

# Electric Railway Journal

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## THE M. C. B. CONVENTION

No casual visitor at the forty-eighth annual convention of the Master Car Builders' Association, which was held at Atlantic City during the past week, could fail to be impressed with the vast amount of technical work accomplished during the three sessions. In addition to the routine business of the organization the reports of eighteen committees were considered and subjected to discussion, including matters of such extended scope and vital importance as a revision of the rules of car interchange and the standardization of coupler design. Obviously the activities of so representative a body must continue regardless of any temporary stagnation in business such as that from which the railroads are suffering. This fact is borne out by the size of the registration lists at the convention as well as by the number and extent of the exhibits. Indeed, the 250 exhibitors with their 82,000 sq. ft. of floor space offer an impressive display of confidence in the early banishment of hard times. The exhibits themselves, of which a brief account is given on another page, are characterized by the importance that has been accorded to locomotive superheaters and stokers, pieces of apparatus which appeal, of course, more especially to the delegates of the Master Mechanics convention which will be held next week, although, in addition to this, the solid cast-steel truck side appears in many different forms. The display of machine tools is unusually elaborate and is notable throughout for refinement of finish, a feature that has been generally lacking in American-built machinery in the past. Nevertheless, the gross weight of machines shown actually exceeds by 10 per cent the exhibition at last year's convention. This fact alone serves as an indication of confidence in the importance of the convention as a whole.

## INTERSTATE SYSTEM OF ACCOUNTS

The new system of accounts for electric railways, issued by the Interstate Commerce Commission for electric carriers subject to its jurisdiction, was prepared in conference between representatives of the commission and the committee on a standard classification of the American Electric Railway Accountants' Association. The titles of the accounts are published in this issue. The classification will probably become the standard of the Accountants' Association. This should influence its adoption in the country at large. The number of roads that will adopt the system because they are required so to do by the interstate character of their operations is very small. The great majority of the roads are now using either the earlier stand-

ard classification of the association or a modification thereof, or they are using a system prescribed by the State commission to which they report. The States have not acted uniformly in their preparation of accounts for electric railways. They have, of course, generally adopted the Interstate Commerce Commission classification of accounts for steam railroad companies; in fact, this classification is mentioned specifically in some of the State laws creating commissions. If the Interstate Commerce Commission had developed its system for electric railways several years ago, probably the State commissions would have held the same attitude toward it that they held toward the interstate system for steam railroads. However, it is desirable now that all interests work together so as to effect a gradual introduction of a uniform system. The interstate classification contains the provision for recognition of the principle of depreciation upon which some of the State commissions have insisted. There is, therefore, no reason from this standpoint why it should not be adopted generally by the States. Certainly uniformity is greatly needed. The result of its introduction will be comparisons where comparisons cannot be made fairly now because of differences in accounting methods.

## PUBLIC POLICY OF TWO INDUSTRIES

While the problems of electric utilities are different from those of electric railways, the two classes of properties have much in common. For this reason the report of the public policy committee of the National Electric Light Association, an abstract of which was published in our issue of last week, is of much more than passing interest. Many of our readers are connected with companies that furnish both classes of service and are therefore equally interested in the problems of each. Some fundamental differences mark the work of the two classes. For instance, the urban railway industry is older than the electric lighting system, and a volume could be written on the differences that arise from this fact. The electric railway has a flat rate of fare; the lighting industry has variable rates. The electric railway suffers unmeasured harm because it is necessarily in constant contact with the public; the electric industry is not hampered by comparison of rush-hour service with normal service. Yet these points of difference, sharp as they are, become as nothing when the larger issues of the two industries are under consideration. Both are affected in the same way by anything that disturbs or changes relations with the public. Both are affected equally by

regulation. Movements toward municipal ownership are of the same concern to the one as to the other. The issues are, in fact, so close that each industry should study the other. There should be the closest co-operation between the two classes. It is much to be desired that the co-operation which has been developed between the public policy committee of the Light Association and the public relations committee of the American Electric Railway Association shall be continued and strengthened. Any means toward this end which can be taken by the railway officials should be adopted without delay.

#### TIME TO BOOST THE CONVENTION

It takes extra energy to get a car up to speed, owing to the fact that a great deal of energy must be stored in momentum. After the car is up to speed, a comparatively small amount of power will keep it going. This homely but accurate analogy is intended to introduce the statement that now is the time to show an active interest in the Atlantic City convention, in spite of the fact that that important meeting is still four months off. Quite a little of that four months is the vacation season when acceleration is not the order of the day, coasting being rather more popular. The next few weeks are the best for planning. The many committees of the association are now holding their summing-up meetings, at which the work of the winter is being brought to a head and put into the form of concrete resolutions and recommendations. The manufacturers are engaging space for their exhibits and are making plans as to the details thereof. A number of important and interesting recommendations are to be made to the convention, and the prospects are bright for the best exhibition yet. The ELECTRIC RAILWAY JOURNAL will do everything in its power during the summer months to keep the industry informed as to the development of convention plans. In the meantime we will continue to remain cheerful by remembering that bumper wheat crops are reported and therefore that the return of general prosperity ought not long to be delayed. A first-class convention will help to bring it back.

#### PHILADELPHIA RAPID TRANSIT AGREEMENT

The agreement reached by A. Merritt Taylor, Director of City Transit, Philadelphia, and the Philadelphia Rapid Transit Company, abstracted elsewhere in this issue, is of vital importance to the city of Philadelphia, and if ratified by Councils and approved by the Public Service Commission it will mean a realization of the city's long-felt desire for a more extensive transportation system. The supreme importance of the plan lies in the fact that the present and proposed transit facilities will be operated as a unit in such a manner as to give the public the greatest service at the least cost. It does not require much more than a superficial examination to disclose terms in the contract that are clearly of advantage to the city, and it should be realized by the

public that the broad-minded citizenship of the company's officials has been no less instrumental in bringing the agreement to its present stage of development than the assiduous efforts of the city's representatives.

The proposed plan provides for a total investment of approximately \$63,000,000, of which \$45,500,000 will be invested by the city in building the subway and elevated lines, about \$12,000,000 by the Philadelphia Rapid Transit Company for the equipment of these municipally owned lines, and about \$6,000,000 by outside interests in constructing the Camden tube. Under this plan Philadelphia takes a place in rapid transit development more in keeping with its area and population as judged by the extensive systems already existing or under construction in New York, Chicago and Boston.

The salient features of the program from the city's standpoint are these: The city is to own all the new facilities. It may compel the company to extend existing lines in accordance with traffic conditions as determined upon hearing before the Public Service Commission, and the Transit Department and the City Comptroller are to have access to the company's books and accounts for auditing purposes. In consideration of the elimination of the present annual charge of \$800,000 for exchange tickets and the establishment of practically universal free transfers, the city is to postpone sinking fund payments for seven years and to release the company for six years from the payment of taxes now levied upon subsidiary dividends of about \$116,000 per year, or a total of \$696,000. Moreover, the city has secured a waiver of all dividends accrued on the Philadelphia Rapid Transit Company's stock up to Dec. 31, 1914, thereby cancelling a \$12,000,000 obligation which would otherwise have to be liquidated before the city could share in the profits above 6 per cent on the company's capital stock under the 1907 contract.

On the other hand, the transit company has also received certain valuable considerations for its participation in the program. From the earnings of the new high-speed lines certain preferential payments will be deducted—namely, 6 per cent on the company's investment for equipment, and after ten years a further 1 per cent to be set up in a sinking fund to extinguish the cost of this equipment. There is also a carefully worded provision to reimburse the company for any falling off in the net income of the existing system on account of the diversion of traffic to the new city-owned lines. The preferential payments are based upon the average net income from the present system for the two fiscal years prior to the operation of the first city-owned line. After such deductions as the above and a further subtraction of interest and sinking fund accruals the surplus is to be divided between the city and the company in proportion to their relative investments.

It is difficult to see how a much more positive guarantee could be given to the city for that increased growth and prosperity that inevitably follows the development of rapid-transit lines. The cost is substantially offset by the one mill tax on personal property

that has been turned over by the State to the city, by the increase in property taxes that will be caused by enhanced values, and by the cancellation of the annual \$800,000 exchange ticket charge. The area suitable for new buildings will be so enlarged as to make it possible for Philadelphia to continue on a wider scale than ever its development of small homes, and the efficiency of the population will be increased by the time saving to a capitalized money value of about \$38,780,000. It may be remembered that Philadelphia is the first American city that has ever had a scientific analysis made of the business possibilities of a proposed rapid-transit system. The celerity with which the city and the company have reached the present program is a fitting sequel to the thoroughness of the preceding engineers' report, and it is to be hoped that Councils will not attempt to play politics or interpose delays for the sake of diverting contract opportunities to party favorites. The program has developed too far for the city to brook any factitious obstruction.

#### ALL-STEEL CARS FOR CITY SERVICE

Elsewhere in this issue is a communication from an engineer of equipment who has devoted an exceptional amount of attention to the subject of car design for city service, and his discussion of the use of all-steel construction for city cars is a very thorough exposition of the subject and certainly well worth perusal. In one case, however, we feel inclined to take issue with the writer. This is in regard to the use of commercial rolled shapes in place of pressed-steel members. Our correspondent's implication is that the former are generally very desirable. As a matter of fact, the average rolled shape, or at least the channel and the I-beam, is designed primarily for use in permanent structures in which weight is a secondary consideration, although as pointed out by our correspondent himself weight is a very serious matter in steel car design. The use of angles and tees is, of course, a necessity in all-steel construction, and to this extent the commercial shape is desirable. In the end, however, so much weight is saved by the use of members with wide flanges pressed from steel plate, and so many advantages in flexibility of design over the commercial shapes can be utilized that the expense of making dies is certainly not of very great importance. When a certain amount of standardization has been developed it will become negligible.

The wonderful possibilities of a pressed-steel design with regard to economies in weight is illustrated by the case of the new 67-ft. car of the New York Municipal Railway Corporation, the framing of which is described elsewhere in this issue. It is true, of course, that this particular car is intended for subway and elevated high-speed service and not for surface operation, but it bears a significant message of economy for the user of city cars. When rolling stock 10 ft. wide can be built to a weight of 1268 lb. per running foot of car fully equipped, the merits of the pressed steel construction cannot be overlooked.

We are, however, in exact accord with our correspondent's statement regarding the ease of forming pressed-steel work. The difficulties of this process have been very greatly exaggerated in the past, possibly because the operation has not been understood. It is true that the use of steel pressings is growing in electric railway repair shops, and in connection with steel car repairs the introduction of the operation need cause no apprehension. Even this work, however, is seldom needed for steel-car maintenance except in case of severe collisions.

The possibility of making complete repairs in a railway company's shop is used by our correspondent as an argument against the tubular post, and undoubtedly the argument is sound. As a matter of fact, even within the last year the tubular steel post has decreased in popularity, at least so far as number used is concerned. Of course, the inherent complication of repairs involved by the tubular steel post design has been accepted largely because of the desire for an all-steel interior finish, but since we consider that steel paneling even for interurban equipment is unnecessary and, on account of its great cost, undesirable, we feel that a pressed or even rolled piece with a finish of wood serves the purposes of a post far better than a tube of thin steel, which has been formed in a complicated outline.

Of course, the matter of collisions in city service is one which affects repairs only. The physical danger to passengers is so slight as to be utterly negligible, and, as pointed out in the communication under discussion, this has had and will continue to have but little influence in deciding whether steel or wood shall be used for the construction of city cars. The question of preference is going to be decided along the lines of maintenance, weight and cost. However, the fact that collisions exert an influence on maintenance costs will be accepted readily by anyone who has witnessed a collision of even moderate severity and seen the roof of a wooden car move forward and spring every post in the sides. Here is a feature inherent in the steel car which is doubly important. Obviously, such a form of damage could not occur to a car designed so that its sides acted as a pair of trusses between the letterboards and the sills. This conception of the duties of car-side construction, however, appears to take hold but slowly, although it has been universally adopted by the most successful designers of rapid-transit cars. There is no reason whatsoever that prevents its use in city service.

Summed up, our correspondent's communication amounts to a strong argument for the use of the all-steel car in all classes of service. If steel construction was generally accepted as best for city cars, its even greater advantages for high-speed service should logically displace the wooden car completely, because, as pointed out, the strains and vibration of elevated, subway and interurban service demand even now a greater strength and rigidity than can be supplied by wood.

# Detroit United Railway's New Machine Shop

This Fireproof Structure, Unique in Many Particulars, Is the Second of the Group of Four Buildings Which Will Form This Company's General Repair Shops

The machine shop building of the Detroit United Railway's new repair shop group has just been completed. This structure, like the paint shop built by this company in the spring of 1913 and described in the *ELECTRIC RAILWAY JOURNAL* of April 12, 1913, on page 668, is fireproofed throughout and contains many unique features. The grouping of the various machine shop departments, the arrangement of the overhead crane system, as well as the construction details, are original in many particulars.

As mentioned in the article describing the new paint shop, the four buildings which will form the complete repair shop group are arranged in the form of a square with a building in each corner. A public street divides the group through the center and serves as a means of entrance for teams as well as for two of the double-track leads to the transfer table pit entrances to the buildings. The site is in Highland Park, a suburban district just outside the corporate limits of Detroit, approximately 6 miles north of the business center of the city.

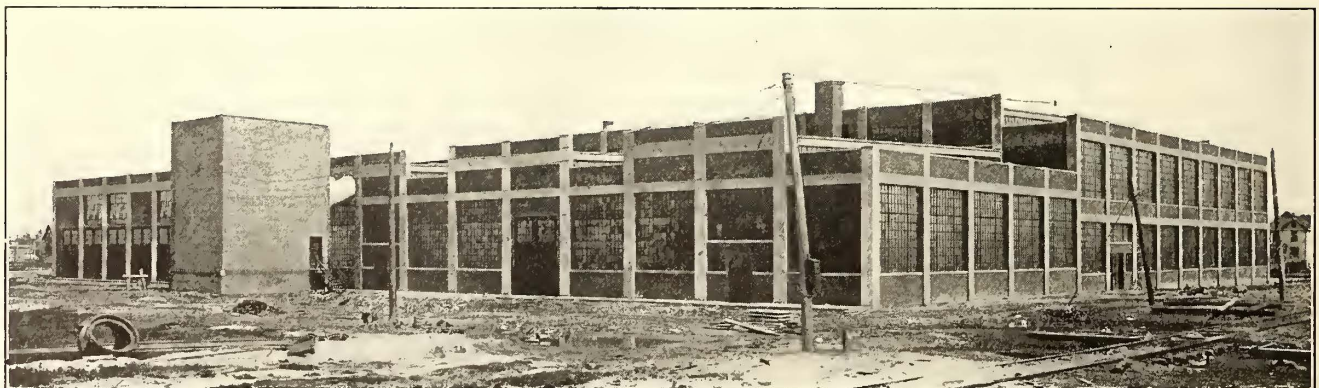
The repair shop property fronts 800 ft. on Woodward Avenue, a principal thoroughfare leading into the city from the north, and it extends west for a depth of 2616 ft. Occupying the east half are the Woodward Avenue carhouse and storage yards, one of the most important stations on this company's system. The shops occupy the west half of the property and are reached by a double-track entrance from the double-track line in Woodward Avenue which, in addition to being the most important city railway line, serves as an entrance for interurban cars. Existing crosstown lines, as well as several new ones recently completed or under construction, intersect the Woodward Avenue line, so that the new repair shops are accessible from all parts of the city as well as from the six interurban lines radiating in three directions from Detroit. A steam-road connection with the Detroit Terminal Railroad provides access to practically all of the steam railroads entering Detroit. This location is also desirable because it is close to a residential district where shop employees can afford to live. At the same time the 48 acres in the tract afford ample space for expansion.

## GENERAL ARRANGEMENT

In plan the new machine shop building is 235 ft. 7 in. x 306 ft. It is divided into three departments,

namely, the truck shop, 151 ft. 4 in. x 235 ft. 7 in. in size; the machine shop, 152 ft. x 153 ft., and the blacksmith shop, 83 ft. 6 in. x 153 ft. The electrical repair shop is situated on the second floor over the machine shop and has the same area. This building occupies the corner diagonally opposite from the new paint shop and is served by two transfer tables. These in turn are reached by four track leads, two on each side of the building, which connect into the main tracks extending along the north side of the repair shop property. Since a transfer table was not needed for entrance to the blacksmith shop, except for the delivery of materials, that portion of the transfer pit beside it was available for the heating plant.

Nine tracks pass through the truck shop, which is designed to be worked from both ends at the same time. One track enters the machine shop at about its center and extends into the blacksmith shop. This will serve for the delivery and receipt of supplies. A wye, leading off of one of the tracks beside the building, permits cars to be turned readily in case it is required that they enter the truck shop in a definite position. Each of these nine tracks contains two 60-ft. pits, one row just inside the entrances at each side of the building. Each pit is equipped with four air jacks of sufficient capacity to lift the maximum car-body weight and so connected to the shop compressed-air system with hose that they may be shifted to meet the various car widths. At each end of each set of nine pits is an aisle in which car bodies can have parts replaced, the bodies being run forward into the aisles after having been raised sufficiently to remove them from the trucks. In each aisle there are two 3-ton bridge cranes for handling heavy repair parts, each equipped with two trolleys and operated by pendant switches. In the aisle between the two equipped with the 3-ton cranes is a 5-ton crane, set on a runway which traverses the full width of the shop. The latter bridge crane serves the entire shop crane system, the runway being high enough to permit defective parts to be carried to the electrical department, the wheel-repair department or the machine shop. Crane runways, at right angles to this large crane runway, permit the handling of heavy repair parts to any part of any of the shop departments, except the blacksmith shop. The small bridge cranes in the electrical machine and wheel-shop departments are each of 1-ton capacity and arranged for control through pendant switches.

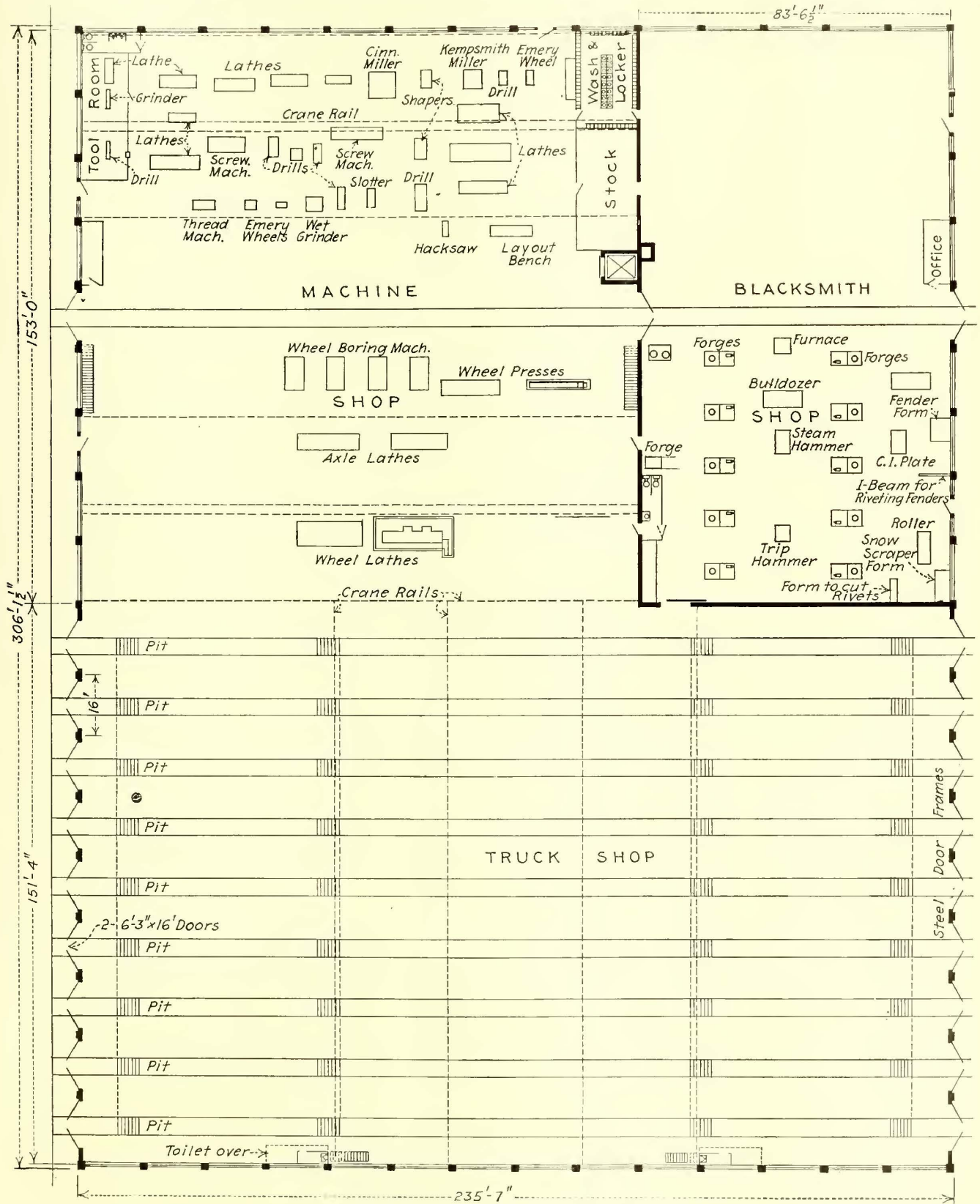


Detroit United Machine Shop—General View of Shop Building, Showing Fanhouse in Foreground

It is planned that the pits will serve only for car inspection and adjusting of brakes, all truck and electrical equipment renewals being handled in the truck repair bay at the ends of the pits. In order to replace defective equipment as promptly as possible, however, it is planned to carry quite a stock of duplicate repair parts. Duplicate sets of motors and trucks will be included among these, although more or less difficulty is experienced in replacing trucks owing to variation in side bearings. In the old repair shops armature and

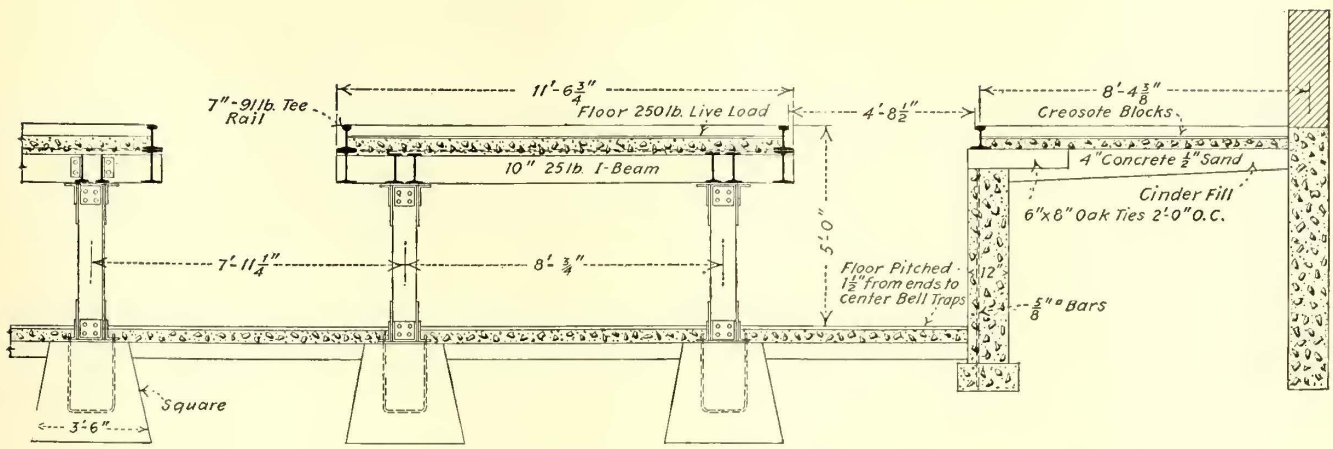
fields were replaced on the trucks, now this work will be handled in the electrical department, truck repairs being made by men who devote all of their time to that class of work.

In line with the plan of procedure in the new paint shop, machine operations were carefully studied with a view of grouping machines and departments to reduce waste motion to a minimum. As a result of this study the location of the truck shop aisles were so planned that they would adjoin the blacksmith shop, the wheel-

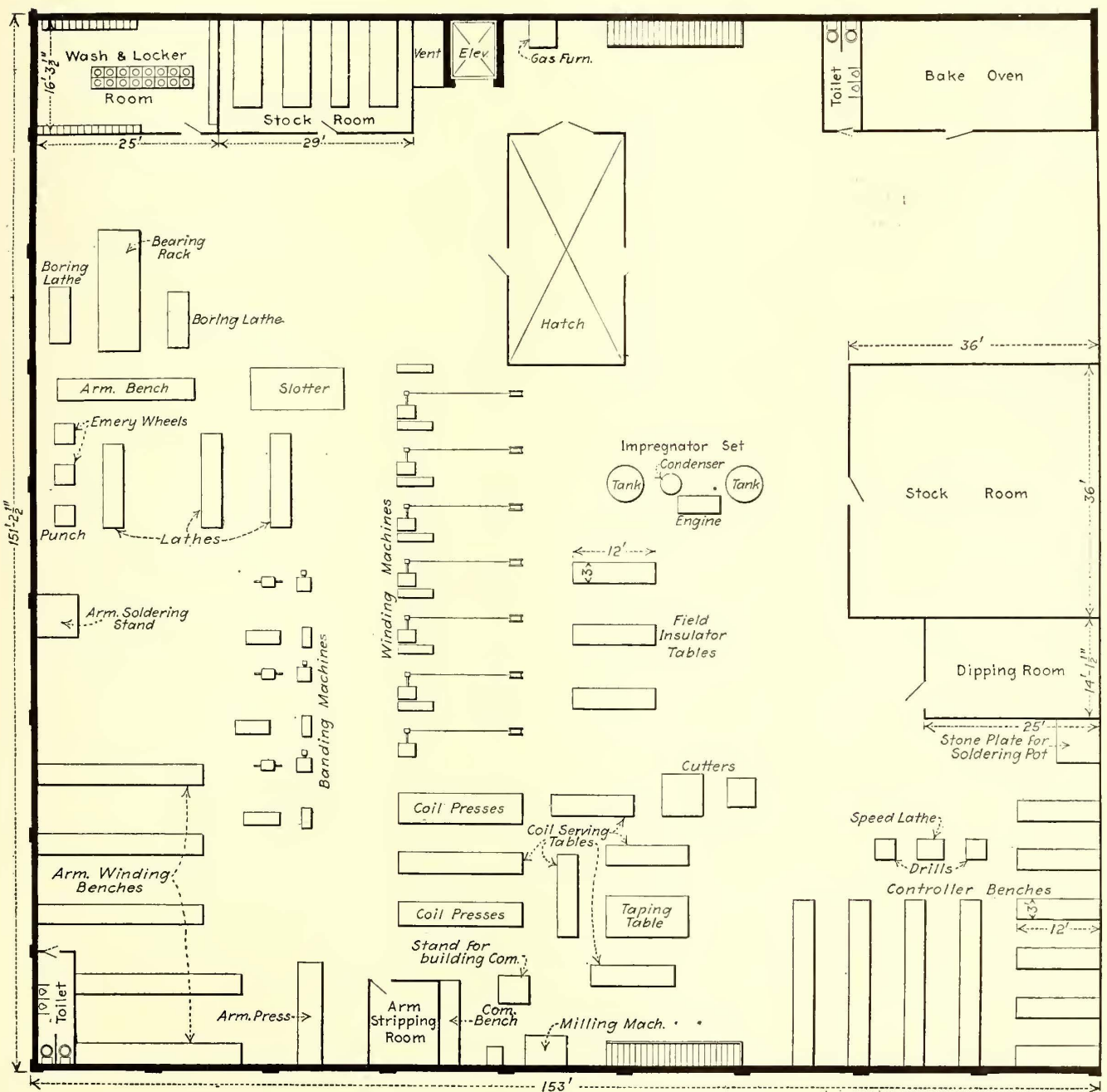


Detroit United Machine Shop—Main Floor

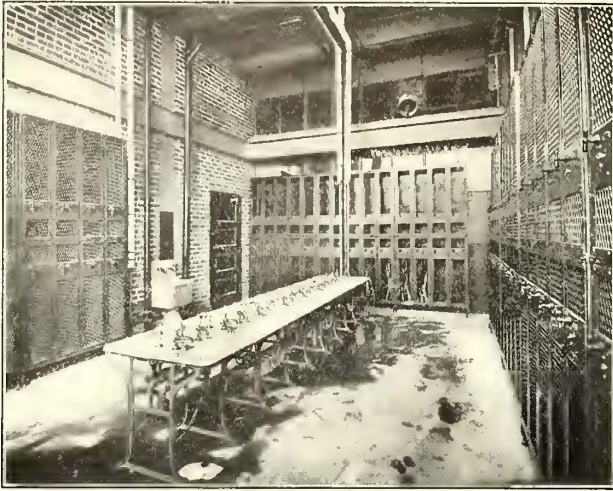




Detroit United Machine Shop—Details of Truck Pit



Detroit United Machine Shop—Electrical Shop



Detroit United Machine Shop—View Showing Arrangement of Locker and Washroom



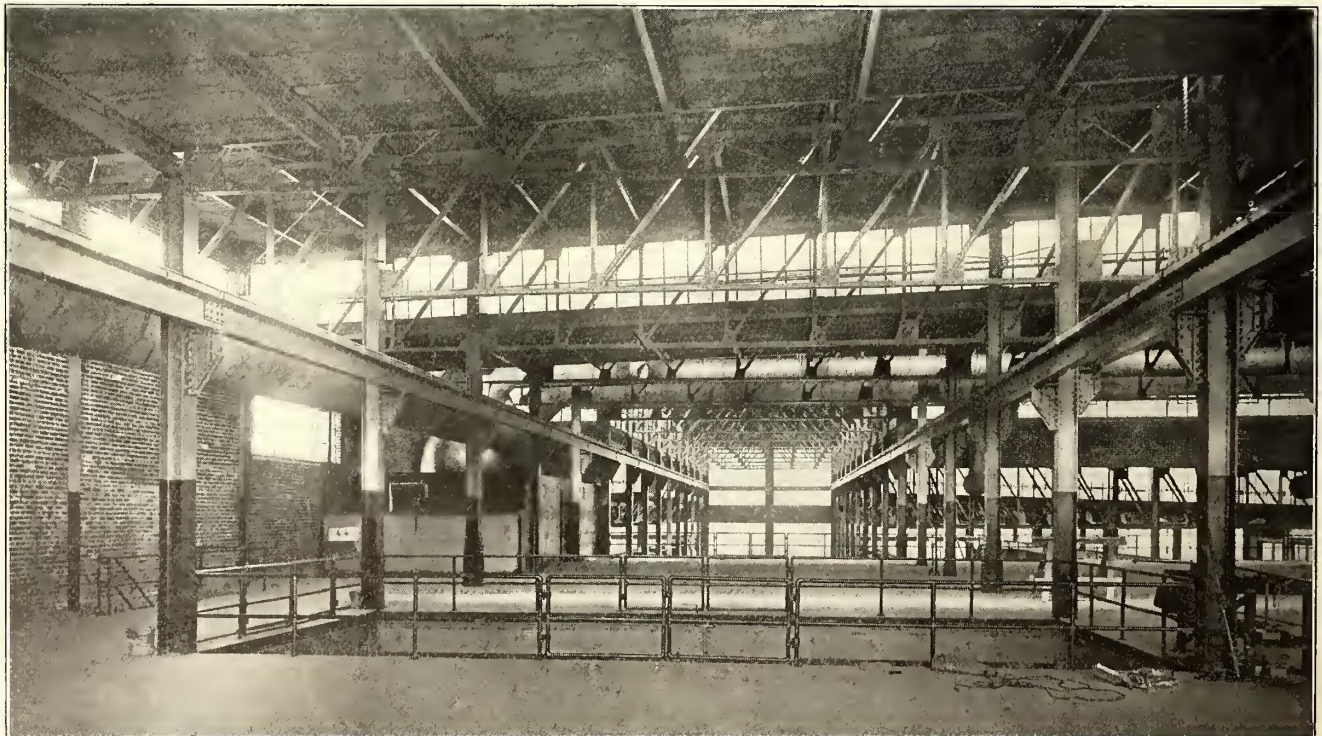
Detroit United Machine Shop—View Showing Typical Toilet Balcony

The wood blocks and 6-in. concrete slabs beneath were considered sufficient foundation for most of the heavy machine tools. Some machines, however, will be anchored to the floor by bolts grouted into pockets made by removing the wood block.

Concrete slabs, 5 in. thick and reinforced with  $\frac{3}{8}$ -in. steel bars,  $4\frac{1}{2}$  in. center to center, were used in the second floor. These are supported on I-beams partially embedded in the slabs, but not completely encased in the concrete. The stairways leading to this floor as well as the toilet balconies are of cast iron with pipe rails. The roof construction is somewhat unique in that reinforced concrete slabs built on the ground and set in place on the I-beam rafters after thorough seasoning were used. The roof was made sufficiently flat to permit the use of a tar and gravel roof covering, hips and valleys along the fire walls being provided by depositing cinder concrete saddles on top of the concrete roof slabs.

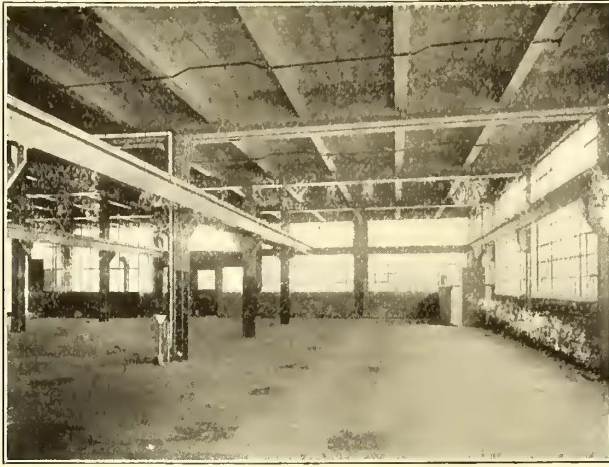
As mentioned at another place in this article there are eighteen 60-ft. inspection pits under the nine tracks which pass through the truck shop. Cars enter the truck shop from both ends under their own power, trolley wire brackets and entrances being provided at the large swinging doors and wooden trolley troughs and trolley to the inside ends of the pits. These pits are rather unique in that the track rails are supported on cantilever beams, thus providing a wider pit floor area than is possible with ordinary design. As shown in one of the accompanying engravings, a standard 91-lb. 7-in. T-rail was used in the shop tracks. This is carried on 6-in. x 8-in. oak ties spaced at 2-ft. centers where the rail is carried over the outside pit walls. The rail is fastened to these ties by clips which are spiked only on the outside of the rail base.

Over the pits the track rail is supported on 10-in., 25-lb. I-beam stringers, which in turn are riveted to transverse floor beams spaced at 6-ft. 8-in. intervals.



Detroit United Machine Shop—View of 5-Ton Crane Aisle from Electrical Shop Floor Level





Detroit United Machine Shop—View of a Corner of Machine Shop Proper Before Placing Machine Tools

These floor beams are also formed of 10-in. 25-lb. I-beams and project into the pit 1 ft. 9 in. beyond the center line of the supporting columns, providing a 4-ft. 5½-in. clear pit width at the shop-floor level and 7 ft. 3¼ in. clear width at the pit-floor level. All pits are 5 ft. deep and each set of nine is made in one large pit area. The aisles between tracks at the shop floor level are 11 ft. wide and are formed of reinforced concrete slabs which in turn carry the creosoted block floor. These slabs are supported on structural steel beams and columns, and steps at both ends of all pits, built of reinforced concrete, lead from the shop floor level into the pits.

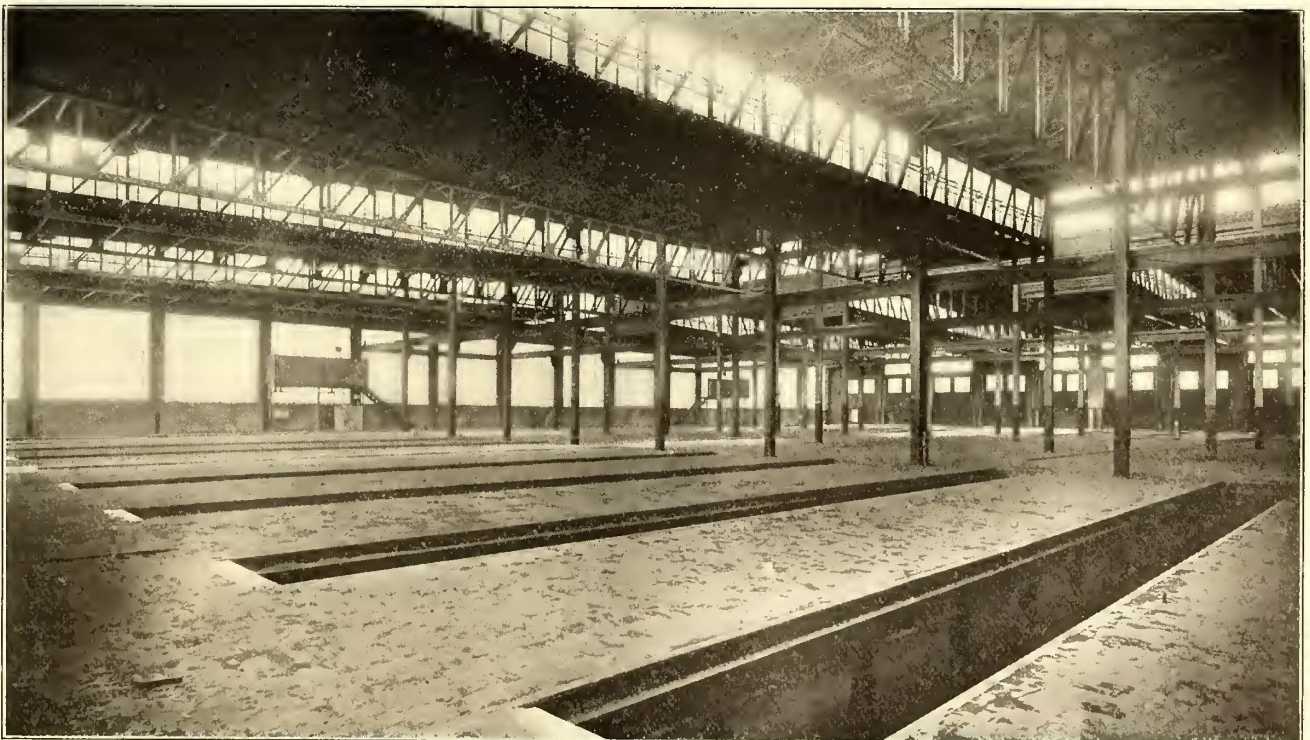
Probably one of the most novel features in the entire machine shop layout is the coil baking oven. This is located in one corner of the electrical repair department beside the blacksmith shop partition. The oven is 16 ft. 8½ in. x 32 ft. in plan with an over-all height of 8 ft. The walls and roof are 3¼ in. thick and are formed of a 3-in. I-beam and channel frame to the out-



Detroit United Machine Shop—View of Repair Pit in Truck Shop

side of which No. 20 steel plate is riveted, with No. 10 steel plate on the inside. The space between the steel plates is packed solid with 85 per cent carbonate of magnesia for insulation. A door, built up like the steel partition walls, and 4 ft. x 7 ft. in size, affords the only entrance for handling coils to and from the oven.

A temperature of 210 deg. is maintained by means of three Peter Smith Heater Company's forced hot-air electric heaters. These were installed outside the insulated walls and the hot air is forced into the oven through 8-in. x 18-in. openings at the floor line along the 32-ft. side of the oven. Three ft. 6 in. above the floor level and extending completely around the inside walls of this oven is a sheet steel deflector, set at 45 deg. to the walls and projecting 14 in. into the oven. It is designed to deflect the rising hot-air currents down and toward the center of the oven. Two 18-in. ventilators carried from the oven roof through the building roof form the hot-air outlets. Each electric



Detroit United Machine Shop—General View of Truck Shop

heater is equipped with an individual switchboard and thermostatic control, so that a uniform temperature can be maintained.

A complete compressed-air piping system was installed in the concrete floors to supply air for the air jacks used in raising car bodies over the pits, and for general use throughout the shops. A reservoir, 3 ft. x 15 ft. in size, placed under the concrete floor forming the pit aisle beside the blacksmith shop, serves the air jacks. Compressed air for this entire system is furnished by an Ingersoll-Rand 125-ft. compressor, electrically driven and automatically controlled. This is installed at one end of the wheel-repair department beside the partition between it and the blacksmith shop.

#### LIGHTING, POWER AND HEATING SYSTEMS

All lighting and power circuits are in pipe conduit, that for the machine tools being imbedded in the concrete floor foundation with conduit outlets for all machines where individual motor drive is to be used. The machine and electrical departments are lighted with 250-watt tungsten lamps placed at sufficiently frequent intervals to make night work possible. The truck

the steam heat feed and return mains. When the new carpenter shop, the next shop building to be constructed, is finished, a permanent heating and power plant building will be erected in the aisle between the carpenter and machine shops. The tunnel for the steam-heat piping system has been so designed that the change in location of the heating plant will make changes in the tunnel system unnecessary.

#### LOCKER ROOMS AND STOREROOMS

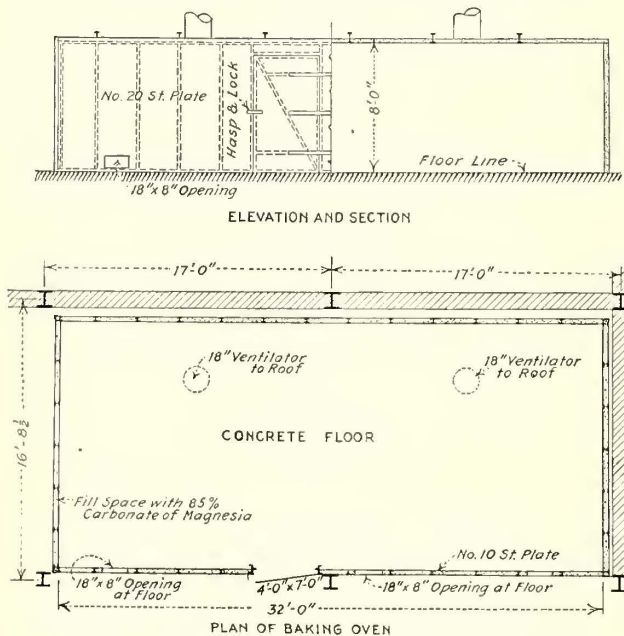
Two locker and washrooms are provided in the machine shop building, one beside the machine shop entrance from the street, that is in the aisle between the two groups of buildings, and the second on the electrical repair floor. Each is fitted with double-deck metal lockers, the upper sections of which are equipped with portable hooks or rods arranged for hanging hats and coats. There are 112 lockers on the first floor and eighty-eight on the second. Each locker room also is equipped with sixteen wash basins arranged in two rows back to back along the center line of the room.

For the present, or at least until the storehouse has been built, the two lunchrooms on the first and second floors will be used as stockrooms. These have been fitted with metal shelving and sets of drawers for storage of miscellaneous small supplies. These storerooms, as well as the truck shop office, will be connected with the paint shop by a local telephone system containing eight telephones. Two trunk lines now connect the new shops with the rest of the railway system. Telephone communication between the various shop departments, as well as between the old and new shops was important because the entire office force has been moved from the old repair shops into a room in the new paint shop building.

As shown on the building plan, the locations of the various machine tools, work benches, etc., have been planned for the future. The wheel and axle machine tools have been grouped at a point where the movement of these parts to and from the truck shop has been reduced to a minimum. Two transverse sections of track leading to the wheel presses from the truck shop have been provided for wheel storage. These presses also are situated beside the hatchway in the electrical shop floor so that the large bridge crane serving the entire shop may deliver wheels to them. This also is true of the location of the material receiving and delivery track which passes through the machine and blacksmith departments. Incidentally this track passes under the hatchway in the electrical shop floor, thus making it possible for the large bridge crane to serve the supply cars.

Eight downdraft Buffalo Forge Company's forges make up the principal part of the blacksmith shop equipment. Seven of these are connected to one large blower, and the eighth forge is provided with an individual blower so that it may be used at odd times. At the present time only one-half of the blacksmith shop floor space is occupied, the remaining portion serving as storage space for various kinds of rough material. Other blacksmith shop equipment includes a bulldozer, a steam hammer, a trip hammer, cast-iron plate tables and forms for fenders, snow scrapers, etc.

The Anglo-Argentine Tramways Company, Buenos Aires, Argentina, has completed excavating work on the tunnel to the terminus at Plaza Primera Junta, in Caballito, of the first section of its subway system, which is open between Plaza de Mayo and Calle Rio de Janeiro. Since the opening of the extension from Once to Rio de Janeiro on April 1 a notable increase in passenger traffic has been recorded.



Detroit United Machine Shop—Details of Baking Oven

and blacksmith shops are illuminated by 2000-cp d.c. arc lamps. Both the lighting and power circuits supply power at 550 volts d.c.

The heating system is by indirect radiation of the forced hot-air type. That in the truck shop is supplied from underground ducts with outlets under the floors between the inspection pits. These ducts and those which supply hot air to other portions of the shop from duct openings overhead radiate from a fanhouse. This is a separate brick building at the end of the transfer table pit beside the blacksmith shop. Cold air for the heating system is taken from the shop floor by large motor-driven fans, which blow it over banks of steam coils. It returns to the shop building through underground ducts on the ground floor and overhead insulated pipe ducts on the second floor.

The fanhouse contains two 12-ft. motor-driven fans and a small fan which serves the truck shop heating system exclusively. The steam coils in the fanhouse are supplied from a temporary heating plant erected on the proposed storehouse site. An underground reinforced concrete tunnel system has been constructed under the transfer table pits between the buildings for

# Interstate Commerce Commission Classification of Accounts

Titles of the Accounts in the New System Which is to Become Effective on July 1, 1914—Depreciation and Valuation Expenses Included—Condensed Classification of Operating Expenses for Small Carriers

The Interstate Commerce Commission has approved the uniform system of accounts for electric railways. Owing, however, to the press of work at the government printing office the printing of the pamphlets containing the new system has been unavoidably delayed. It was expected this week, however, that the final issue would be in the hands of carriers within a few days.

The system of accounts is to become effective for interstate electric carriers on July 1, 1914. It contains classifications of operating expenses, operating revenues, form of income statement, profit and loss accounts, form of general balance sheet statement, and road and equipment accounts. The numbers and titles of the accounts as they are to appear in the final authoritative issue are published herewith.

It will be noted that three classes of carriers are created in the application of the classification of operating expenses. These classes are as follows:

Class A. Companies having annual operating revenues of more than \$1,000,000.

Class B. Companies having average annual operating

revenues of more than \$250,000 but not in excess of \$1,000,000.

Class C. Companies having average annual operating revenues not in excess of \$250,000.

The companies of Class A are required to keep all the primary accounts provided in the text of the classification of operating expenses. Companies of Class B have the option of using the classifications for Class A or the classification provided for Class B carriers. Companies of Class C have the option of using any one of the classifications provided for Classes A, B and C. Carriers using the classification for Class A are to apply the account numbers prescribed. Carriers using the condensed classifications shall adopt the numbers used in the schedules, including those hyphenated to show the merging of accounts.

It will be noted that the classifications provide accounts for depreciation of way and structures, depreciation of equipment, depreciation of power plant buildings and equipment, valuation expenses and amortization of franchises.

## OPERATING EXPENSE ACCOUNTS

### GENERAL ACCOUNTS

- I. Way and Structures
- II. Equipment
- III. Power
- IV. Conducting Transportation
- V. Traffic
- VI. General and Miscellaneous

### PRIMARY ACCOUNTS

[To be kept by electric railways of class A.]

- I. Way and Structures—
  - 1. Superintendence of way and structures
  - 2. Ballast
  - 3. Ties
  - 4. Rails
  - 5. Rail fastenings and joints
  - 6. Special work
  - 7. Underground construction
  - 8. Track and roadway labor
  - 9. Miscellaneous track and roadway expenses
  - 10. Paving
  - 11. Cleaning and sanding track
  - 12. Removal of snow and ice
  - 13. Tunnels and subways
  - 14. Elevated structures and foundations
  - 15. Bridges, trestles, and culverts
  - 16. Crossings, fences, and signs
  - 17. Signal and interlocking apparatus
  - 18. Telephone and telegraph lines
  - 19. Miscellaneous way expenses
  - 20. Poles and fixtures
  - 21. Underground conduits
  - 22. Distribution system
  - 23. Miscellaneous electric line expenses
  - 24. Buildings, fixtures, and grounds
  - 25. Depreciation of way and structures
  - 26. Other operations—dr.
  - 27. Other operations—cr.
  - 28. Equalization—way and structures
- II. Equipment—
  - 29. Superintendence of equipment
  - 30. Passenger and combination cars
  - 31. Freight, express, and mail cars
  - 32. Service equipment
  - 33. Electric equipment of cars
  - 34. Locomotives
  - 35. Floating equipment
  - 36. Shop equipment
  - 37. Shop expenses
  - 38. Vehicles and horses
  - 39. Miscellaneous equipment expenses
  - 40. Depreciation of equipment
  - 41. Equipment retired
  - 42. Other operations—dr.
  - 43. Other operations—cr.
  - 44. Equalization—equipment
- III. Power—
  - 45. Superintendence of power
  - 46. Power plant buildings, fixtures, and grounds
  - 47. Power plant equipment

### III. Power—Continued

- 48. Substation equipment
- 49. Transmission system
- 50. Depreciation of power plant buildings and equipment
- 51. Equalization—power
- 52. Power plant employees
- 53. Fuel for power
- 54. Water for power
- 55. Lubricants for power
- 56. Miscellaneous power plant supplies and expenses
- 57. Substation employees
- 58. Substation supplies and expenses
- 59. Power purchased
- 60. Power exchanged—balance
- 61. Power transferred—credit
- 62. Other operations—cr.
- IV. Conducting Transportation—
  - 63. Superintendence of transportation
  - 64. Passenger conductors, motormen, and trainmen
  - 65. Freight and express conductors, motormen and trainmen
  - 66. Miscellaneous car-service employees
  - 67. Miscellaneous car-service expenses
  - 68. Station employees
  - 69. Station expenses
  - 70. Carhouse employees
  - 71. Carhouse expenses
  - 72. Operation of signal and interlocking apparatus
  - 73. Operation of telephone and telegraph lines
  - 74. Operation of floating equipment
  - 75. Operation of steam locomotives
  - 76. Freight and express collection and delivery
  - 77. Loss and damage
  - 78. Other transportation expenses

### V. Traffic—

- 79. Superintendence and solicitation.
- 80. Advertising.
- 81. Parks, resorts, and attractions
- 82. Miscellaneous traffic expenses
- VI. General and Miscellaneous—
  - 83. Salaries and expenses of general officers
  - 84. Salaries and expenses of general office clerks
  - 85. General office supplies and expenses
  - 86. Law expenses
  - 87. Relief department expenses
  - 88. Pensions and gratuities
  - 89. Miscellaneous general expenses
  - 90. Valuation expenses
  - 91. Amortization of franchises
  - 92. Injuries and damages
  - 93. Insurance
  - 94. Stationery and printing
  - 95. Store expenses
  - 96. Garage and stable expenses
  - 97. Rent of tracks and facilities
  - 98. Rent of equipment
  - 99. Other operations—dr.
  - 100. Other operations—cr.
- VII. Transportation for Investment—Cr.

## CONDENSED SCHEDULES OF ACCOUNTS

Accounts for Class B Carriers.—For Class B carriers—those having annual revenues of more than \$250,000, but not in excess of \$1,000,000—the complete schedule of accounts by titles follows, the preceding numerals showing in each instance the primary account or accounts the contents of which are included under the title named in connection therewith.

- I. Way and Structures:
  - 1. Superintendence of way and structures
  - 2-12. Maintenance of track and roadway
  - 13-19. Other maintenance of way
  - 20. Poles and fixtures
  - 21. Underground conduits
  - 22. Distribution system
  - 23. Miscellaneous electric line expenses
  - 24. Buildings, fixtures, and grounds
  - 25. Depreciation of way and structures
  - 26. Other operations—dr.
  - 27. Other operations—cr.
  - 28. Equalization—way and structures
- II. Equipment:
  - 29. Superintendence of equipment
  - 30-32. Maintenance of cars
  - 33. Electric equipment of cars
  - 34. Maintenance of locomotives
  - 35-39. Miscellaneous equipment expenses
  - 40. Depreciation of equipment
  - 41. Equipment retired
  - 42. Other operations—dr.
  - 43. Other operations—cr.
  - 44. Equalization—equipment
- III. Power:
  - 45. Superintendence of power
  - 46. Power plant buildings, fixtures, and grounds
  - 47. Power plant equipment
  - 48. Substation equipment
  - 49. Transmission system
  - 50. Depreciation of power plant buildings and equipment
  - 51. Equalization—power
  - 52. Power plant employees
  - 53. Fuel for power
  - 54. Water for power
  - 55. Lubricants for power
  - 56. Miscellaneous power plant supplies and expenses
  - 57. Substation employees
  - 58. Substation supplies and expenses
  - 59. Power purchased
  - 60. Power exchanged—balance
  - 61. Power transferred—credit
  - 62. Other operations—cr.
- IV. Conducting Transportation:
  - 63. Superintendence of transportation
  - 64. Passenger conductors, motormen, and trainmen
  - 65. Freight and express conductors, motormen, and trainmen.
  - 66-67. Miscellaneous car-service employees and expenses

## IV. Connecting Transportation — Continued.

- 68-69. Station employees and expenses
- 70-71. Carhouse employees and expenses
- 72-73. Signal, interlocking, telephone, and telegraph systems.
- 74. Operation of floating equipment
- 75. Operation of steam locomotives
- 76. Freight and express collection and delivery
- 77. Loss and damage
- 78. Other transportation expenses

## V. Traffic:

- 79-82. Traffic expense

## VI. General and Miscellaneous:

- 83-84. Salaries and expenses of general officers and general office clerks
- 85. General office supplies and expenses
- 86. Law expenses
- 87. Relief department expenses
- 88. Pensions and gratuities
- 89. Miscellaneous general expenses
- 90. Valuation expenses
- 91. Amortization of franchises
- 92. Injuries and damages
- 93. Insurance
- 94. Stationery and printing
- 95. Store expenses
- 96. Garage and stable expenses
- 97. Rent of tracks and facilities
- 98. Rent of equipment
- 99. Other operations—dr.
- 100. Other operations—cr.

## VII. Transportation for Investment—Cr.

Accounts for Class C Carriers.—For Class C carriers—those having annual revenues not in excess of \$250,000—the complete schedule of accounts by titles is as follows, the preceding numerals, as in the foregoing schedule, showing in each case the primary account or accounts, the contents of which are included under the accompanying title:

## I. Way and Structures:

- 1. Superintendence of way and structures
- 2-19. Maintenance of way
- 20-23. Maintenance of electric lines
- 24. Buildings, fixtures, and grounds
- 25. Depreciation of way and structures
- 26. Other operations—dr.
- 27. Other operations—cr.
- 28. Equalization—way and structures

## II. Equipment:

- 29. Superintendence of equipment
- 30-32. Maintenance of cars
- 33. Maintenance of electric equipment of cars
- 34. Maintenance of locomotives
- 35-39. Miscellaneous equipment expenses
- 40. Depreciation of equipment
- 41. Equipment retired
- 42. Other operations—dr.
- 43. Other operations—cr.
- 44. Equalization—equipment

## III. Power:

- 45. Superintendence of power
- 46. Power plant buildings, fixtures, and grounds
- 47-49. Maintenance of power equipment
- 50. Depreciation of power plant buildings and equipment
- 51. Equalization—power
- 52. Power plant employees
- 53. Fuel for power
- 54-56. Other power supplies and expenses
- 57-58. Substation employees, supplies, and expenses
- 59. Power purchased
- 60. Power exchanged—balance
- 61. Power transferred—credit
- 62. Other operations—cr.

## IV. Conducting Transportation

- 63. Superintendence of transportation
- 64-65. Conductors, motormen, and trainmen
- 66-78. Miscellaneous transportation expenses

## V. Traffic:

- 79-82. Traffic expenses

## VI. General and Miscellaneous:

- 83-89. General expenses
- 90. Valuation expenses
- 91. Amortization of franchises
- 92. Injuries and damages
- 93. Insurance
- 94. Stationery and printing
- 95-96. Store, garage, and stable expenses
- 97. Rent of tracks and facilities
- 98. Rent of equipment
- 99. Other operations—dr.
- 100. Other operations—cr.

## VII. Transportation for Investment—Cr.

OPERATING REVENUE ACCOUNTS  
GENERAL ACCOUNTS

## I. Revenue from Transportation

## II. Revenue from Other Railway Operations

## PRIMARY ACCOUNTS

## I. Revenue from Transportation—

- 101. Passenger revenue
- 102. Baggage revenue
- 103. Parlor, sleeping, dining, and special car revenue
- 104. Mail revenue
- 105. Express revenue
- 106. Milk revenue
- 107. Freight revenue
- 108. Switching revenue
- 109. Miscellaneous transportation revenue

## II. Revenue from Other Railway Operations—

- 110. Station and car privileges
- 111. Parcel room receipts
- 112. Storage
- 113. Demurrage
- 114. Telephone and telegraph service
- 115. Rent of tracks and facilities
- 116. Rent of equipment
- 117. Rent of buildings and other property
- 118. Power
- 119. Miscellaneous

## FORM OF INCOME STATEMENT.

Explanatory Note.—The income statement is designed to show the results from transportation operations and other business of the accounting company during any specified period.

## I. Operating Income:

- 201. Railway operating revenues
- 213. Railway operating expenses  
Net revenue (or deficit)—railway operations
- 202. Auxiliary operations—revenues
- 214. Auxiliary operations—expenses  
Net revenue (or deficit)—auxiliary operations
- Net operating revenue (or deficit)
- 215. Taxes assignable to railway operations  
Operating income (or loss)

## II. Nonoperating Income:

- 203. Income from lease of road
- 204. Miscellaneous rent income
- 205. Net income from miscellaneous physical property
- 206. Dividend income
- 207. Income from funded securities
- 208. Income from unfunded securities and accounts
- 209. Income from sinking fund and other reserves
- 210. Release of premiums on funded debt
- 211. Contributions from others
- 212. Miscellaneous income  
Total nonoperating income  
Gross income (or loss)

## III. Deductions from Gross Income:

- 216. Rent for leased roads
- 217. Miscellaneous rents
- 218. Miscellaneous taxes
- 219. Net loss on miscellaneous physical property
- 220. Interest on funded debt
- 221. Interest on unfunded debt
- 222. Amortization of discount on funded debt.
- 223. Income transferred to other companies
- 224. Maintenance of organization—lessor companies
- 225. Miscellaneous debits  
Total deductions from gross income  
Net income (or loss) transferred to credit (or debit) of profit and loss

## PROFIT AND LOSS ACCOUNTS

## PRIMARY ACCOUNTS

## Credits:

- 301. Credit balance at beginning of fiscal period
- 302. Credit balance transferred from income account
- 303. Profit on road and equipment sold
- 304. Delayed income credits
- 305. Donations
- 306. Miscellaneous credits

## Debits:

- 307. Debit balance at beginning of fiscal period
- 308. Debit balance transferred from income account
- 309. Appropriations of surplus to sinking fund and other reserves
- 310. Dividend appropriations of surplus
- 311. Appropriations of surplus for investment in physical property
- 312. Stock discount extinguished through surplus
- 313. Debt discount extinguished through surplus
- 314. Miscellaneous appropriations of surplus
- 315. Loss on road and equipment retired
- 316. Delayed income debits
- 317. Miscellaneous debits

## FORM OF GENERAL BALANCE SHEET STATEMENT

## ASSET SIDE.

## Investments:

- 401. Road and equipment
- 402. Sinking funds—  
Total book assets at date  
Carrier's own issues at date  
Other assets at date
- 403. Deposits in lieu of mortgaged property sold—  
Total book assets at date  
Carrier's own issues at date  
Other assets at date
- 404. Miscellaneous physical property
- 405. Investments in affiliated companies—  
(a) Stocks  
(b) Bonds  
(c) Notes  
(d) Advances
- 406. Other investments—  
(a) Stocks  
(b) Bonds  
(c) Notes  
(d) Advances  
(e) Miscellaneous  
Total

## Current Assets:

- 407. Cash
- 408. Special deposits—  
Total book assets at date  
Carrier's own issues at date  
Other assets at date
- 409. Loans and notes receivable
- 410. Miscellaneous accounts receivable
- 411. Material and supplies
- 412. Interest, dividends, and rents receivable
- 413. Other current assets  
Total

## Deferred Assets:

- 414. Insurance and other funds—  
Total book assets at date  
Carrier's own issues at date  
Other assets at date
- 415. Other deferred assets  
Total

## Unadjusted Debits:

- 416. Rents and insurance premiums paid in advance
- 417. Discount on capital stock
- 418. Discount on funded debt
- 419. Property abandoned chargeable to operating expenses
- 420. Other unadjusted debits
- 421. Securities issued or assumed—unpledged
- 422. Securities issued or assumed—pledged  
Total

## LIABILITY SIDE

## Stock:

- 423. Capital stock—  
Book liability at date  
Held by or for carrier at date  
Actually outstanding at date
- 424. Stock liability for conversion
- 425. Premium on capital stock  
Total

## Governmental grants:

- 426. Grants in aid of construction

## Long-term debt:

- 427. Funded debt unmatured—  
Book liability at date.  
Held by or for carrier at date  
Actually outstanding at date
- 428. Receiver's certificates
- 429. Nonnegotiable debt to affiliated companies  
(a) Notes  
(b) Open accounts  
Total

## Current Liabilities:

- 430. Loans and notes payable
- 431. Audited accounts and wages payable
- 432. Miscellaneous accounts payable
- 433. Matured interest, dividends, and rents unpaid
- 434. Matured funded debt unpaid
- 435. Accrued interest, dividends, and rents payable
- 436. Other current liabilities  
Total

## Deferred liabilities:

- 437. Liability for provident funds
- 438. Other deferred liabilities  
Total

## Unadjusted credits:

- 439. Tax liability
- 440. Premium on funded debt
- 441. Insurance and casualty reserves
- 442. Operating reserves
- 443. Accrued depreciation—road and equipment
- 444. Reserve for amortization of franchises
- 445. Accrued depreciation—miscellaneous physical property
- 446. Other unadjusted credits  
Total

Corporate surplus:

- 447. Additions to property through surplus
- 448. Funded debt retired through surplus
- 449. Sinking fund reserves
- 450. Miscellaneous fund reserve
- 451. Profit and loss—balance

Total

ROAD AND EQUIPMENT ACCOUNTS

GENERAL ACCOUNTS

- I. Way and structures
- II. Equipment
- III. Power
- IV. General and miscellaneous

PRIMARY ACCOUNTS

- I. Way and structures—
  - 501. Engineering and superintendence
  - 502. Right of way
  - 503. Other land used in electric railway operation
  - 504. Grading
  - 505. Ballast

- 506. Ties
- 507. Rails, rail fastenings, and joints
- I. Way and structures—Continued
  - 508. Special work
  - 509. Underground construction
  - 510. Track and roadway labor
  - 511. Paving
  - 512. Roadway machinery and tools
  - 513. Tunnels and subways
  - 514. Elevated structures and foundations
  - 515. Bridges, trestles, and culverts
  - 516. Crossings, fences, and signs
  - 517. Signals and interlocking apparatus
  - 518. Telephone and telegraph lines
  - 519. Poles and fixtures
  - 520. Underground conduits
  - 521. Distribution system
  - 522. General office buildings
  - 523. Shops and carhouses
  - 524. Stations, miscellaneous buildings, and structures
  - 525. Wharves and docks
  - 526. Park and resort property
  - 527. Cost of road purchased
  - 528. Reconstruction of road purchased
  - 529. Other expenditures—ways and structures

- II. Equipment—
  - 530. Passenger and combination cars
  - 531. Freight, express, and mail cars
  - 532. Service equipment
  - 533. Electric equipment of cars
  - 534. Locomotives
  - 535. Floating equipment
  - 536. Shop equipment
  - 537. Furniture
  - 538. Miscellaneous equipment
- III. Power—
  - 539. Power plant buildings
  - 540. Substation buildings
  - 541. Dams, canals, and pipe lines
  - 542. Power plant equipment
  - 543. Substation equipment
  - 544. Transmission system
- IV. General and miscellaneous—
  - 545. Franchises
  - 546. Law expenditures
  - 547. Interest during construction
  - 548. Injuries and damages
  - 549. Taxes
  - 550. Miscellaneous

BELFORT METER-GAGE SINGLE-PHASE RAILWAY

According to *The Engineer*, London, there was put into operation last autumn in the Upper Rhine section of France a narrow-gage (39.37-in.) railway extending from Belfort to Réchésy. As shown in the accompanying map, the system comprises the following mileage in single track: Belfort to Sochaux, 10.12 miles; Belfort to Réchésy, 17.91 miles; and Belfort to Rougemont, 9.42 miles. Connected with the last line are branch lines from Errues to Etuefont (3.6 miles), and from Errues to La Chapelle (3.2 miles). The grades are slight. Owing to the length of the railway the ordinary low-voltage d.c. system could not be used, nor did a 1200-volt d.c. scheme seem the most advantageous. The engineers, therefore, decided upon the 6600-volt, twenty-five cycle single-phase system. By careful design of the overhead equipment permission was obtained to use this high voltage within Belfort.

Energy is purchased from the Société Des Houillères de Ronchamp, whose steam station at Ronchamp, 12.4 miles from Belfort, contains one 5000-hp and three 2500-hp turbines. Three-phase current is generated at 5000 volts and transmitted, via 30,000-volt lines, to Belfort for transformation to 3000 volts. Converters then change the three-phase current into single-phase current. Each converter consists of a three-phase asynchronous motor and a synchronous single-phase generator coupled together.

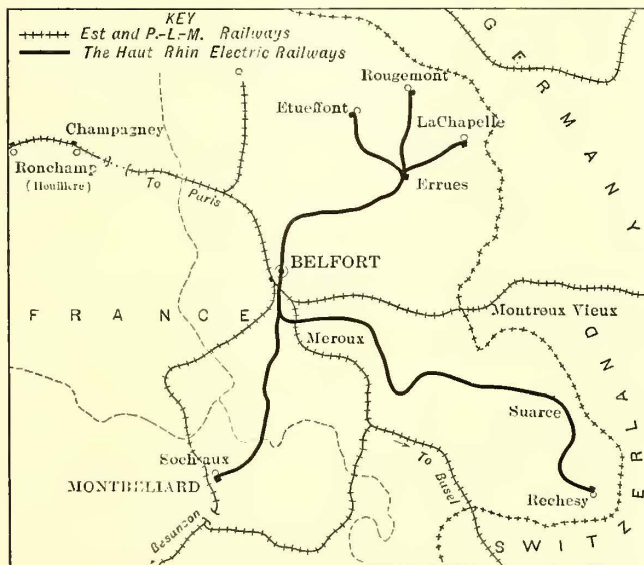
Each double-truck motor car has two 35-hp motors per truck, a main transformer, multiple-unit control, an air compressor and electric lighting and heating. The mo-

tors are compensated repulsion machines. Therefore they have two stator windings, a main exciting winding and a compensating winding. The builders of the electrical equipment appear to favor this type of motor, because a fairly high voltage can be applied to the stator so that the working current is small in comparison with that of a series motor. Speed variation is effected by varying the voltage at the terminals of the motor. The following voltages are applied: 310, 415, 500 and 550. The motors are designed to develop from 35 hp to 40 hp for one hour with a temperature rise not exceeding 75 deg. Cent. above the surrounding air. The gear ratio is 1:4.93, and when the armature is running at a speed of 750 r.p.m. the speed of the cars is 15.2 m.p.h. The diameter of the driving wheels is 34 in. It is possible to run the motors at 1400 r.p.m., and the speed of the cars is then 28.2 m.p.h. Some of the motor cars are making more than 136 miles a day without undue heating of the motors.

The oil-insulated car transformer is suspended between the two trucks. It has two secondary windings: one is wound to give 120 volts for lighting and heating, for working the compressor motor and for operating the contactors; the other winding supplies the traction motors.

All high-tension apparatus is placed in a chamber at the center of the car. Arrangements are made for grounding the high-tension parts automatically when the door of the chamber is opened. The low-voltage equipment, such as contactors, motor switches, and the switches which de-energize the contactors in the event of an overload, are mounted on marble panels and inclosed in a cabinet. One terminal of all the circuits is grounded; the roofs of the car are likewise grounded. Bows operated by compressed air collect the current from the high-tension wire; one bow is used for each direction of running. By turning a two-way cock compressed air is admitted to one cylinder and released from the other cylinder; the bow connected to the first cylinder is thus raised, while the bow connected to the other cylinder is lowered. By means of another lever it is possible to let the air out of both cylinders at once, and then both bows are lowered. A 3.5 hp 110-volt single-phase repulsion motor drives the compressor which supplies compressed air to the bows and brakes.

The single catenary overhead line has a copper conductor of 50 sq. mm (No. 0 B & S) sectional area, and a catenary cable is of stranded steel. Chain hangers spaced about 10 ft. apart serve to suspend the copper wire. Clips at the ends of the hangers join the latter to the catenary cable and contact wire. Oil switches are provided for dividing the line into sections in the ordinary way. In Belfort steel poles have been erected, but those on the remainder of the railway are of reinforced concrete and tapered.



Map of Lines in Belfort District

# N. E. L. A. Convention at Philadelphia

Abstracts of Papers and Reports of Electric Railway Interest, in Addition to Those Published in Last Week's Issue, Are Given Below

In last week's issue of the *ELECTRIC RAILWAY JOURNAL* a partial report of the convention held from June 1 to June 4 was printed, but on account of lack of space the full report could not be given. The following paragraphs contain additional information of reference value.

The convention was notable in the large attendance, 4000, for the value of the papers and reports presented which covered all phases of central station, lighting and industrial power work, and for the exercises which marked the thirtieth anniversary of the first international conference and the first international electrical exhibition, which were held in Philadelphia in 1884. Two books, issued by the association, were brought out at the convention, namely, "The Electrical Salesmen's Handbook" and the "Handbook on Overhead Line Construction." The association rescinded its action on the 1911 report of the committee on overhead line construction by eliminating from it any recommendation of voltage limitation. A resolution was passed to the effect that the National Electric Light Association, as an association, believes that no specifications for the joint occupancy of pole lines having a voltage limitation feature, by inference or otherwise, should be approved or adopted as standard. It was decided also to discontinue the hydroelectric section and to place the work heretofore done by that section in the hands of some other committee. The next convention of the association will be held in San Francisco.

## EXHIBITION ANNIVERSARY EXERCISES

The anniversary exercises were attended by a number of pioneers in the electric lighting and railway business, including Thomas A. Edison, Charles F. Brush, Frank J. Sprague, E. W. Rice, Jr., Samuel Insull, Arthur Williams and others. Walton Clark, president of the Franklin Institute of Philadelphia, under the auspices of which the International Electrical Exposition of 1884 was held, cited the influence wrought by the spirit of Franklin and by the Franklin Institute on the electrical industry to-day and its scientific and industrial development.

E. W. Rice, Jr., president of the General Electric Company, compared electrical conditions existing in the year of the Philadelphia exhibition with the development achieved to-day. In 1884, he said, not a single trolley car was in existence. The highest potential employed was 2000 volts and the largest current in use did not exceed, say, 5000 amp. The largest electrical generator was the Edison "Jumbo," with a rating of 1200 16-cp lamps, and the largest engine on exhibition was of less than 150 hp.

Frank J. Sprague referred to the pioneer work in electrical traction, with which he was so intimately connected. He declared that in trunk-line electrification the electric locomotive still has in its steam competitor a worthy rival, particularly when electrification involves the scrapping of expensive equipment and the purchasing of other expensive apparatus. He predicted the coming of centralized energy generation with interconnecting transmission lines following railroad rights-of-way, perhaps in underground conduit for greater safety and reliability. Before the electrification of the roads, he said that there will come some means of positively connecting the signals along the right-of-way

with the control levers in the locomotive cab, so that in the event of failure of the driver to observe signals the train will be automatically braked and collisions avoided.

## POWER PLANTS AND EQUIPMENT

### PURCHASING COAL

The methods employed by one of the New York electric-service companies in the purchase and delivery of its coal were described in the paper on "Purchasing Storing and Accounting of Coal for the New York Edison Company," by Charles L. Lehmann. The company purchases its coal by yearly contract and follows the railroad shipments to tidewater ports. Coal which is not required for immediate use is stored in a yard capable of holding 150,000 tons. At present about 900 tons of coal can be received and stored per day of nine hours, and about 3000 tons can be reloaded in the same time. Extensions are now being made to accommodate 300,000 tons, and facilities are being provided for increasing the daily unloading and reloading rate to 1800 tons and 5000 tons respectively. Nitrogen-filled and magnetite search-lamps are employed to facilitate carrying on coal-yard operations at night.

### HYDROELECTRIC PROGRESS

T. C. Martin presented a sixty-two-page report setting forth the present status of electric transmission from hydraulic development, discussing in a broad way various aspects of water-power and conservation problems in national and state legislation. The last section of the report was devoted to the description in outline of the most recently completed hydroelectric installations and transmissions in this country and abroad, and many points bearing upon transmission-line practice, station design, substation construction and other practical matters were included.

### TEMPERATURE IN ELECTRICAL APPARATUS

A brief method of calculating heat flow in electrical apparatus was outlined in F. D. Newbury's paper on "Temperature and Its Effect on the Power Capacity of Electrical Apparatus." While low temperature has become a criterion of excellence in electrical apparatus, the operating surface temperature is of importance only in its relation to the maximum temperature to which the insulating material can be subjected safely and continuously. Designing engineers are looking forward to the time when surface temperatures can be entirely neglected and sole dependence placed on internal temperature measurements made at the hottest parts.

In most generators very little heat flows through the insulation between coils as they are usually at about the same temperature. A somewhat larger flow occurs between the lower coil and the core, and a still larger flow takes place from the top coil to the slot wedge. Curves were shown indicating the temperature gradient transverse to conductors and along them. The highest temperature may be expected between separate coils or between the bottom coil and the core, as is borne out by actual tests. Actual measurements in generators showed that temperatures ranging from 100 deg. to 130 deg. C. are not uncommon at the hottest parts.

A safe temperature limit of 105 deg. C. was given for

treated cotton, paper, silk and similar fibrous materials. A temperature limit of 105 deg. to 125 deg. C. was suggested for combinations of the above materials with mica or similar heat-resisting materials when both classes of materials are depended upon for insulation strength. With combinations of the same materials, but in which mica and similar heat-resisting materials furnish the entire insulation strength a limit of 150 deg. C. was suggested.

ELECTRICAL TRANSMISSION OF POWER

HIGH-TENSION TRANSMISSION SYSTEMS

Selby Haar, New York, presented a paper in which were outlined the features of existing transmission plants designed for operation at 70,000 volts or over. A number of interesting deductions were set forth. For example, the average voltage per mile of these systems is slightly over 1200, the limits being 4590 and 440. It appears probable that the transmission voltage will continue to increase as fast as suitable apparatus can be built. A generator of highest rating in these plants is 18,000 kva, and the smallest is 750 kw. Specified power factors range generally from 0.80 to 0.90.

From the data on transformers it appears that very large single-phase units are still being installed, apparently owing to the difficulty of transporting large three-phase units. In most cases delta connection is used for at least one of the windings. The longest transmission is about 240 miles, the normal span ranges from 450 ft. to 850 ft., and most lines are strung on double-circuit towers. The hemp center seems to have been supplanted in conductor design. The average spacing of conductor and the number of insulating units depends almost entirely upon atmospheric conditions and the topography of the region traversed. Under lightning protection the overhead ground wire is firmly established and electrolytic arresters are widely popular. The arc suppressor is also gaining adherence, and something is being done under the heading of excess voltage protection to prevent the formation of surges by the proper proportioning of switching devices, ground wires and line constants. The use of outdoor switching apparatus is steadily increasing.

UNDERGROUND CONSTRUCTION

The report of the committee on underground construction, of which Philip Torchio is chairman, consisted of six separate contributions on the subjects of alternating-current underground distribution systems, underground transformers, high-tension cable joints, protection of cables in manholes, low-cost underground distributing systems and operating data on high-tension cables.

The reports showed that, although considerable improvements have been made in the manufacture of high-voltage cable, the original method of making cable joints, despite its imperfections, is still employed. Results of tests by a large company on a number of 15,000-volt cable joints showed that out of nine splices examined six had failed between 50,000 volts and 63,000 volts, one withstood 65,800 volts for four minutes, and two withstood 70,000 volts for twelve minutes. The vacuum process of making joints was recommended. Tests made recently to determine the relative value of two types of protective cable covering show cement mortar to be superior to asbestos or steel-tape covering. An objectionable feature connected with the asbestos covering is the presence of the iron banding tape, which may become grounded and thus actually become in-

involved in an arc circuit, a condition which cannot exist when cement covering is used.

Attention was called to the fruitless efforts which have been made to develop an inexpensive underground distributing system. Among methods of underground construction which are fairly comparable in cost with those on overhead systems are the use of armored cable and split-fiber conduit laid in the bare earth. An installation of 55 miles of lead-covered, steel-armored cable laid bare in earth was described briefly. Eighty per cent of the cable has been in service about four years, and only one fault has developed in that time.

Conductors	COST OF UNDERGROUND EQUIPMENT			
	Size, B. & S. Gage	Approximate Price per 1000 Feet— Additional Cost of Steel Tape Armor	Iron Pipe	Fiber Pipe
Two	No. 8	\$42.00	\$71.00	\$31.00
Two	No. 6	45.00	71.00	31.00
Two	No. 4	56.00	112.00	34.00
Three	No. 6	47.00	112.00	34.00
Three	No. 4	59.00	112.00	34.00
Three	No. 1	69.00	146.00	37.00
Three	No. 2-0	80.00	146.00	37.00

A similar relatively inexpensive installation was referred to consisting of ordinary line wire laid in individual fiber ducts filled with insulating compound and buried in the earth. Eight years' service seems to indicate that this construction is satisfactory. The cost of installing was about 75 cents per foot.

The report also contained operating data on high-tension cables collected from seventeen companies. A marked difference is shown in the thickness of insulation used by them for cables of relatively low voltages, but greater uniformity for high-voltage cables. The maximum allowable loading employed by different companies gives temperatures varying from 90 deg. to 150 deg. Fahr. in the lead sheath, and tests made to supplement this information show that the temperature of the conductor would be as much as 75 deg. Fahr. higher than that of the sheath. Attention was called to the possibility of varying the maximum loading with the seasons of the year. The cable burn-outs for 2300 miles of cable were 14.2 per 100 miles, of which 78 per cent were in cable sections and 22 per cent in joints. The burn-outs were attributed to electrolysis, extraneous injury, sharp bends in manholes, defective cable, badly made joints and surges due to lightning or trouble on overhead lines joined to the underground cables. A majority of the companies apply a break-down test of 150 to 200 per cent of the working voltage to the new lines for an average of five minutes. Only six companies make any break-down tests on old cables, the voltages used ranging from 125 to 200 per cent, applied for five minutes.

ACCIDENT PREVENTION

A helpful résumé of accident prevention from the central-station standpoint was presented by the committee in charge of this subject, of which Martin J. Insull, Chicago, is chairman. The report outlined the organization of a "safety first" campaign, with practical suggestions as to method of procedure, formation of committees, education of employees, first aid and its limitations. The committee favored uniform reports of accidents, submitting a standard blank for this purpose. An interesting feature was a number of diagrams showing the causes, anatomical distribution and occupations involved in 2670 accidents reported by member companies in the past sixteen months. The more frequent causes were striking or being struck by material, handling tools, wire, glass, sharp edges, lifting or moving material, falling bodies, electric current and falls.

The latter part of the list included a list of standard danger and safety signs, printed in colors, a scenario of the motion-picture film "The Lineman," which is the property of the association and which shows careful and careless ways of working on the distribution system. It may be rented at small cost.

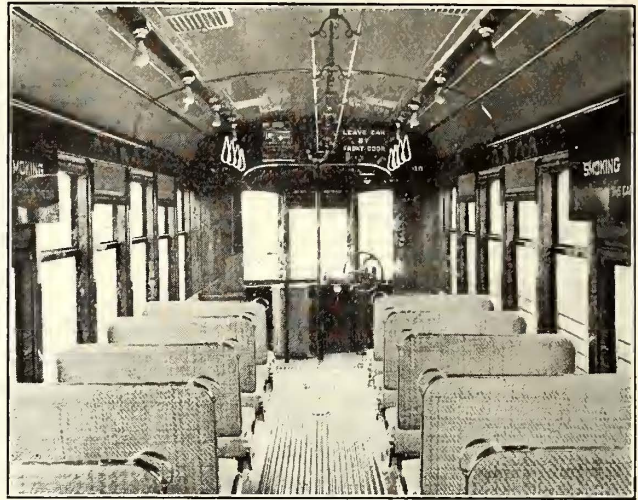
#### APPRAISALS

D. C. Jackson, professor of electrical engineering, Massachusetts Institute of Technology, presented a paper entitled "Appraisals of Electric Light and Power Properties." He called attention to the important differences between operation of public service companies and the ordinary businesses with which the general public has become familiar through experience. The interest on investment in a public utility property is a much larger part of the total revenue than in a mercantile business. Instead of earning a gross annual revenue equal to or exceeding the capital investment, a public service corporation ordinarily expends a sum of money in establishing its plant and business which is not less than four or five times, and in some cases as much as twelve times, the gross annual revenue that it may expect to receive. This at once multiplies the proportion of the revenue which must go to the investors in case a reasonable return is made on the investment.

Competition does not introduce any inconveniences in relations between customer and purveyor in ordinary business, nor is expensive duplication of capital caused by competition where the fixed capital is small. Inconvenience to the customer is often caused, however, by general competition of like public service companies, and duplication of capital is likely to be large and economically defensible in the case of competing public service companies which give like service. Electric utilities might gain greater strength with the public, thereby improving their facilities, by making annual investment and earnings statements of studied definiteness and completeness whether required to do so by public service commissions or not, and the publication of these statements in the daily newspapers, after the manner of the publication of bank statements, would bring matters before the public mind in a way

#### COMPOSITE CONSTRUCTION CARS FOR OGDEN, UTAH

The Ogden (Utah) Rapid Transit Company has lately received from the American Car Company works of The J. G. Brill Company, six closed motor cars of the single-arch type shown in the accompanying illustrations. The new cars are 39 ft. 6 in. over the vestibules, 26 ft. 6 in. over the body, 8 ft. 4 in. over the sills and

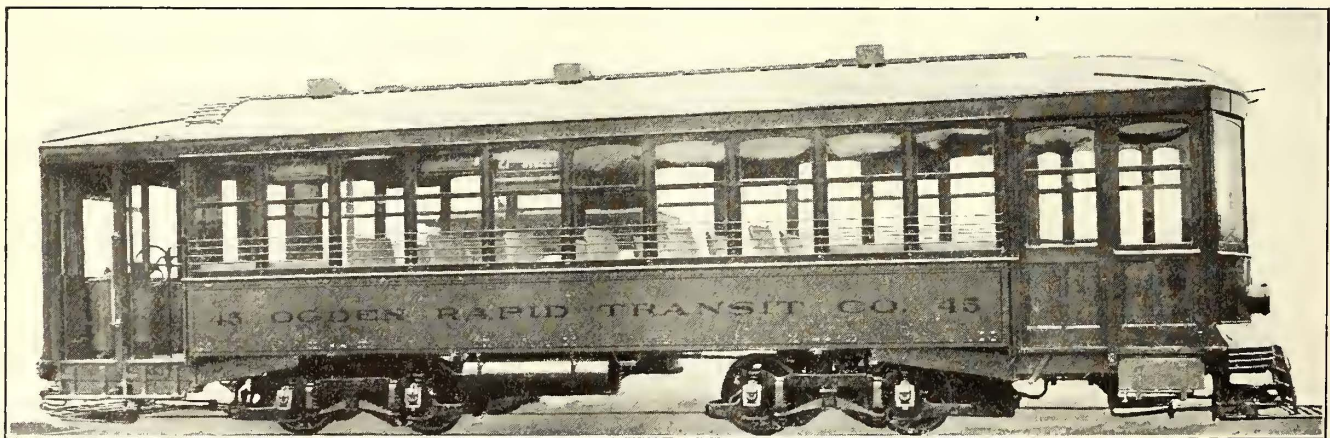


Interior View of Ogden Car, Showing Short Bulkheads

8 ft. 7 in. over all. The height from the rail to the sills is 2 ft. 8½ in. and from the sills to the trolley base 8 ft. 10½ in. The underframe and posts of the car are composed of commercial sections and in addition a side sheathing of 3/16 in. x 28¼ in. x 26 ft. 2 in. The roof headlining is of Galco. The vestibules are 6 ft. 6 in. over all.

The view of the interior shows that no end-body doors are used, the car being operated according to the pay-within system.

A number of interesting specialties have been incorporated in these cars, such as the "Rico" sanitary strap, Ohmer fare register, Railway Utility Company's ventilators, Tomlinson radial couplers, Hedley anti-climbers,



Car of Composite Construction for Ogden (Utah) Rapid Transit Company

that no other process can rival. To bring about the needed confidence between the public and the companies without friction and shock it is of importance that engineering statistics be made more a part of the permanent record of the companies and that the record keeping of the companies become a joint structure of accountants' financial statistics and of engineers' physical and production statistics.

Esterline headlights, Ohio Brass sanders, Berg fenders and Hunter illuminated destination signs. The trucks are of the car builders' 27 G-1 type with the short wheelbase of 4 ft. 6 in. and are equipped with Griffin wheels. The electric and braking equipment comprises two GE-80 outside hung motors, Consolidated heaters, General Electric air brakes with CP-27 A compressor and car builder type hand brakes with Peacock drums.





Bronze hardware composition: Copper, 88.4 per cent; tin, 5.5 per cent; lead, 2.8 per cent; zinc, 3.3 per cent. Impurities exceeding 1.5 per cent are not allowed, but a variation of 10 per cent in the specified amounts of tin, lead and zinc will be permitted.

Perhaps the most interesting feature of the various uses of metal is the adoption of "ingot iron" for floor sheets, doors and roof on account of its rust-resisting qualities. Floor sheets are exposed to the atmosphere, and even galvanized iron will rust at the connections with the rivets. In the case of doors, moisture will penetrate to places which cannot be repainted, which fact is one of the objections to steel doors. Roofs are subject to much moisture, and here the selection of "ingot iron" makes it possible to use thinner sheets than would be practicable with steel.

For rolled steel and ingot iron sheets and plates, the company specified three grades of steel and one grade of "ingot iron" according to the use to which they were to be applied, as follows: Grade A—thin steel for moldings, interior trim, etc.; Grade B—flattened steel used for outside and inside finishing, posts, etc.; Grade C—all other rolled steel sheets and shapes; Grade D—ingot

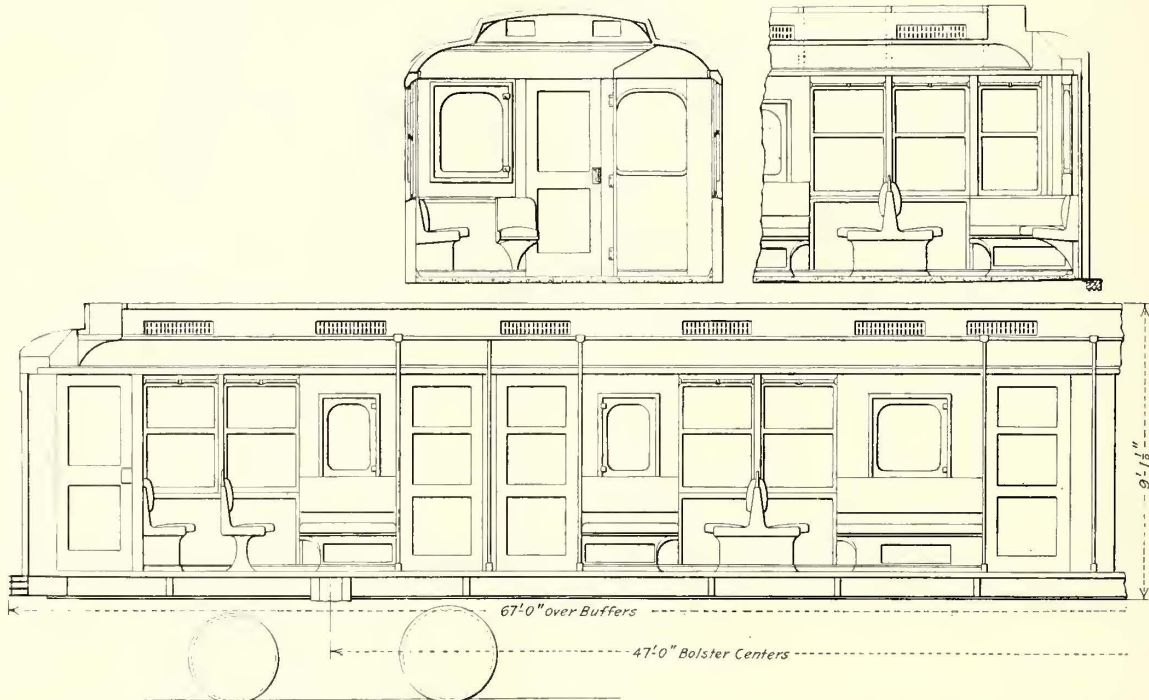
is specified from 55,000 lb. to 65,000 lb. per sq. in., and the elongation in 8 in. is to be not less than 25 per cent.

Grade D or ingot iron—The specification especially devised for this rust-resistor is as follows: Physical—elastic limit not less than 25,000 lb. per sq. in.; tensile strength, not less than 42,000 lb. per sq. in.; elongation in 8 in. not less than 25 per cent.; reduction in area not less than 50 per cent; Chemical—not more than 0.16 per cent total impurities, including the elements of sulphur, carbon, copper, phosphorus, silicon, nitrogen, manganese, oxygen and hydrogen.

ADMISSIBLE STRESSES

The maximum unit stresses to which any member of the car framing will be subjected do not exceed the following amounts:

STRESSES	
Bolsters	12,500 lb. per sq. in.
Sills and framing	16,000 lb. per sq. in.
Shear	
In framing other than buffing	10,000 lb. per sq. in.
Buffing	12,000 lb. per sq. in.
Bearing	
In framing other than buffing	20,000 lb. per sq. in.
Buffing	24,000 lb. per sq. in.



N. Y. M. Car—Side and End Elevations, Showing Seat Arrangements, Doors, Ventilators, Etc.

iron sheets for roofs, floor sheets, ventilators, doors, etc.

The specifications for Grades A, B, C steel, which are based on those of the Pennsylvania Railroad and the American Society for Testing Materials, call for the open hearth process with both phosphorus and sulphur content less than 0.05 per cent. The individual qualifications of each grade follow:

Grade A—Furnished in strips or level sheets. Must be successfully drawn or pressed cold into moldings, etc., without rupture. Must have bright finished surfaces, free from mill scale and rust. No tests other than successful working.

Grade B—Medium blue, annealed, roller-leveled, soft steel capable of being formed either hot or cold by pressing. No physical tests required for sheets less than 0.1 in. thick. For sheets of 0.1 in. or more, tensile strength must be 55,000 lb. to 65,000 lb. per sq. in., and the elongation in 8 in. not less than 20 per cent.

Grade C—Medium soft steel, capable of being formed either hot or cold by pressing. The tensile strength

In the design of the roof carlins, use was made of the United States government's regulations for postal cars in connection with which the following formula is used:

$$\frac{\text{Roof area per carlin}}{\text{Section Modulus}} = \text{not to exceed } 100.$$

For the N. Y. M. car, the corresponding figures were as follows:

$$\frac{10 \times 3}{0.415} = 72.3$$

It will be seen from the foregoing that the strength of the roof members of this car is 38 per cent greater than required by the government specifications.

The stress in the brake rods is 12,000 lb. at emergency applications. This stress is 80 per cent greater than for service applications. Pins are figured not to exceed 15,000 lb. single shear with emergency application. Although theoretically the shear of the pin on the brake rod would be divided, it was assumed that it might come entirely at one point. The bending moment

on brake levers was figured not to exceed 23,000 lb. in emergency. In the endeavor to get greatest strength for least weight in every detail, a study was made of brake lever shapes. To secure a practically uniform stress throughout the theoretically perfect lever would have been tapered in the form of a parabola from the point of maximum stress. For practical reasons, however, this form could only be approximated.

SAMPLE CAR—GENERAL DESIGN

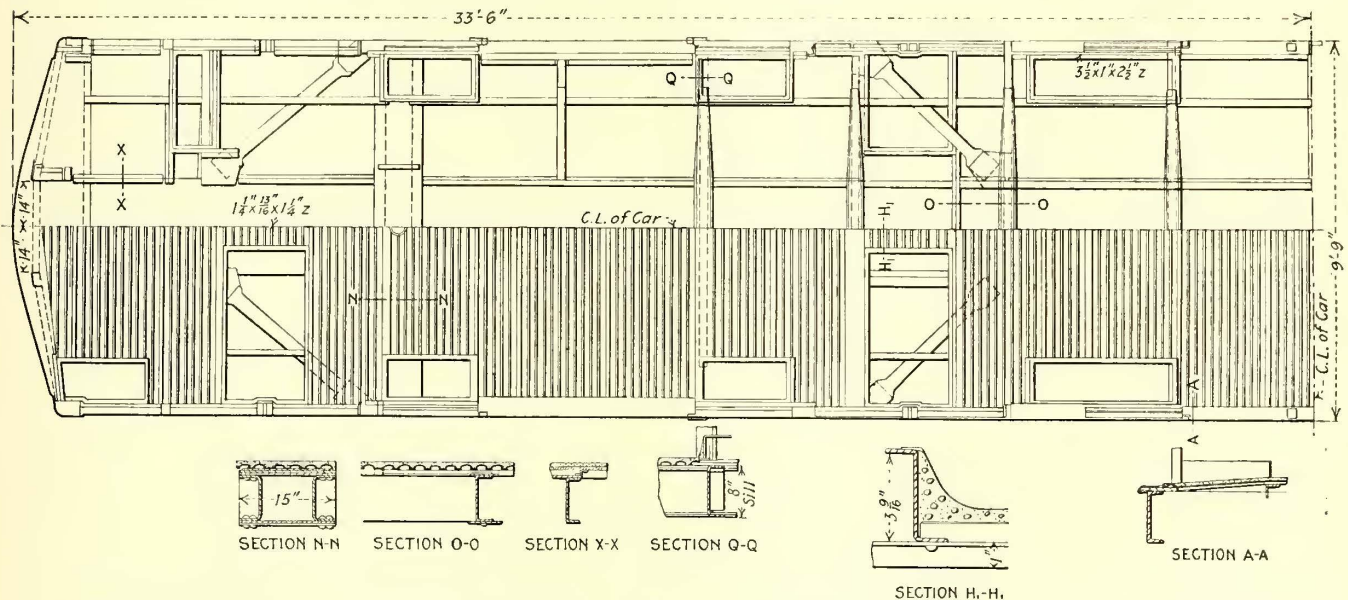
An important feature of the work at the car builder's shop is the construction and equipment of a sample car. As each step in the assembly of this car is completed, adjustments for unforeseen conditions are made and then the car builder is authorized to duplicate the approved stage on the remaining cars.

This car is designed as a side-girder structure in which the full height and length of the sides are available for resisting bending stresses, the door piers being used to transmit the stresses from the lower to the upper members. The underframe as a whole is designed merely to transmit the floor loads to the side sills, but the sections between the ends and bolsters, as hereinafter described, are especially stiffened and tied in with the side frame to take care of buffing shocks. The roof is practically free of all strains except that

are used at the intersection of the door pocket panels at the end side doors and the side sills. Door headers of 1/8-in. Grade B steel pressings are employed over each door opening, riveted to the adjoining panels and body plate. These headers serve to give the proper finish and to provide the reinforcement necessary to compensate for that part of the top plate which has to be cut away to make headroom.

The body plate is of pressed section, of 3-16/in. Grade C steel. At the door opening the body plate is cut and properly formed and reinforced. The sash rests, which are installed in short sections between the window posts, are of 1/8-in. Grade B steel, reinforced on the inside with 1/8-in. Grade C steel pressings fitted at the posts and connected thereto with connection pressings and splice bars. The outside sheets excepting the door pocket panels are of 3/32-in. Grade B steel. Wherever possible the joints are welded to insure maximum strength, homogeneity and watertightness. It will be noted from the foregoing description that there is practically no belt rail as the inside stiffeners serve the same purpose. This construction gives a smooth outer side with no ledges or other water-catching fixtures.

Of the accompanying sections taken through the side, the one marked "vertical section through main win-



N. Y. M. Car—Underframe, Corrugated Metal Base for Floor and Typical Sections—Note the Absence of Flooring Under the Seats and Sanitary Coves as at Section H<sub>1</sub>-H<sub>1</sub>

due to its own weight, and the carlins are little more than ties between the side girders.

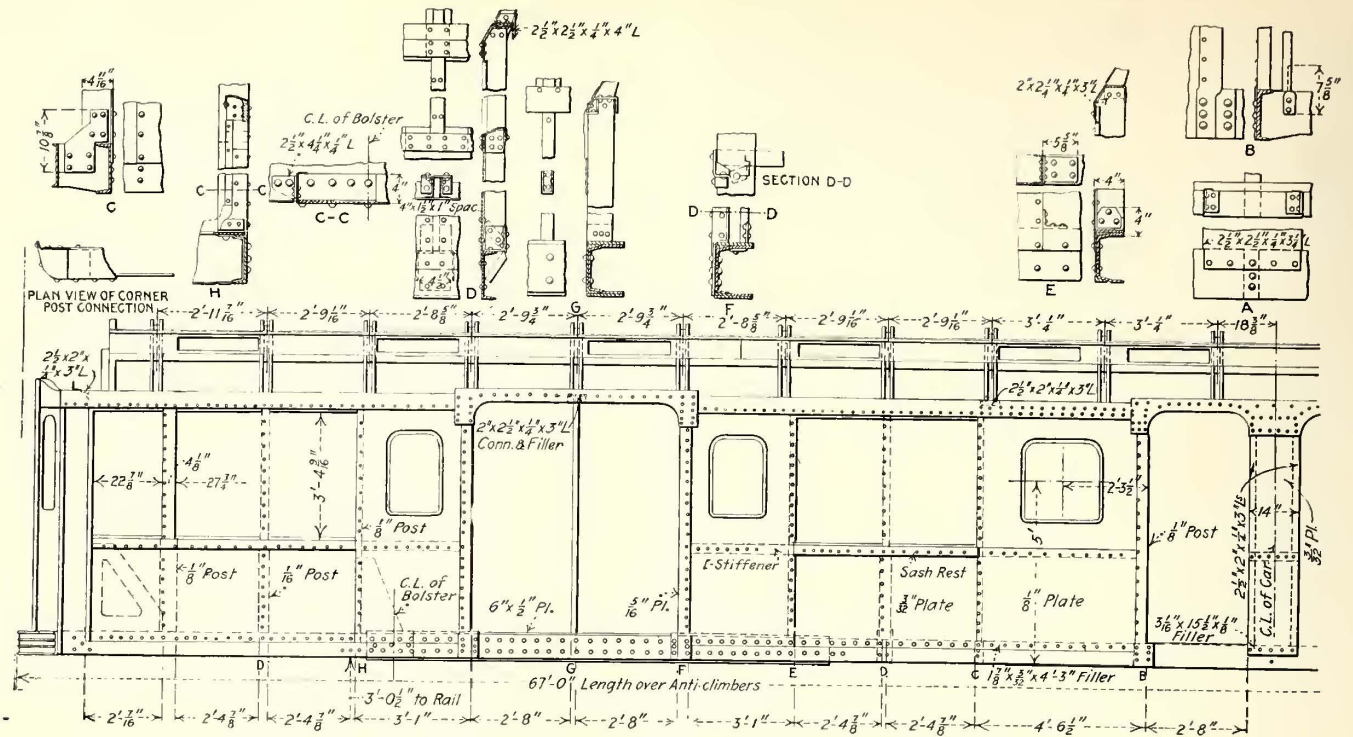
SIDE FRAME

The side frame is constructed of pressed steel panels, posts, pillars, etc. all of Grade B steel. The pressed steel panels provided at each side of each pair of side doors have openings with flanges to take the sash pressed into the same. The door side of these panels is reinforced with pressed steel posts to provide necessary stiffness, and the side adjacent to the windows has flanges pressed to form the sash stop, and at this side is riveted a pressed section of 1/8-in. Grade C steel to form the post. Horizontal stiffeners of 3/16-in. Grade C steel are provided on the inside of these panels in the door pockets, and a gusset plate is attached to the post at rear of the door pockets and to the adjoining cross-bearers. Pressed sections are provided on the post adjacent to the bolster; also at the corner post under the first window; the latter to provide stiffness for the end of car and to serve as a protection against telescoping. Pressed reinforcing plates of 5/16-in. Grade C steel

are used at the intersection of the door pocket panels at the end side doors and the side sills. Door headers of 1/8-in. Grade B steel pressings are employed over each door opening, riveted to the adjoining panels and body plate. These headers serve to give the proper finish and to provide the reinforcement necessary to compensate for that part of the top plate which has to be cut away to make headroom.

UNDERFRAME

The underframe includes two side sills and two center sills, each running practically the full length of the car in one piece. The side sills are 8-in., 11.25-lb. and the center sills 7-in., 14.75-lb. medium steel channels. The side sill channels are attached to the buffer channels and anti-telescoping plates with steel pressings as indicated on the plans. The center sill channels are secured to the buffer channel by connection angles and riveted to the top and bottom buffer or anti-telescoping plates. A cover plate 3/16 in. thick x 30 in. wide is provided on top of the center sill channels, extending from the anti-telescoping plate to the bolster, riveted to the center sill channels; also secured to the anti-telescoping plates and to the bolster by riveting to the extension of the top flange of the pressed diaphragms. Two 3/16-in. x 24-in. anti-telescoping plates are provided at each end

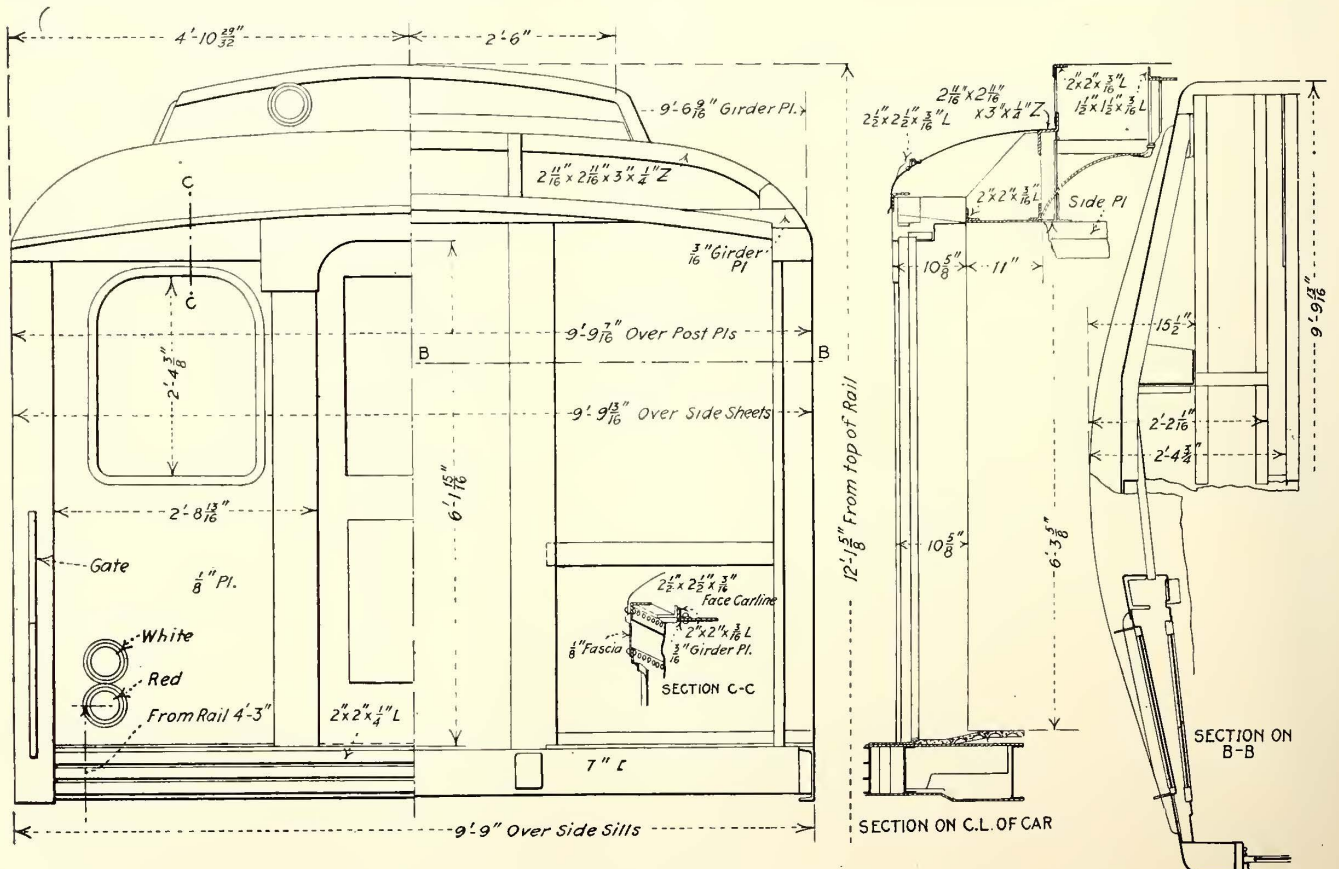


N. Y. M. Car—Side Framing, Including Details of Connections at Various Parts

of the car, located on the top and bottom of the center and buffer channels, riveted thereto and to the side sill channels. These plates extend over the buffer channel to provide for the installation of Hedley 7-in. anti-climbers and the buffer timbers. These anti-climbers are bolted through the buffer timber and channel with countersunk keyhead bolts. The buffer timbers and anti-telescoping plates are clamped together with round keyhead bolts, excepting under threshold plates, where they are countersunk into the anti-telescoping plate, but there is no permanent fastening between the anti-

climbers and anti-telescoping plates. The foregoing anti-telescoping construction between end and bolster is designed to take care of extraordinary buffing shocks without excessive weight of material, and in combination with the diagonals noted in the following paragraph the entire framing strength is made available to resist collisions. Pressings have also been designed for carrying the draft gear attachments and with the 3/16-in x 30-in. cover plate they form a box girder to reinforce the center sills.

At the end side doors the side sills are reinforced to



N. Y. M. Car—End Elevation and Sections, Including Location of the Marker Lamps

take care of the break in the side girders required for the doors. This reinforcement comprises a 5/16-in. pressed steel shape and 1/2-in. x 6-in. cover plates, top and bottom, extending from the bolster itself to the second main cross-bearer from the bolster and riveted to the side sill. To stiffen the underframe laterally, diagonal braces are provided from the intersection of the center sill channels and cross-bearer, between the bolster and the end of the car, extending to the intersection of the bolster and side sill; also from the side sill at the intersection of the next adjoining cross-bearer and center sill toward the middle of the car. These braces are of 3/16-in. plate with ends flared to provide for proper fastening. Provision against the torsion of side sills by reason of eccentric loading is embodied in the reinforcements already described.

The main cross-bearers are built up of 3/16-in. steel diaphragm pressings, with top and bottom cover plates of the sizes shown. The intermediate cross-bearers are of 3/16-in. pressed steel diaphragms without cover plates. The plan of the underframe shows a number of minor features, such as stringers and cross-bearers for carrying the floor; also the 2 1/2-in. x 3 16-in. x 3-ft. reinforcing plates, which will take care of excessive standing loads in the seatless area opposite the side doors.

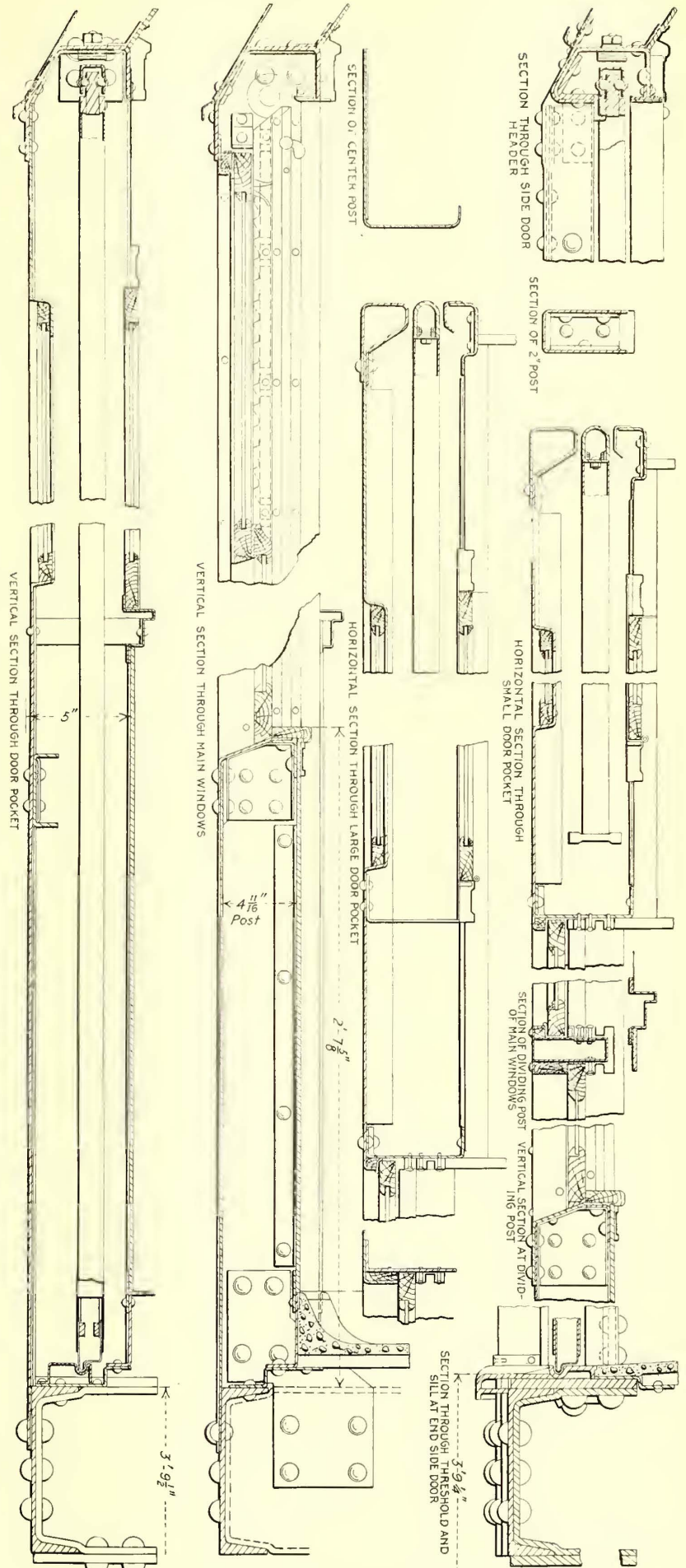
**BOLSTERS AND BEARINGS**

The bolster is of the built-up type, consisting of two 3/8-in. x 15-in. steel plates on top and bottom with 5/16-in. pressed steel diaphragms between the plates. This double-plate section extends from the center outward for about two-thirds of the bolster length. The bolster is riveted to the side and center sills, and a vertical reinforcing flange is provided at the ends of the bolster and riveted to the adjacent post of the side frame.

The car-body center plates are made with two bronze friction disks, and the bearing surfaces of the steel center plate castings are burnished to avoid cutting. For reasons of truck design, the Stucki roller side bearings are of inverted form, the rack being installed on the truck and the plate on the car body. These bearings are of self-centering type, namely, as one side of the roller is heavier than the other the force of gravity rights the bearing as the car departs from curves.

**END FRAMING**

The end sheets are of 1/8-in. Grade B steel specially formed with openings for windows with flanges to take sash pressed into same and riveted to pressed posts at end doors and corners. The corner posts are built up of pressings; the outside post of 1/8-in. Grade B steel and the inside of 1/8-in. Grade C steel. The door posts are Grade C steel 3/16 in. thickness, and the inside door post on door pocket side are of pressed section 1/8-in. Grade B steel. Cast-steel connection castings are employed between the end door posts and buffer sills to resist telescoping, and reinforcements are



N. Y. M. Car—Vertical and Horizontal Sections Through Side

also provided on the end sheets. The hood framing is built up of standard structural steel shapes and plates.

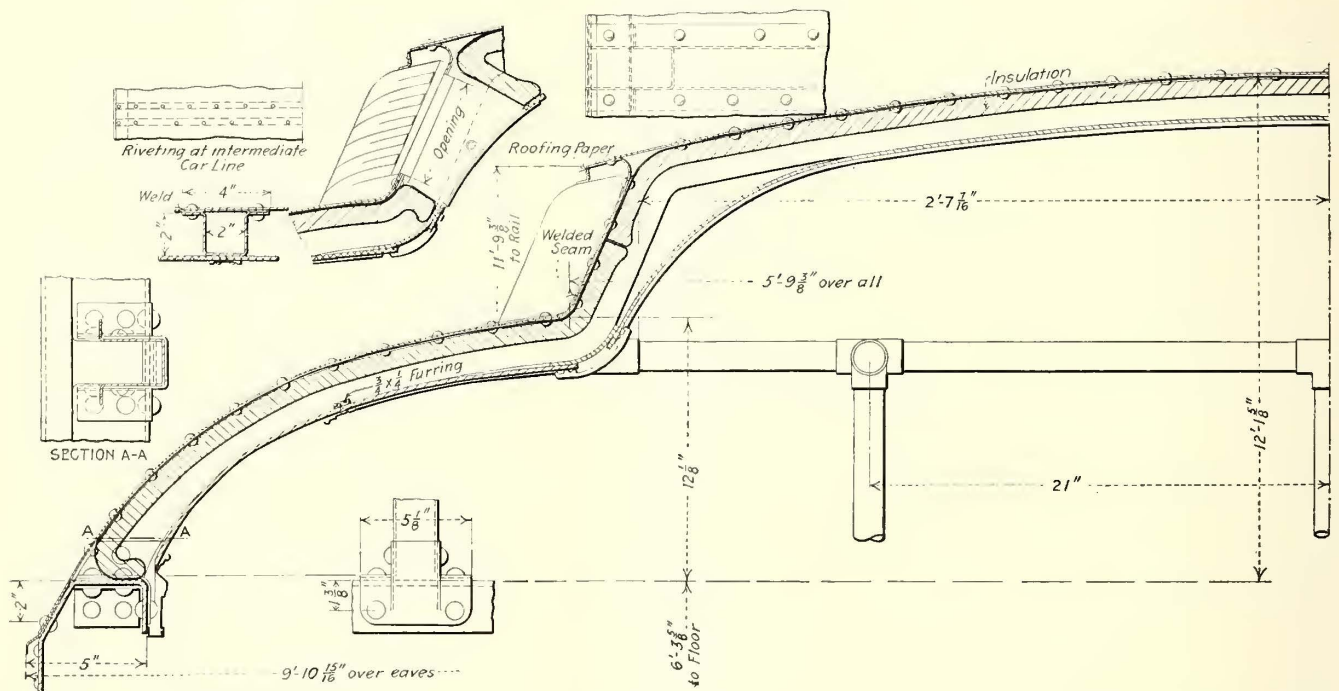
#### ROOF

The form of the roof is a compromise between the single arch and the monitor type, owing to the type of Perry "ingot-iron" ventilators used in the deck and to the need for maximum clearance in the tunnels. Inside the car, the effect is that of an Empire ceiling. The deck plate is of 1/16-in. ingot iron. The carlins are 3/32-in. Grade B steel pressed in one piece, flanged and attached to the body plate with pressed steel brackets. The upper deck roof sheets are of 1/16-in. "ingot iron" and extend in one piece across the entire width of the upper deck. Splices are made at carlins by lapping sheets, riveting to carlins and welding joints. These sheets are riveted longitudinally to the deck plate. The lower deck roof sheets are of 1/16-in. "ingot iron" fastened to the carlins and spliced in the same manner as the upper deck sheets. They are riveted longitudinally to the body plate, cutting out over the door openings.

on top of the floor stringers, riveted thereto and at all joints. A 7/8-in. ramp is provided at each side door. The floor covering is of "Flexolith," laid to a thickness of 3/8 in. above the top of the floor. After the flooring is thoroughly hardened, it receives two coats of a mixture containing one part linseed oil and three parts turpentine. At all sides and at seat risers, etc., a sanitary cove, 2 1/2 in. high, neatly rounded at corners, is provided, and all open spaces at the posts and sides of car are thoroughly sealed.

#### DOORS AND SASH

All doors are constructed of "ingot-iron" sheets. The door joints are welded and thoroughly sealed against moisture. The side and end doors slide into pockets and are hung on "Diamond" ball-bearing door hangers. A novelty in connection with the threshold plates is that the abrasive metal, which is of "Feralun" type, has been combined with the threshold plate and door guide, the abrasive metal being used also for the door guides which are usually of cast iron. The portion of treads



N. Y. M. Car—Section of Compromise Roof Adopted Because of Tunnel Clearances and Form of Ventilator; Other Details

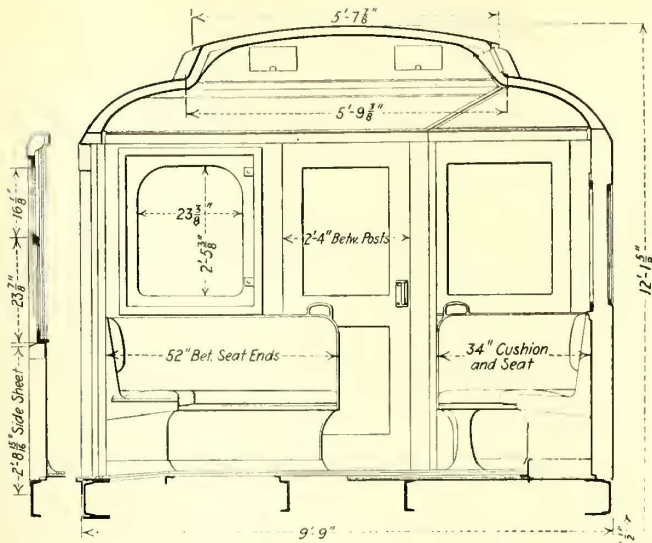
They are also riveted longitudinally to the deck plate. One-ply "Rubberoid" roofing is furnished between each member of the structure and the roof sheets, and the roof sheets are riveted to and spliced at all carlins, whether at splices or not. The hoods and the drip rails are of 1/16-in. "ingot iron." The gutters are of the same material and are soldered to the roof sheets.

#### FLOOR

The floor construction presents a most interesting novelty in that no floor is used under most of the seats. This plan saves appreciable weight and floor material; furthermore, it permits apparatus to be located to better advantage. Thus valves, governor, air-compressor intakes and other fittings can be placed in nooks protected from dust, water, etc., while still accessible for inspection. The seat supports form a box with pressed steel sides open at the bottom but with a 3/16-in. water-proof Agasote shield below the cushion to secure heat insulation. The floor sheets are of "Chanarch" 5/8-in. section No. 22 gage, galvanized sheet "ingot iron," laid

used as door guides has no abrasive surface. Door guides of pressed steel extend from the threshold plates into the door pockets. All side and end doors have an adjustable guide shoe to suit the threshold plates. Felt weather stripping is provided on the rear edge of each side and end door and reinforced sheet rubber at the top of all sliding doors and at the door jamb of the end doors. The end doors are equipped with Howard end door locks. The center door pockets are arranged for destination signs.

All sashes are of mahogany. Fixed sashes set in steel panels are 5/8-in. thick, but the stationary end sashes in steel panels, which have wired-glass are 3/4 in. thick; all other sash are 13/16 in. finished thickness. As in the present subway, the upper side sash is arranged to drop. The sashes on the inside of the door pockets are arranged to swing. Each upper side sash is provided with "Forsyth" metal weather strip and is equipped with O. M. Edwards' two sash catches and Edwards' compression spring rollers. Weather strips of velvet carpet are supplied at the top and bottom of



N. Y. M. Car—Transverse Section and Interior End Elevation

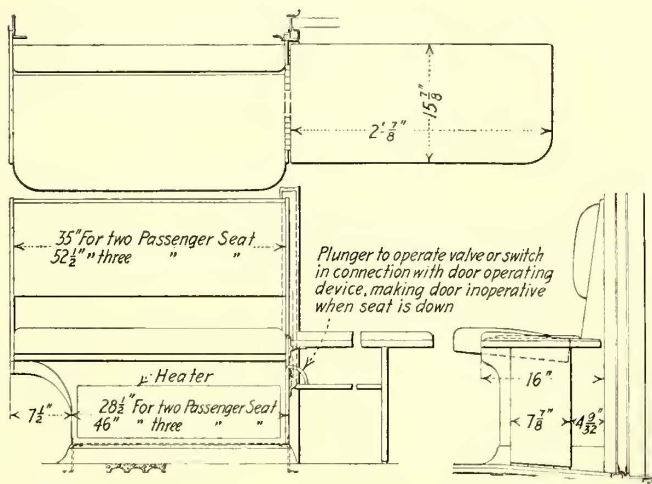
the upper side sashes. All of the sash hardware is of bronze.

The curtain material is of double Pantasote with the Curtain Supply Company's friction type fixtures and Rex all-metal friction rollers at all windows except the side windows in the door panels.

SEATS AND CABS

All the rattan seat cushions and backs are of Hale & Kilburn manufacture. The seat frames are constructed of light Grade A steel sheets. A support of shallow pan shape is built for each seat frame, flanged to support the "Chanarch" flooring at edges and to have a 2 1/2-in. sanitary cove around the entire seat base. The seat frames can be readily installed and removed from the car without in any way disturbing the flooring material or the interior finish. It is interesting to note that the seats, including height, shape and angles have the approval of the American Posture League. Cast-iron porcelain enameled grab handles of "Ellcon" make are provided on the seat framing. Porcelain enamel instead of bronze was selected for sanitary reasons as the metal is not kept clean so readily.

A cab is provided at two diagonally opposite corners of each car, arranged with a door hinged from the end door post and with a curtain in the rear partition, to form an inclosure for the motorman. When open for

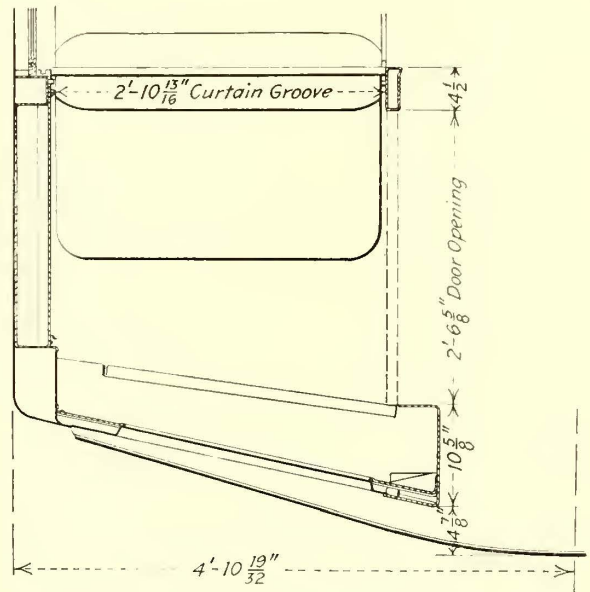


N. Y. M. Car—Longitudinal and Side-Door Folding Seat

passengers the door swings to cover the control and air-brake operating valves at the end of the car, and the curtain in the rear partition is raised. The door is equipped with a double-acting latch with a lock to hold same in position both as made up for cab and as arranged for use of passengers. The motorman's seat is of pressed steel covered with hair felt and rattan. When not in use it is folded to make room for a regular passenger seat. When the latter is folded, the seat cushion is behind the back of the adjoining seat on the other side of the partition while the seat back is hinged to drop.

HEADLINING AND INTERIOR SIDE SHEATHING

All side end and roof sheets, posts and pillars, as well as all other parts of car body, are provided with heat insulation of Johns-Manville "Salamander." This material is applied on a coat of wet freight car paint with crout nails spot-welded to the sheets. The headlining is of 3/16-in. "Agasote," the upper deck extending in one piece transversely and in seven sections longitudinally. The lower deck headlining is made in eight sections longitudinally with joints lining up with the joints in the upper deck ceiling. A transom conforming to the lower deck ceiling is provided transversely at each end of car. All joints of headlining are covered with drawn steel moldings, and held in place with oval head machine screws. A 3/16-in. wainscoting of "Agasote" is provided at the sides of the car between the posts. All sheets



N. Y. M. Car—Passenger Seat in Empty Cab

for interior finish, other than the headlining and wainscoting of "Agasote," are of Grade A steel. All drawn steel moldings are of Grade A material.

MISCELLANY

Grab handles of cold rolled steel with forged ends are used at the ends of the cars. Each end also has two safety gates which are arranged to hang between two adjoining cars. These gates have spring hinges to hold them in the outward position to insure self-coupling, thus avoiding the need for relying upon the guards to close the danger gaps between cars.

Spaces for advertising racks 11 in. wide over side doors and windows, and of special sizes at the ends, are formed of drawn steel moldings. The standing areas inside the car are supplied with vertical stanchions and elevated horizontal railings of 1 5/8 in. and 1 5/16 in. outside diameter steel tubing enameled with porcelain.

# Report of Edmonton Municipal Railway

Official Reports Show the Reasons for the Deficits in Operation by the City and the Increase in Fares Which Was Made Necessary by Continued Losses

The Edmonton *Official Gazette*, published by authority of the Municipal Council of the city of Edmonton, Alberta, gives detailed information in regard to the financial difficulties which have been met in the operation of the municipal electric railway and the increase in fares which has resulted.

## DEPRECIATION AND OBSOLESCENCE

The *Official Gazette* of April 2, 1914, made the following statement in regard to depreciation and obsolescence: "With respect to depreciation and obsolescence which has been charged to all departments covering 1913, it was determined during 1912 that the departments were not on a sound financial basis in that no provision had been made to provide for the difference between the life of the article and the period covered by the debentures to purchase that article. During 1913 certain amounts had been set aside to meet this condition and will be added to from year to year so that it is hoped that each department will be kept on a strong financial basis in all respects."

In the *Official Gazette* of April 9 there is a further reference to depreciation. The provision for depreciation of the capital assets of the utilities was the sinking fund only. A different method had been followed in earlier years but adjustments had been made so as to coincide with the sinking fund. Exceptions to this were the power plant, to which \$100,000 had been granted out of general taxation, and the electric light and power department, whose surplus had been set aside for special purposes. The report of MacIntosh & Hyde, chartered accountants of Montreal, who audited the finances of the city of Edmonton, expressed their opinion that "with the setting aside of the reserves now made, the respective plant values are as correct as they can be made short of an actual physical valuation, to make which would be impracticable in almost every case."

Concerning the street railway department the accountants report that as in other departments, the depreciation in excess of the sinking fund has been brought into the accounts, after which the deficit at Dec. 31, 1913, was \$405,394. The accountants add: "It is maintained that were the street railway to receive all its current without charge it would still not make a profit on its present showing. This is doubtless true, but it is a simple proposition to state that any reduction will operate toward minimizing the annual loss. If, therefore, it can be shown that the charge for current is unduly high every energy should be given toward securing that the basis of charge be equitable. The street railway is helping to cover within a short period a very large amount of obsolescence in the power plant. If the present policy is carried out the street railway can look for no relief under this head for nearly two years, after which there should be a substantial reduction in the cost of power."

## COST OF ENERGY

"In comparing the charge for street railway current in Edmonton with other cities, care should be taken to ascertain the method of measurement. Up to November last the Edmonton Street Railway had to pay 2.4 cents per kw-hr., but of the total current approximately 80 per cent was a.c. and only 20 per cent d.c. The loss in conversion of the former is fully 20 per cent,

raising the real price of the current to almost 2.8 cents. About the same time that the rate was reduced to 2 cents the introduction of new machinery made the proportion of a.c. and d.c. about 50 per cent each, or equal to 2.2 cents all around on the d.c. basis.

"The benefit of the reduction only affects the last two months and the rate is still high. If the power plant problem were solved by the transference of its obsolescence to general taxation the street railway would stand to receive its substantial credit as its share of the power plant's revenue surplus and would be relieved at once from any further contribution to power plant obsolescence.

"In our view probably the two most important factors which contribute to the lack of success which has hitherto marked the history of the street railway are the geography of the city itself and the fact that the development of the street railway is substantially ahead of that of the city.

"Notwithstanding statistics to the contrary, it would appear that the street railway has been extended into districts where there is not yet a sufficient population to justify the construction of the lines, if viewed from a purely commercial standpoint. For the present the railway has to maintain these services, and it is to be hoped that the facilities of transit afforded thereby will so develop the districts in question that the services will, in the course of time, be remunerative. Meanwhile the street railway is burdened with the heavy deficit of \$405,395, to carry which it has no funds of its own and must therefore suffer heavy interest on this sum in addition to its ordinary charges.

## GIVE A FRESH START

"Seeing there is little prospect of material improvement in the near future and as the street railway has suffered considerably by being required to furnish citizens with transit facilities which cannot as yet be other than unprofitable, there seems good ground for the Council to consider means whereby this deficit may be cleared off and the street railway be given a fresh start. We see two practical ways. One is to wipe out the power plant obsolescence, refund the street railway its share of the overcharges already made, reduce the price of current to cost and raise additional revenue by increasing fares to a straight 5-cent basis, with reduced fares only to workmen and children. The other way is to raise sufficient money from general taxation to clear off the deficit in either one or two years and to raise fares until it can be demonstrated that the street railway can afford to reduce same and still pay its way."

MacIntosh & Hyde also take up the position of the power plant. They say that the reason why the power plant quotes rates which result in a huge surplus at the expense of its sister utilities is that it has a large quantity of obsolete plant which stands in need of replacement. While the power charge is not the only factor in the unfortunate showing of the street railway, it is, in their opinion, a distinct present hardship on the railway to be called upon to bear within about three years its full share of the obsolescence of the power plant. The accountants also criticise the financing of the new carhouse. They find that after making adjustments for overcharges and allowing a fair value for material, machinery, tools, etc., returned, the



actual cost of the building was \$167,735. The cost of the original plans was \$2,300, making a total of \$170,035. The total appropriations were \$100,000, indicating an overexpenditure of \$70,035.

#### LOSS OF \$129,636 IN FOURTEEN MONTHS

The annual report of the City Commissioners for 1913 gives the following information in regard to the street railway:

"There has been a heavy loss in the operation of this department for the fourteen months, amounting to \$129,636, and after paying the newly established reserve on depreciation, the loss has been considerably increased, and the total deficiency to date is over \$405,394. We are of opinion that this utility has been extended considerably beyond the ordinary requirements of the city, the consequence being that insufficient revenue has been obtained. With the extended service that is given to each individual passenger, the tariff of fares is not high enough. It has been put forward that companies charging a 5-cent fare have, in addition to expenses, to provide profit for shareholders. It should, however, be borne in mind that the city pays approximately 5 per cent interest, and about 3 per cent for sinking fund, in addition to a heavy charge for depreciation. It might reasonably be held that 8 per cent for interest and sinking fund is equivalent to the dividend that would be paid by privately-owned undertakings. Your Commissioners have under consideration proposals for an increase in fares, approximating to an all-round 5-cent charge.

"The entire system was carefully gone over at the end of the year, and it was determined to make provision for certain depreciation charges not previously taken care of. This has added quite a burden to the system, but we realize that this must necessarily be considered in order to keep our system up to its proper value."

#### RAILWAY FINANCES SHOULD BE TREATED SEPARATELY

The report of the City Commissioners also takes up the subject of depreciation. While provision for depreciation and obsolescence should have the effect of increasing the deficiency in some of the departments, the Commissioners feel that it was necessary to put the matter on a sound basis, as otherwise the true losses of several departments would not be ascertainable from their accounts. The Commissioners say that while the creation of the reserve fund in the power plant has been at the expense of the departments which are the only customers of the plant, "it has been coincident with a reduction in rates to these departments and we feel that the problem of placing the water works and street railway department on a paying basis is one that should be treated separately and not at a sacrifice of a sound policy in regard to treatment of defective assets of the power plant."

The question of raising fares was brought before the City Council on April 28. As reported in the *Official Gazette* of April 30, the operation committee reported substantially as follows:

That in view of the fact that during the early years of street railway construction the railway bore the expense of certain paving charges under a policy which was changed in 1912, and as the committee believes that it would be to the general advantage of the city that a uniform policy similar to the present be made applicable to street railway construction since its inception, the committee recommends that the cost of paving wrongfully charged against the street railway prior to 1912 should now be borne by the city at large.

That subject to the City Solicitor's opinion a straight 5-cent fare be put in operation as speedily as possible

with the exception that tickets be sold for use between 5:30 a. m. and 8 a. m. at a rate of 9 for 25 cents, except on Sundays, and that no alteration be made in children's fares.

That the committee asks for a report showing approximately the effect on land values that the laying of street railway lines has had on property directly benefited.

Definite action was not taken at this time. The *Official Gazette* of April 30 also contained a letter from John Chalmers, Commissioner of Operation, regarding the street railway deficit and suggested future policy. For paving up to 1912 the railway was paying an annual charge of \$11,000. Since 1912 the railway has paid only the extra cost incident to the presence of the tracks on streets. Mr. Chalmers adds that at the inception of the system, the lowest basis of fares in existence in any of the old cities in eastern Canada was adopted, in spite of the fact that construction and operating expenses are from 30 to 50 per cent higher than in those cities. He adds:

#### HIGHER FARE SHOULD HAVE BEEN MADE

"What we say should have been adopted at the inception of this system was to charge, not the lowest but the highest permissible fare, sufficiently high to have insured a balance on the right side of the ledger. Then as the system grew stronger and after a proper reserve fund had been established, reductions could quite properly have been made. There was no rational excuse for adopting such a low tariff at that time. There are to-day but some fifteen systems in America operating under less than a 5-cent fare, and in some cases these are applying for permission to raise to the 5-cent tariff. New York, Buffalo, Chicago, etc., cities where both labor and material are cheap, charge 5 cents per ride and in some cases no transfers are given. It might be argued that all these systems alluded to, being private companies, pay large dividends. Such is not the case. In the last issue of the *Railway Journal*, quarterly dividends of over 40 lines were shown and these run from 1½ to 2 per cent.

"As the city grows maintenance charges increase, better type of construction is required, traffic requires that new and improved cars be put in service, besides many other expenses that a small system has not to meet. Since 1909 the system has also been carrying certain capital expenditures that only recently have become earnings. All capital raised is at present in an earning capacity, but it must be remembered that with any public utility it is scarcely possible at all times to place capital immediately where it can earn returns. Part may have to be carried over for one or two years. This is incident to all large undertakings, and provision must be made to carry this."

Mr. Chalmers also gives costs. To construct 1 mile of ballasted track with overhead work cost in Edmonton \$15,911; cars cost \$8,000; rails \$60 per ton; poles \$12 each; copper \$20.50 per 100 lb.; track fastening \$5 per 100 lb.; cement \$3 per bbl.; stone \$2.50 per yd.; labor, common, 30 cents per hour. For motor-men and conductors the average wage in Edmonton is 35 cents per hour; carhouse men are paid 37 cents per hour. It costs the city over \$40 a day to operate a car, while the returns for the first week in April of this year showed only two routes that are paying.

Mr. Chalmers adds: "Prior to 1913 no provision had been made for depreciation or replacements, and as much of the plant and apparatus will not be useful for the period covered by the lifetime of the bonds, particularly as some of the early bond issues were for forty years, and also that equipment must be superseded by more improved types, it was decided to create a fund

to take care of this proper obligation. In 1913, \$63,289 was charged to this account and a continuous charge is now made of about 3 per cent of the capital invested."

#### OTHER CANADIAN ROADS IN SIMILAR TROUBLE

In another part of his report, Mr. Chalmers says: "Our present financial condition is not exceptional to all other street railways west of Winnipeg. Systems in Saskatoon, Brandon, Regina, Lethbridge and Calgary, all equipped with modern apparatus, operating under the same rates of fare as we are and with the same rates of power charges, are showing deficits. Lethbridge is reported to have lost \$30,000 last year and Brandon is losing at the rate of \$100 per day.

#### GIVING CITY VERY BAD ADVERTISING

"The present financial condition of our non-paying utilities is giving us, in common with our sister cities that have utilities that are not paying, very bad advertising in the financial world, also presenting a strong argument for public utility corporations against public ownership, and it is but a matter of time before our credit will be seriously crippled. These interests do not ask at what rates we are selling our service. They merely take our financial statements and point out that the deficit is so much for last year and more for this year; even if we gave service free it is of no interest to them.

"It is an unsound premise that the public should expect, especially in the developmental stage, and all our utilities are in the development stage and will continue to be for a few more years, service at less than could be produced by a private company operating on a sound financial basis."

Mr. Chalmers therefore recommended that the street railway tariff be raised. Under the schedule of 5 cents with ticket rate of fares of 4 1/6 cents in certain hours and children's fares at 2 1/2 cents, after allowing the full amount for depreciation, this would still leave a deficit of \$54,947. If depreciation should not be considered in the operating expenses, this should give a surplus of \$47,052, which would give roughly 47 per cent of what should be credited to the depreciation account. Mr. Chalmers said he did not feel that the city would be justified in attempting any higher raise in tariff, but that it must endeavor by the closest economy and a constant endeavor to lower the cost of operation and meet the charges. The increase he suggested would mean a 20 per cent increase for cash fares and a 10 per cent increase for ticket fares.

#### ARGUES AGAINST EXTENSIONS

In closing Mr. Chalmers emphasized the necessity of putting the system on a sound basis financially, and advised strongly against the construction and operation of further extensions unless it could be shown conclusively that they would produce sufficient revenue to cover all charges or until the present system is in a financial condition to carry such extensions without having them be a burden and financial loss.

J. H. Larmouth, superintendent of the street railway, in his report to the Commissioner of Operation, suggested that one way in which the account could be made to balance would be to increase the fares until the undertaking earned sufficient money to wipe out the deficit and to show a surplus, when rates could be reduced to whatever level the earnings warranted.

#### REDUCTION IN COSTS NOT IN SIGHT

At a meeting of the City Council on May 5, reported in the *Official Gazette* of May 7, a report on the subject of street railway fares from Mr. Chalmers was read. Mr. Chalmers quoted from his report of May 12, 1913, calling attention to the unsatisfactory financial condi-

tion of the street railway. He said that for some years, at least, material reduction in the cost of operation could be expected. The tendency is always to extend the system further into new territory. The tendency at present is to build up the outlying sections rather than to fill up the central portion of the city. He declared that further extensions should be considered very carefully before being authorized, and in each case, before the extensions were built, there should be assurance of a reasonable revenue. He emphasized again the necessity of prompt action toward a sound financial policy.

At the same meeting the operation committee reported that the proposed increase in fare had been put to vote before the committee and defeated.

The annual report of the street railway department, covering the fourteen months ended Dec. 31, 1913, was published in the *Official Gazette* for May 7. It strongly recommended that definite action be taken to increase the revenue, showing that the department had shown a deficit ever since it started and that the deficit was getting larger each year.

#### AID AND HIGHER FARES FOR THE RAILWAY

At the meeting of the City Council on May 12, reported in the *Official Gazette* for May 14, the Council voted to have the city at large assume the amount of \$131,933 as a general debt. That represents the expenditure borne by the street railway for paving between the tracks. It was also decided that the sum of \$39,192, being the total annual charges paid by the street railway on the paving mentioned to Dec. 31, 1913, be repaid to the street railway by a tax levy in the current year, and that the interest and sinking fund for 1914 also be raised by taxes for the current year. The Commissioner of Operation was directed to make the following schedule of fares operative as speedily as possible: A straight 5-cent fare, with the exception of tickets to be sold at 8 for 25 cents for use between 5:30 and 8 a. m., while the rate for children's tickets remained without change.

#### INTRAMURAL RAILWAY FOR THE PANAMA-PACIFIC EXPOSITION

The intramural railway at the Panama-Pacific International Exposition is to have part of its line completed and equipped in time to handle traffic during the festivities to be held at the grounds on July 4. At least one of the locomotives, a number of cars and that part of the trackage necessary to carry passengers from the Palace of Machinery to the Palace of Agriculture are planned as a demonstration of the service to be rendered during 1915.

The intramural railway will be a replica of a modern railroad system and will be built to one-third standard size in all features where this is possible. The gage will be 19 1/2 in. and complete Pacific-type steam locomotives, which weigh only 13 tons, will be operated by engineers and firemen, members of the national organization, who are not over 5 ft. in height. The line will be double tracked, about 2 1/2 miles between terminals and will be protected by a block signal system. There are to be about 100 cars of 20-ft. and 24-ft. lengths, eight locomotives and one switch engine. These engines will burn either oil or hard coal, the concessionaire guaranteeing that there will be no smoke.

A regular train schedule will be maintained between the eastern terminus at the southeast corner of Machinery Palace and the western end of the line near the Stadium. The line for most of its length runs along the Marina close to the water, and there will be five intermediate stations.

# The Master Car Builders' Convention

Abstracts Are Published of the Papers Presented at Atlantic City, Together with a Description of the Novelties Among the Exhibits Which Were of Special Interest to Electric Railways

The annual convention of the Master Car Builders' Association was held in Atlantic City June 10 to 13, 1914. During the course of the proceedings a number of papers were presented of which many were of special interest to the electric railway industry, and these are published in abstract in the following paragraphs.

## NEW STANDARD COUPLER

The standing committee on coupler and draft equipment, which presented at the 1913 convention a series of results of tests upon couplers in present general use and upon several new types of couplers of increased weight and strength, reported before the convention that it had conducted jointly with the various manufacturers of couplers exhaustive tests and investigations to the end of developing a single standard design. Specifications on a coupler design together with working models built by the various manufacturers in accordance with these specifications were presented at the 1913 convention, and these new types were submitted to exhaustive static and road service tests.

The report of the 1914 committee presented the results of these tests in detail, showing that the couplers designed according to the new specification possessed an ultimate strength 70 per cent greater than the average of the present types of couplers. In addition, the permanent set of the knuckle in the pulling tests was shown to have been reduced to a practically negligible amount, the average figures for a permanent set under a load of 150,000 lb. being 0.21 in. for the present types of coupler and 0.0024 in. for the new specification type. The results of road tests on the present type and on the specification type were also included in detail in the report.

From the data thus obtained the committee made a selection among the various designs of specification couplers submitted, and two which appeared to be superior in strength and rigidity were chosen for a final test. Of these one had a straight lock and the other a wedge lock. The committee then held a joint meeting with the representatives of the various coupler manufacturers at which the tests were generally discussed, the committee stating that it felt that all of the coupler manufacturers should make the trial couplers so that the problem of interchangeability could be worked out and so that all manufacturers would be prepared to make the standard coupler when it was finally adopted.

All of the manufacturers discussed the matter freely, stating generally that they were prepared to manufacture the two types of trial couplers during the experimental stage and expressing a desire to abide by the decision of the coupler committee. With regard to patent features, the manufacturers whose couplers were selected for trial stated that they would live up to their agreement to allow other manufacturers to make the coupler that was finally chosen. It was decided eventually that 5000 couplers of each of the two types were to be tried out in service and that the railroads of the country should be requested to purchase the trial couplers freely until that number had been placed in service. In case the number of 5000 was exceeded the manufacturers other than those two whose couplers had been selected were to begin manufacturing the trial couplers. The two couplers selected

for trial weighed respectively 480 lb. and 467 lb. and had ultimate strengths of 545,000 lb. and 495,200 lb.

## TRAIN BRAKE AND SIGNAL EQUIPMENT

The report of the standing committee on train brake and signal equipment presented a report which recommended that all passenger cars should be equipped with brake and signal-pipe end-clamp hangers of a swinging or sliding design to provide lateral motion. The committee also recommended the use for a conductor's valve of a rubber-seated check valve which was not self-closing, and that the conductor's valve should be corded for the entire length of the car except in the case of dining and other cars where this was impossible. In this case a conductor's valve cord should be made of metallic material and of red color and the signal valve and cord to be of gray, so that these cords could be easily distinguished. The committee also stated its desire to keep before the association the clasp type of truck-brake rigging for passenger cars. The number of cars in service at the present time and equipped with clasp brakes was sufficient to make possible a satisfactory investigation of performance, and the committee advocated the appointment of a special committee to investigate the subject of clasp-brake rigging in general and to make schedules of the weights of cars which should be so equipped. On account of the limited range of action of the present train air signal the committee also pointed out the desirability of developing a satisfactory signal device. In addition the committee advocated consideration of galvanized pipe and fittings for refrigerator and coal cars. A revision of the present general instructions for air-brake and air-signal systems was included in the report.

## BRAKESHOE TESTS

The committee on brakeshoe and brake-beam equipment reported in detail the results of a series of laboratory tests on different kinds of brakeshoes, the tests being made at different speeds and pressures. In these tests it was found that the coefficient of friction decreased steadily as the brakeshoe pressure increased, ranging between 13 per cent and 10 per cent with brakeshoe pressures between 12,000 and 18,000 lb. per shoe. In one case, namely, that of a shoe made up of a pressed-steel back  $\frac{1}{8}$ -in. thick and completely filled with a composition, the coefficient of friction ranged between 20 per cent and 15 per cent with brakeshoe pressures as before. The loss in weight due to wear was found to be very irregular, in general increasing with the pressure. The approximate distance required by each shoe to produce a theoretical stop was found to be inversely proportional to the coefficient of friction in each case. All of the tests were carried out at a peripheral speed equivalent to that of 65 m.p.h.

The same committee included in this report a revision of the specification for tests on No. 2 brake-beams, and stated that in answer to a circular letter regarding the desirability of adopting a standard No. 2 brake-beam as recommended practice of the association the majority of replies were in favor of this action.

## STEEL CAR CONSTRUCTION

The committee on car construction included in its report a recommendation to the effect that existing

steel or steel-underframe cars which had less strength than the following standard should be classified with wooden cars and subject to the same rules for combination defects. This would apply when the area of the center sills was less than 16 sq. in., the ratio of stress to end load was more than 0.09 and the length of center or draft sill members between braces more than twenty times the depth of the member measured in the direction in which buckling might take place. In determining the ratio of stress to end strain the distance between the neutral axis of any member of the car and the center line of strain should be taken as a lever arm through which bending effect is added to direct tension or compression. A formula for the ratio of stress to end strain was given as one divided by area in square inches, plus the quotient obtained by dividing the lever arm in inches by the section modulus. In connection with new cars it was stated that minimum center sill areas between points of impact on existing cars might vary up to 55 sq. in., and, as service experience had demonstrated that cars having minimum center sill strength were crippled in acting as cushions for the strong cars, this made it desirable to aim at uniformity of center sill strength for all cars in the train. Designs of cars which did not go into general service in interchange might be considered only from their own load carrying standpoint without regard to impact strains in the train, but those used in interchange had to be considered from both standpoints. For interchange cars the committee recommended a minimum area of center sills of 24 sq. in., a maximum ratio of end strain to net load of 0.06 and a length of center- or draft-sill member between braces equal to twenty times the maximum depth of the member.

With regard to boxcar end design, the committee recommended that new cars should have ends of steel plate  $\frac{1}{4}$  in. thick reinforced between corner posts with the equivalent of either two vertical steel braces with a total section modulus of not less than nine, or else one vertical and two diagonal steel braces with a total section modulus of not less than ten, or else three horizontal steel braces with the same modulus. Special ends of the corrugated type might be substituted for the ones described.

#### OTHER REPORTS

The committee on the retirement of small capacity cars recommended that the following rule should be submitted to letter ballot: "After Oct. 1, 1916, all cars of less than 60,000 lb. capacity having wooden or metal draft arms which do not extend beyond the body bolster will not be accepted in interchange." The committee reported a considerable majority of replies in answer to a circular letter from roads which considered it practicable to prohibit the use of 40,000-lb. cars in interchange, and that a small majority of the roads replying even considered it practicable to prohibit the use of 50,000-lb. cars. Few roads had restrictions in force regarding the use of 40,000-lb. and 50,000-lb. cars. The committee reported about 50,000 cars of the smaller capacity in service and about 75,000 cars with a capacity of more than 40,000 lb. and less than 60,000 lb.

The committee on specifications and tests for materials presented revised specifications for air-brake and signal hose, for welded pipe, for heat-treated knuckle pivot pins, for steel axles, for refined wrought-iron bars, for helical springs, for chain for passenger and freight cars and for material for journal-box brasses.

The committee on car trucks submitted limiting dimensions and specifications as well as tests for cast-steel truck sides, including a recommendation to estab-

lish a spread of 50 in. center to center for side bars of 140,000 lb. capacity truck bolsters and one providing for clearances of side bearings for new cars amounting to  $\frac{1}{4}$  in. minimum and  $\frac{5}{8}$  in. maximum, this being the total for the truck.

#### THE EXHIBITS

The exhibits of the manufacturers were easily up to the standard set at previous conventions. The floor space occupied by the various booths totalled 82,000 sq. ft., and a number of exhibitors were in evidence with new apparatus which had been developed only during the past year and which was, in consequence, displayed for the first time. Much of this appeared in the machinery exhibit which was unusual on account of the bulk of the machine tools displayed, the estimates giving the whole installation a tonnage that ranged from 10 per cent to 15 per cent in excess of that of last year, but the rapid development of automatic stokers and superheaters for locomotives brought out a number of new devices along these lines as well.

One of the new tools in the machinery exhibit was one called a 10-in. vertical shaper, which had a revolving and traveling table like a slotter, as well as a sliding head that moved in a vertical plane. The ram carrying the cutting tool, however, moved in guides like those of a shaper but these were pivoted at the top so that they could be swung out of the vertical and locked in that position, thus permitting bevel cuts on work of irregular shape. The tool is intended especially for die work.

Another exhibitor in the machinery annex had installed an electric furnace and quenching vats, and with the aid of an impact machine and scleroscope gave actual demonstrations of proper and improper methods for heat-treating gears and pinions. Sample pinion teeth of various qualities of metal both in tool-steel and case-hardened material were heat-treated and then broken to show, by the appearance of the fracture, the results of heating to different temperatures. With case-hardened material the metal was first heated to the critical temperature of the core, or the temperature between 700 deg. Cent. and 800 deg. Cent., depending on the composition, from which the low-carbon steel of the interior of the tooth would cool with a fine-grained structure to give greatest strength and toughness. The metal was then heated to the lower critical temperature of the case, or the skin of high-carbon steel on the outside of the tooth, and quenched a second time. The fracture showed that the refinement of the core had not been injured by the heat-treatment of the case because of the lower temperature at which the second heat was made.

Other notable exhibits among the machinery included a universal punch and shear and cutter for heavy commercial shapes that was built up of steel plate throughout. No casting of any kind was employed in its construction so that, notwithstanding its height of about 10 ft., including the motor which drove it, and its length of 15 ft., the machine was only about 18 in. thick except at the floor line, where the base knees extended outward. An interesting radius grinder was exhibited also. This was of the planer type and it had horizontal rolling curtains that extended over the ways to protect them from dust when they were exposed by movement of the table. The spindle carrying the small emery wheel had a vertical oscillating motion of about 1 in. to keep the wear of the wheel even and the cut true.

The exhibit of the committee on couplers was impressive. Samples of the two experimental standard types of coupler were displayed in both of the forms of contour that are to be tried out in actual service. In

addition two experimental standard couplers with the No. 5 contour that had been subjected to a coupling test by the committee were shown in exactly the condition which they were in after coupling and uncoupling 30,000 times. This was estimated to be the equivalent of eighty-two years of service. Notwithstanding this neither of the couplers showed appreciable wear and both operated with extraordinary ease and positiveness. To show the relative advantages of the No. 5 and the No. 10 contour a set of flat wooden models were mounted on guides and operated, the angle at which the couplings were made being adjustable so that the action when coupling on curves could be investigated. Both of the experimental standard couplers, which will be submitted to the railroads for purchase in small lots to try out in actual service, have straight locks, the advantage of limited knuckle play afforded by the wedge lock being considered to be offset by the possibility of creeping by the latter form under certain conditions. However, tests of the wedge lock are to be continued by the committee on couplers with a view to eliminating creepage if possible without the use of anti-creepers.

That the super-car is imminent was indicated by the large display of 70-ton trucks and other equipment for the extra-heavy coal cars now coming into use, although even this extraordinary lading is somewhat overshadowed by the recent trial of 90-ton cars on the Norfolk & Western Railroad. However, only one complete 70-ton car was shown at the convention, this being on the exhibit track on Mississippi Avenue. The car was unique in having side bearing trucks and a truck bolster that carried no load whatsoever and served only to pivot the truck on curves. Each of the side bearings was a unit composed of two plates with rollers in a guide between them, a ratchet making the motion positive. Side play was provided by a Barber roller-bearing with the rollers set in sloping ways between the bolster and the cap on top of the springs, the latter being coils carried on the cast-steel drop truck side.

All of the cars exhibited were of all-steel construction with the exception of one 40-ton boxcar, which had a steel underframe, steel-truss side and end frames, and a steel roof. The only wood used in it was the planking for the side inside of the steel framing. The trucks of this car were of the built-up type and thus opposed the impression of the popularity of the cast-steel truck side given by the numerous exhibits of various other manufacturers. Among the latter, which included designs of the flexible, boltless and single-casting types displayed at last year's convention, was one in which a side-play feature was introduced through the use of swing links extending between lugs on the journal box to the lower member of the truss-side below, thus affording no direct contact between box and truck, the springs being of the leaf type and set under the bolster ends in the usual manner. Ball and roller side and center bearings of various types were generally prominent numerically.

Most of the cast-steel truck sides gave an impression of heavy, massive construction that was emphasized in the 70-ton trucks. Even the pressed-steel journal boxes which were exhibited were made of steel plate nearly  $\frac{1}{4}$  in. thick, with  $\frac{1}{8}$ -in. lids. In the 6-in. x 11-in. size this type of box weighed 100 lb., and in the  $4\frac{1}{4}$ -in. x 8-in. size 63 lb. The pinless journal-box lid was exhibited again this year, together with a dust-proof lid that was set into the journal-box opening to make a bevel joint along all four edges.

In addition to the welding exhibits, which included one showing a complete plant for the commercial production of oxygen and hydrogen by electrolytic breaking down of water, many displays of hand tools were made. One of these was a quick-adjustable pipe

wrench which had a rack and thumb-latch in place of the usual nut, and which was in consequence but half as thick as the standard Stillson wrench and was capable of use on inaccessible pipes. Another type of pipe wrench had the distinction of having no teeth in the jaws, compression being effected by a toggle action. This produced really remarkable results in exerting pulls on smooth pipe without marking the surface in the slightest degree. A lathe dog that operated on the same principle was a novelty. Both of these tools, however, have different jaws for each change of radius of pipe or bar. Among the hand tools, it may be said, was a 40-ton chain block, and a horse of comparatively light weight used for supporting car bodies in the shop and composed of a truncated cone of sheet steel with cast top and bottom.

Among the miscellaneous features of interest was a spiral pipe clamp which, when in line with the pipe, held it firmly, but which, when turned at an angle, permitted the pipe to be lifted out, no bolts being used and but one piece forming the complete clamp. There was also a coupler that uncoupled when desired under the heaviest pulls, thus eliminating the necessity for taking slack before cutting off a car. This coupler was of the present M. C. B. type but was not one of the two designs selected as experimental standards by the association. Car replacers for city street cars, consisting of low beveled castings, were also shown together with heat-insulating brick of very low conductivity and extraordinarily low weight. Several of the exhibitors displayed samples of steel moldings and pressed panels for the interior finish of passenger cars, indicating a belief in the future demand for this material, and a flange lubricator was shown in which a rolling ball opened a valve that lubricated the flange on one side of the car or engine whenever that wheel moved against the rail. Another scheme for lubricating was a graphite filler in which the graphite in small prongs was attached to a piece of wire netting and the whole set in a journal brass before the babbitt was poured into it. After babbitting the ends of the prongs of graphite were exposed at the bearing surface of the babbitt. A novelty in car steps was also shown. This consisted of a disappearing lower step that was thrust out by air pressure but returned to the concealed position whenever the air was off. The valve that supplied the air had an extended spindle that struck one of the axles and that had a pendulum-like end. When the axle revolved this pendulum was forced to one side by the motion and the consequent full travel of the valve opened a port and released the air. The motion of the step in moving either out or in is so gentle that a passenger's weight upon it prevents it from closing.

It is reported that Belgians will form a company which will undertake the exploitation in Constantinople of the tramways, electricity, gas, and, later on, of an underground railway. At first the company will have a stock capital of \$3,600,000 and a debenture capital of the same amount, as the first object is to exploit the tramways; but it is already foreseen that the execution of the whole programme will involve more than \$20,000,000. The existing 25 km of tramway lines have already been electrified. In 1916 the Belgian company will absorb the light and power undertaking, which is actually worked by a Hungarian company, controlled by the Budapest Aktien Gesellschaft für Elektrische und Verkehrs-Unternehmungen. The Hungarian company already sells over 2000 kw and anticipates greatly increased production. The Belgian group has obtained the concession of an underground railway between Stambul, Galata and Pera. The new company will probably bear the name of Union Ottomane, Société d'Entreprises Electriques à Constantinople.

# American Association News

Notes on Work of Committees on Power Distribution and Education and of the Exhibit Committee of the A. E. R. M. A.—Engineering Manual Distributed this Week

## COMMITTEE ON POWER DISTRIBUTION

Following the session of the committee on power distribution reported in last week's issue of the *ELECTRIC RAILWAY JOURNAL*, another was held on June 5 at association headquarters. This was attended by G. W. Palmer, Jr., Bay State Street Railway Company, Boston, Mass.; Gaylord Thompson, New Jersey & Pennsylvania Traction Company, Trenton, N. J.; Charles R. Harte, Connecticut Company, New Haven, Conn.; Ralph H. Rice, Board of Supervising Engineers, Chicago, Ill., and C. L. Cadle, New York State Railways, Rochester, N. Y.

The sub-committee on concrete poles presented a report in which the application of the deflection formulas given in last year's report covering square poles were extended to include octagonal poles, to meet situations that might call for more artistic appearance. The sub-committee had endeavored to secure criticisms of the formulas offered last year, and such comments as had been received were on the whole commendatory. Mr. Cadle volunteered to construct and test poles as suggested by the committee and arrangements for this work will be made at once.

The sub-committee on specifications for rubber insulated wires and cables, of which R. H. Rice is chairman, presented revised specifications which had been prepared after correspondence with members of the committee. These specifications after consideration by the committee were referred to the sub-committee for further revision and report to the chairman. Since the last convention specifications have been prepared for rubber insulated wire and cables by the joint rubber insulation committee, which is made up of representatives from scientific bodies and users and manufacturers of wires and cables. The recommendations of this committee have been carefully considered in the preparation of the Engineering Association specifications.

## EXHIBIT COMMITTEE OF THE A. E. R. M. A.

H. G. McConnaughy, director of exhibits, announces the following as the exhibit committee for the coming convention at Atlantic City: E. H. Baker, vice-president in charge of exhibits, Galena Signal Oil Company; George Arnold, Cleveland Frog & Crossing Company; S. A. Bullock, Baldwin Locomotive Works; S. J. Cotsworth, Lorain Steel Company; N. M. Hench, Carnegie Steel Company; Wm. M. Henderson, Pennsylvania Steel Company; T. W. Illingsworth, Midvale Steel Company; F. D. Killion, Western Electric Company; J. A. Kucera, *ELECTRIC RAILWAY JOURNAL*; R. C. McCloy, Wm. Wharton, Jr., & Company, Inc.; J. R. McFarlin, Electric Service Supplies Company; J. C. McQuiston, Westinghouse Companies; E. B. Meissner, St. Louis Car Company; J. W. Perry, H. W. Johns-Manville Company; A. L. Price, Ohio Brass Company; F. W. Sargent, American Brake Shoe & Foundry Company; L. W. Shugg, General Electric Company; P. C. Snow, Globe Ticket Company; L. H. Snyder, Jos. Dixon Crucible Company; Charles H. Thomas, Galena Signal Oil Company and S. M. Wilson, J. G. Brill Company.

The circular sent out by the Manufacturers' Association, which was described in last week's issue of the *ELECTRIC RAILWAY JOURNAL*, has brought excellent results. Applications are coming in rapidly for space and the prospects are bright for the best and largest convention yet held. But one week now remains in which

to make applications for space without prejudice as to chronological order. It will be remembered all applications received prior to June 20 will have equal consideration. After that date space will be assigned in order of receipt.

## COMMITTEE ON EDUCATION

The committee on education of the American Association is corresponding with the member companies for the purpose of securing data on apprentice training and general education work which has been undertaken by the companies. The inquiries relate to work other than that covered by the Accountants' and the Transportation and Traffic Associations. The educational committee has secured permission of the executive committee to make preliminary arrangements with a reputable correspondence school for the preparation of a special course for electric railway employees.

A conference will be held in a few days between the committee and representatives of one of the leading correspondence schools. The questions which the committee is asking of the members are as follows: Have you in operation in your shops a regular apprentice system for the training of mechanics, etc.? If so, please give some detail of the shop training furnished. Do you, as a company, give the apprentice boys any instruction of a school nature; drawing, arithmetic, etc.? Is this work done during shop hours? Do you co-operate officially with any trade, vocational, night or other school for the purpose of encouraging your apprentices to study? If so, is attendance voluntary or required? If the American Electric Railway Association should be able to make an arrangement with a reputable correspondence school for a course to be administered under the general direction of the Committee on Education, would you favor it providing that it is understood that the expense will be less than the usual fees and that the students be expected to pay all or a large part of the expense? Can you estimate the number of enrollments which might be expected in such case? Have you any record of the number of your employees enrolled in night or other courses? Do you have any systematic way of following up such work and encouraging it? Would it be practicable for you to appoint an official of your company to act as supervisor of apprentice training, to keep track of all such matters as are referred to above, provided that you were convinced of the advisability of such an appointment? Do you have a systematic plan for training power plant and substation operators? If so, can you give some details of your plan? Have you any training plan for line workers?

## OTHER COMMITTEES

The Committee on Education of the Accountants' Association has received more than a fourth of the number of enrollments required for the course described in a recent issue of the *ELECTRIC RAILWAY JOURNAL*. Applications and requests for information are still coming in. The committee hopes to have the full number soon so that definite arrangements for the course can be made.

The meeting of the committee on equipment, which

was to have been held last week, has been postponed until June 19 and will be held at the Fort Pitt Hotel, Pittsburgh.

The rules committee of the Transportation & Traffic Association held a meeting in New York on June 12. This meeting was held at the association headquarters.

A meeting of the joint committee on block signals of the Engineering and the Transportation & Traffic Associations will be held at Hotel Secor, Toledo, June 23.

#### THE ENGINEERING MANUAL

In the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 15, 1913, page 769, a preliminary description of the volume of standards and recommendations of the American Electric Railway Engineering Association was given. During the past week the complete manual has been distributed to the members of the association. This manual puts in very concrete and tangible form the results of the work of the engineering association, and renders it accessible. Its loose-leaf character makes it very elastic.

The preface which forms the first leaflet in the manual explains first that the material in the volume is comprised under three divisions: (a) standards, which have had the formal approval of the association; (b) recommendations, also approved as such; (c) miscellaneous methods and practices including all other definitely approved recommendations. This material is arranged systematically under seven headings as follows: buildings and structures, power distribution, equipment, power generation, miscellaneous methods and practices, signals and way. These are subdivided as necessary. For example, the section on buildings and structures contains these sections: office buildings, etc., power houses and storage yards, contents, foundations, miscellaneous, power and substations, materials, terminals, shelters, etc. Each section and subsection are appropriately lettered for convenience in arranging the pamphlets. The preface also contains an explanation of the rules for the adoption of standards and recommendations.

Two colors of paper are used in the manual, blue for all standards and recommendations and white for all other material. At the top of the first page of each reprint is a condensed statement of the recommendation or practice, how it was initiated and carried through and references to the records in the proceedings of the action taken. The manual is elaborately indexed.

#### INSPECTION REPORT OF THE MISSOURI PUBLIC SERVICE COMMISSION

The Missouri Public Service Commission has recently issued its first report concerning the annual inspection of the steam and electric railroads of the State. Owing to the fact that the commission was created in April and the work of organizing the nucleus of the engineering department was not completed until September, only 3594 miles out of a total of 11,279 were inspected during the year. Included in this amount were the 81 miles for the Kansas City, Clay County & St. Joseph Railway. The commission states that in its opinion the construction and equipment of this road is first class, that the present condition of the track and roadbed is such that the speed of 50 m.p.h. maintained is safe, and that the service and convenience for the public are in every way satisfactory. In connection with the inspection the commission called upon all the carriers to furnish a concise statement of the physical condition of their tracks, bridges and other facilities. This first inspection report also contains a report on accidents during the year and the protection methods ordered.

## COMMUNICATIONS

### ALL-STEEL CARS FOR CITY SERVICE

June 15, 1914.

To the Editors:

For ten years I have had an excellent opportunity for watching and studying the development of electric railway rolling stock. Although I am neither a car builder nor an operating man my position is such that I must study the trend of the industry and be prepared to decide on the value of various types of rolling stock, and I have been interested in your recent articles and in the communications on the weight of large steel cars such as are used in subway, elevated and high-speed work. Perhaps some of my observations and ideas about the all-steel car for city street railway service may be of interest.

The question as to whether wood or steel cars should be adopted by any road depends very largely on the service to be given, as well as on the comparative first cost, life and maintenance cost. Not so many reasons exist for the adoption of all-steel cars for street railway service as for the service on high-speed lines where danger of collisions and fire hazards are much greater. In metropolitan cities where subways have been built or are contemplated the use of a steel surface car is always justified from the fire-hazard standpoint, providing there is ever a possibility of street cars being run for any distance through subways. In elevated, subway and interurban service the higher speeds demand a car structure designed to withstand the severe strains and shocks due to impact, vibration, swaying, buffing and pulling. It is necessary also to have greater strength in the structure as a protection against possible collision, because the train weights are greater and the speeds higher. Street railway maximum speeds are comparatively low, cars are operated nearly always as single units and they are not run on high structures or in tunnels where the consequences of collision or fire might be serious.

The foregoing reasons account for the present greater use of steel cars on high speed lines than on street railways. There are, however, strong reasons for the adoption of all-steel cars for street railway service, and the tendency right now is toward their quite general adoption.

An inspection of the car articles published in the JOURNAL during the last few years shows a notable increase in the extent to which steel is used in street car construction. I believe that this tendency will grow until practically all the street railway cars, except perhaps in small towns, will be built of steel. I have been told by car builders that even now good ash timber for posts and rails is very scarce. It is difficult to obtain good live wood. Unless the best grade of wood can be used there is little argument to be raised against steel posts.

Some of the first all-steel street cars were very special in design. Few standard rolled shapes were employed. Practically all of the parts were specially formed, and as a great many dies had to be made the first cost of these cars was comparatively high. Now as orders for steel cars increase in number and as the designs tend to become more simple and more uniform, the cost per car for dies will be greatly reduced. It is also possible by care in design to utilize a great many commercial rolled shapes and thereby reduce the number of special die sections to a minimum. Also, as more steel cars are built and as the railway managements become more familiar with them, the designs will become simplified so that the car builders will be more willing to undertake their construction.

For some years the difference between the first cost

of wood and steel cars has been sufficient to prevent the great number of roads considering the use of steel cars. This situation will not last. The design of steel cars will improve, the car builders will grow more familiar with steel construction and the cost of first-class lumber for wooden cars will continue to rise. Thus the difference in price will become less and less, and the steel street car will be more popular.

I have often heard mechanical men discussing the maintenance features of steel cars. There need be little apprehension on that score. First, because a steel street car will withstand much more exterior abuse and require far less shop attention than a wooden car. Also, in repairing steel street cars it has not been found necessary to use expensive steel-working tools, or high-priced special labor, and the repairs have not consumed any more time than would have been necessary to make the same repairs on ordinary wooden equipment. Knowledge of the ease with which pressed-steel work can be formed is spreading, so that quite a number of electric railways are now equipped with home-made presses and dies for making small parts which formerly had to be forged. It is only a short step from such work to the use of larger dies in the shop bulldozers with which can be made practically any section needed for ordinary repairs.

A feature which is being given more and more attention in car design is the choice of parts so that replacements may be made at home without having to rely on manufacturers for duplication, and it is possible to design a steel car post so that duplicates can be made in the railway company's shops. There is also a possibility that the electric spot welding machine will be developed into a portable tool so that it can be taken to the work which it is to perform. Then all of the minor parts of the steel car can be fastened with spot welds rather than with rivets. This not only will simplify and lessen the cost of the construction, but will improve the exterior and interior appearance of the car, because the spot welding will do away with the riveting as well as the fastening of finish with machine screws which have been found very difficult to maintain tight.

An obvious advantage which follows from the stiffer, stronger construction of steel cars is that of increased safety to the passenger. For example, the ability of a steel car to withstand collision with vehicles and to protect the passengers against injury is much greater than with cars having wooden superstructures, although, of course, the composite car with steel up to the belt rail possesses the same advantage: that is, the side structure of the car is strong enough to prevent the pole of a wagon piercing the car and injuring passengers.

An enormous resistance to shearing blows is possessed by the light pressed sections of which the frames of steel cars are usually built. The great advantage of this feature for heavy city service has been exemplified on one large metropolitan system which operates a fairly large number of large steel cars. Here the customary collisions have taken place between cars, heavy trucks and fire engines, but the strength of the steel cars is such that, although the impact from such collisions may bend the front posts far enough inwardly to tip over the controller, the vestibule holds together, nevertheless, and protects the motorman and passengers. In all instances, the bumper and the roof have remained intact even though the posts have been bent inwardly so far as to crack them at the belt. The fact that the top and bottom connections of the posts hold under these severe stresses shows the great value of the steel construction as compared with wooden construction, which, under similar circumstances, would break and crush inward at least to the bulkhead.

The comparative behavior in collisions of steel and

composite cars of about the same general dimensions shows greatly to the advantage of the steel car. In one such collision a composite car with a steel underframe and wood superstructure struck a steel car at right angles midway between bolsters. The damage to the wooden car was considerable. The entire vestibule above the platform floor was sheared off and crushed to a point back of the body bulkhead, the platform of the composite car going under the frame of the all-steel car. But the steel car suffered comparatively little. The side plates were dented and two window posts were bent, one of them being cracked, and some of the equipment underneath the steel car was, of course, sheared off by the platform of the wooden car. Other than this slight damage the steel car was uninjured. The underframe remained in perfect alignment after the collision. A careful inspection showed that, had there been passengers in the seats closest to the point of impact, they would not have been injured except perhaps by falling glass. Had a wooden car received a similar collision blow it is very probable that the side would have been crushed in, the underframe thrown out of alignment and the seats adjacent to the blow badly damaged. In consequence, it is safe to say that steel cars enjoy a greater freedom from time out of service due to external injury than wooden ones, and when repairs are necessary they cost no more with steel construction cars than similar repairs with wood.

On the score of comparative weights of steel and wooden cars, it is possible to design a steel car having the same strength as the composite car but with considerably less weight, and the steel car will offer greater resistance to blows and collisions. This weight economy is accomplished by utilizing the complete side of the car from the top of the letterboard to the bottom sill and all the metal contained therein as a single truss, which, from its depth, has comparatively excessive strength for its weight.

A few years ago it was said that steel cars were very difficult to heat, but progress in the design of heating equipment and in learning the exact requirements for heat installations have practically caused this criticism to disappear. Steel cars can now be built and equipped without any question as to sufficient heating.

With regard to the comparative life of wooden and steel cars, it has been stated that if a steel car of equivalent size compares favorably in weight with the wooden car, then the steel parts are so light that the life may be unduly shortened from rusting. This criticism has not been substantiated in service. I have studied many steel cars which had various parts made of the light pressed sections. These cars have been in service under severe operating conditions for five years, and the probability of rust unduly shortening their life is very remote. When properly designed the steel car will have a much longer life than a wooden car, and in view of this fact it may not always be possible to realize the full life of the car due to rapid changes in the art. On this score, the advisability of building cars which will outlive the natural period of obsolescence might be questioned. However, the greatly reduced maintenance will offset this possibility, and as the first cost of the steel car gets nearer the first cost of wooden cars this criticism disappears.

Looking into the future, we see an increasing demand for seats, for speed and for safety. The all-steel street car has the greatest possibilities for meeting these demands. With regard to seats a larger interior is possible for the same weight and for the same width. Regarding speed and safety, the greater strength of the all-steel car as compared to a wood or composite car is not even debatable.

In conclusion, considering the total annual charges



for operation which involves the questions of weight and maintenance, and assuming the first costs of all-steel and composite cars to be not far apart, the all-steel car is the more economical investment, and, therefore, must come into general use. With the all-steel car showing the economy just pointed out, the electric railway has, by its use, an opportunity for making a saving which will offset to a certain degree the increased cost of general operation due to the rising tide of the labor market and the standing still or recession of the rate of fare.

EQUIPMENT ENGINEER.

A "SAFETY FIRST" DOUBLE ACROSTIC

TORONTO & YORK RADIAL RAILWAY  
TORONTO, ONT., June 6, 1914.

To the Editors:

In view of the wide interest shown in the "safety first" movement, the writer has composed the following double acrostic on this now-famous phrase.

S A F E T Y F I R S T

Safety first, last and always  
Am I my brother's keeper? Yes, and it is  
A First duty to protect him, my employer and myself  
Ever being on the alert, watching for trouble  
To eliminate carelessness in any capacity and assist  
Young and old to reach their goal in safety

First stop, look and listen, be sure yourself  
Illuminate and guard dark spots and places,  
show and be shown, be from Missouri  
Remember, accidents are sometimes the result

of carelessness, so consider  
Study the relations of rules and regulations  
To the ever present and worthy subject  
S A F E T Y F I R S T

A composition like the foregoing may be found to make a serviceable as well as an entertaining poster or dodger.

R. W. ENNIS, Assistant Master Mechanic.

SOLID AND INSERT MANGANESE STEEL SPECIAL TRACK WORK EXPERIENCE

CHICAGO, ILL., June 10, 1914.

To the Editors:

In a paper on track construction and maintenance presented before the New England Street Railway Club and published in the ELECTRIC RAILWAY JOURNAL for June 6, page 1257, the author says that from experience he sees no grounds for the contention that solid manganese special work is not superior to manganese inserts, if it is properly applied. Later, in referring to the experience in Chicago he speaks of the special work there which did not come up to expectations as being "the crop of first experiments," and adds that the pieces are now made up in sections instead of in unit castings. Nevertheless, I would be interested to see a collection of data, as comprehensive as that published about Chicago, gleaned from Eastern properties. It may be that some of these roads are obtaining a better grade of manganese steel than we are able to purchase here. On the other hand, Chicago, too, has many isolated cases where manganese steel special work has given excellent service and was superior to manganese insert work. But it also had equally as many cases where solid manganese steel failed to give good service.

Generally speaking, and after an inspection covering not a few pieces but more than 1200 layouts containing more than 1200 pieces, it was concluded that the insert

work used in Chicago was giving service at least equal to solid manganese steel. On the other hand, the fact that about 50 per cent of the solid manganese steel castings showed superior wearing qualities under the severest service conditions indicated that there was a lack of uniformity in the product.

Chicago's experience with solid manganese steel special work was among the first where results could be had, and the dense traffic over such a wide area caused the special work to reach its wear life limit before other exhaustive tests could be made elsewhere. At the time that the data in your issue of May 2 were published it was believed that the manufacturers had improved the physical properties of manganese steel. Few, if any, other railway companies, however, have had this newer or better manganese steel in service sufficiently long to draw accurate conclusions; at least not conclusions from practically exhaustive experience. Finally, as to the point that the change from unit castings to four pieces in a crossing, there was about an equal number of both kinds used in Chicago, and little or no difference in the physical properties could be observed. The four-piece casting, however, undoubtedly has the advantage over the unit casting in that partial renewals may be made.

G. W. WESTON,

Board of Supervising Engineers, Chicago Traction.

STATUS OF ENGINEERING ORGANIZATION IN THE UNITED STATES

President Hunter McDonald, of the American Society of Civil Engineers, in his address before the Baltimore convention on June 2 discussed several phases of the standing of the civil engineers in this country and abroad. He deplored the fact that the term "civil engineer" has been allowed to change until civil engineering is now looked upon as a branch of engineering. He attributed this condition to inactivity on the part of civil engineers themselves.

Mr. McDonald gave a synopsis of the work and organization of German, French and English engineering societies and showed that foreign societies are doing more for their members than is our own society of civil engineers. However, the profession has cause for pride in the achievement of the completion of the Panama Canal and in other great undertakings in which civil engineers play prominent parts. The American Society of Civil Engineers, while large and prosperous, has a great field in which to work without in any way lowering the standard of requirement for membership. Local societies can be established and assisted so as to raise and elevate the profession. The engineer should also take more active part in public affairs if the public is now awake to the advantages of sound engineering advice. Through the secular press the importance of the engineer in civil life can be brought to the attention of the public. Whenever the people are shown that engineers are organized not only for their own improvement and protection, but also for the public good there will be no lack of proper consideration.

Mr. McDonald advocated the erection of a new building for the society, one which would bring in some income. He estimated that the present accommodations cost the society the equivalent of a rental of \$30,000 per annum. This money could be saved and utilized in extending financial assistance to needy society sections.

The provincial government of Buenos Aires, Argentina, has authorized Juan F. Tetamanti to transfer the concession for an electric tramway service at La Plata to the newly constituted La Nacional Company.

# Equipment and Its Maintenance

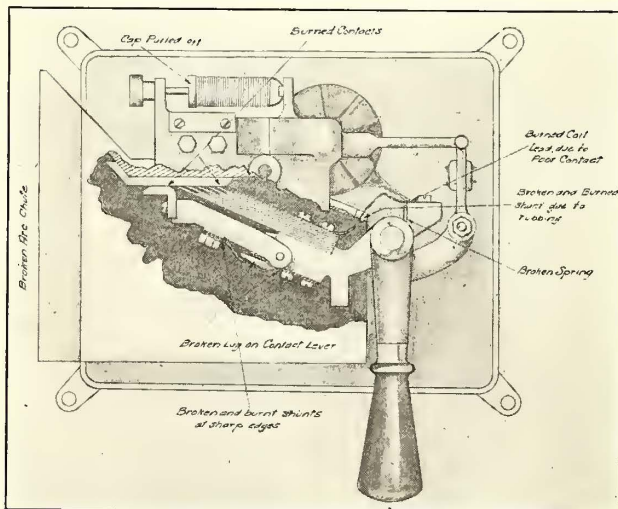
Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

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

## EQUIPMENT DEFECTS—CIRCUIT-BREAKERS AND HOOD SWITCHES—I.

BY C. W. SQUIER, E.E.

On electrically-operated cars it is necessary to have some type of switch to open the main circuit in cases of emergency. This switch should be located within easy access of the motorman, for controller fingers sometimes become fused or bent so that they prevent throwing the power off from the controller. The hood switch or circuit-breaker then affords a means for opening the circuit. It is also desirable to have some form of automatic protection for the equipment to provide against excessive currents due to overload and short-circuits. Circuit-breakers can be set to open the circuit immediately at any overload in excess of their setting. Hood switches do not have the overload attachment for tripping them and are opened only by hand. When hood switches are used the equipment is protected against overload by the fuses which are also employed in most cases with circuit-breakers. Fuses give a time element not afforded in circuit-breakers, as they do not blow instantaneously on overload, and the time taken to blow depends on the magnitude of the overload. There is a common impression that overload circuit-breakers and fuses have the same characteristics, but such is not the case. The overload circuit-breaker depends on the quantity of current for its operation, while the blowing



Westinghouse and General Electric Circuit-Breakers Showing Where Troubles Are Possible

of a fuse depends both upon the quantity of current and upon the time that it is flowing.

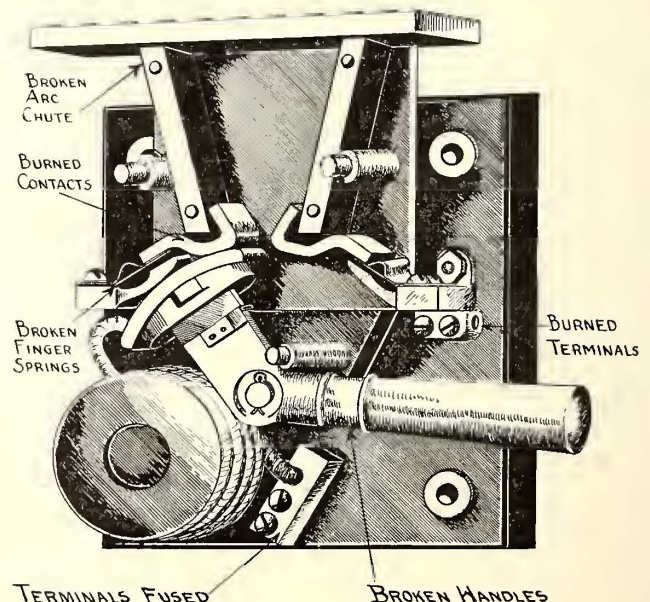
Every piece of apparatus regardless of its character or the purpose for which it is designed has certain parts which are essential to its proper operation. In circuit-breakers these parts are as follows: the current-carrying parts by means of which the circuit is made and broken; the operating mechanism necessary to close and open the contacts, and the insulation necessary to separate parts of different potential and to prevent grounds which might result from the floating of the

arc to some grounded part. The current-carrying parts consist of the terminals, shunts, contacts, blow-out coil and overload coil. The last two are usually combined so that one coil serves both purposes.

### TERMINALS

Terminals are of several different types. Some consist of brass or copper lugs with holes to receive the wires which are clamped in place by means of set screws; others consist of a finished plate or lug to which a cast terminal is bolted either by means of a through bolt or a cap screw, the connecting wire being soldered into the cast terminal. Of these classes the latter gives the least trouble. Troubles at terminals generally arise from the working loose of connections. If the connections become very loose, the consequent arcing will burn the terminal away completely and often damage adjacent parts. Since all parts of a car equipment are subjected to continued vibration terminals with screws are more liable to have loose connections than those fastened by bolts which can be locked in a positive manner.

Great care should be exercised in making connections whenever circuit-breakers are installed after being overhauled or adjusted. These connections come very close

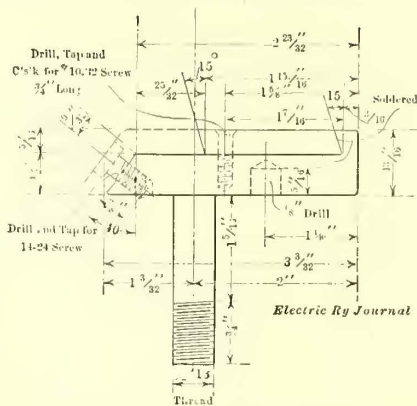


to the main contacts and as the studs of brass or copper are such excellent conductors of heat, a poor connection is often the cause of excessive heating of the contacts and springs, even if arcing does not actually occur.

### SHUNTS

The principal cause of trouble with shunts is due to the breaking of strands where a braided shunt is used. This rupture reduces the section available for carrying current, and overheating and burning take place. Vibration sometimes causes the shunts to rub on

adjacent parts and so become worn. In one of the circuit-breakers illustrated it will be noted that trouble has been experienced by the rubbing of the shunts against the arc chutes and contact arms. Shunts also break at the point of support, usually due to the presence of a sharp edge or corner over which they are required to bend. After the shunts have been installed their position should be noted in both the open and closed position of the breaker, and any sharp edges which would be likely to cut the shunt during operation should be slightly rounded.



Circuit-Breaker Contact Base for New Style Contact

CONTACTS

In addition to carrying the current for the car the contacts must open the circuit when separated by the action of the operating mechanism. They must be of ample cross-section to carry without undue heating the current for which the circuit-breaker is designed. It is possible to increase the capacity of these contact surfaces by increasing the pressure with which they are held in contact. The curve shown in connection with this fact illustrates the increased carrying capacity which can be obtained by greater pressure between the contacts.

The design of the contacts must also be such that destructive arcing will not take place and that their carrying capacity will not be impaired by burning or pitting of the contacts themselves. Of the two types of contacts illustrated, one uses auxiliary contacts which remain closed until the main current-carrying brush contacts have separated so that these auxiliary contacts take the arc due to the final opening of the circuit; the other form is similar to that of controller fingers, the final break occurring on the ball of the finger.

Another essential of good contacts is that they must stand careless handling and excessive operating conditions without being thrown out of adjustment, or if the proper alignment of the contact surfaces is disturbed they should be self-adjusting to a certain extent in order to give proper contact to the surfaces disturbed and also to compensate for the wear caused by severe arcing or continued operation. Nearly all contacts which are in successful operation are more or less self-adjusting. The brush contact shown is made up of laminations of spring copper, and when properly shaped it allows a large amount of self-adjustment. The finger contact is self-adjusting in that the springs allow a variation in either direction from the normal position of the finger. There are several other types that give excellent results, but a discussion of those referred to will bring out the principal troubles.

While inspecting a large number of different style circuit-breakers which were forwarded to the general repair shop for overhauling, I found that fully 75 per cent of them were sent in for the excessive burning of contacts at points where no arcing was supposed to occur. The laminated copper brush is a fruitful source of trouble and care should be taken to make certain that the auxiliary contacts are in firm contact until after the main brush has opened. By failing to make replacements of the auxiliary contacts frequently

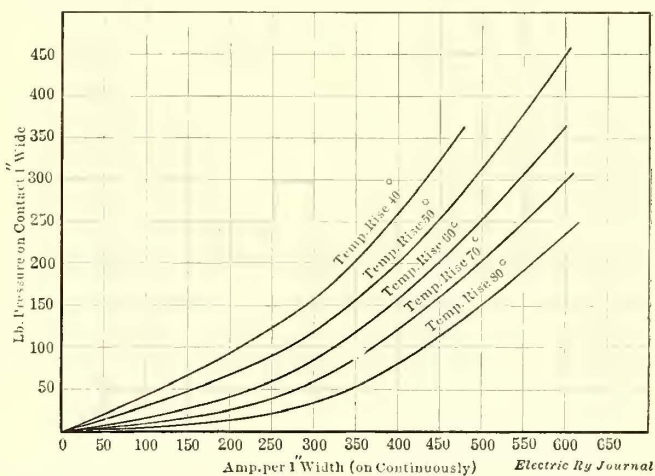
enough, these become burned away so that the laminated brushes take the arcing of the final opening of the circuit. This action soon results in the destruction of the contact surfaces or in the complete burning away of the contacts.

The laminated brush is not easy to adjust in as much as the repairman can see but one edge of its contact surface. While this edge may appear to have proper contact, still the remaining portion may not be making contact at all. The brush should bear evenly throughout its surface with considerable pressure. A brush print that will show poor contact, if it exists, may be made by inserting a piece of white paper together with a piece of carbon paper between the contact block and the brush and then closing the circuit-breaker.

Both main and auxiliary contacts are usually arranged so as to make a face-to-face wiping contact while being closed. This prevents dirt from gathering on the contact surfaces, and the frequent operation to which a car circuit-breaker is subjected will keep these contact surfaces free from dust or grit so that it is not necessary to brush or clean them. To remove carbonization and prevent short-circuits to adjacent parts, however, the circuit-breakers should be blown out with compressed air and all parts wiped clean with cheesecloth. Where the currents handled are excessive, the oxidizing of the contact surfaces will produce local heating.

Another important point to be considered in connection with the contacts is that they must be so designed that the burning and pitting caused by opening the circuit on overload will not cause sticking or jamming and so prevent the opening or closing of the breaker. The contacts of some types of hood switches consist of a jaw and knife blade. These are not satisfactory, as slight burning causes the contacts to jam.

In connection with the replacement of auxiliary contacts, it is desirable that these be designed so that it will not be necessary to replace any but the parts that take the arcing. The Westinghouse Electric & Manufacturing Company has shortened the renewable part of its stationary contacts in late designs in order to



Relation of Current-Carrying Capacity of Contacts to Pressure at Point of Contact

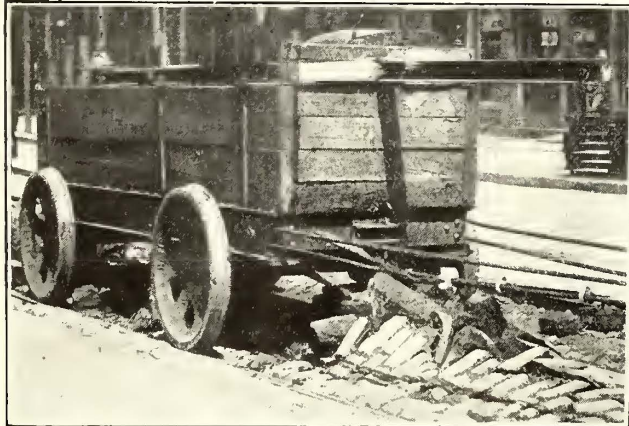
reduce the amount of scrap when renewals are made. Originally these contacts were long enough to take both the auxiliary and the brush contact. An accompanying illustration shows a method of using this short contact on old bases originally designed for a longer contact.

In the various types of contacts, the springs which furnish the contact pressure must be placed in a way that will remove all possibility of their having to carry currents excessive enough to cause overheating and loss of temper.

**BREAKING UP PAVEMENT WITH A PLOW AT CLEVELAND**

BY CHARLES H. CLARK, ENGINEER OF MAINTENANCE OF WAY CLEVELAND RAILWAY

The accompanying half-tones show a novel pavement plow which the writer recently designed for the quick and economical break-up of paving antecedent to track work. The plow consists of a heavy steel casting of suitable shape for lifting the paving blocks and for cutting the tie rods at the same time. It is pulled by a service motor car which is equipped with four Westinghouse 305 motors and HL control. The weight of the motor car with load is about 50 tons. The weight of



Pavement Plow in Action

the plow car together with its counterweight is about 11 tons.

Three men and the crew of the motor car are all the personnel needed to operate the machine. We have found that with this unique plow we can remove 1300 sq. ft. of pavement in one minute. On another occasion the pavement in a stretch of track 2600 ft. long was removed in thirty-five minutes. We have experienced only such slight difficulties as the breaking of the cable which pulls the plow. The plow is used but once or twice a week, for an hour's work with it will give us enough track to work on for eight or twelve days. The plow has been in use for about two months.

**MICHIGAN UNITED TRACTION OIL RECORD SYSTEM**

Anything done to simplify the clerical work of the master mechanic of a small property, as well as a large one, is well worthy of mention. This applies especially to the new method of keeping lubrication records at the outlying shops and carhouses of the Michigan United Traction, Jackson, Mich. This system includes a single form of oil-record card, a case to contain the classified record, punches and a scratch pad. Each day or night the foreman in charge of any carhouse lists the car numbers and parts he wants oiled on a sheet of scratch paper, which he also dates, signs and hands to the oiler.

Motors, journals and air compressors are lubricated every fifteen days, and gears and center bearings every thirty days. The record of the last lubrication is indicated on the oil-record card, a reproduction of which is shown in the illustration. A punch mark beside the date and in the proper column forms the record. Two columns are provided under

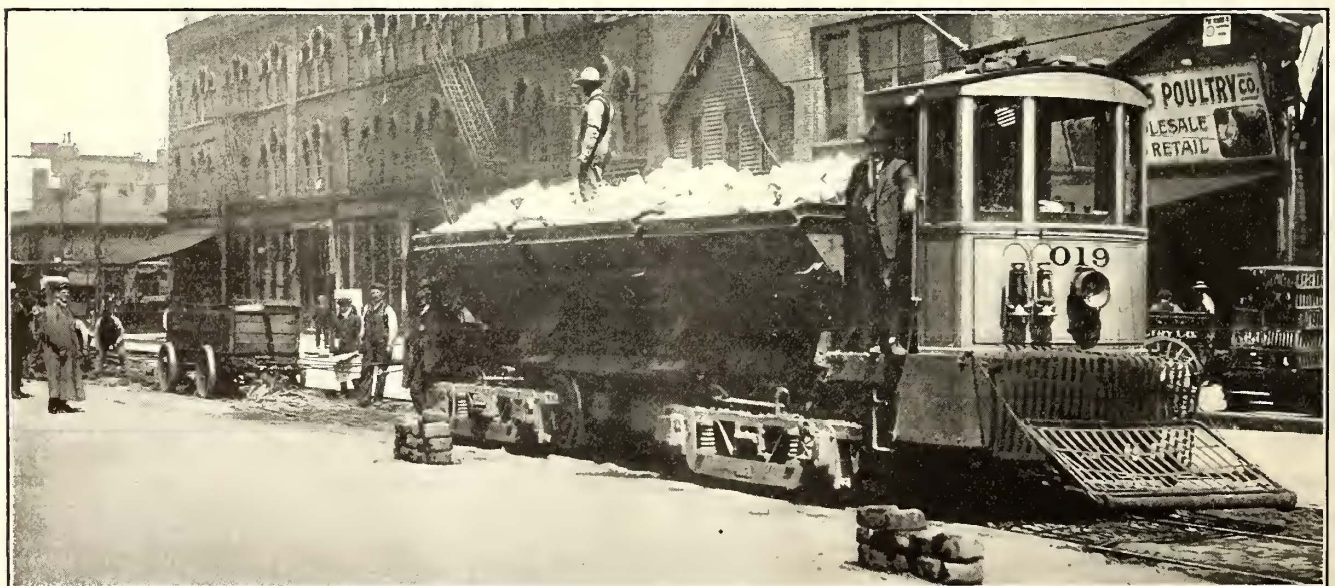
May 1914

Oil Record					
Car No. 340					
A. B.		M. B.		J. B.	
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31

Oil Record

each form of bearing, one for the first and the other for the last fifteen days of the month. One form of punch mark indicates that the oiling was done by the day man and the other by the night man. After each oiler has completed his program of lubrication as furnished by the foreman he signs the slip of paper, dates it and returns it to the foreman's office. From these the oil record is punched on the cards.

A card is assigned to each car each month and all are hung on hooks in a cabinet provided for the purpose. In it the cards are arranged in groups or classified as to runs for city cars, divisions, and whether local or limited for interurban cars and miscellaneous equipment. This arrangement is merely for the convenience of the foreman and at the same time some indication of the class of service in which the equipment operates. At the close of each month new cards for each car are made out and the old ones are collected and mailed to the office of the superintendent of motive power. The simplicity of this record has made it popular and effective.

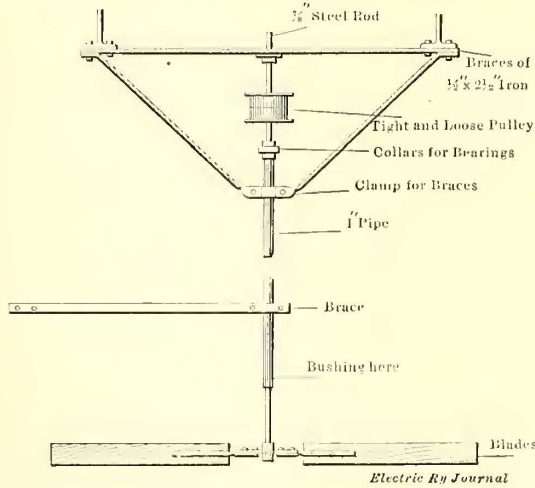


Cleveland Railway's Motor Dump Car Pulling Plow for Tearing Up Pavement

A FAN FOR OPERATION WITH SHAFTING

BY R. H. PARSONS

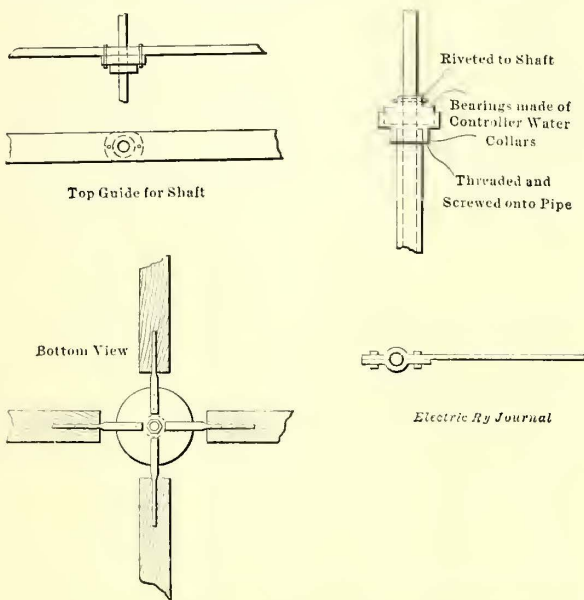
A subject very interesting at this period of the year is that of the fan. It means more than comfort to the men working in warm places. It means more work, by reason of feeling more in a mood to work while the body is cool, and more interest in the work because the company has shown a desire to help the men keep comfortable. The simple fan illustrated herewith can be



Assembly of Fan Used in Connection with Shafting

made of material always on hand in a railway shop, does not cost much, can be run from the shafting or pulleys of machines already in use and is, to say the least, very efficient.

A piece of 1-in. pipe is taken and cut to any length desired, depending on where it is to be used, height of ceiling, etc. A piece of 3/8-in. rod or steel shafting is then also cut to the proper length and placed through the pipe. The pipe is held in place by a brace from the ceiling or from two I-beams above. This brace is forged



Detail of Fan Used in Connection with Shafting

around the pipe, and an additional piece is bolted thereto to form a clamp. Across the top of this brace should be placed a piece of flat iron 5/8-in. x 2 1/2 in., or nearly that size, through which a hole is made, fitted with a brass bushing to make a guide bearing for the top of the shaft.

At the top of the pipe is placed the bearing which takes the weight of the shaft and fan, and which is the main bearing of the fan. In the one illustrated a K-11 controller main cylinder water collar was fitted to the pipe with the large or cup side up. A water collar for the reverse cylinder of the same controller was used for the top part of the bearing, which is riveted to the shaft, installed in the cup of the part fastened to the pipe. At this point also a brass bushing is fitted to the inside of the pipe in which the shaft turns, the whole making an ideal bearing easy to lubricate. Between this bearing and the top guide are fitted a tight and loose pulley with a flange at the top and bottom to keep the belt in place, as the belt runs over these pulleys in a vertical position. The pipe is also bushed at the bottom and held by another brace to some convenient part of the building or machine. The fan proper is made of four flat pieces of wood, fastened to a flange, which in turn is held to the shaft by a set screw. The fans are held to the flange by 3/16-in. x 1-in. strips of iron, given a little twist to give a proper pitch to the blades.

BEACH GAS-ELECTRIC CAR WITH BATTERY AUXILIARY

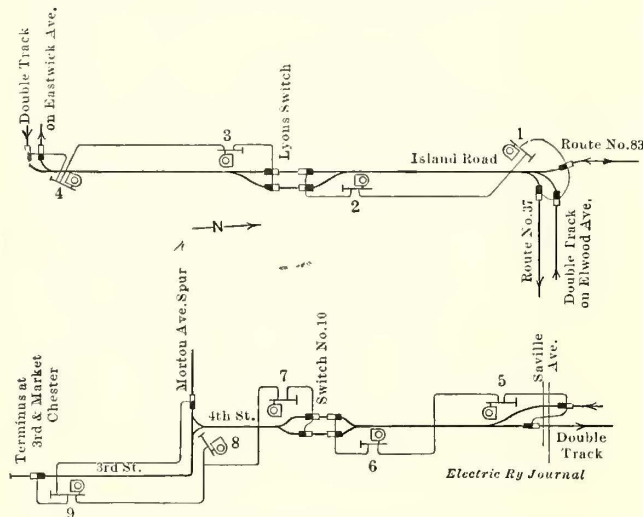
Ralph H. Beach, New York, well known in the field of self-propelled cars, has recently brought out a new type of gas-electric self-propelled car in which the engine requirements are kept to a minimum by the use of a storage battery auxiliary. In the event of failure of the engine from any cause the battery is always available and dependable for at least 50 miles. Mr. Beach believes that the principal defect of other types of self-propelled cars is that they must keep in continuous use an engine capacity which in reality is required only during the acceleration and grade-climbing periods. It is asserted that the use of the battery will therefore make it possible to cut down the engine equipment to one-half of what would ordinarily be installed. It is calculated that on level running with the car stopping each 5 miles 4.9 per cent of the total energy required to drive the car will be derived from the battery and consequently 95.1 per cent of the energy will be furnished by the engine direct, whereas the battery would do 30.1 per cent of the work on a 5 per cent grade.

LONDON ACCIDENTS DUE TO CARS AND OTHER VEHICLES

According to the *Tramway & Railway World*, the highways committee of the London County Council has furnished to the council a statement showing that the accidents on streets with railway service are not greater than in other thoroughfares. In 117 miles of streets with both tramway and motor bus routes the fatalities caused by power-driven vehicles were, in 1910, 67; in 1911, 107, and in 1912, 126; while of these the cars were responsible for 19, 18 and 21; and motor omnibuses for 26, 46 and 67. In 119 miles of omnibus routes without cars the fatalities from power-driven vehicles were in the same three years 53, 71 and 109; and of these there were attributed to motor omnibuses 23, 39, 70. The two divisions of the Metropolitan Police district which had the largest average number of fatalities per square mile for 1910-11 are St. James', with 11.40, and Marylebone, with 8.98. Neither of these had car lines. The area which has the largest number of fatalities recorded in 1912 was Bow, where there were 28, of which four were put down to trams and 24 to other power vehicles. The select committee did not think that anything had been shown to connect with tramways, even indirectly, the alarming rise of fatalities of recent years.

### AUTOMATIC SIGNALS ON THE CHESTER SHORT LINE

The Chester Short Line, which is operated by the Philadelphia Rapid Transit Company, extends from City Hall subway in Philadelphia to Third and Market Streets, Chester, a distance of 14½ miles. The route is largely on private right-of-way and is double tracked except for two single track stretches, totaling about 2¼ miles. Cars on this route, No. 37, have a headway of fifteen minutes in each direction. A second route, No. 83, operates every ten minutes on one of these



Philadelphia Signals—Diagram Showing Signal Location and Control

pieces of single track, between Elmwood Avenue and Island Road.

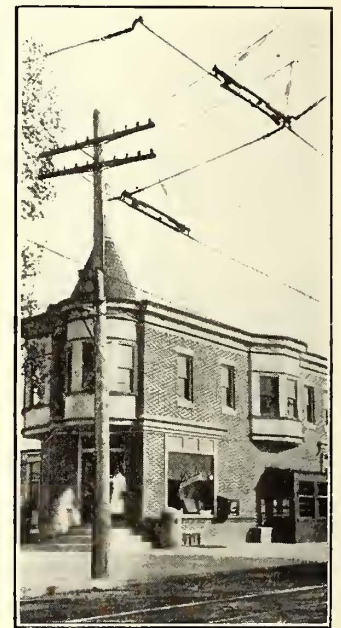
At Eddystone, near Chester, the Baldwin Locomotive Works is located, and to serve this plant trippers are run in the morning and at night to City Hall subway. Some of these are stored on Morton Avenue spur, shown on the attached diagrams, and enter the last single track block in the middle, as many as four sometimes following in succession. Other trippers are turned at Saville Avenue and also at No. 10 Switch.

Elmwood Avenue and Island Road is a loop terminus for several lines, and the single track begins at this point on Island Road. At Lyons—½ mile south—there is a through turnout, and at Eastwick Avenue—½ mile further—the double track is resumed, which continues for about 6½ miles. On Saturday and Sunday afternoons the headway over this portion as far as Darby Creek is reduced to seven and a half minutes. From Saville Avenue, Eddystone, the single track continues to the end of the line. It passes over two bridges with private right-of-way, and descends a grade and curve to Switch No. 10, which is a through type turnout ½ mile south. Three squares beyond this is Morton Avenue with the spur for trippers, while the single track continues to Third and Market Streets, Chester, the south end of the line, ¾ mile from Switch No. 10. At this point the car is reversed, there being no loop or crossover.

In order to safeguard traffic under these conditions the railway company has installed on the single track sections automatic signals furnished by the Nachod Signal Company, Inc. The accompanying line cut shows the signalling layout on the single track sections, the track being represented by the trolley wire over it. The actual location of the signal on the plan is at the base of the pole, and the actual location of the trolley contactors on the wire is at the middle of the

symbol. As these are directional contactors, divided into halves electrically, in the representation the white end signifies that the trolley wheel touching that end first causes the adjacent signal to give the permissive indication, as when a car enters. The wiring shown connecting the signals and contactors of a single block is diagrammatic, and represents one or more wires.

While there is no car in the block between Saville Avenue and Switch No. 10, for instance, signals No. 5 and No. 6 are both "neutral," showing neither lights nor disks. Then a car moving south from Saville Avenue toward Switch No. 10, passing the contactor on the right-hand track at Saville Avenue sets signal No. 6 at stop at Switch No. 10, and after this has assumed the stop position—a red light and a red disk—signal No. 5 at Saville Avenue responds by changing to the permissive position—a white light and a white disk. The signals remain in this condition, preventing an opposing move from Switch No. 10, until the car passes under the contactor on the right-hand track at Switch No. 10, when both signals are cleared. However, should another car have followed the first at Saville Avenue before it had left the block, the second car would find signal No. 5 showing permissive, meaning "block occupied—follow under control." When the first car had left the block at Switch No. 10, the signals would not change, but only after the block had been entirely



Philadelphia Signals—Signal at Lyons and Contactors at Eastcreek Avenue

vacated would they be restored to the normal neutral. This is accomplished by a counter in the signal relay, whereby as many cars must leave the block as have entered it, before the signals will indicate a clear block. The arrangement for counting is perfectly general, and cars might make any shifting moves, whatever the indication of the signals at the time may be, and all counts would be properly registered, either positively into the block or negatively out of it.

The block from Switch No. 10 to the terminus at Third and Market Streets embraces three signals, Nos. 7, 8 and 9, of which 7 and 9 operate as the signals No. 5 and No. 6 previously described. No. 8 is, however, a repeater of signal No. 9, and will always assume the position of that signal. This repeater signal faces the Morton Avenue spur, and a contactor there is wired to signal No. 9, so that a car proceeding south from

Switch No. 10 to Chester sets Nos. 9 and 8 red, and No. 7 white, and clears all signals at the terminus.

On the return trip it sets signal No. 7 red, and Nos. 8 and 9 white, but at Switch No. 10 will clear all signals. If signal No. 8 shows neutral, a Baldwin tripper, stored on Morton Avenue, as previously mentioned, may enter the block and will count in on signal No. 9, setting Nos. 9 and 8 white, and No. 7 red. The tripper may then safely proceed north toward Switch No. 10. Other trippers may, of course, follow on this signal. From the above it will be seen that a tripper may make this move either when signal No. 8 is neutral or when it is showing white due to a regular car moving north in the block. The use of a repeater signal at No. 8 shows the condition of the block at the intermediate point, and the contactor there provides a means of recording an entrance or exit at that point.

MODERN GARBAGE CARS

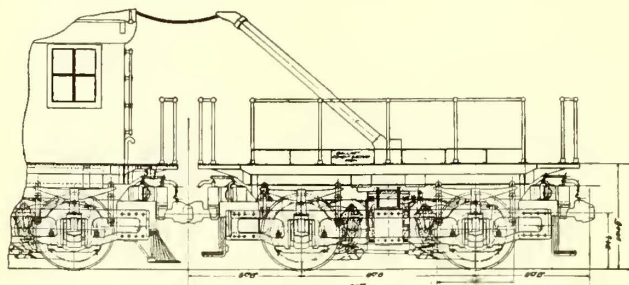
An important advance in the design of garbage cars has been brought out by the Orenstein-Arthur Koppel Company, Koppel, Pa. The principal features of this car will be readily seen from the accompanying side and end elevation. This car is designed particularly for inland cities where garbage is transferred from wagons to the cars which run to the destruction plants. The bodies of these cars are, in reality, large tanks with semicircular bottom and are usually built with a capacity of 1450 cu. ft. to 1800 cu. ft., which gives a tonnage of forty to fifty. The 1450-cu. ft. car has a length of 39 ft. 1 1/2 in. over couplers, a width of 10 ft. 1 in. and height 10 ft. 10 in. The underframes are made according to the usual fishbelly sill construction for large cars. The bodies are supported on the underframe by heavy cast-steel rockers at each end, and at three intermediate points by rollers. The end supports are heavily braced to strengthen the car against end shocks and movement of the load.

The bodies are kept from movement during transit by two heavy side chains on each side. These chains are fastened with a shackle so that they can be quickly released. In dumping the car a crane engages a loop on the side and rolls the body over so that it rests on its side. When the body is in the dumping position, most of the material dumps automatically and the rest

80,000 lb. capacity and 1450 cu. ft. content, weight 44,600 lb.; 100,000 lb. capacity and 1800 cu. ft. content, weight 51,600 lb. These weights refer to trailers only.

TRACTOR TRUCKS AND ADDITIONAL LOCOMOTIVES FOR BUTTE 2400-VOLT RAILWAY

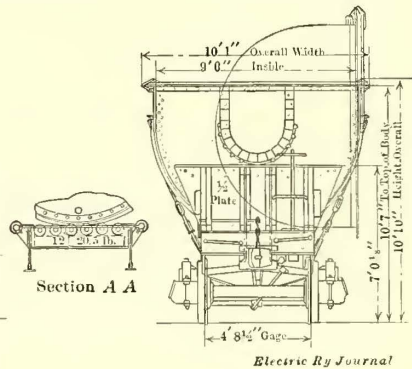
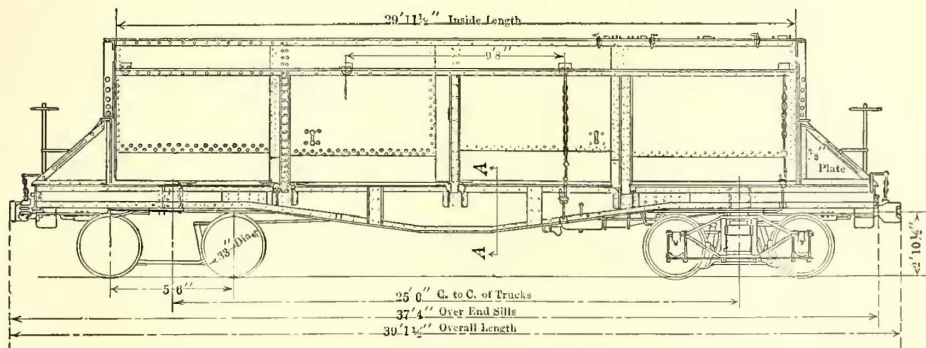
The Butte, Anaconda & Pacific Railway has recently ordered from the General Electric Company four additional freight locomotives which will be duplicates of the seventeen 80-ton units put in service about a year ago. In order to make these locomotives suitable for very slow speed spotting service, there have also been ordered three additional tractor trucks which can be used in combination with the standard locomotive units. These trucks are an ingenious adaptation of standard parts of the freight locomotives, increasing the tractive effort of the standard unit to the equivalent of a 120-ton locomotive. These units will be used



Tractor Trucks for 2400-Volt D. C. Butte, Anaconda & Pacific Railway

especially for spotting cars at the smelter and also for low-speed switching in the Butte yards. While the new locomotives are adapted especially to switching service, they are also capable of operation in combination with any of the freight locomotives now in service and have the same electrical and mechanical equipment.

During the present year it is expected that approximately 25 per cent more ore will be transported from Butte to Anaconda than was hauled last year. This increase arises from the transfer of ore which was previ-



Construction of Steel Garbage Disposal Car

is flushed out. On account of the roller supports in the center and the shape of the cast-steel cradles at the ends only a small air hoist is needed to right or dump the bodies. The bodies, of course, are made watertight. The cars are constructed in accordance with M.C.B. standards and the requirements of the Interstate Commerce Commission so that they can run on their own wheels and axles in connection with standard railroad equipment. The cars are made in two sizes as follows:

ously hauled to smelters at Great Falls. The additional haulage will bring the total annual traffic on the road up to about 6,250,000 tons.

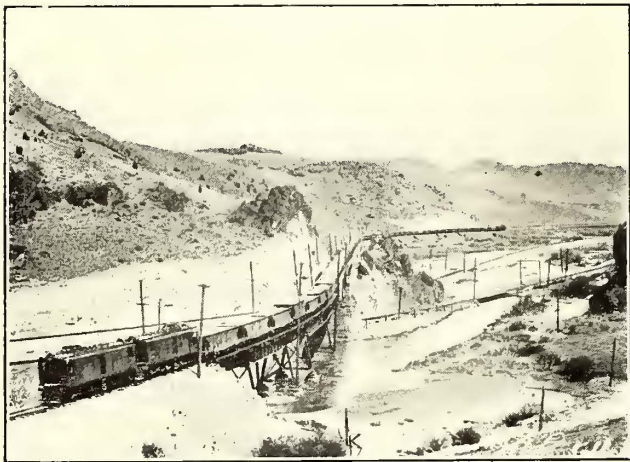
The three two-axle tractor trucks will each be equipped with two GE-229 motors insulated for 2400 volts similar to those on the locomotive. Cable and connecting plugs will also be provided for operation with the locomotives, so that the truck motors will be operated with the other motors from the same control-

ler without change in the main control. The number of steps will therefore be the same as on the locomotive; ten points with six motors in series and seven with two sets in multiple, each set consisting of three motors arranged in series. In operation, each of the tractor truck motors is connected in series with one pair of motors on the locomotive, making a six-axle, six-motor unit which will furnish 50 per cent more tractive effort than the 80-ton locomotive alone at about two-thirds speed without increase in current input.

The characteristics of the 120-ton unit are as follows:

Total weight on drivers .....	240,000 lb.
Starting tractive effort at 30 per cent coefficient.....	72,000 lb.
Tractive effort at one hour rating of motors.....	43,200 lb.
Speed at one hour rating, motors in series.....	4.8 m.p.h.
Speed at one hour rating, motors in series parallel.....	10.3 m.p.h.

Mechanically these trucks are similar in construction to the trucks on the 80-ton locomotives. Instead of a locomotive body, however, a platform is supplied, built up of channels, angles and plates which are supported on the truck transom. Struts are provided at the corners to secure the platform to the side frame. Ballast, consisting of cement and iron punchings of sufficient



Butte 2400-Volt D. C. Locomotives Hauling Sixty-five Cars with 4450 Tons of Ore

quantity to bring up the weight of the truck to 40 tons, is placed between the center channels of the platform in a boxlike structure built for this purpose. A passageway protected by a hand rail extends along each side of the platform.

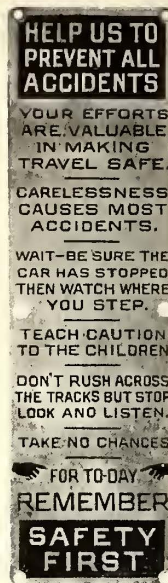
In the center of the platform a crane extends at an angle from the platform floor, suitable for supporting the eight cables necessary for connecting the motors of the tractor to those on the locomotive. This crane can be revolved 180 deg. so as to permit the coupling of the locomotive to either end of the truck. When in operation, this crane is rigidly locked in position. Air-brake equipment with the necessary triple valve, auxiliary reservoir, etc., is also installed on the truck.

Each of the four locomotives now under construction is provided with a junction box placed near the roof above the front window. This is designed so as to permit the removal of couplers with a small amount of labor and time, so that the tractor may be connected to any one of the freight locomotives which is provided with this junction box.

Members of the Kentucky Association of Stationary Engineers, who held their annual convention in Louisville recently, were taken through the High Street power plant of the Louisville Railway by F. L. Ray, chief engineer of the company and a vice-president of the National Association. A special car was used to convey the delegates to points of interest about the city.

BRASS "SAFETY FIRST" PLATES FOR CARS

An interesting and useful development of the "safety first" movement is indicated by the accompanying illustration which shows a specimen of the types of etched brass caution notice plates designed for posting on panels between windows and in other prominent positions on electric railway cars. These plates are manufactured by L. F. Grammes & Sons, Allentown, Pa., and any wording desired by the purchaser is put on them. Pains have been taken to make these plates attractive in order to draw the attention of the passengers and thus secure their co-operation in the present country-wide "safety first" movement. The plates add a pleasing fixture to the car. They are made of brass, with durably lacquered letters on a red background, or of red letters showing through a black lacquer, in either of which styles the lettering stands out prominently and makes these plates easily readable. The size of the plates is 2 in. wide x 7 in. deep. Since the plates were first placed on the market they have won such popularity that more than 20,000 are said to have been purchased by different electric and steam railways in less than a month.



Brass "Safety First" Plate

STORAGE BATTERY CARS AT MILLEDGEVILLE, GA.

In November, 1913, the Milledgeville (Ga.) Railway placed in operation a storage battery car for use over the track of the Central Railroad of Georgia between Milledgeville and a State sanatorium 3½ miles distant. The car is of the Brill single-truck type with longitudinal seats for twenty-six passengers, and its weight including the electrical equipment and storage battery is 16,000 lb. The battery as furnished by the Electric Storage Battery Company, Philadelphia, Pa., consists of fifty-eight type MV-29 "Hycap-Exide" cells and is



Storage Battery Car for Milledgeville, Ga.

mounted under the car seats. This battery has a five-hour rated capacity of 385 amp-hr. The car is geared for a maximum speed of 15 m.p.h. In regular service it makes six round trips a day, the running time for each trip being twenty-five minutes. The grades on the line form an interesting feature of the service. One grade 350 ft. long averages 6 per cent and has a maximum of 7.9 per cent. On this grade a stop is made in both directions. Another grade of 4 per cent is about 6000 ft. long. Both grades are combined with curves,



but the latter, fortunately, are wide. George H. Tunnel, general manager of the railway, in a letter sent under date of April 23 to the manufacturer states that the car is using less energy than was guaranteed, also that it has been operating satisfactorily in every other respect.

**EMERGENCY JACK FOR PHILADELPHIA CARS**

The Philadelphia Rapid Transit Company, after several months of tests and investigations, has decided to equip all of its cars with a Barrett emergency jack as especially designed for it by the Duff Manufacturing Company, Pittsburgh, Pa. The Philadelphia company for some time past has been using the Barrett emergency jack No. 22 on some of its cars. While this jack is suitable for the smaller single truck cars heretofore used by the company, the purchase of near-side cars with Brill No. 39-E double trucks made a new jack necessary.

The placing of a jack under these cars is somewhat difficult, due to their peculiar construction. A steel skirting or plow is riveted to the truck close to the street level, extending over the front and two sides of each truck. This leaves only the rear journal box and bolster of each truck available for the application of the jack. At the front and back overhang, due to the folded steps below the doors, the most available point to apply the jack is under the end sills. All these points are at different elevations above the ground.

In addition, the height under the overhang as well as under the journal boxes and bolsters varies somewhat, depending on where the car is standing, say over a switch, on the track or off the track. However, the most convenient height of the jack when closed was finally determined to be 18 in., with a maximum height of 28 in. when ratcheted up. This makes it possible to apply the head of the jack under the end sills to raise the body of the car 10 in. above the trucks under the most favorable conditions.

For application under the journal boxes and bolsters a bracket or toe is provided which can be adjusted to any height between 5½ and 13½ in. above the ground by sliding it up or down on the outside rack, without ratcheting. The jack is thus made ready for obtaining a "bite" instantly, and the entire raise of 10 in. is made available for actual lifting of the trucks above the ground wherever the car may be standing. This is a new feature in an emergency car jack, but one which should come into frequent use on account of the two important advantages of quick application and the reser-

vation of the entire "raise" of the jack for the lifting of the car above anything pinned beneath it. The outside rack on which the toe or bracket slides is suspended from the top of the inside rack or lifting bar on a swivel joint, permitting the toe to be swung around the jack, with the vertical lifting bar as its axis, over an angle of 90 deg. Therefore, the operation of the lever is not confined to the usual position at right angles to the side of the car, but at the most convenient angle within the above limit which the surrounding obstructions may dictate.

Easy operation was deemed a particularly desirable condition in the present case. As the jack has a capacity of 20 tons on the head and 8 tons on the toe, the leverage has been facilitated by machine-cut reducing gears which, while not preventing a quick lift, greatly reduce the power required for operation. The jack will be known as No. 439.

**HANGERS FOR EASY INSTALLATION OF ARRESTERS**

The Electric Service Supplies Company has placed on the market special types of lightning arrester hangers which are designed for the substantial and easy installation of the company's Garton-Daniels lightning arresters. Heretofore operating men made use of small cleats to fasten these arresters to the cross-arms or have devised other means to meet unusual conditions. The Style C hanger, shown, is for installations between two cross-arms, the upper part of the supports being bent to fit over the upper arm. It is a comparatively easy task to install the arrester when it can thus be secured to the cross-arms without having to be held. This is also true of Style B hanger, shown, but as this style is for single arm installation it does not require a lower support.



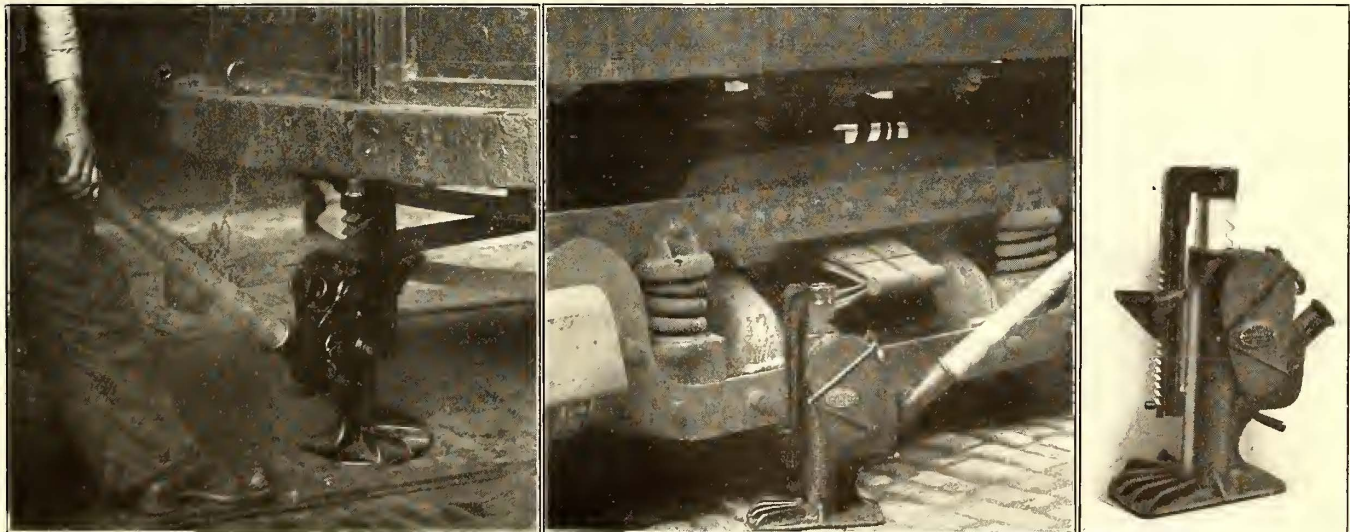
Style C



Style B

the cross-arms without having to be held. This is also true of Style B hanger, shown, but as this style is for single arm installation it does not require a lower support.

The Council of Ministers in Russia has recently approved the raising of a loan of about \$2,000,000 by the town of Vilna for the installation of an electric tramway. The loan has not yet received imperial sanction.



Application of Jack Under End Sill at Truck of Philadelphia Rapid Transit Company's Cars; View of Jack

### A STEPLESS ELECTRIC BUS

The Field Omnibus Company, New York, in co-operation with the engineers of the New York Motor Bus Company with whom it has a contract, has developed the first stepless type of omnibus for public service transportation. This omnibus is of the double-deck type which, it is believed, will be more popular with the public than the single-deck bus except in extreme weather conditions. It is of such a low height than it can operate with safety under trolley wires and viaducts or other elevated structures.

The bus illustrated seats thirty-eight passengers, eighteen on the lower deck and twenty on the upper deck. It is 20 ft. 10 in. high over all; the distance from the ground into the car is 12½ in., and the height of the car roof from the ground is 7 ft. 8 in. The last dimension is 2 ft. 3 in. lower than the London, Paris and New York double-deck buses. This bus is practically 5 ft. shorter than the present type of double-deck bus in use. It is of all-steel construction. It has practically no regular chassis frame, but the body is framed to fill this requirement. The rear wheels are mounted on an auxiliary truck which carries the driving machinery and which can be detached as a whole for examination and repair. Two 10-hp motors are



Storage Battery for Auto Bus

supplied by a motor drive plant which consists of an Edison storage battery equipment of 100 cells. The motor drive is by universal shaft-internal gear and spur pinion with a seven to one reduction. This gives a simple, flexible and independent drive with solid construction and no differential.

The motors, gearing, etc., as well as brakes and strut rods, are readily accessible for examination or adjustment. The front wheels are hung from the body through the springs. The batteries are located under the seats on the first deck and in a rear compartment under the stairway at the back of the door. The interior arrangement is a development of the stepless feature and low hung body. The stairway is located at the left of the entrance. The operator's cab is over the front axle and is completely equipped with a railway type controller with cut-outs for both motors, safety switch, charging plug, circuit breaker, ammeter and voltmeter and two sets of brakes.

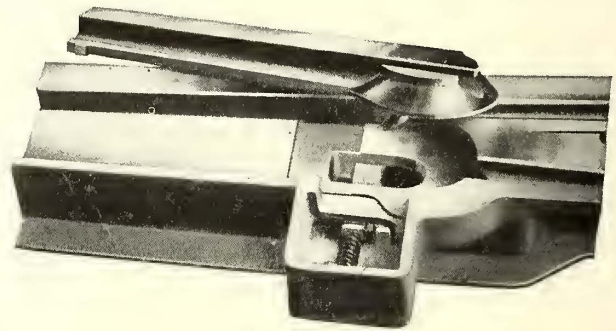
The lighting of the bus operates from a separate set of storage batteries. The interior and stairway is illuminated with enclosed cut-glass fixtures. Headlights, tail lights and portable lights are also provided. The interior finish is equal to that of a Pullman coach. It is of solid quartered mahogany wood, well rubbed down. The spring cushion, leather seats are on mahogany boxes with an iron frame.

The bus is designed to give a daily average of 125 miles or more. It has shown a speed on the level of 10 to 20 m.p.h., and on a 6 per cent grade made a speed of 10 m.p.h.

The builder has also developed a modified bus in which the stepless feature is retained. The body is designed after the old English coach style, having the entrance on the side at the front end instead of at the rear.

### A TADPOLE SWITCH WITH REPLACEMENT FEATURES

A tadpole switch which is designed to meet the most severe operating conditions without becoming loose at the heel, with the resultant tendency to form a lip on the runway rail as well as to overturn under wheel pressure, has recently been developed by the St. Louis Steel Foundry Company. This switch is made of solid manganese steel. One of the difficulties hitherto pertaining to the tadpole design of switch has been in the loose heel and bearing. It is this defect, rather than the wear in the throatways on the running rails, that has fixed the life of the piece. In the case of the present tadpole switch, the maker has made it unnecessary to remove the entire switch piece should some part of it become defective. To this end, also, the heel of the tongue was so designed that a new tongue would always fit into the old socket. As is shown in the accompanying illustration, the principal features in this new switch were embodied in setting and fastening the heel of the tongue. By providing an undercut socket bearing this switch conforms



Tadpole Switch.

to the maker's original design, but the bearing area has been materially increased. The tongue proper also has been reinforced by a web which forms the throatway floor the full length of the tongue. The wide bearing area of the undercut heel reduces the effect of impact at this point to a minimum. It is believed that the maximum wear of the heel has been attained by distributing equally over its 60 sq. in. of bearing surface, the impact at the heel as well as the shifting of the trailing closed point under load. The wide undercut bearing area is equally effective against grinding down and against receiving and distributing impact blows.

The pivot bearing is alongside the gage line and furnishes side restraint at the point best adapted to resist shifting or overturning sideways. This heel is kept tight by pressure on a lug depending from the heel of the tongue. A combination key and wedge bearing on this lug forces the tongue back between the side bearings as well as down on the bottom bearing, and also acts as a lever to hold the point down. The curved part of the heel is not subject to side thrust back of the pivoted center, nor will the heel adjustment permit the shifting of the tongue back of any point of contact along its side and the consequent tendency to throw the point. Wear in the tongue lug and the key which bears against it is readily taken up by driving the wedge tight in the socket.

# News of Electric Railways

## Action on Municipal Ownership Bill in Washington

The District of Columbia committee of the House of Representatives has ordered a favorable report on the Crosser bill providing for the government ownership and operation of the street railways in the District of Columbia. The hearings on this bill have been reported in recent issues of the *ELECTRIC RAILWAY JOURNAL*. The vote in the committee was nine to eight in favor of the measure, and a vigorous minority report is promised when the matter is laid before the House of Representatives. Both the majority and the minority reports are to be ready in about two weeks, and the proponents of the measure declare that they will force action at the summer session of Congress. In view of the crowded calendar and the efforts of the Congressmen to get away for the fall campaign the possibility of a vote in the House is slight. There is no prospect of action by the Senate before winter.

President Wilson has taken no stand on the question, although it is believed that he would sign the bill if it were sent to him by Congress. The fact that all the district commissioners appointed by the President favored the bill makes this the more likely.

If the Crosser bill becomes a law the commissioners of the District of Columbia would be directed to begin condemnation proceedings within ninety days for the acquirement of all the street railways in the District. These proceedings would be held before the Public Utilities Commission of the District, which is made up of the district commissioners, and that commission would fix the price to be paid for the properties. An appeal of its decision would lie to the Court of Appeals of the District of Columbia. To pay for the railroads the bill provides for the issue of thirty-year bonds paying 3.65 per cent. This interest is to be paid out of the revenue derived from the operation of the railroads. The commissioners also are to have the authority to purchase such portions of the Washington systems as extend beyond the boundaries of the District of Columbia by the same method of condemnation proceedings and to pay for them with similar bond issues. The following specific provision in the bill, however, prevents the government from guaranteeing these bonds:

"The United States shall not be liable for the payment of the whole or any part of the principal or interest of said bonds, nor shall any money contributed by the United States for or on account of the District of Columbia be used for such purpose, nor shall any payment made or liability incurred by the District of Columbia on account of the condemnation of such street railroad or railroads be a basis of contribution by the United States for the maintenance of the government of the District of Columbia."

The commissioners are given plenary powers of control, management and operation of the systems thus to be acquired. A special sinking fund is also to be established to wipe out the bonds.

The committee vote came at the end of a series of hearings which began last January but were desultory in character until representatives of the American Electric Railway Association took part about four weeks ago. This raised the general question of governmental ownership. The advocates of the measure are already proclaiming the committee action a national victory for their principles. Every effort will be made to induce Congress to adopt the measure as part of the national campaign for the municipalization of public utilities. In that case Washington will be pointed out as a national example for all municipal ownership propagandists.

The vote in the committee stood as follows:

For the Crosser bill—Representatives Wyatt Aiken, of South Carolina; William L. Igoe, of Missouri; George E. Gorman, of Illinois; Joseph B. Thompson, of Oklahoma; Robert Crosser, of Ohio; Archibald C. Hart, of New Jersey; William J. Cary, of Wisconsin; Carl E. Mapes, of Michigan; Anderson H. Walters, of Pennsylvania.—9.

Against the bill—Thaddeus H. Caraway, of Arkansas; Eugene E. Reed, of New Hampshire; Charles P. Coady, of Maryland; Solomon F. Prouty, of Iowa; Samuel Wallin, of

New York; Samuel E. Winslow, of Massachusetts; Abraham L. Keister, of Pennsylvania; Ben Johnson, of Kentucky.—8.

Representative Henry George, Jr., of New York, had left word before sailing for Europe that he wished to be recorded for the bill, but under the rules this could not be done. Representatives Denis O'Leary of New York and Claude l'Engle of Florida, also out of the city, sent letters asserting that they favored the bill. The only other member of the committee, Representative Horatio C. Claypool of Ohio, left no word as to his attitude. Representative Walters, who voted for the bill, said he did not feel bound by his vote to favor the measure on the floor of the House, but thought the bill was so important that it should be reported by the committee.

The committee report favoring the measure will be drawn up by Representative Crosser. The minority report is being prepared by Representative Winslow.

The action of the committee came somewhat as a surprise because the hearings had been attended by an average of only about four members. As a result it was expected that there would not be a quorum for the committee session when the bill came up for action. As a matter of fact, the attendance of seventeen is about the largest the committee has had during the present session of Congress.

Chairman Johnson of the committee, who voted against the report, declared that he considered the bill "very bad," particularly because it created a lien only on the receipts of the proposed government railways, and he thought in order to make the bonds worth anything they ought to be based on something more tangible. He declared that eventually the United States government would have to lend its endorsement to the bonds. These, he said, would probably total \$50,000,000 and would be a tax upon the people of the District of Columbia, although the latter would have nothing to say about them. "There are so many defects in the bill," concluded Chairman Johnson, "that I cannot conscientiously vote to advance it one step."

Representative Winslow, who is to write the minority report, was even more vigorous in his opposition to the bill. "All the arguments in favor of the progress and the needs of the people," declared Mr. Winslow, "are on the side of the private corporations. It is in private corporations that you find the greatest efficiency, and at no greater cost than in municipal ownership." Mr. Winslow presented a report showing that only three cities and twenty-nine towns in Massachusetts have municipal lighting plants, and of these thirteen are only distributing plants. Municipal ownership, he said, had been rejected by four cities and fifteen towns and four other cities and twenty-five towns dropped such a proposal after preliminary investigation.

Representative Prouty declared that the question was one the people of the District of Columbia ought to settle for themselves. He expressed grave doubt as to whether the 375,000 people of the District would be willing to support the burden of possibly \$50,000,000 worth of bonds imposed upon them by Congress.

Representative Caraway declared he would not be a party "to load this burden on the people here." He said that the only persons who had appeared in favor of the measure were "professional agitators who appear here to pass on every measure that comes before this committee." He declared that they usually misrepresent those whom they claim to represent.

Representative Crosser, the father of the measure, told the committee that he had worked for six months upon the bill and that he was convinced of the soundness of the public policy outlined in it. He cited the Democratic platform in defence of the measure and pleaded that the committee should at least send the measure to the House for a vote there.

Representative Gorman, who made the motion to report the bill, told the committee that he cast his vote in favor of the measure because the people in his district of Chicago had voted in favor of the general proposition of municipal ownership.

The most interesting testimony during the last days of the committee hearings was contributed by Judson C. Wel-

liver, an editorial writer on the *Washington Times*, who told the committee that the people of the District of Columbia were "overwhelmingly" in favor of government ownership of the Washington street railways. Mr. Welliver referred to the failure of the people to secure universal transfers from the two systems as a reason for his support of government ownership. But when Chairman Johnson cross-examined Mr. Welliver for the basis of his assertion that the people of the District favored government ownership there was trouble.

"You have stated that the District of Columbia is overwhelmingly in favor of municipal ownership," said Chairman Johnson. "Will you mind stating what authority you have for that remark?"

"Oh, I have talked with many people here," replied the witness.

"And they say they are overwhelmingly in favor of municipal ownership?"

"Yes."

Then Chairman Johnson insisted upon securing the names of the people with whom Mr. Welliver had talked. In a four-hour session with the aid of a city directory Mr. Welliver named sixteen residents of the District as persons with whom he had discussed the issue and who had favored government ownership. The first three of these were the District Commissioners who had testified at the hearings and the fourth was Corporation Counsel Syme, who also had testified. Another was Gifford Pinchot, but Mr. Welliver withdrew his name because Mr. Pinchot is running for United States Senator in Pennsylvania and he felt Mr. Pinchot might be embarrassed if he were listed as a resident of the District of Columbia.

The public policy committee of the National Electric Light Association in its report presented at the Philadelphia convention last week referred to the Washington situation as follows:

"One of the most serious of recent developments toward government ownership and operation is the proposal pending before Congress that the United States government shall purchase and operate the street railway system of the city of Washington, D. C. It is understood that this is but the first step toward the acquirement of all the public utilities of the city of Washington and the District of Columbia and their future operation as well as ownership by the national government. The movement is one of most serious political and economic import. Obviously, it would be no more possible for private capital and employment to compete with the unlimited resources of the national government in transportation or the manufacture and sale of gas or electricity than it would be for private effort to compete with the resources of the government in the manufacture and sale of clothing or of food or any of life's necessities, the availability of which is a matter of far greater human importance. The principle underlying the one underlies all, and it is to be hoped that upon proper consideration of the matter Congress will defeat this movement. It is urged that our members get in touch with their representatives in Congress and present to them the serious political and economic consequences that are bound to follow an undertaking of this nature so essentially private in its character."

#### Kansas Tax Assessments

The State Tax Commission of Kansas has made public the following valuations placed by it on the principal electric railways in the State:

	1913	1914
Atchison Railway, Light & Power Company..	\$96,694	\$102,986
Arkansas Valley Interurban Railway, Wichita	674,899	674,907
Emporia Railway & Light Company.....	56,712	56,147
Fort Scott Gas & Electric Company.....	61,053	79,800
Hutchinson Interurban Railway.....	181,265	186,541
Iola Electric Railroad.....	70,791	47,687
Joplin & Pittsburg Railway.....	1,390,816	1,510,805
Kansas City, Lawrence & Topeka Electric...	127,642	125,104
Kansas City-Western Railway.....	1,220,629	1,132,827
Kansas City Elevated Railway.....	1,064,992	1,065,948
Manhattan City & Interurban Railway.....	91,762	113,072
Lawrence Railway & Light Company.....	114,765	116,452
Metropolitan Street Railway, Kansas City...	2,645,626	2,942,397
Missouri & Kansas Interurban Railway.....	454,887	449,061
Parsons Railway & Light Company.....	56,053	52,516
Salina Street & Interurban Railway.....	60,568	77,392
Southwestern Interurban Railway.....	150,746	159,747
Southwest Missouri Railroad.....	61,274	61,275
Topeka Railway.....	1,277,158	1,549,428
Union Light & Power Company, Junction City	140,064	120,791
Union Traction Company, Coffeyville.....	753,329	754,188
Wichita Railroad, Light & Power Company..	1,350,669	1,500,619

#### Toledo Committee Withholds Report

A committee of the Toledo Citizens' Franchise Association is preparing a draft of a street railway franchise which will be presented to the City Council at its regular meeting on June 22, if it can be completed in time. Because of the widespread interest in the drafts that have already been discussed before that body or the franchise committee, the association will endeavor to present an instrument that will contain the features upon which the city and company have agreed and suggestions covering subjects upon which they have failed to unite.

The franchise committee of the Citizens' Franchise Association consists of Judge John H. Doyle, Gustavus Ohlinger, Frank L. Mulholland and George Greenhalgh. This committee and the Council franchise committee met in joint session on June 9. It is the purpose of the association's committee to ascertain as far as possible the ideas of the administration on all phases of the situation.

Many data have been secured by the association upon which to base its proposition, but the committee will consult with representatives of all classes interested in the settlement of the franchise question. Inquiry will also be made of the company as to the possibility of incorporating certain requirements in the franchise under consideration.

At the regular meeting of the City Council on June 8, the Council committee of the whole made no report of its rejection of the Doherty franchise and the acceptance of the report of the franchise committee. These matters were held in abeyance pending the proposition from the Citizens' Franchise Association. It may never be necessary for the committee to make a report of its meeting, unless the efforts of the business men are rejected by the Council.

At the meeting of the Council franchise committee on the evening of June 4 Mayor Keller announced that no proposition not based on a 3-cent fare will be entertained.

Henry L. Doherty, representing the Toledo Railways & Light Company, stated that he had no new proposition to make. He did, however, say that he would endeavor to operate the road on a sliding scale of the same general character as that used in Cleveland. This statement was made in reply to a question after the Cleveland plan had been discussed. Seemingly there is a tendency now toward the adoption of this plan so modified as to give the company an additional return on its investment for each reduction made in the fare. It is believed this will furnish an incentive for economic management and operation.

President James Thompson said he was impressed by past investigations that there should be no fixed fare for a period of twenty-five years. He said further that the organization feels certain there should be a sliding scale. This comes as near to a declaration as has yet been made by the association. Mr. Thompson said no attempt had been made by the Council franchise committee to ascertain the cost of street railway service.

Attorney Frank Mulholland, in charge of the association's work, announced its opposition to municipal ownership under present conditions. He said that the time was not ripe for placing the business under political control and that conditions with the railway itself were chaotic.

F. M. Dotson and others, speaking for the city, said they were certain a 3-cent fare would pay, if properly tried out, and that any proposition to gain consideration must have that rate as a basis.

Mr. Doherty maintained that a change in the plan at this time would only mean delay. His plan of an adjustable scale of fare is the most available, and 3-cent fare was possible under it, whereas such fare was impossible under the city's plan. While willing to consider any suggestion, Mr. Doherty told the committee that the company had no new plan to present.

Little has been done yet by the Central Labor Union in circulating petitions for initiating a municipal ownership ordinance.

The Non-Partisan League sends representatives to all Council and committee meetings, but is not actively urging its ideas at these meetings.

Engineers McAdoo and Corbett are in Toledo to report on a plan of an ideal system of lines for the city. Their work will, no doubt, have a favorable bearing upon the negotiations when they are again taken up.

### Tax Injunction in Cleveland

The Cleveland (Ohio) Railway was granted a temporary restraining order by Judge Thomas M. Kennedy, of the Cuyahoga County Common Pleas Court, on May 5, to prevent the county treasurer from proceeding to collect taxes for 1913 upon the valuation fixed by the State tax commission. The petition states that its report for the year was filed with the commission and that the valuation given was correct. Later the commission announced a tentative valuation of \$21,837,330, which was \$7,750,000 in excess of the value returned by the company. At a hearing requested by the company the commission refused to reduce the valuation, and also failed to set forth the rules under which it had been ascertained.

The petition states that the commission violated both the general code and the State constitution in arbitrarily fixing the valuation at the figure named, and that the provision of the general code that "reasonable and proper rules must be used to govern and regulate the mode and manner of all valuations and assessments" has been violated. It is claimed that the valuation is higher than that of any other similar company in the State. The belief is expressed that the valuation was ascertained by taking the receipts of the company for the last three years and calculating the net earnings at 33 1/3 per cent of the gross and capitalizing this at 10 per cent. The net earnings of the company for the last three years were only 19 per cent of the gross instead of 33 1/3 per cent.

This suit followed a tender to the county treasurer of certified checks for \$242,883, the taxes at the regular rate on \$16,078,765, the valuation of the property claimed by the company. J. J. Stanley, president; H. J. Davies, secretary, and H. J. Crawford, of Squire, Sanders & Dempsey, legal representatives of the company, together tendered the checks to Treasurer O'Brien, who refused them. This was done to secure a basis upon which to ask for an injunction. If the company should be successful in its endeavor to overthrow the valuation fixed by the commission, a new system of valuing street railway properties will have to be fixed.

### Business Conditions in Portland, Ore.

C. M. Clark, chairman of the executive committee of the Portland Railway, Light & Power Company, Portland, Ore., has included in the annual pamphlet report of the company for the year ended Dec. 31, 1913, a statement in regard to business conditions in that city which he has concluded in part as follows:

"The capital expenditures required during this year will be small. The development of Alaska and the opening of the Panama Canal should prove helpful in restoring to Portland the prosperity which characterized its growth in the decade preceding 1912. In addition, there are a number of local reasons for increased earnings, such as the development of the light and power business in the Willamette Valley, including the sale of power to the Willamette Valley Southern Railway and the Southern Pacific Company. The overdevelopment of the territory and of your company is temporary only and may soon be changed into a condition where the capacity of the company will be fully required to meet the demands of a new period of growth and development. Even during the last two years there has been a steady growth and improvement in Oregon and in Portland, and the agricultural, financial and industrial conditions are sound and stable."

### New Kansas City Successor Company Incorporated

Articles of incorporation of the Kansas City Railways, which will take over the lines of the Metropolitan Street Railway, Kansas City, Mo., if the proposed franchise extension is granted, were filed on June 4 by Clyde Taylor, attorney for the receivers. The capitalization of the new company is fixed at \$100,000. Eleven nominal directors were named, as follows: Frank Hagerman, Chester H. Smith, Clyde Taylor, Kenneth W. Tapp, R. B. Sayre, J. W. Murray, R. J. Clark, James B. Welch, E. E. Ball, S. R. Freet and J. A. Harder. These directors will resign as soon as the franchise has been approved by the people, and will be succeeded by the five city directors named in the ordinance and the six company directors.

The Kansas City Terminal Railway, on June 5, indicated it would oppose the granting of an extension of a franchise to the Metropolitan Street Railway. Through Samuel W. Sawyer, the company notified the Missouri Public Utilities Commission that it desired to be heard in case the franchise discussion reached that body. The Terminal Railway charged the Metropolitan Street Railway and the city with bad faith in rejecting an old agreement whereby the Metropolitan Street Railway was to share the cost of several viaducts and subways.

The revised franchise went to one house of the Kansas City Council on June 15. The other board will receive it on June 22. The measure will be voted on by the people on July 7.

The franchise committee of the Council signed its report on June 1. The report reviewed the street railway situation in part as follows:

"1. On June 3, 1911, the United States Court appointed receivers of the Metropolitan Street Railway, who have been since operating the property. On Sept. 25, 1911, in the administration of Mayor Brown, the city filed in the receivership case a petition setting forth all its claims for relief against the system, whether arising out of their contractual relations or the needs of a growing community. It took the position that it wanted not any forfeiture of any franchise, but some arrangement made under which the property could be refinanced and improvements in the service made. There was a reference to and hearing before Judge Brumback as special master. He reported the amount necessary to be raised for improvements.

"After considering this report, Judge Hook, on Jan. 2, 1912, directed the receivers to inquire whether the municipal authorities were willing to entertain negotiations for a new franchise, and, if they were, to engage in them. Mayor Brown and his associates deemed a new contract necessary. They expressed a willingness to enter into such negotiations, which were then opened and in good faith continued until the approach of the city election. Both sides, to avoid having politics enter into what should be strictly a business proposition, then agreed to postpone further negotiations until after the April, 1912, city election. The newspapers of Kansas City, as shown by practically every issue of each paper, were unanimous upon the question of the absolute necessity of a new contract.

"2. After the election of Mayor Jost, the receivers asked to reopen negotiations with his administration. This he declined to do until he and his advisers first obtained a knowledge of the value of the property, the earnings therefrom, the expenses of operation and the financial condition of the company.

"To obtain and give this information as to the value the receivers expended more than \$100,000. The city appropriated and spent \$25,000 to obtain its information as to all of said matters. Judge Hook appointed Bion J. Arnold to ascertain the value. This he did, reporting the entire value of the system to be \$36,800,000 and its actual cost, exclusive of the Kansas City & Westport Belt Line, to be \$35,074,000. L. R. Ash and the engineering force of the city made the valuation for the city. He found the entire value to be \$32,000,000. E. P. Moxey examined into the financial condition of the company and the actual cost of the property. He reported that \$38,084,000 had been invested in the street railway property. The earnings and expenses were fully shown, the city having obtained everything necessary to form an accurate judgment. Finally, a tentative form of contract which had been agreed to by the Mayor and the company was introduced in the Council on Oct. 30, 1913. While it was being considered by a joint committee of the Council, the receivers, withdrew from the conference on Jan. 6, 1914, upon the alleged ground that the proposition was not by some being considered as a business matter, for the unbiased judgment of the people, but was being used to make political capital for the spring election.

"3. On April 27, 1914, the bondholders applied to Judge Hook to speed their proceedings to foreclose mortgages securing payment of street railway bonds aggregating \$23,463,043, now due. The receivers asked and the judge granted permission to pay them an additional 1 per cent interest pending one more effort to negotiate a new contract. The additional 1 per cent now authorized under court orders alone aggregates \$230,644 per year.

"Thereupon the receivers asked and the Mayor consented

to a reopening of negotiations. Council committees were appointed to act with the Mayor. They were assisted by Judge A. F. Evans, city counselor; O. V. Wilson, Franklin D. Crabbs and John C. Lester, constituting a committee of the Commercial Club; L. R. Ash, formerly city engineer, and Robert P. Woods, an engineer chosen by the Mayor for the board of control.

"Suggestions have been asked and hundreds of citizens have appeared before the committee. The stenographic report of the proceedings before the former committee, covering months, has been consulted. The report of Bion J. Arnold and P. J. Kealy, engineers for the receivers, and L. R. Ash, engineer, and E. P. Moxey, accountant for the city, have also been carefully considered throughout the negotiations.

"As a result of more than two years' consideration of this subject by the city a form of substituted ordinance has been drawn, printed, and, with a copy of this report, will be mailed to all the voters of the city. This report will be handed to the clerk to hold for one week, subject to the further considerations of the committee, before filing, so that every person may see what, if any, changes have been made by this committee, and within that time call to its attention any possible error, mistake or oversight. Any such suggestion, for convenience, should be put in writing, addressed to the franchise committee and delivered to the clerk."

F. E. Gloyd, who was appointed on Oct. 28, 1913, to the board of directors of the Metropolitan Street Railway as a representative of the city, resigned on June 15. Mayor Jost appointed Frank C. Niles, wholesale cigar man, as his successor. Mr. Niles will serve two years, that being the length of Mr. Gloyd's term.

The Metropolitan Street Railway franchise ordinance, with slight changes, passed the upper house of the Kansas City Council unanimously on June 15. The physical value of the company's property in Missouri has been reduced from \$25,800,000 to \$25,648,806. A provision was adopted whereby the company which builds the central interurban station will receive 20 per cent of the fares of passengers. The power of determining extensions in addition to those provided for the first three years was taken from the board of control and placed with the City Council.

#### Shreveport Rate Cases Decided

On June 8 Justice Hughes of the United States Supreme Court handed down a decision in the long-pending Shreveport rate cases. The decision presents another phase of the problem dealt with in the Minnesota rate cases. Then the court held that rates fixed by the States for the regulation of intrastate traffic could be enforced provided that they were not confiscatory and the government or its agencies had not made specific rules for interstate traffic with which the State rules conflicted.

The present decision dealt with a case in which the rates fixed by a State did conflict with the federal regulation of interstate traffic. The charge was made that the Houston East & West Texas Railway and the Texas & Pacific Railway, pursuant to the order of the Texas Railroad Commission, charged lower rates on shipments from Dallas, Tex., than they charged for shipments for the same distances from Shreveport, La., thus involving a discrimination against interstate commerce as against intrastate commerce. The Supreme Court upheld the right of the railroads to disregard the rates of the Texas commission and to maintain the rates fixed by the Interstate Commerce Commission.

The court first decided that Congress had power to control intrastate charges over an interstate carrier to the extent necessary to prevent injurious discriminations against interstate traffic, and then held that Congress had conferred this power upon the Interstate Commerce Commission. "The fact that carriers are instruments of intrastate commerce as well as of interstate commerce," said Justice Hughes, "does not derogate from the authority of Congress over the latter or preclude the federal power from being exerted to prevent the intrastate operations of such carriers from being made a means of injury to that which has been confided to federal care. Wherever the interstate and intrastate transactions are so related that the government of the one involves the control of the other, it is Congress and not the State that is entitled to prescribe the final and dominant rule."

#### Seattle Suburban Line Sale Negotiations

A conference between William R. Crawford, former president of the Seattle, Renton & Southern Railway; Scott Calhoun, receiver, and city officials, lasting more than two hours, was held on May 23. Councilmen Dale and Fitzgerald and Assistant Corporation Counsel Howard A. Hanson appeared for the city. The two main issues discussed were the matter of the city paying a stipulated sum for the road and the question of what percentage of the receipts from extensions the city would turn over to the receivers. Mr. Crawford adhered to the original proposition. He asked that the city pay for the line by giving stockholders 25 per cent of the gross receipts for twenty-five years. He would consent to no proposition in which the city would pay a stipulated sum at the end of a term of years, or by the sale of bonds. He argued that 25 per cent of the gross receipts on extensions made to the Renton line should be given, the same as under the terms of the sale of the main line. Mr. Crawford's demand that 25 per cent of the receipts of extensions be turned over to the stockholders during that period brought the reply from the city representatives that they could not comply with such a request.

On May 26 city officials of Seattle asked Mr. Calhoun to fix a flat price on the Fourth Avenue extension, from Stewart to King Streets, reserving payment for the rest of the system under a future payment, or percentage plan, to be arranged later.

#### New Mail Pay Bill Introduced in Congress

Representative Tuttle of New Jersey on June 4 introduced in the House of Representatives the bill of the joint committee on postage and second-class mail matter and compensation for transportation of mails to provide a scientific system of paying railroads for carrying mails. The committee is unanimous in its approval of the measure and declares that the leading governmental authorities, including the Postmaster General, also favor it. The bill was referred to the House committee on post-offices and post-roads, and on June 5 was reported with amendments, committed to the committee of the whole House and ordered to be printed. It is now on the calendar and may be called up at any time.

The main provisions that are of interest to electric railways are Sections 1 and 15. Section 1 provides for the readjustment of weights and compensation to railroad companies for carrying mail when the weighing in any particular section is interfered with on account of floods or other causes where weights are decreased below the normal. Such unusual conditions make it necessary that an average of weights in accordance with the section be taken to determine the compensation on roads affected by floods in the Ohio Valley and territories tributary.

The main purpose of Section 15 is to readjust compensation to the railroads for the carrying of mails. The existing laws provide for readjustment of such pay upon two general bases: First, railroad companies are paid for the weight of material carried, and, second, where railway post-office cars 40 ft. or more are required for the distribution of mails en route an additional rate of pay may be allowed therefor. There is no provision in the existing law for additional pay for apartment car service performed in baggage cars furnished by the company. The proposed bill provides for one basis of pay for all service performed in full cars, in apartment cars and in storage cars, that basis being the space authorized as necessary for the distribution and transportation of the mails. Closed pouch service on trains where no car space is furnished may still be paid for on the basis of weight of mail carried. The rates of pay for the several classes of service provided are based upon a consideration of the fair value of the services rendered and are somewhat less than the revenue received by railroad companies for passenger car service.

It is represented by the Post Office Department that the application of these rates for 1915, with allowance for the usual growth in service, will result in a cost to the post office department of approximately \$58,278,000. The appropriation for the transportation of mails on railroad routes for that year is \$61,600,000, which means an approximate saving of \$3,000,000 under the proposed system. A provision is

included in the bill making it unlawful for any railway to refuse to perform mail service at the rates of compensation provided by law.

**Pittsburgh Arbitrators Selected.**—Judge S. L. Mastrezat, of the State Supreme Court, has been selected as the third arbitrator in the dispute between the Pittsburgh Railways and its employees. The employees recently selected Representative Stephen G. Porter and the company its attorney, James C. Gray, with the understanding that if these two failed to reach an agreement on the points in dispute they would select a third.

**Wage Adjustment in Connecticut.**—An adjustment of wages and working conditions covering the period from June 1, 1914, to June 1, 1916, has been reached by the management with a committee representing the motormen and conductors on the lines of the Connecticut Company and the New York & Stamford Railway. The same conditions have been made effective on the lines of the Westchester Street Railroad, the men of which were not represented at the conference.

**Strike at Westinghouse Works.**—A number of the employees of the Westinghouse Electric & Manufacturing Company and the Westinghouse Machine Company went on a strike recently because the management refused to recognize the demands of the newly-formed labor union, the Allegheny Congenial Industrial Union, and as a result the works of these companies at East Pittsburgh are partly shut down. The management of the company does not believe that the trouble will be of long duration.

**House Passes Trust Bills.**—Three of the Administration's anti-trust bills were passed by the House of Representatives on June 5. They are the railroad capitalization bill, providing for the close regulation and control by the Interstate Commerce Commission of issues of railroad stocks and bonds; the Covington bill, creating an interstate trade commission, with broad inquisitorial powers over corporations engaged in interstate commerce, and the Clayton bill, the provisions of which are designed to strengthen and support the Sherman law and other acts against monopolies and restraints of trade.

**Elevated Third-Tracking Contract Awarded.**—The Public Service Commission for the First District of New York has approved the award of the contract for the third-tracking of the Fulton Street elevated railroad in Brooklyn by the New York Municipal Railway Corporation to Terry & Tench, the lowest bidders, for \$462,871. This contract covers that portion of the road between Nostrand Avenue and Sackman Street. The steel for this work has already been ordered from Milliken Brothers, Inc. Actual work must begin within ten days after the delivery of the contract, and the entire work must be completed within twelve months from that time.

**Indiana Liability Act Interpreted.**—The Appellate Court of Indiana on June 3 affirmed the Tipton Circuit Court in holding that interurban motormen do not come within the provisions protecting railroad employees under the Employer's Liability Act of 1893. The decision was made in holding that Earl Hughes cannot recover damages from the Union Traction Company of Indiana for injuries suffered in 1908. The forward end of a telephone pole fell from a work train that was traveling at 50 m.p.h. An end of the pole caught in the ground while the middle of it caught on a car of the train, throwing the other end forward on the cab, injuring Mr. Hughes, who was motorman of the work train. The opinion of the court tells of the history of railroad and interurban legislation, and shows that the Legislature has always treated railroads and interurbans as public utilities requiring different rules governing their activity. The Appellate Court held that the rules of law on which Mr. Hughes sought to recover were made to apply to steam railroads, and that he, as a motorman on an interurban work train, cannot recover under those statutes.

**Newark Terminal Contract Awarded.**—The contract for the construction of the foundation of an eight-story terminal building and subway connections have been let by the Public Service Corporation of Newark, N. J., to the Holbrook, Cabot & Rollins Corporation, New York. This work, which will cost between \$600,000 and \$700,000, is part of a plan which will involve an outlay of several millions to

relieve transportation congestion in Newark. An eight-story office structure will top the terminal, which will occupy an 180-foot frontage on Park Place, with wings on Canal, East Park Street and Pine Street, devoted exclusively to the uses of the Public Service Corporation and allied companies. The grade floor will be used as a concourse and showrooms for commercial departments of gas and electric companies. The first floor will be used for surface car loops, and the basement will be for subway tracks. To these there will be approaches underground, starting from private property on Washington, near Warren Street, the subway to extend under Halsey, Cedar and Broad Streets at Military Park to the company's terminal site between the American Insurance Company and Proctor Theater buildings. The plans of the terminal and subway are by George B. Post & Sons. The plans for the building were described and illustrated in the *ELECTRIC RAILWAY JOURNAL* of Feb. 8, 1913, page 246.

**United States Chamber of Commerce on Class Legislation.**—The Chamber of Commerce of the United States of America has issued a circular letter to its organization members regarding proposed unjust discrimination against business and in favor of labor and agriculture in various bills awaiting passage in Congress. The letter calls attention to the clause included in the sundry civil appropriation bill providing that no part of the money can be used for prosecuting violations of the anti-trust laws by organizations or individuals seeking increased wages, shorter hours of labor, better conditions of labor, or "fair and reasonable" prices for farm products. There is also mentioned the two clauses of the Clayton bill relating to the exemption from prosecution under the anti-trust law of labor and agriculture organizations and to restrictions placed upon the courts in using the ordinary processes of injunction against certain specified methods employed by labor unions in conducting strikes. In referendum No. 3, which was closed on June 14, 1913, and adopted unanimously at the last annual convention, the members of the Chamber of Commerce placed themselves on record against class legislation and the exemption of labor organizations from the Sherman act. The above circular letter is a call for prompt and determined action on the part of business organizations and business men in the country regarding such legislation.

## LEGISLATION AFFECTING ELECTRIC RAILWAYS

### MASSACHUSETTS

A bill providing for the unification of electric railways centering in Boston has been presented by the Bay State Street Railway. The proposed act incorporates the Commonwealth Electric Railway, with authority to acquire or operate the whole or any part of the street railway properties located within the Boston Metropolitan District. The principal systems included in the proposed merger are the Boston Elevated Railway, the Bay State Street Railway, and the Boston, Revere Beach & Lynn Railroad. The proposition includes the standardization of the gage of the latter, with its electrification and connection with the East Boston tunnel. In acquiring the Boston Elevated Railway, the Commonwealth company would not become its successor in respect to fare limitations and privileges, but the fares proposed would be submitted to the Public Service Commission for approval. An interesting feature of the bill provides that the company and any steam or electric railroad owning or operating lines within the metropolitan district may enter into contract for a connecting suburban service. The district includes territory within 10 miles of the capitol building at Boston.

The bill to allow street railways to refund the cost of replacement of reconstruction work up to 120 per cent of their capital stock has been ordered to be engrossed by the House of Representatives.

## PROGRAMS OF ASSOCIATION MEETINGS

### Society for the Promotion of Engineering Education

The twenty-second annual meeting of the Society for the Promotion of Engineering Education will be held at Princeton, N. J., June 23 to 26. All the meetings of the society and the council for the discussion of papers and business

matters will be held in the Palmer Physical Laboratory at Princeton University. The registration headquarters will be in Nassau Hall. Practically all the papers which are to be read at the convention were published in the April, May and June bulletins of the association.

National Association of Corporation Schools

The second annual convention of the National Association of Corporation Schools was held at the new auditorium of the Curtis Publishing Company in Philadelphia on June 9, 10, 11 and 12. The annual banquet was held at 7:30 p. m. on June 12 at the Hotel Bellevue-Stratford. The papers presented at the convention dealt with salesmanship, advertising and distribution; accounting, financing and purchasing; apprenticeship and engineering schools; general office work schools; vocational guidance and welfare work, including physical efficiency, hygiene and sanitation.

New York Electric Railway Association

As previously announced in the ELECTRIC RAILWAY JOURNAL, the thirty-second annual meeting of the New York Electric Railway Association will be held at Hotel Champlain, Bluff Point, N. Y., Tuesday and Wednesday, June 30 and July 1. At the business sessions on Tuesday and Wednesday the principal addresses and discussion will be on the subjects of accident insurance, accident prevention and efficiency; the questions in the question box will also be presented for discussion. The annual banquet will be held at Hotel Champlain on the evening of Tuesday, June 30. There will be a morning session only on Wednesday. The complete program will be published in next week's issue of the ELECTRIC RAILWAY JOURNAL.

Central Electric Railway Association

The program has been announced for the summer meeting of the Central Electric Railway Association to be held at Assembly Hall of the Hotel Secor at Toledo, Ohio, on June 25 and 26. On the evening of June 25 Thomas N. McCarter, president of the Public Service Corporation of New Jersey and past president of the American Electric Railway Association, will address the members of the association and the public in Zenobia Theater at 8 p. m. This meeting will also be addressed by Peter Witt, Street Railway Commissioner of Cleveland, and others. The address of welcome to the members will be delivered by Carl Kellar, Mayor of Toledo, and the response will be made by E. F. Schneider, general manager of the Cleveland, Southwestern & Columbus Railway, who is president of the Central Electric Railway Association. The program for the business session on June 25 provides for the following addresses:

Henry L. Doherty, chairman of the board of directors of the Toledo Railways & Light Company.

A. W. Brady, past president of the American Electric Railway Association and past president of the Central Electric Railway Association, and president of the Union Traction Company of Indiana.

"The Credit of Public Utility Companies," by C. Edgar Elliott of Breed, Elliott & Harrison, Chicago, Ill.

C. L. Henry, second vice-president of the American Electric Railway Association, first vice-president of the Central Electric Railway Association and president of the Indianapolis & Cincinnati Traction Company.

"Our Traffic Association," by A. L. Neereamer, secretary of the Central Electric Railway Association and chairman of the Central Electric Traffic Association.

"Economies in Operation of Field Control Equipments on the Toledo Railways & Light Company's Line," by F. E. Wynne, general engineer of the railway department of the Westinghouse Electric & Manufacturing Company.

At 10.30 a. m. on June 25 there will be an automobile ride for ladies with luncheon at the Inverness Club. At 8 p. m. there will be a theater party for the ladies.

The entire day of June 26 will be spent at Toledo Beach. At 2 p. m. there will be a ball game between the railway and the supply men. A special feature of the entertainment program at Toledo Beach on June 26 will be demonstrations by Harry N. Atwood with his aeroplane. Arrangements have been made for free rides with Mr. Atwood for members.

# Financial and Corporate

## Stock and Money Markets

June 10, 1914.

The session on the New York Stock Exchange closed dull to-day. The trading totaled only a little more than 100,000 shares. The bond market was broader to-day but the sales were at about the same volume as yesterday. Interborough-Metropolitan shares were active in the morning on rumors of prospects of a dividend out of the extra disbursement of the Interborough Rapid Transit Company. Rates in the money market to-day were: Call, 2 per cent; sixty days, 2 @ 2 1/4 per cent; four months, 2 3/4 @ 3 per cent; six months, 3 @ 3 1/4 per cent.

The transit issues were inactive in Philadelphia to-day. Otherwise the market was strong.

The Chicago market was narrow and dull to-day. The bulk of the bond transactions was in Chicago City Railway 5's.

The Boston market was dull and more or less irregular. The tone was easier at the close.

The stock transactions in Baltimore to-day totaled only 814 shares. The bond transactions totaled \$32,800, par value.

Quotations of traction and manufacturing securities as compared with last week follows:

	June 3	June 11
American Brake Shoe & Foundry (com.)....	87 1/2	89
American Brake Shoe & Foundry (pref.)....	136	137
American Cities Company (com.).....	*29	29
American Cities Company (pref.).....	65 1/2	67
American Light & Traction Company (com.)...	337	336
American Light & Traction Company (pref.)...	108	108
American Railways Company.....	37	37
Aurora, Elgin & Chicago Railroad (com.)....	32 1/2	34
Aurora, Elgin & Chicago Railroad (pref.)....	77	77
Boston Elevated Railway .....	81 1/2	87 1/2
Boston Suburban Electric Companies (com.)...	7	7
Boston Suburban Electric Companies (pref.)...	a65	*65
Boston & Worcester Electric Companies (com.)...	*6 1/4	*6 1/4
Boston & Worcester Electric Companies (pref.)...	36	36
Brooklyn Rapid Transit Company.....	92 3/4	92
Capital Traction Company, Washington.....	100 1/8	99
Chicago City Railway .....	135	135
Chicago Elevated Railways (com.).....	20	20
Chicago Elevated Railways (pref.).....	62	65
Chicago Railways, pteptg. ctf. 1.....	95	95
Chicago Railways, pteptg. ctf. 2.....	34 1/2	34 1/2
Chicago Railways, pteptg. ctf. 3.....	5	5
Chicago Railways, pteptg. ctf. 4.....	2	2
Cincinnati Street Railway .....	102 3/4	103 1/4
Cleveland Railway .....	104 3/8	105
Cleveland, Southwestern & Columbus Ry. (com.)...	*4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)...	*30	*30
Columbus Railway & Light Company.....	13	13
Columbus Railway (com.).....	53	*53
Columbus Railway (pref.).....	79 1/2	79 1/2
Denver & Northwestern Railway.....	*63	63
Detroit United Railway .....	a80	a80
General Electric Company .....	147 1/2	148 1/8
Georgia Railway & Electric Company (com.)...	120	120
Georgia Railway & Electric Company (pref.)...	86 1/2	83 3/4
Interborough-Metropolitan Company (com.)...	14 1/4	15
Interborough-Metropolitan Company (pref.)...	62	64 1/2
International Traction Company (com.).....	*40	30
International Traction Company (pref.).....	*85	85
Kansas City Railway & Light Company (com.)...	*18	22
Kansas City Railway & Light Company (pref.)...	*37	39
Lake Shore Electric Railway (com.).....	*6	6
Lake Shore Electric Railway (1st pref.).....	*92	90
Lake Shore Electric Railway (2d pref.).....	*22	*22
Manhattan Railway .....	131	131 1/2
Massachusetts Electric Companies (com.)...	12	12 1/2
Massachusetts Electric Companies (pref.)...	60 1/4	62
Milwaukee Electric Ry. & Light Co. (pref.)...	95	95
Norfolk Railway & Light Company.....	*25 1/2	26
North American Company .....	76	76 1/2
Northern Ohio Traction & Light Co. (com.)...	70	a70
Northern Ohio Traction & Light Co. (pref.)...	101	97 1/4
Philadelphia Company, Pittsburgh (com.)....	39	38 3/4
Philadelphia Company, Pittsburgh (pref.)....	38 1/2	37
Philadelphia Rapid Transit Company.....	15 3/4	15 3/4
Portland Railway, Light & Power Company...	*50	47
Public Service Corporation .....	112	112
Third Avenue Railway, New York.....	41	42 3/4
Toledo Traction, Light & Power Co. (com.)...	a20	20
Toledo Traction, Light & Power Co. (pref.)...	a70	70
Twin City Rapid Transit Co., Minn. (com.)...	105	105 1/4
Union Traction Company of Indiana (com.)...	*11 1/2	11 1/2
Union Traction Company of Indiana (1st pref.)...	*75	*75
Union Traction Company of Indiana (2d pref.)...	*14	14
United Rys. & Electric Company (Baltimore)...	28	28
United Rys. Inv. Company (com.).....	14	13
United Rys. Inv. Company (pref.).....	38	37 1/2
Virginia Railway & Power Company, (com.)...	49	48 3/4
Virginia Railway & Power Company (pref.)...	99	99 3/8
Washington Ry. & Electric Company (com.)...	87 1/4	87 1/2
Washington Ry. & Electric Company (pref.)...	83 1/2	83
West End Street Railway, Boston (com.)...	66	67 1/2
West End Street Railway, Boston (pref.)....	85	a92
Westinghouse Elec. & Mfg. Company.....	76 1/4	76 3/4
Westinghouse Elec. & Mfg. Co. (1st pref.)...	124	124

\* Last sale. a Asked.



Washington Railway & Electric Company

The statement of income, profit and loss of the Washington Railway & Electric Company, Washington, D. C., and its subsidiaries for the year ended Dec. 31, 1913, is as follows:

Gross earnings from operation.....	\$4,943,315
Miscellaneous income .....	10,221
Gross income .....	\$4,953,536
Operating expenses, including taxes.....	2,669,971
Gross income, less operating expenses and taxes.....	\$2,283,565
Fixed charges .....	1,126,915
Surplus income .....	\$1,156,650
Disposition of surplus:	
Payment of 5 per cent dividend on preferred stock...	\$425,000
Payment of 6½ per cent dividend on common stock...	422,500
Total .....	\$847,500
Distribution to conductors and motormen under profit-sharing plan .....	\$30,082
Depreciation on equipment—railways.....	81,174
Removal of abandoned tracks.....	1,047
Charged off, account Glen Echo Park.....	2,000
Charged off, account adjustment of taxes prior to Jan. 1, 1913.....	4,543
Sinking fund requirements—(Potomac Electric Power Company .....	92,320
Uncollectible accounts—(Potomac Electric Power Company).....	2,706
Loss due to abandonment of street lighting equipment—(Potomac Electric Power Company).....	14,429
Total .....	\$228,301
Credited to profit and loss.....	\$80,849

The gross earnings from operation as shown by the above statement were an increase of \$294,987 over those of 1912, while miscellaneous income decreased \$3,012. The gross income increased \$291,975; the operating expenses, including taxes, \$141,748; the gross income, less operating expenses and taxes, \$150,228; the fixed charges, \$19,308, and the surplus, \$130,919. The net expenditures of the railway companies for additions, extensions and new equipment chargeable to construction accounts amounted to \$249,820. Similar net expenditures by the Potomac Electric Power Company amounted to \$235,952. The requirement for the year for the sinking fund of the Potomac Electric Power Company amounted to \$93,320. The amount set aside for maintenance and depreciation of the railway and lighting departments amounted to \$804,570 in 1913, as compared to \$740,502 in 1912.

The record of passengers carried during the year showed 85,982,161. Of these 20,003,412 were free transfers. The average fare per pay passenger was 4.301 cents, with an average fare of all passengers carried of 3.269 cents, including transfers. The total car mileage for the system for the year was 10,771,952. Greater efficiency was shown during the year by a reduction in car hours of detention, the record for the year showing an improvement of 23 per cent.

The report gives a detailed description of the various improvements in the track and roadway department and the mechanical department during the year. Those in the track and roadway department consisted of the installation of new rails, special work, trolley poles, railroad ties, automatic electric track switches and trolley wire. The entire system was prepared for car wheels with 3-in. threads, instead of the previous 2½-in. standard. The report of the master mechanic for the year showed in the main that thirty new city and ten suburban cars were assembled and put into service, forty-seven cars equipped with air brakes, sixty-three cars repaired, seventy-one cars painted and ninety-seven varnished.

During the year 538 claims were settled by the claims department at a total expense of \$118,749. Under the profit-sharing system of the company, whereby 26 per cent of the gross passenger receipts less the District of Columbia tax of 4 per cent is appropriated for trainmen's wages and accidents, \$30,081 was set up for the profit-sharing fund, giving each man in service for one year \$42.53. In regard to the activities of the medical department, the report states that the number of office calls made during the year was 3466, and treatment was rendered to 951 at their homes. There were 1297 surgical dressing cases, 87 operations and 281 vaccinations. The report discussed at length the numerous other welfare activities that have been inaugurated by the company for the benefit of the men, such as recreation

rooms, Christmas entertainment, savings and loan department, relief association, public library, and the like. Tables are also presented showing the total outstanding capital stock and funded debt of the subsidiary companies and the amount thereof owned by the Washington Railway & Electric Company.

New Orleans Railway & Light Company

The comparative and consolidated income statement of the New Orleans Railway & Light Company, New Orleans, La., for the years ended Dec. 31, 1913 and 1912, follows:

	1913	1912
Operating revenue:		
Railway department .....	\$4,401,152	\$4,295,027
Electric department .....	1,335,186	1,244,042
Gas department .....	1,158,094	1,089,078
Total .....	\$6,894,432	\$6,628,147
Operating expenses:		
Railway department .....	\$2,542,886	\$2,450,917
Electric department .....	608,046	551,915
Gas department .....	449,449	417,524
Total .....	\$3,600,381	\$3,420,356
Net operating revenue.....	\$3,294,051	\$3,207,791
Revenue deductions:		
Taxes .....	\$724,535	\$560,980
Uncollectible consumers' accounts.....	6,661	5,010
Total .....	\$731,196	\$565,991
Net operating income.....	\$2,562,855	\$2,641,800
Income from outside operations.....	11,791	10,464
Total operating income.....	\$2,574,646	\$2,652,264
Miscellaneous income .....	34,762	31,110
Gross income .....	\$2,609,408	\$2,683,374
Income deductions:		
Interest on funded debt.....	\$1,630,731	\$1,569,973
Other interest charges .....	52,181	44,049
Dividends on stocks of minority stockholders of leased company.....	4,107	4,130
Amortization of funded debt, discount and expense .....	23,375	39,971
Taxes on non-operating land and improvements .....	16,559	16,785
Miscellaneous deductions .....	4,926	9,473
Total .....	\$1,731,879	\$1,684,381
Net income before deducting dividends.....	\$877,529	\$998,993
Dividend deductions on stocks of other affiliated companies in system owned by others .....	4,770	3,960
Net income after deducting dividends on stock of affiliated companies owned by others .....	\$872,759	\$995,033

The surplus on Dec. 31, 1912, of \$2,739,519, credits of \$885,606, debits of \$1,338,939, and dividends of \$799,690 give a surplus as of Dec. 31, 1913, of \$1,486,496. As compared with the results of the previous year the gross operating revenue increased \$266,285, or 4.02 per cent, and operating revenue \$86,260, or 2.69 per cent. The net income decreased \$122,273, or 12.28 per cent. The decrease in the net income was due entirely to the increase in taxes, the board of taxation having increased the assessment approximately \$3,500,000, or 20 per cent. On the same basis of taxation as in 1912, the net income would have shown an increase of approximately \$40,000, in spite of the increased cost of operation due to higher cost of materials and wages and the increased amount set aside to cover renewals and replacements, amounting to \$180,025.

Charges for maintenance during the year amounted to \$814,401, an increase of \$32,639, or 4.1 per cent. In addition to this amount there was expended \$225,231 for renewals and replacements, of which \$180,813 was charged to operating expenses, maintenance accounts, and \$44,418 against the depreciation reserve. During the year there was expended for construction, improvements and betterments the sum of \$685,658.

The total miles of single track in operation in 1913 were 205.56 as compared to 190.92 in 1905, and cars 641 as compared to 552 for the same years. The comparative railway traffic statistics for these two years were as follows:

	1913	1912
Revenue passengers carried.....	87,038,951	65,021,214
Transfer passengers carried.....	22,373,512	6,641,193
Percentage of passengers using transfers..	25.7	10.2
Average fare per passenger—cents.....	3.99	4.57
Car mileage .....	19,815,363	16,753,874
Number of 18-hour cars.....	122,839	102,156

### Unification of Chicago Surface and Elevated Lines Being Considered

A plan is now being considered by the local transportation committee of the Chicago City Council for the unified operation of the surface and elevated roads. L. A. Busby, president of the Chicago Surface Lines, has attended these conferences and expressed willingness to enter into such an operating arrangement. The aldermen are inclined to oppose his request that the 45 per cent and 55 per cent division of the net receipts be applied to the merged properties, because they believe such an arrangement will reduce the city's income to the traction fund.

**Belt Line Railway Corporation, New York, N. Y.**—A decision has been handed down by the United States Circuit Court of Appeals which modifies the decree of the Federal District Court by holding the Metropolitan Street Railway for the payment of an issue of bonds and by freeing the bondholders of the Central Park, North & East River Railroad, now the Belt Line Railway Corporation, of the expense of the electrification of the line which was turned over by the receivers to the company on Aug. 6, 1908. In the matter of the claim of the Metropolitan Express Company for damages for breach of the lease for the operation of freight cars over the surface line the United States Circuit Court of Appeals has reversed the decree of the lower court. The lower court is directed to dismiss the claim as to the New York City Railway and to enter a decree in favor of the Metropolitan Express Company for the sum of \$129,704.32 against the Metropolitan Street Railway.

**Brooklyn (N. Y.) Rapid Transit Company.**—The Brooklyn *Daily Eagle* says: "The stockholders' list of the Brooklyn Rapid Transit Company has steadily lengthened since the payment of the initial dividend in 1911. The records of the company show that at the time of the first dividend the payment went to 1200 stockholders and the last quarterly dividend, which has just been declared, will go to approximately 5000 stockholders. The feature of the list is the number of small holdings of stock ranging from one share upward, and the large number of women stockholders. The growth in the list of stockholders represents gradual distribution, as practically none of the convertible bonds was presented for conversion up to a year and a half ago."

**Calgary Municipal Railway, Alberta, Can.**—The Calgary Municipal Railway produced a total revenue of \$767,726 for the year ended Dec. 31, 1913. Of this amount \$741,948 came from car operations. The operating expenses amounted to \$575,691, divided as follows: Maintenance of way and structures, \$23,408; maintenance of equipment, \$73,258; transportation expenses, \$427,900, and general expenses, \$51,124. After the payment of debenture interest amounting to \$71,672, debenture sinking fund payment, \$34,008, taxes, \$2,452, and rental charges, \$982, there was left a surplus of \$83,160. Of this surplus \$70,267 was carried to the depreciation and replacement account and the balance of \$12,893 to the net revenue account. Miscellaneous statistics of the railway for the year included the following: Car miles run, 3,040,214; revenue passengers, 18,355,274; transfer passengers, 6,478,332; average fare per revenue passenger, 3.994 cents; average fare all passengers, 2.952 cents; car earnings per car mile, 24.404 cents; gross earnings per car mile, 24.758 cents, and operating expenses per car mile, 18.918 cents.

**Chardon, Jefferson & Meadville Interurban Railway, Cleveland, Ohio.**—Permission has been granted by the Public Utilities Commission of Ohio to the Chardon, Jefferson & Meadville Interurban Railway to issue \$400,000 of its 5 per cent bonds and \$300,000 of common stock. The proceeds secured from the sale of the securities will be used to construct the proposed line between Chardon and Jefferson, a distance of about 10 miles.

**Dayton, Springfield & Xenia Southern Railway, Dayton, Ohio.**—The Dayton, Springfield & Xenia Southern Railway has been authorized by the Public Utilities Commission of Ohio to issue its first mortgage 5 per cent bonds, maturing on Oct. 1, 1923, of the total principal sum of \$3,500 and its equipment trust certificates, bearing interest at the rate of 6 per cent a year, maturing at the rate of one-tenth each

year, of the total principal sum of \$12,000, the bonds to be sold for not less than 75.

**Empire United Railways, Inc., Syracuse, N. Y.**—The Empire United Railways has applied to the Public Service Commission of the Second District of New York for permission to issue \$295,000 of 5 per cent first and refunding bonds.

**Federal Light & Traction Company, New York, N. Y.**—The directors of the Federal Light & Traction Company have authorized, since Jan. 1, expenditures amounting to approximately \$583,000, covering additions and improvements that will be completed before the end of the current year. It is stated that a further appropriation of \$160,000 will be made to serve new business and to place in effect economies in operation. The company has procured street lighting contracts at remunerative rates, and the Santa Fé shops are being enlarged and will be electrically equipped. A contract for 2000-hp for mining purposes at Trinidad has been closed, which will result in an estimated gross business of \$70,000 a year.

**Fort Dodge, Des Moines & Southern Railroad, Boone, Ia.**—The Fort Dodge, Des Moines & Southern Railroad and its subsidiaries recently filed open end mortgages to the Old Colony Trust Company, Boston, Mass., as trustee to secure first mortgage twenty-five-year gold bonds dated Dec. 1, 1913, as follows: Fort Dodge, Des Moines & Southern Railroad, first mortgage 5 per cent bonds, \$4,500,000 authorized; Fort Dodge Street Railway, first mortgage 6 per cent bonds, \$100,000 authorized; Central Iowa Light & Power Company, first mortgage 6 per cent bonds, \$500,000 authorized. The principal is due on Dec. 1, 1938, but the bonds are redeemable on any interest date at par and interest. Of the bonds of the Central Iowa Light & Power Company, \$100,000 are reserved to retire \$100,000 of income demand notes which remain out.

**Hanover & McSherrystown Street Railway, Hanover, Pa.**—The controlling interest in the Hanover & McSherrystown Street Railway is reported to have been purchased by B. W. Frazer & Company, Philadelphia.

**Interborough Rapid Transit Company, New York, N. Y.**—The directors of the Interborough Rapid Transit Company have declared an extra dividend of 5 per cent on the \$35,000,000 of stock, which will make this year's distribution 15 per cent. As all but \$1,000,000 of the stock is held by the Interborough-Metropolitan Company, the extra dividend means an addition of \$1,700,000 to that company's income, which has hitherto, except when extra dividends were declared, been only sufficient to pay bond interest. In 1912 the operating company declared an extra dividend of 5 per cent and in 1913 one of 2 per cent.

**Lincoln Railway & Light Company, Lincoln, Ill.**—Fredrick Hudson, Charleston, Ill., executor of the Traner estate, and W. H. Mowry, Philadelphia, both bondholders of the Lincoln Railway & Light Company, have filed notice through their attorney that they intend to start foreclosure proceedings, the company having defaulted in the payment of interest due on its bonds. Under the terms of the original trust deed to the American Trust & Savings Bank, Chicago, the holders of 20 per cent of the bonds can at any time take action for foreclosure, by giving the other bondholders thirty days' notice. P. E. Kuhl, Lincoln, has been named as trustee of the company to succeed the American Trust & Savings Bank. Under the terms of the original trust deed it was provided that the holders of 50 per cent of the bonds could at any time name a different trustee. Mr. Kuhl was appointed because he is a local man, familiar with the details of the company.

**Madison Light & Railway Company, Madison, Ind.**—James R. Magoffin, New York, is offering at a price to yield more than 6 per cent first mortgage 6 per cent gold bonds of the Madison Light & Railway Company due in 1942. The authorized issue is \$150,000, of which \$90,000 is outstanding. The bonds are in the denomination of \$1,000. The Pittsburgh Trust Company, Pittsburgh, Pa., is trustee of the issue.

**Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.**—The directors of the Mahoning & Shenango Railway & Light Company are considering plans to consolidate the half dozen or more subsidiary companies

into one corporation to be called the Mahoning & Shenango Valley Electric & Railway Company.

**Marion, Bluffton & Eastern Traction Company, Bluffton, Ind.**—The Marion, Bluffton & Eastern Traction Company has applied to the Public Utilities Commission of Indiana for permission to issue \$504,000 of bonds and \$206,000 of common stock.

**New Orleans Railway & Light Company, New Orleans, La.**—E. H. Rollins & Sons, Boston, Mass., are offering at par and interest to yield 6 per cent \$750,000 of New Orleans Railway & Light Company's 6 per cent debentures, dated June 1, 1913, and due June 1, 1916, with optional retirement at 101 and accrued interest on any interest payment date. The debentures are of \$500 and \$1,000 par value, coupon, with privilege of registration as to principal. They are guaranteed as to principal and interest by endorsement by the American Cities Company, which owns 96 per cent of the common and 87 per cent of the preferred stock of the New Orleans Railway & Light Company. These debentures are authorized to an amount of \$4,000,000, of which \$3,250,000 have been issued to pay existing construction indebtedness and to provide for new construction during 1914. The remaining \$750,000 are reserved to meet the anticipated construction requirements of 1915.

**New York (N. Y.) Railways.**—On June 15 the Public Service Commission for the First District of New York will hold a hearing, before Commissioner Milo R. Maltbie, on the application of the New York Railways for permission to purchase 4204 shares of the stock of the Twenty-third Street Railway. The company proposed to purchase this stock at \$350 a share, or a total of \$1,472,000, and to pay for it by the issuance of its 4 per cent first mortgage gold bonds. The Twenty-third Street Railway was operated by the old Metropolitan Street Railway under lease, and this lease was taken over by the New York Railways. Under this lease rental was a sum equivalent to 18 per cent on the par value of the stock of the Twenty-third Street Railway. This stock aggregates 6000 shares of the par value of \$100 each, and the annual rental, therefore, amounted to \$108,000.

**New York, Westchester & Connecticut Traction Company, New York, N. Y.**—The New York, Westchester & Connecticut Traction Company, which is controlled by the Third Avenue Railway, New York, has applied to the Public Service Commission of the Second District of New York for permission to reduce its capital stock from \$600,000 to \$200,000.

**Northern Electric Railway, Chico, Cal.**—The trustees of the Sloss securities have notified the creditors of the Northern Electric Railway, the Northern California Securities Company, the Vallejo & Northern Railroad and the Valley Syndicate that it will not be possible to pay the interest on the first and consolidated 5 per cent forty-year bonds of the Northern Electric Railway or on any notes secured by the bonds. Coupons on all the underlying bonds are being paid as they mature.

**Nova Scotia Tramways & Power Company, Halifax, N. S.**—The bill incorporating the Nova Scotia Tramways & Power Company has been passed by the Nova Scotia Legislature with a number of amendments. As the bill stands the capital of the company is \$6,000,000, and in addition to absorbing the Halifax Tramways the new company is also authorized to acquire the power sites and rights on the Gaspereaux River owned by the Nova Scotia Light & Power Company. It is agreed that the yearly payment to the city of Halifax shall never be less than that paid in 1913 by the Halifax Tramways and that the rates for light and power shall never be increased above those paid at the present time. The fares now charged on the local railway are not to be increased and in addition workmen's tickets at a price of eight for 25 cents are to be sold in the future. All points at issue are to be referred to the Public Utilities Commission for settlement.

**Oakland, Antioch & Eastern Railway, Oakland, Cal.**—The following notice has been sent to the stockholders of the Oakland, Antioch & Eastern Railway: "The directors of the Oakland, Antioch & Eastern Railway have levied an assessment of \$2 a share on the capital stock of the corporation, payable on July 3, and a further assessment of \$1.50, payable about Oct. 1, 1914, and \$1.50 payable on Jan. 1,

1915. After careful consideration, the opinion of the directors is that this will finance the needs of the railroad. For the first quarter gross earnings, despite general unfavorable conditions, were: March, \$47,000; April, \$48,900; May (estimated), \$52,000. There are \$1,350,000 bonds in the treasury of the corporation authorized by the Railroad Commission. The largest stockholders have decided that they would prefer to pay an assessment on their stock rather than endeavor to put these bonds out under the present unfavorable conditions and burden the company with high interest charges. Heretofore assessments to furnish capital have been considered unnecessarily conservative; but the directors of the Oakland, Antioch & Eastern Railway believe that assessments levied for capital improvements and additions and not for deficits or loss, will be, before long, considered the soundest foundation for any corporation to build on. In order that the stockholders may share this understanding, a physical valuation is being made by Bion J. Arnold, as well as a consolidated audit of the companies by Price, Waterhouse & Company which, when completed in the near future, will be distributed to stockholders."

**Ottawa (Ont.) Electric Railway.**—The Ottawa Electric Railway has called for payment \$15,000 of 4 per cent debenture bonds issued under the mortgage dated June 29, 1897. The bonds will be paid at par and interest on July 5, 1914, at the office of the company in Ottawa.

**Pacific Gas & Electric Company, San Francisco, Cal.**—The Pacific Gas & Electric Company has issued a circular to stockholders outlining a plan of financing and requesting the approval of a charter amendment for the re-classification of the capital stock into \$100,000,000 of common, \$50,000,000 of first preferred 6 per cent cumulative and \$10,000,000 of present preferred. The stockholders will have the right to subscribe to an immediate issue of \$12,500,000 of new preferred at \$82.50 a share. The right is extended to holders of the old issue of \$10,000,000 of preferred stock to receive after July 1, 1916, 10¼ shares of new preferred for ten shares of old preferred. The proceeds from the sale of new preferred stock will be applied toward the payment of one-year notes amounting to \$7,000,000 and other indebtedness, leaving approximately \$2,500,000 in the company's treasury. The company controls the Sacramento Electric, Gas & Railway Company.

**Sioux City (Ia.) Service Company.**—The First National Bank, Milwaukee, Wis., is offering at 97 and interest first and refunding mortgage sinking fund 5 per cent gold bonds of the Sioux City Service Company, dated 1910, and due June 1, 1928. The amount of the bonds outstanding under this issue is \$1,378,000. The company was formerly known as the Sioux City Traction Company. It operates 45 miles of line and supplies power for industrial and lighting purposes.

**United Railways & Electric Company, Baltimore, Md.**—The stockholders of the United Railways & Electric Company have authorized the issue of \$1,000,000 of 5 per cent convertible notes which were recently offered and over-subscribed. The stockholders also authorized the sale of \$489,000 of 5 per cent bonds of the Maryland Electric Railways now in the treasury of the company. It is stated that the stockholders of the United Railways & Electric Company took all of the notes to which they were entitled, leaving only about \$100,000 to be divided among non-stockholding subscribers. The subscriptions from non-stockholding subscribers totaled several million dollars and the bankers, Alexander Brown & Sons, threw out all bids for lots of more than \$10,000, while those who asked for less than \$10,000 and more than \$1,000 were awarded from one-tenth to one-twentieth of the amount requested. The Public Service Commission on June 5 heard the application of the United Railways & Electric Company for permission to issue the \$1,000,000 of two-year notes, which have already been sold subject to the approval of the commission. The commission reserved its decision.

**Warren, Brookfield & Spencer Street Railway, Brookfield, Mass.**—The property of the Warren, Brookfield & Spencer Street Railway was offered for sale at Brookfield on June 4, under foreclosure of the mortgage, for which the International Trust Company, Boston, Mass., is trustee. The upset price of the property was fixed at \$150,000, but no

bids were made. The property will be offered again on July 16. H. N. Lathrop, president and general manager of the Plymouth & Sandwich Street Railway, Plymouth, Mass., stated before the adjournment of the sale that parties he represented would bid for the property provided the minimum price to be received for it by the receiver was reduced by the court. Thomas T. Robinson, Boston, the receiver, is reported to have stated that he does not favor a modification of the court's decree with respect to the selling price.

**Dividends Declared**

- Brazilian Traction, Light & Power Company, Toronto, Ont., quarterly, 1½ per cent, preferred.
- Columbus (Ga.) Electric Company, 3 per cent, preferred.
- Continental Passenger Railway, Philadelphia, Pa., \$3.
- Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.
- Indianapolis (Ind.) Street Railway, 3 per cent.
- Manila Electric Railroad & Lighting Corporation, Manila, P. I., quarterly, 1¾ per cent.
- New Orleans Railway & Light Company, New Orleans, La., 1¼ per cent, preferred; 50 cents, common.
- New York State Railways, Rochester, N. Y., quarterly, 1¼ per cent, preferred; quarterly, 1½ per cent, common.
- Philadelphia Company, Pittsburgh, Pa., quarterly, 1¼ per cent, common, 2½ per cent, 5 per cent non-cumulative preferred.
- Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1¾ per cent, preferred; quarterly, 1½ per cent, common.
- Union Traction Company, Philadelphia, Pa., \$1.50.
- United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

**ELECTRIC RAILWAY MONTHLY EARNINGS**

**AURORA, ELGIN & CHICAGO RAILROAD COMPANY, WHEATON, ILL.**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Apr., '14	\$149,756	*\$104,010	\$45,746	\$33,345	\$12,400
1 " " '13	146,266	*95,923	50,344	32,735	17,609
10 " " '14	1,669,962	*1,071,008	598,954	343,043	255,911
10 " " '13	1,602,216	*956,167	646,049	322,062	323,987

**CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Apr., '14	\$31,896	*\$17,317	\$14,579	\$11,005	\$3,574
1 " " '13	29,683	*16,501	13,182	10,607	2,575
4 " " '14	115,833	*66,498	49,336	43,789	5,547
4 " " '13	110,307	*64,306	46,000	41,727	4,273

**CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Apr., '14	\$99,627	\$60,562	\$39,065	\$32,190	\$6,875
1 " " '13	94,941	57,567	37,374	31,238	6,136
4 " " '14	373,925	239,493	134,433	128,143	6,290
4 " " '13	354,933	231,044	123,889	124,213	†324

**DETROIT (MICH.) UNITED RAILWAY**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Apr., '14	\$1,009,588	\$682,897	\$326,502	\$179,533	\$166,969
1 " " '13	1,063,666	687,012	376,653	179,882	196,771
4 " " '14	3,864,029	2,660,615	1,203,414	721,055	402,359
4 " " '13	4,035,876	2,671,773	1,364,103	717,294	646,808

**LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Apr., '14	\$109,199	*\$75,175	\$34,025	\$35,287	†\$1,262
1 " " '13	102,229	*71,694	30,535	35,063	†4,528
4 " " '14	410,161	*878,244	131,816	140,906	†9,090
4 " " '13	386,166	*260,263	135,903	139,891	†13,988

**NEW YORK (N. Y.) RAILWAYS**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Apr., '14	\$1,180,514	\$733,840	\$446,674	\$371,949	\$74,725
1 " " '13	1,202,761	743,173	482,170	375,770	106,400
10 " " '14	11,806,187	7,287,075	4,519,112	3,708,666	810,446
10 " " '13	12,025,770	7,270,817	4,754,953	3,765,138	989,716

**NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Apr., '14	\$287,719	*\$173,322	\$114,397	\$50,331	\$64,066
1 " " '13	238,546	*154,621	83,926	45,214	38,712
4 " " '14	1,080,884	*668,302	412,582	200,155	212,427
4 " " '13	925,727	*582,406	343,321	180,296	163,025

**TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Apr., '14	\$743,578	\$386,032	\$357,546	\$225,063	\$132,483
1 " " '13	697,429	350,659	346,770	231,458	115,312
4 " " '14	2,920,604	1,603,032	1,317,572	900,448	417,124
4 " " '13	2,733,883	1,446,037	1,287,846	929,595	357,951

\*Includes taxes.  
†Deficit.

# Traffic and Transportation

## "Safety First" Banquet in Indiana

The fourth semi-annual "safety first" banquet of the Union Traction Company of Indiana, held at the Hotel Doxey, Anderson, Ind., on the evening of May 22, was attended by nearly 100 trainmen and officials. H. A. Nicholl, general manager of the company, was toastmaster, and in the absence of A. W. Brady, president of the company, J. A. Van Osdel was first to respond. Others who spoke were R. N. Hemming, superintendent of motive power; G. H. Kelsay, superintendent of power; W. H. Forse, Jr., secretary-treasurer, J. E. Hester, Anderson; C. O. Balfour, Indianapolis; Joseph Overman, Marion; Frank Smith, Muncie, and W. W. Fadely, Tipton. All the men took as their subject some phases of "safety first." During the evening several selections were sung by a quartet of employees of the company.

E. E. Slick, the claim adjuster, was chairman of the board of judges in the essay contest in which essays from employees were submitted on the subject of "Prevention of Accidents to Passengers," but the selection of the papers was made by the other members of the contest board, which consisted of J. E. Hester, general shop foreman; M. E. Graston, division passenger and freight agent; G. Graham, division shop foreman; A. Newhouse, division shop foreman, and A. A. Dunlap, division engineer.

The safety organization of the company consists of a general safety board made up of the operating officials of the company and five local safety committees, located at the different division points. These committees are made up of the division superintendents of the transportation, roadway, power and motive power departments, whose tenure of office is permanent, and of employees from the above departments and the general offices of the company to make the number of fourteen or fifteen for each committee. These members are changed every six months. The chairman of the local safety committees are appointed by the general manager, but a secretary is elected by each committee. The semi-annual banquets, in which the members of the general safety board and all members of the local safety committees participate, have proved very effective in promoting good fellowship and co-operation among all departments. In July or August, two separate days will be set aside for the third annual picnic, at which all employees are expected to be present.

To stimulate interest by its trainmen the company determined to offer for the best three papers written on the subject of "Prevention of Accidents to Passengers" a first prize of \$15, a second of \$10 and a third of \$5. The contest was open to all motormen, conductors and brakemen in good standing and the essays were to consist of not less than 150 and not more than 300 words. Each local safety committee selected one of its number as a judge of the contest, and the committeemen thus selected, in conjunction with Mr. Slick, as chairman, constituted the contest board to pass on all articles presented, and on all subjects of dispute.

The essay of Harley G. Hook, a conductor on the interurban division of the company who was awarded the first prize, was as follows:

"For the prevention of avoidable accidents to passengers, as far as the passenger-carrying company is concerned, efficient and responsible men imbued with the safety-first idea are an absolute necessity.

"Men must be selected for training in the passenger service, in whom efficiency and responsibility can be developed in a high degree, hence their selection is a matter of careful discrimination.

"The strict and careful adherence to duty that can result only in the formation of habits that prepare the trainman to carry out his work with machine-like precision, is his first care.

"This line of action brings about the complete co-operation of hand, brain and eye that makes the efficient man. This state of development, however, presupposes temperate living.

"Under any other condition the highest degree of efficiency is impossible, and lack of efficiency is lack of responsibility, and irresponsibility means loss of life, limbs and material valuation. Trainmen of conscience and Christian character,

never take a chance with the lives of others. A man of this degree of development in his business will know the condition of the mechanism he has to operate, will know how to act in an emergency and will work in accord with those with whom he is associated."

The essay by John E. Hancock, a motorman on the interurban division, who was awarded the second prize, was as follows:

"The prevention of accidents lies in the mental power and action of man; concentration of power and ability to succeed are equal to the foundation for stability of character. Worry, excitement, or anything else which tends to disturb the mind, would be detrimental to successful concentration. With effort of will, we can shut out annoying impressions. This may seem hard to do, yet it is an accomplishment worth cultivating. The impression may be so strong as to hold attention against the resisting efforts of the will. However concentration necessarily limits the range of thought and action within the scope of mental vision, and confines one's acquirements closely to a specialized field.

"Difficulties are only stimulants to intelligence. The word impossible is often a mere call to sacrifice strength and endurance; in other words, our greatest accomplishments were considered to be impossible of achievement at one time.

"The experiences or acts of to-day furnish food for thought for to-morrow, and we should profit thereby; whether it is the acts of others or our own deeds. If they are bad, improve them; if they are good make them better. We should not allow ourselves to think what is, will be, and so cannot be improved.

"We should never allow our minds, or range of vision, to wander beyond the territory of the position which we are filling. We should look after the interest and welfare of the passengers the same as we would the members of our family. We are responsible for their safety so long as they are in our care. Remember, we can bring cheer and happiness to many homes instead of sorrow, if we only do our duty. We must strictly adhere to all rules and regulations, be loyal to our passengers, our company and ourselves. Accidents will then vanish and safety reign supreme."

The essay by Joseph R. Finn, a motorman on the city lines of the company who was awarded the third prize was as follows:

"To determine the best means of preventing accidents, we must first learn the cause of all accidents. Strictly speaking, there is no such thing as an accident, for there cannot be an effect without a cause. All causation is mental first, last and all the time. Thought must precede all cause and action. A motorman can best help to prevent so-called accidents first by getting on good terms with himself, by leading an honest, straightforward, sober, clean life.

"No one can be an efficient workman if he is at war in his thought with anyone. Second, a workman must look on the officials of the road as co-workers in bringing out the service for the public and all other employees in the same sensible way. No man can do first-class work if he looks at his job from a personal or selfish standpoint. Having got our basis right, we must necessarily be in a harmonious state of thought. Being in a harmonious state of thought, we are in a mental condition to detect anything wrong and know how to prevent bad results. If a man is in a resentful, angry, hating state of thought, he cannot see bad conditions, but, on the contrary, is actually helping to make the conditions that cause accidents. Whatever a man does, he must give his undivided attention to it if he wishes to succeed. If a man cannot succeed in the small thing pertaining to his duty, he surely can never advance to larger things."

The names of the general safety board of the company follow: William H. Forse, Jr., secretary and treasurer; H. A. Nicholl, general manager; Walter Shroyer, auditor; S. R. Dunbar, purchasing agent; E. E. Slick, claim adjuster; C. A. Baldwin, superintendent of transportation; F. D. Norviel, general passenger and freight agent; C. H. Allen, real estate and tax agent; G. H. Kelsay, superintendent of power; R. N. Hemming, superintendent of motive power, and L. A. Mitchell, superintendent of track and roadway. The chairman of the board is H. A. Nicholl. S. R. Dunbar is secretary.

#### Increase in Fare on Kentucky Line

At least one electric railway in Kentucky will gain an advantage from the new State law designed to reduce the cost of travel, when that law goes into effect on June 20. Heretofore the average rate on the 70 miles of interurban lines of the Kentucky Traction & Terminal Company, Lexington, Ky., has been 2 cents a mile. After June 20, according to an announcement just made by the company, the rate will be increased to 2½ cents. The lines of the company connect Lexington, Paris, Georgetown, Nicholasville, Versailles and Frankfort.

The law will have the effect of reducing the cost of travel on the steam roads, but on the lines of the Kentucky Traction & Terminal Company it will mean, for instance, additions of 5 cents to the fares from Lexington to Georgetown, Versailles, Nicholasville and Paris. The rate to Frankfort has always been on the basis of 2½ cents a mile. Short rides, which have heretofore been charged for as a 5-cent fare, will, under the new law, yield the company 10 cents, the minimum fare which may be paid. Fares have been more or less arbitrary between certain points heretofore, but are to be made to conform exactly to the distances the passengers are carried.

The company heretofore has made an extra charge for carrying baggage other than hand baggage, but under the new law will have to carry up to 150 lb. for each passenger so desiring, free of charge. This phase is not expected to make much difference, for the lines have done very little baggage carrying under the former provisions when the total cost of travel, including the extra charge for baggage, was less than that on the steam lines.

The law applies to railroads which exceed fifty miles in length and earn \$4,000 gross or more a mile.

#### Economy Prize Contest Awards

Edwin C. Faber, vice-president and general manager of the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., has announced the prize winners in the contest for suggestions for the elimination of waste and the adoption of practices which would tend to greater economy in operation. The contest was first announced in a personal communication from Mr. Faber to each of the employees of the company. An abstract of this communication setting forth the objects of the contest appeared in the ELECTRIC RAILWAY JOURNAL for March 7, page 561. The competition closed on April 1. Sixty-two employees contributed papers and suggestions. These were judged by a committee consisting of three employees, one department head and one senior officer. A total of 175 separate suggestions was received. These were so keyed before delivery to the committee that the identity of the writers was unknown to the committee. In a number of cases investigations were necessary and data were compiled to obtain more exact knowledge of the true value of the suggestions. On account of the difficulty in deciding between some of the suggestions, the committee requested and was granted permission to award four additional prizes of \$5 each. In all, \$170 was divided into fifteen prizes. The first prize was \$50, the second prize \$25, and so on down in steps of \$5, with ten prizes of \$5 each.

In announcing the winners Mr. Faber wrote:

"You will readily appreciate that all of the suggestions cannot be carried out because some would involve an expenditure wholly out of keeping with the saving to be effected, but the spirit of loyalty and helpfulness displayed in this contest is very gratifying to the company and we believe it will lead to further campaigns along similar lines."

The prize winning suggestions were as follows:

Suggests shop experience and instruction for motormen while breaking in.

Suggests method of fare collection to prevent over-riding between Fifty-second Avenue and Fifth Avenue Terminal in Chicago.

A new collection system for Elgin Light & Power department.

A checking system for shop tools.

System for stopping illegitimate use of O.K'd cash fare receipts.

Suggests a system of inspection and marking for ties which should be removed from service.

Suggests replacement of certain obsolete electric meters.  
Improved method of handling wire and cable in storeroom.  
Oil lanterns and markers to be burned only while needed.  
City cars not to delay at end of lines.

Extra brasses for Chicago cars to be kept at Aurora and Elgin terminals.

Air hose on cars to be hung up properly.

Use of hedge fence for snow fences.

Pit lights in shops to be turned out when not needed.

Saving twine and using old reports for scratch pads.

The winner of the first prize made the suggestion that "when a new motorman has finished going over all the lines and is ready to accept the responsibility of the position for which he has applied, he should be placed under the instruction of the shop foreman. The shop foreman would explain to him during a short course of study the mechanism of the different types of cars in service, what the different parts are called, what and what not to do in case of car becoming disabled, what might happen in case of the abuse of different parts, what it costs this company annually for flat wheels and how to avoid them, how to start a car without causing a destructive rush of current to the motors, how to operate cars in snow, sleet and flooded streets without damage, how to save current on curves, etc., and what it costs annually for sand, its purchase, shipment, and the drying of same, and how and when to use it without waste."

**New Kansas Road Ready for Operation.**—The first car run over the Kansas City, Kaw Valley & Western Railway left Kansas City on the morning of June 6, carrying officers of the company. Regular service will begin on June 15. Power will be secured from the municipal plant in Kansas City, Kan.

**Record Traffic in Kansas City.**—More than 400,000 passengers were carried by the Metropolitan Street Railway, Kansas City, Mo., on Decoration Day, May 30, setting a new record for the day. This number was handled with only one accident. This occurred to a newsboy who attempted to board a moving car.

**Liquor Advertisements Barred From Cars.**—Orders have been issued canceling all liquor advertisements in cars of the West Penn Traction Company, Pittsburgh, Pa., which operates throughout the coke region. The company is strictly enforcing the rule against drinking by employees, and the officials decided that in view of their attitude in this matter it was not consistent to accept liquor advertising.

**Accidents in New York in April.**—Reports of accidents on railroads and street railroads in New York City during April, made to the Public Service Commission for the First District, show that the total number was 5352, which is a decrease of nearly 400 from the same month last year. The total number of injuries decreased from 3827 to 3310, and the number killed increased from four to nine, although the total of serious injury cases, 200, was sixteen less than in the same month last year.

**Railway and Real Estate Companies Co-operate.**—The Topeka (Kan.) Railway is co-operating with real estate concerns of the Kansas capital by utilizing its advertising space to urge residents to locate as far out as possible. The company's advertising explains that a number of advantages are available in the suburbs, such as low taxes, better air and more room. It concludes by asserting that the suburbs are as convenient as homes in the central part of the city because of the rapid and reliable street railway service.

**Safety Campaign in Ottawa.**—The Ottawa (Ont.) Electric Railway has started a "safety first" campaign in Ottawa. Permission has already been obtained from the school boards to hang "safety first" calendars, such as are used in Brooklyn, N. Y., in each classroom, and arrangements have been made with moving picture houses to run "safety first" films. The Montreal Tramway's campaign will be followed in a modified form by educating and instructing the company's employees, obtaining the assistance of the newspapers and attempting to educate the public generally along "safety first" lines.

**Canadian Fare Reduction Petition Dismissed.**—The application of Mayor Baillie, of Aylmer, Ont., made to the Railway Commission of Canada, on behalf of the town of Aylmer for a reduction of the fare between Hull and Aylmer on the

Hull (Que.) Electric Railway, has been dismissed by the board. Mayor Baillie told the board that there were 400 people in Aylmer who work in Ottawa all the year round and that the number would be increased if the fares were reduced. E. W. Beatty, representing the company, contended that the fares per mile on the Hull Electric Railway are lower than on many other similar roads in Canada and the United States. He also explained that the company pays a dividend of only 3.7 per cent. Gordon Gale, general manager for the company, took exception to the statement of Mayor Baillie that 400 people travel daily into Hull from Aylmer.

**"Safety First" League in Louisville.**—At the last meeting of the directors of the Louisville (Ky.) Railway a fund of \$35,000 was set aside to be expended in "safety first" work under an original method. Every one of the 1050 motormen and conductors in the company's employ who joins the "safety first" league which the company intends to organize will share in this fund at the rate of 1 cent an hour for the time he is actually at work. All the company's lines are affected, namely the city lines, the Louisville & Interurban lines and the Louisville & Eastern Electric Railway. The distribution of the fund became effective on June 1, and the fund will be sufficient to keep the plan in operation for the remainder of the fiscal year. It was not so stated but it is understood that the arrangement, provided it proves reasonably successful this year, will be continued in succeeding years. Actual organization of the men will follow at once, according to Samuel Riddle, superintendent of the company. It is intended that much of the work shall be done through committees.

**The Louisville Disbarment Case.**—The members of the firm of Louisville, Ky., attorneys recently accused by Judge Field of the local Circuit Court at Louisville of practices which if proved, meant disbarment, have thrown themselves on the mercy of the court. Responses filed when the case was originally called denied that the attorneys were guilty of acts charged. This meant a trial by jury. The formal responses were withdrawn recently and the attorneys, who have been prominent in suits for damages against the Louisville Railway, each filed his statement with the court. The members of the firm are all young men and the firm has been remarkably successful in getting judgments from juries. The following extract from the statement of one of the accused attorneys is characteristic of the statements filed by the other members of the firm. "If it be unprofessional to solicit business or to lend money to an injured person having a family and unable to work, then my firm and a large portion of the lawyers at this bar are guilty of such conduct. . . . Lawyers much older than I have for many years set the example of soliciting business and rendering financial aid to their clients."

**Hearing in Cincinnati Suburban Fare Case.**—The hearing on the injunction case of the Ohio Traction Company and the Cincinnati & Hamilton Traction Company against the city of Cincinnati, to prevent the latter from putting into force a 5-cent fare ordinance on the Millcreek Valley line between Cincinnati and Hartwell, was begun before Federal Judge John E. Sater on June 8. In closing the arguments Attorney Lawrence Maxwell, for the companies, stated that the enactment of the ordinance fixing a fare of 5 cents is an unlawful attempt to force the companies to make a reduction. He said that fraud is shown upon the face of the instrument. Mr. Maxwell contends that the county commissioners have a right to grant perpetual franchises on all roads lying within a municipality when they have control of them, as they did in this case. According to him the franchises held by the company were, with one or two exceptions, all granted by the County Commissioners. City Solicitor Schoenle contended that the franchises granted by the County Commissioners are not valid. He declared further that the commissioners had no right to grant perpetual franchises and no right to grant franchises on portions of road lying within the corporate limits of a municipality. According to him the companies have no franchises on the Springfield pike to Wyoming through Hartwell. Walter A. Draper, vice-president of the Ohio Traction Company, stated that a total of more than \$450,000 has been spent on the road between the Cincinnati Zoo and Carthage.

## Personal Mention

**Mr. C. O. Mailloux** has had the degree of Doctor of Science conferred on him by Lehigh University.

**Mr. Louis B. Stillwell** has had the degree of Doctor of Science conferred on him by Lehigh University.

**Mr. R. M. Hannaford**, assistant chief engineer of the Montreal (Que.) Tramways, has been elected second vice-president of the Canadian Railway Club.

**Mr. C. N. Wilcoxon**, who for the last four years has been general manager of the Chicago, Lake Shore & South Bend Railway, was elected president of the company at the annual meeting, held at Michigan City, Ind., on June 8.

**Mr. Howard Griswold**, formerly assistant engineer for the San Francisco-Oakland Terminal Railways, Oakland, Cal., has been made mechanical and electrical engineer for the Central California Traction Company, with headquarters at Stockton.

**Mr. J. V. Sullivan**, formerly general supervisor of the Chicago (Ill.) Railways, has resigned that position to become assistant to Mr. John E. Wilkie, vice-president of the Chicago Railways and assistant to L. A. Busby, president of the Chicago Surface Lines.

**Dr. Harold Pender**, at present professor of electrical engineering at the Massachusetts Institute of Technology and director of the research division of the department of electrical engineering, has accepted an invitation to become professor in charge of the department of electrical engineering at the University of Pennsylvania and will take up his new duties next fall.

**Mr. Alva C. Dole** has been appointed superintendent of the Elmwood division of the Rhode Island Company, Providence, R. I., to succeed the late A. Frank Searle. Mr. Dole became connected with the Rhode Island Company last November and was assigned to the Clyde carhouse, which embraces all of the car lines in the Pawtuxet Valley, including the Providence-Washington, Phenix-Rocky Point, and the Crompton-Hope lines. Prior to last November he was superintendent of the Providence & Fall River Street Railway for five years, with headquarters at Swansea.

**Mr. James Walter Gillette**, formerly general manager of the Fort Smith Light & Traction Company, Fort Smith, Ark., has accepted the position of sales engineer for the Electrical Engineers' Equipment Company, Chicago, Ill. Mr. Gillette was born on June 28, 1871, and was educated in the Middle West. He has had extensive engineering experience with electrical manufacturing companies and central station companies both in the United States and in South America. At the sixth annual convention of the Arkansas Association of Utility Operators in May, 1913, he was elected president of that body.

**Mr. Paul Breese** has been appointed superintendent of the Clyde division of the Rhode Island Company, Providence, R. I., to succeed Mr. Alva C. Dole. Mr. Breese has been with the Rhode Island Company since 1900, excepting for an interval of one year. He was first employed as a motor-man in 1900, and in 1902 he went with the Berkshire Street Railway. In 1901 he was inspector for about a year. Mr. Breese returned to Rhode Island in 1903 and worked as conductor. For about five years he was engaged in special work and was in charge of the construction car. He has been a conductor on the East Greenwich line for the last two years.

**Mr. A. D. Schindler** has resigned as vice-president and general manager of the Northern Electric Railway, Chico, Cal., to devote himself to his private interests in southern California. Mr. Schindler has been connected with the Northern Electric Railway since July, 1906. Prior to that time he was with the Pacific Electric Railway. He was previously connected with the Spreckles interests in San Diego. He also served for three years with the engineering forces of the steam railroads in Washington, which are now part of the Great Northern System. Before that he was connected with the Southern Pacific Company in Arizona for twelve years as a civil engineer.

**Mr. B. J. Jones**, who has been manager of the Steubenville & East Liverpool Railway & Light Company, the East Liver-

pool Traction & Light Company and the Ohio River Passenger Railway, East Liverpool, Ohio, will continue to manage the Steubenville & East Liverpool Railway & Light Company and the Ohio River Railway. Mr. Jones became connected with the properties at East Liverpool on Nov. 1, 1913, to remain only during the receivership, which was terminated on April 1. The owners of the properties at East Liverpool have decided to separate them, and have appointed Mr. F. A. Nichols, Buffalo, as manager of the East Liverpool Traction & Light Company.

**Mr. C. B. King**, who has been elected president of the Canadian Electric Railway Association, was born in Galena, Ind., on Sept. 12, 1871. He attended the public schools at New Albany, Ind., and was graduated from the high school there in May, 1891. Mr. King began work in the shops of the Louisville (Ky.) Railway in June, 1891, and shortly afterwards was appointed storekeeper, which position he held till April, 1895, when he accepted the office of chief clerk to the general manager of the Detroit Citizens' Street Railway. This company was reorganized in 1900 as the Detroit United Railway with practically the same officers as the Detroit Citizens' Street Railway, and Mr. King continued with the new company as assistant division superintendent and assistant to the president until November, 1905, when he was appointed manager of the London (Ont.) Street Railway, which position he still holds.

**Mr. Robert Patterson Woods**, who recently was appointed to the board of control of the Metropolitan Street Railway, Kansas City, Mo., representing the city to succeed Mr. L. R. Ash, subject to ratification, was born at Buffalo, N. Y., on March 4, 1870. From 1891 to 1901 Mr. Woods was connected with a number of bridge, waterworks and sewer projects for various corporations. In 1900 he was chief engineer in charge of construction of the Wabash River traction line. In 1901 he held the same position in connection with the building of the Indianapolis-Shelbyville line. From 1902 to 1904 he was with the Indianapolis & Northwestern Traction Company as chief engineer. In 1904 he became consulting and construction engineer in charge of the design and construction of the Lebanon-Thorntown Electric Railway, Lebanon, Ind. He is at present vice-president and general manager of that company. A 10,000-acre electric pumping project at Portales, N. M., engaged Mr. Woods' attention after he had completed the Indianapolis & Western lines in 1908. From May, 1911, to June, 1913, he was chief engineer for the Kansas City, Clay County & Excelsior Spring Railway. Mr. Woods is the author of a number of technical papers on engineering. He served two terms as president of the Indiana Engineering Society. His home is in Kansas City and he maintains offices in that city and in the Traction Terminal Building, Indianapolis.

**Mr. A. L. Valentine**, superintendent of the department of public utilities of the city of Seattle, Wash., which includes the municipal street railway and the division of weights and measures, was born in Fontanelle, Adair County, Ia., on June 18, 1868. He went to California with his parents in 1875, and soon thereafter settled in Seattle with his uncle. Mr. Valentine's education was obtained in the Seattle public schools. In 1886 he was employed by the Puget Sound & Grays Harbor Railroad as a member of the surveying party. From 1887 to 1890 he was employed in the office of the city engineer of Seattle. Later he was associated with the Port Townsend Southern Railroad as engineer in charge of terminals, and subsequently was associated with the Northern Pacific Railway in connection with the Seattle terminals. From 1892 to 1897 he was assistant engineer of the Oregon Improvement Company and chief clerk to the superintendent of the Columbia & Puget Sound Railroad, a subsidiary of the Oregon Improvement Company. In 1897 he was employed by the Northern Pacific Coal Company, but re-entered the employ of the Oregon Improvement Company in the fall as manager of its store at Franklin, Wash., where he remained until 1899. During the summer of 1899 he was employed on engineering work by the Great Northern Railway. In the following year he went to Nome, Alaska, where he resided three years. In 1904 Mr. Valentine was elected to the office of county engineer of King County, Wash. In 1906 he was re-elected to the position of county engineer. He was appointed to the position of superintendent of public utilities on Sept. 29, 1909, by Mayor John F. Miller to fill

an unexpired term, and on Jan. 1, 1910, he was appointed for a full term of three years. He was reappointed for a term of three years on Jan. 1, 1913, by Mayor George F. Cotterill. During 1912 Mr. Valentine was chairman of the Board of Public Works of Seattle.

#### OBITUARY

**Spencer Swain**, vice-president of the Heywood Brothers & Wakefield Company, died on June 7 at his home in Harrison, N. Y.

**Edward Brill**, vice-president and treasurer of The J. G. Brill Company, died of pneumonia at his home in Atlantic City, on June 7, after a short illness. Mr. Brill was born in Philadelphia and was the third and, at the time of his death, the only remaining son of John George Brill who, with his eldest son, George Martin Brill, founded the business in 1868. He was educated in the public schools of Philadelphia and started with the company in 1880 as timekeeper at the old plant at Thirty-first and Chestnut Streets. He rose through several departments to become head of the lumber department in 1888. This office he retained until 1906, when he was elected treasurer and remained in charge of the financial affairs of the company until his death. In 1912 he was in addition elected vice-president. Mr. Brill always took a great interest in financial affairs. He was possessed of a remarkable memory for details and a keen faculty for exactness. In addition to being vice-president and treasurer of The Brill Company he was a director and treasurer of the John Stephenson Company, Elizabeth, and the American Car Company, St. Louis; assistant treasurer and director of the Wason Manufacturing Company, Springfield, and he was also a director of the G. C. Kuhlman Car Company, Cleveland.

**Jacob Furth**, president of the Puget Sound Traction, Light & Power Company, and the Puget Sound Electric Railway, Seattle, Wash., and one of the foremost financiers on the Pacific Northwest, died at his home in Seattle on June 2. Mr. Furth was born in Schwihau, Bohemia, on Nov. 13, 1840. He was one of ten sons and attended the schools of his native country until he reached the age of fourteen. In 1858 Mr. Furth settled in Nevada City, Cal., where he obtained employment as salesman in a mercantile establishment. Shortly thereafter he opened a small store at North San Juan, Cal. In 1870 he removed to Colusa, Cal., where he conducted a general store for twelve years. In 1882 he removed to Seattle. In the fall of 1883 Mr. Furth and others organized the Puget Sound National Bank. Later he was elected president of the institution, which soon grew to be the largest and strongest bank in the city. In 1899 Stone & Webster, Boston, began negotiations toward consolidating the light and railway properties in Seattle and enlisted Mr. Furth's assistance. He was financially interested in the Madison Street cable line and also the First Avenue cable system. As a result of negotiations covering several months, a merger was consummated which included all the street railways. Mr. Furth was elected president of the system, first known as the Seattle Electric Company, and now incorporated as the Puget Sound Traction, Light & Power Company. Mr. Furth's benefactions to Seattle were many and far reaching.

In his annual report as president of the Public Service Company of Northern Illinois Samuel Insull refers to the new Public Utilities Commission of Illinois. He also describes at length welfare work for employees in which the company has engaged. Mr. Insull says that the new Illinois commission law "will doubtless cause some operating inconvenience for a time, but no serious difficulties are anticipated, and the ultimate result should be beneficial both to the public and to the company. The company's service is rendered in fourteen counties and in 144 municipalities, with varying ordinance requirements, and eventually regulation by one body must naturally tend toward a larger degree of uniformity. A service annuity system to make provision for faithful employees was put into effect on Dec. 1, 1913. It is administered by a committee of five composed of the president of the company as chairman, the secretary of the company as secretary, ex officio, and three other members to be appointed annually by the board of directors.

## Construction News

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

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

#### RECENT INCORPORATIONS

**Wilmington & West Chester Railway, Wilmington, Del.**—Application for a charter has been made by this company in Delaware to build an electric railway from the present end of the Washington Street line of the Wilmington & Philadelphia Traction Company on the Boulevard to Concord Avenue. It is expected to eventually extend this line to Lombardy cemetery on the Concord turnpike in Wilmington. Capital stock, \$6,000. Incorporators: William A. Heindle, Alfred W. Burke, Joseph A. Berndt, Julius Theobald and David L. Ott. [E. R. J., May 30, '14.]

**\*Kansas City (Mo.) Railways.**—Incorporated in Missouri to succeed the Metropolitan Street Railway, Kansas City, if the proposed franchise extension is granted. Capital stock, \$100,000. Directors: Frank Hegeman, Chester H. Smith, Clyde Taylor, Kenneth W. Tapp, A. B. Sayre, J. W. Murray, R. J. Clark, James B. Welsh, E. E. Ball, S. R. Freet and J. A. Harden.

**\*Grand Falls (N. B.) Electric Railway.**—Incorporated by the New Brunswick Legislature to build an electric railway in Grand Falls, N. B.

**\*Nova Scotia Tramways & Power Company, Halifax, N. S.**—Incorporated in Nova Scotia by the Nova Scotia Legislature to take over the Pictou County Electric Company with its electric railway, and the Halifax Electric Tramway Company, Halifax.

#### FRANCHISES

**Fresno, Cal.**—John B. Rogers, promoter of the Fresno Interurban Railway, has bought a franchise from the Council to build a short line within the city limits of Fresno from the city corporate line to Belmont Avenue, Fresno.

**New Haven, Conn.**—The Connecticut Company has received three of the five petitions for permission to relocate its tracks in different towns in Connecticut. The petitions granted were for relocations in East Hartford, Bridgeport and Hartford.

**Wilmington, Del.**—The Wilmington & West Chester Railway, the incorporation of which is noted above, will ask the Council for a franchise to build an electric railway from the present end of the Washington Street line of the Wilmington & Philadelphia Traction Company on the Boulevard to Concord Avenue in Wilmington.

**Miami, Fla.**—B. B. Tatum, representing the Miami Traction Company, has asked the Council for a franchise to build a 2½-mile trackless trolley line in Miami.

**Freeport, Ill.**—The Freeport Railway & Light Company has asked the Council for a franchise to extend several of its lines in Freeport.

**Greenville, Ky.**—The Central City, Greenville & Drakesboro Railway has received a franchise from the Council in Greenville. This is part of a plan to build an electric railway to connect Central City, Drakesboro, Greenville, Hillside, Brownsville, Mercer, Powderly, Bevier and Graham. W. H. Netherlands, Central City, is interested. [E. R. J., May 9, '14.]

**Louisville, Ky.**—Action on the measure to create a franchise for the extension of the Chestnut Street line of the Louisville Railway has been deferred by the Board of Aldermen of Louisville, to which body the measure was sent after its passage by the Councilmen. The Aldermen's Committee asked for further time on the measure.

**Brockton, Mass.**—The Bay State Street Railway has received a franchise from the Council to extend its tracks in Brockton.

**Tonawanda, N. Y.**—The Frontier Electric Railway has received from the Board of Aldermen a six months' extension of time on its franchise in which to begin the construction of its line in Tonawanda. James S. Simmons, Niagara Falls, vice-president. [E. R. J., March 21, '14.]



**Wilmington, N. C.**—The Tidewater Power Company has received a franchise from the Council to extend its line out on Red Cross Street to Oakdale cemetery and also to make certain changes on Princess Street in Wilmington.

**Cape Breton, N. S.**—The Cape Breton Electric Company has received a franchise from the Cape Breton County Council for an extension to New Waterford.

**Sharon, Ohio.**—The Mahoning Valley Street Railway has received a franchise from the Council to extend some of its lines in Sharon.

**Dunnville, Ont.**—The Dunnville, Wellandport & Beamsville Electric Railway has received an extension of six months on its franchise for the completion of the line under construction in Dunnville.

**Pittsburgh, Pa.**—The Wilkes-Barre Railroad has asked the Council for a franchise to extend its West Pittston Street line in Pittsburgh from the present terminus, at Wyoming Avenue, up Exeter Street to the tracks of the Delaware, Lackawanna & Western Railroad.

**Forney, Tex.**—Application has been made by the Stone & Webster interests to the Council in Forney and in Mesquite asking for franchises for the Dallas & Terrell Interurban Railway in Forney and in Mesquite. [E. R. J., May 2, '14.]

**Temple, Tex.**—The Southwestern Traction Company has asked the Council for a franchise to extend its lines in Temple.

**\*Raymond, Wash.**—Frank McMean has asked the County Commissioner for a franchise to build a system of electric railways on all the public highways in Pacific County.

#### TRACK AND ROADWAY

**\*Mobile, Ala.**—H. L. Misamore, Fairhope, and associates are considering plans to build an electric railway to connect Mobile and Pensacola. The line would extend from a point on the Mobile River opposite the foot of Dauphin Street across Mobile Bay, thence south on the eastern shore to Zundels, then east to Magnolia Springs, Foley, Elberta, Lillian and Pensacola.

**Alabama Traction Company, Montgomery, Ala.**—Having lost its legal fight to force the Montgomery Light & Traction Company to allow it to use tracks through the business streets, the Alabama Traction Company plans to build its electric railway through other streets and touch the business and residential sections in Montgomery.

**Edmonton (Alta.) Interurban Railway.**—Plans are being considered by this company as to the most economical form of motive power for its line to St. Albert; also as to the advisability of building a line to Fort Saskatchewan, 18 miles east of Edmonton.

**Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.**—This company has placed an order with the United States Steel Products Company for rails. Good progress is being made with the grading for its line between Lacombe and Edmonton. Gasoline-electric cars will be operated. J. B. McBride, Lacombe, secretary. [E. R. J., March 14, '14.]

**Warren-Bisbee Railway, Warren, Ariz.**—This company plans to buy four special track layouts from the Buda Company, Chicago.

**British Columbia Electric Railway, Vancouver, B. C.**—In connection with the operation of its Saanich interurban line, opened for service last year, this company is making plans for the development of a pleasure resort on Vancouver Island to meet the demands of residents and visitors to Victoria, B. C.

**Northern Electric Railway, Chico, Cal.**—This company plans to double-track its line from Factoryville Junction to the Scranton City line.

**Pacific Electric Railway, Los Angeles, Cal.**—The first official run has been made over the newly completed Los Angeles-San Bernardino electric line, which will probably be placed in service in July with due ceremony at Urbita Springs, a point central to all towns which will benefit by the new electric line.

**Marin County Electric Railway, Mill Valley, Cal.**—Work has been begun by this company on Cascade drive in Mill

Valley on the branch of this railway which will connect Mill Valley and Sausalito. W. Wesley Hicks, 320 Market Street, San Francisco, chief engineer. [E. R. J., May 30, '14.]

**San Francisco (Cal.) Municipal Railway.**—The contract for the construction of about 2 miles of new track for this company was awarded on June 4 by the Board of Public Works of San Francisco to F. Rolandi. This new line is to lead from Market Street and Stockton Street through the Stockton Street tunnel to Columbus Avenue and thence to and across the Fort Mason military reservation to a terminus near one of the exposition entrances in San Francisco.

**Okeechobee Interurban Railway, Arcadia, Fla.**—About 15 miles have been graded by this company on its line from Arcadia to the eastern coast of Florida. This line will connect two canals and a steam railway. E. Prouty, Arcadia, president.

**Idaho-Pacific Railway, Twin Falls, Idaho.**—Work will be begun by this company within the next few weeks on its line between Twin Falls, Hagerman, Tuttle, and Castleford. Headquarters: First National Bank Building, Twin Falls. M. J. Sweeley, Twin Falls, president. [E. R. J., April 11, '14.]

**Freeport Railway & Light Company, Freeport, Ill.**—Extensions of this railway to the southerly and westerly portions of Freeport are being contemplated by this company. One line will be extended to within a block of St. Francis Hospital and another line to within the same distance of the city cemetery.

**Marion, Bluffton & Eastern Traction Company, Indianapolis, Ind.**—This company has effected a reorganization under the name of the Marion & Bluffton Traction Company. Articles of incorporation for the new company were filed recently with the Secretary of State. The directors, who include Hugh Dougherty, Indianapolis, remain the same. The capital stock of the company as now incorporated is \$216,000, divided into 2160 shares of common stock.

**Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.**—Work will soon be begun by this company on extensions to Morton Park and to Beallview Park in Richmond.

**Union Electric Company, Dubuque, Ia.**—This company is asked to consider plans for an extension along Dodge Street and Fremont Avenue to the Wartburg seminary in Dubuque.

**Joplin & Pittsburg Railway, Pittsburg, Kan.**—Work has been begun by this company on the extension from Broadway on Ninth Street to Lincoln Park in Joplin.

**Shreveport (La.) Traction Company.**—Preparations have been begun by this company for double-tracking its Fair Grounds-Highland Park line on Texas Avenue between Jordan Street and the Kansas City Southern Railway crossing in Shreveport.

**\*Fort Fairfield, Maine.**—Louis A. Cyr, John M. Wood and Alfred L. Noyes are considering plans to build an electric line from Fort Fairfield to Limestone, Caswell, Cyr, Connor and other points.

**Portland, Gray & Lewiston Railroad, Portland, Maine.**—The 10-mile line between Lewiston and Portland has been completed and will soon be placed in operation.

**Bay State Street Railway, Boston, Mass.**—Plans are being contemplated by this company for a double-track line over Main Street in Randolph from the Avon line to West Corners, where the state highway begins.

**Grand Rapids (Mich.) Railway.**—Work on the extension in Grand Rapids on Franklin Street from Lafayette Avenue to Division Avenue S. E., is under way.

**\*Muskegon-Saginaw Electric Company, Muskegon, Mich.**—This company has been organized with a capitalization of \$1,000,000, and 90 miles of right-of-way for an electric line between Muskegon and Stanton have been obtained. The organization of this company was made by the stockholders of the Muskegon-Casnovia Land & Development Company.

**Duluth (Minn.) Street Railway.**—This company is asked to consider plans for an extension between New Duluth and Gary.

**Cortland County Traction Company, Cortland, N. Y.**—During the summer this company plans to build about 1 mile of new track in Cortland. All orders have been placed.

\***Fredonia, N. Y.**—Surveys are being made to build an electric railway between Fredonia and Van Buren Point, 4 miles. No names are yet given of those interested in the project.

**Geneva, Seneca Falls & Auburn Railroad, Seneca Falls, N. Y.**—A 3-mile extension of this line in Geneva through Hamilton Street and Reed Street to Lyceum Street to form a loop connection with the present line at Milton Street is being considered by this company.

**Carolina & Yadkin River Railway, High Point, N. C.**—This company has placed in operation its line between High Point and Thomasville.

**Cleveland, Youngstown & Eastern Traction Company, Cleveland, Ohio.**—The Public Utilities Commission of Ohio has ordered the Cleveland, Youngstown & Eastern Traction Company to make repairs to its tracks and bridges that will require rebuilding to a large extent.

**Dayton, Middletown & Cincinnati Railway, Middletown, Ohio.**—This company is asked to consider plans to build its proposed line between Dayton, Middletown and Cincinnati, so that it will extend to Germantown. James G. Miller, West Chester, president. [E. R. J., May 30, '14.]

**Oil Belt Traction Company, Oklahoma City, Okla.**—Plans are being formulated by this company to build an electric railway which will have Oklahoma City for its Western terminus and Fort Smith, Ark., for the Eastern terminus. The railway has been financed and construction will soon be begun. The company will ask a bonus from each city. Concessions in the way of bridge rights may be accepted in lieu of a cash bonus. Oklahoma City is to be the headquarters. The main line will run east to Shawnee, thence to Henryetta and Okemah, to Checotah, pass through Warner, cross the Arkansas River near Tamaha, and, passing through Mackey, Sallisaw, Muldrow and Rowland, cross the Arkansas River again and enter Fort Smith. From Henryetta the first of the subsidiary lines of the company will branch off, running through Okmulgee, Kiefer, Sapulpa, Tulsa, Talala to Centralia, which is to be the junction point of a number of branches. From Centralia one line will run west to Nowata and Bartlesville. Another branch will be built northwest to Coffeyville. Another is to run east with Miami as its destination, and a fourth is to be built southeast through Vinita to Grove, and almost to the Arkansas line. It is planned to build a branch west from Sapulpa to Dumwright and Cushing, and a branch from Collinsville to Claremore also is projected. [E. R. J., May 16, '14.]

**Altoona & Logan Valley Electric Railway, Altoona, Pa.**—Work has been begun by this company double-tracking the Tyrone division. An additional track is being laid from East Altoona to the top of Hutchinson's Hill and also in the vicinity of Tipton.

\***Elizabethtown & Hershey Railway, Elizabethtown, Pa.**—Plans are being made by this company to apply soon for a charter to build an electric railway from Elizabethtown to Hershey via Conewago and Deodate.

**Montreal & Southern Counties Railway, Montreal, Que.**—The extension from Marieville to St. Cesaire, 9 miles, has been placed in operation. Work on the 15 mile extension from St. Cesaire to Granby is expected to be begun at once, and the contract calls for completion in October.

**Nashville-Gallatin Interurban Railway, Nashville, Tenn.**—Some 20 miles of extensions are being planned by this company. A branch will be built to connect with the existing line at Edgefield Junction and to extend in a northwardly direction from Nashville to Goodlettsville, Ridge Top, Green Briar and Springfield. Arrangements have been made to finance this project.

**Dallas (Tex.) Consolidated Electric Railway.**—Satisfactory arrangements are being completed between the Southern Methodist University and this company, which will insure the construction of a new line to be built on Abbott Avenue to Hillcrest and to the campus of the University.

**McKinney, Bonham & Paris Interurban Railway, McKinney, Tex.**—This company has awarded a contract to Fred-

erick A. Jones, Dallas, to make surveys for this 74-mile line to connect McKinney, Bonham and Paris. L. A. Scott, president. [E. R. J., June 6, '14.]

**South Morgantown Traction Company, Morgantown, W. Va.**—During the next few weeks this company will award contracts to build about 2 miles of new track from its present terminus to Tin Mill at Sabraton, W. Va.

**Seattle (Wash.) Municipal Railway.**—The second division of this railway which extends from Youngstown, in the southern part of Seattle, 9 miles in a southerly direction to Lake Burien, has been placed in operation.

**Beloit, Delavan & Clinton Railway, Beloit, Wis.**—Grading has been begun by this company on its 22-mile line between Beloit and Delavan. Charles F. Lathers, Beloit, is interested. [E. R. J., Dec. 20, '14.]

**Janesville & Madison Traction Company, Madison, Wis.**—This company has asked the Railway Commission of Wisconsin for certificates of convenience and necessity to build an electric railway between Janesville and Madison. G. Pickardt, 409 Washington Building, Madison, president. [E. R. J., May 23, '14.]

#### SHOPS AND BUILDINGS

**British Columbia Electric Railway, Vancouver, B. C.**—It is stated that excavation has been begun by this company at the site for the new carhouse at Vancouver, but plans for the structure have not been completed.

**Muncie & Portland Traction Company, Portland, Ind.**—This company has purchased the property in Portland opposite the present headquarters of the company and will remodel and rebuild the structure now on the ground for new headquarters. Terminal for freight and switching purposes will be established on the new property.

**Tri-City Railway, Davenport, Ia.**—This company is adding to its carhouse as described in the ELECTRIC RAILWAY JOURNAL for May 30. In the addition will be recreation rooms for the employees.

**St. John (N. B.) Railway.**—The carhouse addition to be built on Wentworth Street, St. John, will be begun at once. The structure will be of steel and brick construction, 58 ft. x 115 ft. The contract for the carhouse is reported to have been awarded to A. R. C. Clarke & Son, St. John, N. B.

**Atlantic City & Shore Railroad, Atlantic City, N. J.**—This company expects to occupy its new carhouse and office building in Atlantic City, about June 15.

**Sioux Falls (S. D.) Traction Company.**—This company has completed its new carhouse, office, shop and waiting room building in Sioux Falls. The structure is 88 ft. x 150 ft., with a capacity for 24 cars, and is of brick and granite construction. The office section of the building is two stories high, 22 ft. x 150 ft.

#### POWER HOUSES AND SUBSTATIONS

**Halifax (N. S.) Electric Tramways.**—This company is considering plans for the installation of another 2000-kw, high-pressure turbo-generator set.

**Guelph (Ont.) Radial Railway.**—Alterations are being made at this company's power house in Guelph. The improvements consist of dispensing with engine and boilers, and putting in car pits and stock rooms at a total cost of \$3,500.

**Portland, Eugene & Eastern Railway, Portland, Ore.**—Plans are being made by this company to build a shipping station at Georgetown.

**Dallas Electric Light & Power Company, Dallas, Tex.**—This company will add to its substation equipment a 1000-kw, two-unit, three-bearing motor-generator set. The apparatus has been purchased from the General Electric Company.

**Monongahela Valley Traction Company, Fairmont, W. Va.**—It is reported that this company will soon add a 1000-kw generator, gas-engine driven, at its power plant in Clarksburg.

**Milwaukee Electric Railway & Light Company, Milwaukee, Wis.**—This company will install additional substation equipment consisting of a 3000-kw rotary converter with starting panel and a 3150-kva water-cooled transformer. The contract for the apparatus has been placed with the General Electric Company.

# Manufactures and Supplies

## ROLLING STOCK

Aurora, Elgin & Chicago Railroad, Wheaton, Ill., is reported to be in the market for ten gondola cars.

Albany Southern Railroad, Albany, N. Y., has ordered two double-truck cars from The J. G. Brill Company.

South Morgantown Traction Company, Morgantown, W. Va., expects to purchase two Brill semi-convertible cars.

Lacombe & Blindman Valley Electric Railway, Lacombe, Alta., expects soon to purchase a gasoline-electric motor car for its new line between Lacombe and Edmonton.

Ephrata & Lebanon Street Railway, Ephrata, Pa., has ordered three steel passenger cars, three combination passenger and baggage cars and one 40-ft. baggage and express car from the Cincinnati Car Company.

Marine Railway, Brooklyn, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of May 30 as having ordered two closed storage-battery cars from the Railway Storage Battery Car Company, has placed the order for the car body with The J. G. Brill Company.

Wellington (New Zealand) Tramways are in the market for one motor car, according to foreign trade notice No. 13,181 of the Bureau of Foreign & Domestic Commerce, Washington, D. C. Copies of the specifications may be obtained from the office of the Tramways and Electrical Engineer, Harris Street, Wellington, on payment for the contract of \$5.11, which will be refunded upon receipt of a bona fide tender. Bids must be submitted by July 9, and local representation is necessary.

Scranton (Pa.) Railway has specified the following details for the ten closed prepayment cars which were recently ordered from the J. G. Brill Company:

Seating capacity.....48	Curtain fixtures,	Cur. Sup. Co.
Bolster centers, length,	18 ft.	Curtain material,
Length of body...30 ft. 6 in.		Pantasote
Length over vestibule,	42 ft. 6 in.	Destination signs...Keystone
Width over sills.....8 ft.		Door signals.....Consol.
Width over all...8 ft. 2 in.		Fenders.....H. B.
Height, rail over trolley		Gongs.....12 in. Dedenda
board.....11 ft. 6 in.		Hand brakes.....Peacock
Body,		Heaters .....Consol.
steel frame, wood finish		Headlights ....Crouse-Hinds
Interior frame...mahogany		Motors,
Headlining ..... agasote		4 GE-203, inside hung
Roof.....plain arch		Sanders ..... Brill
Underframe ..... steel		Sash fixtures.....Brill
Air-brakes .....West.		Seats ..... Brill
Bumpers ..... Hedley		Seating material,
Car trimmings.....bronze		mahogany slats
Control .....GE-K-35		Trolley catches...Keystone
Couplers ..... Brill		Trucks ..... Taylor
		Ventilators ..... Peerless

Houston (Tex.) Electric Company has specified the following details for the ten closed prepayment cars which were recently ordered from the American Car Company:

Seating capacity.....43	Gears and pinions,	tool steel
Bolster centers, length,	19 ft. 2 in.	Gongs.....Wall Mfg. Co.
Length of body...26 ft. 6 in.		Hand brakes...Am. Car Co.,
Length over vestibule. 39 ft.		with Peacock brakes
Width over sills...8 ft. 4 in.		Headlights ....Crouse-Hinds
Width over all...8 ft. 7 in.		Journal boxes.....Brill
Height, rail to sills...32 3/8 in.		Motors,
Height, sill to trolley base,		2 West. 307, outside hung
8 ft. 9 1/2 in.		Paint.....Am. Car Co.
Body ..... composite		Registers .... International
Interior trim,		Sash fixtures.O. M. Edwards
statuary bronze		Seats,
Roof.....plain arch		Heywood Bros. & Wake
Underframe ..... metal		Seating material...cherry
Air brakes.....West.		cushions, back stained
Axles ..... Brill		mahogany
Bumpers.....Am. Car Co.		Springs ..... Brill
Cables ..... West.		Step threads.....Feralun
Car trimmings.....Dayton		Trolley catchers,
Control.....H.L. single-end		Elec. Serv. Sup. Co.

Couplers.....Ohio Brass	Trolley base.....Holland
Curtain fixtures,	Trucks.....Brill 39-E
Cur. Sup. Co.	Varnish ..... Chicago
Curtain material,	Ventilators,
Pantasote	Am. Car Co. (Stone &
Destination signs...Hunter	Webster hood type)
Fare boxes.....Johnson	Wheels ..... Brill
Wheelguards,	H.B. life guards

## TRADE NOTES

Fred A. Poor, Chicago representative of the Rail Joint Company, resigned on June 1, 1914, to become president of the P. & M. Company, with general offices in the Railway Exchange Building, Chicago, Ill.

Joseph Dixon Crucible Company, Jersey City, N. J., has received an order to apply a double coating of silica-graphite paint on the 900 tons of structural steel which are being supplied by the Lackawanna Bridge Company for the construction of the superstructure of the Rochester Railway & Light Company's new power plant.

Hatfield Rail Joint Manufacturing Company, Macon, Ga., has made arrangements with T. B. Bowman, formerly assistant to the president of the Q. & C. Company, and now with the Efficiency Company, New York, N. Y., to assume charge of sales with offices at 2 Rector Street, New York, and 700 Railway Exchange, Chicago, Ill.

J. A. Bodkin has resigned from his position as engineer for the Q. & C. Company, New York, N. Y., effective June 15, 1914, after which time he will be associated with his brother in the Track Specialties Company, 29 Broadway, New York, N. Y., manufacturer of rail, step and insulated joints, rail anchors, braces and benders, brace and tie plates, guard rail clamps and braces.

Milwaukee Concrete Mixer & Machinery Company, Milwaukee, Wis., has appointed George C. Marsh as general manager, succeeding W. J. Roseberry, Jr. Mr. Roseberry has been appointed sales manager of the newly organized concrete mixer department of the Power & Mining Machinery Company, Cudahy, Wis., which manufactures the International concrete mixer.

Electric Service Supplies Company, Philadelphia, Pa., has added the services of W. J. Bryan to its sales force. Mr. Bryan was graduated in engineering at the University of Michigan in 1906, and was for five years connected with William B. Scaife & Sons Company, Pittsburgh, Pa., in various capacities. He will represent the Electric Service Supplies Company in the New England States, with office in Boston.

Ohio Brass Company, Mansfield, Ohio, has received a large order for overhead construction, rail bonds and a considerable amount of car equipment to be used in connection with forty to sixty-mile track extensions which the Ogden (Utah) Rapid Transit Company is constructing. This company has also received a large order from the Pennsylvania Railroad for rail bonds to be installed in the new Philadelphia-Paoli electrification.

General Electric Company, Schenectady, N. Y., has received orders for the following car equipments: Southern Traction Company, two G.E.-203, 50-hp, two-motor and four G.E.-201, 60-hp, 600-1200-volt, two-motor car equipments; Dayton, Springfield & Xenia Southern Railway, four G.E.-201, 60-hp motors; Trenton & Mercer County Traction Corporation, ten G.E.-210, 70-hp, two-motor equipments; Dallas Consolidated Electric Street Railway, 35 G.E.-201, 60-hp, two-motor car equipments with Type MK multiple-unit control; Union Street Railway, six G.E.-200, 40-hp, four-motor equipments; Central New York Southern Railroad, five G.E.-201, 60-hp, two-motor equipments; Memphis (Tenn.) Street Railway, twenty-five G.E.-201, 60-hp, two-motor equipments.

Harold Almert, Chicago, Ill., consulting engineer, has been retained as technical counsel by the Washington Railway & Electric Company and the Potomac Electric Power Company, of Washington, D. C. The appraisal division of Mr. Almert's staff will make a detailed inventory and valuation of the property of these companies, not only in Washington, but throughout the District of Columbia. This is in preparation for a hearing before the Federal Utility

Commission, which appeared before the local committee of Congress, through the corporation counsel, on June 2, and declared itself in favor of immediate municipal ownership of the utilities in the District of Columbia.

W. A. Thomas, who for several years past has been commercial engineer in charge of all sales of mining apparatus for the Westinghouse Electric & Manufacturing Company, with headquarters at East Pittsburgh, Pa., has resigned his position with that company, and has taken up the practice of consulting engineering in Pittsburgh, with offices in the Second National Bank Building. He will specialize in mining. Mr. Thomas was graduated from Penn State College in 1898 and was thereafter connected with the testing department and the power and mining engineering department of the General Electric Company for several years. For two years he was in charge of the power equipment of the Pennsylvania Coal & Coke Company, Cresson, Pa., later resigning this position to take charge of the mining work of the Westinghouse Electric & Manufacturing Company. Mr. Thomas is also president of the Rocky Ridge Coal Company, Robertsdale, Pa.

U. S. Light & Heating Company, Niagara Falls, N. Y., has appointed L. R. Pomeroy as manager of its New York sales office, with office at 24 West 61st Street. Mr. Pomeroy has been in the railroad and railroad supply business for more than thirty-five years. He was educated at Irving Institute, Tarrytown, N. Y. From 1880 to 1886 he was secretary and treasurer of the Suburban Rapid Transit Company of New York and then for nine years he was with the Carnegie Steel Company, introducing basic boiler steel for locomotives and special forgings. Subsequently he engaged in the same kind of work with the Cambria Steel Company and the Latrobe Steel Company jointly. For three years to 1902 he was assistant general manager of the Schenectady Locomotive Works and then for six years represented in the railway field the General Electric Company. Then he went to the Safety Car Heating & Lighting Company and afterwards to J. G. White & Company as chief engineer of the railway and industrial divisions. For some time he has had an office as consulting engineer at 50 Church Street, New York.

#### ADVERTISING LITERATURE

Power Specialty Company, New York, N. Y., has issued a catalog describing its Foster locomotive superheaters.

Tool Steel Gear & Pinion Company, Cincinnati, Ohio, has issued sheets describing its tool steel gears and pinions for railway use.

Ohmer Fare Register Company, Dayton, Ohio, has issued a folder on the subject of its merit system of fare protection.

Standard Underground Cable Company, Pittsburgh, Pa., has issued Bulletin No. 680-1 describing its steel tape armored cables.

MacGovern & Company, New York, N. Y., have issued a catalog describing their electrical and steam machinery, including cars and car equipments.

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued a sheet describing its ball-bearing mountings for jib crane columns. Another catalog has also been issued by this company describing its ball bearings and their application to axle generators.

Zarro Amusement Device Company, Ltd., Beaver Falls, Pa., has issued a catalog describing its complete line of amusement features for electric railway parks. These features are fully illustrated in the catalog and include riding devices of all kinds, coasters, scenic railways, chutes, old mills, carousels, interior or exterior mechanical amusement devices, fun houses, playground apparatus, scenic studios, theater equipment and electric working signs.

Redmond & Company, New York, N. Y., have issued a circular showing the charted fluctuations of twenty-five standard railroad bonds based on average quotations from 1904 to 1914. This circular is an amplification of a statement in the previous circular of the company to the effect that many listed bonds were selling close to the low prices of 1907. Among the securities recommended by Redmond & Company for investment are the 5 per cent bonds due 1934 of the Southern Pacific Company, San Francisco, Cal.,

the first mortgage 5 per cent sinking fund gold bonds due 1952 of the Columbia Railway, Gas & Electric Company, Columbia, S. C., and the first mortgage 5 per cent bonds due 1937 of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.

Macbeth-Evans Glass Company, Pittsburgh, Pa., has issued a catalog on the subject of Alba lighting shades for electric railway cars. The catalog describes with the aid of comparative illustrations an interesting test made by the Cleveland (Ohio) Railway in one of its cars. In this case nineteen bare 23-watt tungsten lamps gave almost the same amount of illumination on the useful plane as the same number of bare 64-watt carbon lamps. These lamps were then equipped with Alba shades, and the resulting illumination on the useful plane was increased 62 per cent simply by properly directing the light. Twenty-four 23-watt tungsten lamps were required to furnish the same amount of illumination on the useful plane as nineteen 64-watt carbon lamps, while only fifteen 23-watt tungsten lamps equipped with Alba shades were required. The circular also contains illustrations of illuminated car interiors of the Fort Wayne & Northern Indiana Traction Company, the Union Traction Company of Indiana, the Third Avenue Railway, Mahoning & Shenango Railway & Light Company, Northwestern Pennsylvania Railway, and Columbus, Delaware & Marion Railway, in which these shades are used.

Railway Improvement Company, New York, N. Y., has issued a publication in de luxe binding entitled "A Practical Bonus System for Motormen." Starting from the premises that a successful bonus system presupposes increased earnings by the railway company and increased pay for the employees, the book proceeds to discuss the use of the coasting time recorder as a practical instrument for the fulfillment of the above requirements. It is shown that the recorder, by measuring the number of minutes their car is coasting without power, enables the railway to pay more money in wages out of the saving effected thereby. By this system the motorman who can coast the greatest number of minutes is entitled to a bonus, while the man who coasts the least number of minutes is instructed in the proper operation of his car so that in future he can coast better and make a better record. The manufacturers offer a unique plan of guarantee of the ultimate self-paying features of the recorder by the issuance of "clock trust certificates" to cover their purchase. The end of the publication contains tabulated records from recorders in actual service on the Third Avenue Railway, San Francisco-Oakland Terminal Railways, Virginia Railway & Power Company, Manhattan Elevated Railway, British Columbia Electric Railway, Washington Railway & Electric Company, Denver City Tramway, Los Angeles Railway, London (Eng.) Electric Railway, Interborough Rapid Transit Company and Hudson & Manhattan Railway.

#### NEW PUBLICATION

List of Publications Pertaining to Government Ownership of Railways.—Bulletin No. 62.—Published by Bureau of Railway Economics, Washington, D. C. 74 pages, paper-bound.

This pamphlet gives a list of articles that have been written in all parts of the world on the subject of government ownership of railroads, the names of the authors, the special subjects covered and the sources in which the articles may be found. The general articles are classified under one head, and those dealing with foreign countries and with the United States are grouped by countries for ready reference. In the introduction it is stated that every effort has been made to include references to all available literature on the subject—good, bad and indifferent—for and against government ownership. No attempt has been made, however, to include reference to the larger subject of the relations of railroads to the State, or to books and articles that are merely descriptive of State railroads. In introducing the bibliography for the United States the pamphlet gives the following railroads in this country as being now or formerly under national, State or city ownership: Western Atlantic, Georgia; Columbia, Pennsylvania; North Carolina, Western North Carolina; Texas State, Texas; Troy & Greenfield Railroad and Hoosac Tunnel, Massachusetts; Richmond, Fredericksburg & Potomac, Virginia; United Railways of New Jersey, New Jersey; Cincinnati Southern, city of Cincinnati; Panama Railroad.