, vice-president Manhattan Bridge Three-Cent Line.

The case was continued on Nov. 15 and 16. Mr. Brackenridge was cross-examined by counsel for the company. Counsel for the city took up again the question of intercorporate relations.

The order of the Board of Public Utility Commissioners suspending the abolition by the company of the sale of tickets at the rate of six tickets for a quarter expired on Nov. 15. The company will respect the order pending a ruling by the board.

NEW JERSEY SCHOOL TICKET DECISION

The Board of Public Utility Commissioners of New Jersey made an order on Nov. 12 in which it declared unreasonable and unjust the increase in fare through the Public Service Railway withholding the special rates of fare from students of business schools. On the lines of the Public Service Railway school children have a fare which amounts to about 3 cents, but the company sought to prevent the students of business schools taking advantage of these rates because these institutions are conducted for profit and it would be an unusual preference. In dealing with the situation, the Board of Public Utility Commissioners, in its opinion, says:

"The fallacy of the argument lies in the assumption that because the teacher may receive a stipend from the pupil for instruction, the latter shall be deprived of a right to which otherwise he would be entitled. There is probably nothing that so manifests itself in the public policy of the State as its fixed purpose to further the education of the young to the end that they may be fitted to assume the duties and responsibilities of citizenship. The citizenship at which the State aims is most likely to be found when the largest possible number are employed in useful pursuits. The business schools supplement the grammar school education, which the State gives, by giving a training for commercial employment to those of high school age who cannot or will not avail themselves of the high school course which the State furnishes.

"The business school course is shorter than the high school course. The end obtained, however, is largely the same, namely, the development of a citizenry intelligent and useful. To hold that the business school pupil of school age shall be denied the right to the same rate of fare as other children of school age is to discriminate against him. To hold that because he pays for an education during the years of his school age, the more quickly to befit himself for a useful occupation, is in effect to penalize him for doing the thing, without expense to the State, that the State aims to do in pursuance of its public policy.

"The Supreme Court has indicated that the issuing of school tickets to school children involved neither injustice nor discrimination, the company, either by agreement with the municipalities or on its own volition without agreement, having constituted itself an auxiliary of the State in furthering the cause of education. The company having failed to show that any reasonable distinction can be made between business school pupils and those of other schools, the Supreme Court decision would seem to include such pupils as among the school children to whom the giving of a reduced rate is not unreasonable or preferential. The Board, in conclusion, holds that the company has not made out a case and the fare change, or alteration, is accordingly disapproved."

The case is a sequel to the action of the company in seeking to do away with all special school rates upon the ground that they constituted an unreasonable discrimination and hence were in violation of the law. That action, taken in 1911, was held up by an order of the Public Utility Commission whose findings were subsequently affirmed by the Supreme Court. Failing to obtain sanction for the increase of rates to all school children, the company more than a year ago undertook to make a new order that school tickets should not be sold to pupils attending business schools. The operation of this order was temporarily suspended by the board on Sept. 22, 1914, and by mutual agreement was not enforced by the company pending the determination of the appeal, notwithstanding the lapse of the two months' statutory period for which an order of suspension can be made effective.

Safety-First Posters in New Jersey.—The Public Service Railway, Newark, N. J., is installing in its cars lithographed posters 10 in. x 24 in. in size which depict accidents that result from failure to heed safety-first rules. A series of twelve subjects has been designed, one to be shown each month for a year.

Skip Stops in St. Paul.—The Twin City Rapid Transit Company, Minneapolis, Minn., has decided to run during the rush hours cars which will make no stops between Seven

Corners and Dale Street, on the Selby-Lake and Grand to Cretin lines in St. Paul. The company has announced that if the plan proves successful it will be put into operation on other lines.

Rerouteing Proposed in Providence. — Officials of the Rhode Island Company, Providence, R. I., have presented to the committee on railroads of the City Council a tentative plan for the rerouteing of the cars on ten of the city lines which are subjected to the heaviest traffic. This plan is suggested as a part of the scheme for putting into use the new Fountain and Empire Street tracks.

New Springfield Tariff Suspended.—The Public Service Commission of Massachusetts has suspended until Jan. 1, 1916, operation of the proposed local and joint class rates and minimum tariff filed by the Springfield Street Railway to become effective on Nov. 15, covering business in connection with the Worcester Consolidated Street Railway, Rhode Island Company, and four other street railways.

Open Cars for Brooklyn Smokers.—Except on stormy days, or when the temperature is excessively low, the Brooklyn (N. Y.) Rapid Transit Company plans to run open cars at intervals of approximately fifteen minutes on all its lines. This is primarily in answer to the pleas of smokers. The company has announced that the policy is definitely settled for the operation of the cars throughout the year.

Proposed Fare Increases Suspended.—The Public Service Commission of New Hampshire has suspended for three months proposed fare increases from 25 cents to 32 cents on the Manchester-Nashua, and from 15 to 21 cents on the Manchester-Derry line of the Manchester Traction, Light & Power Company, Manchester, N. H. The commission said that no complaint had been received, but that it deemed an investigation expedient.

Increase in Wages in Wheeling.—The wages of the trainmen of the Wheeling (W. Va.) Traction Company and affiliated lines were increased on Nov. 1 in accordance with an agreement entered into last May. All of the employees who were receiving 29 cents an hour were granted the advance in salary and others will receive this increase, after working so long. When the men are first taken on they receive 22 cents an hour, and at the end of each year advance until they reach the limit, now 30 cents an hour.

Courtesy in Topeka.—The Topeka (Kan.) Railway, always solicitous to provide special accommodations for visitors to the capital of Kansas, by the instruction of its trainmen in the giving of information and the handling of crowds, made unusual efforts during the recent convention of the State Teachers' Association. The service rendered by conductors in pointing visitors to destinations in the residence district was the subject of much favorable comment. The company took occasion, in its newspaper advertisements addressed to the teachers, to refer to the advantages of its service as compared with the jitneys.

Fare Concession to Steel Workers.—The International Railway, Buffalo, N. Y., has inaugurated a 6-cent service during morning and evening rush hours to and from the plant of the Lackawanna Steel Company in Lackawanna, N. Y. Heretofore it was necessary for passengers to pay a 5-cent fare to the Buffalo city line on either the International Railway or Buffalo & Lake Erie Traction Company cars and then an additional 5-cent fare on the lines of the latter road to the various gates of the steel plant. The line starts at Seneca Street and Bailey Avenue and no transfers are issued to passengers going farther than this point.

New Form of Safety Zone in Kansas City.—A new form of safety zone is designed by Street Commissioner Beggs in Kansas City, Kan., to be painted in black on the pavement now being laid on Minnesota Avenue. These zones will be extensions of the sidewalk lines across the street, and will mark the path to be taken by pedestrians in crossing the street, and serve as warnings to drivers of vehicles as well as motormen as to the exact line where the pavement intersection begins, where pedestrians are likely to be found, and outside of which vehicles and street cars must stop. The zones are intended primarily to encourage square turning of corners by vehicles.

Toronto Running Boards to Go.—The running boards on the cars of the Toronto (Ont.) Railway are to go. A statement to this effect was made by D. L. McCarthy, counsel for the company, before the judges of the Second Division Appellate Court on Nov. 8 during the hearing of the city's appeal from the interim order of the Ontario Railway Board, which relieved the company of the necessity of immediately dispensing with the running board. Mr. McCarthy thought all the cars would be reconstructed by next season. Application will, however, be made by the city to the Legislature for the passing of an act to compel the company to discontinue the use of the running board on all open cars. This decision was reached by the Board of Control on Nov. 10.

Competition on Traffic Question in San Francisco.—At the suggestion of M. M. O'Shaughnessy, city engineer of San Francisco, Cal., a competition was recently held in that city under the direction of the Beaux Arts Society for the handling of traffic at the foot of Market Street. The prize of $50 offered by the San Francisco Society of Architects was won by Ernest Weihe, whose plans provide for the segregation of traffic into three classes, each to use its own level; street cars would rise by ramps to the level of the upper decks of ferryboats, the street level would be used by vehicles, and subways would be provided for pedestrians. Two large piers for pleasure purposes, cafes, etc., are also included in the plan. They would give an ornamental effect to the scheme.

Temporary Jitney Injunction Denied in Terre Haute, Ind. —In the United States District Court at Indianapolis, Judge Anderson has denied a temporary injunction to the Fidelity Trust Company, Philadelphia, Pa., trustee under the mortgage of the Terre Haute, Indianapolis & Eastern Traction Company, in its suit against the jitney operators in the city of Terre Haute. A hearing in this case was held at the Federal Building, Indianapolis, on Oct. 4, and was reported in the ELECTRIC RAILWAY JOURNAL of Oct. 9, page 782. At that time Judge Anderson stated he would take the case under advisement, but indicated that he did not think the plaintiff had conclusively proved interference with its business and property rights. The case was dismissed as to forty-two of the sixty defendants, as they were found to have discontinued the business as jitney operators. It is not yet known whether the case will be pushed on a hearing for a permanent injunction against the remaining eighteen defendants.

Westfield Trolley Service Finding.—The Massachusetts Public Service Commission has recommended that twenty-minute service be reinstated on the Mill and Union Streets and the Highland-Franklin Street lines of the Westfield division of the Springfield Street Railway. The former is 2.68 miles in length and the latter 2.79 miles. Early in October the headway was increased to thirty minutes. The board held a public hearing at Boston, at which both the complainants that the old service should be restored and the company conceded that car-mile receipts were insufficient for profitable operation, but the commission held that the twenty-minute service should be restored in view of the fact that it had been in effect more than twenty years, during which time the population of the town has steadily increased. The finding points out that the increase in headway materially discouraged traffic and calls attention to the opinion of the former Railroad Commission that a street railway cannot reasonably expect that all the lines which it operates in any given district will be profitable.

First Brooklyn District Safety Campaign.—The first meeting in the district safety campaigns which, in connection with the public safety instruction in the schools, will be the features of the work of the Brooklyn Institution for Safety during the coming year, was held on the evening of Nov. 17. This campaign covers the district along the South Brooklyn water front from Erie Basin to the neighborhood of Joralemon Street. Coincidently with these meetings, safety posters are to be displayed throughout the district and thousands of safety leaflets distributed through the congested areas within the district. The preliminary work of organizing the first of the district safety campaigns has consumed several weeks and from now on those

campaigns will follow each other in quick succession. It is expected that about twelve district safety campaigns will be conducted during the next year in co-operation with various public and semi-public agencies and organizations. These twelve campaigns will, in the aggregate, cover all of the congested sections of Brooklyn and will have to do not only with the perils of the street, but with the fire hazard and all of the other elements entering into the question of public safety.

Fare Reduction Complaint Dismissed.—The Railroad Commission of California has decided the case of J. W. Ray vs. the Pacific Electric Railway, Los Angeles, Cal. The complainant attacked the rates of the company between Pacific Ocean Avenue Junction and Temple Avenue, both points being within the limits of the city of Long Beach, and petitioned the commission to reduce such rates from 10 cents to 5 cents, contending that the 10-cent rate was a material detriment to the development of the district adjacent to Temple Avenue. The commission held that though territory may be within the incorporated limits of a city it does not necessarily mean that a street railway should operate at a 5-cent fare irrespective of the excessive mileage covered and the light traffic to be obtained. It was shown that the defendant's present line is operated at a loss and was constructed only at the earnest solicitation of property owners who agreed at the time that the present rates would not be questioned. The complaint was dismissed with the understanding that the defendant would establish at an early date the adjustments which it proposed at the hearing.

New Fast Service in Indiana.—Additional and faster limited service between Indianapolis and Terre Haute was inaugurated by the Terre Haute, Indianapolis & Eastern Traction Company on Nov. 7 with the adoption of a limited service to be known as "The Highlander." The two trains will be operated in each direction every day, covering the distance of 72 miles from terminal to terminal in two hours and five minutes, cutting twenty minutes from the regular limited schedule. Stops are made at Plainfield, Greencastle and Brazil. Of the total running time of two hours and five minutes, twelve minutes are required to reach the city limits of Indianapolis, fifteen minutes to pass through the city streets of Brazil, and twelve minutes passing over the city streets of Terre Haute. The standard three-compartment passenger car of the company, with an over-all length of 61 ft. 6 in., equipped with four Westinghouse No. 121 motors, rated at 90 hp. at 500 volts, will be used for the new service. The choice of the name "Highlander" to designate the new service was the result of a prize contest arranged by the company. The name was derived from Terre Haute, meaning high land. The new service was created to permit business men to travel between Indianapolis and Terre Haute, transact their day's business and return home before nightfall.

Overcrowding Held to be a Crime.—In upholding the conviction of the Toronto (Ont.) Railway so far back as February, 1911, the judges of the First Division Court of the Appellate Division at Toronto on Nov. 9 in a lengthy written judgment disposed of the company's appeal and directed that the overcrowding nuisance be abated. Chief Justice Sir William Meredith, who expressed the opinion of the court, said there was no doubt that the company was charged with and convicted of having committed a public nuisance and the evidence showed there had not been an isolated case of overcrowding, but a systematic course of the conduct which affected all who became passengers in the cars. The court at first sight thought that the argument that there could not be an indictment because there had been an abatement of the nuisance was fatal to conviction, but held that a count on the indictment which alleged that the nuisance was continued at the time of the indictment disposed of that argument. One section of the Ontario railway act gave the court power to interfere when there was a contravention of the by-law such as to cause danger or annoyance to the public. The court held that the offence of the company was indictable and punishable as a crime and in concluding the judgment Sir William Meredith expressed the hope that the decision would result in putting a stop to overcrowding.

Personal Mention

Mr. J. T. McMahon has been appointed roadmaster of the East St. Louis, Columbia & Waterloo Railway, East St. Louis, Ill., to succeed Mr. Joseph Genduso.

Mr. William Dods, formerly vice-president of the Carbon Transit Company, Mauch Chunk, Pa., has been elected president of the company to succeed Mr. Val Smith.

Mr. F. B. Van Vorst has been appointed secretary and assistant treasurer of the United Railways Investment Company, New York, N. Y., to succeed Mr. W. J. Duane.

Mr. F. H. Mason has been appointed engineer of maintenance of way of the Waterville, Fairfield & Oakland Railway, Waterville, Me., to succeed Mr. Lester E. Choate.

Mr. D. Penman, formerly assistant traffic manager of the Pittsburgh & Butler Railway, Pittsburgh, Pa., has succeeded Mr. Thomas G. Orr as traffic manager of the company.

Mr. C. H. Latta has been elected vice-president of the Carbon Transit Company, Mauch Chunk, Pa., to succeed Mr. William Dods, who has been elected president of the company.

Mr. Trueman J. Bach has been appointed electrical engineer and master mechanic of the North Kankakee Electric Light & Railway Company, Kankakee, Ill., to succeed Mr. John McFarland.

Mr. Louis P. Baurhenn, who has been superintendent of the Bergen division of the Public Service Railway, Newark, N. J., has been made superintendent of the Hudson division of the company.

Mr. Elmer L. Williams, who has been superintendent of the Hudson division of the Public Service Railway, Newark, N. J., since 1905, has been made superintendent of the Essex division of the company.

Mr. F. H. Chamberlain, general manager of the Alabama Power Company, Anniston, Ala., was elected president of the Alabama Light & Traction Association at the meeting of the association in Montgomery on Oct. 20 and 21.

Mr. Frank A. Bailey, who has been superintendent of the Southern division of the Public Service Railway, Newark, N. J., with headquarters at Camden, N. J., has been made superintendent of the Bergen division of the company.

Mr. James P. Gorman has succeeded Mr. S. E. Jones as claim agent of the Wilkes-Barre & Hazleton Railway, Wilkes-Barre, Pa. Mr. Gorman has also succeeded Mr. Jones as claim agent of the Lehigh Traction Company.

Mr. William B. Graham, who has been superintendent of the Essex division of the Public Service Railway, Newark, N. J., since 1907, has been made superintendent of the Southern division of the company, with headquarters at Camden.

Mr. W. M. Morton has been elected secretary and treasurer and appointed auditor of the Charlottesville & Albemarle Railway, Charlottesville, Va. He succeeds Mr. E. E. Starke, as secretary, Mr. Norman James as treasurer and Mr. J. H. Windsor as auditor.

Mr. H. C. Bushnell has been appointed mechanical assistant to the superintendent of motive power of the United Railways & Electric Company, Baltimore, Md. Mr. Bushnell was formerly employed as an engineer with Mr. H. E. Mole, a consulting engineer with offices in New York City.

Mr. Nathan Rumney, traveling freight and express agent, has been named general freight and express agent of the Detroit (Mich.) United Lines to succeed the late George W. Parker. Mr. Rumney has been connected with the Detroit United Railway in the freight and express department for fourteen years.

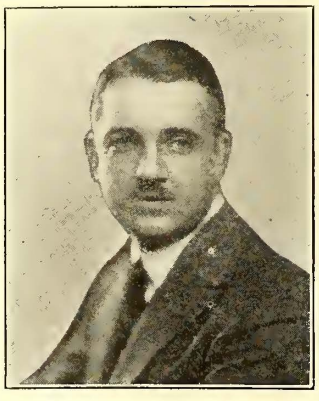
Mr. Charles W. Bosworth, a director of the Springfield (Mass.) Street Railway, has been appointed counsel for the company to succeed Ely & Ely, who have resigned, effective June 30, 1916. Mr. Bosworth will handle all the new business from now on and will take over all the unfinished business next June. Mr. Bosworth is widely known among the legal fraternity in Massachusetts. He has built up a lucrative law practice in addition to his duties as referee

in bankruptcy and president of the Union Trust Company. Mr. Bosworth conducted the trial of the company's cases against the three conductors who were discharged early this spring for the alleged mishandling of fares. The elder Mr. Ely, Mr. Henry W., has been counsel for the Springfield Street Railway since June, 1906.

Mr. George H. Binkley has resigned as engineer of maintenance of way and structures of the San Francisco-Oakland Terminal Railways, Oakland, Cal. Mr. Binkley's experience in engineering work has been very broad. He was born in Richmond, Ind., and was educated at De Pauw University. He entered engineering work with the Pennsylvania Railroad, served on the engineering staff of the Chicago exposition, engaged in track elevation work for the Chicago, Rock Island & Pacific Railway in Chicago, served for five years as chief engineer of the Calumet Electric Street Railway, Chicago, and was subsequently connected in turn with Kohler Brothers, Chicago, contracting engineers; the American Engineering Company, Indianapolis, Ind., of which he was vice-president and chief engineer, and the Arnold Company, Chicago.

Mr. Oscar T. Crosby has returned from Brussels, Belgium, where he has been since April in general charge of the distribution of supplies for the Commission for Relief in Belgium. On Nov. 17 he made an address at the Technology Club in New York advocating the establishment of an international court for the settlement of international disputes, with sufficient military and naval force to carry out its decrees. This is a plan in which Mr. Crosby has been interested for several years and which he hopes will be adopted by the United States and other leading countries. Its main principles were embodied in a resolution introduced last spring in the United States Senate by Senator Shafroth, and at about the same time a similar resolution was introduced in the House. These resolutions did not succeed in passing at the last session but it is expected that they will be introduced again at the coming session. Mr. Crosby expects to remain in this country for some time and will reside at Warrenton, Va.

Mr. T. W. Connette, assistant superintendent of transportation of the Buffalo division of the International Railway with headquarters at Buffalo, N. Y., became superintendent of transportation of the Buffalo division of the company on Nov. 15, as previously announced in the ELECTRIC RAILWAY JOURNAL. Mr. Connette is not yet twenty-six years old, but has had unusual opportunities to become well versed in the management of street railway properties. As early as 1901 he was employed in the shops of the Syracuse (N. Y.) Rapid Transit Railway, of which his father, Mr. Edward G. Connette, now president of the International Railway, was then general manager. In 1906 he began work during the summer months with the Worcester (Mass.) Consolidated Street Railway, of which his father at that time was general manager, and for several years was in the shops, mechanical department, power house and the track and line departments. He attended Williston Seminary, Easthampton, Mass., and in 1910 he entered Lehigh University and took a course in civil engineering. In 1912 he entered the transportation department of the International Railway at Buffalo. During that year he was made assistant superintendent of equipment in the mechanical department under Mr. G. W. Dunlap, superintendent of equipment. On Aug. 25, 1913, he was made assistant superintendent of transportation, Buffalo division, under Mr. N. H. Brown. He now succeeds Mr. Brown as superintendent of transportation of the Buffalo division, Mr. Brown having been made general superintendent of transportation of the entire system.



T. W. CONNETTE

OBITUARY

Dennis Sullivan, a director of Cities Service Company, New York, N. Y., and a Colorado pioneer in mining, banking and public utilities, is dead. Mr. Sullivan was born in Rensselaer County, New York, in 1837.

Joseph G. Hendrickson died on Nov. 4 after an illness lasting less than a week. Mr. Hendrickson was sixty-nine years of age. He founded the Ajax Metal Company in 1880. He retired as president of the company a little more than a year ago and since then has been chairman of the board, also chairman of the board of the Ajax Metal Company of the South, Birmingham, Ala., and president of the Ajax Lead Coating Company.

William Frederick Allen, president of the National Railway Publication Company, New York, N. Y., which publishes the *Official Railway Guide*, died on Nov. 9 at his home in South Orange, N. J., in his seventieth year. In 1910 Mr. Allen was elected vice-president of the company, and president in 1914. He was appointed general secretary of the American Railway Association when it was founded in 1875 and held that office until his death.

Charles Haglin Rinker, superintendent of the St. Paul lines of the Twin City Rapid Transit Company, Minneapolis, Minn., died of pleurisy at St. Luke's Hospital, St. Paul, on Nov. 9. Mr. Rinker was born in Minneapolis, and after he was graduated from the University of Minnesota he continued to reside there and was identified with Haglin-Stahr, general contractors, Minneapolis. In September, 1912, he became connected with the Twin City Rapid Transit Company. He was thirty-two years of age.

George Whitfield Parker, general freight and express agent of the Detroit (Mich.) United Railway, died on Nov. 11 at Harper Hospital, Detroit, following an operation. He was forty-five years old. Mr. Parker was born in Detroit. He became connected with the Detroit United Railway as general freight and express agent in September, 1901, and his years of service had given him an exceptionally wide acquaintance in traffic circles among both steam and electric railway officials. His preliminary experience in freight business was gained under Mr. J. K. Muir on the Grand Trunk Railway, where he served in the capacities of rate clerk, chief clerk, soliciting freight agent and traveling freight agent with headquarters in Detroit. He is survived by his widow.

E. T. Munger, who was general superintendent of the Hudson & Manhattan Railroad, New York, N. Y., from January, 1909, to January, 1914, died on Nov. 14 at Paterson, N. J. Mr. Munger was born in Menominee, Wis., in 1870. He was graduated with the degree of bachelor of mechanical engineering at the University of Wisconsin in 1892. Previous to his work on the Hudson & Manhattan Railroad Mr. Munger had held a number of responsible engineering positions, such as master mechanic and later superintendent of motive power and equipment of the Metropolitan West Side Elevated Railway, Chicago, and later president and general manager of the Havana (Ill.) Telephone Company. After resigning from the Hudson & Manhattan Railroad Mr. Munger was for a short time general manager of the Cumberland County Power & Light Company, Portland, Me., which position he relinquished on account of ill health. Mr. Munger is survived by his widow and three daughters.

Herbert M. Wheeler, engineer in charge of electrolysis and electrical distribution of the Chicago (Ill.) Surface Lines, died suddenly on Nov. 12, 1915. Mr. Wheeler was born in Shawano, Wis., in 1876, and following his graduation in electrical engineering at the University of Minnesota in 1896, he began work with the Fort Wayne (Ind.) Electric Corporation. His career as electrical engineer in street railway work began in 1899 with the North Chicago Street Railroad, where he served as an assistant engineer. Four years later he resigned to become an instructor in mathematics and engineering at Lewis Institute, Chicago, and in 1907 he again returned to railway work as electrical engineer of the Chicago Railways. In 1909 he was made assistant to Mr. John Z. Murphy, then chief engineer of the company. In February, 1914, he was appointed to the position which he held at the time of his death. Mr. Wheeler is survived by his widow and two children.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Mexico & Santa Fé Railroad, Mexico, Mo.—Incorporated in Missouri to construct and operate an electric railway from a connection with the Chicago & Alton Railroad at Mexico to a point in Monroe County, 16 miles northeast. Capital stock, $160,000. The Mexico Investment & Construction Company is building the road. Incorporators: J. A. Botts, W. W. Mundy, M. W. Beamer and J. P. Cauthorn of Molino, and T. C. Botts, J. D. Bates and W. W. Botts of Mexico.

FRANCHISES

Berkeley, Cal.—The petition of the San Francisco-Oakland Terminal Railways to discontinue the operation of its line on Dwight Way from College Avenue to Shattuck Avenue has been denied by the Council of Berkeley.

San Pedro, Cal.—The Council of San Pedro has authorized the sale of a franchise through Front, O'Farrell, Newport and Bay Streets to the Pacific Electric Railway.

Decatur, Ill.—The Council of Decatur has revoked the franchise of the Illinois Traction System to use Morgan, William and other east-side streets over which the interurban line from Champaign into Decatur was to have entered the city and which have never been used.

Peoria, Ill.—An ordinance is being prepared by the legal department of the city of Peoria extending the time of the franchise granted the Illinois Traction System in February, 1914, to construct tracks on Jefferson and Hamilton Streets into the new traction terminal building.

Buffalo, N. Y.—The International Railway has received a franchise from the Council to construct a line on Bailey Avenue. It is planned to complete the line between Clinton and Broadway and between East Genesee and East Ferry Streets by Jan. 1, 1917; between Broadway and East Genesee Street by Jan. 1, 1918; between East Delavan Avenue and Kensington Street by Jan. 1, 1919, and between Clinton and Seneca Streets by Jan. 1, 1920.

***Baker, Ore.**—J. L. Soule has asked the Council for a franchise to construct and operate an electric railway in Baker. The Commercial Club of Baker is interested.

Dallas, Tex.—The Northern Texas Traction Company has received a twenty-year interurban franchise from the Board of Commissioners of Dallas on Jefferson Street between Commerce Street and Trinity River. The franchise stipulates that work on the proposed viaduct over the steam lines entering the new Union Terminal, crossing the rails of the Northern Texas Traction Company, must be started within ninety days from the date the ordinance becomes operative, and the work must be completed within fifteen months thereafter. The original petition of the company included local street car service to Oak Cliff, but this was eliminated by the city attorney and must be handled under a separate franchise when the present ordinance expires.

TRACK AND ROADWAY

Pacific Gas & Electric Company, Sacramento, Cal.—Plans are being considered by this company for the construction of an extension of its East Lawn line through Elmhurst to the State Fair grounds.

Municipal Railways of San Francisco, San Francisco, Cal.—At a meeting recently held in San Francisco the Board of Park Commissioners unanimously declined to grant permission for the municipal cars to cross Golden Gate Park from Tenth Avenue to Fourteenth Avenue. While denying the petition, the Board intimated that it might favorably consider a proposition to construct a tunnel line in the vicinity of Nineteenth or Twentieth Avenues.

Hartford, Meriden & New Britain Railway, Hartford, Conn.—This company has been organized to construct a line from Meriden to Hartford via Kensington, New Britain and Newington, 20 miles. Stock to the amount of $1,000,000 has been subscribed, company officials elected, a full preliminary survey of the route made and plans completed to begin work next spring. Construction will be begun in Meriden, New Britain and Hartford at the same time. Louis Fiske, Branford, has been elected president of the new company and Robert O. Eaton, North Haven, secretary and treasurer. [May 29, '15.]

Evansville (Ind.) Railways.—This company has placed an order with the Cloverport Boat & Machine Company, Cloverport, for two boats to be used in connection with the interurban service of the company at points along the river. The boats will cost $8,000.

Iowa & Illinois Railway, Clinton, Iowa.—This company will rebuild 5 miles of overhead structure in the vicinity of Comanche at an estimated cost of from $7,500 to $10,000. It is also reported that the company will rebuild much of the overhead work between Davenport and Clinton.

Boston, Mass.—The contract for the construction of Section G of the Dorchester Tunnel, on Dorchester Avenue, between West Fourth Street and Old Colony Avenue, South Boston, has been awarded by the Boston Transit Commission to Coleman Brothers, 1 Marginal Street, Chelsea, Mass., at $382,364. [Oct. 30, '15.]

Bay State Street Railway, Boston, Mass.—Work has been begun by this company installing double track on Main Street, Haverhill. The line will be constructed from the Pleasant Street turnout to the end of the Haverhill bridge this year, and the remainder of the work of double-tracking the line to the corner of Main and Salem Streets will be done early next year.

New York Municipal Railway Corporation, Brooklyn, N. Y.—Bids will be received until Dec. 7 by the Public Service Commission for the First District of New York for the construction of Section No. 3, Route No. 8, comprising the tunnel section under the East River from Fourteenth Street, Manhattan, to North Seventh Street, Brooklyn, being a part of the Fourteenth Street-Eastern District subway line. This line connects with the Broadway elevated line of the New York Consolidated Railroad, which runs out to East New York.

International Railway, Buffalo, N. Y.—After informal conferences with city officials of North Tonawanda, the objections raised against the elevation of tracks through that city of the fast line to be built between Buffalo and Niagara Falls by the Frontier Electric Railway have been withdrawn. Work has been begun on the line and with the exception of a few very small parcels of property, all the right-of-way has been acquired. The Frontier Electric Railway is owned by the International Railway.

New York, N. Y.—Bids for the installation of tracks on the Queensboro subway extension, the Astoria elevated line and the Corona elevated line, all in the borough of Queens, were received by the Public Service Commission for the First District of New York during the week. The Queensboro subway extension is a part subway and part elevated line, extending from the present terminus of the subway near Jackson and Van Alst Avenues, through Fourth Street, Davis Street and Ely Avenue to the Queensboro Bridge Plaza, where the line connects with the Astoria and Corona railroads, the former extending northerly through Second Avenue to Ditmars Avenue, Astoria, and the latter northeasterly through Queens Boulevard, Greenpoint Avenue, Skillman Avenue and Roosevelt Avenue to Sycamore Avenue, Corona. The contractor must begin work within thirty days from the date of delivery of the contract, and complete the work within six months. According to unofficial figures, submitted by representatives of the contractors present at the bid opening, George S. Bennett, 36 Northern Avenue, was the lowest bidder, at $204,000, the second bidder being the Thomas Crimmins Contracting Company, of 444 East Sixty-ninth Street, at $204,900.

Interborough Rapid Transit Company, New York, N. Y.—Bids will be received until Nov. 30 by the Public Service Commission for the First District of New York for the construction of Section No. 2 of Routes Nos. 19 and 22, being the elevated extension of the Southern Boulevard and Westchester Avenue branch of the Lexington Avenue subway, extending over Westchester Avenue, The Bronx, from Whitlock Avenue to Pelham Bay Park.

Bartlesville (Okla.) Interurban Railway.—Plans are under consideration by this company for the construction of extensions from Bartlesville to Pawhuska and from Bartlesville to Nowata.

Toronto (Ont.) Civic Railway.—The Council of Toronto has authorized the construction of the Bloor Street line from Dundas Street to Quebec Avenue at a cost of $125,000.

Toronto (Ont.) Civic Railway.—The Council of Toronto has approved plans for the extension of this company's lines on Yonge Street from the tracks of the Canadian Pacific Railway to Farnham Avenue.

Hershey (Pa.) Transit Company.—Surveys have been completed and work has been begun by this company on the construction of an extension of its line from Hershey to Fredericksburg. The line will enter East Hanover, north of Hershey, and will extend east to Fredericksburg via Ono and Jonestown. It is estimated that the cost will be about $300,000.

Philadelphia, Pa.—Bids are desired until Dec. 7 by the Department of City Transit, Bourse Building, for the construction of concrete column foundations on piers for about 4000 ft. of two-track elevated railway in Frankfort Avenue from Unity to Dyre Streets. Bids are also desired until Dec. 14 for the construction of steel superstructure and appurtenant work for the same section. [Sept. 25, '15.]

Eastern Pennsylvania Railways, Pottsville, Pa.—Work has been begun by this company on its extension from Pottsville to St. Clair, 2½ miles. From St. Clair the line will extend on Third Street to Patterson Street, to Second Street, north on Second Street to connect with the line from Frackville. The entire line from Pottsville through to Frackville will be completed by the end of next February. The road is being built by the White Construction Company.

Scranton, Pa.—Rights-of-way are being obtained for a third-rail electric railway system throughout central Pennsylvania. According to J. F. Richard, fiscal agent of the Northumberland County Gas & Electric Company, Sunbury, franchises will be asked for in many towns in that section. Starting at Scranton, the proposed road will follow the west side of the Susquehanna River, touching Kingston, Mocanaqua, Shickshinny, Berwick, Bloomsburg, Danville, Northumberland and Sunbury. Recrossing the river, it is to follow the Susquehanna River to Harrisburg. From Sunbury a line is to be built to Shamokin, Mount Carmel, Tamaqua and Hazleton, where it will connect with the Lackawanna & Wyoming Valley Railroad. Power for the system is to be furnished by the Harwood Electric Company, Hazleton.

Nashville & Eastern Railway, Nashville, Tenn.—It is reported that this company plans to begin construction immediately on its line from Lebanon to Smithville, 35 miles. Myers Construction Company, Chicago, will build the road. C. T. Edwards, Nashville, is interested. [Sept. 4, '15.]

Fort Worth & Denton Interurban Railway, Fort Worth, Tex.—At a meeting of the directors of this company held at Fort Worth on Nov. 11, it was decided to release the Stone & Webster Engineering Corporation from its contract to build the line upon receipt of one-half the losses sustained by the company, provided these do not exceed $30,000, which, with the $52,000 now on hand would be returned to the stockholders. The money on hand together with the amount to be received from Stone & Webster will make possible the return of 80 per cent of the money originally paid in as stock. The financial statement presented by President Sam Davidson showed that the company sustained a loss of approximately $39,000, due to the failure of the Fort Worth Savings Bank & Trust Company. The contract from which Stone & Webster were released bound them to start work on the line within one year, and the promoting company agreed to furnish a bonus of $75,000 and right-of-way. G. H. Clifford, general manager of the Stone & Webster interests at Fort Worth, told the directors that his company desired to build the Fort Worth & Denton Interurban Railway but had been prevented from doing so because of stringent financial conditions brought about by the European war and the introduction of the jitney into the city traffic. [July 17, '15.]

Houston, Richmond & Western Traction Company, Houston, Tex.—Offices have been opened by this company at 506-507 Moore Building, San Antonio, to take charge of the construction of the first 100 miles of this company's line between San Antonio and Houston. It is expected that engineers will soon be sent out and a decision reached as to which of the two routes under consideration will be adopted. E. Kennedy, Houston, president. [Oct. 16, '15.]

Richmond, Rappahannock & Northern Railway, Richmond, Va.—Bids have been received by this company for the construction of its line from West Point to Urbana, 17 miles, and it is expected that the contract will soon be awarded. C. L. Ruffin, 514 American National Bank Building, Richmond, chief engineer. [Oct. 2, '15.]

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—Operation has been begun by this company on the extension of its Twenty-seventh Street line between Center Street and Hopkins Avenue.

SHOPS AND BUILDINGS

Union Traction Company of Indiana, Anderson, Ind.—This company will build a new freight house on East Washington Street, Alexandria. The building will be of cement blocks or brick. The passenger station will be removed at once from the present site at Harrison and Monroe Streets to a location farther up-town.

Springfield (Mass.) Street Railway.—Plans have been drawn up for this company's new Hooker Street carhouse and shops which will be erected shortly. The buildings and tracks will cover the entire property of the company, which measures 300 ft. on North Main Street and extends the entire front of the property and back 350 ft. It will be of fireproof construction with an office section in front. One-half of the office section will be two stories high and the rest one story. The new carhouse will eliminate that now in use at Carew Street, but the one on the west side of Birnie Avenue will be retained and two more tracks will be extended to the Boston & Maine tracks. The principal building will have a capacity of 120 cars, the yards 190 and the Birnie Avenue carhouse thirty-two. It is estimated that the cost will be about $175,000.

New York Municipal Railway Corporation, Brooklyn, N. Y.—The contract for the construction of station finish on Section No. 2 of Route No. 39, the New Utrecht Avenue elevated railroad in Brooklyn, has been awarded by the Public Service Commission for the First District of New York to A. L. Guidone & Son, Inc., the lowest bidders, for $513,656. The steel structure for this section is nearly completed. This line will be operated by the New York Municipal Railway Corporation on a branch of the Fourth Avenue subway. The contract provides for the finishing of the stations between Thirty-eighth and Sixty-second Streets within three months so that the new road may be operated as far south as Sixty-second Street, where transfers can be given to the Sea Beach line to Coney Island.

Toronto (Ont.) Suburban Street Railway.—This company is constructing a carhouse at Lambton Park.

POWER HOUSES AND SUBSTATIONS

Illinois Traction System, Peoria, Ill.—This company has completed the construction of a stack at Danville, Ill. The stack is 250 ft. high and is 18 ft. in diameter. It will take the place of three stacks which have been used in the past.

McComb & Magnolia Railway & Light Company, McComb, Miss.—It is reported that this company, which was recently incorporated in Mississippi to construct a line in McComb and an interurban railway to Summit, Fernwood and Magnolia, contemplates the construction of a power plant. H. W. Bell, Laurel, engineer.

Jersey Central Traction Company, Keyport, N. J.—Plans are being made by this company to erect a new substation at Stone Church to replace the portable one now in use. The new station will supply energy in Highlands and adjacent towns.

Toronto (Ont.) Suburban Street Railway.—Substations are being constructed by this company at Georgetown and Guelph.

Manufactures and Supplies

ROLLING STOCK

Pittsburgh (Pa.) Railways are reported as expecting to purchase at once a large number of cars.

Miami (Fla.) Traction Company advises that it will need construction cars and equipment for extensions, also trailer cars.

Lake Erie & Northern Railroad, Brantford, Ont., has ordered eight electric cars from the Preston Car & Coach Company, Preston, Ont.

American Sugar Refining Company, Brooklyn, N. Y., is considering the possible purchase of one electric freight locomotive, for third-rail, overhead or storage battery operation.

Muscatine & Iowa City Railway, Muscatine, Ia., has ordered four gas-electric motor cars from the General Electric Company and will also purchase some gas-electric locomotives.

United Traction Company, Albany, N. Y., noted in previous issues of the Electric Railway Journal as expecting to purchase fifteen new cars, has ordered these car bodies from the Wason Manufacturing Company.

Toronto (Ont.) Suburban Railway has ordered six center-entrance interurban cars from the Preston Car & Coach Company, Ltd., Preston, Ont. They will be 61 ft. long over vestibules and will be mounted on Standard Motor Truck Company trucks. They will be equipped for 1500-volt d.c. operation.

General Electric Company, Schenectady, N. Y., has received an order from the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., for eighty General Electric motors, to replace a similar number of motors of its present equipment.

TRADE NOTE

S. K. F. Ball Bearing Company, Hartford, Conn., which is about to erect a factory in Hartford for the purpose of manufacturing the S. K. F. ball bearings in America, as noted in the Electric Railway Journal of Sept. 18, 1915, has elected Frank A. Vanderlip of the National City Bank as a director. The board of directors will also consist of B. M. W. Hanson, vice-president; Pratt Whitney, Hartford; F. B. Kirkbride, 7 Wall Street, New York; A. Carlander and S. Winquist. B. G. Prytz will act as president.

ADVERTISING LITERATURE

Trolley Supply Company, Canton, Ohio, has issued a catalog describing its headlight for interurban cars.

E. I. du Pont de Nemours & Company, Wilmington, Del., has issued a colored sheet illustrating the uses of its explosives for railroad construction and other purposes.

Ajax Metal Company, Philadelphia, Pa., has issued a catalog describing its various metals, including white metals, ingot metals, journal brasses, plastic bronze and "bull" babbitt metals.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a large catalog announcing its Christmas program for 1915, in connection with Electrical Prosperity Week.

Canton Culvert & Silo Company, Canton, Ohio, has just published a set of specifications for corrugated metal culverts. These have been prepared with a view to co-operating with railways and highway engineers, contractors and others, in supplying them, for references at least, if not for adoption, a foundation for a comprehensive specification for culverts. The specifications are not limited to any single type, riveted or nestable, but rather present a choice of all that the company considers fair and good in the production of a first-class culvert. The various sections embody the experience gained by the company in studying metal culverts. One of the sections covers the analytical features which call for a pure iron, but the company explains that this may be omitted and the remaining clauses cover the best type of culvert construction.

Harrison Safety Boiler Works, Philadelphia, Pa., has issued a 68-page booklet entitled, "Finding and Stopping Waste in Modern Boiler Rooms," and devoted to the use and design of Cochrane meters. The value of feed-water and condensate meters as aids in the management of power plants is taken up in detail in the introductory part of the book, covering among other factors, grade of fuel, grates, methods of firing, air leaks, control of draft, condition of gas passages, scale and soot on boiler tubes, radiation, etc. With a feed-water meter installed, it becomes possible to measure the effect of changes in connection with these several factors. As a result, scientific management becomes easy and natural, and standard rules of operation, such as directions for handling fires, regulation of draft, blowing of soot, banking of fires, carrying overloads, etc., can be written out, so that any man following them can obtain good results. The use of records further arouses the ambition and spirit of emulation of the men, and makes it possible to reward special skill or attention to duty by bonuses or promotions. In the subsequent sections of the book, the Cochrane metering heater, a combined open feed-water heater and hot-water meter, with its several modifications, is described in detail, also the Cochrane flow recorder for use in connection with V-notch weirs. In the last pages of the book a new type of meter, working on the volumetric principle by means of which it is possible to obtain an accuracy of within one-third of 1 per cent, is described.

NEW PUBLICATION

Statistics of Railways in United States, 1904-1914.—Consecutive Bulletin No. 81. Bureau of Railway Economics, Washington, D. C. 67 pages.

This bulletin, which supersedes Consecutive Bulletin No. 75, gives tabulations for steam railroads based upon official data published by the Interstate Commerce Commission for the fiscal years ended June 30, 1904, to 1914, the latest year for which such official data are obtainable. Mileage, capitalization, operating, equipment, labor and accident statistics are included.

NEW YORK TRANSIT CONTRACT AWARDS

The Public Service Commission for the First District of New York has adopted the recommendation of its counsel and chief engineer and denied the request of the New York Municipal Railway Corporation for permission to let the contract for the construction of the Coney Island terminal to the George W. McNulty Company without competitive bidding. The New York Municipal Railway had asked permission to do this on the ground that the McNulty Company, which had built the Sea Beach Railroad, was thoroughly familiar with the work required, had given satisfactory service in its previous contract, and had submitted a list of unit prices for the proposed work which were reasonable and compared favorably with prices obtained by the commission under competitive bidding. The commission, however, refused to consent to the award of the contract without competitive bidding.

Alfred Craven, chief engineer of the commission, has approved the award of a contract by the New York Municipal Railway Corporation to the Charles A. Myers Contracting Company, Inc., for grading, removing existing tracks, laying new tracks and special work, installing contact rail and other electrical work, etc., in the improvements now being made by the company in its Fresh Pond Road yard in Queens Borough. The contract amounts to $17,123.

The commission has given a qualified approval to the award by the New York Municipal Railway Corporation to the American Bridge Company of a contract for furnishing steel to be used on the third-tracking of the Fulton Street elevated line in Brooklyn between Nostrand Avenue and Adams Street, on the Coney Island terminal, on the third-tracking and reconstruction of the elevated railroad at East New York, and for the reconstruction of the Brighton Beach line from Church Avenue to Malbone Street, aggregating $2,274,700. The company submitted to the commission bids from eight different firms to whom the specifications were submitted, and the American Bridge Company was the lowest of these bidders.