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NOTICE TO ADVERTISERS

Changes of advertising copy should reach this office by 10 a. m. Monday preceding the date of publication, except the first issue of the month, for which changes of copy should be received two weeks prior to publication date. New advertisements for any issue will be accepted up to noon of Tuesday for the paper dated the following Saturday.

Of this issue of the Street Railway Journal 8200 copies are printed. Total circulation for 1905 to date, 285,750 copies, an average of 8164 copies per week.

The Detroit Prizes

The Detroit United Railway Company, through its "Detroit United Weekly" and in other ways, is conducting a steady and well-organized campaign to keep up public interest and stimulate both city and interurban travel. First it was a prize for a trolley song, which excited much interest not only in Detroit but all over the country. Another plan recently worked was the offering of a prize for the best list of flowers native to the communities through which the Detroit United Railway system runs. Now a contest is announced open to every school boy or girl in these five counties of Michigan, offering three prizes for the best short story,

A. R. M. and E. A. Convention

The advance copies of the papers prepared for the third annual convention of the American Railway Mechanical and Electrical Association which are now being sent out indicate what a wealth of valuable matter is to be considered by the master mechanics' track and power house departments at Philadelphia the last week in September. The quality and quantity of these papers, and the fact that they are prepared by track operating men, show what an important place these departments must be given in the pending reorganization and consolidation of the various department associations. In previous years shop and rolling stock matters have been considered almost to the exclusion of everything else by this association. The present year the track and power house departments are well represented. The association is to be congratulated on having a management and contributing members who make it possible to send out advance copies this far in advance of the convention, so that they may have due consideration by those who will attend and time need not be taken in the reading of the papers, which can be more profitably spent in discussion.

The Chicago Municipal Railway Estimates

We publish elsewhere a short abstract of the report made by A. B. Du Pont to Mayor Dunne, of Chicago, giving estimates on the earnings and operating expenses of the proposed 264-mile municipal street railway system to be built on streets where franchises are claimed to have expired and on streets where no street railways exist at present. The question of how much such a system can earn per mile of track is a matter of business and engineering judgment, to be based on what has been earned by other large city systems, taking into account the local conditions in Chicago. Of course, every traction expert has a right to his own opinion in such matters, but we must confess that we think our good friend, Mr. Du Pont, is over sanguine in his estimates of what such a system can earn when he figures gross earnings of over \$45,000 per annum per mile of single track the first year the road is in operation. We do not know of any figures of similar American street railway systems which come anywhere near this. The Chicago City Railway Company, operating under almost the same conditions as would the proposed municipal system, earned last year in round numbers \$30,000 gross per mile of single track. The Philadelphia Rapid Transit Company earned \$29,000 per mile, and the Boston Elevated Railway Company \$28,000 per mile. Chicago is not a city of great density of population, as land is plenty and the tendency has been to spread out over the prairies rather than to confine the population to narrow limits. In the item of first cost (about \$95,000 per mile), Mr. Du Pont comes fairly near other estimates made on the entire reconstructing of roads in Chicago. Operating expenses, maintenance and depreciation are estimated at 55 per cent of the gross receipts the first five years, and at 60 per cent after that time. This is also a rather hopeful view to take of the situation, but as all the estimates depend on the gross receipts per mile of track assumed to start with, it is useless to discuss the matter further.

The Revised Constitution of the American Street and Interurban Railway Association

Elsewhere in this issue will be found the complete text of the proposed constitution and by-laws of the American Street and Interurban Railway Association which are to be voted upon at the Philadelphia convention. For the benefit of those who have not been following closely the proposed plans for reorganization, we might state briefly that following the meeting in New York, Feb. 3, of the executive committees of the various associations interested, the sub-committee on reorganization appointed at that meeting has been engaged in drawing up a working plan according to the principles agreed upon at that time. Suggestions were requested from all interested in the subject, and were considered at a meeting of the reorganization sub-committee in Philadelphia on June 12. As a result of this conference the original plan was modified in detail, although not in principle, and the wording of the constitution and by-laws was decided upon. Since that time the subject matter has been passed upon from a legal standpoint by a prominent attorney who has had a wide experience in corporate organization, the proportion of fees has been worked out upon a basis of the estimated budget, as decided at Philadelphia, and the revised form has been prepared ready for submission at the Philadelphia conventions to the various organizations interested. In view of the importance of the matter it has been thought advisable by the reorganization committee to make the form public some time previous to the Philadelphia convention, so that everyone should have an opportunity of reading the constitution and by-laws and of understanding the plan before attending the convention.

We have already expressed our hearty accord with the purposes of the committee on reorganization, and these purposes seem admirably embodied in the draft of organization before us. The change of name from the American Street Railway Association to the American Street and Interurban Railway Association has already been commented upon. Although somewhat long, the new name expresses the field covered by the organization better than any other combination of words which has been suggested. This is to be the parent body and will have certain "affiliated" associations, three at present, which will represent the present Accountants', Mechanical and Claim Agents' associations, whose organizations are to be entirely autonomous, but which will work largely upon lines suggested by the main association, and will receive grants of money to defray the expenses of the work done along these lines. Each of these organizations will receive a charter from the parent body, which will guarantee their "affiliation" with it and consequently its financial support, and representation upon its executive committee. The individual membership of each affiliated association and its membership dues are controlled by the association itself, as is also its selection of officers. The establishment of similar affiliated organizations destined to pursue investigations and studies along other branches of street railway work not covered by any of the present organizations is provided for in the constitution by the grant of additional charters.

A special feature of the new plan is the establishment of a permanent office and the appointment of a secretary, who shall devote his entire time to the needs of the parent and affiliated associations, and who shall also collect and compile information of value to all companies and be prepared to supply it to members of the association.

The scale of dues, as will be noticed, is based upon the gross

receipts, and is approximately between 1 cent and 2 cents for each \$100 of receipts, with a certain maximum. Each member company has the same privileges as every other member company, so that the plan should appeal especially to the smaller companies.

The proposed plan of reorganization should be of interest not only to those companies who are now members of the American Street Railway Association, but to those who have never joined that body. Statistics at present show that more than three-fourths of the operating companies of the country are not members of the American Street Railway Association. This condition ought to be changed under the new order of things. Whatever may have been the inducements for membership in the past, the new body ought certainly to unite the energies of the street railway companies of the country and should have a largely increased membership. It is not too much to say that this has been one of the principal purposes of the reorganization committee, and that the useful work which the new body can do in the future will depend largely upon the number of outside companies which will show their approval of the plan by becoming members. We urge upon all such a careful consideration of the advantages which membership in the American Street and Interurban Railway Association affords them, and as evidence of this approval their enrollment in the body. In conclusion, we wish to compliment the committee itself upon the thoroughly businesslike organization which is outlined in its report, and which should be of inestimable benefit to the street railway interests of the country.

Car Wiring in Conduit

The running of wiring underneath a car in iron-pipe conduit is a practice but recently adopted by certain elevated roads, but the superiority of this plan of car wiring appeals so strongly to various companies that it will probably not be long before all new surface cars will be wired in iron conduit. As far as street railway cars are concerned, this practice is decidedly at its beginnings, and many improvements will no doubt be suggested in the next few years which will simplify conduit wiring as well as improve its mechanical and electrical points. Some companies have for some time provided certain runways for cables the length of the car between certain sills. It would be but a step to line these runways with steel and so make them practically iron conduits. Considering the large amount of apparatus under a car, it is not always easy to find good locations for conduit pipes, as no provision has been made for them in the design of the car bottom. The plan of providing for the conduit in the building of a car would seem to be by all means the most rational. There is room for much improvement over current practice in the methods of connection to motor leads and the fireproofing of wires where they leave the conduits.

A Season for Weeds

The past season with its abundant rains continued well through the summer has been not only good for cultivated crops in the Central States, but has also been favorable to the raising of an immense crop of weeds along railroad roadbeds. In fact, not for years has there been a season that the growth of weeds has been so rapid or when they have sprung up so tenaciously and rapidly after successive weedings. The interurban road, with a limited amount to spend on maintenance of way as compared with steam trunk lines, has a harder time to cope with the weed problem. It has been suggested that roads having portable sub-stations might find it worth while to make

some experiments in the way of weed killing with high-potential alternating current. Inasmuch as the sub-station is equipped with step-down transformers, it might be run "back-end-to"—that is, taking direct current from the trolley wire and delivering high-potential alternating current for weed-killing purposes.

Overhead and Third Rail Equipment

It is a singular fact that with all the rapid advances that have been made in motors, trucks and controlling devices for electric railways, the progress in overhead construction and equipment should have been relatively so small. To be sure, there have been changes, so that the old joke of "Drop a nickel in the slot and see the trolley come off" has lost somewhat of its savor. Nor can one now break the monotony of a long ride by getting out to watch the motorman and conductor throwing clubs at the trolley end, stuck in a switch and dangling just out of reach and heedless of maledictions. Nevertheless, the overhead construction and the trolley equipment are essentially the same as they were in the good old times. The trolley wire, to be sure, is larger than of yore, for more current has to be carried, but it is in the same location, carried by the same sort of devices and the current is taken from it by the same sort of running contact, although the speed has been doubled and the energy required per car quite quadrupled. Such uniformity bespeaks either early perfection or extreme conservatism, or, what is more likely, something of both. In the whole country we know of very few roads, aside from the third-rail contingent, which do not use the ordinary form of trolley wheel underrunning a trolley wire hung in the regular way.

As to overhead work, by far the most important recent change is the importation of the catenary suspension. It is just now fairly starting in this country as a result of the move toward high tension and high speed. With the old construction heavy strains were necessary in order to get the trolley wire taut enough for comfortable running, with added risk of breakage everywhere, and particularly risk of jarring hangers loose or of jumping the wire near the hangers and knocking them off by a blow of the trolley pole. The catenary construction relieves these difficulties and at the same time gives a wonderfully even and smooth running line of trolley wire. For high-voltage lines designed for high-speed interurban service, this is of very great importance indeed, but the point which we here desire to raise is that there are many cases in ordinary electric railroading where a light catenary construction could be used to very great advantage. The immediate result is to make it possible to diminish considerably the number of lateral supports or of bracket poles while gaining at the same time a much better alignment of the trolley wire. A heavy catenary construction may, of course, require frequent supports, but we see no reason why rather long catenaries cannot be used to advantage, provided the weight of the trolley wire is not excessive, giving upon the whole a better looking and certainly a better working overhead line, especially for interurban work.

Ordinary trolley wheels will work with admirable smoothness under such a line, but if the bow or, better, the roller trolley is a good thing for taking off large currents at high voltage, why is it not also a good thing for taking off current at ordinary voltage? A road here and there has been driven to such construction by necessity, but are there not many cases in which a roller trolley and catenary overhead construction would settle the question of current collection on high-speed direct-current interurban roads? For these the new overhead methods and equipment seem on the face of things singularly well

adapted, and we hope that such construction will be taken up and at least worked out to its legitimate conclusion. It is probably not perfect—few new things are—but it at least gives the promise of great usefulness and is well worth the labor required to reduce it to the form best adapted for American practice.

In this connection it is of extreme interest to consider the solution which the New York Central engineers have adopted in connection with their collection problem. In view of the large amounts of current required by the heavy trains and the use of direct current, an overhead wire was not practicable. At the same time, the commission which had the matter in charge looked askance at the ordinary third rail as somewhat dangerous, somewhat difficult to insulate, and involving a considerable amount of annual expense in the way of maintenance charges. It has been known for some time that the company has been experimenting on its tracks near Schenectady with an inverted third rail and under contact, but the announcement this week that this system has been decided upon will, we think, create no little interest. The under-contact third rail has been suggested before, but the system has never been worked out, or at any rate tried out, before. The principal objection which has been raised to this form of construction in the past has been the difficulty of designing a satisfactory system of switches and crossings, but this seems to have been more theoretical than actual. In other respects the system certainly possesses a number of advantages over the ordinary type of third rail, even with a protecting cover, and the adoption of the system by such a large corporation as the New York Central, and upon such an important scale as will be involved in this company's "electrical zone," promises to settle for all time the relative advantages of the two systems of third-rail contact.

Fire Protection of Car Houses

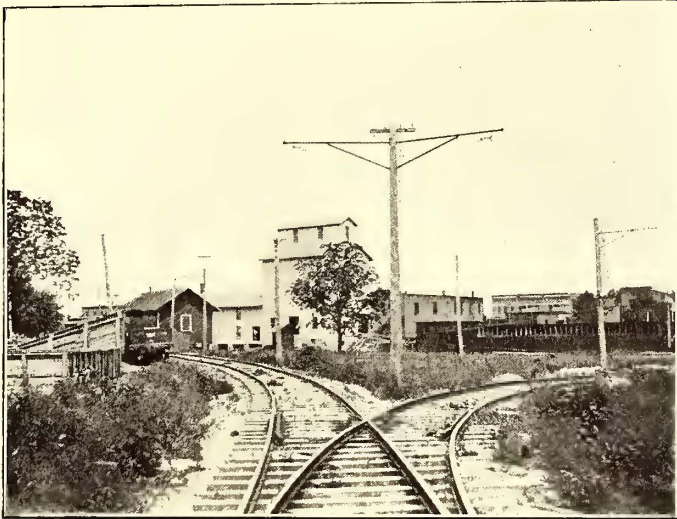
Readers of this paper are familiar in a general way with the tests which have been conducted by the Fire Underwriters and different railway companies in regard to the protection of car houses by automatic sprinklers, but all have perhaps not realized the principal object of these various costly experiments. Their main purpose has been to determine the relative efficacy of ceiling and aisle sprinkling for car house protection. A car house presents an entirely different kind of fire risk from a mill or store house, and must necessarily be treated in a different manner. The fire is apt to originate in a car into which it is extremely difficult to get water from above until the car roof has burned through. In the meantime the flames bursting through the windows may easily communicate to other cars. Furthermore, in some of the tests recently conducted, it has been demonstrated that with a heavy draft through a peaked roof car house it is more than likely that the ceiling sprinklers opened will not be those over the fire, but possibly 100 ft. or more away from it.

The object of sprinkling is, of course, to get the water on the origin of the fire. This seemingly can be accomplished by aisle sprinklers in a shorter time than in any other way, and consequently with a vast difference in the amount of smoke created. This latter is an important factor, because the smoke prevents free access of the firemen to the fire.

The question of water supply is also one of considerable importance, and the benefits of a heavy pressure were illustrated in the recent Newark tests, where centrifugal and rotary pumps were used to increase the city pressure, which in a great many cases is too low to be considered a good sprinkler supply.

FREIGHT DEVELOPMENT ON THE TOLEDO & WESTERN RAILWAY

Few electric roads have attracted as much attention from the freight-carrying standpoint as the Toledo & Western Railway, of Ohio. The property, which at that time was undeveloped, was fully described in the *STREET RAILWAY JOURNAL* of Nov. 29 and Dec. 20, 1902, and the major portion of the articles was devoted to the company's plans for freight business. Since then a great many interesting changes have taken place. It will be remembered that the main line of the Toledo & Western



TERMINAL YARD AT PIONEER, OHIO, SHOWING CATTLE PEN, FREIGHT STATION AND ELEVATOR

extends westward from Toledo, closely following the Michigan and Ohio State line. Within the past year the line has been extended to Pioneer, giving a main line mileage of about 60 miles, with a branch from Sylvania to Adrian, Mich., about 22 miles. The road has no competition between points on the main line and Toledo, and but three of the towns have railroad connection of any sort, these being located on north and south roads. In other words, the road was built through an undeveloped territory lying between two divisions of the Lake Shore & Michigan Southern Railway (steam), which are from 20 miles to 25 miles apart. It is a rich and fertile territory, but the handicap of having to drive 10 miles to 12 miles to a railroad caused the district to stand still for many years while the territory all around it was prospering.

The advent of an electric line equipped to handle carload freight as well as passengers was hailed with delight. The company instituted an intelligent campaign of education, and as a result the entire complexion and industries of the district have changed in a manner really astonishing.

New houses, buildings and factories have been erected in every town on the line. At Metamora, Berkey, Lyons, Fayette, Alvordton and Pioneer, grain elevators have been erected; in the latter place there are two. The farmers haul their grain to these elevators instead of to points on the steam roads, and the towns profit thereby. Due to these improved facilities, the cultivation of wheat, corn and other grain has increased considerably. The same is true of cattle raising. Cattle are brought in from Chicago and Western points when young and fattened on the rich lowland grass in this district. In the fall they are shipped East, many of them being sent abroad. The

accompanying illustration shows a twelve-car train of fancy cattle for export. On practically all live stock the company gets a double haul—in and out. In every town it has long sidings and cattle pens.

Baling of hay is a new industry that is thriving, several establishments having been started for this work. Still another new industry in this district is the production of sugar beets. The company interested a number of farmers in this innovation, and this year over 1600 acres are under cultivation. Up to the present time the greater portion of the crop in this district has been shipped to Fremont, Ohio, the electric line carrying it to Toledo for reshipment. The importance of the new field caused the owners of the Fremont plant to decide on the erection of a large plant at Blissfield, on the line of the Toledo & Western. This plant is now partially completed, and it is the plan to have it in operation to take care of this year's crop. It is an enormous establishment, covering fully 20 acres, and having a capacity for grinding 600 tons of beets per day. Yards laid into the plant include over 2½ miles of track. The Lake Shore & Michigan Southern (steam) has a track connection with the electric line at this point, and all the material used in the construction of the plant was handled by the company's electric locomotives. About 70 per cent of this material was hauled over its line, either from Toledo or from Alvordton, where it has connection with the Wabash, the latter point giving the company a haul of over 50 miles. By the time the plant is completed the company will have handled over 600 cars of material. Three of the larger buildings of the plant are illustrated herewith, giving some idea of the size of the pieces handled. The large tank shown in the foreground extended over two flat cars. In the operation of the plant the beets will be unloaded from bottom dump gondola cars into bins by means of overhead trestles. The company will handle a large proportion of the ingoing raw material and a considerable portion of the finished product. It will be necessary to maintain a locomotive at this point practically all the time for switching purposes; and as it may be used at night, when the plant is shut down, and because of the undesirability of stringing and maintaining expensive overhead lines in the rather intricate yards, the company decided to purchase a steam locomotive for this work. The announcement that the company proposed buying such a locomotive recently gave rise to the



HANDLING LIVE STOCK FOR EXPORT ON THE TOLEDO & WESTERN RAILWAY

report that it had abandoned the use of electric locomotives in its freight service, but there is no truth in this.

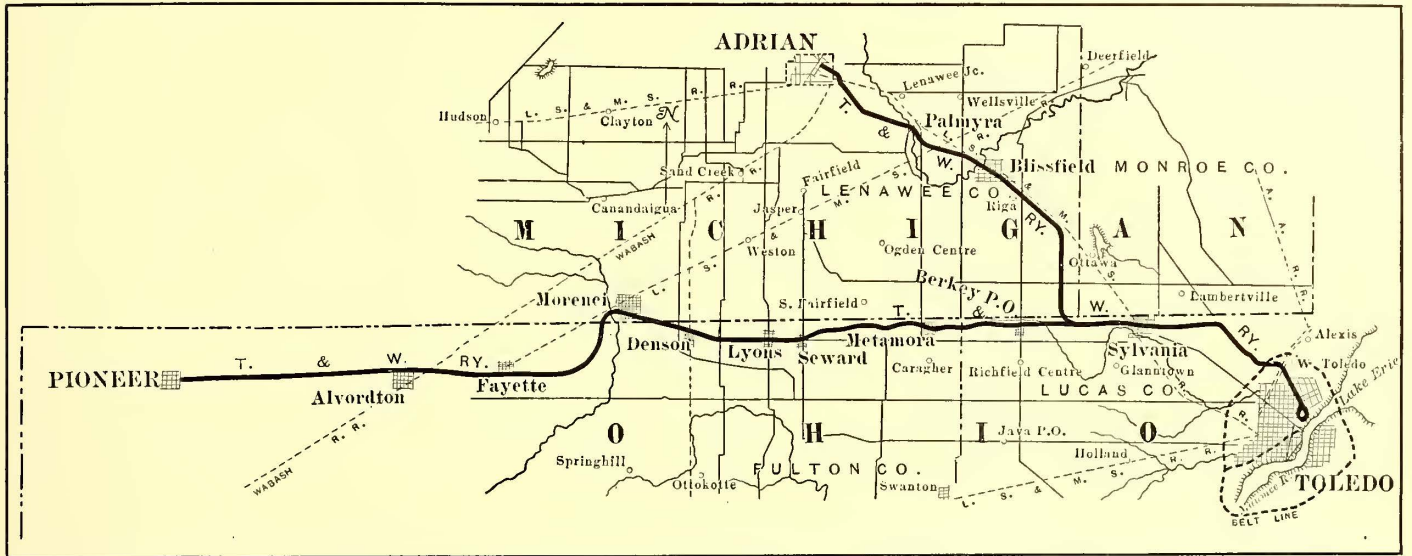
In the erection work on the beet sugar plant, the company laid the tracks and is furnishing power for motors used for various purposes, such as a sawmill, crane, etc. It also furnishes power to several industries, including a stave mill and a machine shop. Several of the elevators above mentioned are not "elevators" in the strict sense of the word, but the

grain is fed into the cars by means of motor-operated blowers. Current is furnished to industrial establishments from the trolley circuit at 5 cents per kw-hour. At first the company installed meters, but this was found too expensive, and now it meters and inspects each circuit about once a month and bases the charge accordingly.

When the road started it had no interchange of business with the steam roads, but gradually it has secured recognition, until at present it has satisfactory arrangements with nearly all the steam roads in its district. It is a member of several of the steam road associations, including the Master Car Build-

the Detroit Southern, giving it an outlet north and south. The interchange with this road has been so great at times that the steam road has started trains from this point.

Originally it was impossible to ship carload material into Toledo, and the company maintained a yard at West Toledo, from which point goods had to be carted into the city. Recently a very satisfactory arrangement has been made with the Toledo Terminal & Belt Company, which operates a steam belt entirely around the outskirts of the city, touching a large number of manufacturing establishments and having connection with all the steam roads entering the city. It transfers cars to



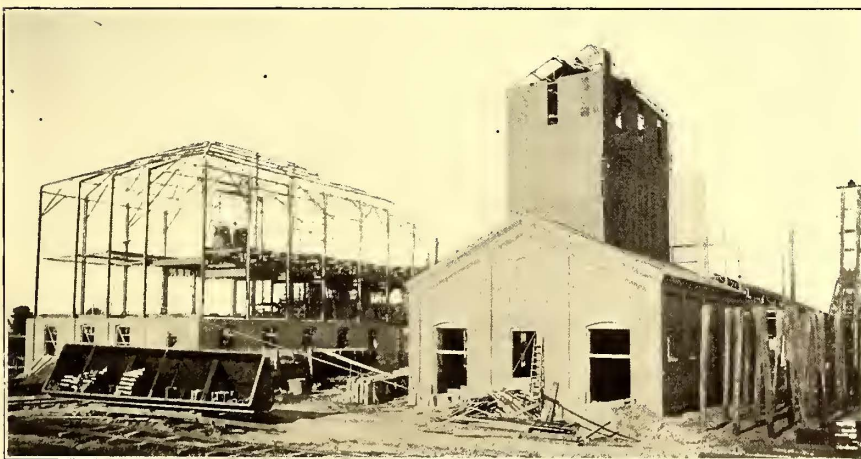
MAP OF TERRITORY SERVED BY THE TOLEDO & WESTERN RAILWAY

Street Railway Journal

ers' Association and the Auditors' Association, and while it has not secured recognition from the Central Service Association or the Joint Traffic Association, it receives foreign cars from some of the roads, receiving a pro rate for the haul over its line, and its cars have been sent all over the country, from Maine to California, although as a rule it endeavors to keep them at home and use foreign cars for distant shipments. Foreign cars requiring repairs are taken care of in its shops, as on all steam roads, and an association inspector examines its cars.

points into Toledo at from \$2 to \$3 per car, and it practically gives the Toledo & Western track connection with all the steam roads entering Toledo.

At the present time the Belt line offers no facilities for loading or unloading broken lots of package freight, and the electric line still operates package freight cars independent of its freight trains. These run to the interurban union freight station in Toledo, and they make practically express time. There are two of these runs over the Adrian division and one on the main line. These cars handle only package freight to and from Toledo, and while it is spoken of as package freight, they handle practically anything that will go into the car, and rates are the same as though the goods were handled in the freight trains. General Manager Franklin, of the company, is satisfied that this branch of the business is not profitable, but it is necessary to give patrons who ship material in and out of Toledo equal facilities with those who ship package freight between way points, or to foreign points. If better facilities for package freight in Toledo could be obtained, it would be his idea to institute an express business, charging higher rates than for freight, which would be reasonable, owing to the faster service afforded.



MAIN BUILDING OF NEW BEET SUGAR PLANT, BLISSFIELD, MICH.—ALL MATERIAL HANDLED BY TOLEDO & WESTERN RAILWAY

A connection with the Wabash at Franklin furnishes an excellent outlet to the west and south, and at this point it has a connecting yard equal to almost any connection between two steam roads. It has its own transfer station, with a receiving track and a delivering track. At the crossing there is a full interlocker, maintained by both roads, and giving both equal rights. A view of this crossing and connecting tracks is shown on page 328. At Denison it has a very good connection with

On the main line, which, of course, furnishes the heaviest portion of the freight, there is a local freight train each way daily except Sundays. Trains leave either terminus early in the morning as soon as possible after the switching has been done. The trains attend to the switching in each town, and the through run of about 58 miles requires about eight hours. Each train has a local car for local freight, and a four-wheel caboose, together with the loaded or empty cars to be handled. Occasionally, if cars are received at junction points after the

departure of the regular trains, extra trains are made up, and these, of course, run through on faster time. On the Adrian division there are no regular scheduled freight trains, the local business being taken care of on the package express cars and the carload business being handled special. Freight crews are paid by the month instead of by the hour. Each train has a motorman and conductor and one or more brakemen, and where there is a lot of switching to be done there is a trolley man. Conductors and engineers receive \$60 per month, and the brakemen \$45.

The company employs twenty-two station men, who handle freight, baggage and passenger business. Nine of the stations



CROSSING OF THE TOLEDO & WESTERN RAILWAY AND THE WABASH RAILROAD, SHOWING INTERLOCKER, TRANSFER TRACKS AND TRANSFER STATION

are in connection with rotary sub-stations. It will be seen that the stations average about 8 miles apart, which is closer than on the majority of interurban roads. Five of the stations are operated on double shift, it being the practice to close down four of the stations in the evening after the freight trains are off from the road.

An ice house has recently been erected at Sylvania for icing cars of fruit or dressed meats, of which the company has been handling considerable of late. A charge of \$2.50 per car is made for icing. The company is also considering selling ice to towns along the route.

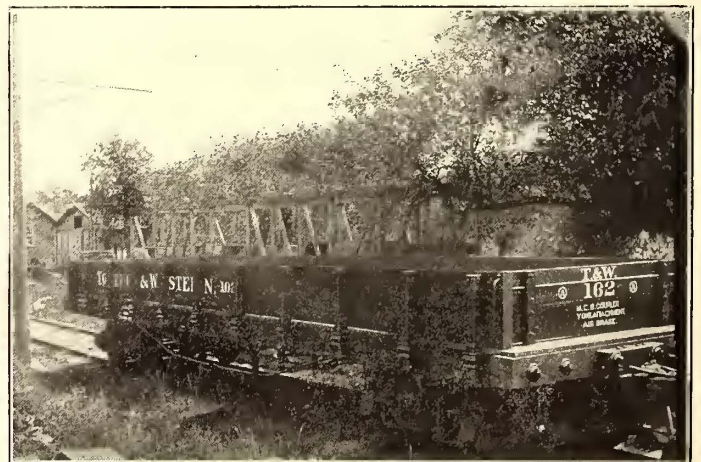
All trains, passenger as well as freight, are inspected and journals lubricated as they pass Sylvania, and a complete oil house has been erected. It is absolutely fireproof, the walls being of concrete block, the roof of steel and tile and the floor of cement. There are large tanks for the various varieties of oils and lubricants, and zinc-lined compartments for waste and scrap.

The present freight car equipment consists of twenty 60,000-lb. box cars, eighteen gondolas, five 80,000-lb. Rodgers convertible gondolas, three stock cars, twelve flat cars and two four-wheel cabooses. There are also three locomotives equipped with four 50-hp motors. These are geared very low—14 to 59—and they will handle from twenty to twenty-five loaded cars at a speed of 12 m.p.h. to 15 m.p.h., which is the limit for freight trains. They are building in their shops a locomotive of considerably heavier type; it will weigh 110,000 lbs. The flooring is made up of 10-in. I-beams, and it will be equipped with four Westinghouse No. 76 (75-hp) motors. It will have special Dorner trucks, weighing 10,500 lbs. each, and 34-in. wheel, 6-in. axles and 5-in. x 9-in. journals. It will

be fitted with Westinghouse K-15 controllers having two sets of resistances and fourteen points, and will have a No. 2 Christensen air compressor, capable of handling thirty-five cars, which it is figured the locomotive will haul without trouble.

Additional rolling stock is now on order, including ten bottom dump gondolas for handling beets and coal. The company has built several cars at its own shops, and has under construction six gondolas and several box cars. Some of its productions are illustrated herewith. It is necessary to retain three men for passenger and freight car repair work, and when these men are not busy they work on new cars. A good gondola can be built for \$600. All cars are equipped with Westinghouse air brakes and M. C. B. couplers, so that they can go anywhere. An electric shovel was recently built. It consists of a Baby Giant shovel outfit, furnished by the Vulcan Iron Works Company, of Toledo, mounted on a low flat car. The shovel is operated by a 25-hp motor, and the current is taken from the trolley. It will load twenty-five cars per day. Several 120-ton track scales have recently been installed at points along the line. Depressed side-tracks have been laid at a number of points to accommodate large shippers of beets and grain, so that the goods can be loaded directly from wagons into cars.

The theory that the handling of heavy freight trains in connection with passenger service produces a very uneven load on the power station is not borne out by the observations of the electrical engineer of this line. He claims that the load is remarkably steady for the character of work done, and that it fluctuates but little more than on roads having all passenger service. He claims that a locomotive with from twelve to fifteen cars requires but little more current, either in acceleration or in steady running, than the passenger cars. The locomotives are geared as low as it is possible to make them, and, as stated, never exceed 15 m.p.h. The passenger cars are geared for 45 m.p.h., and average about 28 m.p.h. to 30 m.p.h. between stations. The freight trains seldom make stops between stations, while the passenger cars have many stops. The road is



CAR BUILT BY THE TOLEDO & WESTERN RAILWAY, FRAME FOR BOX CAR UNDER CONSTRUCTION

remarkably level, having no grades over $1\frac{1}{2}$ per cent, and few of these. It is claimed that a skilled motorman can effect a greater saving of power on a heavy loaded freight train than on a passenger car, and the possibilities in this case are well known to all engineers. It is claimed that not only should a train be started very slowly, but the current should be thrown on and off intermittently, first giving it enough to start the locomotive and allowing the momentum gained to help start the first car, then giving it some more to assist the first car, which in turn starts the second car, and so on, building up slowly. A great deal of current is also saved in coasting on grades and rolling into sidings and up to derailing switches.

Sidings are all 1200 ft. to 1800 ft. long, so that in the majority of cases freights do not have to stop in passing passenger trains. The power station is equipped with two 750-hp and one 500-hp engines. Normally, during the day time, there are two freight trains, two express cars and five passenger cars, in addition to about 250-hp of motors. This load is taken care of by one of the larger and the small machine. In the evening, as before stated, four sub-stations are cut out and the small machine is shut down.

It is perhaps unfortunate that no accurate record is kept at this station of the cost of producing current; neither is it known exactly what portion is used in moving freight, hence the cost of operating the freight department cannot be accurately determined. It is stated that the cost of operation per car-mile for all classes of service is about 17 cents, and it costs somewhat less than 60 per cent of the gross receipts to operate the property. It should be stated, however, that a large number of investments, such as building cars, stock pens, sidings and additional ballasting since the road was completed, have been charged to operating rather than to capital account.

C. F. Franklin, general manager of this property, is an old steam road man, having been general superintendent of the Clover Leaf, a Toledo road, and his acquaintance and influence with steam road people have been of immense importance in securing the recognition which this road has obtained. After three years of experience in the operation of an electric railway under steam road conditions, Mr. Franklin has arrived at some conclusions which are of interest to all traction managers.

He believes that package freight business handled in single cars at rates equal to steam freight is unprofitable, and that an electric road having business enough to warrant high-speed half-hourly, or even hourly, service should not undertake freight business, unless, perhaps, it can afford double track. The Toledo & Western is so situated that it could not live on its passenger business alone, the receipts from this source just about paying the operating expenses of the road, the freight taking care of the fixed charges and leaving a small balance at present. The passenger schedule gives a car every two hours to Adrian, and the same to Fayette, while the traffic to Pioneer warrants a car only every four hours at present. The patrons are largely country people, and high speed is not essential, hence passenger cars can afford to lay up for freights occasionally, if necessary. Mr. Franklin is satisfied that a road of this character cannot be operated as cheaply as an exclusively passenger road, or one doing only a small freight business, this being due to the increased number of station agents, train crews, shop men and office force necessary to handle the business as compared with passengers. He believes that a road should have private right of way through villages as well as in the country to handle freight successfully. Grades over 2 per cent make such traffic almost prohibitive, as it is necessary to cut trains and handle a car or two at a time, besides which the strain on the power station is greatly multiplied by heavy grades. While it might be possible for an electric road having steam competition to secure a portion of the carload business, it could hardly prove a large item, due to the tendency of other roads to favor the steam road, also because of the advantage the steam road has on long hauls. Where roads are situated as the Toledo & Western is, he is most enthusiastic on the subject of freight, and finds there is more money in it than passenger business.

The passenger as well as the freight earnings of the road have shown steady gains, and the figures indicate that the freight is making better gains than the passenger. It is estimated that the gross earnings this year will reach \$240,000, of which \$90,000 freight is expected. The following statements, covering a period of three years, are from the reports of the Auditor of State for years ending April 30:

	1903	1904	1905
Passenger	\$95,644	\$123,637	\$135,735
Freight	24,879	46,368	60,536
Mail	1,227	1,935	3,801
Other	412	3,826	5,333
Totals	\$122,162	\$175,766	\$205,405

SINGLE-PHASE TRACTION IN BELGIUM

According to "Elektrische Bahnen," a 12-mile single-phase railway has recently been put in operation in the Borinage district, which is the southern coal region of Belgium. The railways in this district are owned, like all interurban roads in Belgium, by the Société Nationale des Chemins de Fer Vicinaux, which operates at present more than 1300 miles of track. This company was one of the first which introduced electric traction in Europe, but could do so on only five of its lines, which in their character resemble street railways. All other lines were continued to be operated by steam, although the company has always manifested great interest in electric traction. When direct current at 600 volts was found to be uneconomical, the company asked for bids for a three-phase system, but the tenders did not fulfil the expectations. It was then decided, in March, 1903, to use the single-phase system, and this would have been the first commercial line of this system in Europe if there had not been delays in acquiring some land needed. The total length now equipped with the single-phase system is 12 miles, but this will be extended to 77 miles, which will be supplied from one point with single-phase current at 6600 volts. For the lines equipped at present, the voltage is reduced in transformers along the line to 600 volts, while for further extensions a higher voltage will be employed on the trolley wire, in order to reduce the number of transformers needed. The company has not yet its own power plant, but buys the current from a lighting and power company. The frequency is 40 periods per second. The power plant contains only three-phase generators, but for traction, two phases only of the generators are used. There will be four transformer stations, operating in parallel on the system. Since there are telephone lines in the neighborhood which use the earth as return, the rails could not be used for the return railway current; there are therefore two trolleys and two overhead wires. The motors are of the Winter-Eichberg type. Each motor car contains two motors, each of 40 hp. The characteristic curves for a frequency of 40 are not as good as for a frequency of 25, but are said to fulfil all requirements of the service. Regulation is obtained by series-parallel control in connection with a regulating transformer; the connections of the stator windings only are changed, while the rotor windings are always connected in series. The regulating transformer is built as an autotransformer. There are no resistances used for starting, but a resistance is employed for the change over from the series to the parallel connection. The system has been in successful operation since April 6.

Two electric locomotives have just been completed in the shops of the Los Angeles Pacific Railway. It is intended to put the new machines into service for freight hauling over the standard gage divisions of the Los Angeles Pacific, and also to handle the passenger traffic which this electric road is planning to take from and deliver to the Santa Fe and the Southern Pacific at Inglewood and Sunset stations respectively, for Venice and Playa del Rey. In this way the company expects to make ample provision for passenger traffic on exceptionally heavy days at this resort. At both of the above-named stations the steam trains will be switched to the tracks of the electric railway company, coupled to the electric locomotives and hauled down to Venice, and returned by the same route.

THE NEW REINFORCED CONCRETE SHOPS AND CAR HOUSES OF THE CENTRAL PENNSYLVANIA TRACTION COMPANY, AT HARRISBURG, PA.

BY MASON D. PRATT, MEM. AM. SOC. C. E.

The Central Pennsylvania Traction Company, of Harrisburg, Pa., operates under lease and otherwise several systems of which the old Harrisburg City Horse Railway Company is the foundation, including, in addition, the Harrisburg Traction Company, Steelton, Highspire & Middletown Electric Railway

detail. This construction was decided upon primarily to eliminate all fire risks as far as possible.

GENERAL ARRANGEMENT

A general plan of the layout is shown in Fig. 4, from which it will be seen that ample space has been allowed between the buildings and from the streets to the buildings. If found necessary in the future, an additional building can be erected at the corner of Forster and Twelfth Streets, either for a paint or carpenter shop, and further bays added to the car house as needed. The present repair shop, including all machine tools and the winding room, occupies 225 ft. of the front end of the

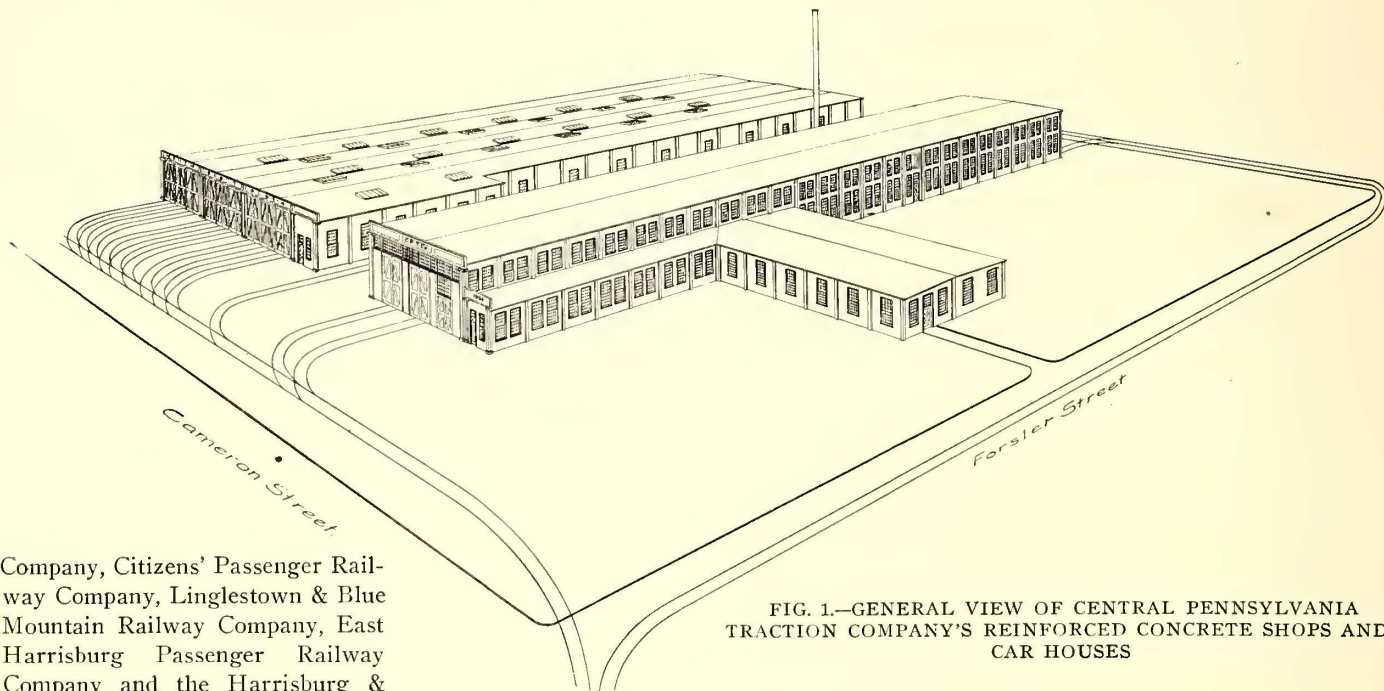


FIG. 1.—GENERAL VIEW OF CENTRAL PENNSYLVANIA TRACTION COMPANY'S REINFORCED CONCRETE SHOPS AND CAR HOUSES

Company, Citizens' Passenger Railway Company, Linglestown & Blue Mountain Railway Company, East Harrisburg Passenger Railway Company and the Harrisburg & Hummelstown Street Railway Company. Four of these companies had car houses located at different points throughout the district covered, but none of them was large enough or well located with reference to the consolidated system. It was therefore decided last year to concentrate at one

main shop building, while the rear portion will be used for the present as a carpenter shop and paint shop. These are separated by partitions, which, on account of their temporary nature, will be constructed of a steel frame with a corrugated steel covering and corrugated steel rolling lift shutter doors. The

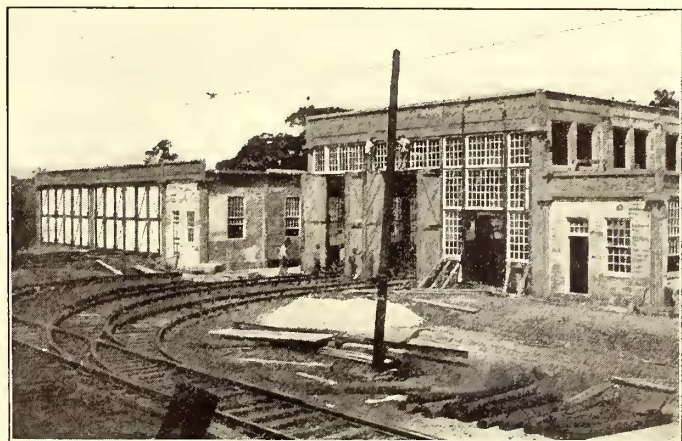


FIG. 2.—PUTTING ON THE FINISHING TOUCHES ON THE FRONT OF THE BUILDING

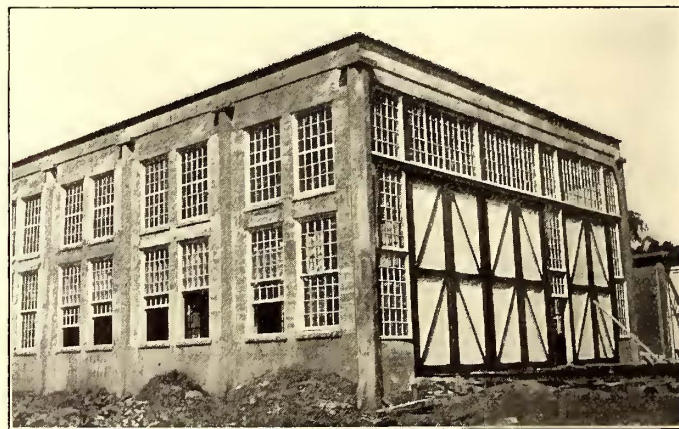


FIG. 3.—REAR END OF SHOP, SHOWING DETAILS OF FINISH

place all of the car houses and repair shops. For this purpose the leasing company purchased 8 acres fronting on North Cameron Street, Harrisburg, between Forster and Herr Streets. On this ground there is now a car house 75 ft. x 360 ft., in two bays, and a repair shop building 50 ft. x 375 ft., with wings containing a blacksmith shop, storeroom, winding room and steam heating plant. All of these buildings cover an area of 53,000 sq. ft. They are constructed entirely of reinforced concrete, and are perhaps the first example of structures of this kind in which this method has been used in practically every

machine shop portion will be served by a 44-ft. electric crane, furnished by the Cleveland Crane & Car Company, of sufficient capacity to raise an entire car body. This crane also has movement speeds which will make it useful in serving the machine tools. The latter are placed along the south wall, and since the center of No. 1 track is 22 ft. from the center line of this wall, sufficient space is given for the tools and for handling the work around them. The two tracks through the shop are spaced 15 ft. center to center, and as the No. 2 track is 10 ft. from the central line of the north wall, ample space is given between

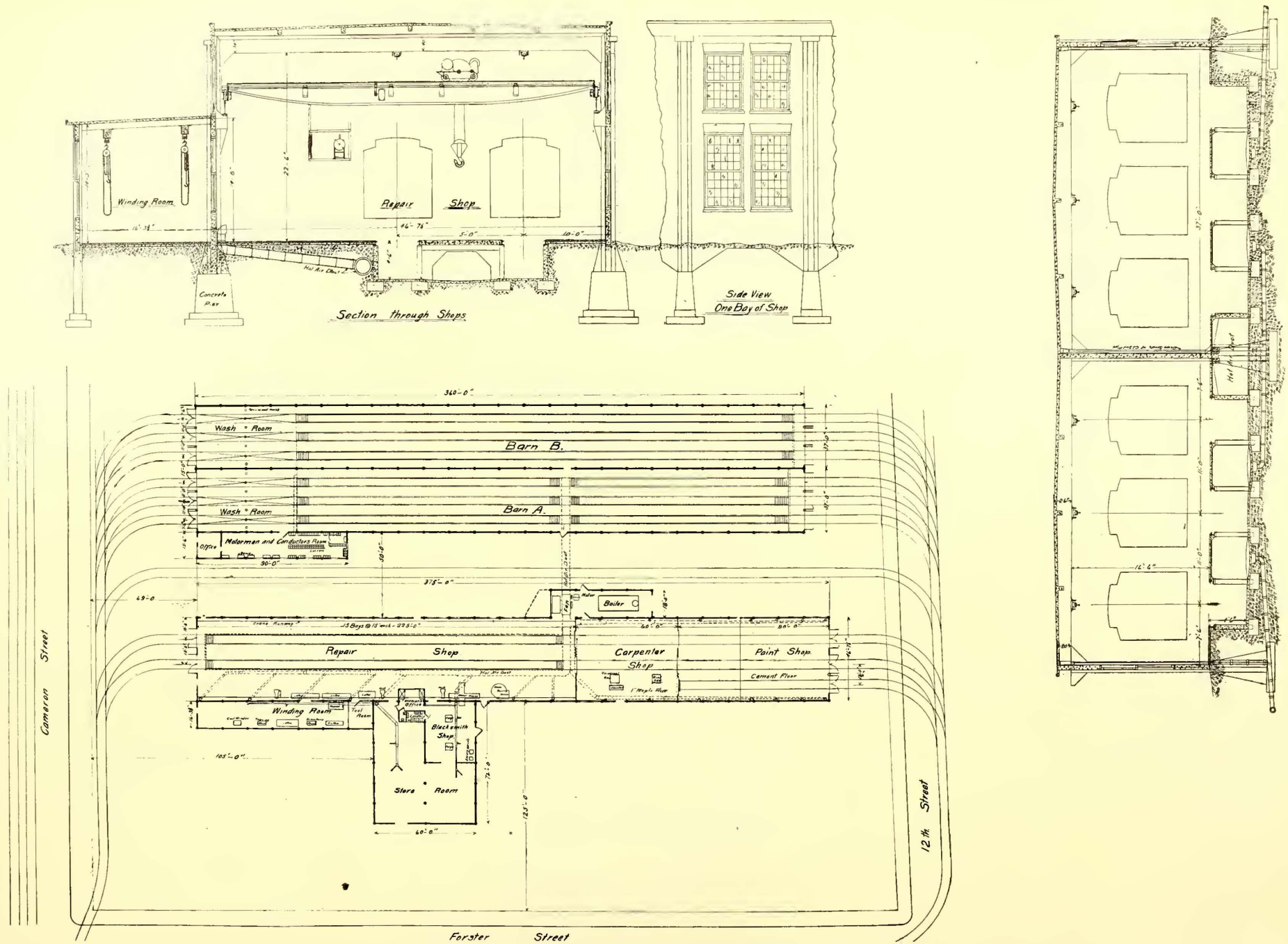


FIG. 4.—PLAN AND SECTIONS OF THE CENTRAL PENNSYLVANIA TRACTION COMPANY'S NEW SHOPS AND CAR HOUSES

and around cars for getting at all parts. The trolley wire is placed directly over the center of the tracks, and is 22 ft. from the floor, giving just sufficient room for the operation of the



FIG. 5.—INTERIOR OF COMPLETED CONCRETE CAR HOUSE

electric crane—the movement of the cars being effected by their own trolley. The crane itself will also take its operating current from the central trolley wire, as it is provided with 500-



FIG. 6.—INTERIOR VIEW OF SHOP, SHOWING SCAFFOLDING FOR FILLING IN WINDOW SPACES. LAYING CONCRETE FLOOR TO PITS

volt direct-current motors. Every machine tool will be operated by a separate Robbins & Meyer motor of the same voltage. An inspection of the plans will show that the lighting facili-

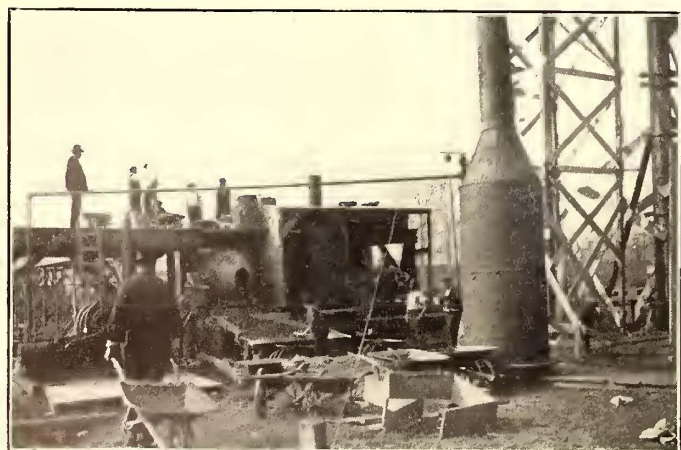


FIG. 7.—CONCRETE MIXING PLANT AND ELEVATOR

ties of the shop are excellent, four large windows being provided in each bay, while the building itself, both inside and out, has been left with the natural cement finish. The soft gray

light diffused throughout the shop is very restful to the eye.

The floor of the shop and of the pits is of concrete, while the pit tracks themselves are carried on reinforced concrete posts 6 ins. in diameter, spaced 3 ft. 9 ins. centers, longitudinally. The pits extend the entire length of the building, with the exception of 45 ft. at the front end of each bay, which portion has a well-drained concrete floor, and is provided with hose

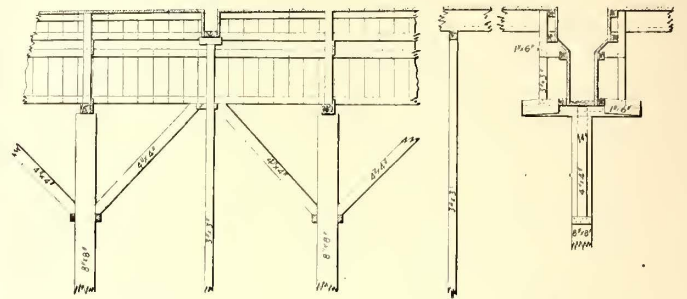


FIG. 8.—DETAIL OF GIRDER CENTERING

connections between each track for washing the cars. Concrete steps lead up from the pits at each end. The space between the tracks is open beneath the floor, thereby giv-

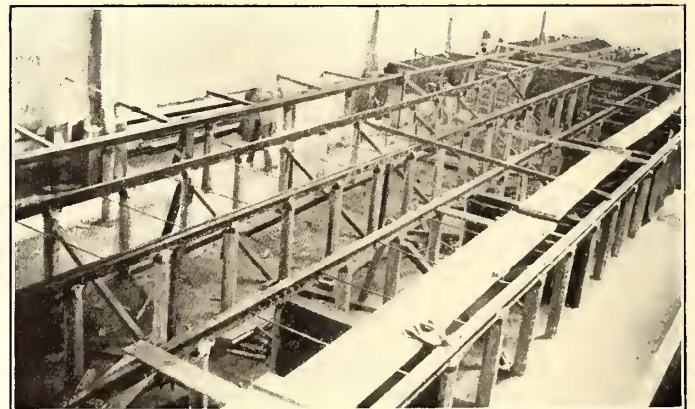


FIG. 9.—METHOD OF SUPPORTING PIT TRACKS ON REINFORCED CONCRETE POSTS, CONCRETE STEPS AND CASE WALLS BETWEEN PITS

ing ample room for easy passage between the car pits.

The floor of the carpenter shop is of 1-in. matched maple on 1-in. rough hemlock boards laid on stringers. In the ex-

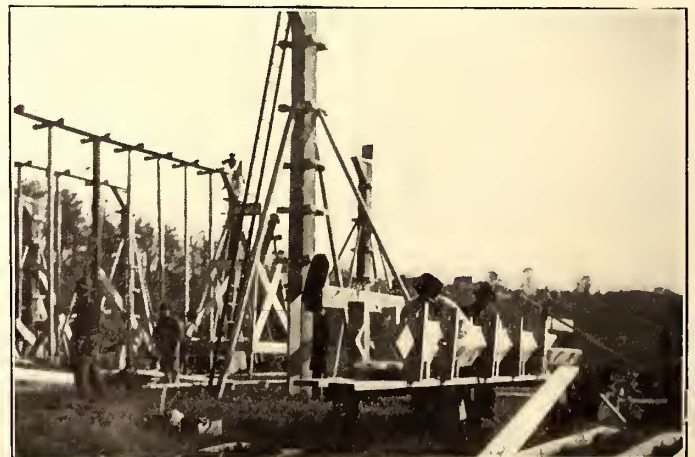


FIG. 10.—MAKING HEXAGONAL COLUMNS FOR THE CAR HOUSE

treme rear end of the paint shop the floor is cemented and provided with drains so that cars may be washed.

The storeroom and blacksmith shop is located in a wing 60

ft. x 72 ft., placed nearly central with the repair shop, the supply room having a concrete floor and partition walls. The shop foreman has an office at this point, with a fully glazed bay window extending 5 ft. into the repair shop, so that he can have a full view of practically the entire repair shop and all operations therein.

DETAILS OF CONSTRUCTION

As will be seen by the plan and cross sections, the car house, composed of two bays, 37-ft. span center to center each, and 360 ft. long, divides into twenty-four bays of 15 ft. each. Each bay contains three tracks, spaced 11 ft. centers. The headroom from the floor to the under side of the roof girder is 16 ft. 6 ins. Curves lead

from every track, both front and back, to a siding on the company's property. At present this building provides only sufficient room for the fifty-six active cars; sum-

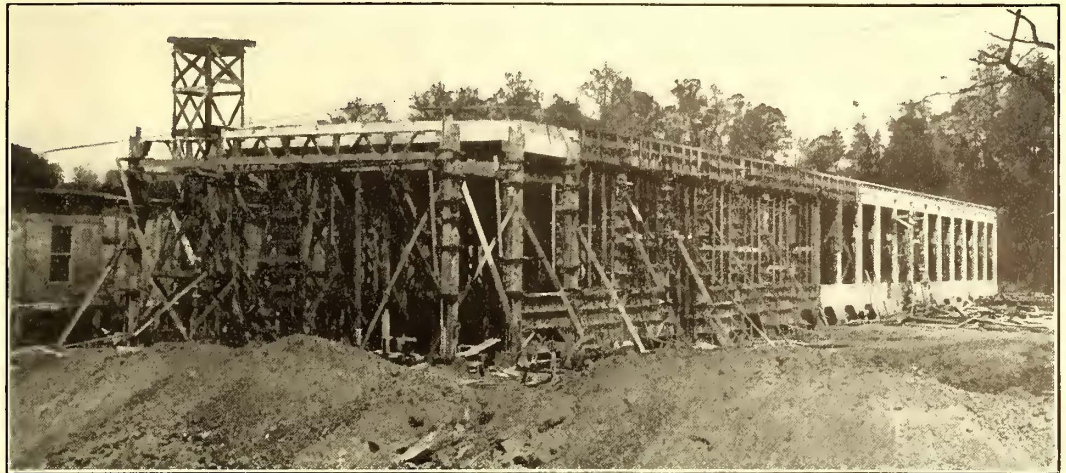


FIG. 11.—VIEW SHOWING THE "PROGRESSIVE" CONSTRUCTION OF THE SHOP

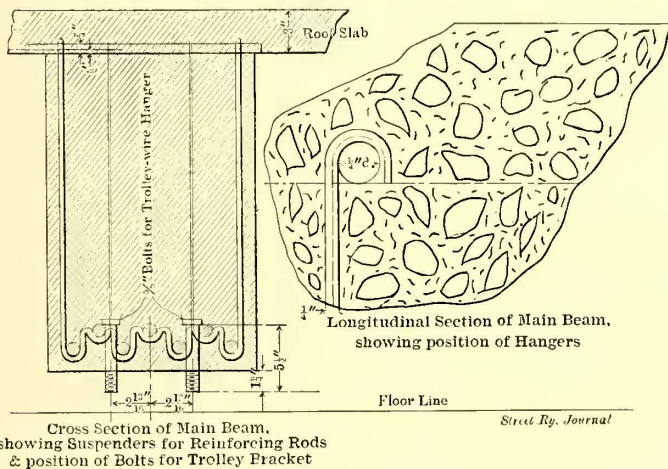


FIG. 12.—SOME DETAIL WORK IN THE CENTRAL PENNSYLVANIA TRACTION COMPANY'S NEW CAR HOUSES

mer and winter cars are now being stored in the Third Street car house. A novel feature of this car house is the method of hanging the doors by means of a 2½-in. x ½-in. steel strap hinge, formed to fit around 5-in. wrought-iron pipe posts resting on collars secured to the posts by bolts, the doors themselves being 3 ins. thick. The hinges are offset in such a way as to allow the two wings hanging from each post when open to fold flat against each other, thus giving the maximum possible clearance for cars. Swinging wooden doors were selected in preference to rolling steel shutters, on account of the greater ease and quickness of opening in case of fire. The drainage system embraces the use of cast-iron trapped drain boxes placed in pits between the tracks at frequent intervals, while all down spouts, which are of cast-iron soil pipe, lead directly to the sewers. All drains lead directly to a common main sewer, located midway between the shop and car house, which connects with the city system at a manhole in Cameron Street.

The shop has a span of 46 ft. 7¼ ins., and is 375 ft. long, with one T 60 ft. x 72 ft. for the blacksmith shop and a store house, and a leanto 16 ft. wide and 90 ft. long for the armature winding room, and one leanto 18 ft. x 60 ft. for the boiler and heating apparatus. The surface of the ground on which these buildings are located was from 2 ft. to 10 ft. below floor level, thus greatly increasing the height of the centering supports. The column forms, which were hexagonal in the case of the car house and octagonal for the shop (all with 8-in. faces), were built horizontally on the ground and raised by hand, as will be seen in Fig. 10. Sufficient lumber was bought for centering up about one-half of the car house, and as the concreting proceeded, the first forms were taken down, carried forward and re-erected, as may be noted in Fig. 6. The lumber, which was all

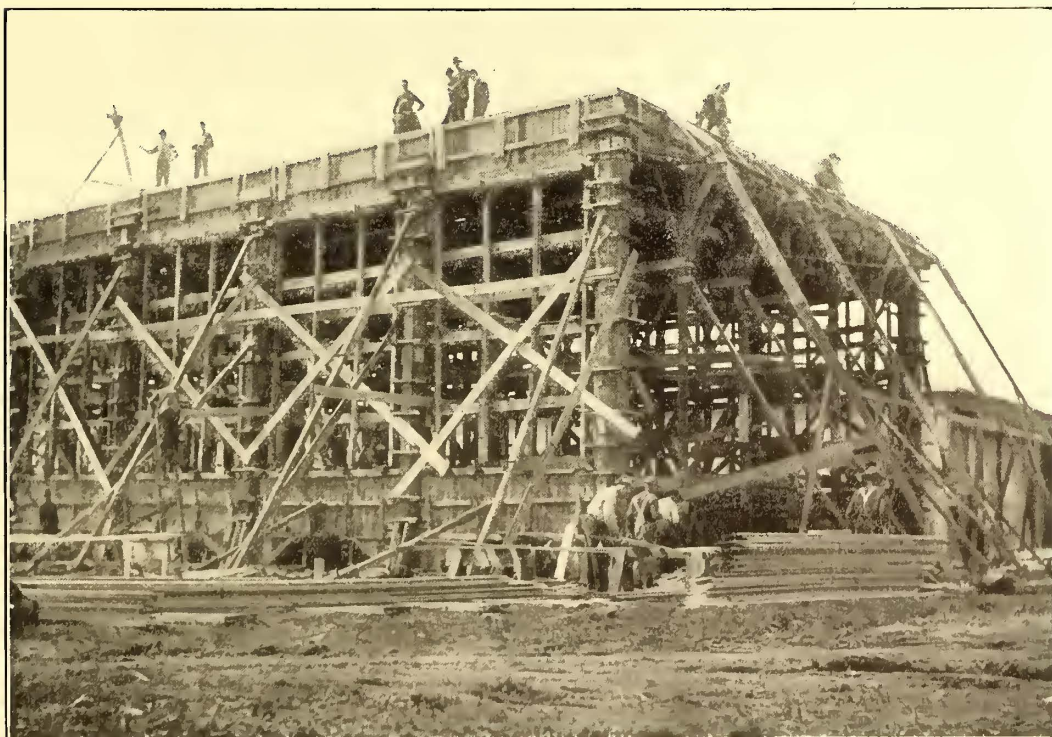


FIG. 13.—CENTERING FOR SHOP; HOISTING THE REINFORCING RODS

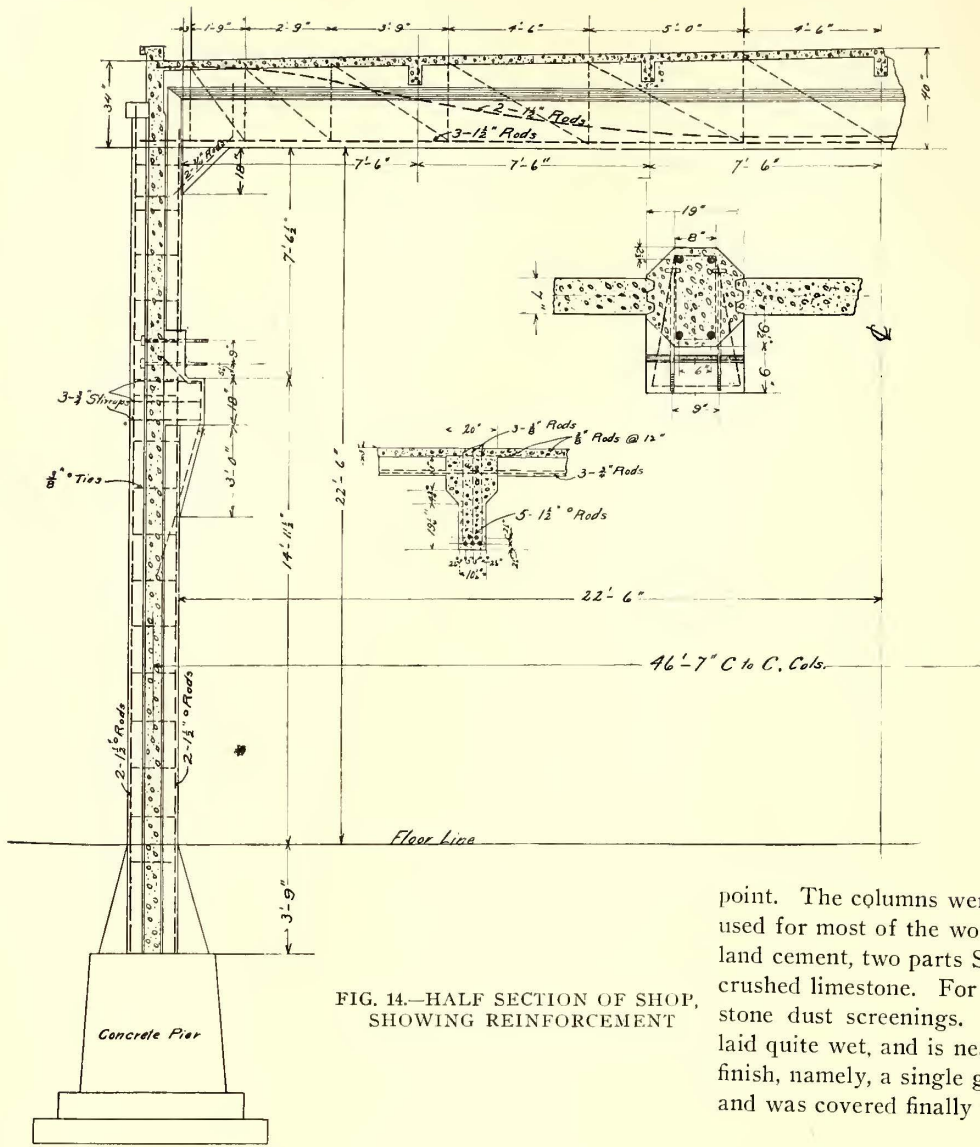
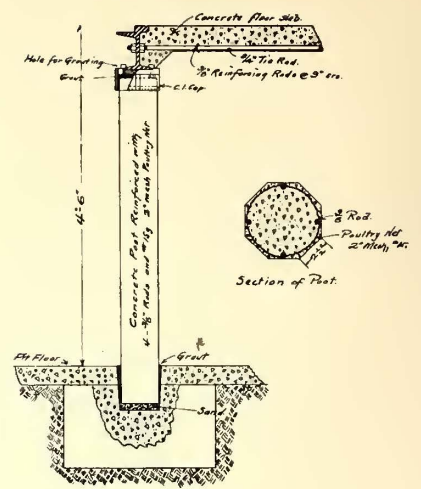


FIG. 14.—HALF SECTION OF SHOP, SHOWING REINFORCEMENT

hemlock, was used as often as six times. In this manner the columns, main girders and roof slabs were constructed, with a longitudinal girder both at the top and the bottom of the columns, which was utilized later as a means of holding the wall forms in place. The Smith concrete mixer



Detail of Pit Posts

FIG. 16.—DETAIL OF PIT POSTS

used was located centrally and moved about from place to place as the construction proceeded, the ingredients being dumped directly into the hopper of the mixer from wheelbarrows. The concrete, which was made quite wet, was shoveled into wheelbarrows, hoisted to the roof and carried directly to the required point. The columns were all filled from the top. The mixture used for most of the work consisted of one part "Giant" Portland cement, two parts Susquehanna River sand and four parts crushed limestone. For the roof slab the sand was replaced by stone dust screenings. The slab, which is 3 ins. thick, was laid quite wet, and is nearly impervious. It was given but one finish, namely, a single good troweling closely after concreting, and was covered finally with a coat of roofing pitch.

REINFORCEMENT

As the car house roof was carried by three rows of columns rising 16 ft. 6 ins. above the ground, it was not considered necessary to use any reinforcement in them. The main girders were reinforced with seven 1 1/4-in. round steel bars, five of which lay parallel to the bottom of the girder and two having their ends raised to the level of the top of the girders. These rods were carried by hangers of the special form shown in Fig. 12, made of 1 1/4-in. round iron, the rods being all suspended in the

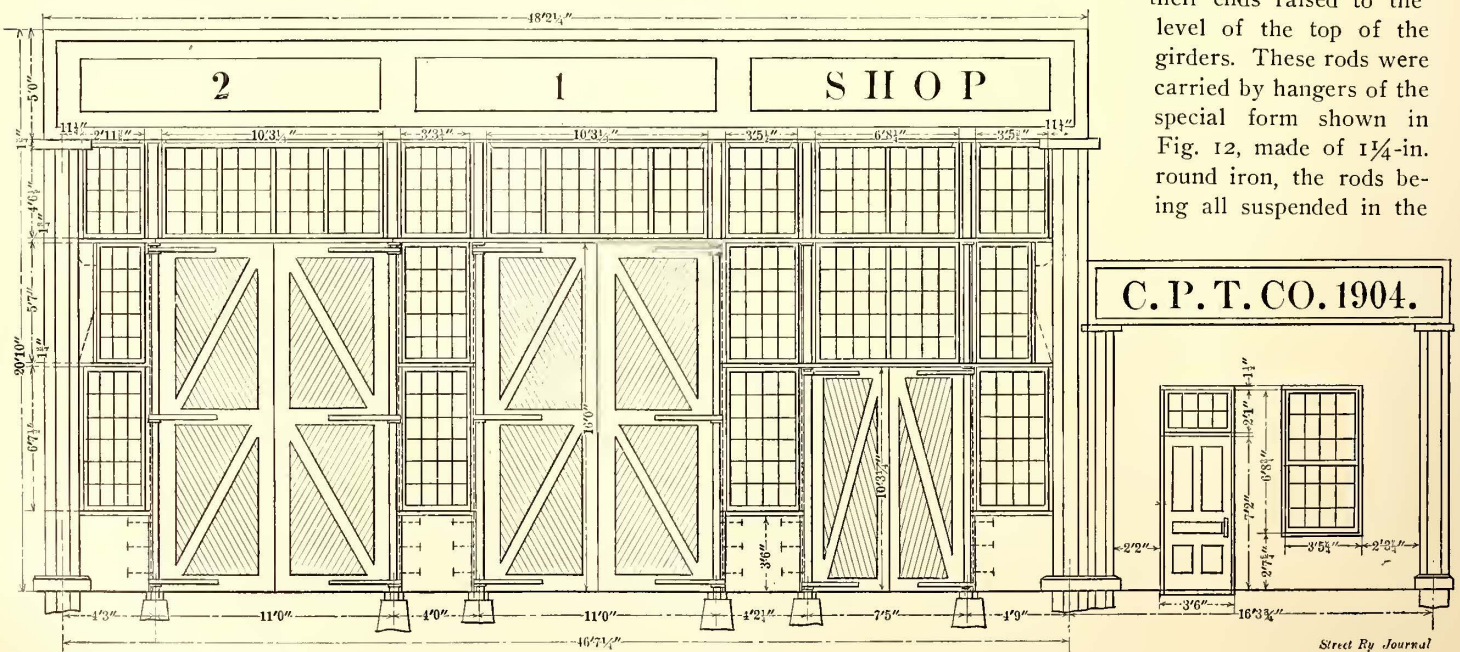


FIG. 15.—FRONT ELEVATION OF CAR HOUSE BUILT FOR THE CENTRAL PENNSYLVANIA TRACTION COMPANY

girder boxes before any concrete was placed. This method of placing the reinforcement was not entirely satisfactory, as it was found that even with wet concrete voids would be left owing to dumping too much concrete at one time; hence the method of placing a layer of concrete 3 ins. deep along the full length of the girders was adopted before placing the rods. This proved more satisfactory. The longitudinal beams supporting the roof slabs are reinforced with three 3/4-in. plain round bars, while the roof slab is reinforced with 3/8-in. rods. The roof has a slope of 1 in. in 3 ft.

The columns for the repair shop, owing to their greater height and their having to carry the eccentric crane load, were reinforced with four 1 1/2-in. rods tied together at 18-in. intervals with a bridle of 3/4-in. iron, formed with a complete loop at each corner, snugly fitting the vertical rods. The crane brackets were further reinforced with 3/4-in. round bridles which were attached to the vertical rods near the outer face

columns of the building, about 1000 being required in all. As previously stated, these posts are spaced 3 ft. 9 ins. center to center, longitudinally of the building, carrying a 6-in. girder rail in the car house and a 7-in. girder rail in the shop. The floor space between tracks is filled with reinforced concrete slab, and a concrete cross wall 6 ins. thick is placed at 15 ft. intervals for lateral stiffness.

The carpenter shop is floored with maple, but all other floors are of concrete. The shop building, which was constructed last, is made entirely of stone dust concrete, as it was found that this gave a much denser and stronger concrete, and also came from the forms with a smoother surface and sharp corners.

FIRE PROTECTION AND WATER SUPPLY

The fire protection and water supply consists of a 6-in. cast-iron main laid in the space between the shop and the car house, with 4-in. branches extending into each building, leading to fire hose carried on reels. Each reel contains 50 ft. of 2-in. cotton hose, and there are three in each car house and six located at different points throughout the shop, all being easily accessible to the doors.

HEATING SYSTEM

All of the buildings are heated through underground ducts. The larger size ducts are constructed of concrete and the smaller sizes of terra-cotta pipe in the storeroom, blacksmith shop, winding room and men's room. In the car house, where the pipes come up above the floor, the warm air is distributed through galvanized piping overhead. The repair shop and car house are heated by warm air delivered through the pit walls into the pits through 12-in. openings. It is the intention to have 12-in. diameter canvas hose with galvanized-iron sleeves which will fit into these openings, and by means of which the hot air can be directed against the under part of the cars, thus enabling them to be more quickly thawed out in emergencies. It is believed that this method of heating through the pits will not only make them more comfortable to work in than is usually the case, but that the building will be heated more uniformly. Steam for the heating apparatus is supplied from a 72-in. x 18-ft. tubular boiler having a 30-in. x 70-ft. wrought-iron stack. A 10-ft. Sturtevant motor-driven fan is employed.

EMPLOYEES' ROOM

Accommodation for the motormen and conductors is provided in a room at the south side of the south car house, 75 ft. x 16 ft., in which will be placed individual steel lockers and an excellent lavatory. There will also be provision for reading matter and games.

President Mathew Slush, of the Detroit, Monroe & Toledo Short Line, recently hit upon a novel method of advertising the company's resort at Monroe Piers. He obtained permission from the managers of each of the different roads out of Toledo to run a special car over the road, not stating for what purpose it was intended. He took personal charge of the various trips and plastered every fence, post and building, wherever it was possible to stop a car, with posters calling attention to his resort. He also called on the newspapers in each town and arranged for an excursion on a certain date. Each manager and his assistants were invited to participate in the outing at Monroe Piers. All the towns within a radius of 50 miles of Toledo were represented by newspaper men and the outing wound up with a fine fish dinner at the Piers Hotel. The company has spent in the neighborhood of \$60,000 in improving this resort this season, including the erection of a casino building, bath house and special attractions, and it is proving one of the most popular resorts on the lake district. As a result of the advertising campaign mentioned, all of the Toledo roads have been sending special excursion parties to the Piers in their own cars.

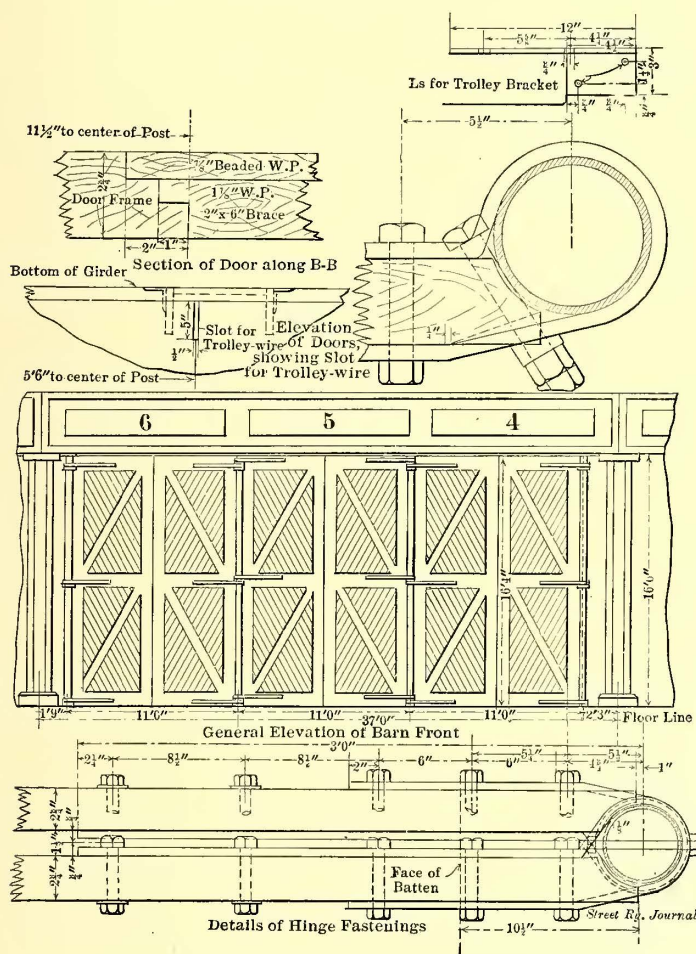


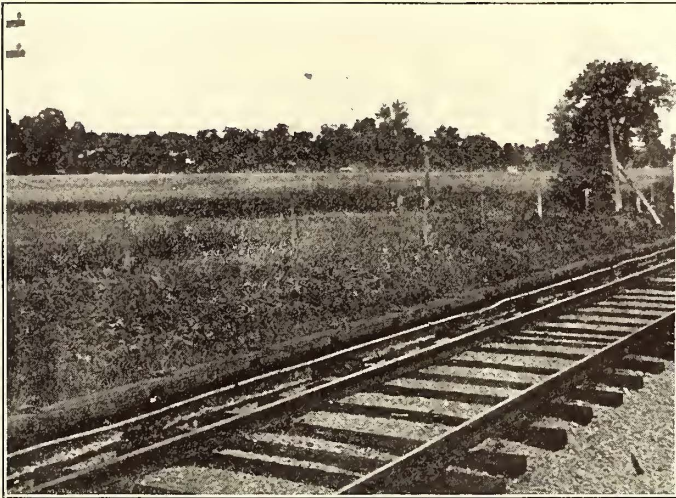
FIG. 17.—CONSTRUCTION DETAILS OF CAR HOUSE

of the columns. A departure from the usual practice was adopted in the case of the roof girders, in that they were made with the heavy top chord or T-section shown in Fig. 14, the reinforcement consisting of five 1 1/2-in. plain round bars, on the three lower rods of which was formed a truss of 3/8-in. round rods; the trussing from the center of the beam to the outer end is of one piece, the roof slab being reinforced as on the car house building. The skeleton continuous method of construction was also followed in this case, columns and roofing being placed at one time and the wall space containing the window frames filled in later.

An interesting detail is shown in the construction of the pit tracks, which were supported on reinforced concrete posts 6 ins. in diameter, the reinforcing consisting of four 3/8-in. rods vertically with a 2-in. mesh No. 15 wire poultry netting cylinder. These posts, of course, could not be made in place. They were cast in octagonal wooden forms similar to the main

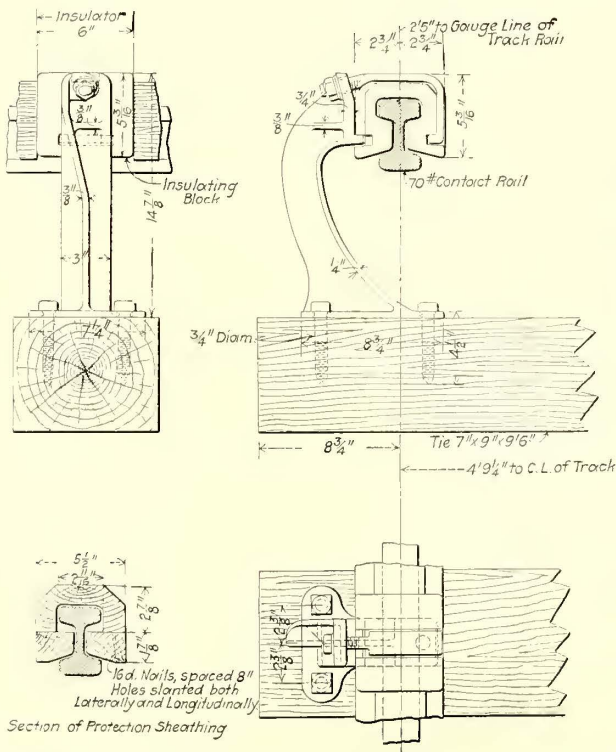
UNDER-CONTACT THIRD RAIL FOR THE NEW YORK CENTRAL

After extended experiments with various types of third rail on its experimental track near Schenectady, and an exhaustive study of the subject, the Electric Traction Commission of the New York Central Railroad has decided upon the adoption, for its New York City electrical zone, of the under-contact third rail illustrated in the accompanying en-



EXPERIMENTAL TRACK NEAR SCHENECTADY, WITH TOP-CONTACT PROTECTED RAIL

gravings. The third rail, as shown, is supported every 11 ft. by iron brackets, which hold the insulation blocks by a special clamp. The blocks, which are in two pieces, are 6 ins. long, and are designed so as to be interchangeable. Experiments



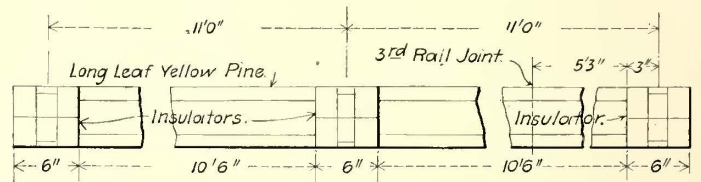
DIAGRAMS SHOWING CONSTRUCTION OF SUPPORTING BRACKET, INSULATOR, THIRD RAIL AND WOODEN SHEATHING USED BETWEEN SUPPORTING BRACKETS

are now being conducted with insulators of reconstructed granite, vitrified clay, rubber and indurated fibre to determine the relative advantages of these materials for the conditions. Between the supporting brackets the upper part of the rail is

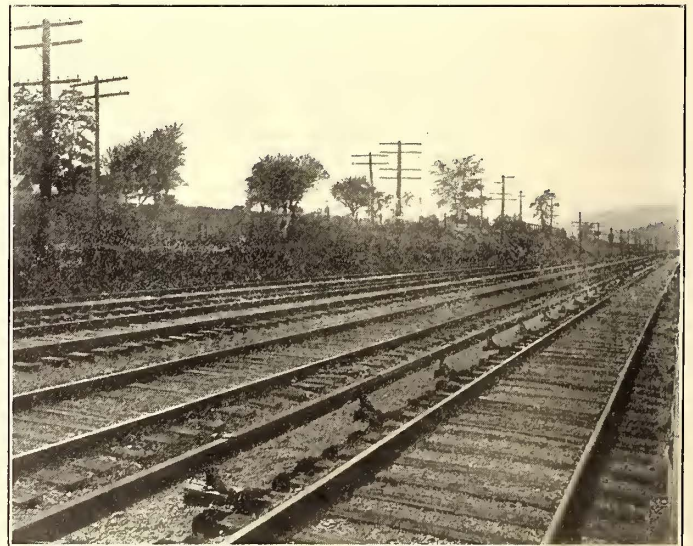
covered by wooden sheathing. This sheathing, as shown, is applied in three parts, which are nailed together. At the joints where the third rails are bonded, and at the feeder taps, the wooden sheathing is mortised.

To afford the same clearance as would be permitted with a top-contact protected type of third rail, such as used on the Long Island Railroad, the New York Central third rail requires a location of from 1/2 in. to 3/4 in. further out, but to secure a wider clearance, the New York Central engineers have decided to place the rail 1 1/2 ins. further from the gage line, or a total of 29 ins. This difference will not preclude the interchange of equipment with a suitable shoe which can be arranged so as to pass automatically from the under-contact to the top-contact third rail, and vice versa. The under surface of the New York Central third rail is 2 3/4 ins. above the top of the service rail, while the upper surface of the Long Island third rail is 3 1/2 ins. above the top of the service rail. This difference can be taken up automatically by the spring pressure due to the shoe sliding on its under and upper surface in each respective case.

The principal reason for adopting the under-contact rail is that it can be more thoroughly protected, and hence is safer than the ordinary type of contact rail. There are no projecting live edges or bolts, and no slot between the third rail and its cover through which an animal or any person ignorant of danger can make contact with the live conductor. The only possibility of reaching the third rail is from below and by an upward movement, and this fact, it is thought, greatly decreases the chance of injury from shock. Other advantages which it



PLAN OF THIRD-RAIL CONSTRUCTION, SHOWING SPACING OF SUPPORTING BRACKETS



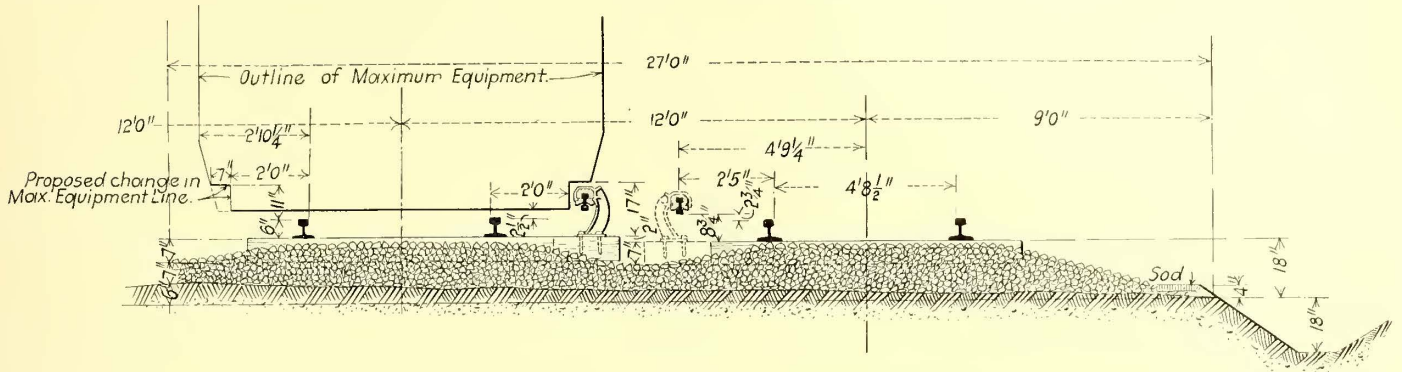
EXPERIMENTAL TRACK NEAR SCHENECTADY, WITH UNDER-CONTACT THIRD-RAIL—THE TYPE NOW ADOPTED

is claimed are possessed by this arrangement over the ordinary type of third rail are: (1) There is less strain on the insulators, as the pressure from the shoe acts against instead of with gravity; (2) the board protection, having a continuous support, is less apt to crack and warp; (3) the rail is more protected from the weather, and hence less liable to corrode; (4) the contact surface is more thoroughly protected from sleet and snow; (5) the construction is self-cleaning, and as there is a much greater space between the lower portion of the third

rail and the tie, there will be less danger of an accumulation of snow, ice and rubbish, and consequently less leakage.

The system is the joint invention of W. J. Wilgus, fifth vice-president of the New York Central Railroad Company, and Frank J. Sprague, who is a member of the Electric Traction Commission of the company. The working details of the system have been developed under their direction by E. B. Katte,

acquired the Rochester & Eastern Railway, operating from Rochester to Geneva, 50 miles. The 50 miles from Geneva to Syracuse will be filled either by electrifying that portion of the Auburn branch or building a separate line. Between Rochester and Buffalo the syndicate has no plans that it cares to speak of at present, but the West Shore tracks could be utilized. As outlined this gives a continuous line from Rochester to Little



HALF CROSS SECTION OF FOUR-TRACK NEW YORK CENTRAL LINES, SHOWING POSITION OF UNDER-CONTACT THIRD RAIL

electrical engineer of the company, and a complete and satisfactory system of crossings, switches, approaches, etc., has been designed.

The third rail is not mounted rigidly in the insulators, but is given a little play for expansion and contraction, except at certain central points, where it is anchored. It weighs 70 lbs. per yard, is of special section and composition, and has a resistivity between seven and eight times that of copper. The accompanying views show sections of track near Schenectady equipped with the new and old systems.

THE WEST SHORE ORDER AWARDED

Contracts have been awarded for the electrical equipment of the West Shore Railroad from Utica to Syracuse. This is in line with the plans of the Andrews-Vanderbilt New York Central interests for interurban electric service across New York State. Contracts were placed with the General Electric Company for motor equipments and sub-station apparatus. The placing of the latter contracts settles the much vexed question of whether or not the single-phase a. c. system would be adopted in this electrification work. The contracts indicate that it will not. The present contract is for four sub-stations, each to have four 300-kw rotary converters.

The kind of contact for the cars has not been decided upon; the engineers are still undecided between third-rail and a side-contact system. As intimated some time ago, an overhead trolley was considered undesirable because of the gases arising from steam locomotives, and because of the danger to trainmen on top of freight cars. The line voltage therefore will be in common with that of the Utica & Mohawk Valley, with which the Syracuse-Utica line will be connected. The West Shore between these points is being four-tracked, and two tracks will be equipped for electricity. The work is to start in the very near future. The West Shore through passenger trains between these points will be diverted to the New York Central tracks; in fact, this is being done very largely at the present time. Freight trains will continue to operate as heretofore. Four 125-hp motors will be the car equipment, and the GE type M control will be used, as it is proposed to run the cars in trains of three or four. In entering the streets it will be necessary, of course, to cut the trains and operate the cars through cities singly.

It was intimated some time ago that the Auburn branch would be electrified to fill the gap between Syracuse and Rochester. This plan has been modified. Instead the syndicate has

Falls, a distance of about 160 miles, the plan for operation of which has been fully determined upon. As is generally known, the syndicate owns the Schenectady Railway, operating a 14-mile line from Schenectady to Albany, with other lines to Troy and Ballston Spa. From Schenectady westward to Tribes Hill, 22 miles, is the fine double-track line of the Fonda, Johnstown & Gloversville Railway. It is denied that this system has been acquired, but it seems reasonable to suppose that it will come into the chain when the links are connected up. From Tribes Hill to Little Falls, 35 miles, there is no line at present.

At the present time the Utica & Mohawk Valley leases power from the Trenton Falls water-power. This service will be abandoned as soon as the 33,000-volt transmission lines from the plants of the Hudson River Power Company near Lake George, and which are now supplying the Schenectady system, are extended westward to Syracuse, giving a transmission line of about 126 miles. From Syracuse westward the power will be supplied by Niagara Falls power, a contract having recently been made with the Ontario Power Company.

Under the plans outlined, it is apparent that the local traffic through Central New York is to be taken care of by means of frequent service on these interurban lines, but there is nothing to indicate that at the present time the New York Central has plans for electrifying its main lines for the through passenger service. The electrification which is being done out of New York City is simply to improve the metropolitan terminal facilities and suburban service.

Montreal, and particularly the east end of the city, was in gala attire a few evenings ago in honor of the opening of the second annual picnic of the Montreal Street Railway Mutual Benefit Association at Riverside Park. Fully 10,000 people attended the opening, but the event of the twenty-four hours was easily the electric car street parade in the evening. Some thirty cars, strung with lanterns, brightly illuminated with electric bulbs and bedecked with flags and bunting, took part, the various sections of the city being covered with different divisions, the whole finally getting into one long line and proceeding east to Riverside Park, which was literally jammed with people. Aside from the vaudeville programme, there were various sports which interested the thousands of people both afternoon and evening. There were tugs of war between the various branches of the service, these to be continued throughout the week, a handsome prize going to the champions, while the hose-coupling competition in the afternoon attracted a great deal of attention.

**PROPOSED CONSTITUTION AND BY-LAWS OF THE
AMERICAN STREET AND INTERURBAN
RAILWAY ASSOCIATION**

CONSTITUTION

NAME AND LOCATION

I. a. The name of the association shall be the "American Street and Interurban Railway Association."

b. The headquarters of the association shall be located in the city of New York.

OBJECTS

II. The objects of the association shall be as follows:

a. The discussion and recommendation of methods of construction, management and operation of street and interurban railways, and of safeguarding the interests of the same.

b. The establishment and maintenance of a spirit of cooperation among the members, and the encouragement of friendly relations between the companies and the public.

c. The acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of street and interurban railways, and the diffusion of this knowledge among the members.

MEMBERS

III. The membership of this association shall consist of two classes, as follows:

a. Active members, consisting of American street and interurban railway companies, or lessees, or individual owners of street and interurban railways. Each member shall be entitled to one vote, which shall be cast by the properly accredited delegate.

b. Associate members, consisting of individuals who are or have been at some time actively identified with street and interurban railway interests, and other persons who in the opinion of the executive committee have had experience of such a nature as to render desirable their connection with the association. The privileges of the associate members shall be similar to those of the active members, excepting that they shall not be entitled to vote or hold office, nor shall they have the privileges of the floor unless permitted by the association.

AMENDMENT

IV. This constitution may be amended by a two-thirds vote of the members present at a regular meeting, provided the proposed amendment shall have the approval of the executive committee, and provided that a copy shall have been sent to each of the active members at least thirty days prior to the date of the meeting at which the proposed amendment is to be acted upon.

BY-LAWS

ELECTION OF MEMBERS

I. Every applicant shall signify his desire to the secretary, enclosing the requisite fee. All applications for membership shall be referred to the executive committee, a two-thirds vote of the members of the executive committee by ballot being necessary to election. In case of rejection, the membership fee shall be returned. The executive committee shall report at each meeting the names of new members elected.

OFFICERS

II. a. The officers shall consist of a president, vice-presidents equal in number to the number of affiliated associations, a treasurer and a secretary. The officers shall assume their duties immediately after the meeting at which they are elected.

b. The president, vice-presidents and treasurer of the association shall be elected at the annual meeting of the association. All such elections shall be by ballot, and a majority of the votes of all members present shall be necessary to an election. The secretary shall be appointed by the executive committee.

PRESIDENT AND VICE-PRESIDENTS

III. The president shall be the chief executive officer of the association. He shall preside at the meetings of the association and of the executive committee. In the absence of the president, any duties devolving upon him may be performed by one of the vice-presidents.

TREASURER

IV. The duties of the treasurer shall be to receive, safely keep and account for all moneys of the association; to keep correct accounts of the same, and to pay all bills approved by the president. He shall make an annual report to be submitted to the association. He shall give a bond to the president in such sum, and with such sureties, as shall be approved by the executive committee. He shall be paid a salary fixed by the executive committee.

SECRETARY

V. The duties of the secretary shall be as follows:

a. To take minutes of all proceedings of the association and of the executive committee and to enter them in books proper for the purpose.

b. To conduct the correspondence of the association.

c. To read minutes and notices at all meetings, and to present papers and communications if the authors wish it.

d. To collect and file for the benefit of the members information and statistics regarding matters relating to the purposes of the association.

e. To receive applications for membership and to lay such before the executive committee.

f. To attend to the publication of the proceedings of this association; and, in conjunction with the secretaries of the affiliated associations, to the publication of the proceedings of such affiliated associations.

g. To send notices to all members of the association at least thirty days before each meeting, mentioning papers to be read and any special business to be brought before the meeting.

h. To perform such other duties as may be required of him by the constitution and by-laws, and such duties as may be assigned him by the executive committee.

The office of the secretary shall be maintained at the headquarters of the association. He shall be paid a salary fixed by the executive committee. He may or may not be in the employ of an active member of the association.

THE EXECUTIVE COMMITTEE

VI. a. The entire charge and management of the affairs of the association shall be in the hands of an executive committee, which shall consist of the president, the vice-presidents and one member appointed by each of the affiliated associations. The executive committee shall make arrangements for carrying out the objects of the association.

b. The executive committee shall hold a regular meeting before each regular annual meeting of the association, and shall hold such special meetings as may be necessary. Such special meetings may be called by the president or any five members of the executive committee. Five members of the executive committee shall constitute a quorum at all meetings.

The secretary shall give such reasonable notice of all meetings as the committee shall by vote prescribe, and all such notices shall specify the business to be brought to the attention of the committee at such meetings.

c. The executive committee may assign to its allied association, the American Street Railway Manufacturers' Association, the management of the exhibit features of the annual conventions, and it may arrange with the said Manufacturers' Association the details of such entertainments as may be given in connection with the annual conventions of this association.

d. The executive committee shall present a report to each regular annual meeting of the association, and shall include

in such report the names of members elected during the year, and its recommendations for the future work of the association.

MEETINGS

VII. a. Regular annual meetings of the association shall be held at such time between the 15th day of September and the 15th day of December, in each year, as the executive committee may decide to be best suited to the locality in which the meeting is to be held; the time to be decided upon and each member notified of the selection by the 1st day of May in the year in which the meeting is to be held. Special meetings may be held upon the order of the executive committee. Notice of every meeting shall be given by the secretary, in a circular addressed to each member, at least thirty days before the time of the meeting. Fifteen members shall constitute a quorum at any meeting.

b. At all meetings of the association discussion shall be limited to active members, provided, however, that special privileges may be accorded others at the will of the meeting.

c. At any regular or special meeting, executive sessions may be held. Such sessions shall be open to active members only.

ORDER OF BUSINESS

VIII. The regular order of business shall be:

1. Reading of minutes of last meeting.
2. Report of the executive committee.
3. Address of the president.
4. Report of the treasurer.
5. Reports of standing committees.
6. Reports of special committees.
7. Reports from affiliated associations.
8. Reading and discussion of papers.
9. General business.
10. Election of officers.

COMMITTEE ON SUBJECTS

IX. In order to secure continuity of work and uniformity of general purpose, a committee on subjects shall be appointed each year by the executive committee. The function of this committee shall be to suggest topics for the work of the American Street and Interurban Railway Association and its affiliated associations for each year in advance.

The committee shall consist of one member from each of the affiliated associations and a number from the American Street and Interurban Railway Association equal to the total number from the affiliated associations. The committee, at each annual meeting, shall present its plans for the coming year.

VOTING

X. All votes except as herein otherwise provided shall be viva voce; and in case of a tie, the presiding officer may vote.

READING OF PAPERS

XI. All papers read at the meetings of the association must relate to matters connected with the objects of the association, and must have been previously approved by the executive committee.

AFFILIATED ASSOCIATIONS

XII. This association shall do all in its power to promote the welfare of other associations organized with its approval to investigate technical matters connected with street and interurban railway construction and operation. To this end it will, in the following way, and in others which may be determined by the executive committee, assist in the work of such affiliated associations:

- a. By granting charters to and approving the constitutions of such associations.
- b. By admitting to the executive committee a member from each of such associations.
- c. By granting financial assistance to such associations for specific purposes.

d. By editing, printing and binding the reports of the proceedings of such associations.

e. Through its secretary and committee it will assist in arranging for conventions, suggesting suitable subjects for investigation; it will file information for reference and distribution, and in every way endeavor to stimulate interest in all of the affiliated associations.

PAPERS, DRAWINGS, ETC.

XIII. All papers, drawings and models submitted to the meetings of the association shall remain the property of the owners; subject, however, to retention by the executive committee for examination and use, but at the owner's risk.

FEES

XIV. Active members shall pay an admission fee of \$10 and annual dues, payable in advance, based on gross earnings from railway operation during the preceding fiscal year, as follows:

Gross receipts under \$100,000.....	\$25
Gross receipts between \$100,000 and \$250,000.....	50
Gross receipts between \$250,000 and \$500,000.....	100
Gross receipts between \$500,000 and \$1,000,000.....	150
Gross receipts between \$1,000,000 and \$2,500,000.....	250
Gross receipts between \$2,500,000 and \$5,000,000.....	350
Gross receipts between \$5,000,000 and \$10,000,000.....	500
Gross receipts over \$10,000,000.....	600

Associate members shall pay in advance an annual fee of \$5.

ARREARS

XV. No member whose annual payment shall be in arrears shall be entitled to vote.

WITHDRAWAL

XVI. Any member may retire from membership by giving written notice to that effect to the secretary and the payment of all annual dues to that date, but shall remain a member and liable to the payment of annual dues until such payments are made, except as hereinafter provided.

EXPULSION

XVII. A member may be expelled from the association by the vote of two-thirds of the members present at any regular meeting of the association, upon the written recommendation of the executive committee.

RULES OF ORDER

XVIII. All rules not provided for in these by-laws shall be those found in Roberts' Rules of Order.

AMENDMENT

XIX. All propositions for adding to or altering any of these by-laws shall be laid before the executive committee, which shall bring them before the next regular meeting of the association, if it shall consider such course desirable; and it shall be the duty of the committee to do so, on the request, in writing, of any five members of the association.

FORM OF CHARTER TO BE GRANTED BY THE AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION

The American Street and Interurban Railway Association, in order to promote the acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of street and interurban railways, and the diffusion of this knowledge among those persons interested in the improvements of street and interurban railway service and the reduction of its cost, hereby agrees to co-operate in the work of the Street and Interurban Railway Association in the following ways:

1. By admitting to its executive committee a member of the said affiliated association.
2. By granting financial assistance for specific purposes to the said affiliated association.
3. By editing, printing and binding the reports of the proceedings of the said affiliated association.
4. By suggesting subjects for investigation and in every way

encouraging such investigation on the part of the said affiliated association.

5. By managing the details of conventions and other meetings for the said affiliated association.

6. By collecting, filing for reference and distributing such information as may be desired by members of the said affiliated association.

In consideration of this assistance, the Association by the acceptance of this charter agrees that the constitution and by-laws of the said affiliated association shall be subject to the approval of the American Street and Interurban Railway Association, and all amendments to and changes in the same shall be subject to such approval; and that the American Street and Interurban Railway Association shall have the right to withdraw its support and assistance whenever, in the judgment of its executive committee, the said Association is not satisfactorily accomplishing its objects as stated in Article II. of the constitution of the said affiliated association.

In witness of this agreement, we, the presidents and secretaries of the American Street and Interurban Railway Association and of the Association have affixed our signatures hereto, this day of, 190..

..... Secretary of A. S. I. R. A.
..... Secretary of
..... President of A. S. I. R. A.
..... President of

EQUIPMENT OF THE NEW PLANK ROAD CAR SHOPS OF THE PUBLIC SERVICE CORPORATION

BY MARTIN SCHREIBER, M. E.

In the July 22 issue of this paper the writer described the general arrangement and construction of the new car shops and houses which the Public Service Corporation of New Jersey is now erecting on the Plank Road, Newark. It has been the aim of the management that these shops should represent the most modern practice and engineering, not only in the buildings themselves, but in their equipment. Several of the shop tools are especially designed so that they will be of more than ordinary interest to those concerned in the maintenance of the rolling stock of street railway systems. The new equipment will embody apparatus to manufacture to a considerable extent as well as to replace the defective parts of the car. The company believes that a combination of such an arrangement with that of standardizing the parts which go to make up the rolling stock is the ideal method for satisfactory and economical maintenance.

Probably no other railway company has such a severe condition to meet as the Public Service Corporation, on account of the endless variety of both the mechanical and electrical equipment which it has, and which was brought about by the consolidation of so many independent roads. Not only have repairs up to this time been made at different points about the system, but many small parts were obtained from outside sources, so that the management has been not only a victim in a great part to high prices, but has also been handicapped to some extent by unsatisfactory deliveries. However, by the centralizing of the heavy repairs at the new extensive Plank Road shops, with its splendid equipment, the officials of the corporation expect to reduce very materially the cost of operating its 1700 cars.

THE TRUCK SHOP

The accompanying large drawing, which for convenience is

reproduced from the previous article already referred to, shows the plan of the machine shop building, where most of the repairs, exclusive of painting and woodwork, are to be made. Along the east side of this building are twenty-one pit tracks equipped with electric car hoists and air jacks, and one pit track arranged with a newly-designed wheel-grinding apparatus. The pit tracks are 80 ft. long, so that when a car body is jacked up over the pits there is ample room to run out the crucks for inspection and overhauling. The illustration on page 342 shows the pits, which are 60 ft. long. This is considered the practical length necessary to take care of the largest size cars in service and still have room in the pits so that the air jacks may be run clear of the car bodies. The pit walls are built entirely of concrete and are solid, and arranged so that they do not connect. Connecting pits were thought undesirable, for the reason that the space between generally forms a lodging place for grease and debris, and also because they are unpopular with the fire underwriters. The rails over the pits are fastened to ties at about 7-ft. 6-in. intervals along the length of the pit. The ties are anchored to the pit walls by 3/4-in. anchor bolts 2 ft. long, and extend across between tracks, leaving the pits clear. Four-inch pilasters are placed on the inside of the pit walls at the tie spacing. The pit walls, except at the pilasters, are on a line with the center of the rail. It will be seen that the space between pits was made to suit the driving mechanism of the electrically-operated hoists, and is only 3 ft. 6 ins. deep, while the pits are 4 ft. 6 ins. from the top of the rail to the floor line. The space between pits is covered over at the floor level with steel reinforced concrete.

Each hoist has four steel jack screws, which are shown in the diagram on page 342, and are 4 ins. in diameter and 8 ft. long. These screws travel up and down on opposite ends and sides of pits in a case made from a standard 5-in. wrought-iron pipe and filled with lubricating oil, and are installed beneath the floor of the space between pits. The jack screws are operated by cast-steel worm gears that are bushed with threaded brass shells and that rest on a casting with steel balls intervening. The whole forms a step bearing that in turn is bolted to a bed-plate into which is shrunk the casing for the jack screws. The bearing for the cut-steel driving worm is attached to the step bearing of the worm gear. Power for driving the worms is obtained from a Westinghouse No. 3 motor situated in the forward end of the pit, and is transmitted by means of 1 1/2-16-in. diameter shafts and mitre gearing. The worm shaft will have intermediate bearings about every 5 ft. along the length of the hoist. Reinforced concrete is also used to cover the ends of the pits occupied by the motor, similar to the space between the pits. Each of the jack screws has its upper end slotted to take the 12-in., 30-ft., 31 1/2-lb. I-beam that carries one side of the car. The bottom flanges of the I-beams are coped out so that the web will slip into the slot of the screw shaft. It will be understood by this arrangement that the hoisting mechanism is clear of the pits proper, which are left entirely unencumbered for the workmen. Each pit will also be arranged with a two-way switch and controller. One position of the switch sends a current into the controller for operating car hoist, and the other position makes use of current for running trucks out from under cars and for testing.

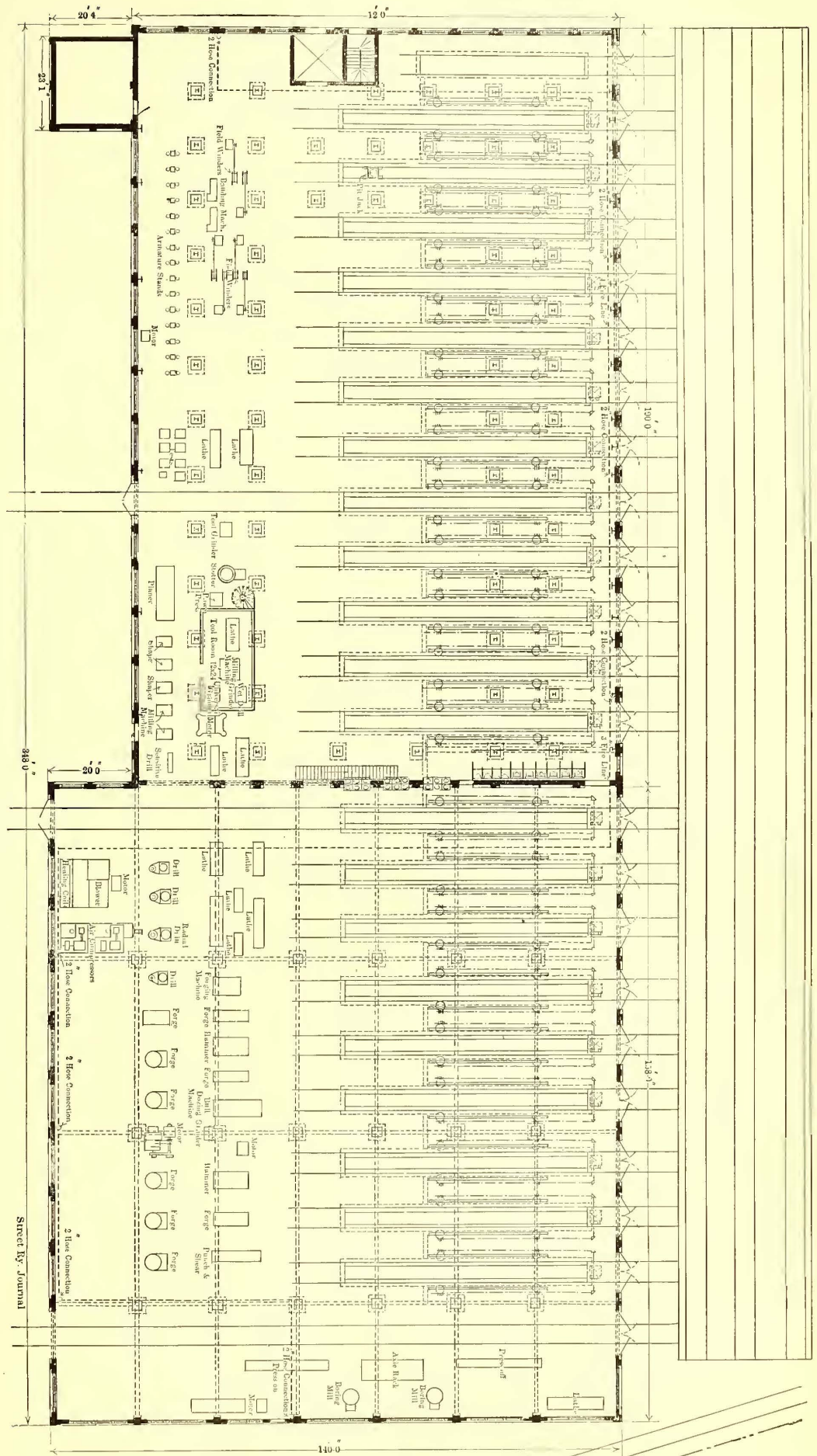
At present there are several hoists in use similar to the one described above, except that a sprocket chain is used for transmitting power from the motors instead of the shafts and mitre gears. The shaft driving is superior to the chain drive, inasmuch as the sprocket must cross the pits. In deciding to adopt a suitable hoist, overhead designs were considered, but none was found comparable with the jack screws under the prevailing conditions of single-floor shop. The important features of the hoist adopted are the following: First, it is safe; second, it is positive in its action; third, it is convenient and rapid; fourth, it has a low cost of maintenance; fifth, it takes up

practically no shop space. The Pittsburg Company has the contract to equip the twenty-one pits with the foregoing electric car hoist at a cost of about \$15,000. It may be of interest to state that the best figure that could be obtained for hydraulic hoists operating on a similar principle was nearly \$40,000.

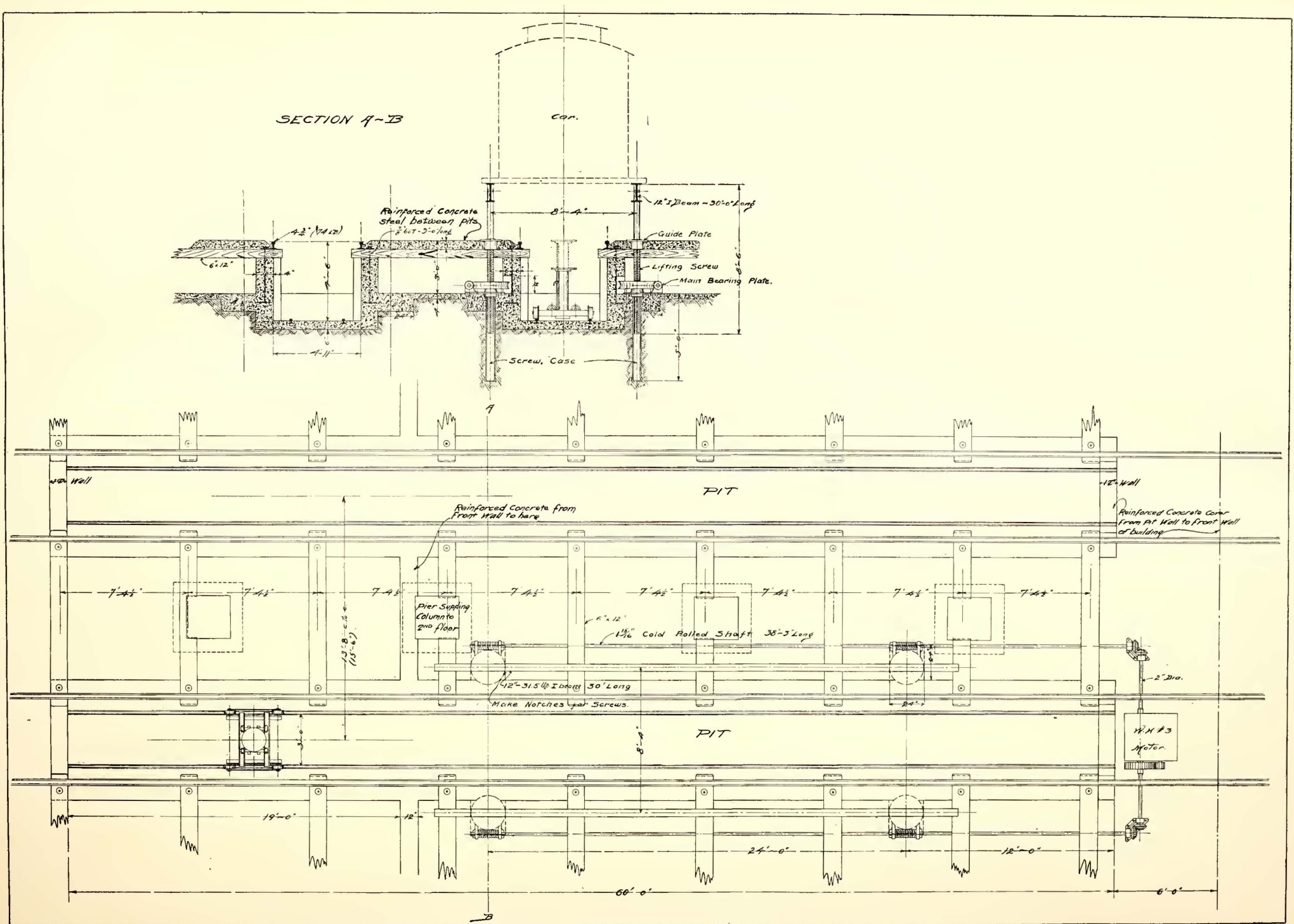
Each repair pit has a 3-in. T-rail track of 3-ft. gage imbedded in the concrete floor and extending along the whole length. This is installed to accommodate the pneumatic pit jack shown on page 342. The jack is constructed so that it moves transversely on a carriage, and the carriage runs at right angles to the latter direction along the pit track, so that the heavy parts suspended underneath the cars may be placed in position or easily removed. The pit jack can carry its load to one or the other end of the pit and be clear of the hoisted car. From the latter position the repair part may be transferred to the shop floor by means of self-supporting jib cranes that are to be placed at the west end of the space between pits, or the jib cranes may deliver their burden to any surface or overhead traveling device, so that the repair part is put into line for any department of the building. The pneumatic jack has the outside tubing 8 ins. in diameter, and the lift operates through a distance of 30 ins. Air is supplied to the jack by means of a system of 3/4-in piping. The American General Engineering Company, of New York, has the order to build twenty-one air jacks according to this design for approximately \$4,000.

One of the new machine tools of the equipment will be the wheel-grinding machine for the truing of flatted wheels without removing the trucks from the car body,

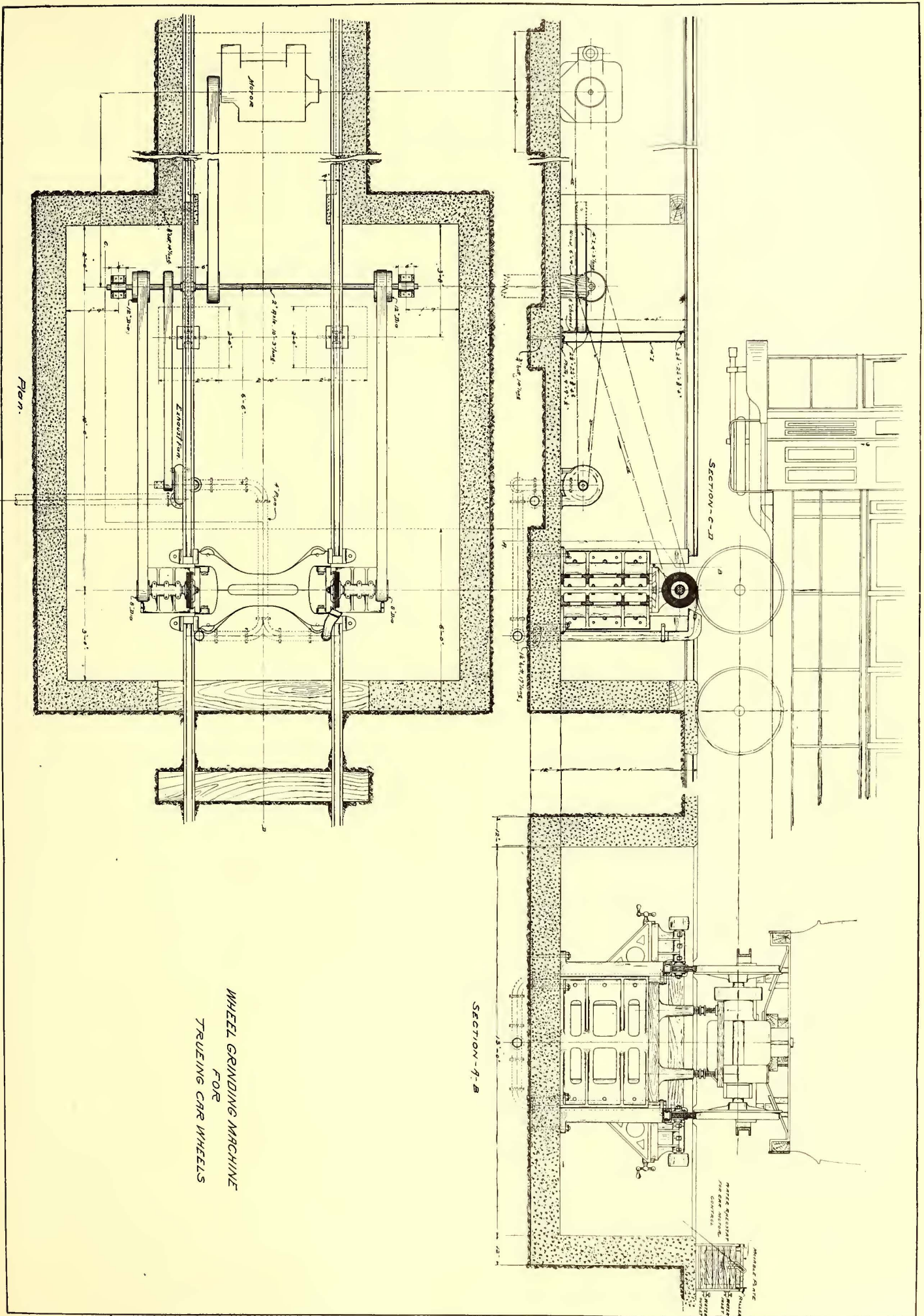
FLOOR PLAN OF MACHINE SHOP, NEW PLANK ROAD SHOPS



Street Ry. Journal



PIT HOIST WITH WORM GEAR FOR RAISING CARS AND HYDRAULIC JACK IN PIT, PLANK ROAD SHOPS



Plan.

SECTION-C-D

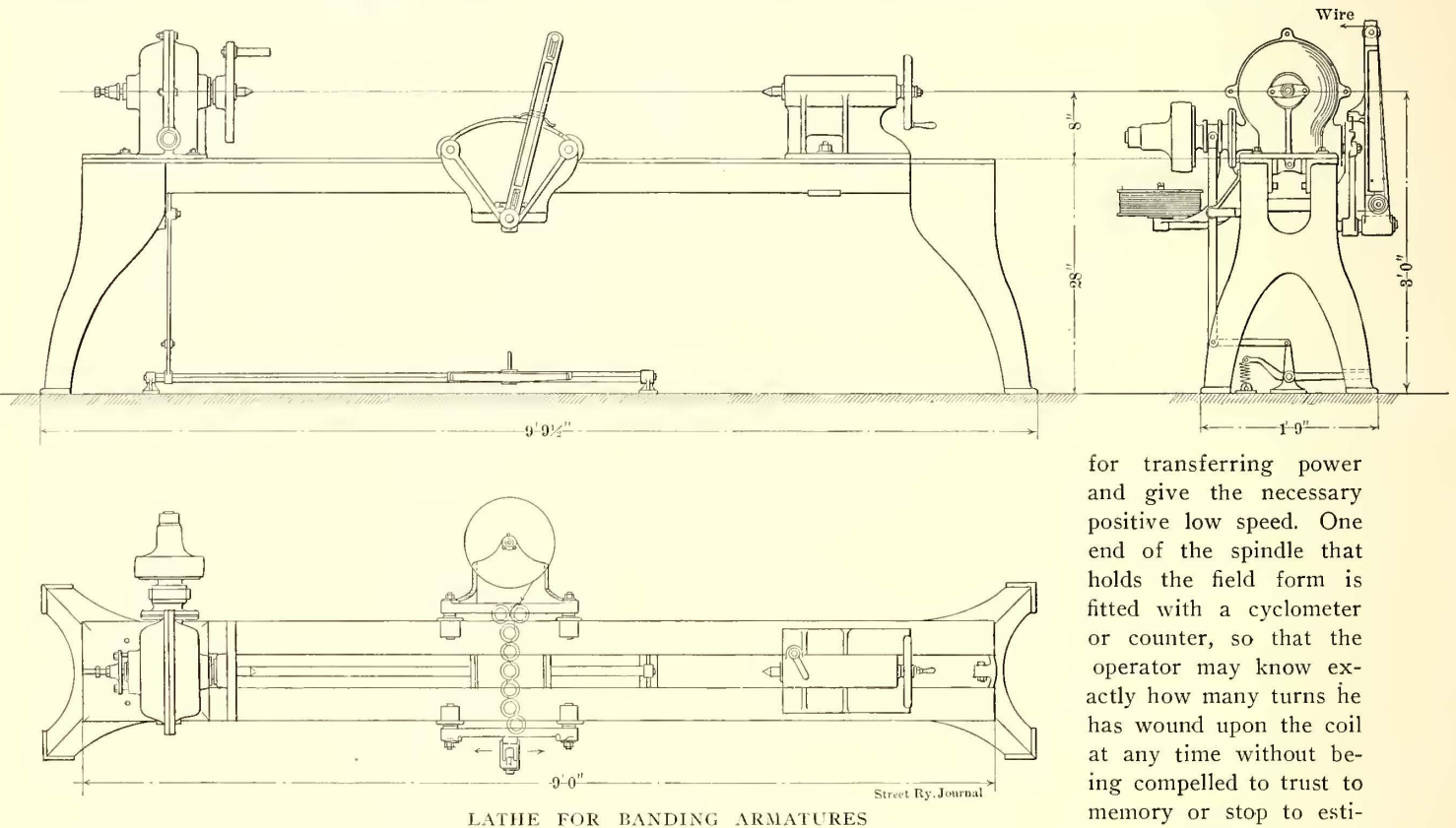
SECTION-A-A

WHEEL GRINDING MACHINE
FOR
TRUEING CAR WHEELS

WHEEL GRINDING MACHINE
FOR TRUEING CAR WHEELS

and which is illustrated on page 343. This wheel grinder has recently been patented by the superintendent of rolling equipment of the Public Service Corporation, and is to occupy the extreme north pit of the building. As may be seen from the drawing, a car may be run in over the pit, jacked up and the wheels trued down without any further arranging. Moreover, it is estimated that a pair of wheels may be gotten in shape every twenty minutes—that is, a car coming into the shop with a flat wheel will be turned out again O. K. in that lapse of time. A new wheel grinder is not only to be installed in the main shop, but also in the auxiliary or light overhauling shops, distributed over 550 miles of track. From the illustration it is plain that the longitudinal and vertical slides, giving two movements to the emery wheel on either side, are supported by a single cast-iron frame. This cast-iron frame also affords a firm bearing for the ends of the rails forming the track, as well as rigid and positive positions for the slides. Four foundation bolts fasten

The intention is to make this equipment as complete as possible. The small addition on the northwest corner comprises the oven and dipping room, the construction of which is to be entirely fireproof. One of the cuts shows the power field winders that are to be used. Six of these machines are already constructed and are working very satisfactory in the old shop. The 1½-in. spindle to which the form is bolted is driven by a worm and gear, which in turn receives its power by engaging a friction cone pulley that is operated by a foot lever. When the foot lever is released, the spindle instantly stops, because the lever spring causes a disengagement of the friction pulley, and also causes the disc of the clutch fastened to the worm shaft to bear against the disc attached to the worm-shaft bearing. The disc face of the clutch is surfaced with leather. The wooden frame of the machine is constructed to form a table with a top 2 ft. x 2 ft., which is very convenient to hold the operator's tools. The worm and gear with the pulley clutch form a desirable method



LATHE FOR BANDING ARMATURES

the cast-iron frame securely to the concrete in the bottom of the pit. The emery wheels are 14 ins. in diameter with 2-in. face, and are to be driven by two 4-in. belts from a countershaft at a peripheral speed of 5000 ft. per minute. The countershaft is connected by means of a 6-in. belt to a GE 800 motor. Four-inch I-beams are arranged to form a support for the countershaft bearings and to hold up the pit rails. A Buffalo Forge 4-in. exhauster is installed on the floor of the pit to carry away the emery and iron dust, when the machine is operating, through a system of piping, as shown. When a car is brought in to have flats ground down it is first jacked up to clear the wheels and the raised end is held in position by hooking chains on the side frames of the trucks. Then the 500-volt current is introduced into the motors by first passing it through a water rheostat, by which the speed of the flatted wheels can be regulated by varying the distance between the terminal plates. The car wheels rotate in an opposite direction to the wheel grinder. The wheel grinders are manufactured by the Columbia Malleable Iron & Machine Company, of Brooklyn.

THE ELECTRICAL DEPARTMENT

From the plan on page 341, it will be seen that the electric work occupies the space on the northwest side of the building.

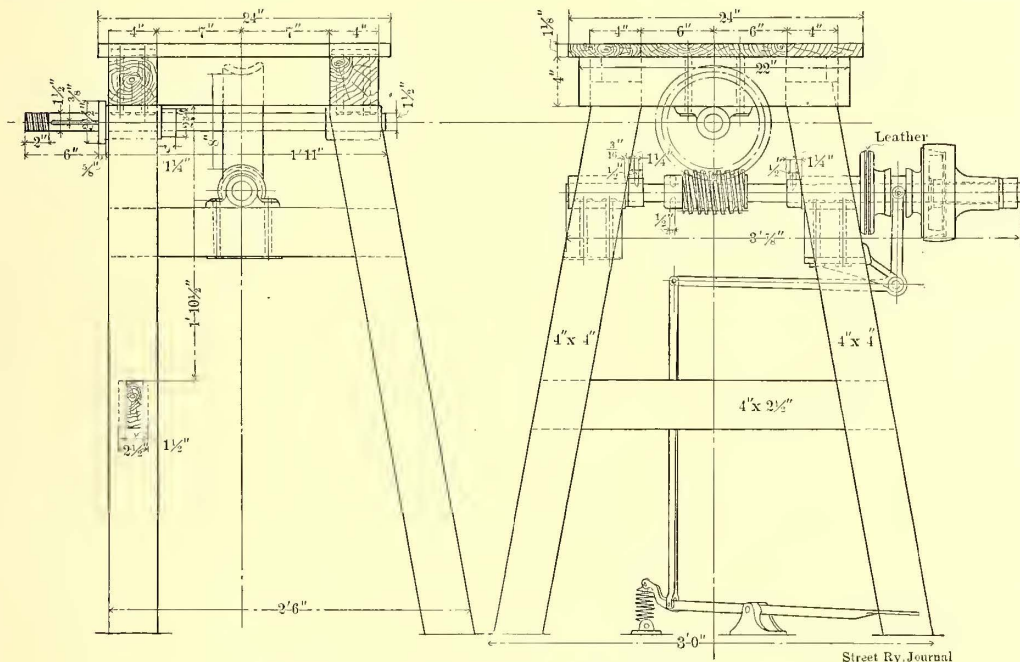
for transferring power and give the necessary positive low speed. One end of the spindle that holds the field form is fitted with a cyclometer or counter, so that the operator may know exactly how many turns he has wound upon the coil at any time without being compelled to trust to memory or stop to estimate.

Another illustration shows the patent power armature bander, which is entirely new. Two of these machines are now being assembled at the old shops, and were built by the American General Engineering Company, of New York, according to drawings submitted. The frame of the machine consists of four cast-iron legs and two 4-in. x 4-in. x ½-in. angles placed back to back and 4 ins. apart. The tops of the angles are planed and constitute the runs for the carriage, one side of which is constructed with a spindle to hold a reel of banding wire. When an armature is swung into the machine for banding, the wire is led from the reel alternately over and under 2-in. diameter brass sheaves which are attached to the lower side of the carriage frame, and which, when the machine is in operation, give the required tension to the banding wire. From the tension sheaves the wire is brought to the top of the feeder arm that is pivotally carried to the carriage frame on to the armature. As the armature turns, the feeder arm will automatically deliver the band wire in place. A spring, forged of ⅛-in. x ¾-in. spring steel, regulates the movement of the arm as the latter slides along its radial path over the top of the carriage frame. The power for turning the headstock of the bander is transferred by a worm and gear and through a friction cone clutch pulley similar to that described for the field

winder. The tread that operates the lever for stopping and starting is situated near the center of the machine, so that the operator may always be over his work. A worm gear case affords a receptacle for lubricating oil.

There will be fifteen pair of new armature stands in the new equipment. Each will consist of a cast-iron column flared at the bottom for a base, and with the top of the column terminating in a bearing box for a pair of twin rollers. The stand is arranged with an adjusting jack screw so that its height may be varied to suit the operator, and also has a slot pocket to which a cast-iron shelf is fixed to form a table for the winder's tools.

All the soldering irons will be heated by No. 2 American Gas Furnace Company's soldering iron heaters. A 3-in. gas connection from the city main is to be brought into the building, and 1½-in. branches are run overhead, from which drop connections are taken off for the furnaces near the armature stands. Air will be supplied in conjunction with the gas at the soldering furnace from the compressor lines through a reducing valve. Gas furnaces were installed in the old shop



DETAILS OF STAND FOR WINDING FIELD COILS

about a year ago, and have proven desirable on account of cleanliness, convenience and efficiency, and are more economical in the end than a crude fuel furnace.

The general plan on page 341 shows the location of the motor-testing apparatus, just south of the armature stands. Here all the armatures are tested before going out by placing them in test frames and imposing a generator load. This department will also be equipped for making transformer tests on fields and armatures.

The balcony of the machine shop building has a space 28 ft. x 42 ft. reserved for a taping or insulating room. This department is located on the balcony, as the work is to be carried out by girls, and materials can conveniently be transferred to and from the electrical department below by means of a 6-ft. x 6-ft. elevator. Moreover, the elevator landing is convenient to the oven and dipping room.

The oven will be heated by electricity, the heaters being placed in a pit underneath the floor. The dipping room and oven are separated by tin-covered, overlapping sliding doors, and are equipped with armature and coil hangers.

THE MACHINE SHOP

The machine work proper occupies the central portion of the west part of the building, and has been carefully designed

according to modern ideas. A number of machine tools that are in use at the Plank Road and West Hoboken shops will be reinstalled, and several new tools are to be added to make this particular department complete. It is worthy of note that a complete installation of independent motor-driven tools was not in favor with the management on account of past experiences. It was found that as the different machines required different sized driving motors, the maintenance of these motors interfered with the progress of the shop work, because, often in cases of break-downs of the motor, the particular part that required renewal was not at hand. It was usually necessary to go to considerable trouble to replace the damaged part, which involved the sacrifice of having a much-needed tool lying idle. Of course, this inconvenience could be obviated by having enough repair parts in stock, but the scheme is expensive as well as impractical with such a variation of sizes as is called for in the machine equipment of a street railway shop. Accordingly, it was decided to operate the machine tools in gangs and with overhead shafting. Each gang of tools is to have an independent 500-volt motor, and inasmuch as each

driving motor may be arranged to pull approximately the same load, all the driving motors will be about the same size. The interchangeable repair parts will thus be reduced to a minimum. However, the isolated machine tools are to be independently driven. All the shop motors will be 500 volts, and are to work off the regular railway circuit. Maxwell, Manning & Moore, of New York, have the order for most of the new tools, and some that are already on the ground are: Two 48-in. radial drills, one 4-spindle drill, two 16-in. engine lathes, one V. & O. punching press, two milling machines, one Barnes tool grinder, one special grinder, one cutter and reamer grinder, two metal saw benches and two 2-in. x 24-in. turret lathes.

The tool room is situated near the center of the shop, under the shop superintendent's office, and will be equipped with a Warner & Swasey engine lathe, a No. 2 Hendley milling machine, water tool grinder, complete with 24-in. emery wheel, and one special duplex grinder with surfacing attachment.

FORGE SHOP

The hand forges adopted are No. 8 T Buffalo down-draft forges, complete with down-draft exhaust hoods. These forges will be operated by a 15-hp d. c. motor, driving a 5-in. Buffalo blower and a 48-in. Buffalo exhaust through a system of underground ducts. Besides the Buffalo forges, there will be four Ferguson oil furnaces, furnished by the Railway Materials Company, of Chicago. The latter will be operated for the power hammers, bulldozer and bolt machines. The oil furnaces are very desirable for heavy forging work on account of convenience, ease in regulation, cleanliness and capacity. The Ferguson furnaces are cold blast and require about 8 ozs. at the fire. Besides the Bradley hammers and shears obtained from the old equipments, a new No. 7 Williams & White bulldozer and an Ajax 2-in. heading and forging machine will be installed.

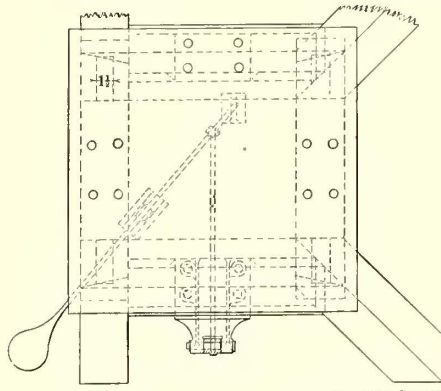
WHEEL DEPARTMENT

A space in the south end of the building, as shown in the illustration, is reserved for wheels and axles, and the inter-

vening space between the south wall and track is to be equipped with straddle tracks for a wheel platform. Generally this department is fitted up with two boring mills, an engine lathe, axle rack, wheel grinder and two Schafer 36-in. 200-ton wheel presses.

COMPRESSED AIR

Compressed air is to be very extensively used throughout the repair work, and it is the intention to run a series of air-pipe lines all around the building from the two air compressors located, as seen in general plan, near the forge shop. From the pipe lines flexible hose connections may be had to supply the air chisels, drills, riveters, hoists, etc. The air tools are to be of the Chicago Pneumatic type. The two new air compressors, complete with two 18-in. x 36-in. air tanks, are ordered from the National Electric Company, of Milwaukee, and are to be of the motor-driven two-stage type, with a capacity of 100 cu. ft. of free air per minute, cylinders 8½ ins. x 8 ins., 150 r. p. m. and 90 lbs. pressure, with electric and water governors.



PLAN OF STAND FOR WINDING FIELDS

ins. wide, running across the front of the building and under the tracks. It is covered with a perforated cast-iron top and has an overflow connection from the duct into the street sewer, and also a catch basin with an area 4 ft. x 4 ft., so that dirt from the cars will collect in one place. The catch basin may be cleaned out from time to time, thus assuring the concrete duct from filling up with debris. The floor of the building, including the rails, is graded from the front to the duct, which is situated 30 ft. back from the entrance doors. The floor and rails are also graded toward the duct from a line at right angles to the tracks and 30 ft. back of the duct. The edge of the duct is carefully protected by a 2-in. x 2-in. x ¼-in. angle-iron, so that in removing the perforated cast-iron cover the concrete floor will not be chipped away.

There will be a 2-in. gas connection into the building, with a main and branch pipe carried along the ironwork of the roof; also 1-in. drop connections between every pair of tracks. The latter will be used for supplying gas through a rubber hose to a burner for burning off paint and varnish from the car. An air supply will also be arranged to mix with gas for the burner.

It is a well-known fact that convenient and efficient scaffolding is of prime importance in a paint shop, so several different designs were considered. The scaffold decided upon will be supported by 5½-in. x 3½-in. posts placed along the center of the space between tracks every 16 ft., and supported on the top by the bottom chord of the roof trusses. A 1-in. x 10-in. truss plank scaffold will be arranged to move up and down between the posts, and be operated with a chain and light cast-iron shears, attached to the ends of the planks and the sides

ERECTING SHOP AND MILL ROOM

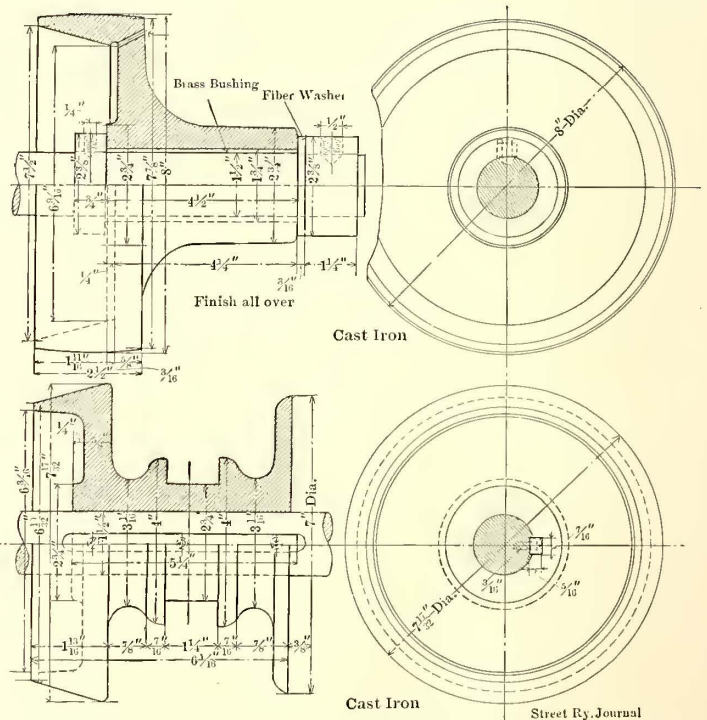
There is no especial departure in the way of equipment for the new mill room, although it was carefully laid out for general convenience in handling material and for the workmen. The equipment for the present will be almost entirely obtained from the old Plank Road and West Hoboken shops. The heavy machines, such as rip saws, car tenoners, four head planers and shapers, will be located on the side of the mill room nearest the erecting shop. Ample room is to be left around the tools, so that workmen are not hampered in handling swinging stock of large dimensions and weight, such as sills, framing, etc. There will be a pattern shop in connection with the mill room, which will be equipped with modern tools.

A power conveyor is to be installed between the mill room and the central boiler house, so that sawdust, shavings and waste stock may be consumed under the boilers.

A dry kiln, situated on the south side of the mill room, is just large enough to accommodate a flat car loaded with lumber. The dry kiln has doors on each end, so that a car can be taken in or out by the transfer table between the erecting and machine shop, or by the run-around track that has connections to any part of the yards. The kiln is equipped with steam coils, supported by I-beams under the track. Liberal radiation is provided so that at least a temperature of 125 degs. F. may be obtained. Thermometers are to be built into the side wall of the kiln, so they may be conveniently read from the outside, and there is a careful layout with vents and slides for a close regulation.

PAINT SHOP

The paint shop is fitted up with a car-washing arrangement, using rain water, as was fully described in the previous issue of the STREET RAILWAY JOURNAL. It may be stated that a washstand was put in each of the nine entrance tracks, so that it is impossible to bring a car into the shop for painting without first passing over them. This arrangement aids the assurance of the car being washed down. When the wash house is in a remote corner, as is often the case, there is a tendency of the workmen to avoid this important procedure. The washstand consists of a concrete duct 22 ins. deep and 12

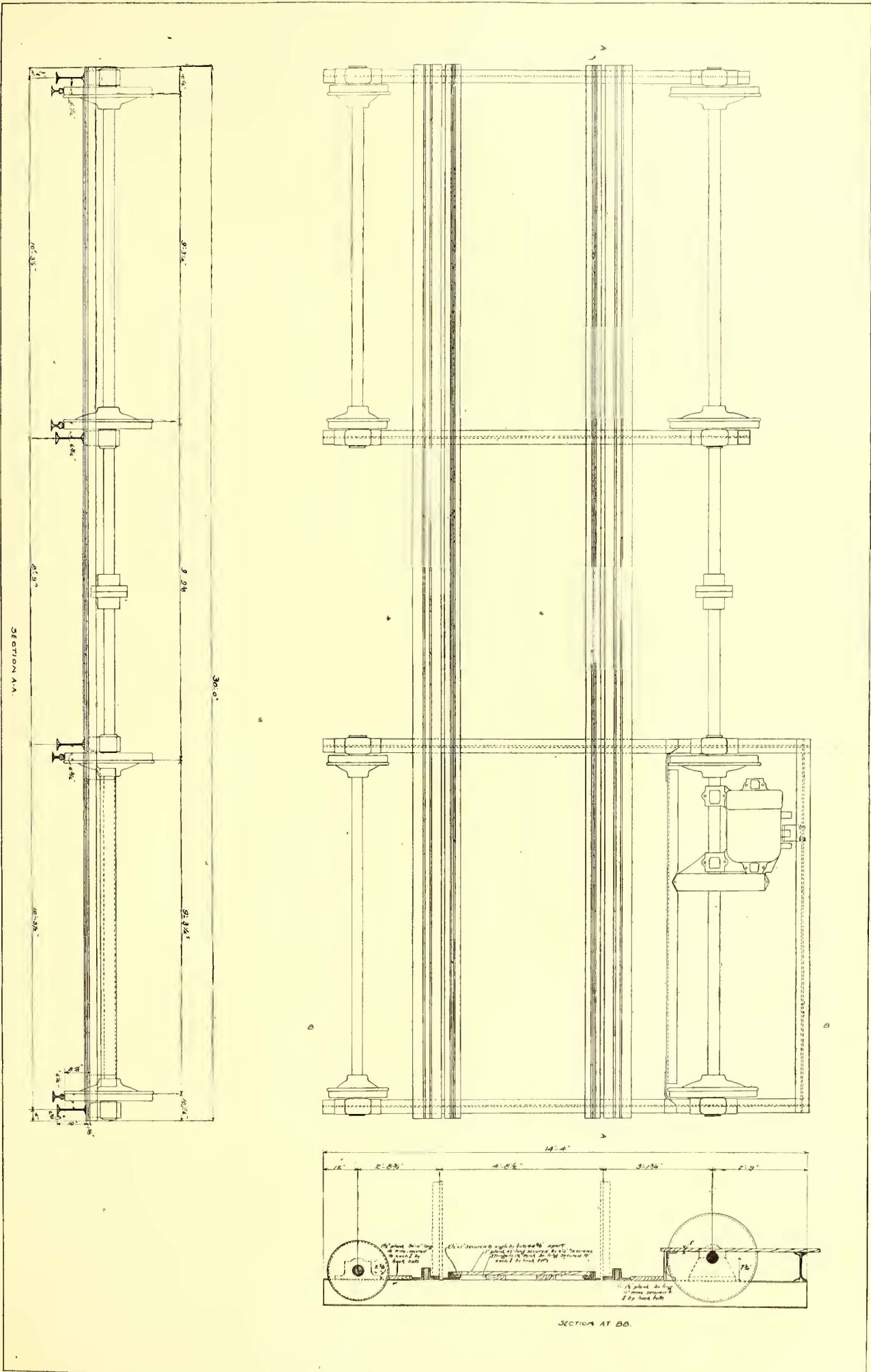


DETAILS OF CLUTCH AND BEARING FOR FIELD WINDING MACHINE, PLANK ROAD SHOPS

of the posts. The ends of the scaffold between each pair of posts will terminate into a neat cast-iron guide that fits snugly one-quarter way around the post.

The finishing room was designed of ample size for handling sash, doors and small parts that are stripped from the car body. Here will be located a zinc-lined washing vat and sash racks run at right angles to the tracks. Between each pair of sash racks a table will be provided with revolving frames, so that the sash may be laid upon a frame and turned in any position convenient to the workman. The paint storeroom is constructed entirely independent of the shop proper, and of non-

TRANSFER TABLE, PLANK ROAD SHOPS



combustible material. An ample amount of north light was carefully provided for so that all the colors could be satisfactorily mixed.

SHOP ACCOMMODATIONS

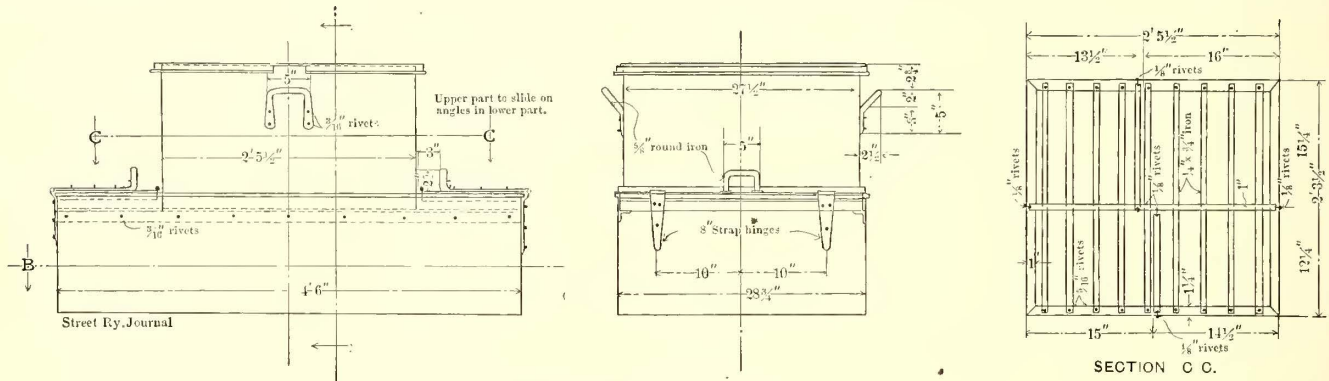
An important feature of the repair shops will be the excellent accommodations for the men. The lavatory, wash basins and lockers are to be of the best. The plumbing is all open work, with nickel-plated piping and slate stalls, and the entire outfit of this line is very acceptable. There will be in all 400 lockers, which will be installed in the shop buildings, and are to be furnished by Merritt & Company, of New York. The lockers will be 18 ins. deep by 12 ins. wide and 6 ft. high, with the bottom of the lockers 6 ins. from the floor. The legs will be a continuation of the angle-iron corners, and will set in neat cast-iron shoes. The sides, backs and tops of the lockers are to be solid steel, and the doors, bottoms and shelves will be expanded metal with 1/8-in. mesh. Each locker is to be fitted with five clothes hooks and a shelf 12 ins. from the top, and the door is to be equipped with three malleable-iron hinges, a three-way latch, and be arranged so they may be fastened with a Yale lock or a padlock. Especially designed lockers will be placed between the tracks in the truck shop. These are a combination clothes locker, tool and waste box. One of the illus-

6000 lbs., and erected between tracks near the ends of pits, and intended to lift the repair parts taken from beneath the car to the shop floor. Each pit is also to have a portable air jack, as described in the main shop equipment. A new air compressor and storage tank, similar to the ones already described, is also provided. The space in the rear of the shop is reserved for the machine tools, which consist of an engine lathe, a drill press, emery wheel, shaper and grindstone. There is also a Buffalo hand forge. Jib cranes with chain blocks are installed near the machine tools for convenience in handling material.

A. B. DUPONT'S REPORT ON A CHICAGO MUNICIPAL STREET RAILWAY SYSTEM

A. B. Du Pont, who was recently employed by Mayor Dunne, of Chicago, as a special expert adviser in traction matters, has submitted to the Mayor a report on the probable cost and earnings of a system of municipal street railways comprising 264 miles of track on streets where the city officers claim franchises have expired, and in a few cases on streets not now occupied by tracks.

The following extracts give the more important features :



TANK FOR DRAINING WASTE

tration shows the oil filter and waste tank adopted for the truck shop.

Time clocks are to be placed in every department, and electric gongs connecting to a clock in the timekeeper's office will announce the opening and closing of the working hours.

A dining room and kitchen are to be equipped on the west side of the balcony, so that employees may obtain their meals at the works.

A reading room 42 ft. x 28 ft. is also to be constructed on the west side balcony that will be supplied with mechanical and technical papers and magazines and other current literature.

The headquarters of the superintendent of rolling equipment, with clerks' offices and drafting room, is located on the northeast balcony. From these offices there are to be private telephones and gongs to all the different buildings and departments. Here also will be the emergency gong connection for the auxiliary fire-alarm system.

THE AUXILIARY SHOP EQUIPMENT

It may be of interest to mention the standard equipment of the new auxiliary overhauling shops that are to be operated in connection with the Plank Road shop. There are five of these to be equipped about the system, and are located at Montgomery Street, Jersey City; Market Street, Paterson; South Orange Avenue, Newark; Milltown and Westfield.

The Montgomery Street shop is about completed, and has five tracks with pits 100 ft. long. A low pit transfer table travels across the front of the shop, and is shown in detail in one of the illustrations. A wheel grinder, especially designed and already described, is to be installed in one of the pit tracks. There will be five jib cranes with air hoists, designed to lift,

The system is to be so designed as to be readily extended as the franchises expire on contiguous streets, so as to embrace the entire city.

In the operation of these railways the lines running approximately north and south, in the North Side and the South Sides, respectively, and east of Halsted Street, should be connected together and operated as through routes through Wabash Avenue.

The diagonal lines running approximately southwest from the central portion of the city should be connected to the diagonal lines, and to lines that are established approximately diagonal, in a generally northwest direction from the central portion of the city, and operated as through routes through Dearborn Street.

The lines on the West Side that run east and west should not at present be extended east of Dearborn Street.

Such an arrangement of routes would avoid grade crossings and do away as much as possible with congestion in the heart of the city. I would recommend such a system of routing until such time as proper underground terminals would be furnished for the through routes above referred to; in which event these West Side lines could be properly operated to Wabash or Michigan Avenue. All other lines should be operated as cross-town routes, and transfer passengers to the routes above mentioned.

Transfers should be made at all intersecting points from any one route to any other route, not, however, including a transfer to such a route that would enable a passenger to return for one fare to approximately the point he started from. And for the sake of transfer, Dearborn Street, and Wabash Avenue in the central portion of the city should be considered intersecting points with all east and west lines that only reached Dearborn Street.

This system of railways should also be required to issue and receive transfers from the other street railways in Chicago, or, better still, on all lines that are continuations of the lines of the designed railway it should exchange its cars with the cars of the old railway at the connecting point, so that the passengers shall have a through ride to their destination, and only the motorman and conductor transfer. The condition of the present street railway companies after the construction of the proposed line will make it

necessary for them to exchange transfers to profitably conduct their business.

The fact that there exists an immediate necessity for the improvement of the street railway situation and the complete solution of the problem necessitates the construction of general terminal subways, which should not be done until the rights of the city and the street car companies are settled as to the streets now occupied by them.

Temporarily, and until such time as general terminal subways

report, I can, after an investigation of conditions below the surface of the streets, prepare a detailed report and submit plans and specifications.

After careful comparison of the earning capacity of the designed system and remaining parts of the Chicago City Railway and the Union Traction Company at 5-cent fares and the transfers above indicated, I am of the opinion that should the designed system be put in operation for the year 1908, its gross earnings will not be less than \$12,000,000.

Of course the above estimate is on the supposition that the city will not allow any invasion of the territory of the designed system.

The cost of operation, including maintenance and depreciation, but not including taxes, for the first five years of the designed railway should not exceed 55 per cent of the gross earnings.

After that time, owing to the track and equipment becoming older, this cost would probably equal 60 per cent of the gross earnings.

I estimate the financial results from the operation of the designed system with 5-cent fares and transfers as indicated, as follows:

FOR THE YEAR 1908

Gross earnings	\$12,000,000.00
Operating expenses, including maintenance and depreciation, but not taxes	6,000,000.00
Net earnings from operation, 45 per cent	5,400,000.00
Interest on cost, 5 per cent on \$25,000,000.....	1,250,000.00
Surplus	4,150,000.00

FOR THE YEAR 1913

Gross earnings on annual increase of 5 per cent of earnings of 1908	15,315,378.75
Operating expenses, including maintenance and depreciation, but not taxes, 60 per cent	9,189,227.25
Net earnings	6,126,151.50
Interest on first cost, \$25,000,000, 5 per cent	\$1,250,000.00
Interest on \$3,000,000 additional cost to provide for increase in traffic at 5 per cent	150,000.00

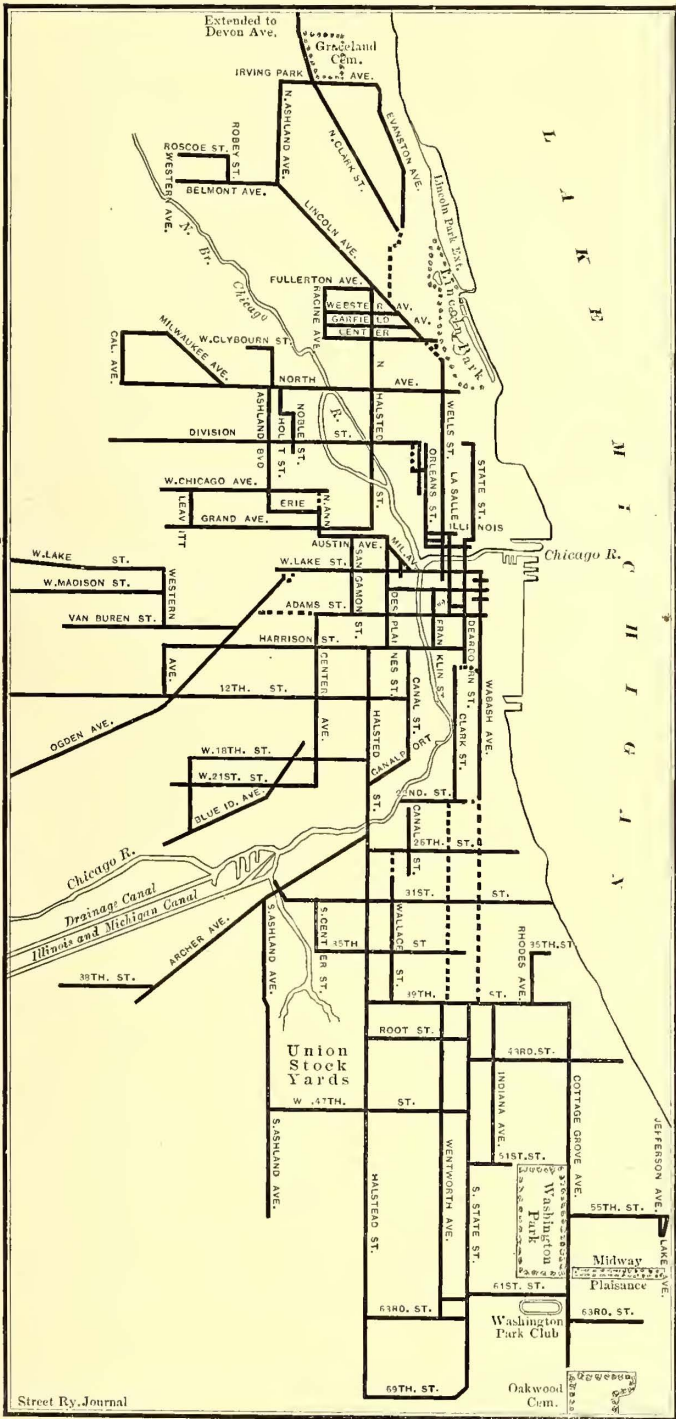
Total charge	1,400,000.00
Total surplus	4,726,151.50

I am advised by counsel that there is very little doubt of the right of the city to construct a line on North and South Clark Streets, on North State Street, and on Milwaukee Avenue.

If these streets are available it would add about fourteen miles to the system, as herein set out, and would make a further cost of \$1,600,000. This addition of mileage in these streets would increase the earnings \$1,000,000 per year, with the same percentage of profits as herein indicated.

DETROIT UNITED TO GIVE PRIZES FOR SHORT STORIES BY CHILDREN

The Detroit United Railway announces the opening of a short story contest to the children regularly enrolled in the schools of Wayne, Oakland, Macomb, St. Clair and Genesee Counties, through which the lines of the company pass. The contest will be open a sufficient length of time, about nine weeks, to give every boy and girl a chance to become settled in their year's school work and give proper time to their best possible composition. There are to be three prizes, the first of \$25, the second of \$15 and the third of \$10. The theme of the story is to be confined to some incident, experience or anecdote descriptive of travel on the electric cars, either Detroit city or interurban lines. No story must be more than 2500 words or less than 1500 words in length. The composition must be absolutely original. The contest will close at 6 p. m. Saturday, Nov. 4, 1905. All compositions must have been mailed or delivered to John H. Fry, 12 Woodward Avenue, Detroit, before that hour. A committee, consisting of three of Detroit's most eminent writers, authors or newspaper men, will pass upon the manuscripts submitted, and select those which in their opinion show the greatest literary excellence, originality and style. This committee will be announced later. It is planned to publish the work of the first prize winner, and possibly all three winners, in the daily newspapers. It is the aim to arouse school children's interest in literature.



PROPOSED MUNICIPAL RAILWAY FOR CHICAGO

are built, I recommend that the overhead trolley system be extended to include the center of the city, thereby saving the excessive waste that would be entailed by the premature construction of the electric conduit system. In case there should be any delay in getting possession of any connection at the time needed, a subway can be constructed to make such connection, and can be so designed as to be a part of a permanent subway system.

The cost of construction of the 264 miles of track above indicated will not exceed \$25,000,000. Such a sum, besides constructing the railway complete, will provide ample power and cars to take care of the riding public.

I am not prepared at the present time to estimate the cost of subway construction in Chicago, but if it is desired in my final

THE OHMERGRAPH TRANSFER-ISSUING MACHINE

The general demand and necessary adoption of the transfer system has grown beyond all calculation. The growth has been so widespread and to such enormous proportions that it has to be reckoned with by every street railway manager in the country. The value of a transfer and its necessity are too well known for comment, and the abuses following its introduction



TAKING A TRANSFER TICKET FROM MACHINE

have more than kept pace with its good features. These abuses are so generally practiced that managers are continuously conferring with one another, and the subject is discussed at every meeting of railway associations. The transfer seems to be supreme, and the conclusions are always practically no conclusions at all; the problem has continued beyond solution. At the time of its issue the transfer should be accurately punched to fix the date, the time by hours and by fractions of hours, but when the traffic is more or less congested, it is impossible for the conductor to collect his fares and issue transfers with the proper limitations. He must either collect his cash fares and issue transfers with the limitations punched as best he can, or properly punch the transfers at the expense of not getting some of the cash fares.

John F. Ohmer, vice-president and general manager of the Ohmer Fare Register Company, of Dayton, Ohio, has invented a device to solve this most perplexing problem. It is a small machine which is called the "Ohmergraph." This machine is worn on the side or chest of the conductor, and is so light that its weight is scarcely perceptible. It will perforate the month, the day, the direction, the hour, the minute (by fractions of an hour), and it issues and records each transfer in less time than the conductor could place his hand in his pocket for a pad of transfers. The machine is enclosed within an aluminum case, and contains transfers put up in rolls of 200 and 300 each. The transfers are consecutively numbered in the usual way and checked out to the conductor by the consecutive numbers, and also by the register record. The operation requires one hand only of the conductor, and the transfer is properly punched, issued and recorded in one operation by the movement of a single lever.

Two of the illustrations show transfers before and after issue. It will be observed that the matter is printed transversely across the paper and can be read without turning. The first perforation is shown in the top column at 12; the next under

minutes at 15; the next, on the same transverse parallel, punches out the direction, "N;" the next perforation, "P. M." Under the word "Days" are figures from 1 to 11, and then a cipher. It will be observed that 5 is punched for the fifth day, and the last perforation on the transfer, as shown, indicates March. The figures 1, 2 and 3 on the third transverse column are used for indicating the days in excess of the 11th. For the 12th day, for instance, the figure 1 would be punched with the figure 2 directly below the 1. On the 22d day of the month the next figure 2 would be perforated, and on the 30th the next figure 3 and the cipher in the next column below would be perforated. It is impossible to punch and issue transfers without recording them in the machine. From a sanitary standpoint the innovation should be highly commendable and popular with the public, as there is no chance to contaminate the transfer with dirty money, tobacco, etc., carried by the average conductor.

The transfers will be printed in different colors, denoting special lines or streets from which they are issued. An audible indication (bell ring) is the accompaniment to each transfer issued, and the number of bell rings must indicate the number issued. Under these circumstances the conductor would not dare to issue surreptitiously more transfers than are legitimately required by passengers. The perforators for the month and day are concealed and are not accessible to the conductor. The punches controlling the hours, the minutes and the direc-

00113												
OHMER FARE REGISTER CO.												
DAYTON, OHIO. U. S. A.												
John F. Ohmer, V.-Pres. & Gen. Mgr.												
Issued by JEFFERSON AVE.												
Examine Your Transfer, as the same will NOT be accepted unless properly punched.												
				HOURS								
1	2	3	4	5	6	7	8	9	10	11	12	
Minutes	TRANSFER.			Direction								
15	30	45	Good only on first connecting car on date, direction and airtime punched in margin as shown.			N S E W						
	Subject to rules of this company.			A P			Day Night					
	1	2	3	DAYS								
	1	2	3	4	5	6	7	8	9	10	11	0
Days from 1st to 11th are punched here; from 11th to 31st with figures 1, 2, 3 above this row.												
JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	

00007												
OHMER FARE REGISTER CO.												
DAYTON, OHIO. U. S. A.												
John F. Ohmer, V.-Pres. & Gen. Mgr.												
Issued by JEFFERSON AVE.												
Examine Your Transfer, as the same will NOT be accepted unless properly punched.												
				HOURS								
1	2	3	4	5	6	7	8	9	10	11	12	
Minutes	TRANSFER.			Direction								
15	30	45	Good only on first connecting car on date, direction and airtime punched in margin as shown.			S E W						
	Subject to rules of this company.			A P			Day Night					
	1	2	3	DAYS								
	1	2	3	4	5	6	7	8	9	10	11	0
Days from 1st to 11th are punched here; from 11th to 31st with figures 1, 2, 3 above this row.												
JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	

SPECIMEN TRANSFERS BEFORE AND AFTER ISSUE

tion are available to the conductor, and can be set in an instant to the required time. In operation it will only be necessary for him to move the hour punch once an hour, the minute punch once in fifteen minutes and the direction punch simultaneously with the issuing of the transfer.

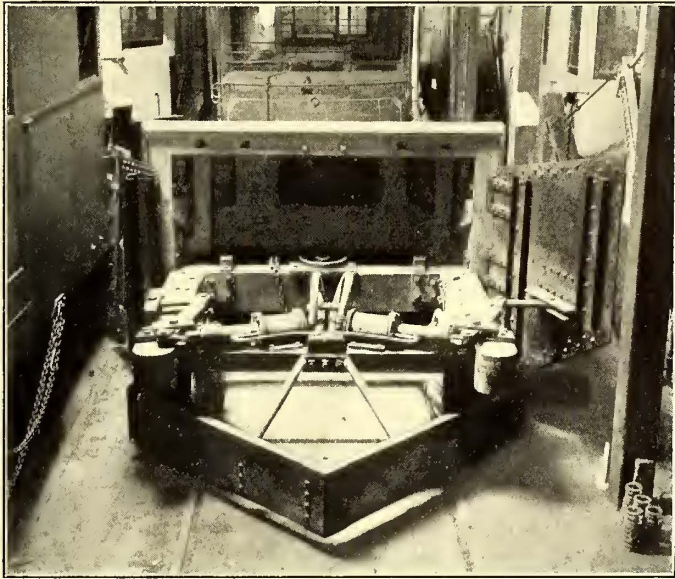
Mr. Ohmer's company has for the past eighteen months been preparing to manufacture the Ohmergraph on a large scale. The first machines will be ready to exhibit at the forthcoming American Street Railway convention, which assembles in Philadelphia this month.

NOVEL SNOW-PLOW

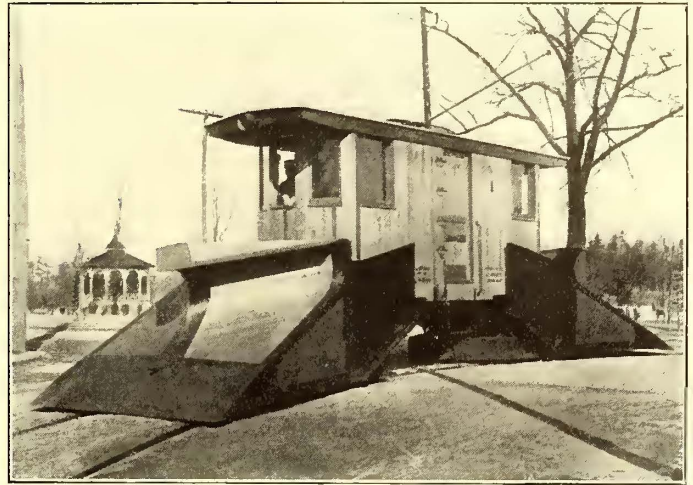
The accompanying illustrations show a novel type of snow-plow which has been in use for the past two winters on the lines of the Worcester Consolidated Street Railway and for one winter on the Boston & Worcester Street Railway. As will be seen, one feature of the device is the use of a square or shovel-nose plow, consisting of an incline built straight across the track from but a few inches above the rail in front, and

on the Worcester Consolidated, the equipment consisted of four GE 67 motors with K-6 controllers, while that used by the Boston & Worcester was equipped with four GE 57 motors with K-14 controllers. This plow, however, is designed to take motors as heavy as 125 hp. The wings are of boiler plate and are controlled pneumatically.

On the Worcester Consolidated the inventor states that the plow made an excellent record. With its light equipment it maintained a speed of over 8 m.p.h. for miles through snow that averaged from 1 ft. to 3 ft. in depth, frequently taking side-hill drifts 3 ft. to 5 ft. on the high side. At a speed of from 15 m.p.h. to 20 m.p.h., the snow would be thrown from 20 ft. to 30 ft. from the track and over fences and stone walls.



FRONT VIEW OF SNOW PLOW, SHOWING PNEUMATIC CYLINDERS FOR OPERATING THE WINGS

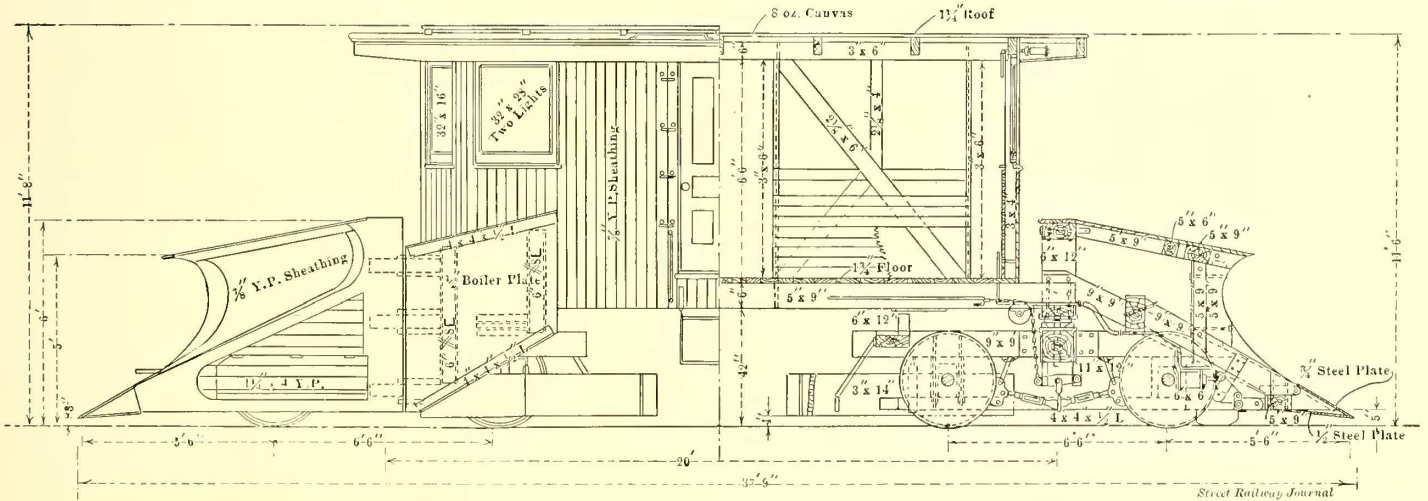


RADIAL SNOW PLOW COMPLETE

extending far back, at an angle of 30 degs., above and to the rear of supporting wheels, and a moldboard, either divided in the middle or extending entirely across the incline, and located some distance back from its front edge.

In fighting snow it has worked continuously for twenty-four hours at a stretch, yet never was stalled, derailed or disabled.

Two men are all that are needed to operate the plow, though eight have ridden in it without discomfort. The body is



CONSTRUCTION DETAILS OF RADIAL SNOW PLOW.

To adapt this style of plow to electric railways having many curves of short radius and frequent sudden changes of grade is the feature upon which the inventor, W. E. Wilder, of Worcester, has been granted a patent. The plow portion, instead of being mounted on the usual car body, is carried on and forms a part of the truck. It also substantially covers the end of the body, which terminates practically at its point of support on the trucks, thereby allowing the plows to turn with the trucks and clear the rails, even on curves of 25-ft. radius.

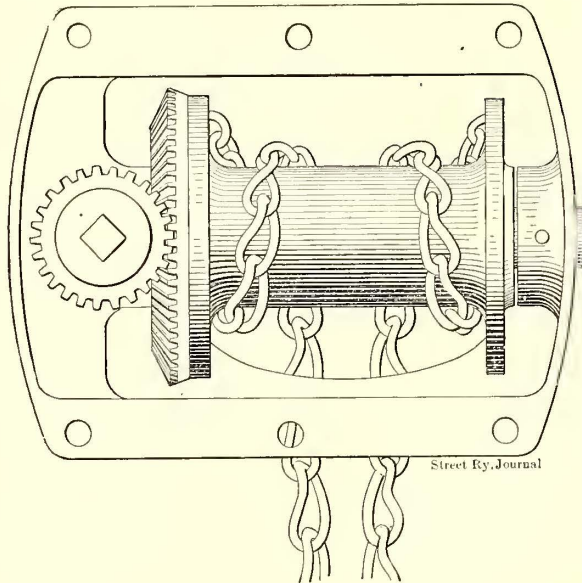
sheathed inside and out, and the windows have double lights, preventing frost from forming on them, and making the plow warm and comfortable.

The framing of the body is yellow pine, and the plow is oak. The sheathing all over is yellow pine, and is finished in the natural wood. Each end of the plow is supplied with a "Huff" two-way locomotive air sander and a 3-in. chime whistle, while a 12-in. gong is located up under each hood. On the plow used

The first place that the interchange of tickets between the electric and steam lines of the New York Central Railroad is to take place will be at Syracuse during the week of the New York State Fair, Sept. 11 to 16. The Syracuse Rapid Transit Company has no line to the fair grounds, but the West Shore Railroad has a station on the grounds. An arrangement has been made whereby the street car conductors can sell tickets in any part of the city direct to the fair grounds and return. The West Shore conductors will give transfers to the Rapid Transit lines.

SAFETY CAR BRAKE

For the last six months the Union Railway Company, of New York, has been trying out in every-day service a new quick-action safety car brake made by the Traction Equipment Company, of Brooklyn, N. Y. The principal details of this brake, for which many advantages are claimed, are shown in the accompanying cut. The horizontal drum is an entirely new feature, which prevents locking of the chains. Two chains are used, and these are secured on each side of drum by staples



DOUBLE-CHAIN CAR BRAKE

riveted through the drum head. This divides the strain on the links and makes the chain less liable to break. If one chain should break, the other would still remain in operation to perform its functions. The drum takes up the slack chains quickly. The gear wheels have a tendency to bring a car to a full stop without any perceptible jar. The pinion shaft has a square hole in it to receive the brake staff, thus making it impossible for it to slip.

This brake is designed for service on electric and steam railroads, and for equipments from single-truck cars up to the heaviest rolling stock. While possessing all the advantages claimed, this brake is not more expensive than other brakes now on the market.

AUTOMOTONEERS IN CHICAGO

A number of the Garton-Daniels Company's "Automotoneers" for restricting the too rapid advancement of the controller handle have been put in service on cars in Chicago. As this device has only recently been installed in large numbers, considerable interest attaches to the results obtained with it. The conditions under which it has been tried in Chicago have not been such as to make possible as good comparative tests as might be desired, but some idea can be obtained as to what it accomplishes.

The Chicago Union Traction Company has had thirty cars equipped with "Automotoneers" since January, 1905. This is a full equipment for the Evanston line, which is a suburban line running from the terminus of the North Clark Street cable line to Evanston. This is a suburban run, not requiring the number of stops per mile that occur in downtown city service. It is not therefore the kind of a line on which the advantages of such an apparatus as the "Automotoneer" should be most apparent. The records of the company include special daily reports on the subject from Jan. 22, when the "Automotoneers"

were put in service, for a period of ninety days. The chief interest in these reports lies in the reduction in the number of motor troubles reported after the "Automotoneers" had been in service a month. During the month of February there was no noticeable reduction in the number of cars turned in for motor and controller troubles. This was as might be expected, as the results of previous abuse of motors without the "Automotoneers" would continue to make themselves felt over considerable time. In March, however, a change in the number of motor defects began to be noticed. From March 1 to 15, 1904, 23 cases of motor trouble were reported. For the same period of 1905 there were only 9 cases. Motor troubles on this line for the year 1904 averaged 40 per month. For the month of March, 1905, there were 16 cases. From March 31 to April 21, 1905, there were 9 cases. The weather was exceptionally good in 1905, but even taking this into account, the conclusion was reached that the "Automotoneers" were saving at least 50 per cent of the motor troubles. The cars were the same in number and equipment as the year before, being equipped with GE 52 motors and weighing about 22 tons. The equipments are eight years old, and it might be expected that the number of motor and controller defects would, if anything, increase from year to year. The results for the period for which the records were kept were very favorable to the use of the "Automotoneers" for preventing misuse of motors.

The Calumet Electric Street Railway Company has "Automotoneers" ordered and in its shops for the entire equipment of its road. Its most important cars have been already equipped. The South Chicago City Railway Company also has many of its cars equipped. The Twenty-Sixth Street line of the Chicago City Railway has been thus equipped for some time.

MORE SEMI-CONVERTIBLE CARS FOR NASHVILLE

The Nashville Railway & Light Company has purchased from the J. G. Brill Company twenty-three cars having the "grooveless post" semi-convertible window system. Ten of the cars are 22 ft. 7 ins. over the bodies, and the other thirteen measure 30 ft. 6 ins., eight of the latter being intended for trailer service. About two years ago a shipment was made the railway company of twenty-five cars of the same dimensions as these, and altogether sixty semi-convertible cars, which are all mounted on Brill trucks, have been furnished by this builder. The order for the cars was placed through the engineering firm of Ford, Bacon & Davis, who, within the last month, have also ordered thirty-five of the "grooveless post" semi-convertible cars for Memphis.

The single-truck cars are seated for thirty-two passengers and the double-truck cars for forty-four passengers, the seats being of rattan and transversely placed. The absence of wall window pockets by reason of the roof pocket storage of windows permits the use of an unusually low window sill. From the top of the floor to the top of the window sill is but 25 ins., giving a large window opening and adding much to the comfort of the cars in warm weather. The height named is the builder's standard for the window sill of this car. As the window sill is rather low to be reached by the elbow of a seated adult passenger, neat arm rests are provided. Seven-bar guard rails are an excellent feature in connection with the window sills.

The interiors of the cars are richly finished in cherry, with bird's-eye maple ceilings, undecorated. The vestibules are also finished in cherry. The seats are 34 ins. long and the aisles are 23½ ins. wide. The platform knees are reinforced with angle iron and protected and strengthened at the ends with angle-iron bumpers. No. 27-G short-base double-trucks with 4-ft. wheel base and 33-in. wheels and No. 21-E single-trucks with 7-ft. 6-in. wheel base and 33-in. wheels are used. Both types have solid forged side frames. The weight of a single-

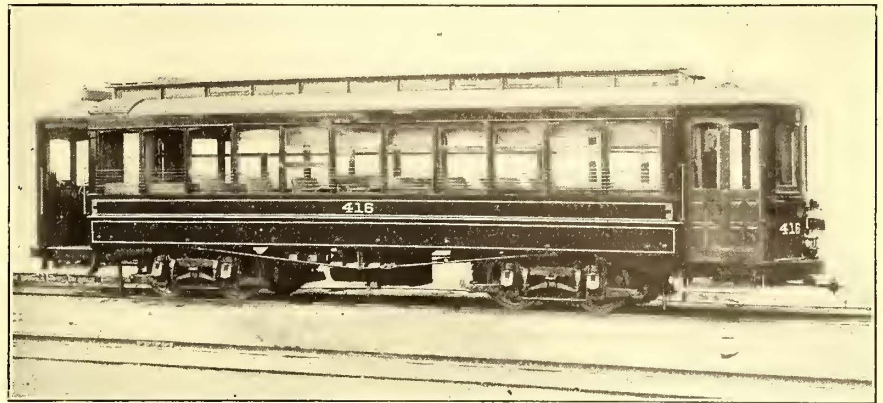
truck car without the electrical equipment is 18,620 lbs., and of a double-truck car, including all of the equipment, 44,940 lbs.

The general dimensions of the cars are as follows: Double-truck motor and trailer cars are 30 ft. 6 ins. over the end panels, and 40 ft. 6 ins. over the crown pieces and vestibules. The platforms are 5 ft. The width over the sills is 7 ft. 8 ins. The side sills are 4¾ ins. x 7¾ ins., and the end sills, 5¼ ins. x 6⅞ ins.; the thickness of the corner posts is 4½ ins. x 5½ ins. in one piece; the thickness of the side posts is 3¼ ins. The single-truck cars are 22 ft. 7 ins. over the end panels and 31 ft. 7 ins. over the crown pieces; platforms are 4 ft. 6 ins.; width over sills, 7 ft. 8 ins.; height of the window sill from the top of the car floor, 2 ft. 1 in.; side sills, 4¼ ins. x 6 ins., and the end sills, 3½ ins. x 6⅞ ins.; thickness of the corner posts, 4½ ins. x 5½ ins., made in one piece, and the thickness of the side posts, 2¾ ins.

THE WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY AT THE LEWIS AND CLARK EXPOSITION

In the STREET RAILWAY JOURNAL of Aug. 12 some facts were given about the more important exhibits at the Lewis and Clark Exposition. Further details have just come to hand of the Westinghouse electrical exhibit, and these are presented herewith. In the building devoted to machinery, electricity and transportation, the Westinghouse Electric & Manufacturing Company occupies 1500 sq. ft. of floor space. Starting in at the main entrance to the exhibit, the visitor's attention is attracted by the most prominent and most interesting feature of

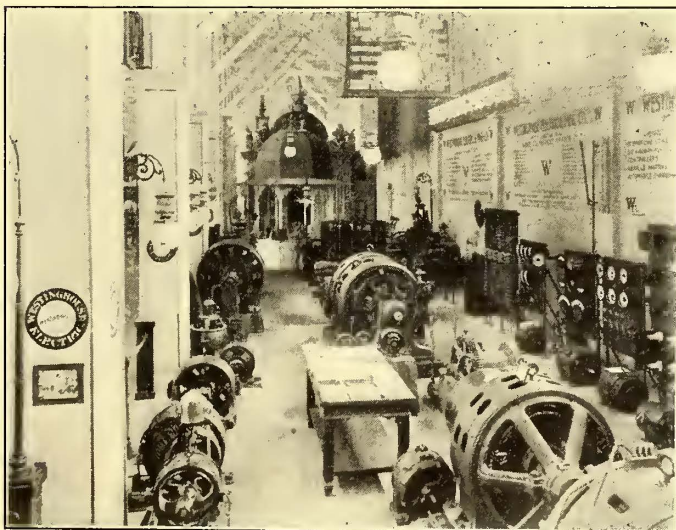
motor-generator set consisting of a 150-hp induction motor and a 100-kw direct-current engine-type generator, and in im-



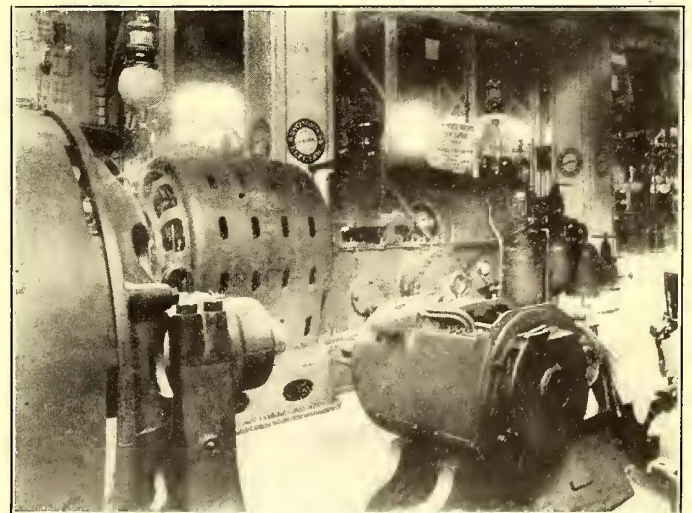
DOUBLE-TRUCK CAR FOR NASHVILLE RAILWAY & LIGHT COMPANY

mediate succession are a group of type R direct-current motors, 1-6 hp to 1 hp; a 120-kw revolving-field self-contained a. c. generator, and a 100-hp type HF induction motor. At the extreme rear the Sanitary Devices Manufacturing Company displays, in conjunction with this exhibit, an automatic dust-removing plant driven by a type S motor.

In the rear section are also some distinctive types of Westinghouse transformers, including a 110-kw air-blast transformer, a number of type OD, type N, manhole type. Five OD transformers, ranging from 7½ kw to 25 kw, are mounted on the wall. On turning to the left and walking toward the main entrance, may be seen a group of induction motors, types H and CCL for constant-speed work, and types F and C for variable-speed service. A line of special motors, both a. c. and d. c., for crane service is also shown. Standard switch-board instruments, comprising voltmeters, wattmeters, am-



D.C. AND A.C. GENERATORS AND MOTORS IN FOREGROUND, 600-HP TURBO-GENERATOR ON LEFT AT REAR



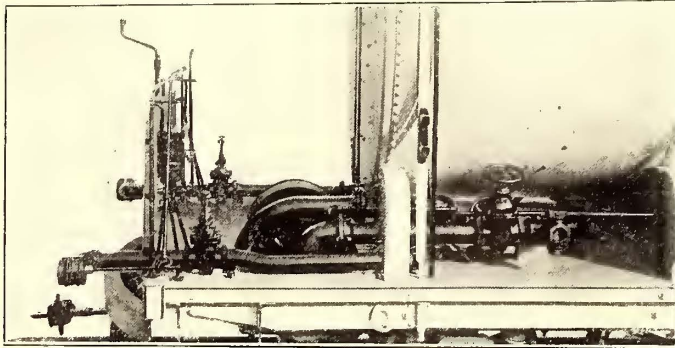
600-HP STEAM TURBO-GENERATOR SET—TURBINE OPENED FOR INSPECTION

the display, a 400-kw Westinghouse-Parsons turbo-generator unit. To the left is a showcase containing all the standard types of portable instruments, and just behind this is an electrically-operated distant-control automatic oil circuit breaker, designed to open a 200-amp. 33,000-volt circuit. Down the aisle is seen a No. 92 50-hp direct-current and a No. 107 75-hp alternating-current single-phase series railway motor and a switch group of the multiple-control system. To the right is a group of type S motors, including a vertical type machine, a 25-kw rotary converter and a 2-kw type S generator, direct connected to an Ohmen high-speed engine manufactured by the Ohmen Engine Works, of San Francisco, Cal. Across the aisle is a

meters, power-factor meters, etc., are arranged on display boards against the wall. In the controller section are found an oil-immersed auto-starter for use with the CCL motors, a rheostatic controller for the type HF motor, an elevator controller used with type F motors, an automatic pump controller, and finally a three-wire double-voltage controller for use with direct-current motor in machine-tool drive. Near the center of the exhibit is a rope hoist manufactured by the Denver Electric Company, to which is connected a No. 103 A type F induction motor. Various classes of fuses artistically arranged on a board, a double-throw oil switch, a static interrupter, choke coil and lightning arresters complete the display.

NEW CENTRIFUGAL SPRINKLING CAR

One of the most important inventions of the year in electric railway equipment is a recent invention of the J. G. Brill Company, known as the Brill centrifugal sprinkling car. Instead of using air pressure in the tank or in an auxiliary tank, the pressure is obtained by using a centrifugal pump operated by a direct-connected motor, both of which are located on the platform at one end of the car. The apparatus takes up comparatively little room and supplies enough pressure to sprinkle 50 ft. on either side of the car. About two years ago the Brill Company designed and built a double-truck gravity sprinkling car for the Bergen Turnpike Company, of New Jersey, which,



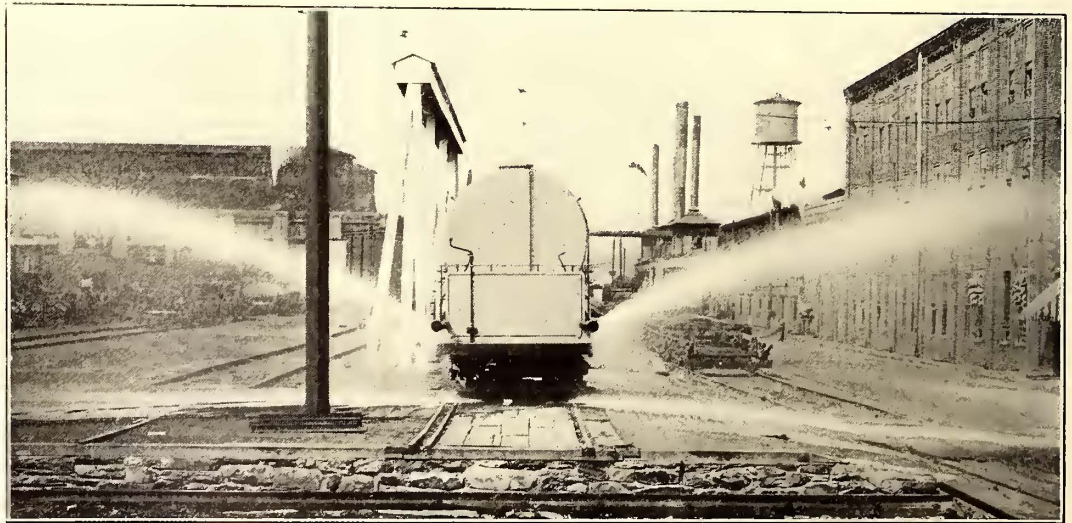
PIPING CONNECTION UNDER TANK

instead of being filled in the usual way, was furnished with a centrifugal suction pump operated by a motor. By means of this centrifugal pump the car was filled from a lake near the track and so got around the necessity of using hydrants, the water tax being excessive. This type was a complete success, and the company has built several cars with filling pumps. It suggested the use of a centrifugal pump for expelling the water, and not being entirely satisfied with the power sprinkler which the company has been building for a number of years, experiments have been carried forward for more than a year, and the new centrifugal sprinkler is the result. One of the drawbacks associated with the compressed-air sprinklers is the necessity for expensive tanks, as the pressure requires double riveting and special bracing, while in the new form only the weight of the water has to be taken into account. Where auxiliary tanks are used, valuable space is occupied and the expense of riveting to provide for high pressure is considerable. An important advantage of the centrifugal over other power sprinklers is that there are no wearing surfaces other than the shaft of the centrifugal pump; therefore, there is no possibility of the machinery becoming heated, no check valves, inlet valves, crank shafts, nor piston rods, are employed. In the centrifugal sprinkler, when the valves are all closed, provision is made by means of an automatic by-pass, for preventing back pressure on the motor at such a time when all four sprinkling heads might be quickly closed.

With a constant and uniform pressure produced by the centrifugal pump, and with sprinkling heads at both ends of the

car which keep the amount and range of water always under control, it appears that a power sprinkler thoroughly practical from every standpoint has at last been devised. One of the illustrations, showing the centrifugal sprinkling car in operation, is made from an unmanipulated photograph, and shows a uniform spray of water projected upon the ground from a point inside the rail to a point at right angles 50 ft. from the rail. It will be seen in this illustration that the light line produced by the water falling upon the ground has the same appearance from the track to the edge of the picture, proving that the spray falls in a uniform amount over the entire surface. This is accomplished by the builder's special form of sprinkling attachment, consisting of a head vertically slotted for half its circumference and having inside a cylindrical chamber with a corresponding slot. The cylinder is moved forward and back, and revolved by a handle on the platform. Gate valves are also provided, as there are sprinkling heads at both ends. They are not absolutely necessary, because the sprinkling heads completely cut off the water, but it is an added convenience to have them.

The piping is very neatly arranged. There is but one opening in the bottom of the tank, and from that point a large pipe leads to the centrifugal pump on the platform and returns through the centrifugal pump to a pipe which leads to both sides of the car and direct to the sprinkling heads at the four corners. By attaching a suction hose under the centrifugal pump, water may be drawn by the pump into the tank, may easily be lifted vertically 20 ft., and may be drawn from quite a distance, so that if there is a lake or stream anywhere along the lines it is a simple matter to run a hose or lay a main from the track to the water and connect with a short hose to the pump. This enables a company to be independent of hydrants or expensive elevated tanks and their pumping equipment. Valves are provided in the piping and an inlet furnished so that the tank may be filled in the usual way from a hydrant or may be filled through a manhole.



VIEW SHOWING THE CENTRIFUGAL SPRINKLING CAR SPRAYING WATER FOR A DISTANCE OF 50 FT. ON EACH SIDE

The car shown has been delivered to the Lehigh Valley Traction Company, which operates over 200 miles of track in Allentown, Pa., and the vicinity. The length of the car over the end sills is 16 ft., and the width over the sills is 6 ft. 10 ins. The size of the tank is 6 ft. 6 ins. x 10 ft. The length from the tank over the end sills at either end is 3 ft. The side sills are 4¾ ins. x 10 ins., and the end sills are 7 ins. x 7 ins. The weight of the car body with the tank and the equipment is 9500 lbs., and including trucks, but without truck motors, 14,500 lbs. The car is mounted on the builder's No. 7 trucks with 33-in. wheels and 7-ft. wheel base.

LEGAL DEPARTMENT*

ACCIDENTS AT WINDOWS

The rule prevailing in the United States is that it is negligence as matter of law, precluding a recovery for damages for injury, for a passenger in a steam railway car, intentionally or inadvertently, to protrude his arm, hand, elbow or other part of his body through a window, while the car is in motion. (V. American and English Encyclopedia of Law, 683.) It is true that some American courts have held that such an act does not, per se, constitute contributory negligence, but the decided weight of authority and the better opinion support the rule above stated. Somewhat illogically, according to the judgment of the writer, the tendency of authority is in the opposite direction as regards passengers in street railway cars. There are not as many decisions dealing with street railway passengers as with travelers on steam railroads, but such cases as have been reported seem to favor the view that whether or not a street railway passenger is negligent in allowing part of his person to protrude from a window is a question of fact under the actual circumstances of the case to be submitted to the jury. In *Miller vs. St. Louis R. Co.* (5 Mo. App., 471) it is said: "It does not necessarily follow, however, because the exposure of the person from the window of an ordinary railroad carriage moved by steam is negligence, that the same exposure from the window of a street car is so. The motive power is much more under control in one case than in the other, whether we speak of the carriage in which the passenger is or of anything likely to approach it from a parallel track, and the speed is less."

On various occasions legitimate distinctions as to the measure of care and liability between steam railroad and street railway companies have been pointed out in this place. It is, however, difficult to perceive any proper basis for a distinction in the considerations above quoted. It scarcely would be contended that because street cars are run at a comparatively low rate of speed those operating them are chargeable with the duty before passing obstructions or other cars to make an inspection for protruding arms and elbows and give warning to withdraw them. Nevertheless, a discrimination between the two forms of conveyances has been drawn and, according to the present state of the law, must be reckoned with.

The advisability is therefore suggested, especially as to cars running on routes where protruding arms and elbows are particularly liable to contact with outside objects, of providing bars or screens. Indeed, the duty of furnishing such safeguards has been laid down in a few adjudicated cases even as to steam railroad cars. A recent street railway case betokens a judicial disposition to deal reasonably with the question of a company's liability if it has taken fair precautions to avoid harm to passengers.

In *Christensen vs. Metropolitan Street Railway*, decided by the United States Circuit Court of Appeals, Eighth Circuit, in April, 1905 (137 Fed., 708), it was held that screens with large meshes fastened across the lower half of the windows of a street car on the side next to the poles supporting the trolley wires are a sufficient protection against the accidental injury of passengers from such poles, and a sufficient warning of danger to absolve the railway company from the charge of negligence in that regard. It was actually decided that a passenger in a street car who, on account of a sudden illness, extended her head through a window above a screen which covered the lower half of the window, and was injured by striking against a trolley pole beside the track—she being obliged in order so to reach the window to stand upon the seat—was chargeable with contributory negligence as matter of law. The court remarked:

"While the plaintiff's sudden illness undoubtedly placed her in a very uncomfortable and distressing position, yet that fact

would not authorize her to disregard unmistakable warnings of danger. She must have known that the heavy screens which barred the windows were placed there for no other purpose than to prevent passengers from extending their arms or heads out of the windows, as the meshes in the screen were too large to serve any other purpose. To disregard this plain warning was, we think, such contributory negligence upon her part as will necessarily preclude a recovery in this case."

CHARTERS, FRANCHISES AND ORDINANCES

GEORGIA.—Taxation of Street Railways—Equal Protection of the Laws—Contracts—Impairment of Obligation.

1. A street railway company is not denied the equal protection of the laws by a municipal tax on its business at a rate of \$100 per mile or fraction of a mile of its trackage in the city streets because a steam railway, making an extra charge for local deliveries of freight brought over its road from outside the city, is not subjected to this tax.

2. No exemption from the municipal taxation of the business of a street railway company results from provisions in its agreement with the municipality preserving its easements for railway purposes in land to be conveyed by it to the city, and granting it the right to lay down, construct, maintain and operate its railway through certain streets, subject to the control and regulation of the Mayor and Aldermen.—(*Savannah, Thunderbolt & Isle of Hope Railway, of Savannah, Ga., Plff. in Err., vs. Mayor and Aldermen of the City of Savannah*, 25 Sup. Ct. Rep., 690.)

INDIANA.—Railroads—Crossings—Construction of Safety Devices—Constitutional Law—Presentation of Constitutional Questions.

1. Under act March 3, 1903, p. 125, c. 59, requiring street railroads desiring to cross railroad tracks to maintain and operate a system of interlocking works and derailing apparatus within six months after it commences to use the crossing, and authorizing the road desiring to make the crossing to enjoy the use of the same at once by paying the amount of the award into court, and presenting a summary method for hearing and settling objections, the six months within which the interlocking works must be constructed commences to run at the time that the street railway begins to use the crossing, and is not postponed until the final termination of litigation as to damages to be paid by the street railroad for constructing the crossing.

2. A street railroad which, in crossing the tracks of a railroad, has made no attempt to comply with act March 3, 1903, p. 125, c. 59, requiring the construction of interlocking works with a derailing apparatus, cannot, in litigation with the railroad over its failure to comply with the statute, raise the question of the constitutionality of that portion of the statute requiring the works to be constructed to the satisfaction of the State Auditor.—(*Chicago I. & L. Ry. Co. vs. Indianapolis & N. W. Traction Co.*, 74 N. W. Rep., 513.)

KENTUCKY.—Railroads—Right of Way Agreements—Erection of Station Houses—Breach—Damages—Instructions—View—Misconduct of Jury.

1. In an action against a railroad to recover damages for breach of an agreement to maintain a station near plaintiffs' land, in consideration of which plaintiffs conveyed to defendant a right of way through their land, a charge defining the measure of damages as such sum as would represent the difference in what would have been a fair market value of the residue of plaintiffs' land after the conveyance of the right of way if the station had been established and the fair market value of such residue without the station was proper and sufficient, without further telling the jury not to take into consideration the value of the strip of land deeded to defendant.

2. In an action against a railroad for breach of an agreement to maintain a station near plaintiff's land in consideration of a conveyance of a right of way through such land, the damages claimed were based on the value of the land for suburban residential purposes, and its value for agricultural purposes was not in issue. A view was awarded, and, while on the premises, there was some conversation between a juror and a stranger as to the quantity of hay grown on the place, and the jury, or some of them, walked over the tract, stepping off the distances. Held, that the misconduct of the jury was immaterial.—(*Louisville, A. & P. V. Electric Ry. Co. vs. Whipps et ux.*, 87 S. W. Rep., 298.)

MASSACHUSETTS.—Street Railroads—Location—Restrictions—Statutes—Construction—Powers of Town—Streets—Repair—Reconstruction.

1. A restriction as to street repairs contained in the original location of a street railway company's line by a town is not af-

* Conducted by Wilbur Larremore, of the New York Bar, 32 Nassau Street, New York, to whom all correspondence concerning this department should be addressed.

fectured by St. 1898, p. 742, c. 578, s. 11, providing that street railroads shall be subject to a mileage tax corresponding to the amount formerly paid for the repair of streets, and that such railroads should not be required to keep any portion of the streets and highways in repair, but should remain subject to all legal obligations imposed in original locations granted by a city or town, etc.

2. Under Pub. St. 1882, c. 113, s. 7, authorizing selectmen of a town to grant a street railway location under such restrictions as they deem the interests of the public may require, the selectmen of a town, in granting a location, were authorized to require the railway company to keep that portion of the streets included between its tracks, and for 18 ins. outside thereof, at all times flush with the top of the track, and keep the same in repair, to the satisfaction of the selectmen, though such restriction was more onerous than the general law (Pub. St. 1882, c. 113, s. 32) limiting a street railroad company's obligation to repair the paving, upper planking, or other surface material of the portions of the streets, etc., occupied by its tracks, and, in case of unpaved streets, for a distance of 18 ins. on either side of the portion so occupied.

3. Under Pub. St. 1882, c. 113, s. 7, authorizing selectmen of a town to grant a street railway location under such restrictions as they deem the interests of the public may require, the town was authorized to impose a restriction in a grant of location requiring the railroad to reconstruct its track and roadbed by laying such different material therefor as the selectmen, after a public hearing, may judge that public safety and convenience require, etc.

4. Such restriction was not rescinded by St. 1898, p. 743, c. 578, s. 13, providing that all locations previously granted or in use are ratified and confirmed as if accepted under the provisions of such section, the first clause of which ratified the validity of all restrictions which could have been made thereunder.

5. Where a street railroad location contained a restriction requiring the railroad company to reconstruct its track, etc., with different material, as required by the Board of Selectmen, the railroad company could not refuse to comply with an order requiring it to take up 50-lb. T-rails specified in the location, and lay down 90-lb. girder rails in place thereof, because both were of the same material.—(Dunbar et al. vs. Old Colony St. Ry. Co., 74 N. E. Rep., 353.)

MASSACHUSETTS.—Street Railroads—Restrictions—Fares—Street Lighting—Statutes.

1. Under Pub. St. 1882, c. 113, s. 43 (Rev. Laws, c. 112, s. 69), providing that a street railway company may establish the rates of fare subject to its charter, and the statutes (St. 1898, p. 743, c. 578, s. 13), providing that the selectmen of a town, in a location to a street railroad company, may impose such conditions as the public interest may require, does not authorize them to impose a limitation on the rates of fare.

2. That an electric street railroad company was forbidden to use its electricity for lighting purposes by Rev. Laws, c. 121, ss. 24, 26, and c. 122, s. 1, did not preclude it from using electricity for lighting as an incident to its business, or constitute an excuse for its failure to comply with an order of the selectmen of a town requiring it to maintain 100 electric lights, of 25 cp each, for 5 miles, along a street on which it operated its line.—(Cunningham et al. vs. Boston & W. St. Ry. Co., 74 N. E. Rep., 355.)

MISSISSIPPI.—Carriers—Passengers—Separation of Races—Evasion of Statute—Ejection of Passenger—Justification—Punitive Damages.

1. Signs 8 ins. x 12 ins. in size, having painted thereon the words "White" and "Colored," respectively, and supported on the backs of seats in street cars, are not "adjustable screens" within the meaning of Laws 1904, p. 140, c. 99, requiring the separation of the white and colored races on street cars, but permitting the use for that purpose of adjustable screens, to be moved about as the needs of the traffic may require.

2. A street railway company which evades Laws 1904, c. 99, p. 140, requiring the separation of the white and colored races on street cars, by merely posting small signs to mark the limits of the space allotted to the respective races, cannot invoke the provision of the law authorizing the conductor to move the partition or screen separating the races according to the needs of the traffic, and to put all passengers who refuse to accommodate themselves to such adjustment off the cars as a justification for his act in ejecting a passenger.

3. Punitive damages may be awarded to a female passenger who was rudely ejected from a street car by the conductor, and compelled to walk some distance in the mud, because of her refusal to comply with an unwarranted demand of the conductor that she change her seat in the car.—(Southern Light & Traction Co. vs. Compton, 38 S. Rep., 629.)

NEW YORK.—Street Railroads—Transfers—Recovery of Penalties.

1. Laws 1890, p. 1106, c. 565, s. 78, as amended by Laws 1892, p. 1398, c. 676, provides that any railroad corporation may contract with any other for the use of their respective roads, and if such contract shall be a lease, certain formalities are to be observed in its execution. Section 104 (p. 1114) provides for transfers from one road to another upon payment of a single fare. Held, that the latter section applies to surface lines leased by one or more corporations to another, and operated by the lessee, so as to render the lessee liable where transfers are tendered and refused for the penalties provided for their refusal.

2. The penalties provided for on refusal of transfer on payment of a single fare from one to another of leased surface railroads, under Laws 1890, p. 1082, c. 565, as amended by Laws 1892, pp. 1398, 1406, c. 676, ss. 78, 104, are not cumulative, and the bringing of an action for one penalty is a waiver of all previous penalties incurred.—(Griffin vs. Interurban St. Ry. Co., Scudder vs. Same, 72 N. E. Rep., 513.)

NEW YORK.—Street Railroads—Extension of Line—Franchise—Expiration—Statutes.

Railroad Law (Laws 1890, p. 1084, c. 565), s. 5, provides that, if any domestic railroad corporation fails to begin the construction of its road within five years after the certificate of incorporation is filed, its corporate existence and powers shall cease; and section 99, art. 4, p. 1112, which article is entitled "Street Surface Railroads," provides that in case such corporation shall commence the construction of its road, or any extension thereof, within one year after the consent of the local authorities and property owners, and shall not complete the same within three years, its rights may be forfeited. Held, that where a street railroad company was granted a franchise to construct an extension, but it failed to commence such construction within five years, its rights were lost, ipso facto, under Railroad Law, s. 5, the same being self-executing.—(In re Brooklyn, Q. C. & S. R. Co., 94 N. Y. Suppl., 113.)

NEW YORK.—

1. The contract arrangement for the payment to a municipality of a license fee on each street car, modified as to the amount of such fees under the authority of a statute accepted by the street railway company, stating that such fees should be taken "in full satisfaction for the use of the streets or avenues," does not exempt the company from the tax imposed, under N. Y. Laws 1899, c. 712, on its franchise.

2. A street railway company cannot claim to have been denied due process of law in the valuation of its franchise for the purpose of the special franchise tax imposed by N. Y. Laws 1899, c. 712, on the theory that it was ascertained by speculation and guesswork, where such valuation is required to be made by the State Board of Tax Commissioners, to which the owner of the franchise is required to furnish a written report, and notice and hearing are accorded such owner, and a review of the assessment by certiorari is afforded.—(People of the State of New York ex rel. Brooklyn City Railroad Company, Plff. in Err., vs. State Board of Tax Commissioners, 25 Sup. Ct. Rep., 713.)

OHIO.—Street Railroads—Franchises—Limitations—Municipal Corporation—Powers—Contract Rights—Surrender—Unlimited Franchises—Judgments—Estoppel—Res Judicata—Consolidation of Lines—Effect—Extension of Franchise by Implication—Ordinance—Title—Permission to Extend Tracks—Effect—Determination of Franchise—Statutes—Construction—Extensions—Authority of Municipality—Double-Tracking Line—Validity.

1. A municipal corporation entitled to grant a street railway franchise had power to limit the grant as to time, prior to the passage of act Ohio May 14, 1878 (75 Ohio Laws, p. 360), providing that no grant or renewal of a grant shall be valid for a greater period than twenty-five years, though prior to the passage of such act there was no statute authorizing the municipal corporation to limit such grants.

2. Where a street railway company, having an alleged unlimited franchise to operate a line on a certain street, granted prior to the adoption of 75 Ohio Laws, p. 360, limiting such grants to twenty-five years, accepted the terms of a subsequent ordinance authorizing it to extend its line on such street, and to equip and operate such extension and all of its tracks on such street for a period of twenty-five years, the acceptance of such ordinance operated as a surrender of its alleged unlimited franchise as to such street.

3. Where a street railway company was compelled by action of the public to defend itself in court against a present claim of misuser of its franchise, mere reasons presented by it in argument in such action, though inconsistent with its subsequent

claim as to the continuance of its franchise, did not amount either to an estoppel or establish a claim of *res judicata*.

4. Neither the consolidation of street railway lines into one company and one system, nor transfer obligations imposed by an ordinance authorizing the laying of an additional line on another street, operated to prolong the life of any prior franchise.

5. Where none of the titles of several city ordinances granting street railway extensions contained any intimation of a purpose to deal with the subject of the life of the original grant, though the "subject" of the ordinance was required to be "clearly expressed in its title," an extension of the main franchise could not be implied therefrom.

6. Ordinance granting a street railway company permission to extend tracks and operate them "in connection with the main line" for a period which endures longer than the right to operate the main line did not operate as extending the main line franchise, regardless of whether such extensions were capable of independent operation.

7. Where a street railway company operating lines on various streets, under franchises which expired at different times, accepted an ordinance authorizing the substitution of electricity for horse power on its G. Street branch, and providing that the right to operate such branch should continue during the term of the company's then present grant for the operation of the tracks on such branch, the ordinance fixed a uniform period for termination of the franchise of the G. Street line over its entire length, as extended under a prior ordinance, and therefore abrogated any prior contract for the operation of an extension of the G. Street branch for a period longer than the expiration of the G. Street franchise.

8. Rev. St. Ohio, ss. 2501, 2502, provide for the granting of original street railway franchises, after advertisement on public bids, to the corporation which will agree to carry passengers at the lowest possible rates of fare, and shall have previously obtained the written consent of a majority of the property holders on the several streets along the proposed route, provided that no street railway grant, or renewal of a grant, shall be valid for a longer period than twenty-five years. Section 2505 authorizes the City Council to grant any street railway corporation power "to extend its track," subject to the provisions of sections 3437-3443, none of which, however, relates to the establishment of a route or a renewal of a grant, and did not require such extensions to be on competitive bidding, etc. Held, that an extension granted under such sections is not a "new route," having an independent life, but depends for its existence on the original line, and expires with the franchise thereof.

9. Where a City Council established a street railway route, and granted a franchise for the operation of the road, as provided by Rev. St. Ohio, ss. 2501, 2502, the City Council had no power, by merely giving the corporation the right to double track its lines, to confer power on the railroad company to operate the second track for a period beyond the term of the franchise of the line double tracked.—(Cleveland Electric Ry. Co. vs. City of Cleveland et al., 137 Fed. Rep., 111.)

PENNSYLVANIA.—Railroads—Property Tax—License.

Where a city of the second-class imposed a tax of 25 cents per foot for each foot of track laid or operated by a street railway within the city, except such tracks as were in the yards or buildings of the company, it was a property tax, and not a license tax, within act March 7, 1901 (P. L. 40), art. 19, s. 3, pars. 4, 22), though the ordinance designated the tax as a license tax.—(Pittsburg Rys. Co. vs. City of Pittsburg et al., 60 Atl. Rep., 1077.)

WEST VIRGINIA.—Eminent Domain—Railroads—Crossing Other Road—Jurisdiction—Character of Crossing—Statutes—Construction—Bill—Multifariousness—Pleading—Costs.

1. The acquisition of a crossing by one railroad over another involves a taking of private property for public use.

2. Section 11 of chapter 52 of the Code of 1899 does not confer upon courts of equity jurisdiction to condemn the property of one railroad, turnpike or canal company for the purpose of a crossing by another railroad, turnpike or canal company.

3. By said section such courts are empowered to determine the exact places at which, and the manner in which, such crossings may be made, when the parties are unable to agree; but the right to cross must be obtained by proper proceedings under chapter 42 of said code, when it cannot be secured by consent and agreement of parties.

4. The place and character of the crossing to be decreed, when the parties fail to agree, are determined by the situation of the parties, the public interests, the topography of the place, the connections to be made, the expense of making the crossing, and all the material facts and circumstances affecting the public and the rights of the parties immediately concerned, and not upon

the choice and will of the parties desiring it. Hence the court may decree a crossing other than the one described in the bill.

5. Railroad crossings at grade are neither prohibited nor discriminated against by the statute. On the contrary, they are expressly authorized, and, when the parties fail to agree, the court may order such crossing to be made, as, under all the circumstances, is fair, just and reasonable, viewed from the standpoint of the parties interested, and promotive of the public welfare.

6. The clause in section 11 of chapter 52 of the code reading as follows, "Provided its work be so constructed as not to impede the passage or transportation of persons or property along the same," neither contemplates nor prohibits such impediments as are merely incidental to a properly constructed crossing at grade.

7. Wherever a crossing is necessary in the construction of a railroad, the law allows it, and confers the right to obtain it; but this power is to be exercised, in the absence of an agreement by the parties, under such conditions and limitations as to the place and mode of crossing as a court of equity may justly impose, in view of the interests of the parties and the public.

8. In the construction of a statute, its spirit, rather than its letter, is the guiding star, but contradiction and repugnance must be avoided when it is possible to do so. The statute must be construed as a whole, and every word in it made effective, if possible.

9. A clearly expressed intention in one part of a statute does not yield to a doubtful construction of another portion of it; and when the general intention of the Legislature is clear, and the spirit and purpose of the statute are manifest, a mere implication or inference of a contrary particular or special intent, arising out of language of doubtful meaning, must yield to the general intent.

10. Where the language of a statute is ambiguous or the meaning doubtful, the surrounding circumstances, the history of the times, and the defect or mischief which the statute was intended to remedy, may be resorted to in seeking its true meaning and purpose.

11. An undeviating course of legislation in a certain direction through a long period of time, in an effort to systematize and perfect the law relating to a given subject, strongly emphasizes the express language embodying the final declaration of legislative will.

12. All former statutes on the same subject, whether repealed or unrepealed, may be considered in construing provisions that remain in force.

13. Uniting a purely legal demand with an equitable demand, in a bill seeking the enforcement of the latter, does not render the bill multifarious.

14. In such case the allegations respecting the legal demand may be treated as surplusage and ignored.

15. The extent to which facts must be set out in a bill depends upon the nature of the principal facts to be established. When a general term used has a double meaning, and, standing alone, may import either a mere fact or a conclusion of law, it must be accompanied by a statement of such additional facts as constitute ground for the legal conclusion which the plaintiff undertakes to establish; else the rule that pleadings must be certain to a common intent is violated.

16. Bills filed under section 11 of chapter 52 of the Code of 1899 are governed by the ordinary rules of equity pleading applicable to bills in general, and a bill so filed is sufficient if it so states the plaintiff's case as to inform the defendant of what he is called upon to meet.

17. When, in a suit under section 11 of chapter 52 of the Code of 1899, the court decrees a crossing substantially different from the one demanded of the defendant before the institution of the suit, a decree for costs against the plaintiff is proper.—(Wellsburg & S. L. R. Co. vs. Panhandle Traction Co. et al., 48 S. W. Rep., 746.)

LIABILITY FOR NEGLIGENCE

ALABAMA.—Street Railroads—Injury to Person Crossing Tracks—Contributory Negligence.

1. At street crossings pedestrians and operators of street cars have equal rights of passage, but each is presumed to know of the danger incident to the crossing by the former of the car tracks, and upon each is incumbent the duty of exercising such care to avoid injury as a reasonably prudent person would use under the circumstances.

2. It is the duty of a pedestrian, before crossing tracks on which street cars are being operated to look and listen for approaching cars, from which he is not absolved by the fact that a car had but recently passed, and where he could have seen an approaching car by which he was struck and injured, but failed to look, he is chargeable with contributory negligence, which precludes his re-

covery for the injury, notwithstanding the negligence of those operating the car, unless their negligence was willful or wanton.

3. Where plaintiff, upon alighting from a street car at a street crossing, passed around behind it, and upon a parallel track, without looking to see whether there was a car approaching thereon, and was struck and injured by a car going in the opposite direction, the question of his contributory negligence is not affected by the fact that the rules of the company required the car to stop on meeting another, which had stopped to take on or discharge passengers, and also to sound the bell at crossings, which was not done; it not appearing that such rules were customarily observed, or that plaintiff relied upon or knew of them.—(Birmingham Ry., Light & Power Co. vs. Oldham., 37 S. Rep., 452.)

ARKANSAS.—Carriers—Street Railroads—Injury to Passenger—Time to Alight—Premature Start—Care Required—Instructions.

In an action against a street railroad for injuries to a passenger, plaintiff claimed that the car suddenly moved forward while he was alighting, and there was testimony that the car was moving at the time plaintiff alighted. The court charged that if the conductor knew of plaintiff's negligent conduct, and could, by the exercise of proper care, have prevented the injury caused thereby, and did not do so, the contributory negligence of plaintiff would be no bar to his recovery, notwithstanding the jury might find that the conductor did not and could not have had any reason to anticipate that an injury would probably be caused. Held, that the instruction was calculated to mislead, since, if the car was moving so slowly that the conductor, by reasonable foresight, could not have anticipated that plaintiff would be injured, it was not the conductor's duty to make an effort to avoid such consequence.—(Little Rock Traction & Electric Co. vs. Kimbro, 87 S. W. Rep., 614.)

ARKANSAS.—Carriers—Street Railroads—Passengers—Ejection—Exemplary Damages.

Where a street railway conductor improperly refused to accept plaintiff's transfer because it was too late, and required plaintiff to pay another fare or leave the car, but in doing so the conductor acted in obedience to the rules of the company, as he understood them, and was guilty of no unnecessary rudeness, plaintiff was not entitled to recover exemplary damages.—(Little Rock Traction & Electric Co. vs. Winn, 87 S. W. Rep., 1025.)

CONNECTICUT.—Negligence—Instructions—Damages—Proof—Evidence of Cost of Article.

1. In an action for injuries from a leakage of electricity from defendant electric company's wires into a street where plaintiff was driving, the court read to the jury defendant's request to the effect that there was no contractual relation between the parties, and that defendant was not an insurer of the plaintiff's safety, and then refused to so charge—such expressed disapproval being accompanied by instructions contained in plaintiff's requests which in effect made defendant an insurer—and elsewhere in plaintiff's requests other measures of defendant's duty were given. Held, that such instructions were prejudicially erroneous as to defendant.

2. Where, in an action for injuries, the jury were once told in a charge that the subject of plaintiff's contributory negligence was not in issue, and elsewhere they were correctly told otherwise, it was prejudicial error as to defendant.

3. Where, in an action for injuries to a horse, plaintiff testified as to his worth before and after the injuries, defendant, on cross-examination, should have been permitted to ask what plaintiff paid for the horse.

4. In an action for injuries to a horse, the admission of evidence as to the price paid for the animal, on the issue of damages, is to be determined by considerations involving the exercise of a sound discretion, under all the circumstances.—(Rosenstein vs. Fair Haven & W. R. Co., 60 Atl. Rep., 1061.)

DELAWARE.—Street Railways—Collision with Team at Crossing—Negligence and Contributory Negligence.

A street railway company is liable for collision with a team at a crossing if its employees in charge of the car fail to exercise ordinary care, considering the circumstances of the place and occasion, and this is the proximate cause of the accident, and the person in charge of the team does not, by failure to exercise such care, contribute to the accident.—(Boudwin vs. Wilmington City Ry. Co., 60 Atl. Rep., 865.)

DELAWARE.—Street Railroads—Negligence—Duty of Car Operatives—Care Required—Running Into Funeral Procession.

1. A street car is not required to stop at street intersections for a funeral procession to pass, nor to give a funeral procession the right of way.

2. The fact that by courtesy street railroads have given funeral processions the right of way does not relieve one driving a vehicle in a funeral procession from using reasonable care and precaution to avoid collision with a street car.

3. In an action for injuries to plaintiff, who was driving a vehicle in a funeral procession, owing to a collision between his vehicle and a street car, it appearing that it had been the uniform practice of defendant to give funeral processions the right of way, which was known to plaintiff, such custom might be taken into account by the jury in estimating the degree of diligence required of plaintiff.

4. In approaching a crossing where there is a steep down grade, it is the duty of a motorman to make the descent at reasonable speed, so as not to put the car beyond his control.

5. Where a street railway approaches a crossing at a point where the rails are wet and slippery, or where the view of the railway from the crossing street is obstructed, greater care is required of the car operatives than where such conditions do not exist.

6. In an action against a street railroad company for injuries sustained in a collision between plaintiff's vehicle and a car, the burden of proving defendant's negligence is on plaintiff.

7. Where there was negligence on the part of the motorman of a street car, but the negligence of plaintiff contributed to the collision between plaintiff's vehicle and the car, or was the proximate cause thereof, the railway was not liable for the injuries.—(Foult vs. Wilmington City Ry. Co., 60 Atl. Rep., 973.)

DELAWARE.—Street Railroads—Trespassers—Children—Negligence—Care Required.

1. In an action for injuries, the burden of proving negligence is on plaintiff.

2. Whether negligence exists in a particular case is a question of fact for the jury.

3. What constitutes negligence is a question of law for the court.

4. In an action against a street railroad company for the death of a child, on the ground that defendant's motorman ordered him to jump off a car when it was in motion, whereby he was frightened, and either fell or jumped from the car, the jury were to determine whether defendant exercised due care, such as a reasonably prudent person would have done under the circumstances.

5. The term "ordinary care and diligence," applied to the management of electric cars in motion, means all the care, prudence and discretion which the circumstances of the place and occasion require.

6. In an action for the death of a child, if deceased, notwithstanding his tender years, contributed to the accident, so that his conduct was the proximate cause thereof, no recovery can be had.

7. The ordinary care of an infant is that degree of care which children of the same age, of ordinary care and prudence, are accustomed to exercise under like circumstances.

8. Where a child of tender years gets on the platform of a street car, and remains there unobserved by the servants of the company, and the child then jumps off or falls off without any negligence on the part of the servants, the company is not liable.

9. A street railroad company is not bound to so guard its cars as to prevent trespassing children from getting on or off while the car is in motion.

10. Where an infant trespasser on a street car was seen in a perilous position by the operatives, who could have prevented injury to him, caused by his jumping or falling off, but they made no effort to do so, there was such a lack of care as to constitute gross negligence.

11. Where the motorman of a street car saw a 5-year-old trespasser in a dangerous position on the front platform while the car was in motion, and by order or threat of the motorman the infant was frightened, so that he jumped or fell from the car, whereby he was injured, the company was liable.—(Goldstein vs. People's Ry. Co., 60 Atl. Rep., 975.)

ILLINOIS.—Street Railroads—Injury to Passengers—Instructions—Contributory Negligence—Question for Jury—Trial—Limiting Instructions—Prejudicial Error.

1. The error, in an order limiting the number of instructions to be requested or given, which does not deprive a party of any proper instruction, is not reversible error.

2. Where, in an action against a street railway company for injuries sustained by a passenger while alighting from a car, the issues were whether the passenger was injured because of the sudden starting of the car or because of his contributory negligence, and the court instructed that the burden of proof was not on the company to show how the passenger fell, and, if it was not shown that he fell by reason of the negligence in starting the car, as charged in the declaration, he could not recover, and the court also correctly submitted the defense of contributory negligence, it was error not to refuse to charge that the negligence alleged was that

the company suddenly started the car while the passenger was in the act of alighting, after the car had come to a stop.

3. Whether a passenger is guilty of contributory negligence in attempting to board or alight from a moving car is a question of fact for the jury, in view of all the circumstances.—(Chicago Union Traction Company vs. Olsen, 71 N. E. Rep., 985.)

ILLINOIS.—Street Railroads—Pedestrians—Injuries—Negligence—Contributory Negligence—Question for Jury—Direction of Verdict—Instructions—Modification—Special Interrogatories—Submission to Counsel—Prejudice.

1. The question of contributory negligence becomes a question of law for the court only when the undisputed evidence is so conclusive that the court could arrive at no other conclusion than that the injury was the result of plaintiff's negligence.

2. In an action for injuries caused by a street car striking a timber being carried by plaintiff and his companion, evidence considered, and held, that the question of plaintiff's contributory negligence was for the jury.

3. Plaintiff was injured by a street car striking a timber which plaintiff and his companion were carrying in the street. In an action against the railway company for such injuries the court charged that, if ordinary care on plaintiff's part required him to look and ascertain whether or not a car was approaching before he took such a position that the timber could come in the course of the car, and if plaintiff could "or would," by the exercise of ordinary care, have looked to see whether a car was approaching, and if he did not so look, and was injured because of his failure to look and ascertain whether or not a car was so approaching, and if "he did not exercise ordinary care for his own safety just before and at the time of the accident complained of, and was injured by reason thereof," he could not recover. Held, that the insertion of the words quoted in the instruction as requested was not erroneous, as charging that, though ordinary care required plaintiff to look, and he could, but omitted to do so, still such conduct did not amount to a failure to exercise ordinary care.

4. An instruction defining circumstantial evidence as such as gives rise to a reasonable inference in the minds of the jury, based on proof of the truthfulness of the facts alleged and sought to be proved, provided such circumstances, together with all the other evidence bearing on such facts, constitute a preponderance of the evidence, was not misleading.

5. An instruction that plaintiff was not bound to prove "his case" beyond a reasonable doubt, but only by a preponderance of the evidence, and that, if the evidence bearing on "plaintiff's case" preponderates in his favor, it will be sufficient, was not objectionable in that it used the term "plaintiff's case" and "his case" instead of referring to the allegations in the declaration.

6. An instruction that if plaintiff's evidence preponderates in his favor, although but slightly, the verdict must be for him, was not reversible error.

7. Where special interrogatories submitted by the court to the jury fully covered the issues of negligence and contributory negligence, defendant was not prejudiced by the failure of the court to submit them to counsel for examination before submitting them to the jury.—(Chicago City Ry. Co. vs. Nelson, 74 N. E. Rep., 458.)

ILLINOIS.—Carriers—Street Railroads—Injuries to Passengers—Electric Equipment—Explosion—Panic—Prima Facie Case Res Ipsa Loquitur—Instructions—Appeal—Right to Allege Error—Questions Not Raised at Trial.

1. In an action for injuries the judgment of the Appellate Court is conclusive on the question as to whether the verdict is supported by the weight of the evidence.

2. Plaintiff, while a passenger in defendant's street car, was startled by an explosion in the controller, which caused a panic. When the explosion occurred, the passengers, including plaintiff, rushed from the rear door, and plaintiff was pushed and fell to the pavement, sustaining serious injuries. Held, that the circumstances of the accident were sufficient prima facie evidence of negligence on the part of the carrier under the doctrine of res ipsa loquitur.

3. An objection on the ground of variance between the issues and proof cannot be reviewed where the question was not raised in the trial court.

4. Where, in an action for injuries to a passenger, the declaration averred that the injury was the result of an explosion in the electric equipment of the street car; that such explosion created a panic among the passengers, causing plaintiff and the other passengers to rush to the rear door, and in the excitement plaintiff was pushed from the car to the pavement and received the injury—it was not objectionable after verdict, on the ground that it did not allege that plaintiff was injured by the explosion, or in endeavoring to escape from danger apprehended by her therefrom.

5. Where plaintiff and other passengers on a street car were thrown into a panic by an explosion in the controller box, and plaintiff was injured in attempting to escape from the car, an instruction that if a person, without fault on her part, is confronted with apparent sudden danger, the obligation resting on her to exercise ordinary care for her safety does not require her to act with the same deliberation and foresight which may be required under ordinary circumstances, was properly given.

6. Where the court charged that plaintiff was required to prove that she was pushed or thrown from defendant's car and injured, as alleged, or she could not recover, it was not error to refuse to charge that plaintiff could not recover unless the jury believed from a preponderance of the evidence that plaintiff was in fact pushed and thrown from the car to the street, as charged in the declaration.—(Chicago Union Traction Co. vs. Newmiller, 74 N. E. Rep., 410.)

ILLINOIS.—Street Railroads—Injuries to Pedestrians—Derailment—Negligence—Issues and Proof—Evidence.

1. Where plaintiff sets out in his declaration in an action for injuries the negligent acts of the defendant relied on as a basis for a recovery, he cannot recover by reason of negligent acts not alleged, though proved to have caused the injury.

2. In an action for injuries to a pedestrian by being struck by a derailed street car, evidence held to justify a finding that the derailment was caused by defendant's negligence in leaving a switch open at a curve.—(Chicago City Ry. Co. vs. Bruley, 74 N. E. Rep., 441.)

ILLINOIS.—Street Railroads—Injuries to Pedestrians—Wrongful Death—Willful Injury—Actions—Special Interrogatories—Submission—Notice to Counsel—Instructions.

1. Where plaintiff's intestate, a boy 5 years old, was killed by coming in contact with a street car at the side as he was crossing the street behind another car going in the opposite direction, it was improper for the court to submit special interrogatories as to whether the child ran into the side of the car, or whether the car ran into and struck the child, as such interrogatories were both immaterial, and related only to evidentiary facts.

2. Where, in an action for death resulting from a street car collision with intestate at a crossing, the court charged that there was no evidence to support two counts of the declaration besides the count charging a willful and wanton injury, it was improper for the court to submit special interrogatories requesting findings as to whether defendant was guilty of wantonness or recklessness in driving the car in question, and whether it was guilty of negligence charged "in the declaration, or some count thereof."

3. It is improper for the court to submit special interrogatories to the jury without notice to counsel, and an opportunity given them to argue the same.

4. In an action for death caused by a collision between plaintiff's intestate and defendant's street car, an instruction on willful injury that it was not necessary for plaintiff to prove that defendant intended to drive the car upon deceased, in order to sustain an allegation of willfulness—but failing to charge what was necessary in order to sustain such allegation, was erroneous.—(Chicago City Ry. Co. vs. Jordan, 74 N. E. Rep., 452.)

ILLINOIS.—Carriers—Injuries to Passengers—Damages—Witnesses—Cross-Examination—Curing Error—Instructions.

1. Where, in an action for injuries, each of three instructions given at defendant's request, advised the jury that plaintiff could only recover such damages as were the result of the accident complained of, a former instruction on the question of damages was not prejudicially erroneous for failure to confine the jury to such damages.

2. Where the evidence on the issue of damages in an action for injuries was very conflicting, and it was doubtful whether plaintiff's present physical condition, which was emphasized in the presence of the jury by an ocular demonstration, was the result of the accident complained of, an instruction permitting the jury, in estimating plaintiff's damages, to take into consideration plaintiff's present physical condition, as shown by the evidence, was error.

3. Where the extent of plaintiff's injuries, as claimed by her, was strenuously denied, plaintiff's denial, on cross-examination, that she helped take care of her mistress, who was the keeper of a boarding house, during an illness, did not so cover a subsequent interrogatory as to whether she did not carry her mistress' meals to her from the basement as to preclude defendant from being entitled to an answer thereto.

4. Error of the court in sustaining an objection to such question was not cured by subsequent testimony given by a witness who was in defendant's employ that plaintiff did perform the service inquired about for her mistress under the circumstances specified.—(Chicago Union Traction Co. vs. Miller, 72 N. E. Rep., 25.)

ILLINOIS.—Negligence—Release of Person Liable—Fraud—Raising Question of Fraud—Evidence—Question for Jury—Injuries—Hearsay Evidence—Impeaching Witness.

1. Where one signing a release is induced to do so by a fraudulent representation, but understands what he is signing, in order to make an attack on the release resort must be had to equity.

2. Where one signing a release is deceived into signing it by the belief that he is signing something else, he may attack the instrument in an action at law.

3. Where, in an action for personal injuries, there was evidence that plaintiff signed a release under the belief that he was signing a receipt for something else, the question whether the release was obtained unfairly was for the jury.

4. In an action for injuries where one defense was that prior to the accident plaintiff had met with other accidents, which had caused many of the ailments attributed to the accident in question, it was error to permit plaintiff to introduce the testimony of witnesses as to what they had heard about prior injuries to plaintiff.

5. Where evidence was introduced by plaintiff over objection, and defendant thereafter introduced evidence of the same character, he was not thereby precluded from questioning the correctness of the ruling on plaintiff's evidence.

6. In an action against a street railway for injuries sustained by having been struck by one of defendant's cars, it was error to admit on behalf of plaintiff's evidence showing that a policeman arrested the motorman and conductor several hours after the accident.

7. A party had no right on cross-examination of a witness to examine him as to his relations with his wife, and as to whether he supported his family.—(Chicago City Ry. Co. vs. Uhter, 72 N. E. Rep., 195.)

ILLINOIS.—Street Railroads—Persons on Track—Collisions—Death—Willful Injury—Witnesses—Interest—Competency—Instructions.

1. Since a judgment against a street railway company for death caused by the alleged negligence of a motorman in an action to which the motorman was not a party would not be evidence against the motorman in a suit by the railway company to recover over against him, such motorman was not interested in the suit against the railway company so as to be an incompetent witness for the defendant therein within Laws 1867, p. 183, removing the disqualification of witnesses on account of interest in the event, except (section 2) that a party interested shall not be allowed to testify of his own motion or on his own behalf as against the administrator of a deceased person, etc.

2. Where, in an action for death of a traveler on a highway in a collision with a street car, every witness to the occurrence testified to the sudden application of the brakes by the motorman before collision, and there was no evidence of any intention or purpose not to discharge any duty incumbent on defendant with reference to the accident, an instruction withdrawing from the jury an issue of willful and wanton injury was proper.

3. Where, in an action for death of a traveler in a collision with a street car, there was no evidence of a willful injury, a requested instruction to find for plaintiff, though deceased was guilty of negligence contributing to the accident, if the evidence showed that the motorman managed the car in a wanton and reckless manner, was properly refused.

4. In an action for death, an instruction authorizing recovery for mere negligence on the part of defendant's servant, notwithstanding contributory negligence of deceased, was properly refused.—(Feitl vs. Chicago City Ry. Co., 71 N. E. Rep., 901.)

ILLINOIS.—Carriers—Injuries to Passengers—Mental Condition—Non-Expert Opinions—Trial—Misconduct of Counsel.

1. Where, in an action for injuries to a passenger, it was claimed that his brain was injured, it was competent to show his mental status before the injury, and also continuously from and after the injury to the time of the trial.

2. Where an injury to a passenger was alleged to have resulted in loss of reason, non-expert witnesses who had known plaintiff before and after the accident, and who had testified to instances of action on plaintiff's part, occurring after the accident, tending to show a diseased mind, were competent to give their opinion as to his mental condition.

3. An action for injuries having been previously tried, on a subsequent trial defendant's counsel objected to an answer, whereupon a colloquy occurred between the court and counsel, and, with reference to the remarks made, the court said, "I hoped we would get along without them and be satisfied," whereupon plaintiff's counsel remarked, "I was satisfied at the end of the other trial." Counsel for defendant thereupon objected, and the court said, "Yes, it is improper," notwithstanding which ruling, defendant's counsel took an exception. Held that, since the verdict in favor of the plaintiff was amply sustained in other respects, the reference made by

plaintiff's counsel to the previous trial was not reversible error.—(Chicago Union Traction Co. vs. Lawrence, 71 N. E. Rep., 1024.)

ILLINOIS.—Street Railroads—Injuries to Passengers—Action—Instructions—Contributory Negligence.

1. It is improper for the trial court to limit the number of tendered instructions.

2. Marking a tendered instruction "not received," instead of "refused," is not material where the instruction should not have been given.

3. In an action against a street car company for injury to a passenger, where the action was based on negligence in suddenly starting the car as plaintiff was about to alight, its proper to refuse a tendered instruction relating to negligence in failing to properly stop the car.

4. As it is not, as a matter of law, contributory negligence for a street car passenger to fail to take hold of the rail or bar of the car while riding on the platform preparatory to alighting, it was proper to refuse an instruction, in an action for injury in being thrown off by the sudden starting of the car, that such failure of a passenger would be contributory negligence.

5. In an action by a passenger on a street car for injuries received, where the instructions required the jury to find that plaintiff could not recover unless she was in the exercise of due care for her own safety, and that the giving of notice in some way to the conductor that she desired to alight was involved in her exercise of due care, it sufficiently presented to the mind of the jury the question of notice to the conductor.

6. An instruction requiring the jury to notice and consider the extent to which any one of the instructions given might be qualified by other instructions is not erroneous, as submitting to the jury a question of law.

7. Instructions to the jury must be regarded as a continued series, and it must be clear that the jury have drawn an improper inference from a single instruction before the judgment will be reversed.—(Chicago Union Traction Co. vs. Hanthorn, 71 N. E. Rep., 1022.)

ILLINOIS.—Street Railroads—Injury to Pedestrian—Contributory Negligence—Question for Jury—Finding of Appellate Court—Conclusiveness—Peremptory Instruction—Waiver of Ruling.

1. A defendant does not waive his right to have reviewed the action of the trial court in refusing a peremptory instruction because it is offered at the close of all the evidence, or because after its refusal he requests instructions as to the law of the case.

2. Where there is any evidence to establish a fact as found by the Appellate Court, the finding is binding on the Supreme Court.

3. In an action against a street railway company for the death of a pedestrian struck by a car, a witness testified that he saw decedent walking on the street; that just as he reached the carline the witness heard the gong of a street car, and instantly the car, going at the rate of 12 or 15 miles an hour, struck decedent down; that the witness went to the car, which had stopped, and found decedent dead under the car. The proof tended to show that decedent had almost cleared the track when he was struck, and that no warning of the approach of the car was given. Held, that the question of the decedent's contributory negligence was for the jury.—(Chicago Union Traction Co. vs. O'Donnell, 71 N. E. Rep., 1015.)

INDIANA.—Street Railroads—Vehicles—Collisions—Injuries to Travelers—Imputed Negligence—Contributory Negligence—Questions for Jury—General Verdict—Special Interrogatories—Conflict—Witnesses—Credibility—Instructions—Appeal—Review.

1. In determining whether special findings are in irreconcilable conflict with the general verdict, all reasonable presumptions and intendments must be indulged in favor of the verdict, and nothing can be presumed in favor of the special findings or answers to interrogatories.

2. Where plaintiff was injured by a street car striking a vehicle in which she was riding with her husband, special findings of isolated facts to the effect that plaintiff, while passing along the street prior to the accident, did not look to discover the approach of the car; that she made no effort to ascertain the location of the car; that she heard it approaching, and gave her husband some warning that they were in danger, etc.—were insufficient to overthrow a general verdict in favor of plaintiff, as showing that she was guilty of contributory negligence as a matter of law.

3. In an action for injuries to plaintiff in a collision between a street car and a vehicle in which she was riding, evidence held to require submission of plaintiff's alleged contributory negligence to the jury.

4. The preponderance of the evidence does not depend on the number of witnesses, but means the greater weight of the evidence.

5. The use of the words "shall" and "should," in an instruction that, if the jury shall find from the preponderance of all the evidence that plaintiff acted as a person of ordinary prudence under all the circumstances, they should find her free from contributory negligence, did not render such instruction erroneous.

6. Where the jury had been instructed that they should consider all the circumstances and surroundings at the time of the injury in determining whether plaintiff was guilty of negligence which contributed to her injury, and were fully and correctly charged as to imputed negligence, an instruction that, on the question of plaintiff's contributory negligence, the jury should consider not only her own acts and conduct, but all other circumstances surrounding the accident, and determine from these whether plaintiff was free from contributory negligence, and if she was herself free from such negligence, and was merely a passive guest of her husband, without any authority to control his conduct or movements in driving and managing the horse and vehicle in which she was riding at the time, his negligence, if any, could not be imputed to her, was not objectionable as invading the province of the jury, and misleading them to believe that in considering plaintiff's contributory negligence they were not to consider the negligence of her husband.

7. Where, at the time plaintiff was injured, she did not in any manner undertake to exercise reasonable care for her safety through the agency of her husband, who was driving and managing the vehicle in which plaintiff was riding at the time, the negligence of the husband in failing to look out for an approaching street car, etc., by which plaintiff was injured, could not be imputed to her.

8. An instruction that the jury were the exclusive judges of the credibility of the witnesses, and that it was their duty to reconcile, so far as they could, conflicting evidence, etc., was not objectionable as confining the jury to the consideration of the interest and character of such witnesses whose evidence was conflicting.

9. Failure of the court to charge with sufficient fullness on particular issues is unobjectionable, where no further instructions were requested.—(Indianapolis St. Ry. Co. vs. Johnson, 72 N. E. Rep., 571.)

INDIANA.—Carriers—Street Railroads—Injuries to Passengers—Premature Starting.

1. A complaint alleged that plaintiff was thrown with such force to a brick pavement that he was rendered unconscious for six hours; that his head was cut open, and the muscles of his back strained, so that he was and would always be unable to do any manual labor; that in falling he struck his elbows on the pavement so that the flesh was torn away and the bones exposed to view, and plaintiff was then and there rendered a permanent cripple. Held that the complaint was sufficiently specific as to the injuries sustained.

2. A complaint alleging that defendant's street car stopped at a regular stopping place, when plaintiff and other passengers began to leave the car by the rear platform; that the conductor could have seen, and did see, the position of such passengers until they stepped off the car; and that, as plaintiff was in the act of stepping from the lower step, the car was suddenly started with a violent jerk, and that the conductor, without regard to plaintiff's dangerous position, negligently signaled the car to be so started—sufficiently charged negligence on the part of the conductor.

3. Where a street car has stopped for the purpose of permitting passengers to alight, it is the duty of the conductor to know that passengers have alighted before starting the car.—(Union Traction Co. of Indiana vs. Siceloff.—(72 N. E. Rep., 266.)

INDIANA.—Remand After Change of Venue—Review—Personal Injuries — Jurisdiction — Instructions — Evidence — Inconsistent Findings.

1. The ruling on a motion to remand a cause to the court from which the venue had been changed should be questioned by making it a reason for a new trial rather than by separate assignment of error.

2. That the court has no jurisdiction to try the case cannot be raised by demurrer where want of jurisdiction does not appear on the face of the complaint.

3. In an action for personal injuries from alleged negligence it was proper to instruct that "care is required to be in proportion to the danger to be avoided and the fatal consequences that might result from the neglect."

4. In an action for injuries to a person on the track of an electric street railway, an instruction that the motorman must use diligence to avoid danger to a person on the track, and that the car must be stopped, if there is time to stop it, where the person is in a dangerous position, and if there was time, in the exercise of ordinary care, for a motorman to have stopped the car after seeing, or after he was bound to see, with ordinary care, the dangerous position of the person on the track, and failed to check the speed of the car, then the defendant was guilty of negligence, is

not objectionable in not properly stating the theory of "the last clear chance."

5. The distance within which a street car in motion may be stopped by the use of the brake is a question on which an expert witness may properly give an opinion.

6. In an action for injuries by collision with a street car, findings that the motorman sounded his gong when the horse first went on the track, and that up to that time there was no indication of danger, and that the motorman was in proper position, and paying attention, and should first have known that the buggy would not get off the track when the car was 40 ft. from it, and the car could have been stopped with the utmost care within 35 ft., are not inconsistent with general verdict for plaintiff.—(Indianapolis St. Ry. Co. vs. Seerley, 72 N. E. Rep., 169.)

INDIANA.—Master and Servant—Injuries to Servant—Omission to Sand Tracks—Assumption of Risk—Proximate Cause—Pleading.

1. In an action against a street railroad for injuries to a motorman, a complaint alleging that defendant was in the habit of roughing the rails on a grade by sanding them, but on a certain date negligently failed to do so, or to take any means or precaution to prevent the cars from slipping, sufficiently averred defendant's dereliction of duty, without further stating what other means could have been used to make the track safe.

2. The omission of a street railroad to roughen or sand its track at a place where a steep grade makes sanding necessary in order to make the track safe for the operation of cars is negligence.

3. The negligent omission of a street railroad to sand its track, in consequence of which a car became unmanageable, and collided with another car, injuring a motorman, was the proximate cause of such injury.

4. A motorman on a street car assumes the usual and ordinary risks incident to his employment, so far as such risks are known to him, or could be known by the exercise of ordinary and reasonable care.

5. Where a street railroad had recognized its duty to make the track safe for the operation of cars by roughing or sanding the same, a motorman who knew this fact had a right to rely upon the performance of such duty by the railroad, in the absence of knowledge that the custom of sanding the track had been changed, and at a time when, by reason of darkness, he could not see whether the track was sanded or not.—(Union Traction Co. of Indiana vs. Buckland, 72 N. E. Rep., 158.)

INDIANA.—Appeal—Sufficiency of Evidence—New Trial—Impeaching Evidence—Instructions—Presumption.

1. Evidence tending to prove the essential facts in a case is sufficient to sustain the verdict.

2. As affecting the credibility of the president of a corporation, who testified that he did not notify a director of a special meeting at which the note sued on was authorized, a statement of his at the meeting as to the reason the director was not present, inconsistent with his testimony that he did not notify the director, is admissible.

3. It will be presumed that the jury regarded the instruction that they should consider certain evidence for no other purpose than as affecting the credibility of a witness.

4. A new trial will not be granted on appeal unless it appears that substantial justice has not been done.—(Indianapolis, G. & F. R. Co. vs. Hubbard et al., 74 N. E. Rep., 535.)

IOWA.—Street Railways—Negligence—Injuries to Passenger Alighting from Car—Contributory Negligence—Recovery by Husband for Injury to Wife—Measure of Damages—Present and Future Services—Assignment of Husband's right of Action—Burden of Proof—Evidence—Res Gestæ—Instructions—Error.

1. Where plaintiff, a passenger on a street car, in alighting fell by reason of defendant's negligence in failing to let down a folding step, evidence that immediately after plaintiff fell she exclaimed "Yes; let down the step after I fall!" was admissible; the declaration being relevant to evidence that the step was let down after plaintiff fell.

2. A street railway is bound to use extraordinary care and precaution to protect its passengers from injury.

3. In an action against a street railway by a passenger for personal injuries, there was no inconsistency between an instruction that defendant was held to the exercise of extraordinary care and caution to prevent injury to plaintiff, and that plaintiff was bound to exercise only ordinary care and caution, and an instruction that if plaintiff was not guilty of contributory negligence, and was injured by reason of defendant's negligence, she was entitled to recover.

4. In an action against a street railway by a passenger for personal injuries, an instruction that if the plaintiff failed to use ordi-

nary care, and such failure contributed to the injury, defendant was not liable, and that, as to the issue of plaintiff's contributory negligence, the burden of proof was on her to establish by a preponderance of the evidence that she was in the exercise of ordinary care and caution, was not misleading as to the burden with reference to contributory negligence.

5. While, in personal injury actions, present worth, rather than the aggregate of future damage, should be estimated, yet, where no specific instruction as to present worth is asked, the jury may be directed as to the general basis on which the right to recover is founded, and allowed to fix such sum as, in their judgment, is reasonable.

6. A husband can recover for injuries to his wife such compensation as the jury deem a money equivalent for the loss of such services, assistance, companionship and society as he has been deprived of by the injury.

7. If a wife, after receiving personal injuries, should be able to earn money in an independent business, such earnings would be no set-off to the damages which her husband might have recovered, or which she may recover under an assignment from him of his right of action, for damages for deprivation of her services, and for expenses incurred for medical attendance, etc.

8. In an action for personal injuries, plaintiff could recover, under an assignment to her by her husband of his right of action for damages for deprivation of her services, only the value of the services of which he had been or in the future might be deprived by reason of the injury.—(Hutcheis vs. Cedar Rapids & M. C. Ry. Co., 103 N. W. Rep., 779.)

MASSACHUSETTS.—Streets—Use by Teams—Impeding Traffic—Negligence—Questions for Jury.

1. Whether the driver of a team was negligent in leaving his horse standing, with his trace unfastened, so near to passing street cars that a passenger standing on the running board of a car was crushed between the horse and the car, held a question for the jury.

2. The right of a merchant to leave his team standing in the street while merchandise is being unloaded therefrom must be exercised with due regard to the rights of others lawfully using the street.—(McCormack vs. Boston Elevated Ry. Co., Same vs. Standard Oil Co., 74 N. E. Rep., 599.)

MASSACHUSETTS.—Carriers—Street Railroads—Injuries to Passengers—Space Between Cars—Negligence.

It was not negligence for an elevated railroad company to permit an open space in the passageway between the platforms of its cars, made necessary by sharp curves in its line, and to impliedly invite passengers to use such passageway at stations in going between the cars without informing them in words of the existence of such open space.—(Falkins vs. Boston Elevated Ry. Co., 74 N. E. Rep., 338.)

MICHIGAN.—Master and Servant—Injuries to Servant—Street Railroads—Construction—Collisions—Duties of Servant—Vice-Principal—Negligence—Contributory Negligence—Assumed Risk.

1. The general superintendent and manager of an electric railway was a vice-principal, and not a fellow-servant, of an employee engaged in the work of construction.

2. In an action for injuries to an employee, while riding on an electric railway construction train, caused by a collision with other loaded cars left on a spur track, evidence held to authorize a finding that defendant's general superintendent was negligent in placing such loaded cars on the spur track, and in failing to give notice of the fact to those in charge of the train on which plaintiff was riding.

3. Where an employee of an electric railway company elected to ride on the outside of a house car at the close of the work, in order to watch the tools, with the acquiescence of defendant's assistant superintendent, and was injured in a collision between the train on which he was riding and loaded gravel cars negligently left on a spur track, he was not guilty of contributory negligence, as a matter of law, because of the position he assumed, the danger of collision being not one he was required to anticipate.

4. Plaintiff, an employee of an electric railway company, took a position on the outside of a house car prior to his being transported to his destination at night, and, on being cautioned by the assistant superintendent to go inside, replied that he had taken his position to watch the tools and see that none fell off, and that he had a good seat, whereupon the road master replied, "All right, then," and plaintiff remained in such position. Held to justify an inference that plaintiff was directed to stay where he was and there perform a duty for defendant.

5. Where, in an action for injuries to an employee, while riding on an electric railway construction train, by a collision, it ap-

peared that the shock of the collision was much greater than that ordinarily resulting from cars coming together on the siding, plaintiff did not assume the risk as a matter of law.—(Milbourne vs. Arnold Electric Power & Station Co., 103 N. W. Rep., 821.)

MICHIGAN.—Street Railroads—Negligence—Construction of Track—Rails Above Street Surface—Overturning of Vehicle—Personal Injuries—Evidence—Admissibility—Sufficiency—Instruction.

1. In an action for injuries to plaintiff from the overturning of his cutter in striking the rails of the defendant's track, which were alleged to have been negligently left above the surface of the street, where the sole question was the condition of the street, and whether its condition was negligence, evidence of prior accidents of a similar character at the same place was inadmissible.

2. An instruction that if the jury believed that any witness for defendant testified under a fear of losing his employment, or a desire to avoid censure, or fear of offending, or a desire to please his employer, such fact might be considered in determining the weight to be given to his testimony, was erroneous, when not coupled with any caution that the jury would not be justified in drawing unfair inferences simply because the witnesses were employees, and there was nothing in the testimony itself or in the manner of the witnesses to justify the conclusion that the testimony was tainted in the manner suggested by the instruction.

3. Where none of the witnesses for the plaintiff who testified as to the condition of defendant's track where the accident occurred had made such an examination as entitled their testimony to much weight, but, on the contrary, eight for the defendant testified to a careful examination, and that it was in good condition—two of them being officers of the village in which the accident occurred—a verdict for plaintiff was contrary to the clear weight of the evidence.—(Gregory vs. Detroit United Ry. Co., 101 N. W. Rep., 546.)

MISSOURI.—Master and Servant—Injuries to Servant—Defective Appliances—Assumed Risk—Statement Against Interest—Weight—Instructions—Curing Error.

1. In an action for injuries to a street car conductor caused by a defective step, an instruction that plaintiff must show "that he did not know of the broken and unsafe condition" of the step, and that the same was not obvious to plaintiff in the exercise of reasonable care, was erroneous, as plaintiff did not assume the risk of the defect, though he had knowledge thereof, unless it was so obviously dangerous that ordinary prudence would have dictated that he refuse to use it.

2. Such error was not cured by a subsequent disconnected instruction correctly declaring the law, the instructions being conflicting and misleading.

3. An instruction that any statements made by plaintiff either during the trial or elsewhere, which were against his interest, were to be taken and treated by the jury as "absolutely true," was erroneous, such statements not being conclusive of the facts alleged to have been admitted.—(Shepherd vs. St. Louis Transit Co., 87 S. W. Rep., 1007.)

MISSOURI.—Jury—Verdict by Nine—Conflicting Evidence—Question to Physician—Street Cars—Stopping to Discharge Passenger—Instructions—Remarks of Counsel.

1. No right under the United States Constitution is violated by the Missouri constitutional amendment authorizing a verdict in a civil case by three-fourths of the jury.

2. A verdict on conflicting evidence can be set aside on appeal only where it appears to have been the result of prejudice and passion.

3. To obtain from the physician who attended plaintiff his opinion, based on his own knowledge of the case, whether the symptoms of pain in the head from which plaintiff testified she still suffered were probably caused by the injury received in the accident in question, is the fair purpose of the question: "In view of what you had seen when you first visited her, and in view of the fact that you continued to treat her, and that she has remained under your care to the present day, and in view of the fact that she now claims she is still suffering from pains in her head, I will ask you, in your opinion as a physician, would those pains that she claims to suffer be caused, or be likely to be caused, by the injury to her head for which you treated her?"

4. Though an ordinance required defendant street railway company to stop its cars on the far crossing, yet, cars having frequently, to plaintiff's knowledge, been stopped at the place of the accident before reaching the far crossing, to receive or discharge passengers, and she having signaled the car to stop to let her off, she had a right to suppose, on its stopping before it reached the far crossing, that it stopped to let her off, so that, there being no suggestion that it stopped for any other purpose, defendant can-

not complain that the jury were authorized to find that it was stopped for such purpose.

5. It is not error to refuse an instruction in effect a repetition of instructions given.

6. The remarks of plaintiff's counsel that he was tricked by defendant not calling to the stand one subpoenaed by it, and that a certain witness was a perjurer and a villain, though not justified by the record and improper, are not ground for reversal.—(Franklin vs. St. Louis & M. R. R. Co., 87 S. W. Rep., 930.)

MISSOURI.—Street Railroads—Use of Tracks—Collisions With Teams—Death—Actions—Release by Person Injured.

1. The fact that an injured person was, prior to his injuries, afflicted with the disease of which he subsequently died, and that his injuries merely hastened his death, does not preclude a recovery by the persons entitled thereto for his death.

2. The driver of a wagon is not a trespasser, nor guilty of negligence, in driving on a street railroad track, but is merely bound to use reasonable care to avoid interfering and colliding with the cars.

3. Conceding that one driving a wagon on a railroad track should have driven away from the track on hearing the gong of a car approaching from the rear, yet the fact that he disregarded his duty in that regard did not authorize the motorman of the car to run the wagon down and knock it off the track.

4. A husband or father, who suffers injuries through the negligence of another, cannot, by executing a release, deprive his widow or children, in case he dies from such injuries, of the right of recovery given them by Rev. St. 1899, secs. 2864, 2865.—(Strode vs. St. Louis Transit Co., 87 S. W. Rep., 976.)

MISSOURI.—Carriers—Street Cars—Passengers—Assault by Conductor—Termination of Relation—Actions—Instructions—Verdict—Conflicting Evidence—Appeal.

1. Defendant's street car conductor committed an unprovoked assault on plaintiff, who was an old man, as he was endeavoring to alight, and pushed or threw him from the car. Plaintiff's umbrella remained on the platform, and when he attempted to get it the conductor kicked him in the groin, whereupon plaintiff hit the conductor with the umbrella, and the latter then followed plaintiff to the street and beat him. Held, that the assault was continuous, and that the relation of carrier and passenger had not entirely ceased when plaintiff was kicked.

2. Where, in an action for injuries to a passenger, no witness was impeached by evidence of his bad character for truth and veracity or by inconsistent statements, it was not reversible error for the court to refuse to charge that, if the jury believed any witness had knowingly testified falsely to any material fact in issue, the whole or any part of the testimony of such witness might be disregarded, the jury having been fully charged that they were the sole judges of the credibility of the witnesses, and the proper rule for determining the weight to be given to their testimony.

3. In an action for injuries to a passenger it was not error for the court to strike the words "and no other cause" from an instruction that the burden was on plaintiff to establish that his alleged injuries were the direct and natural result of the assault by defendant's conductor, and of no other cause, etc.

4. In an action for injuries to a passenger on a street car, caused by an assault by the conductor, a requested instruction, ignoring evidence given by the conductor that after he was struck by plaintiff with an umbrella he followed plaintiff into the street, and continued the assault on him when he was retreating from the car, was properly refused.

5. An instruction assuming facts not in evidence is properly refused.

6. A verdict based on conflicting evidence will not be interfered with on appeal, though it may appear that the preponderance of the evidence is against it.—(Flynn vs. St. Louis Transit Co., 87 S. W. Rep., 560.)

MISSOURI.—Negligence—Injuries to Children—Turntables—Capacity—Age—Instructions.

1. Where, in an action for injuries to a child while playing on defendant's turntable, there was evidence that when defendant abandoned the turntable it was securely fastened, and was unfastened when plaintiff was playing thereon, an instruction purporting to cover the whole case, and directing a verdict for plaintiff if the matters submitted were believed, which omitted any hypothesis of defendant's negligence, or of its knowledge that the table was unfastened or being revolved by children at play, or that by ordinary care it could have known such condition, was erroneous.

2. In an action for injuries to a child while playing on defendant's turntable, it was proper to submit plaintiff's age and

capacity on the issue of the care exercised by him.—(Edwards vs. Metropolitan St. Ry. Co., 87 S. W. Rep., 587.)

NEBRASKA.—Street Railroads—Collision With Team—Negligence—Evidence.

1. If the driver of a vehicle who arrives at a street intersection and who sees an approaching car is justified in believing that there will be sufficient time for him to cross the track before the car, if run at its usual and ordinary rate of speed, will reach the point of crossing, he cannot be said as a matter of law to be guilty of negligence in attempting to cross, and the question is a question of fact for the jury, to be determined from all the evidence before it.

2. The exclusion of testimony to show that the car might have been seen at a greater distance is not erroneous, since the question was not whether the plaintiff might not have seen the car at a greater distance, but whether he was guilty of negligence in attempting to cross with the car at the distance it actually was when he saw it.—(Omaha St. Ry. Co. vs. Mathieson, 103 N. E. Rep., 666.)

NEW JERSEY.—Carriers—Street Railroads—Injuries to Passengers—Time to Alight—Contributory Negligence—Actions—Pleading—Issues and Proof—Evidence—Moral Character—Effect—Limitation—Negligence.

1. In an action for injuries to a passenger on a street railway car while attempting to alight, evidence held to require submission of plaintiff's contributory negligence to the jury.

2. In an action for injuries to a passenger by the premature starting of a street car as she was attempting to alight, an allegation that it then and there became and was the duty of the defendant to use due care that the plaintiff should be safely conveyed on her journey, was sufficient to present the question of defendant's negligence in not properly supervising the car and in looking after passengers at the point where plaintiff attempted to alight, to see whether any of them wanted to alight or not, and whether defendant's employees did everything that reasonable prudence required of them at the time, etc.

3. Where, in an action for injuries to a passenger on a street car, defendant, in rebuttal, introduced evidence showing a physical condition since the accident different from that described by plaintiff at the trial, some of which tended to asperse plaintiff's moral character, it was not error for the court to charge that the evidence relating to plaintiff's moral conduct could not be used to impeach her testimony as a witness.

4. Where a street car approached a railroad crossing protected by a derailing switch there was no negligence in the mere fact that the conductor of the street car left it and went ahead to operate the switch.—(Camden & S. Ry. Co. vs. Rice, 137 Fed. Rep., 326.)

NEW YORK.—Street Railways—Defect Between Tracks—Injury to Pedestrian—Negligence—Contributory Negligence.

1. Merely because there was a large knothole in a board constituting part of the temporary crossing where a street railway company had the street torn up between its tracks, whereby a pedestrian was injured, does not show that it was negligent; it not being shown that it put the board there, or that it had knowledge of the defect, or that the board had been there long enough to give it notice.

2. A pedestrian injured by stepping into a knothole in a board in a temporary crossing, where a street railway company had the street between its tracks torn up, must, to show freedom from contributory negligence, show that she took precautions to observe the condition of the temporary crossing, of which she had knowledge.—(Keating vs. Metropolitan St. Ry. Co., 94 N. Y. Suppl., 117.)

NEW YORK.—Carriers—Injuries to Passengers—Evidence of Injury—Sufficiency—Damages—Personal Injuries—Pleading—Evidence—Excessive Verdict.

1. In an action against a street railroad for injuries to a passenger resulting from a collision, evidence held sufficient to authorize a finding that plaintiff was physically injured, and not merely frightened, by the collision.

2. Proof of uterine trouble, consisting of irregularity of menses, is admissible under an allegation of severe injury to the person, as the result of which plaintiff was made "sick, sore and disabled," notwithstanding subsequent specific allegations of a severe shock to the nervous system, headaches and dizziness.

3. In an action for injuries to a passenger caused by a collision, there was evidence that, while there were no bruises or outside indications of injuries, plaintiff had suffered severe pain in her spine, had become nervous, sick and dizzy, and had disclosed symptoms of internal injuries. There was also evidence

of uterine trouble, consisting of irregularities of menses. Held, that a verdict for \$500 was not excessive.—(Lofink vs. Interborough Rapid Transit Co., 94 N. Y. Suppl., 150.)

NEW YORK.—Damages—Pleading—Personal Injuries—Allegations of Specific Injury—Carriers—Injuries to Passengers—Violation of Statute.

1. In an action for injuries, the admission of evidence that plaintiff suffered from gastritis was erroneous, where no facts were stated in the complaint from which it could be inferred that plaintiff had been thus affected, but it was alleged therein that she had sustained a wound of the thigh, extending to the periosteum, dividing the nerves and blood vessels of the same, so that she suffered loss of sensation and impeded circulation, was unable to use her leg as before, and sustained a severe shock to her nervous system.

2. A violation of Laws 1890, c. 565, s. 138, providing that no train on an elevated railroad shall be permitted to start until every passenger on the platform desiring to board or enter the cars shall have actually boarded or entered the same, does not create a presumption of negligence against the railroad, but is merely evidence to be considered with other facts on the question of negligence.—(Brown vs. Manhattan Ry. Co., 94 N. Y. Suppl., 190.)

NEW YORK.—Carriers—Injury to Passenger—Cause of Accident—Burden of Proof—Negligence—Jury Question—Instructions—Conflict—Error—Theory—Trial—Appeal.

1. The burden is on a street railroad company, in an action by a passenger for injuries resulting from the falling of the poles or wires on the car, to show the cause of the accident.

2. In an action for injuries to a passenger on one of defendant's open trolley cars, it appeared that the span wire broke from some unexplained cause while the car was going very fast; that the trolley pole and wire fell on the car, and, in the unusual commotion which ensued, plaintiff was either thrown or jumped in fright from the car, though in her complaint she alleged that she was thrown from the car. The evidence was conflicting, and would support either theory. The defendant offered no testimony as to why the pole or wire fell. Held, that the alleged negligence of the defendant was properly submitted to the jury.

3. The court instructed that, if the car became so violent that plaintiff was thrown out involuntarily, then she could recover, but that if there was no commotion or violence, and the car immediately stopped, and then, without any reason, she voluntarily got off, she could recover nothing. On requests for further rulings, the court charged that even if, though voluntarily, she was induced by the disorder to get off, then it would be attributable to the company, and also that the plaintiff must recover, if at all, on the theory that she was thrown from the car, "within the law as the court had laid it down." Held, that the charges were in such irreconcilable conflict as to require a reversal.

4. The fact that the complaint alleged that plaintiff was thrown from the car would not defeat her right to recover on the theory of involuntary motion, unless the sufficiency of the complaint to sustain the recovery be first disposed of in the trial court.—(Stern vs. Westchester Electric Ry. Co., 90 N. Y. Suppl., 870.)

TENNESSEE.—Master and Servant—Personal Injuries—Negligence—Telephone Poles Dangerously Near Railroad Track.

A street railroad company is not chargeable with negligence in permitting telephone poles to be erected on land not owned or controlled by it so near the track as to be dangerous to employees operating cars.—(Chattanooga Electric Ry. Co. vs. Moore, 82 S. W. Rep., 478.)

TEXAS.—Street Railroads—Injuries to Travelers—Defective Track—Evidence—Relevancy—Instructions—Appeal—Assignments of Error—Prejudice.

1. Where, in an action for injuries, a physician had previously testified that his attendance on plaintiff had cost plaintiff nothing, and the court's charge on damages excluded any allowance for such an item, the fact that the court inadvertently permitted the witness' evidence that his services were reasonably worth \$150 to stand, over objection, on the promise of plaintiff's counsel to show its relevancy, which he failed to do, did not constitute reversible error.

2. An assignment of error not followed by a proposition cannot be considered on appeal.

3. It is not error to refuse a request to charge, substantially covered by the charge given.

4. Where, in an action for injuries to a hack driver while crossing defendant's railway track, the petition alleged that defendant's rail was negligently permitted to extend and remain above the ground, and that defendant negligently allowed the earth to be

washed and removed from such rail, plaintiff's evidence with reference to a hole in defendant's roadbed at that place was relevant.—(El Paso Electric Ry. Co. vs. Davis, 83 S. W. Rep., 718.)

TEXAS.—Carriers—Street Railways—Failures to Stop—Questions of Fact—Instructions—Weight of Evidence.

1. Where a petition sought both actual and exemplary damages, and the charge authorized a verdict for both kinds of damages, and the verdict did not state for which kind of damages it was given, and there was no evidence justifying exemplary damages, the judgment on the verdict would be reversed.

2. Whether an intending passenger was "compelled" to walk between stops on a street railway line because of the failure of a car to stop for him was a question of fact, and a charge that the jury might take into account the fact that such passenger "was compelled" to walk was on the weight of the evidence.

3. Whether an intending passenger was subjected to discomfort, inconvenience, and expense in walking between stops because of the failure of a street car to stop for him was a question of fact.—(Northern Texas Traction Co. vs. Hooper, 80 S. W. Rep., 113.)

TEXAS.—Carriers—Injuries to Passengers—Alighting from Street Cars—Negligence—Contributory Negligence—Measure of Care Required—Instructions—Questions for Jury—Appeal—Assignments of Error—Propositions.

1. An appellate court cannot weigh testimony to pass on conflicting evidence or determine issues of fact, but its province in that behalf is limited to a determination of whether there is evidence reasonably sufficient to support the findings of the jury.

2. It is the duty of a street railway company and its employees to use such high degree of care and foresight in the protection of passengers and in guarding against possible dangers as would be used by very cautious and competent persons under like circumstances, although such a company is not an insurer of the safety of its passengers.

3. A charge that street railway companies are not to be regarded as insurers of the safety of their passengers was, if meaningless, not prejudicial to the company, in view of the remainder of the charge on the degree of care that such companies are required to use.

4. A proposition which is not cognate to the assignment of error under which it is placed, and which states no point that can arise from it, but presents and raises a distinct question arising from the action of the court upon separate matter, cannot be considered.

5. Where the charge of the court covered every material issue raised in the pleadings and evidence, the failure to fully state the issues in the preliminary part of the charge was not a ground for reversal where no special instruction was requested for the correction of the omission.—(El Paso Electric Ry. Co. vs. Harry, 83 S. W. Rep., 735.)

TEXAS.—Personal Injuries—Sufficiency of Petition—Parol Evidence.

1. A petition in an action for injuries to plaintiff's wife is sufficiently definite where it alleges a collision of defendant's cars, and that plaintiff's wife suffered a miscarriage as a result of "the jolt, jar and shock" by such collision.

2. Where an accident occurred in June, which caused plaintiff's wife to miscarry the following day, a second miscarriage the following November, resulting from the same injury, is not too remote for a recovery in the same action.

3. Though a small money consideration be expressed in a written release of a cause of action, parol evidence is admissible to show that the real consideration was a verbal promise by defendant of future employment of plaintiff.

4. Where the court divides the issues in relation to a release pleaded as a defense, charging that if, when the release was signed, plaintiff had been promised employment by defendant, to find for plaintiff, otherwise to find for defendant, with instructions as to the form of the verdict, and then gave another charge on the question of damages, so that two general verdicts were rendered, defendant, though the practice was irregular, suffered no injury thereby.—(Rapid Transit Ry. Co. vs. Smith, 82 S. W. Rep., 788.)

VERMONT.—Street Railroads—Injury to Passenger—Theory of Trial—Inconsistent Instructions.

Where, in an action for injuries to a passenger when alighting from defendant's street car, plaintiff's declaration and evidence showed that after the car had come to a full stop it was suddenly started, whereby plaintiff was injured, and in argument plaintiff's counsel expressly disclaimed any claim or right of recovery on any other ground, plaintiff could not complain that the court, in submitting the case to the jury, refused to charge on any theory on which a recovery might be had other than the car had come to a full stop.—(Fogarty vs. Rutland St. Ry. Co., 60 Atl. Rep., 801.)

LONDON LETTER

(From Our Regular Correspondent.)

The bill of the Administrative County of London and District Electric Power Company, which has been before the House of Lords and the House of Commons and generally in the public eye for the past two or three months, has finally been "squelched," for this year at any rate. It will be remembered that this is the bill which has been brought forward by its promoters for the establishment of three enormous turbo-generating stations in the County of London, situated at various points on the River Thames, the purpose of the company being to supply electricity in bulk especially for the furnishing of power. The bill, of course, met the determined opposition of all the existing companies and municipalities operating their own power stations, but notwithstanding that opposition it passed the House of Lords' committee and also passed the second reading in the House of Commons. It has been before the House of Commons' committee, of which Sir James Kitson has been president for the past few weeks, and volumes of testimony, both pro and con, have been taken from the leading experts in Great Britain. There has been recently a general feeling that the bill would not be allowed to go through this year, and many of those who voted for the second reading undoubtedly would not have voted for the third reading. The bill, however, never got so far through committee that it came up for a third reading, and at the last moment an attempt was made to have it postponed in the state in which it was so as to avoid the enormous expense next session. Even this has failed, so that when the promoters bring it up next year the whole preliminary work will have to be thrashed out again at the same enormous expense. There is no doubt that the promotion of this bill will stimulate the existing companies and municipalities to seek for a greater power load and to reduce the price of current to a much more reasonable figure. Many of the companies during the fight made arrangements with the promoters of the company by which the latter agreed not to interfere with the regular lighting business, but would simply furnish the existing companies with current in bulk at a less rate than that at which they could themselves produce it. Many arrangements of this kind were made, but as we have stated, the bill has not gone through, and all of this work has now become void. Notwithstanding the need for cheaper current in London there is a strong feeling against granting to this company such a huge monopoly as that for which application was made, and it is perhaps just as well that for this year at least the bill has not gone through, as it will give those really interested in the supply of electricity for London more time to consider fully the best method of future procedure.

The London County Council is still proceeding with its various schemes to electrify tramways in various portions of London, and also in bringing fresh bills before Parliament for such rights as are still necessary. It has been decided to apply again to Parliament for powers to construct an electric tramway from the Marble Arch, along the Edgware Road to Cricklewood, where the Council has previously met with very serious rebuffs. Now that the omnibus companies have placed a number of motor omnibuses on this road it is to be feared that the tramway scheme will receive even more serious opposition than previously. The construction of the subway between Southampton Row and the Strand is proceeding apace, and much of it is now completed. The construction of the electric tramways from the present terminus at Theobalds Road to the Angel is now practically completed, and this is the system of electric tramways which will be first connected to the subway. The highways committee has asked the Council to approve a sum of nearly £60,000 to cover the necessary expenditure for the equipment of this line in addition to the sum that was necessary for its construction. The bill for the construction of tramways over Blackfriars and Westminster Bridges was rejected by the House of Lords at the last moment, and the highways committee has recommended that this bill be brought forward again next year, when it is hoped it will meet with a better fate. In the meantime, important contracts will be let in the immediate future for the construction of the electric system in the southern portion of London, about which we have already given particulars. As is well known also, negotiations have been pending for some time with the London County Council for the securing by the North Metropolitan Tramways Company of the lease of its northern tramways, which does not expire until June, 1910. It is now distinctly stated that an offer has been made to the North Metropolitan Company by which the Council will take over this lease, commencing from the first of April next. Provided that the claim is ratified by the shareholders it is calculated that from the money to be received from the London County Council the shareholders of the North Metropolitan Tramways Company would get a return of from £4 to £5 per share.

Owing to the introduction of electric traction, the District Railway has for sale fifty-four locomotives and 368 coaches. The engines weigh about 47 tons each. One coach is fitted with electric light, and the rest with oil gas, and they measure 26 ft. x 8 ft. 6 ins. They are to be sold by private treaty, not under the hammer.

A very representative exhibition, embracing all branches of electricity, is to be held at Olympia during September and October. The exhibition is under the direct patronage of the Institution of Electrical Engineers, and Sir William H. Preece, F. R. S., is the president of the committee, which includes a number of gentlemen well known in the electrical world. We understand that the space at Olympia has nearly all been taken up.

At a special meeting of Largs (Scotland) Town Council a proposal was submitted for the construction of a tramway between Largs and Wemyss Bay. The want of facilities other than those provided by the steamboats have long been felt, and several schemes for connecting the two places by rail have been proposed in past years since shortly after the opening of the Wemyss Bay Railway, but none of them ever took practical shape. It now seems possible, owing to the development of tramway enterprise, to provide that desired communication. In the details submitted for the consideration of the Council an estimate was given that the journey from Glasgow and Largs via Wemyss Bay and the proposed tramway, could be accomplished in seventy minutes. The tramway will also provide much needed facilities for people residing in North Ayrshire, generally reaching Rothesay, Dunoon and other places on the opposite shore of the Clyde, so that the proposed line is expected to act as a feeder to both railway companies. The members of the Town Council were unanimously in favor of the scheme, and expressed a hope that the tramway would also be extended to the southern boundary of the burgh.

A few weeks ago the Middlesex County Council opened its new electric tramway from the Highgate Archway to Whetstone. Now the London County Council has commenced the construction of its link to the Archway Tavern, so as to connect this new line with the main system of London tramways. When this work is completed, it will be possible to travel by tram from the city—either the Moorgate Street or Holborn terminus—to Whetstone with one change only, a distance of 10 miles.

The competition of the electric trams with the steam railways is so keen that Mr. Cosmo Bonsor, at the Southeastern Railway meeting recently, said that in the course of the half year the railway had carried nearly a million and a half fewer passengers than in the corresponding six months of last year.

West Ham has completed its great tram scheme, and by it another important chain of lines has been added to the electrical systems, which are fast linking up the metropolitan area. The value of the system is felt not alone in West Ham itself. At a cost of close upon £300,000 the Town Council has now become possessed of a network of systems which practically control the traffic from Aldgate to Romford—nearly 14 miles. With the exception of Leyton, all the surrounding authorities have now their systems in full work. Walthamstow on the northeast, and East Ham and Ilford on the far east, are all running, and it only needs the London County Council to set about its East London section in order to allow the passengers to travel right through from Aldgate to the Romford boundary by tramcar.

An inquiry was recently held in the Londonderry Literary Institute, Seaham Harbor, before Col. G. F. O. Boughy, R. E., C. S. I., and Henry Allan Steward, of the Light Railway Commission, as to the expediency of granting the application made to them by the Ryhope, Seaham, Murton & South Hetton Tramways Company for a provisional order to lay tramways in the districts mentioned. The promoters of this light railway are called the S. M. H. Syndicate, and are composed almost entirely of shareholders in the Sunderland & District Electric Tramways Company.

Motor omnibuses are becoming more and more common in the streets of London, and a lively fight is now going on between one or two of the new companies, which were organized for the purpose of running motor omnibuses, and the old London omnibus companies, which have been using horse-drawn omnibuses for years. The latter, however, are now wakening up to the situation and are themselves putting on large numbers of motor omnibuses and have many more on order. For the past month or two one of the best known motor omnibus, called the "Vanguard," has been running successfully from the Law Courts in the Strand to Cricklewood by means of Charink Cross Road, Tottenham Court Road, Edgware Road, Maida Vale, etc. This route has been changed so far as the southern portion of it is concerned, and these buses now continue their career along Waterloo Bridge to the Elephant and Castle. The London General Omnibus Company has also started a service of motor omnibuses to compete with this new service over exactly the same route, completing their southern journey, however, at the Law Courts. Next year, therefore, will see keen

competition between the various omnibus companies, who have each probably a hundred motor omnibuses on order, and it is extremely probable that in the course of the next year or two the old horse omnibuses will practically have disappeared from the streets of London. These motor omnibuses are now well patronized, as they save at least 20 to 30 per cent of the time occupied on a journey, and so far as can be judged at present, they are being operated successfully and with economy. The tale of the tires is, however, not yet completely told, though it is confidently expected that the enormous expense of tires will not be prohibitory to success.

The bill promoted by the Birmingham Corporation for the construction of its new tram lines has now passed all the Parliamentary stages, and though it has not as yet received the royal assent it has for all practical purposes gone through this session successfully. The city of Birmingham now stands committed to an expenditure of over a million pounds on the electrification of its tramways, so that in the course of a year or two Birmingham will be in a position to compare favorably with other cities of its size. It has been the last large city in England to get thoroughly settled down to an electrification scheme of its tramways system, which for years have been a sore spot in the eyes of all electrical engineers, the old-fashioned steam cars and cable cars being still in use. A considerable portion of the amount, probably a fifth or more, will have to be spent in street widening, as many of the streets in Birmingham are extremely narrow and tortuous, but at least £600,000 will be spent for electrification equipment, including the erection of a large generating plant, sub-stations, car houses, underground cables, overhead construction, etc.

The North-East London railway bill, which has already passed the House of Commons, has now successfully passed the committee stage of the House of Lords, and it has now been decided that the bill may proceed. The railway is to run from the city, where there will be three stations, to Waltham Abbey. From the Monument to Hackney Road it will be in the tube tunnels, and for the rest of the distance it will be just an ordinary electrically-equipped railway on the surface. The Parliamentary estimate of the cost of the scheme was about three millions and a half sterling, and, in order to carry it out, a company is to be incorporated with a capital of £4,000,000.

Last month we had the pleasure of recording a test of the Raworth regenerative system at Birmingham, and this month we have the pleasure of reporting a very interesting test of the Johnson-Lundell regenerative system of tramway control, which was furnished to members of the press during the past month at the works of the Johnson-Lundell Electric Traction Company, Ltd., at Southall, a few miles outside of London. This system has been more or less before the public for some years, but as yet, outside of one or two experimental cars, no actual system of tramways has been equipped with it. The company has, however, been persevering in its efforts and now claims to have perfected a system by which it can demonstrate a great saving of current. At its works in Southall, the company has equipped a line in an adjoining field, and on this line has a rough car, which is used for experimental purposes, which is fully equipped with the system and fitted with measuring instruments to show the regenerative effect. The Johnson-Lundell system differs very considerably from that invented by Mr. Raworth. Without going into details at present, we may say that everything passed off most successfully at the trial, the car being under perfect control at all times, and even when going at full speed being brought gently to rest by the regenerative system. The platform controller has the ordinary appearance of the usual controller, but in the handle is a button which, upon being depressed by the thumb of the driver, operates another controller underneath the car by electromagnets, which alters the field winding from simple to compound, so that the motors begin to regenerate. The car can thus be brought to a speed of about 2 miles an hour, when a mechanical brake acts automatically and brings the car to a standstill. It is estimated by the Johnson-Lundell Company that a saving of from 40 to 55 per cent can be effected, and though there are necessarily some extra complications involved by the use of the regenerative system, the company claims that, even should the regenerative devices get out of order, the ordinary operation of the car would not be affected.

The Durham County Council is seriously considering the practicability of a county scheme of electric tram service. The Electricity Supply Committee has reported that the population of the county during the past ten years has grown to the extent of about a hundred thousand, and it appears to the committee that access to the rural districts ought to be more practicable by means of electric tramways, as the ordinary steam train service of the county does not in any way afford adequate communication. It is probable, therefore, that in the next session a bill will be brought forward for some tramway scheme for county service.

A. C. S.

PARIS LETTER

[From Our Regular Correspondent.]

The question of the reorganization of transport in Paris drags its weary course, without apparently arriving at any definite results. The last propositions of the special committee appointed to examine the question have been discounted, if not completely ignored, by the Municipal Council, and further reports are to be gotten out by the committee. The matter, however, is at all events recognized to be a very serious one, and it would appear that the present year will not have made way for 1906 before a solution is found for the present deadlock. One sign of this lies in the fact that the concession for the steam tramway running from the Louvre to Versailles will not be renewed by the authorities for another ten years, as previously arranged, but only for the period of six months, which is considered ample time for the new traction regime to come into force. At present, however, all discussion is adjourned until the end of October. The main difficulty to be cleared from this fertile field of discussion is that of obtaining or imposing an accord between the General Omnibus Company and the various tramway lines at present operating a more or less frequent service in the various zones of Paris. It is recognized on all hands that the omnibus routes are unnecessary, and will become more and more a burden to the operating company as the Metropolitan Railway approaches completion. The receipts of the Omnibus Company are constantly decreasing, and, even with a modified method of adjusting fares and routes, it is estimated that the horse omnibus traffic will never permit of anything but a deficit to the company.

The Omnibus Company, however, is not exactly at a standstill. It is experimenting with certain steam and gasoline omnibuses, and at certain non-official trials organized by the French Automobile Club, several presentable specimens of motor omnibuses took part in the tests, and with good results. Among other types was one furnished with a gasoline-electric combination, consisting of a Richard-Brasier 24-hp motor, coupled to generator, with geared motors operating the rear wheels of the omnibus, which has a total weight of 7600 lbs. The Gardner-Serpollet Company, which has perfected a very practical type of steam car, is in a good position to furnish this kind of omnibus.

Two prolongations of the Paris deep level tube railway have been authorized: one from the Central Ouest Railway station of St. Lazare and extending to Porte St. Ouen, and the other from the Montparnasse Railway Station to the Porte Versailles. The form of this railway will therefore be that of an irregular "Z," the main stroke of the "Z" running north and south through the city.

Line 4 of the Paris Metropolitan Railway has now definitely been put in hand. The most interesting portion of this line is undoubtedly the passage beneath the Seine, of which some 60 m will be built not far below the river bed. The manner of tunneling this part will be that known as the Poetsch freezing process. Around the center of the mass of earth to be removed are driven long, double tubes, spaced according to the nature of the soil. In these tubes is circulated a freezing liquid, refrigerated by a special plant installed on the work. After several weeks of circulation in this manner, a frozen zone is formed around the tubes, so as to form a wall enclosing the tunnel. This excludes the water and quicksand, so that work can be prosecuted inside the frozen area by the methods usually used in rock excavation. This work, constituting the seventh section of line 4 of the Metropolitan Railway, will cost over two million dollars, and a delay of eighteen months is accorded to the contractor for the completion of the work.

The Paris, Lyons & Mediterranean Railway Company is, it is stated, seriously considering the electrical equipment of one or two of its lines. Although no estimates have as yet been asked for the necessary material, it is believed that the schemes will have some considerable magnitude. One of the first lines to be transformed electrically will be that from Cannes to Vintimille, on which the traffic is large during certain months of the year.

The development of the single-phase system is being watched with great interest here. There is a small shuttle line running on the Tramway Sud, as already detailed in this column, equipped with Latour motors of the repulsion series compensated type. Whenever a single-phase motor is evolved of fairly large output and suitable for meter gage tracks, it will find a ready application in several interurban railway systems at present in abeyance in France, and which would probably not stand the cost of a direct-current system.

In Vienna at the present moment, two rather important lines of the operating company are being transformed from direct current to single-phase, and it may be presumed that the activity shown in this direction will be accentuated in the near future.

On the State railways in Sweden it appears that it is absolutely decided to transform electrically as soon as possible. The government is being asked for a credit of four million crowns for the purchase of water-falls, of which no less than seventeen are located close to the railway system, and are capable of being turned into account. Of these, some ten are private property. Eight important falls are in the southern regions of Sweden and give an effective output of 40,000 hp, and the State believes it good policy to purchase these falls before they are exploited by private owners.

The party in France which favors the purchase of the French railways by the State is again showing some activity, but it cannot be said that any great headway is being made in this question, although it reappears for discussion periodically, and is as often turned down for further evidence. M. V.

PLANS FOR TOLEDO STATION

L. E. Beilstein, general manager of the Toledo Railways & Light Company, is having preliminary plans prepared for the proposed union passenger station for interurban roads entering the city. The company owns almost the entire square bounded by Beach, Huron, Superior and Jackson Streets, in the down-town section of the city. The union freight station is now located on this site. It is the plan to erect a building of several stories, where the roads could have their offices, and about 500 ft. long fronting on Beach Street and extending from Superior Street to Huron Street. A proposed feature is to have the passengers take the various cars by way of a basement, descending stairs from the waiting room with passages leading to any desired track. In this way there would be no crossing of tracks. The entire rear of the building would be devoted to tracks, and it would have a shed covering of glass and structural work. Last week Henry A. Everett, Barney Mahler, T. J. Ross and F. J. Stout, all prominently identified with the Everett-Moore interests, which controls the city company and two of the interurbans, met to consider the plans. The matter will now be presented to the various interurbans. The plan is to form a holding company to buy the property and erect the station; all the interurbans to be interested in the project.

ANOTHER IMPORTANT OHIO INTERURBAN

An important addition to Ohio interurbans was made last week by the opening of the 17-mile extension of the Toledo, Fostoria & Findlay Railway. The new division connects Fostoria and Pemberville, as shown in a map of the system published in the *STREET RAILWAY JOURNAL* of Aug. 12, 1905, and its completion marks a record for quick construction. Grading was started on April 29, and although twenty-seven working days were lost on account of the wet season, the entire line was in operation on a regular passenger schedule in less than four months from the date of starting. The entire work was done by the company, in charge of F. W. Adams, the general manager of the company, who is being complimented upon his practical demonstration of how to build a railroad.

The Toledo, Fostoria & Findlay Company, always one of the best in the State, now takes on added importance because of its location as the connecting link between two great systems, the Lake Shore Electric and the Western Ohio. With the completion of the Western Ohio branch from Lima to Findlay, in about sixty days, the cross-State Cleveland-Cincinnati route will be a reality. While the route may appear to be rather indirect, it is not so in practice, as compared with steam routes between the same cities. This is owing to the fact that all the present steam routes have been made up by the joining of various small railroads, in a few cases favorably located. The interurban combination, as contemplated, foots a through mileage of 294 miles from Cleveland to Cincinnati. There are four steam lines between these cities whose mileage is as follows: Pennsylvania, 291; Big Four, 263; Erie, 372, and B. & O., 349. It can thus be seen that a through traffic arrangement between the roads forming the trans-Ohio route would start under more favorable circumstances than did some of the small steam roads, which have since been combined into famous railroad systems.

Taking for granted that the limited cars now operating from Dayton to Lima, via the Dayton & Troy, and Western Ohio will run into Findlay; and that the Toledo, Fostoria & Findlay cars will run the 5 miles from Pemberville to Woodville over the L. E. B. G. & N. to reach the Lake Shore Electric, only three changes of cars would be necessary in the 294 miles, without further traffic arrangements, which is certainly an unusual combination of traction lines.

A TERMINAL IN BALTIMORE FOR THE W., B. & A. RAILWAY

The Baltimore Terminal Company has been organized as a subsidiary company of the Washington, Baltimore & Annapolis Railway to construct a terminal in the city of Baltimore to accommodate the cars of the interurban company. An ordinance is already pending before the Council of Baltimore to permit the parent company to operate its interurban cars in the city, having Baltimore Street and Hopkins Place as the site of the terminal. This is in an advantageous location, within two blocks of the shopping district. George T. Bishop, president of the company, states that the subsidiary company will spend \$5,000,000 in improvements at that point and proposes to start with the work at once. Touching upon the service that is to be given between Washington and Baltimore, Mr. Bishop states that it is the intention to have at least three, and possibly four, trains each way every hour. Cars will be equipped with four 125-hp motors, capable of 70 m.p.h. The track will be laid on private right of way except in the two cities, and the line will be double track.

ACCIDENT FAKIRS APPREHENDED IN CLEVELAND

Through efforts of Claim Agent Boone, of the Cleveland Electric Railway, aided by Cleveland detectives, a clever gang of accident fakirs which has operated successfully in several cities has been apprehended and committed to the Cleveland workhouse.

On Aug. 8, a man giving his name as John Edwards, residence, Buffalo, N. Y., boarded a car at the Public Square while it was in motion and apparently was thrown to the ground somewhat injured. He was taken to a hospital, and a day or so later a party giving his name as Edward Benson, a friend of the injured party, tried to secure a settlement of \$200. The company's physicians were unable to find any injuries beyond a few bruises, but the patient complained of pains in his head and back and at times had convulsions. The point which was suspicious was the fact that one of the division superintendents happened to see the accident and reported that the man rolled off and held on to the step, permitting himself to be dragged. Putting them off a few days, Mr. Boone corresponded with officials of the International Traction Company, of Buffalo, giving description and address of the parties. A wired reply requested that the men be held, and the following day W. C. Smith, special agent of the Buffalo Company, with A. C. Reid, proprietor of the lodging house where the men boarded, came to Cleveland. They identified Benson, whom they knew under the name of H. C. Forbes, but were unable to identify Edwards, until Chief Doran, of the Cleveland detective force, stepped over and pulling off a false wig and mustache, showed a very different looking man, whom both the Buffalo men identified as F. Wilmot. Mr. Smith, of the Buffalo company, stated that the men had attempted to work a similar accident in Buffalo, on Aug. 5.

In an examination neither of the men would admit the truth of the charges, but they told conflicting stories. They were unable to show visible means of support, and their statements relative to business connections were found to be untrue; accordingly they were charged with suspicion, and in court last Monday they were fined \$50, costs, and given 30 days. As they had no money it will take about a year to work out the sentences.

The reports from Buffalo indicated that there was another accomplice, and on Tuesday of last week the police apprehended a party giving his name as Jos. Burns, 189 Covert Street, Brooklyn, N. Y. He was induced to make a written confession. He stated that he met Wilmot and Forbes on May 5, at New York. They worked an accident on the Third Avenue line at Fourteenth Street, from which they were unable to obtain any money. On July 23, at Philadelphia, Forbes was "injured" at Market and Ninth Streets, as a result of which they secured \$300. On Aug. 5, as previously stated, Wilmot fell from a car on Main Street and Atlantic Park, at Buffalo. They were unable to collect promptly and came to Cleveland, Aug. 8. He claimed that he had never worked any of the accidents, but operated simply as the disinterested spectator. Furthermore he said that, as a result of his refusal to have an "accident" in Cleveland, the other men abandoned him, and he was not associated with the Cleveland job. Burns is being held for trial.

Edwards, alias Wilmot, is about 5 ft. 8 ins., sallow complexion, black hair, dark brown eyes, slight droop to one eye lid, square shoulders, and weighs about 140 lbs. Benson, alias Forbes, is about 5 ft. 9 ins., closely cropped tow hair, wore brown curly wig, is slightly pock marked, blue eyes, wore glasses, weighs about 155 lbs. Burns is of boyish appearance, rather slight, blue eyes, brown hair, weight about 120 lbs. It is believed that Wilmot and Forbes have operated in other cities aside from those cases to which Burns admitted complicity.

PROPOSED MICHIGAN LINE TAKES OVER STEAM ROAD'S RIGHTS

By the closing of one of the most remarkable railroad deals in the history of the State of Michigan, the Kalamazoo, Lake Shore & Chicago Traction Company has come into possession of the Michigan Central Railroad track and right of way for a distance of 16 miles, between Kalamazoo and Mattawan, completing the right way for a line between Kalamazoo and South Haven. The section of track sold by the Michigan Central was not adapted to the giving of a perfect steam road service. It is winding and the grade is heavy. The work of laying a new line of track was begun two years ago, and is now completed. With the taking over of this track by the interurban company the prospects are bright for the opening of traffic between Kalamazoo and Lawton this fall, as the stringing of the trolley wires and the bonding of the track are comparatively simple jobs as compared with the building of a new line. The route of the interurban railway will be from South Haven through Bangor, Lake Cora, Paw Paw, Lawton, Mattawan and Oshetemo. The power house will be located at South Haven. The officers and stockholders of the company are. S. J. Dunkley, president; George E. Bardeen, vice-president; W. R. Beebe, treasurer; James Grand, general manager; Joseph E. Lockwood, consulting engineer; E. C. Dayton, C. W. Williams, George L. Craig, A. W. Norton, George T. Arnold, J. W. Thompson, Senator Julius C. Burrows.

INTERURBAN TRAFFIC MEN ORGANIZE

For the betterment of the service generally, and particularly to encourage interchange of traffic among the various interurban electric railways operating out of Toledo, the Toledo Interurban Traffic Association, composed of the general freight and traffic managers of the different roads, has been organized. A temporary organization, with C. T. Chapman, of the Toledo & Western, with headquarters at Sylvania, as chairman; Robert Dittenhaver, of the Toledo & Indiana, with headquarters at Delta, as treasurer, and J. S. Young, of the Maumee Valley & Toledo Railways & Light Company, as secretary, has been effected.

At a meeting of the association, held at the offices of the Maumee Valley Railways & Light Company in the Smith & Baker Building, Toledo, on the evening of Aug. 25, the temporary officers elected at Point Place on Aug. 17 were selected to fill these offices permanently, and the chairman appointed a committee to draw up the rules and by-laws, which are to be acted upon at the next meeting, Sept. 15. The association also decided to broaden out and take in the managers, heads of the operating departments and of the accounting departments and also any one who is connected with any of the various interurban lines entering Toledo who is not under a chief clerk. The hope of the organization of this association in Toledo is that similar bodies will be organized by representatives of companies in other cities. It is not the intention of the Toledo association to encroach upon the Ohio Interurban Railway Association, but simply to come together locally, so as to become better acquainted in social and business dealings.

THE FIRST SINGLE-PHASE ON THE COAST

A complete street car service is soon to be inaugurated in Napa, Cal., all cars starting from Lincoln Avenue, that city, and making connections at the depot in East Napa for Vallejo. Six round trips will be made daily between Napa and San Francisco, passengers taking boats at Vallejo to connect for San Francisco. In a few weeks work will be completed, extending up the valley to St. Helena and Calistoga. Trips will be made from St. Helena and Calistoga to San Francisco. This is the first single-phase electric railway on the Pacific Coast.

OHIO AND PENNSYLVANIA COMPANIES TO CONSOLIDATE

The Mahoning & Shenango Railway & Light Company, capitalized at \$10,000,000, of which \$4,000,000 is 5 per cent cumulative preferred and \$6,000,000 common, has been formed under the laws of Pennsylvania to effect the consolidation of the Youngstown-Sharon Railway & Light Company and the Pennsylvania & Mahoning Valley Railway Company. Of the capital stock of the new company, \$1,600,000 par value of the preferred stock and \$2,400,000 par value of the common stock are set aside for the acquisition of

the Youngstown-Sharon Railway & Light Company, and \$2,400,000 par value preferred stock and \$3,600,000 par value common stock are set aside for the acquisition of the Pennsylvania & Mahoning Valley Railway Company.

The new company will also authorize and provide for an issue of \$10,000,000 of ten-year first consolidated refunding 5 per cent gold bonds, of which bonds to the par value of \$3,000,000 are to be made available for extensions, betterments and improvements of the properties of the new company, and the acquisition of new properties. Two million eight hundred thousand dollars par value of the said bonds will be reserved by the trustee under the mortgage for the purpose of taking up and retiring a like amount of underlying bonds of the Youngstown-Sharon Railway & Light Company. One million three hundred and twenty-five thousand dollars of the bonds will be used in the acquisition of the Pennsylvania & Mahoning Valley Railway Company, and \$2,875,000 will be reserved by the trustee under the mortgage for the purpose of taking up and retiring a like amount of underlying bonds of the Pennsylvania & Mahoning Valley Railway Company.

The proposed merger is based upon a valuation of 60 per cent for the Pennsylvania & Mahoning Valley Railway Company as against a valuation of 40 per cent for the properties of the Youngstown-Sharon Railway & Light Company.

Of the stock to be used in the acquisition of the Youngstown-Sharon Railway & Light Company 18,750 shares of common stock have been reserved for the purpose of taking up the stock of the Youngstown-Sharon Railway & Light Company; each share of stock of the Youngstown-Sharon Railway & Light Company being entitled to three-fourths of a share of the common stock of the new company.

The 16,000 shares of preferred stock, and the balance (5250 shares) of the common stock of the new company are to be used for the purpose of raising the amount of cash required for the payment of the floating debt of the Youngstown-Sharon Railway & Light Company; the reducing of its bonded indebtedness from \$3,500,000 to \$2,800,000, and the expenses of the managers, the whole sum necessary for said purposes being estimated at \$1,000,000.

The said 16,000 shares of preferred stock and 5250 shares of common stock are offered to the stockholders of the Youngstown-Sharon Railway & Light Company in proportion to their respective holdings, each stockholder having the privilege to subscribe in cash to the amount of 40 per cent of the par value of his stock.

SINGLE-PHASE PROJECT FOR INDIANA

W. H. Schott, of Chicago, president of the Terre Haute & Indiana Southern Railway, says the construction of the company's proposed line will be begun in the near future, possibly this month. The line is to be 70 miles long, and will connect Terre Haute and Linton, with belt lines to the coal district. The road will be standard gage, and operate twelve cars. Of especial interest is the statement by Mr. Schott that the single-phase system will be used. The power station and the repair shops will be located at Shelbourne. The officers of the company are: W. H. Schott, president; Job Freeman, of Linton, Ind., vice-president; A. E. Hazlerigg, of Sullivan, Ind., secretary; James R. Riggs, of Sullivan, treasurer. Mr. Schott himself will act as chief engineer of the company.

PUBLIC SERVICE INTERESTS CONSOLIDATED IN NEVADA

The Nevada Power, Light & Water Company is the name of the new company, combining the lighting, railway and water interests in Reno, Nevada. The company has \$1,000,000 capital stock and \$750,000 bonds, \$300,000 of which are reserved for the purpose of retiring a like amount of the Nevada Power, Light & Water Company 6 per cent bonds. The 6 per cent sinking fund bonds now offered are issued to acquire a controlling interest in the Washoe Power & Development Company and the Nevada Transit Company. There are no bonds against either of these two companies, and none can be issued in the future. The Washoe Company is acquired on a basis of \$225,000, and the Nevada Company on a basis of \$100,000. The proceeds of the bonds will be used entirely in payment of the stock of these two companies. An estimate of the value of the Reno Power, Light & Water Company properties before acquiring the two companies named was \$806,424, against which \$512,000 bonds are issued. This value does not include water rights and franchises. It is expected that the acquisition of the two companies named will increase the net earnings of the company at least \$40,000 per annum, making total net earnings of about \$135,000, against which the interest charge on the entire \$750,000 bonds will be \$45,000. The net earnings for the year ended March 31, 1905, were \$156,597.

PERSONAL MENTION

MR. ALFRED SKITT, of the Interborough Rapid Transit Company, of New York, sailed from Europe for New York Thursday, Aug. 24. Mr. Skitt is understood to have gone to the Continent in the interest of August Belmont, for whom he is said to have been in conference with the Rothschilds.

MR. H. S. RYKERT, despatcher for the Aurora, Elgin & Chicago Railway Company, has been appointed superintendent of transportation of the Rockford & Interurban Railway Company, of Rockport, Ill. He was for several years connected with the operating department of the Brooklyn Rapid Transit Company.

MR. JOHN T. YOUNG has been appointed general manager of the Muskegon Traction & Lighting Company, of Muskegon, Mich., to succeed Mr. Samuel A. Freshney, who became, on Sept. 1, superintendent of public works of Grand Rapids. Mr. Young, who has had twelve years' experience as a mechanical and electrical engineer, comes to Muskegon from Akron, Ohio, where he was in charge of the mechanical and electrical department of the Cleveland Construction Company, his entire business career having been with that company.

MR. GEO. R. FOLDS, assistant to Vice-President and General Manager Calderwood, of the Brooklyn Rapid Transit Company, was tendered a banquet at the Clarendon Hotel, Brooklyn, on Tuesday evening, Aug. 29, by about thirty of his associates in the company, the occasion being his departure from Brooklyn for Chicago, where he is to act as general manager of the South Chicago City Railway Company and the Hammond, Whiting & East Chicago Electric Railway Company, which operate co-jointly in Illinois and Indiana. Mr. Calderwood, acting for the employees, presented Mr. Folds with a handsome silver loving cup.

MR. PETER M. KLING, recently superintendent of the John Stephenson Company, of Elizabeth, N. J., has been appointed manager of passenger car department of the Pressed Steel Car Company, with headquarters at McKees Rocks, Penn., appointment to take effect Sep. 1. The Pressed Steel Car Company, it will be remembered, recently announced its intention of building steel cars for regular passenger service on street and interurban railways. Mr. Kling is recognized as one of the most expert car builders in the country. Previous to his connection with the Stephenson Company, he for a long time was general manager of the St. Louis Car Company.

MR. J. C. COLLINS has been elected secretary and assistant treasurer of the Rochester Railway Company, of Rochester, N. Y., vice Mr. Geo. G. Morehouse, resigned. Previous to entering the street railway field Mr. Collins was in the employ of the accounting department of the Norfolk & Western Railroad. When E. W. Clark & Company, of Philadelphia, purchased the Chester Traction Company, Mr. Collins was appointed to the position of chief clerk and remained in that capacity until just previous to the time of the sale of the road by them. Mr. Collins next filled the position of assistant secretary of the Camden & Suburban Railway Company, with which he remained four years. Entering the employ of E. W. Clark & Company as one of their railway auditors, Mr. Collins remained with the firm until his appointment as chief clerk of the Rochester Railway Company on July 1, 1904. His election to the position of secretary and assistant treasurer of the Rochester Company was made to date from Aug. 10.

MR. F. H. LINCOLN has been appointed assistant general manager of the Philadelphia Rapid Transit Company. Mr. Lincoln prior to 1893 was engaged in practical electric railway work in the Middle West. In that year he went to Philadelphia, and was engaged in engineering work on the Philadelphia Passenger Railway system under Mr. J. R. Beetem. In 1895 he was made superintendent of lines and cables on the People's system, and when the Union Traction Company was organized he was appointed superintendent of lines and cables for the entire system, aggregating about 470 miles of track. He was continued in this position when the Philadelphia Rapid Transit Company took over the Union Traction property. He has retained this office ever since, and in 1903, in addition to his other duties, was made manager of Willow Grove Park. Mr. Lincoln's promotion to the office of assistant general manager comes as a well earned advancement and bears witness to energy and ability exhibited in the line of his previous duties.

MR. LEAVENWORTH WHEELER, who has been superintendent of the Worcester & Southbridge Street Railway since its opening, severed his connection with the company Aug. 20, and on the following day took up his new duties in Pittsfield as superintendent of another and larger division of the Consolidated Railway Company, viz., the Berkshire Street Railway. The appointment of Mr. Wheeler to the new position, with its added responsi-

bilities, was in recognition of his able management of the Worcester & Southbridge property. Mr. Wheeler was very much surprised to find on entering his office at Pittsfield to take up his duties as superintendent, an elegant quartered oak Derby roll-top desk, which had been sent on from the factory at Boston as a gift from the employees of the Worcester & Southbridge and the Southbridge & Sturbridge Street Railways. Mr. J. B. Potter, of Webster, superintendent of the Worcester & Connecticut Eastern division of the Consolidated Railway Company, has been appointed superintendent of the Worcester & Southbridge and Worcester & Sturbridge Companies, and has entered upon his new duties.

COL. A. C. WOODWORTH, general manager of the Consolidated Car Fender Company, of New York, died suddenly at his home in Chicopee, Mass., at 10 p. m., Saturday, Aug. 26. Col. Woodworth, who had been ill for some time, had not been at the office of the company for more than a month before his demise. Although known to be suffering from a severe attack of two diseases that had become chronic with him, still fears were not entertained until Saturday morning, when complications in the shape of pneumonia set in. So rapid was the progress of the disease that by evening his vitality had become so exhausted that hope was finally abandoned. Col. Woodworth was born in Marysville, Ohio, June 5, 1841. One of his first business connections was with the Ames Manufacturing Company. Shortly after the organization of the Consolidated Car Fender Company, about 1895, Col. Woodworth accepted the position of manager of the company, and mainly to him is the success of the company due. Col. Woodworth's title was the result of his serving as colonel of staff of Gen. Butler, of Massachusetts. Col. Woodworth married into the Ames family, taking to wife Miss Sarah Ames, who, with a daughter, survives him. The funeral was held from the Woodworth home in Chicopee on Tuesday, and interment was in the cemetery at that place.

MR. H. F. J. PORTER has opened an office in the Metropolitan Building, 1 Madison Avenue, New York, as a consulting industrial engineer. He will give especial attention to installing modern methods of organization and management, and to the establishment of the welfare work which is now recognized as a most important portion of every large industrial plant. Mr. Porter has had a long experience in engineering and manufacturing, and is also known as an authority on social and economic subjects. He was one of the first advocates of hollow shafts for steam engines, and as western agent of the Bethlehem Steel Company in 1894-97, and later as assistant manager of the company, he took an active part in the manufacture and introduction of these shafts in railway power stations. In 1902 he resigned from this company to become connected with the Westinghouse interests, first as manager of the American branch of the publishing department, and later as second vice-president of the Nernst Lamp Company. In these capacities Mr. Porter has had an exceptional opportunity to study industrial methods and conditions. Many companies desire to improve their organization and the conditions of their employees, but do not understand how to effect a change from former methods, and it is this class of service which Mr. Porter proposes to render.

MR. W. B. ROCKWELL, general manager of the Syracuse, Lake Side & Baldwinsville Railway Company, is being mentioned favorably as a candidate for appointment as commissioner on the New York Board of Railroad Commissioners. It will be remembered that the New York Legislature at a recent session enlarged the commission to five members, and Governor Higgins will appoint the fifth commissioner early in the fall. Mr. Rockwell has received the support of the political and business interests in his locality, and his appointment to the place has been urged strongly upon the governor. Mr. Rockwell had his first experience in engineering work with the Delaware, Lackawanna & Western Railroad in 1874. In 1885 he was interested in the development of the Van Depoele system of electric traction at Scranton, Pa., and was one of the builders of the early street railway line laid down in that city, which is said to be the first practical electric railway in the United States. He left Scranton in 1892 to build an electric road at Athens, Pa. In 1893 he went to Middletown, N. Y., and built the Middletown-Goshen Electric Railway, looking after all the details of securing the franchise, financing the enterprise and building the road. He operated this line for two years and then sold out to go to Staten Island, where he built the Staten Island Midland Electric Railway in 1895. In this connection Mr. Rockwell also planned and built Midland Beach on the southern shore of Staten Island, which is now one of the most popular beach resorts around New York. Some time after he was called to Syracuse to take charge as manager of the Syracuse, Lake Side & Baldwinsville Railway Company, which was then in financial straits. He has managed this property since with so much success that at receiver's sale, recently, the property brought more than the par value of the stock.

TABLE OF OPERATING STATISTICS

Notice.—These statistics will be carefully revised from month to month, upon information received from the companies direct, or from official sources. The table should be used in connection with our Financial Supplement "American Street Railway Investments," which contains the annual operating reports to the ends of the various financial years. Similar statistics in regard to roads not reporting are solicited by the editors. * Including taxes. † Deficit. ‡ Decrease due to strike.

Table with columns: COMPANY, Period, Total Gross Earnings, Operating Expenses, Net Earnings, Deductions From Income, Net Income, Amount Avail- able for Dividends. Rows include companies like AKRON, O., AURORA, ILL., BINGHAMTON, N. Y., BUFFALO, N. Y., CHICAGO, ILL., CINCINNATI, O., CLEVELAND & SOUTHWESTERN TRACTION CO., DETROIT, MICH., DULUTH, MINN., FINDLAY, O., FT. WAYNE, IND., FORT WORTH, TEX., HANCOCK, MICH., HOUSTON, TEX., MILWAUKEE, WIS., MINNEAPOLIS, MINN., MONTREAL, QUE., OAKLAND, CAL., PHILADELPHIA, PA., ROCHESTER, N. Y., SAN FRANCISCO, CAL., SAVANNAH, GA., SEATTLE, WASH., TERRE HAUTE, IND., TOLEDO, O., and YOUNGSTOWN, O.