

# Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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## Why the Helical Gear Interests Master Mechanics

EQUIPMENT men and others who attended the recent Harrisburg meeting of the Pennsylvania Street Railway Association were the recipients of much information regarding helical gear design and operation in the paper by Messrs. Phillips and Holy. Unfortunately the paper came near the end of a busy session, and there was no time available for discussion. Further, the paper was of a technical character and only those who were conversant with the subject would have been capable of discussing it even if there had been a chance. The paper is, therefore, printed in extended abstract in this issue of the ELECTRIC RAILWAY JOURNAL and the points which were raised in it can very properly be discussed in these columns so that equipment men generally may benefit.

The helical gear is attracting attention for three or perhaps four reasons: The chief one is that operating men expect to obtain longer life from their gearing. Helical gearing promises quieter running as compared with the spur gear now most generally used, hence will be better for the public; the reduction in tooth vibration which its use insures will lower maintenance cost, which will please the railway management, and it is a technical development in equipment design and construction, thus affording stimulating engineering problems to the alert superintendent of equipment.

The gearing is a part of the propelling machinery of the electric railway car that has been difficult to change to meet advances in technical information. Interchangeability, regardless of age, is a practically essential feature here. The present contours of spur gear teeth were laid out many years ago in the light of the best information then available, and they have proved reasonably satisfactory. Once fixed, however, practically no change has taken place. However, the material in both gears and pinions has been wonderfully improved, so that the spur gear can now be considered well nigh perfect except for defects inherent first in even a perfect tooth, if such is possible, and, second, in the actual present standard tooth, which is a compromise among conflicting conditions complicated by impracticability of making radical changes.

As the authors pointed out in the paper, the advent of the helical tooth in electric railway gearing permits gear manufacturers to cut loose from existing contours and to introduce improvements which they will be glad to apply on spur gears if they have the opportunity. In the helical gear they are not hampered by the necessity for interchangeability with existing equipment, and they can, therefore, while gaining the advantages of the helical form of tooth, add to them the virtues of a new design of contour. This design aims to give increased strength and better wearing qualities, with greater rolling and less sliding action.

The alacrity with which master mechanics have undertaken experiments with helical gears shows that

they appreciate the defects of the spur gear. The principal defect is that it produces vibration as the teeth are stressed in succession. Each tooth is of course deflected as it comes into action, returning to normal position with respect to its anchorage as it goes out of action, its maximum deflection occurring when it is carrying the load alone. That this vibration causes losses was explained in an article by G. W. Remington in the issue of this paper for Aug. 17, 1918, page 288. A flexible mounting of the gear was proposed to overcome the difficulty following the same general line as that in some designs for electric locomotives. The helical drive accomplishes much the same purpose, in a cheaper and simpler manner and in addition assures a more nearly uniform transfer of load from tooth to tooth. These gears are used in some other machinery besides that of electric traction drive and the experience thus gained outside of this field will be useful within it.

It would be helpful to have some instructive facts as to helical gears brought out at the meeting of the Engineering Association at Atlantic City next October. That will furnish an excellent occasion for asking questions of manufacturers and users, as to recent experience with the large number of helical gears which have been in use during the past few years.

## What Characterizes a Good Convention Paper?

ELECTRIC railway men spend in the aggregate a large number of man-hours at conventions annually. They naturally want to get something for their effort, and as their employers are the ones who largely "foot the bill" the latter expect a reasonable return on their investment. These facts ought to be weighed carefully by committees responsible for the programs of meetings. A look forward to the fall and later conventions and one backward in review over those of the past year or so may well be taken, so that the lessons of the past may be helpful in the plans of the future. This is the more important because some convention programs have been somewhat disappointing when the actual results have been compared with the ideal. This remark naturally raises the question: "What is an ideal program and an ideal paper for a convention?" Here are some suggestions along this line:

Obviously a program as a whole and the units composing it must be adapted to the needs of the audience. There are at least three such needs, aside from that for good fellowship and general inspiration. First, the association which is in conference needs a general view of the outstanding questions of its industry. This is necessary so that intelligent interest in managerial questions should be possessed by the staff generally. Second, the men in convention can profit by non-technical accounts of the outstanding things that

are being done by the specialists. Third, the specialists themselves ought to have their own respective questions discussed in ways to make them better specialists. This means sectional or group meetings.

As to the first point mentioned, any man who has attended conventions at all has heard enough good addresses which were full of "perspective" to know when a speaker is generalizing too much, beating around the bush, or rambling from the subject altogether. He is therefore apt to be critical when he feels that his time is being wasted. It is up to a program committee so to co-operate with an invited speaker that the latter will know what he is expected to cover. This is only fair both to the speaker and to the audience. A little tact will accomplish much here.

The second suggestion above is prompted by the fact that valuable papers on highly technical subjects often lack some degree of perfect success in delivery because presented, in the prepared form, before the wrong audience. Before a selected group, such as the specialists mentioned, a paper of this kind would produce exactly the result desired.

Convention programs in the electric railway field are good, many are excellent. These suggestions are made in the belief that they can be made even better by still more careful planning.

### Bus or Bust—

#### A Possible Contingency

**I**N LAST week's issue the Connecticut Company was reported as another electric railway about to operate motor buses. This company, which recently received the necessary legislative authority, announced that motor bus service will be established on some long-needed extensions and for cross-route connections, that is, as supplementary and complementary service to the trolley system. In some communities there exists a feeling that the trolley has had its day and that, because this is a motor age, transportation should be by that agency alone. But it can easily be proved that for routes of fair traffic density, on an equal basis of seat-miles furnished, the trolley car is the more economical in operating costs including fixed charges, as well as taking less space in the streets. With lower density of traffic, the bus will often prove the more economical.

Of course, economy per mile operated is not the only standard on which to judge service. Transportation has its commercial as well as its financial characteristics. If the rider demands a particular service and is willing to pay for it on a basis which will provide a fair return on the investment and an allowance for maintaining at all times the integrity of the investment, it is but reasonable to expect that such a form of service will be provided. If buses are demanded, their service in some cases may have to overlap, at least in part, existing rail service, but in the interest of economical operation this duplication should be kept to a minimum by a co-ordination of both operations under one management. Obviously this unified operation should be under the direction of the railway management as the most experienced and capable agency for this work. In other words, if the bus is demanded to supply a real transportation need and the community is prepared to support it, the railway company should be prepared to furnish the service. Otherwise it may become a case of "Bus or Bust."

### Abandoned Lines Result from Faulty Diagnosis

**A** DECREASE of 623 miles of track in operation as against 167 miles of new extensions during 1920 is one of the indications that many electric railways were built in territories whose growth in traffic and revenue have been insufficient to keep pace with the rising cost of operation. There are probably many other miles of track being operated at great loss in similar localities. Whatever the reason for this—increased private automobile travel, failure to obtain increased fares, or whatnot—this well known condition exists. But while the financial condition of the individual railways which have discontinued service may be improved, what of the welfare of the communities served? In many of them the whole development was based on the transportation service, now defunct.

In order to maintain transportation service to such communities subsidies from the general fund of municipalities have been suggested and sometimes tried, but this seems questionable, at least until the operating company has properly studied, prescribed and tried all possible cures in the way of suitable operating economies. Among other things, these economies mean that lighter weight cars with lighter equipment may be substituted, that speed be increased, that one-man operation be tried, and that service be confined to less than eighteen hours per day.

Even then, the railway, having done everything within its power to demonstrate that the route has not an earning capacity sufficient to maintain rail service, can logically resort to the same means of transportation services that will be taken up by individual operators the moment cars are withdrawn. This means that rail-less traction can often be substituted where the highways are built so that they will stand such traffic.

Certainly, any company prior to the actual discontinuance of service should give careful consideration to the possibilities of this form of transportation and should not give up a franchise on a given route until it has been proved conclusively that the territory cannot support any regular means of transportation at all. The advantages of such action on the part of the company are almost too self-evident to require repetition—maintenance of the integrity of one universal transportation system, retention of public confidence and good will, prevention of jeopardizing other parts of the system, etc. It is good business to make a careful business diagnosis and to seek every remedy available to cure the apparent ills.

### A Model for

#### Operating Men's Meetings

**A** GOOD example of the value of conventions among electric railway men is afforded in the gatherings of the mechanical men of Pennsylvania, Ohio and West Virginia, one of their meetings being covered in this issue. Their sessions begin promptly; they get right down to business, and they stick strictly to it throughout the meeting. Their procedure is largely informal as is also their organization, but the information brought out in answering questions raised and in exchanging experience is invaluable. There is a noticeable absence of lost motion and waste of time. A manager makes no mistake in sending his master mechanic to them. The success of these meetings has demonstrated that similar meetings could very profitably be provided in other sections of the country.

## Developing a Freight Business

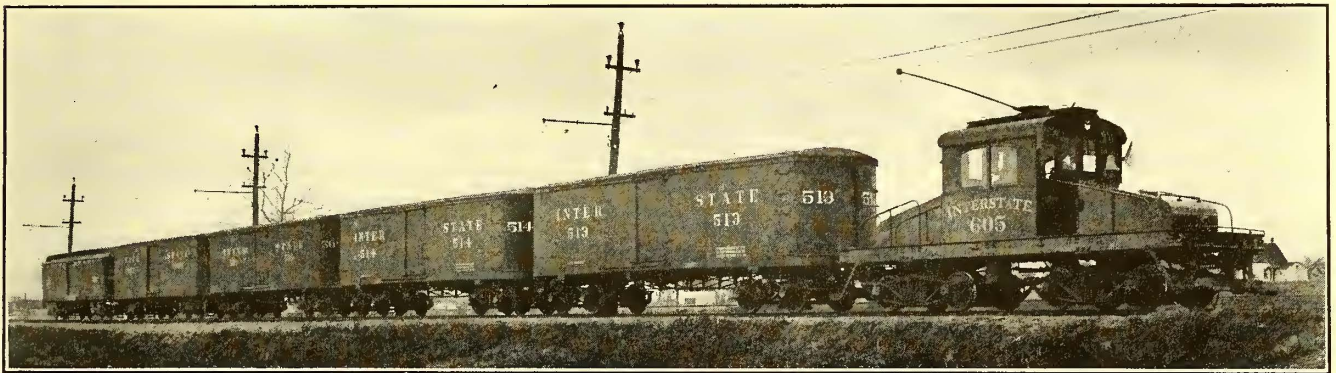
**Extensive Improvements of Indianapolis-Louisville Line Include New Freight Equipment and Overnight Freight Service—Interesting Layout of New Shops Under Construction Is Treated—Method of Financing Betterments Is Explained**

**A**N ACCOUNT of the passenger equipment of the Interstate Public Service Company, operating a high-speed interurban electric railway between Indianapolis & Louisville, was published in the issue of this paper for June 4. The company also does a considerable freight business and during the last year has increased its facilities for handling freight by the purchase of twenty new box cars and two electric locomotives.

In the main, these box cars are a copy of the standard Pennsylvania Railroad box car with a few alterations to meet the operating conditions of the electric line and to conform to certain standards adopted in the Central Electric Railway Association territory. They are 37 ft. 2½ in. long over the end sills, but the square end used by the steam railways was replaced by a round end, built on a 5-ft. radius to meet the standard C. E.

clude six motor merchandise cars, two locomotives, thirty box cars and twelve flat cars. Three of the motor merchandise cars have been rebuilt so that they are capable of pulling as many as twelve box cars. At the present time it is unnecessary to run trains of more than five or six cars, and a four-car train is the limit that may be hauled through the streets of Louisville or Indianapolis, according to ordinance in the latter and an order of the Board of Works in the former. The locomotives, of course, are capable of handling longer trains. They are used very largely in hauling gravel and cement.

Having prepared itself with these facilities, the company, on Feb. 17, inaugurated an overnight freight service between any two points on the system. This resulted almost immediately in a pronounced increase in the tonnage offered to the company. Prior to this time all freight had been handled by local trains, making



INTERSTATE FREIGHT TRAIN SHOWING LOCOMOTIVE HAULING FOUR OF THE NEW STANDARD BOX CARS. THE OVERHEAD AND TRANSMISSION LINE CONSTRUCTION IS ALSO SHOWN

R. A. drawbar requirements, so that the length of the car over bumpers is 42 ft. 4¾ in. These rounding ends increase the capacity of the standard Pennsylvania car by about 140 cu.ft. They are 39 ft. 4 in. long inside and 7 ft. 9 in. wide and 7 ft. 4 in. high. The roof is of plain arch construction, built with ¾-in. tongue and grooved pine, a layer of 7-in. felt paper and covered with No. 8 duck, instead of the wood roof used by the steam roads. The standard MCB arch-bar freight truck is used, but it is stiffened by tying the ends of the side frames together at both ends of the truck with a bar bolted on the pedestal bolts of the arch bars. The hand-brake wheels are installed on the ends of the cars instead of on top, so that a brakeman will not need to get on top of the car where he might come in contact with the overhead.

These cars weigh 33,400 lb. and have a capacity of 50,000 lb. The Interstate company has standardized on this design of box car.

One of the two locomotives purchased by the company is a 37½-ton machine equipped with four Westinghouse 75-hp. 318 motors and St. Louis trucks. The other locomotive is a new 25-ton engine equipped with four 50-hp. GE-57 motors and St. Louis trucks.

With these new purchases of freight equipment, the total facilities for handling freight business now in-

clude about forty-eight-hour deliveries. The regular freight schedule now includes the following:

A through freight train from Louisville to Indianapolis leaves Louisville daily at 5 p.m. This runs local as far north as Columbus, Ind., and picks up freight at all stations for points north of Columbus. At Columbus a car is set off and the remainder of the train proceeds without stopping, except for making delivery, and arrives at Indianapolis about 8 a.m. The car set off at Columbus leaves there at 10:30 a.m. and runs to Indianapolis, serving local points intervening, in picking up northbound shipments. Southbound a local train leaves Indianapolis at 11:30 a.m. and runs as far south as Columbus, serving Greenwood, Edinburgh and other local stations, and pulling one trail car for Columbus and one for Seymour. A through train which leaves Indianapolis at 5 p.m. then picks up the Seymour car at Columbus, and usually a car from Columbus for Louisville, and frequently a third trail car for Louisville from either Indianapolis or some way station, and goes on through. A daily milk train is also run, leaving Columbus at 12:30 a.m. and proceeding to Indianapolis. On the return trip this train handles empty cans and local freight. In addition there are two local freight trains which operate between some of the smaller cities and way stations.

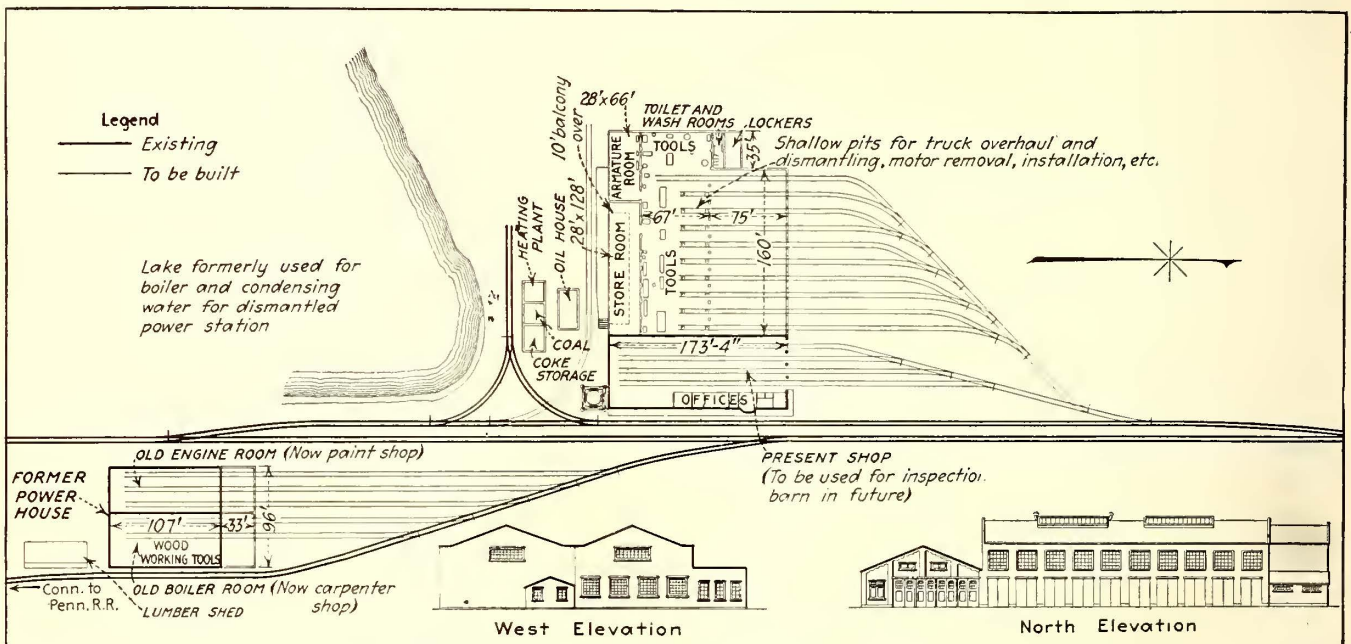
In 1920 the Interstate company handled more than 100 carloads of canned goods from one canning factory. It earned more than \$60,000 gross revenue in hauling cement into Louisville from a plant about 15 miles out, one of the locomotives being kept busy on this work. A revenue of \$6,000 was earned in hauling logs from Charleston and Scottsburg to Caruthersville. The Union Starch & Refining Company, at Edinburgh and the Bush Milling Company at Seymour were also heavy shippers over the electric line. Nearly \$20,000 of revenue was earned from hauling milk. Arrangements have been completed with the small fruit growers for handling a very considerable quantity of strawberries and other berries from New Albany to Indianapolis, for which a rate of 70 cents a hundred is earned. Approximately 50 per cent of the freight business handled by the Interstate is made up of carload shipments.

Under the direction of Bert Weedon, general freight and passenger agent, a thorough canvass is continually made of the territory served in order to keep advised of any business available, to place the services of the

representatives of the traffic department are engaged at other points on the 117-mile road.

For interstate business, the freight tariff of the Interstate company follows the same classifications and the same scale of rates as used by the competing steam lines. For intrastate traffic the rates are the same except that the electric line did not apply for the last 7 per cent increase in freight rates awarded to the steam roads. The competition which the Interstate company must meet is the Louisville Division of the Pennsylvania Railroad, which has a direct line running between Indianapolis and Louisville.

With increasing traffic and additional equipment to be maintained, the mechanical department has been somewhat handicapped in its work for lack of shop facilities. It has been unable to do any rebuilding of old equipment or much work other than strictly maintenance. In view of this, plans have been completed and work recently begun on a new shop at Scottsburg, Ind., a town of 1,200 population located 83 miles from Indianapolis and 34 miles from Louisville. At the pres-



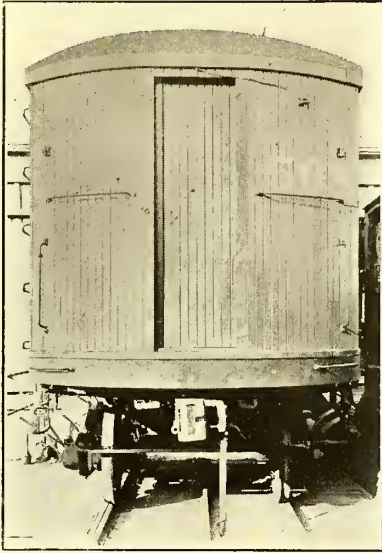
LAYOUT OF NEW SHOP TO BE BUILT BY THE INTERSTATE PUBLIC SERVICE COMPANY AT SCOTTSBURG, IND.

company before the shipper and also to enable the company to plan in advance to handle it. Every local agent is expected to keep in touch with his territory, including the condition of crops from time to time, so that the transportation requirements may be estimated. In planning to handle the shipment of fruit, every farmer in the berry and melon territory was solicited and information secured as to the size of his crop and where he intended to ship, so that the company could plan to meet his requirements. At all times the closest co-operation between the transportation department and the traffic department is maintained and this has been a very important factor in the expansion of the freight business handled by the company. This applies equally well to the passenger business, for the company has been enjoying a very considerable revenue from special trains. The traffic department is not the only sales organization for the services of the company, for it is a frequent occurrence for the superintendent of transportation, L. M. Brown, to go out and contract for some special service, or send one of his assistants located at various points along the line to do so, when the repre-

ent time small shops at Scottsburg, Columbus and Greenwood are in use, but the plan contemplates the centralization of all shop work at the new Scottsburg shop and utilization of the other shops for light inspection work and car storage, and likewise the present Scottsburg shop.

In an accompanying drawing the complete layout of the shop and track facilities at Scottsburg as planned by H. H. Buckman, master mechanic, may be seen. It will be noted that the main overhaul shop, machine shop, armature room, forge shop, store room, etc., are to be located in a building which is to be built as an extension to the present shop building. The offices of the master mechanic will remain where they are now in the present shop, although there will be a balcony office for the general foreman in the new building. The main overhauling shop will be served by ten tracks, whereby ten large cars may be simultaneously shopped. A row of pillars extending across the center of this space divides it into two portions which will be served by a 30-ton 75-ft. span cab-operated traveling crane and a 20-ton 67-ft. span floor-operated traveling crane.

None of the tracks will have pits except for shallow ones at the inner ends of the tracks to aid the truck overhaul work. The scheme of handling overhaul will be to pick up the entire car body with the large crane, roll the trucks forward from underneath it, and lower the body onto horses or shop trucks. Any portion of the truck can then be picked up with the smaller crane and delivered to any machine in the entire shop, the runway of this crane extending from the wall of the present shop to the opposite end of the new building, 195 ft. The efficiency of this layout can be readily appreciated by a study of the accompanying floor plan showing the various machine locations. It was originally planned to build a new carpenter and paint shop to the south of and adjacent to the machine and overhaul shop



STANDARD INTERSTATE BOX CAR  
View showing rounded end and tie bar connecting the side frames of the trucks.

already described. More recently, however, the Scottsburg power house belonging to the company was dismantled, and it was decided that with some remodeling this building, which is only a few hundred feet away from the present shop building, could be utilized for this purpose. A 33-ft. addition will be built on the front end and three tracks built in what was formerly the engine room and two in the old boiler room. The wall separating these two rooms will be left in place and will serve to separate the paint shop from the carpenter shop, permitting the maintenance of higher temperatures in the paint shop and keeping it free from the dust of the wood shop. The old boiler room will be filled in to bring the floor level of the carpenter shop up even with that in the engine room or paint shop. Various wood-working machines will be located in the carpenter shop as shown. A basement will be built under a portion of the carpenter shop and the heating plant for the building installed therein. The present coal bunkers used for receiving coal for the power plant will be used for storage of coal for shop uses. The track extending along the east side of the power plant runs over these bunkers on a trestle, so that coal may be unloaded from bottom dump cars, and connects to the south with the Pennsylvania Railroad, so that coal may be received direct in carload lots.

The use of the old power house for a portion of the shop will involve a slight increase in the amount of shifting of equipment required in the various shop operations, but it will make a material saving in building construction costs, as well as obtain further use of the investment in the power-house building.

In maintaining the 108 passenger cars, fifty freight cars and nine service cars owned by the company the regular routine work calls for the shopping of 124 cars annually. As it is planned to do considerable rebuilding work in addition to this, the construction work on the

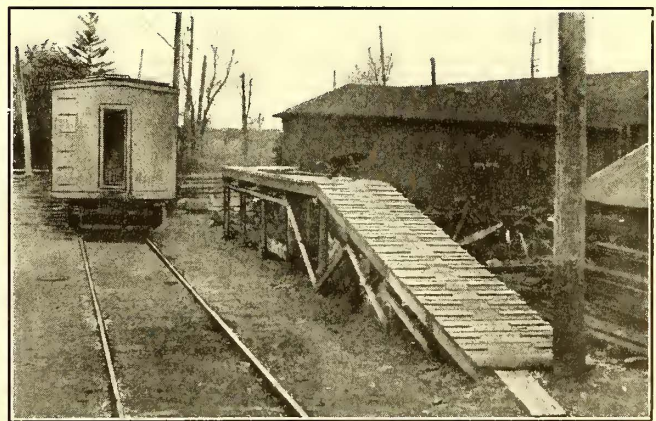
new shop is being pushed to completion, the contract having been let about April 1.

Coincident with the improvements already mentioned, the company made important changes in its power system including the shutting down of two stations, the building of 54.6 miles of new 33,000-volt transmission lines and the rebuilding of 58.25 miles of existing transmission lines for higher voltage, the erection of six new substations and the re-equipment of others, etc. An account of this work was published in the issue of this paper for June 25.

Question will quite naturally arise in the mind of any interurban operator as to how this extensive improvement program of the Interstate company was financed. This may be answered briefly by stating that it was done in good part through the activity of the company in selling its stock to its own customers. In order to purchase the new rolling stock, a subsidiary company known as the Interstate Car Trust Equipment Company was organized. Except for \$50,000, the new cars were purchased entirely through the sale of the 6 per cent preferred stock of this company. This \$50,000 represented the income from the sale of the common stock of the equipment company to the Interstate Public Service Company, for which the latter obtained the money through the sale of Interstate Public Service Company's 7 per cent prior lien preferred stock. The latter was sold along with about \$200,000 more of the same stock to the public of Indiana. There was also a bond issue during 1920 of \$400,000, which was backed up by additions to the plant account during the year amounting to over \$800,000.

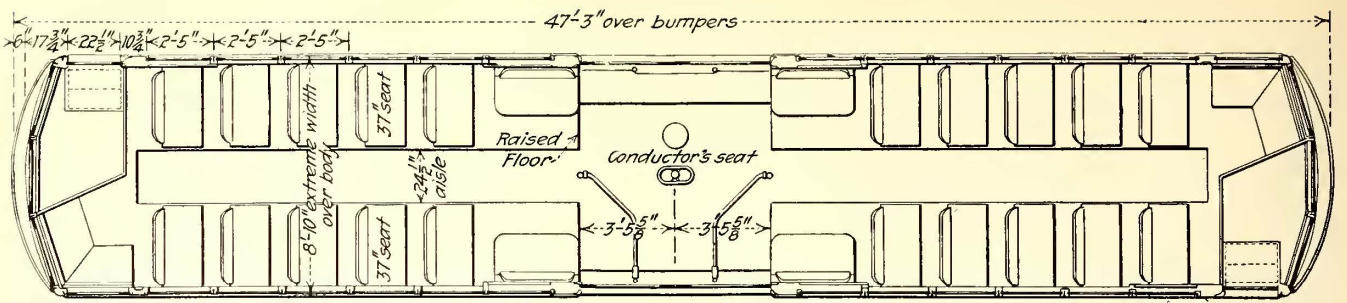
### Refuse Loading Platform Saves Labor

**B**Y BUILDING a platform with an incline at one end and high enough so that a wheelbarrow may be dumped over the side of a gondola car considerable saving in labor has been made in connection with the disposal of refuse at the Wheaton, Ill., shops of the Aurora, Elgin & Chicago Railroad. Formerly the refuse was wheeled in a barrow and placed on the ground in the shop yard. It was then necessary to rehandle it to put it in the refuse car for disposal. By means

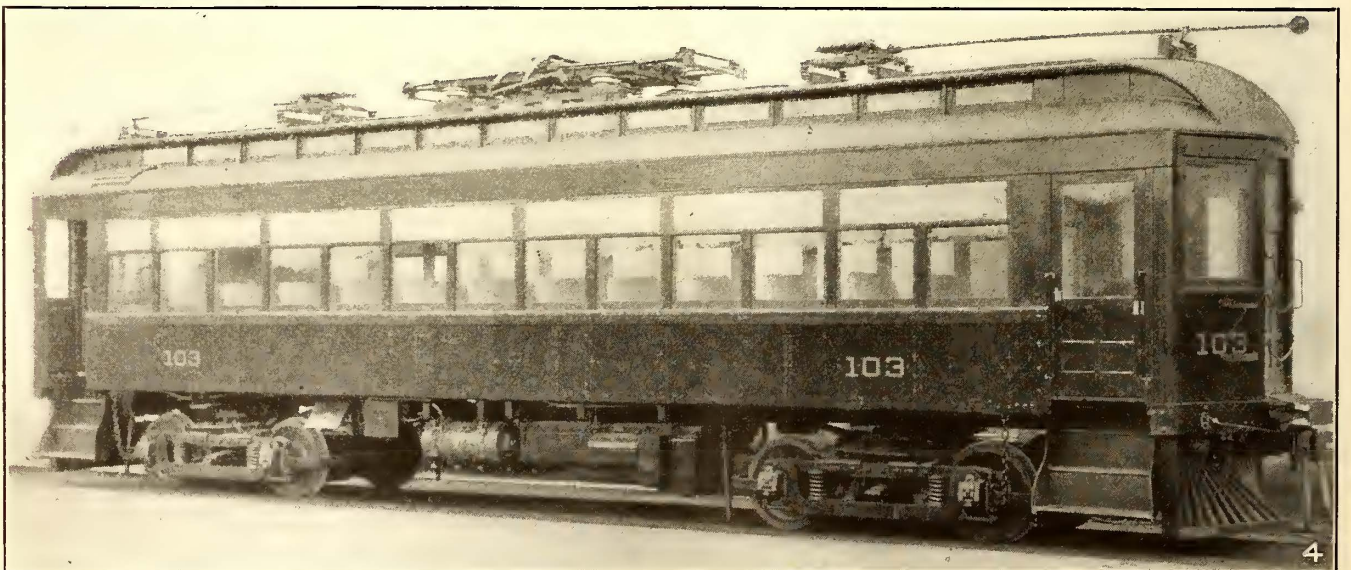
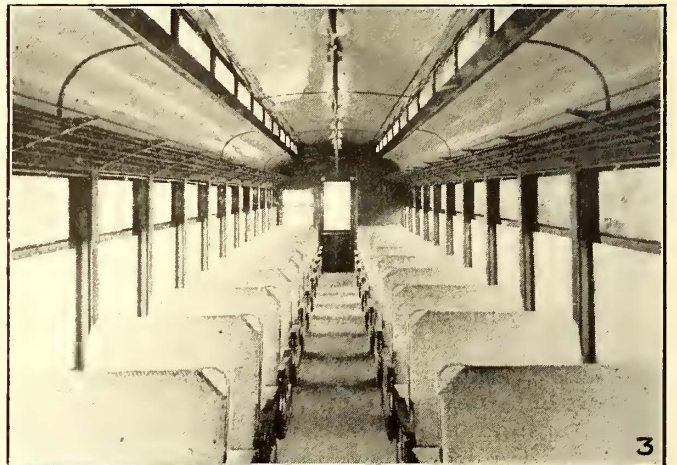
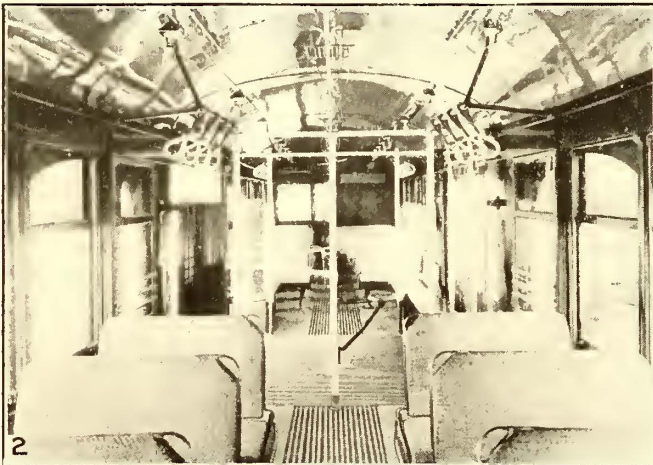
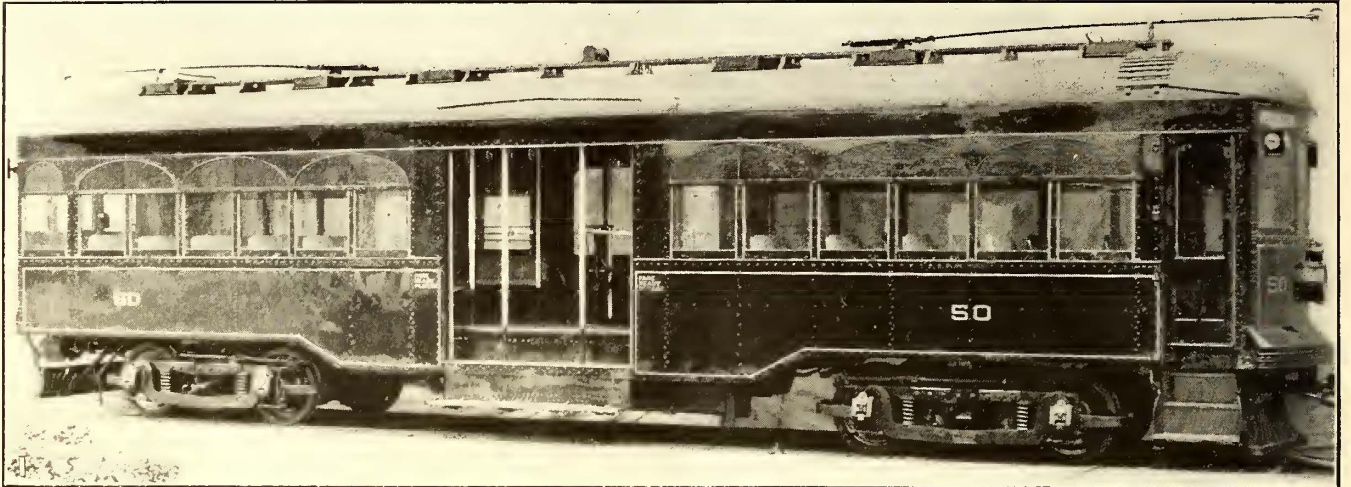


PLATFORM BUILT TO AVOID REHANDLING OF REFUSE

of this platform this second handling is entirely dispensed with. The refuse car, which is a small single-truck car used entirely for this purpose, is spotted beside the platform and the refuse dumped in it as it accumulates. The gondola was away being dumped when the accompanying picture was taken.



FLOOR PLAN OF THE PHILADELPHIA & WEST CHESTER TRACTION COMPANY'S CAR



No. 1—NEW CAR FOR THE PHILADELPHIA & WEST CHESTER TRACTION COMPANY.  
 No. 2—INTERIOR VIEW OF THE PHILADELPHIA & WEST CHESTER TRACTION COMPANY'S NEW CAR.

No. 3—INTERIOR VIEW OF THE HERSHEY CUBAN RAILWAY'S NEW PASSENGER CAR.  
 No. 4—LATEST ADDITION OF THE PASSENGER EQUIPMENT OF THE HERSHEY CUBAN RAILWAY.

## Some Recent Interurban Car Designs

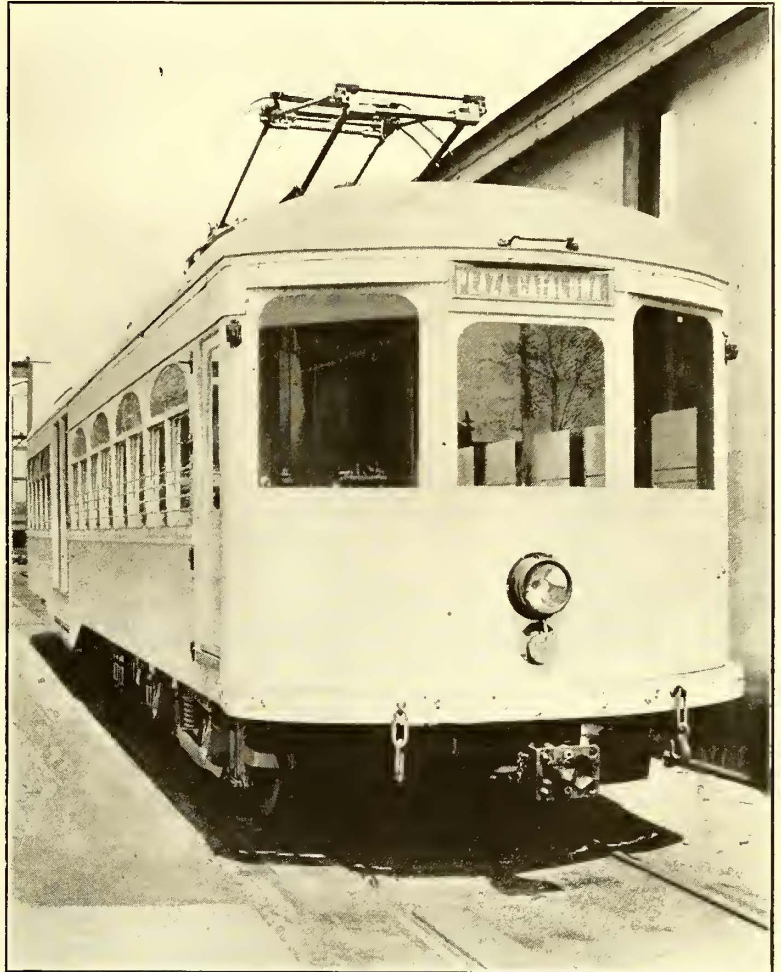
While Very Few Interurban Cars Are Being Constructed at This Time, the Accompanying Information Regarding Four Types Recently Ordered Will Indicate the Trend of Practice in This Field

THE following facts regarding recent interurban cars relate to several types which have been built by the J. G. Brill Company. The data will be of interest in connection with the descriptions of the rapid-transit urban cars contained in articles in the June 11 issue.

Twelve all-steel, center-entrance motor cars were delivered to the Cataluna Tramways of Barcelona, Spain, last year. These have a central platform, which divides the car into two compartments, one for second-class and the other for third-class passengers. Partitions separate the second-class compartment from the central platform and from the other part of the car. There is no partition between the third-class compartment and the platform, but an arrangement of vertical and horizontal pipe railings is used to direct the incoming and outgoing passengers.

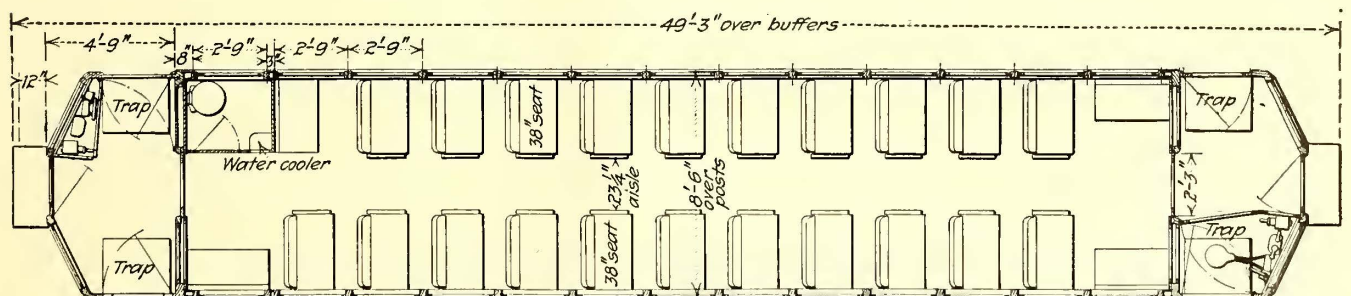
These cars are mounted on Brill 27-M. C. B. high-speed interurban trucks and the bodies are substantial. The underframing is of steel, with side sill angles 5 in. x 4 in. x  $\frac{3}{8}$  in., extending the full length of the car body without interruption at the central platform. Sub-side sills of  $3\frac{1}{2}$ -in. x 3-in. x  $\frac{3}{8}$ -in. angles extend from each side of the central platform to the end. There are two 5-in., 11 $\frac{1}{2}$ -lb. channel center sills and also crossings of 4-in., 5 $\frac{1}{2}$ -lb. channels securely riveted and gusseted to the side-sill angles and channel center sills.

In the upper framing the main side posts between the windows are of two 1 $\frac{1}{2}$ -in. x 2-in. x  $\frac{1}{8}$ -in. tees, with inside and outside steel cover plates, while the intermediate posts between the two lower sash of each window are of 1 $\frac{1}{2}$ -in. x 2-in. x  $\frac{1}{8}$ -in. strips encased in wood. The corner posts and the posts of the central platform are a combination of 1 $\frac{1}{2}$ -in. x 2-in. x  $\frac{1}{8}$ -in. tees and an angle 2 in. x 1 $\frac{1}{2}$  x  $\frac{1}{4}$  in., with suitable steel cover plates. The sides are covered below the windows with  $\frac{3}{8}$ -in. steel sheathing riveted to the underside of the angle side sill and also to the belt rail, side and corner posts. Attached to the top of each side post and supporting the plain arched type of roof are pressed steel U-shaped carlines, fitted with a wooden strip for the attachment of the roof boards.



BARCELONA CAR—THREE SINGLE SASH IN THE VESTIBULES DROP INTO POCKETS

The single upper sash of each double window is stationary and fitted with opalescent glass. The lower two sash are arranged to raise. In the end vestibule the sash drop into pockets behind the dasher. A motorman's cab is partitioned off at diagonal right corners of the car. These have swinging doors to the motorman's right, for entrance and exit, and another at his back, making the cab accessible from inside the car. As the side door is glazed in the upper panel, it is provided with a pantasote curtain. A stirrup-type step is installed below for the use of the motorman.



PLAN AND SEATING ARRANGEMENT OF THE HERSHEY CUBAN RAILWAY CAR

The side doors at the central platform for entrance and exit are manually operated by levers located at the conductor's position. Each door slides into a pocket next to the central platform post and is separately operated in conjunction with a sliding step. A feature of the door and step mechanism is that the doors cannot be opened until the sliding step is fully out, thus eliminating the possibility of step accidents. A single sliding door is located in the partition between the second-class compartment and the central platform, which separates this compartment from the rest of the car in a rather exclusive manner.

In the second-class compartment four reversible-back transverse seats on each side of the aisle and a semi-circular seat against the front vestibule provide seating accommodations for twenty passengers. All reversible seats in this compartment are of the Brill "Winner" type, with spring cushions upholstered with rattan. The interior of the second-class compartment is furnished in mahogany. The third-class compartment is equipped with slat seats. There are five reversible-back Brill "Winner" type seats on each side of the aisle and a longitudinal seat for five passengers on each side next to the central platform, together with a circular seat for four passengers against the vestibule. In all, this provides seating accommodations for thirty-four third-class passengers and gives a total seating capacity for the car of fifty-four. By the use of the longitudinal seats next to the central platform in the third-class compartment the placing of vertical and horizontal pipe railings is permitted. This arrangement also provides additional standing space when traffic is heavy.

The ceilings are of agasote and below the windows hardwood sheathing is used painted to conform to the interior finish of each compartment. These cars are equipped for multiple-unit operation and have pantograph-type trolleys.

#### MOTOR CARS FOR THE PHILADELPHIA & WEST CHESTER TRACTION COMPANY

Ten cars of another center-entrance all-steel motor type were put into commission by the Philadelphia & West Chester Traction Company. The roofs of these cars are of the plain arch type, of  $\frac{1}{2}$ -in. poplar roof boards covered with No. 8 canvas. The center entrance is provided with sliding doors of two sections, each sliding back into the body of the car. The doors, together with the single folding step, are operated by pneumatic mechanism controlled from the conductor's position on the center platform. The National Pneumatic Company's equipment is used for this purpose.

On each side of the center platform and on each side of the car there is a stationary longitudinal seat for two passengers. There is also a stationary seat for two persons against the vestibule window to the left of the motorman. A hinged longitudinal folding seat of cherry slats, when in use, extends across the doors on the closed side of the center platform. The reversible seats in the car body are also of the "Winner" type, upholstered in twill-woven rattan.

The side windows are fitted with double sash, the lower portions of which raise, and the upper sash, each extending across the width of two lower sash, are stationary. The three vestibule windows at each end drop into pockets and those in the center and at the right are provided with suitable sash racks which permit the sash to be held at various heights. The interior finish of the car is cherry, and the ceilings are of agasote, painted

and decorated in accordance with the standard of the railway.

At diagonally opposite right-hand corners of the car body a motorman's cab is installed, entrance to which is made through a single swinging door to the motorman's left or the one to his right.

The underframe construction consists of angle side sills, 5 in. x  $3\frac{1}{2}$  in. x  $\frac{1}{8}$  in.; crossings of 4-in., 5 $\frac{1}{2}$ -lb. channels securely gusseted to the side-sill angles and center stringers of 6-in., 10 $\frac{1}{2}$ -lb. channels. The side posts of the upper framing are of  $1\frac{1}{2}$ -in. x 2-in. x  $\frac{1}{8}$ -in. tees, extending from the side sill angles to the top rail and securely riveted to No. 14 pressed steel U-shaped carlines. Side sheathing and letterboards are  $\frac{3}{8}$ -in. steel. Some of the principal dimensions are given in Table I.

TABLE I—DIMENSIONS AND WEIGHTS OF MOTOR CARS FOR PHILADELPHIA & WEST CHESTER TRACTION COMPANY

Length of car body over vestibule.....	46 ft. 3 in.
Length of center platform.....	6 ft. 9 in.
Width of car body over post.....	8 ft. 7 in.
Height from rail to top of floor.....	3 ft. 8 in.
Height from top of floor over trolley pole.....	8 ft. 9 $\frac{1}{2}$ in.
Seating capacity .....	57
Weight complete .....	57,160 lb.
Type of truck.....	Brill 27-M.C.B.-2X
Wheelbase .....	6 ft.
Track gage .....	5 ft. 2 $\frac{1}{2}$ in.
Diameter of wheels.....	33 in.
Journals .....	4 $\frac{1}{2}$ in. x 8 in., M.C.B.

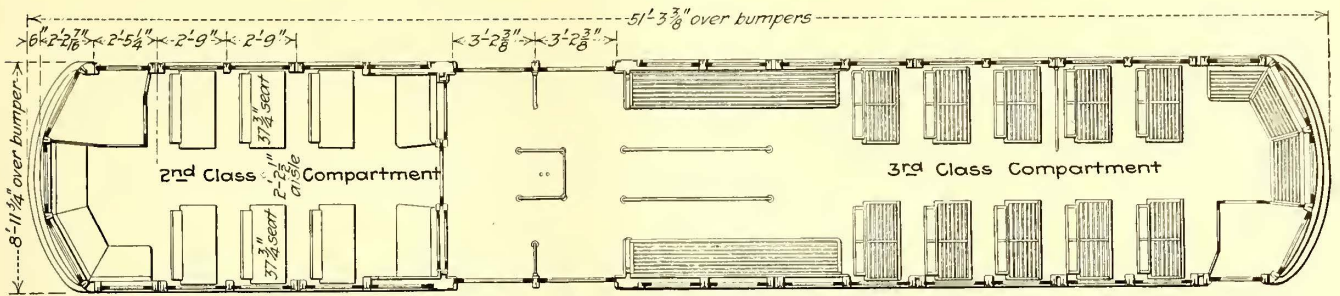
#### EQUIPMENT FOR ELECTRIFIED HERSHEY CUBAN RAILWAY

Hershey Central, where the vast plantation of the well-known Hershey chocolate and cocoa interests is located, is situated in Havana Province, midway between Havana and Matanzas on the north coast of Cuba. For several years the surrounding district has been served by the Hershey Cuban Railway, a 35-mile steam line which is now in the process of electrification and extension. With the completion of the electrification of this line, it is intended to maintain the service between Havana and Matanzas, a distance of 56 miles, for the transportation of sugar, local freight and express, as well as a multiple-unit train service on an hourly headway schedule. Including all spurs, sidings and extensions this railway will have some 80 miles of track when the proposed extensions are completed.

Accompanying illustrations show the type of car to be used, ten of which were ordered from this company. The cars have steel underframes consisting of side sills with 4-in. x 4-in. x  $\frac{1}{8}$ -in. angles the full length of the body, to which  $\frac{3}{8}$ -in. steel side sheathing is fastened, extending from the under side of the side-sill angle to the belt rail. The center stringers consist of two 6-in., 10 $\frac{1}{2}$ -lb. channels extending from buffer to buffer. Crossings are of 4-in., 5 $\frac{1}{2}$ -lb. channels which are securely gusseted to the side sill angles and the channel center stringers. The upper structure is principally of wood with body and vestibule posts of oak. Ash and yellow pine are used for the other members.

The closed vestibule on each end is constructed with two windows and a swing-type train door. The windows have double sash, the top sash being stationary and the lower sash arranged to drop. Sash racks are included to permit holding the drop vestibule sash at any desired distance. The upper sash of the swing train door is fitted with double sash, the top one of which is stationary and the lower arranged to drop. There is also a swing door on each side of the platform. A hinged trap door folds up against the end of the car body when this door is open. Triple steps are provided on each side of





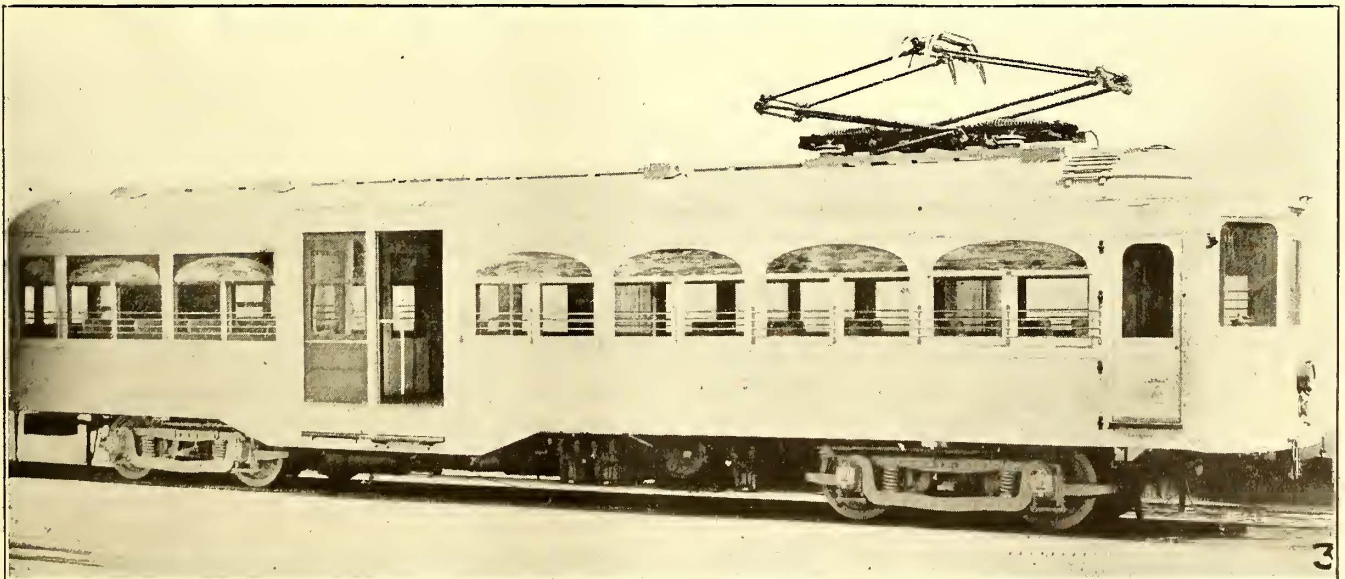
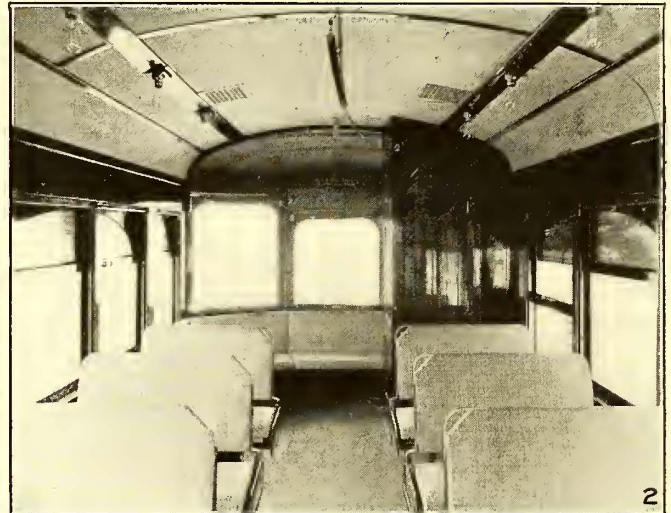
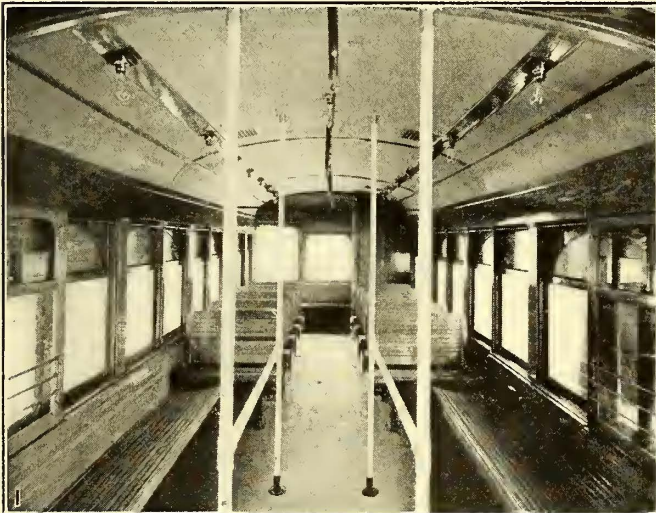
PLAN OF CAR FOR BARCELONA, SPAIN

the platform. The height from the rail to the top of the first step is 14 in. and each of the other steps is 12 in. high. All vestibule sash and door channels are of mahogany. The top sash in the side windows are stationary and extend across the space of the two lower sash, which are arranged to raise. The upper side sash and ventilator sash are glazed with green opalescent glass.

The roof is of the monitor deck type extending over the hoods in steam coach style. The roof boards are of poplar and after being given a thick coat of paint, its entire length is covered with No. 8 canvas.

As will be noticed from the illustration, in addition to

the two trolley poles and bases there is also mounted on the roof a pantograph type of trolley, and in order that the roof may properly support this equipment, it is strengthened with concealed steel rafters, which are so placed that they will relieve the strain of the trolley equipment. Inside the car body the floor is of the channeled type, filled in with flexolith painted in red to conform to the appearance of the inside finish. Below the belt rail on each side, the car is sheathed with agasote. The ceilings are also of agasote. Mahogany is also used for the inside finish, which is quite plain, conforming to what is known as "sanitary finish." No advertising moldings are used in the construction.



NO. 1—THIRD-CLASS COMPARTMENT IN A BARCELONA CAR. NO. 2—SECOND-CLASS COMPARTMENT OF CENTER-ENTRANCE CAR FOR BARCELONA. NO. 3—ALL-STEEL CENTER-ENTRANCE MOTOR CAR FOR BARCELONA

A continuous iron basket rack is placed above the windows on each side of the car for the storage of miscellaneous packages which the passengers may have. The seats are of the reversible-back "Winner" type, including pressed steel pedestals, wall and aisle plates. The aisle plate is capped with mahogany arm rests. In each of the four corners of the car body there is a small longitudinal seat. All seats are upholstered with twill-woven rattan.

In one corner of the body is a saloon, next to which is an alcove for a water cooler. At diagonal corners on each platform a motorman's cab is partitioned off.

The trucks are of the Brill 27-M.C.B.-2X type with 6-ft. wheelbase and 6-ft. 3-in. side-frame centers. The trucks are constructed for standard-gage track. They are constructed with solid-forged side frames and are equipped with 4½-in. x 8-in. journals of the M. C. B. type. The weight of the car and trucks complete is 64,280 lb.

PHILADELPHIA & WESTERN CAR

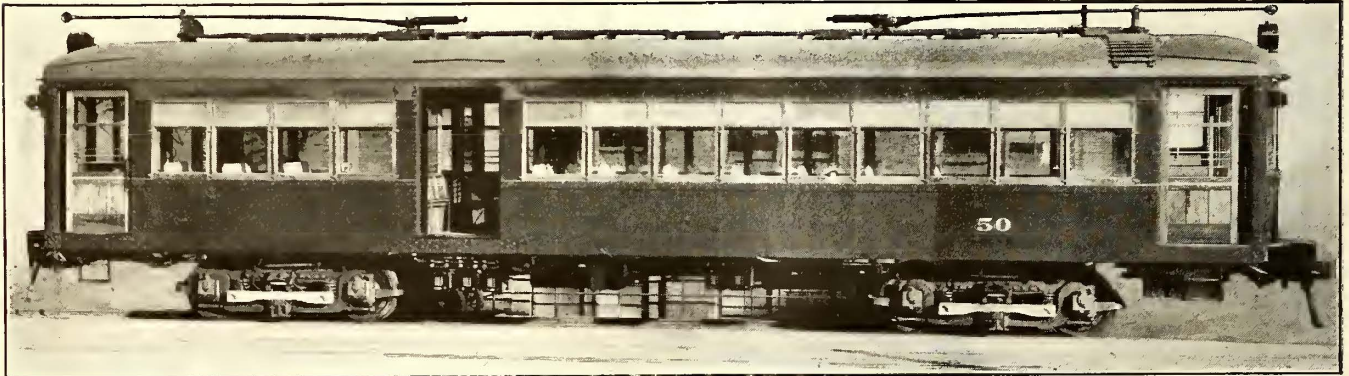
A 56-ft. all-steel passenger car has been purchased by the Philadelphia & West-

at each end of the car body. These bulkheads are constructed with suitable pockets to take the sliding doors.

The seats, of the reversible "Winner" type, are 40 in. long. Eighteen transverse seats upholstered in twill-woven rattan are placed in the main passenger compartment and eight of the same type in the smoking compartment. These seats have arm rests of an inter-urban and steam car design and are also equipped with single automatic foot rests which move into position with the reversing of the seat-back. Between the seats the aisle is 26½ in. wide. On the center platform back against the partition are four folding wood slat seats, providing additional accommodations for eight persons.

The seating capacity of the passenger compartment is thirty-six, the smoking compartment sixteen, making a total of sixty persons.

The interior finish, including doors, moldings, etc., is of mahogany, and agasote is used for the inside lining below the window sills and also for the ceilings. At the center-entrance door no steps are provided as the car is constructed so that the floor will come flush with the station platforms of the rail-



AT TOP, INTERIOR OF THE PHILADELPHIA & WESTERN RAILWAY'S NEW CAR. AT BOTTOM, PASSENGER AND SMOKING CAR OF THE PHILADELPHIA & WESTERN RAILWAY

ern Railway. The roof is of the plain arched type and is constructed of yellow poplar securely bolted to the pressed steel carlines and covered with No. 8 cotton duck.

The lower sash of the side windows are arranged to raise and are fitted with grooves with the "Renitent" all-metal post casings. The two windows in each vestibule have stationary sash. With the exception of the one in the center of each vestibule all doors are of the sliding type and are pneumatically operated. Steel bulkheads are placed on each side of the center platform and

way company. This car is equipped with Westinghouse A. M. M. air brakes and General Electric 263-A type motors and control. The weight completely equipped is 78,480 lb. Some of the principal dimensions of the car are given in Table II.

Protecting Eyes of Electric Welders

A DEVICE developed by an employee of the Market Street Railway of San Francisco affords protection for the eyes of an electric welder without the use of the usual metal head dress. It consists of a board slotted near one end for the insertion of colored glasses which are held in place by a clamp. The operator holds the board in the proper position with his left hand, while his right hand manipulates the welding tool. In locations where an assistant would otherwise be required, with this device a single operator can safely carry on the welding operation because he has an unobstructed view in all directions. The board hangs from a strap around the operator's neck.

TABLE II—DIMENSIONS OF ALL-STEEL PASSENGER AND SMOKING MOTOR CAR FOR PHILADELPHIA & WESTERN RAILWAY

Length of body over bumpers.....	56 ft.
Length over corner posts.....	44 ft. 3½ in.
Width of car body over posts.....	10 ft. 7 in.
Height from rail to top of roof.....	12 ft. 9½ in.
Height from rail to top of floor.....	4 ft. 9½ in.
Truck centers.....	31 ft. 3 in.
Post centers.....	2 ft. 10 in.
Center door opening.....	3 ft. 6½ in.
Type of truck.....	Brill 27-M.C.B.-3
Wheelbase of truck.....	6 ft. 6 in.
Diameter of rolled steel wheels.....	34 in.
Journals.....	5 x 9 in. M.C.B.

## Introducing Economies in the Paint Shop

Cost of Painting Freight Cars Cut in Two by Use of a Painting Machine and a Saving of 40 per Cent Obtained in Cost of Painting Passenger Cars Through Simplifying the Method and Reducing the Labor Necessary

BY W. G. MURRIN

Assistant General Manager British Columbia Electric Railway, Vancouver

THE use of efficient methods in the paint shop speeds up work and yields economies that are most essential in these times of high prices. The experience of the British Columbia Electric Railway and the methods by which the costs of painting equipment were cut in half should prove interesting to those responsible for this work on other systems.

On the mainland division of the property, comprising 144 miles of city and 158 miles of interurban tracks, the mechanical department has the care of 250 city cars, seventy-three interurban passenger and express cars, thirteen locomotives, more than 400 standard freight cars and a number of service and construction units, making altogether 805 cars. These cars are maintained in four carhouses and one freight repair yard, with the general shops located in the carhouse at Prior Street, Vancouver. Painting is done to freight equipment at the "rep. track," in New Westminster, which is the center of the interurban systems, and to all other equipment in the paint shops at Vancouver, which have a capacity of six cars.

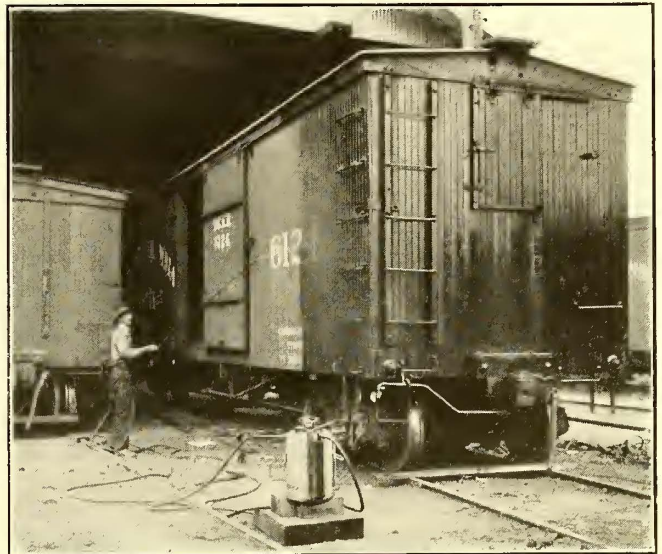
### COST OF PAINTING PASSENGER EQUIPMENT DECREASED 50 PER CENT

Up to the middle of 1915, when the effects of the great war, combined with the peak of the jitney craze, brought the railway revenue down to the lowest point in the last ten years, passenger cars were painted about every two years, the whole car being repainted, as outlined in the schedule below. The need for stringent economy led the master mechanic and paint shop force to study the work more closely, as a result of which they developed a method of treating the cars which practically cut the cost of ordinary periodical painting in two. It was found that while cars require revarnishing comparatively often, the groundwork remains in good condition for about ten years, and so, until the varnish begins to show signs of peeling off, it can be used as a ground and need not be entirely removed at each time of painting.

Since the method was changed, six consecutive wage increases have brought the cost back to what it was under the old method, but in view of this the actual saving is the more noticeable. The old method used for passenger cars with city equipment was as follows: (1) Washing; (2) varnish removed where necessary; (3) sandpapering, puttying up nail holes, joints, etc., where repairs had been made and priming over new work; (4) two coats of body color; (5) lettering and striping put on; (6) two coats of varnish; (7) painting trucks, ironwork, etc. The average cost of this work per city car was about \$28 for material and \$46 for labor, making a total of \$74. In some cases the cost reached \$85 or more. Interurban cars were proportionately higher.

The method was simplified in the revision as follows: After washing, the body is sandpapered where neces-

sary, such as around repairs, over scratches or where the varnish shows cracks; new work is primed. The light color is given one coat and the dark color touched up where necessary to an even base for the next coat, with one coat over new work. Then, after retouching



SPRAY MACHINE USED FOR PAINTING CARS AT VANCOUVER

of the gold-leaf work where required, one full coat of dark color is applied, with "cutting in" around the lettering and striping with a fine brush. Then follow the usual coats of rubbing and finishing varnish. The cost of this method averaged at first about \$16 for material and \$28 for labor, a total of \$44. The interior painting was not materially altered, except to substitute paint for varnish in some places, particularly where the original natural finish was becoming discolored from age or the action of the weather.

The color standards for city equipment are: Red roof; dark green on fascia, corner posts, dash, sides below belt rail and vestibule ceilings; light corn color for window posts; light red on sash, doors, vestibule wainscots, trussplanks, etc., and seat frames; drop black on moldings, and black asphaltum for trucks and ironwork.

For interurban cars, the corn color is replaced with dark green, with a little striping of vermilion on moldings. Locomotives have Pullman green, with yellow lettering instead of gold leaf.

To show the effect of rising labor rates, the following comparison is interesting:

#### AVERAGE COST OF PAINTING CITY CARS

Year	Material	Labor	Total
1915-16	\$16 65	\$26 10	\$42 75
1916-17	14 70	30 75	45 45
1917-18	15 00	32 60	47 60
1918-19	15 65	35 25	50 90
1919-20	20 00	42 25	62 25
1920-21	20 30	53 60	73 90

Had the old method been still in use the last figure would have been about \$125 per car. The saving, therefore, has been more than 40 per cent.

As most of the freight equipment was purchased in 1912 and 1913, repainting on an extensive scale was not begun till early in 1919. In July of that year a Dunn type-AA painting machine was purchased, with a capacity of 10 gal. The saving effected by this machine was such that it was paid for before twelve box cars had been completed.

#### FREIGHT EQUIPMENT PAINTED WITH MACHINE AT LESS THAN HALF THE COST

To paint and letter a 40-ft. box car by ordinary means required eight to twelve hours for lettering and about thirty-six hours for painting, practically all of this work being done by a first-class freight-car painter. The average cost for material was \$18.50 and labor \$27, a total of \$45.50 per car. The standard color is green, with lettering in white lead put on with stencils. About 6 gal. of mixed green, 1 gal. of red roof paint and one-half pint of white lead were used to a car.

After a few cars had been done with the machine and the men had acquired experience in operating it, it was found that better work was being done with a gallon and a half less paint per car. The average time for applying the green paint on all four sides was about two hours; one hour was plenty for the roof, and the time for lettering was about eight hours. The machine does not require a regular painter and can be operated by a brush hand. The actual cost of the first twenty-four box cars done with the machine was \$14.55 for material and \$6.80 for labor, a total of \$21.35 per car. The saving is therefore about 51 per cent.

The accompanying photograph shows the machine in operation, and an idea of the rapidity with which the work is done can be obtained from the fact that while the photographer was changing plates and taking three exposures the end and portion of the side shown was sprayed. The paint is laid on in two coats, the amount to a coat being determined by the distance from the surface at which the nozzle is held. Rough spots, cracks, nail holes, etc., are penetrated more thoroughly than can be done with the brush, and the finish is all that could be desired. At first some difficulty was found from the spray being carried by air currents, till all the surrounding "scenery" was being painted, as well as the operator, but experience has enabled the reduction of this trouble to a negligible amount. As already stated, the actual amount of paint used is less than with the brush. A flat car will require about  $\frac{1}{2}$  gal. of paint and a quarter of a pint of lead. One hour is required with the machine and four and a half hours for stenciling, the total cost being about \$8.

The machine is operated by compressed air at 60 lb. pressure, supplied from a pipe line through a feed valve, with outlets convenient to the painting track. In order to avoid clogging of valves and atomizer it is better to clean out the machine after using, so the work is arranged so as to keep the machine in operation all day, a sufficient number of cars being done at a time, thus reducing the extra labor for cleaning the machine to a minimum per car.

The success attained in painting cars has suggested the use of the machine for painting shelters and other structures along the right-of-way, such as telephone booths. This will probably be tried during the present summer.

## Electrification at Edinburgh

Gasoline Motor Buses and Electric Railway Cars Replace Cable Operation—The Choice Was Determined by Traffic, Power and Price Conditions

THE ELECTRIC RAILWAY JOURNAL of Oct. 2, 1920, contained some interesting comparisons of electric car and gasoline motor bus costs presented by R. S. Pilcher, tramways manager Edinburgh Corporation Tramways. The Edinburgh problem is that of superseding the cable system by a combination of electric railway and motor bus routes which will give the city the most effective transportation at lowest over-all cost. The installation of buses was begun in 1919 on some of the northern cable routes, where the track was in the worst condition. In a report made to the Municipal Council on April 2, 1921, Mr. Pilcher goes into detail concerning future work. This report is abstracted herewith.

#### CARHOUSE, SHOP, LINE AND TRACK ESTIMATES

Mr. Pilcher first explains what has been done in the way of installing electric cars and buses, and to care for the electric cars he recommends a forty-car addition to



SAMPLE REBUILT DOUBLE-DECK CAR, SHOWING VESTIBULING AND OPEN PORTIONS OF UPPER DECK

the Leith carhouse at a cost of £23,953 (about \$96,000 at \$4 to the pound) and alterations at the Shrubhill shops for the pit accommodation, etc., of thirty cars at a cost of £9,466 (about \$37,900).

For all of the first section, except Leith Walk, span construction, including the use of rosettes, is recommended. The width, 69 ft., of Leith Walk, however, suggests the use of center-pole construction in harmony with the construction already in use on the absorbed Leith Tramways. These poles would be used also for lighting fixtures, the existing lighting standards being replaced. The estimated cost of 4.3 miles overhead line, including section boxes, is placed at £19,989 (\$80,000).

Although the rails on this section weigh only 83 lb. per yard, while the latest British practice calls for 105 lb. and more, Mr. Pilcher recommends their retention, provided the rail joints are in good condition, and that these joints be bonded and welded. The cost of this work for 3.4 miles of route is placed at £1,600 (\$6,400) a mile. It is noted that the use of the Dicker electric weld on 1,550 yd. of track on this route was very successful, despite the worn condition of the rails, and that the cost of entirely renewing the track would be £27,000 (\$108,000) per mile of route.

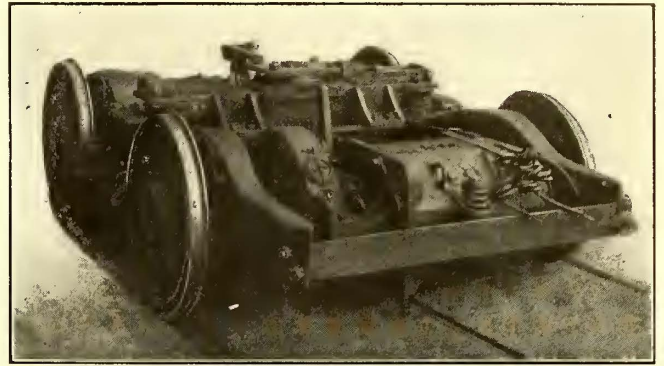
In view of the fact that the penny or short-haul riders of Edinburgh constitute 25 per cent of the traffic, it is not desirable, says Mr. Pilcher, to have a double-deck car seating more than sixty passengers and over 31 ft. long, as a larger car would have too many stops to permit a satisfactory rate of speed. For suburban traffic, a larger car can be considered when the time comes. Because of the climatic conditions, the upper decks of all cars should be covered, but open seats for four passengers could be left at each end. The ventilator windows should be arranged to open horizontally instead of vertically to insure better ventilation. Not only would Mr. Pilcher finish the lower saloon in teak but he also suggests the rather novel (in Great Britain) installation of upholstered cushions and back rests of leather or leather substitute, the usual practice being along less comfortable lines.

Another departure from current practice would be the spacious platforms—these being 6 ft. 1 in. long—inclosed vestibules and front exits with folding gates and steps operated by the motorman. These front exits are intended only for use at terminals and busy stopping places.

The bodies would be mounted on single trucks of long wheelbase, the journal boxes being fitted with links to give a certain amount of play to the axle when rounding curves. Two trucks of this type and with a 7 ft. 6 in. wheelbase are already in use on the Leith electric lines. Two distinct brakes are suggested: (1) Ordinary hand wheelbrake with Ackley attachment; (2) magnetic track brake operated from car motors acting as generators. An additional power track brake would be used in later operation of steeper lines.

#### REBUILT DOUBLE-DECK, DOUBLE-TRUCK CARS WILL ALSO BE USED

Where possible, Mr. Pilcher recommends the reconstruction of top-cover cable cars at a cost of about

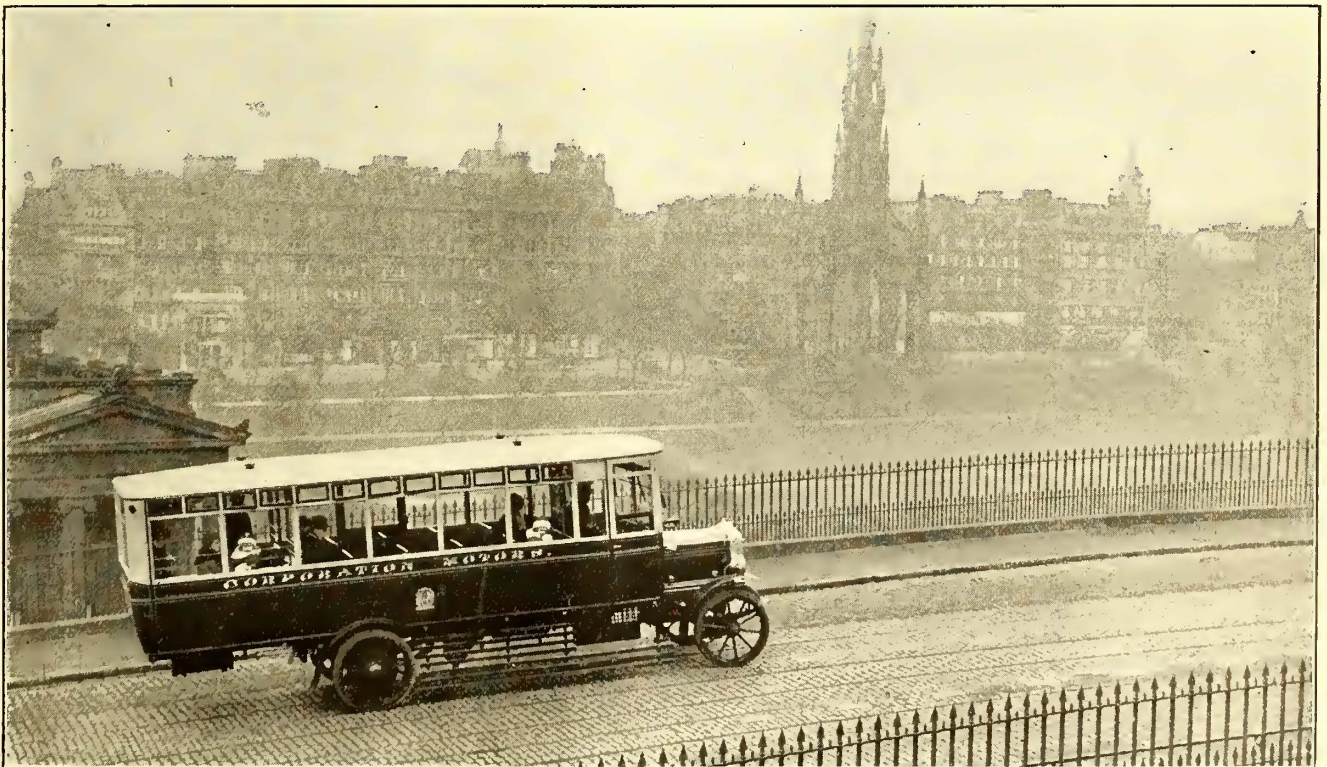


PRESSED STEEL WELDED MOTOR TRUCK WITH INTERPOLE MOTORS  
FOR EDINBURGH CARS

£300 (\$1,200) each to the style illustrated. These cars also happen to be exceptionally light. A trial has already been made of refitting the existing cable trucks for electric traction. The wheels have been increased from 22 in. to 24 in. diameter, stronger axles have been installed, the spring suspension has been altered and the journals have been equipped with roller bearings. The cars have been equipped with two 27-hp. interpole, self-ventilated motors. The illustration on page 12 shows this car.

The electrical and mechanical equipment of this sample car weighs only 7,668 lb. compared with 13,492 lb. for that of the like equipment on an electric car of the Slateford route. The sample car complete weighs 18,928 lb., which is 5,216 lb. less than the single-truck electric cars on the Leith Lines. The motors used are stated to be of the safety car type. Tests of the sample car show a maximum running speed of 17.5 m.p.h. when operating on the level and 11.5 m.p.h. on a 5 per cent grade.

To operate the first section forty-seven cars will be required. Mr. Pilcher suggests that bids be asked for



EDINBURGH CORPORATION MOTOR BUS CLIMBING THE MOUND, THE FIRST CABLE ROUTE IN EDINBURGH TO BE ABANDONED.  
SCOTT MONUMENT AND PRINCESS STREET IN THE BACKGROUND

sixteen new cars and that thirty-one of the existing cable cars be converted. The cost is estimated as follows:

16 car bodies at £1,500 each	£24,000 (\$96,000)
31 cable cars with new top covers, to be converted, £300 each	9,300 (\$ 37,200)
45 electrical and mechanical equipments at £1,400 each	63,000 (\$252,000)
	£96,300 (\$385,200)

The third item includes new trucks for sixteen cars and altered trucks for thirty-one cars.

On certain other routes the motor bus is considered more suitable so long as the present prohibitive prices of track continue. In conclusion, Mr. Pilcher summarizes the chief reasons why electrification should be proceeded with as soon as sufficient power is available, namely, greater reliability of service, through running to the neighboring city of Leith and lower over-all cost than the cable system, despite additional capital requirements.

## Germany Sticks to Single Phase

Federal Railway Administration Has Never, Even Temporarily, Considered Any Other System—Sweden Is Extending Its Single Phase Lines

ACCORDING to the *Deutsche Allgemeine Zeitung* for May 14, the German Federal Railway Administration has denied that it is considering any system other than the single-phase for its railway electrification. Commenting on a contributed article in the issue of this paper for March 5 in a statement which is reported to be official, the *Zeitung* says, in part: "The German Federal Railway Administration has always considered the single-phase system as the only one possible for its main lines and has never, not even temporarily, considered any other. A similar stand was taken previously by the individual state administrations. All existing federal main lines are a.-c. operated, and only this system will be used for any new lines. Hence, any international congress is not necessary. Last February there was a meeting of representatives of the federal lines and those of private lines, but its only purpose was to solve the question of current supply."

Sweden is also extending its single-phase lines. According to F. Overholm, chief electrical engineer, Swedish State Railways, there were in Sweden in May of this year 260 miles of electrified railroads, of which 240 were single phase and 20 were direct current, and the extensions during the remainder of this year, all single phase, will amount to 140 miles.

## New High-Voltage Line in Arkansas

THE Arkansas Light & Power Company of Pine Bluff has started work on the construction of a 33,000-volt line from its substation at Stuttgart to the substation of the Arkansas Utility Company at Clarendon, a distance of 20 miles. The line will cost \$60,000 and is being built by William Crooks, engineer and contractor. No. 0000 steel aluminum strand will be used with R. Thomas & Sons No. 3,058 insulators and Moloney transformers. White cedar poles are to be used, except where the line crosses the White River. The 1,000-ft. span across this stream will be suspended from two 90-ft. steel towers. It is expected that the work will be completed by July 15. The Arkansas Utility Company will distribute the electricity at Clarendon,

Brinkley and Cotton Plant. The Arkansas Light & Power Company will generate the electricity at its plants at Pine Bluff and Picron, from which lines extend to other communities. The Arkansas Light & Power Company also operates stations at Russellville.

## Using Lye to Remove Old Insulation

In Reinsulating and Repairing Old-Type Field Coils an Indiana Railway Facilitates the Removal of Old Insulation and Tearing Down Coils By Use of Lye

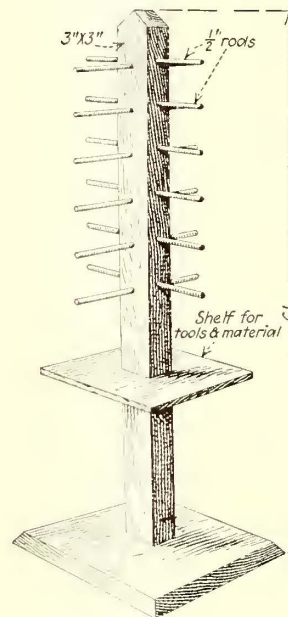
By J. E. HESTER

Master Mechanic Union Traction Company of Indiana, Anderson, Ind.

THE Union Traction Company of Indiana has twenty quadruple equipments of Westinghouse No. 85 motors in service. This type of motor has wire-wound field coils and, due to insulation breakdowns, it has been found necessary to tear them down and reinsulate them a number of times during the twenty years of their active

service. In this work soaking the field coils in a strong solution of lye for several days has been found to loosen the old baked insulation, which can then be readily removed. After the insulation has been taken off the wires, the coils are allowed to dry and are again reinsulated by hand, with the aid of a type of rack shown in the accompanying illustration. The work of reinsulating the coils is necessarily done by hand and a laborer can insulate two of these coils a day.

In re-forming the coils the wire is first given a coat of linen tape and the wires are then reassembled by hand in as nearly their original shape as possible, after which a coat of cotton tape is applied. The coils are then dipped and baked, after which they are

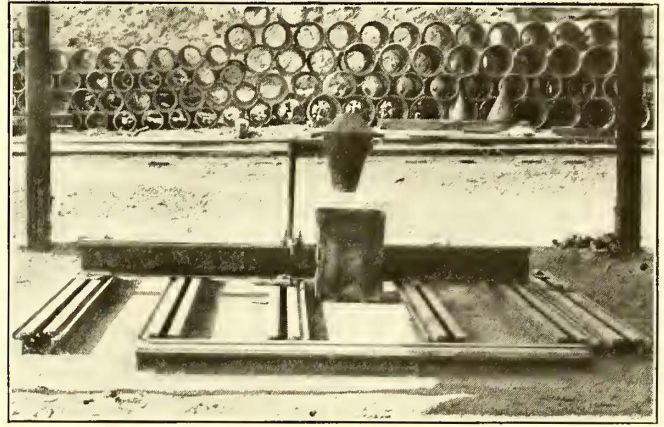
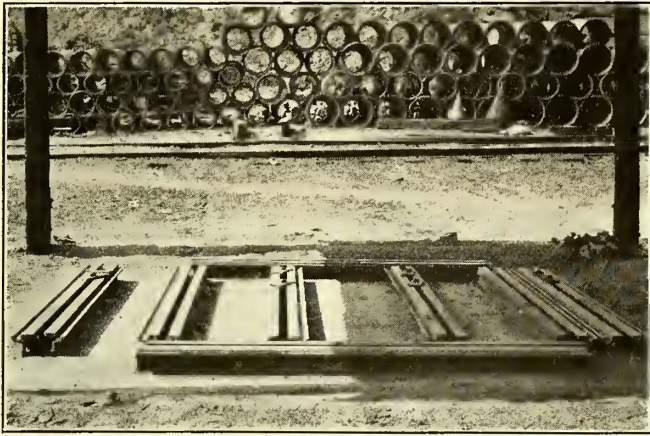


VERTICAL RACK FOR USE IN REINSULATING FIELD COILS

put into a forming press to restore them to their original shape.

The forming press is a homemade affair, constructed of second-hand material found on the property. The base consists of a 20-in., 70-lb. steel I-beam, to one end of which an air cylinder is fastened. To operate this press it was necessary to have a piston travel of 23½ in., and in order to obtain this long travel two 12-in. air-brake cylinders were welded together. The form used for reshaping the coils is made of cast iron and bolted to the opposite end of the I-beam. It is connected to the air cylinder by the 1-in. x 6-in. pressure bar with a ratio of 2 to 1. Air for operating the mechanism is secured from a convenient air-testing bench, and a pressure of 100 lb. per square inch is used.

After the coils have been properly formed they are again put in the baking oven and given another baking, as the previous baking was only preliminary and the coils were but partly baked. After this final baking, additional insulation is applied and the leads are soldered in place. By this method it is found that the coils are restored to their original condition for a very small cost as compared with that of new coils.



TWO VIEWS SHOWING ACTUAL APPEARANCE OF ATLANTA'S THERMIT WELD PLATFORM

### Building Frogs in Atlanta

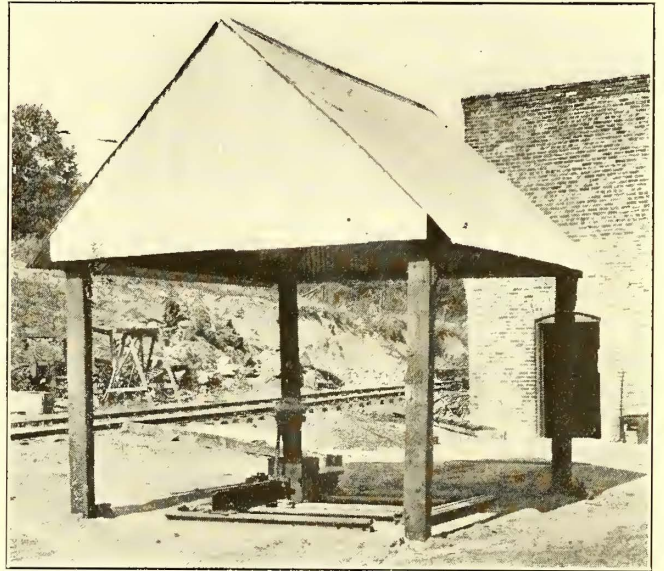
Experience Shows that a Good Welding Platform Is Most Essential to Insure the Careful Alignment of Parts

FOR more than a year now the Georgia Railway & Power Company, Atlanta, Ga., has been building crossovers and frogs by the Thermit process in cases where one or two frogs have gone to pieces in a crossing the rest of which is apparently good for several years. The company reports that there has been uniform satisfaction in this work. Records indicate that, in the case of the welding of frogs, the cost has been about one-third of the cost of a new frog ordered especially to take the place of the one which had given out.

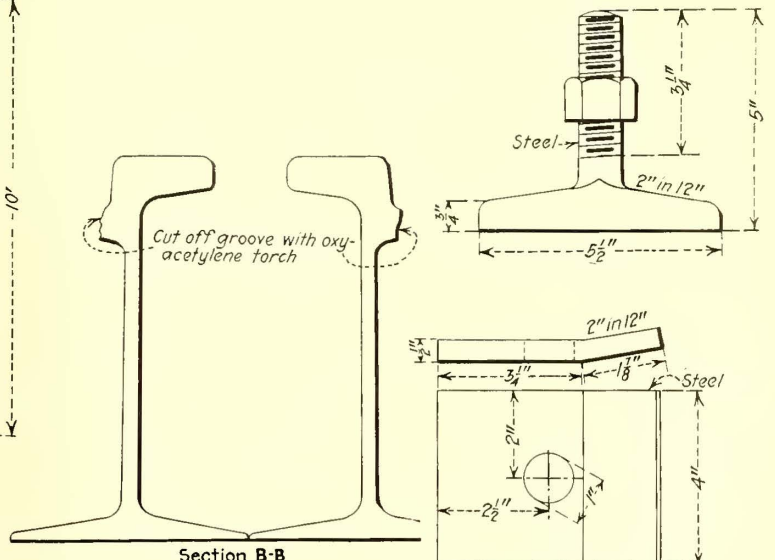
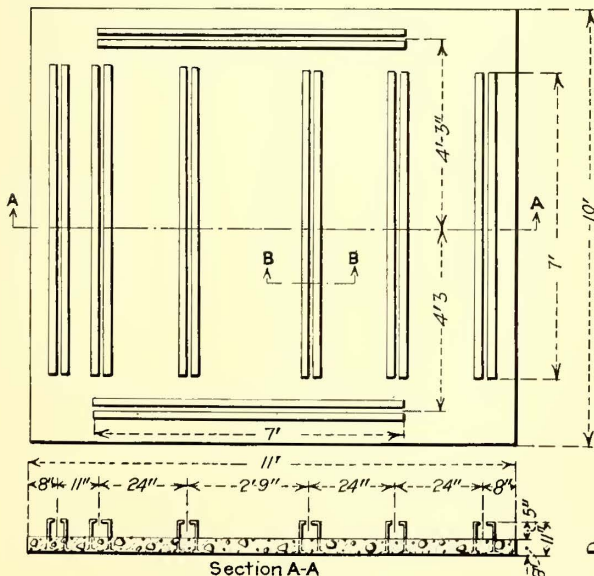
The first requirement, however, to make good frogs is that there shall be a good platform upon which to build them, so that the various parts which are to be welded together will be aligned accurately and held in place rigidly while the welding is being done. Accordingly, the ways and structures department, under the direction of C. A. Smith, superintendent of roadway, has constructed a special platform, housed under a roof, for this purpose. An accompanying drawing indicates the details of this platform, with the type of clamp used also shown. It is seen that this is constructed by the use of old rails imbedded in concrete and the platform gives excellent satisfaction. Accompanying pho-

tographs show the platform installed and a rail on it ready for welding.

Another illustration shows the entire installation with the roofing for protection against weather.



ENTIRE WELDING INSTALLATION WITH ROOFING FOR PROTECTION AGAINST WEATHER



DETAILS OF THERMIT WELD PLATFORM CONSTRUCTED OF RAIL AND CONCRETE IN ATLANTA

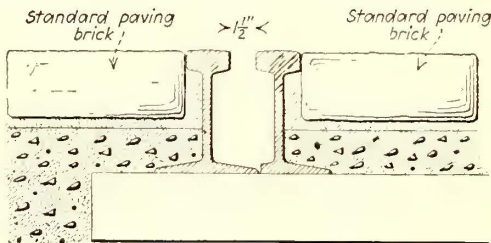


NEW BRICK CROSSING IN LITTLE ROCK

### Maintaining Brick Crossings

**I**N MANY cities brick paving is used between the car tracks, and where this kind of paving is used with T-rails and the track is crossed by heavy vehicular traffic the usual result is a wearing away of the bricks next to the rail until such a state is reached that automobilists swear at the street railway company. If the pavement is maintained satisfactorily, the cost is exceedingly high.

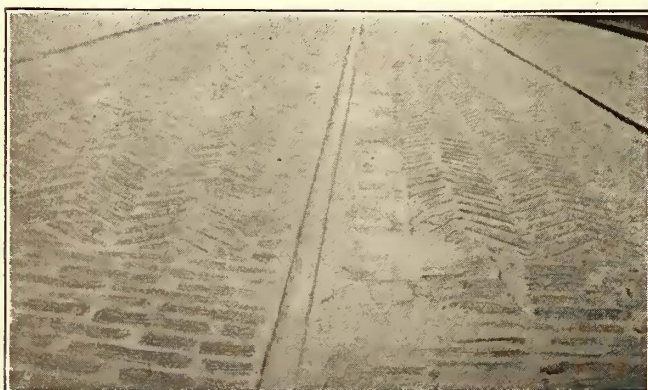
In Little Rock, Ark., this trouble has been an ever-present annoyance to the railway management, but a



OLD T-RAIL WITH ONE FLANGE CUT OFF, INSTALLED AS PROTECTION ON BRICK CROSSING

satisfactory scheme has now been devised so that in the future such crossings, when once repaired, will stay that way.

Old lengths of T-rail have had one flange cut off by an oxyacetylene torch, so that they may be set in the pavement on the ties with a 1½-in. spacing between the edges of the wheel rail and the guard rail thus installed, leaving this 1½ in. as a flangeway. An accompanying sketch shows the relative arrangement of the two rails. Standard brick is then laid directly against this inside guard rail as well as the outside rail, so that the finished crossing is absolutely level and smooth except for the 1½-in. flangeway space which remains. This provides



OLD BRICK CROSSING WHICH JARRED VEHICULAR TRAFFIC

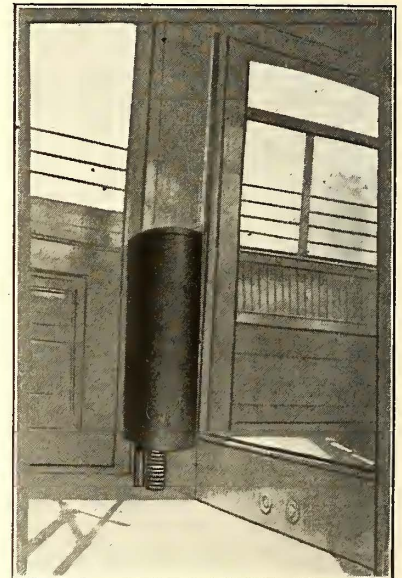
a very satisfactory crossing for vehicular traffic, and the one installation which has so far been made in Little Rock indicates no tendency toward deterioration at all.

The change has been so noticeable that there have been many freely offered commendations of the railway company for its efforts in this direction.

Accompanying photographs show the typical crossing before treatment and the crossing which has been built as described herewith.

### Effective Air Sander

**P**ARTLY, at least, as a result of the recommendations of its safety committee, the Chattanooga Railway & Light Company has been equipping its cars with air sanders. In arriving at a decision as to the type of sanders to use the company paid particular attention to a study of how to keep the sand always dry. Previous experience had indicated that sand boxes under the car or under the front seat and resting on the floor were very apt to have the sand in them made wet by water thrown off by the wheels. The accompanying illustration shows the sand box finally decided upon and now being installed upon the cars of this company. This sand box is metal, shaped very much like a controller box, and is mounted about 5 in. or 6 in. above the floor of the platform. The usual air pipe leads to the box at the bottom and a flexible coiled wire sand pipe about 2 in. in diameter carries the sand to the point



NEW TYPE SAND BOX INSTALLED AT CHATTANOOGA

in front of one wheel where it is desired. Experience so far with this installation has proved that the sand is always dry, and the company is satisfied with this installation. In some cases there has not been enough room to place the sand box on the rear or bulkhead side of the platform and it has been necessary to mount it at the left of the controller. This necessitates, of course, a much longer sand pipe from the box to the discharge point above the rail, in some cases making a pipe as long as 4 ft. or 5 ft., but this apparently has not diminished the effectiveness of sand delivery as needed.

The May issue of the *Monthly Labor Review*, published by the United States Department of Labor, is devoted very largely to the publication of statistics of wages and hours of labor in the different industries, among them the steam railroad industry and the electric railway industry. The steam railroad statistics are based on figures compiled by the Interstate Commerce Commission and the Bureau of Railway Economics. The electric railway figures show wages paid on a number of properties on Dec. 31, 1920, and are from the *Motorman and Conductor*.



## Pennsylvania Association at the State Capital

Pertinent Addresses Were Presented by Philip H. Gadsden; W. D. B. Ainey, Chairman, and Dr. F. H. Snow, Engineering Department of the State Commission; T. L. Montgomery, State Librarian, and D. N. Casey, Field Director State Chamber of Commerce — President T. B. Donnelly Re-elected

THE Pennsylvania Street Railway Association held its annual meeting on June 16 and 17 at the Penn-Harris Hotel, Harrisburg. The topics considered included an address by Philip H. Gadsden, president American Electric Railway Association, and papers covering personnel work, public relations, one-man cars, street railway history, helical gearing, automobile hazards and snow removal.

In his opening remarks President T. B. Donnelly, claim agent West Penn Railways, pointed out the complication of electric railway operation imposed by the automobile from the standpoints both of competition and accident hazard. He also paid a tribute to the association for the service rendered to its members in assisting them in solving their common problems.

### PHILIP H. GADSDEN SPEAKS

Mr. Donnelly then introduced P. H. Gadsden, president American Electric Railway Association, who outlined the electric railway situation and suggested four remedies for present ills. First, he said, the real trouble is not inadequacy of rates, but lies deeper than that, although that is a factor. The "heavy hand of regulation" has been laid on the transportation and other utility business as on no other. Prices in other lines ran riot, and while high prices were secured in other industries the utilities languished financially. During the war electric railways, at a loss, carried highly paid workers to plants operating at a high profit. They should not be expected to sell their goods below cost.

The financial plight of the electric railways is due, in part, to the devotion of managers to giving good service to the neglect of the commercial and financial sides of the business, whereas in other activities executives give large attention to the selling end. Thus the 5-cent fare, inaugurated largely for historical reasons, was allowed to stand because the economics of transportation did not receive proper attention. It was assumed that an unlimited quantity of the product could be sold at a fixed price, in defiance of economic laws. Obviously some kind of "metered service" must be furnished, such as is supplied under a zone-fare system.

From now on the commercial instinct and class consciousness must be developed, we must "go to some school of salesmanship." The industry has "arrived," it has become stabilized; the war taught that electric railway transportation is essential and lies at the basis of industry. Now electric railway credit must be re-established, not by individual properties but as a whole,

because the investing public has lost confidence in this field for investment. This is made more difficult by the ease with which municipalities can issue tax-exempt securities, which to persons of large income are more attractive than any securities which can be put out by electric railways at much higher rates of interest.

The result of all this is that railways cannot make needed repairs. The public then becomes irritated with the resulting unsatisfactory service and is inclined to consider municipal ownership as the way out. Thus while political policies of government are opposed to such ownership, the fiscal policies favor it. As much municipal expenditure is for unproductive enterprises, if municipalities can borrow money for public use with tax-exempt securities, much of the country's capital will be deflected from utility as well as industrial enterprises.

Among things that can be done to restore electric railway credit the following may be mentioned:

1. The real value of the properties should be definitely and officially established.

2. A system of rate regulation should be established under which the rates shall be flexible and quickly responsive to changing conditions; presumably some kind of a service-at-cost system.

3. Closer fundamental relations between the railway management and the public and employees must be fostered.

4. Publicity, in the large sense, must be persistently used to cultivate a personal touch with the car rider. This will be assisted by the campaign to be launched on July 8 by the Committee of One Hundred of the American Electric Railway Association.

### PAPERS BY MESSRS. CASEY AND BOYCE READ

Daniel N. Casey, field director Pennsylvania State Chamber of Commerce, followed Mr. Gadsden with a paper on "The Street Railway and the Community." A paper prepared by W. H. Boyce on "Personnel Work" was then read by Secretary Henry M. Stine, in the author's absence. Both of these papers are abstracted elsewhere in this issue.

The reading of the above listed papers was followed by a brief general discussion, during which such points as the following were brought out: There is no one solution for all electric railway problems. For instance, the mere raising of rates of fare may defeat its own purpose by decreasing patronage. Obviously the purpose is to choose a rate commensurate with the service and

with due regard to the convenience of the passenger in paying his fare. Improvement will be the reward of thorough analysis. Again, valuation procedure has yet to be put on a permanent basis to prevent a continual reappearance of the question. In the practical determination of value an element always considered is earning power, and this is inevitable. Great emphasis was laid on the fundamental necessity for getting capital from those to be benefited by the facilities for which it is to be spent. The future financing of extensions in particular should take this form. In many cases the assistance of municipal credit, which attracts money at lower interest rates, will have to be sought. This does not, however, involve municipal ownership. In addition a portion of the future financing of the railways must be drawn from earnings.

It was also suggested that many properties might benefit by a campaign of "cleaning your own house." For example, some railways may have cut service too far in their desire to meet expenses, and cases were mentioned where an increase in car-miles had brought more patronage.

### JITNEY PROBLEM TO BE STUDIED

At the close of the discussion on the morning session papers C. L. S. Tingley, vice-president American Railways, called attention to the importance of studying the jitney problem for the purpose of insuring operating conditions which are equitable to all concerned. He applied the well-known phrase "Eventually, why not now" to the burdens which the buses must ultimately carry and he pointed out that their situation is similar to that of the electric railways during their development period. People were then so glad to get street railway service that they imposed few burdens on this promising transportation system. Later, however, the burdens became increasingly serious. Such burdens the jitney business cannot continue to sidestep indefinitely.

On Mr. Tingley's motion a committee to study and report on this subject was authorized. President Donnelly, in due course, announced the following appointments: Mr. Tingley, Douglas Ford, superintendent North Branch Transit Company, and Thomas Newhall, president Philadelphia & Western Railway.

### FRIDAY MORNING SESSION

The first paper read at the morning session on June 17 had for its topic the one-man car. It was read by the author, C. D. Smith, superintendent Pennsylvania-Ohio Electric Company. The paper is abstracted elsewhere. This

was followed by a talk by Dr. Thomas L. Montgomery, State Librarian of Pennsylvania, who, with the aid of lantern slides, traced the development of transportation from primitive times to the early days of the electric railway. His purpose was to furnish a historical background for an appreciation of modern transportation facilities.

The next speaker was C. K. McGun-negle, who read a paper entitled "Changes Necessitated in Operation Owing to the Automobile Hazard," written by M. T. Montgomery and himself, both of whom are assistants to the general manager of the Pittsburgh Railways. This paper is abstracted on another page.

The discussion on the above papers brought out the difficulty of comparing the maintenance costs of cars of different types and ages and the importance of standardizing on the parts of car equipment, track details, etc., especially those requiring frequent renewal. A digest of the discussion on the one-man cars, which was a feature of the Lake George convention of the New York Electric Railway Convention, held during the preceding week, was also given.

The final paper read was by W. H. Phillips, manager engineering department, R. D. Nuttall Company, on helical gearing. This was of a technical character and special lantern slides were shown to illustrate the characteristics and action of different types of gear teeth. An abstract of this paper also appears in this issue.

On motion of the nominating committee the following were re-elected to serve for the coming year: President, T. B. Donnelly, West Penn Railways; vice-president, C. B. Fairchild, Jr., Philadelphia Rapid Transit Company; secretary and treasurer, Henry M. Stine, Harrisburg, Pa.; members of executive committee, C. L. S. Tingley, American Railways; Gordon Campbell, York Railways; F. B. Musser, Harrisburg Railways; Thomas Cooper, Westinghouse Electric & Manufacturing Company.

A committee of manufacturer members was also appointed to enlarge the membership among supply men. The secretary was also instructed to send the greetings of the association to F. B. Musser, president Harrisburg Railways, who was in Edinburgh, Scotland, at the time of the meeting.

#### NOTABLE SPEAKERS AT BANQUET

The annual dinner of the association was held at the Penn-Harris on Thursday evening, with Mr. Tingley as toastmaster. He first called upon C. B. McCahill, president Pittsburgh, Harmony, Butler & New Castle Railway, to tell of the profit-sharing plan in operation on the latter's two properties operating in the Pittsburgh region. Mr. McCahill explained that a fourth of the companies' common stock is lodged with a trust company in a trust fund, the dividends being divided among the employees who have been a year or more in the railway service. Three out of seven of the directors of each of the

companies are elected annually by the employees, and they have proved helpful in suggestions and in spreading the facts regarding operation among the men. A group insurance plan is also in operation, supplementing the required "Workmen's Compensation," and old-age pensions are in contemplation. The men like the scheme, they receive a substantial return, they are reasonable regarding wage adjustments and they endeavor to keep down the payroll and other expenses.

Dr. F. Herbert Snow, chief of the department of engineering, Public Service Commission of Pennsylvania, was the next speaker. He emphasized the principles of democracy, applying them to the regulation of public service, and deplored the efforts which had been made to abolish the public service commissions. These, he urged, are doing an essential work, and, while the legislation behind them may need some revision from time to time, the basis of their functioning is sound.

Mr. Gadsden then spoke, supplementing his address of the afternoon. He said that he had not intended to paint a gloomy picture in depicting the difficulties of public utility financing, for the industry is now seeing better days. The average fare has been increased by 50 per cent, and while this is much less than increases in materials and labor it is something. Expenses are decreasing, so that, with the co-operation of the commissions and the public, the long-deferred return to utility owners and bondholders ought to materialize. Electric railways have now "rounded the turn" and their condition is far different from that disclosed in the hearings of 1919 before the Federal Electric Railways Commission.

Hon. W. D. B. Ainey, chairman of the

Pennsylvania commission, followed Mr. Gadsden. He expressed on behalf of his colleagues and himself a sympathetic interest in the solution of public utility problems. The commission has desired that equitable rates be provided for, but has been handicapped by contracts entered into by the electric railways when the eventual inadequacy of a 5-cent fare was not realized. Moreover, the commission has to operate within the provisions of the public service company law, which gives no jurisdiction over securities unless requested by the utilities.

Mr. Ainey credited the railway men with the exercise of initiative, which led to the solution of their problems. He felt confident now, as he had before, that the difficult problems ahead will be solved. The commission will co-operate with them and, as was indicated by the "Wilkesburg decision," the legal rights of the utilities will be recognized. However, the commission will be embarrassed in its work in placing values upon utility property until some legal definition of "valuation" is agreed upon. All interests involved should strive to this end. Furthermore, too much dependence must not be placed upon law, for after all the appeal must eventually be made to enlightened public opinion, to the "heart basis" of constitutional rights. The local problems, also, are interwoven with national ones, necessitating a general public interest in their solution.

In closing, Mr. Ainey impressed on his hearers the fallacy of thinking of laws and political majorities in terms of the mass. After all, the operation of a law affects the individual primarily. While enacted by the majority, it lays its hand on the minority, whose rights are just as sacred as those of the majority.

## The Electric Railway and the Community\*

BY DANIEL N. CASEY

Director Field Service Bureau Pennsylvania State Chamber of Commerce, Harrisburg, Pa.

**T**he electric railway has been maligned and misrepresented, but it has persisted because it is a public necessity. Not long ago it was quite popular to condemn transportation systems, and there was a time when many deserved censure. Those days are done. Most street railway men now realize that they owe something to the communities in which they operate and to the men who aid them in functioning, as well as to the investors.

The community must have the street car and the street car must have the community. Their interests are mutual. The street railway, like the school and the church, serves the entire community. The banker who drives to his office in an automobile is able to serve a public ten times as large as he could serve otherwise because of the street railway. The clerks can work in the city, where wages are high, and live in

the suburbs, where rents are comparatively low. Real estate values in the business districts are much higher because the cars bring to town thousands of people who could not do business there otherwise. Suburban property is more valuable because the cars make it accessible to the city. Residential property is increased in value because it is located near a car line. Even if a man always walks or always drives in his motor he derives a dollars-and-cents benefit from the street railway. The community has a big stake in the success of the traction company. It must see that there is an orderly development of this as well as its other democratic institutions.

#### ELECTRIC RAILWAY SERVICE IS FUNDAMENTAL

The street railway industry is the most important in any community because it makes all other industries possible. Take away the means of transporting the workman to and from the

\*Abstract of paper read before Pennsylvania Street Railway Association, Harrisburg, Pa., June 16, 1921.

factories and the factories cease to function. So the manufacturer and his employees have an interest in the trolley lines.

Moreover, there is a social side of the local transportation, not only in that it produces a commingling of the various community factors, so essential to co-operative development and success, but if the transportation be not reasonably comfortable and adequate the impression upon the minds of the workmen may be the reverse of that which is highly to be desired in this period of stress. Although the treatment of the problem is primarily local, its scope is national because it is essential to the highly efficient industrial productivity through which the nation must carry out its program of reconstruction.

#### HOW THE CITIZENS CAN HELP

Both the store and the street car company must sell service; each is essential to the other and both are institutions integral to our community fabric. To promote the interests of the street car company, which in the end will help his business and aid in the constructive development of his community, the merchant can protest when drastic ordinances are proposed, when vehicular traffic is unjustly favored, when undue regulation of trolley companies is considered and when unfair advantage is taken of the street railway.

The citizen's work is most effective when it is united with that of others. Nearly every chamber of commerce has a transportation committee, which might well give heed to the street railway problem in general and to special problems as they arise. This committee should be advised of those points by the individual citizen as he learns of them and he should be prepared to assist the committee in its investigation and reports.

Last winter the Pennsylvania State Chamber of Commerce took a referendum among its membership as to whether the Public Service Commission should be granted increased authority to suspend rates pending a hearing. It was the opinion of the majority of the membership who answered this referendum that such authority should not be granted, and therefore our legislative bureau protested against the proposal. The bill was subsequently defeated. The voice of the State had spoken. It said that the utilities should not be further hampered.

The Chamber of Commerce of the United States appointed a committee on public utilities with regard to local transportation. The recommendations of this committee, submitted to the membership of the national chamber for referendum, were approved almost unanimously. The approval indicates that the broad-minded business man realizes the imperative necessity of retaining the vitalization and private ownership of street railway companies. These referendum results and the enthusiastic co-operation of many com-

munities with the transportation companies show that the keen business man appreciates the problem and realizes that prosperity for one institution in the community aids toward prosperity for all. Very seldom now is there a disposition on the part of the public to cavil at the trolley company merely because it is a corporation. There is a better spirit and a heartier desire to help.

In nearly every instance the street railway has laid its cards on the table. It is here, a definite institution in our

communities. It may have erred in the past, but let us not forget the pioneers who stretched the rods of steel into country formerly untapped and brought conveniences and comforts to the doors of those who seldom knew them and who forged communities together into a closer relationship. They have made us more American. Our work is with the railway of today in the constant developing of the twentieth century American city, and their work is with us for this common purpose.

## Practical Personnel Work\*

BY W. H. BOYCE

General Manager Beaver Valley Traction Company, New Brighton, Pa.

**A** DOZEN men engaged in personnel work would give as many definitions of this work. Tead and Metcalf define personnel administration as "the direction and co-ordination of the human relations of any organization with a view to getting the maximum necessary production with a minimum of effort and friction and with proper regard for the general well being of the workers."

Until recently no attention was given to the personnel of an organization. A foreman, superintendent or other official in charge was held to be the "whole works." If there was success, it was due to the foreman; if there was failure, it was his fault, as his superior held him responsible. The loss to industry through incompetence of foremen has been great. Later, the idea developed that employees have a share in success or failure and that all are necessary. That, in embryo, is "personnel." Personnel is a science, the fundamentals of which are possessed in some degree by all.

In this paper I shall deal with personnel along its applied lines, with frequent reference to methods tried and proved in a small organization, but applicable in part to a property of any size. The administration of personnel work on a small property is the general manager's responsibility. On properties large enough to warrant the organization of a personnel department, the head of that department should be a member of the president's staff.

#### WHAT PERSONNEL WORK IS

To me personnel work has meant: (1) Realization of the needs, a well-charted purpose and definite plans for progress; (2) selection of employees and fitting them into proper positions; (3) keeping the employees satisfied; (4) determination, from results, of correctness of purpose, plans and selection; (5) weeding out, changing about, building up; (6) analysis of everything having to do with the previously determined needs, plans and purposes.

While on a small property the personnel is the general manager's responsibility, it does not follow that he

is personally to do all the work. He must gather about him a group of trained assistants to carry out the details.

The general manager must realize that it is not he who is in daily touch with the public but rather the trainmen; that trainmen, barnmen and shopmen have more to do with the actual selling of transportation than he has.

#### GETTING THE EMPLOYEE STARTED RIGHT

Personnel work begins with the visit of the applicant for employment. The man in charge of that department must have had a wide experience; must know that even in declining employment to the applicant he has an opportunity to make a good impression for the company. He should proceed to select his men on the basis of physical qualifications, intelligence, education, temperamental requisites, appearance, character, common sense, practicality and general personality.

It is the duty of the man in charge of employment to explain to the applicant the character of work to which he will be assigned, the hours of work, the rate of pay, the chances for advancement, the policy of the company toward the public and its employees, and the methods used in keeping a check upon and record of the actions of employees.

He "sells the job" to the applicant by creating an interest in it. An extreme case where this was not done was the following: On a certain railroad the president sent for an employee who had been in the service and engaged on one job for thirty-five years, to award him a cash prize and to compliment him on his continuous service. In answer to a question as to his duties, the workmen said that when a train came into the station he went along each side and tapped the wheels with a hammer. Asked by the president why he did this, he replied: "I'm darned if I know." The man had been drawing wages for thirty-five years without knowing what he was really paid for.

After the applicant has been accepted he is placed under the direction of a foreman or instructor, who has been properly trained as to his attitude toward the new employee. Instructors,

\*Abstract of paper read before Pennsylvania Street Railway Association, Harrisburg, Pa., June 16, 1921.

especially those for trainmen, should realize that the greenhorn is in the same position as they were in when they entered the company's employ.

#### DEVELOPING MORALE IN THE ORGANIZATION

Personnel work develops an organization whose members have more than the wage-drawing habit. Its essentials are: (1) Careful selection; (2) proper instruction; (3) continual satisfaction; (4) consideration; (5) absolute justice to all; (6) placed responsibility; (7) supervision, continual instruction and job education; (8) supervisory and managerial vision.

On our property we have an employees' service code, which has been freely distributed publicly, and has produced good results. Our rate of labor turnover is small, and our list of applicants for trainmen positions exceeds 50 per cent of the number employed. Every employee planning to leave our service

is first interviewed by the employment supervisor. If he is dissatisfied, an effort is made to remove the cause and to retain him in our employ. Our promotions are from within the organization, according to a charted promotion plan. Employees are additionally trained in their promotion lines. Since December, 1920, we have had but one trainman resign and were compelled to discharge but one, and that for discourtesy.

Through bulletins, letters to the homes of the men and talks we show them that their welfare and the company's welfare are so closely allied that they cannot afford not to be on the alert for the company's interest. We trust our employees and they trust us. We know them; they know us. Finally, it may be said that success is assured through applied personnel only when the proper attitude toward the employee is maintained from the head of the organization down.

cured, in the way of passengers carried and revenue received, are shown in the accompanying charts. In Fig. 1 data are given for the East Hill line, Sharon, from April 1, 1919, to March 31, 1921. A 7-cent fare was in effect in 1919 and up to Dec. 12, 1920. A 10-cent cash fare, with six tickets for 50 cents, became effective Dec. 12, 1920. Twenty cars were placed in operation on this line on April 21, 1920. For comparison, the results with the Valley line, Sharon, operated with two-man cars, are given in Fig. 2. This shows passengers and revenue from April 1, 1919, to March 31, 1921. The conditions in respect to fare are the same as those pertaining to Fig. 1.

The results of the safety-car operation show that in every instance during the first five months of 1921 a period of industrial depression, there has been an increase in paid passengers upon lines operated with one-man cars, whereas on the line in which the headway has remained unchanged and has continued to be operated with two-man cars there has been a decrease.

Relative to equipment expense, a special investigation showed that for the safety cars this is approximately 2½ cents per car-mile, including inspection. As to power consumption, special tests showed that the one-man safety cars on one of the lines were consuming 1.26 kw.-hr. per car-mile for propulsion or 1.54 kw.-hr., including heating. These figures include all overhead losses.

In regard to the one-man car as a means of selling transportation, it is obvious that every manufacturer of or

## Experience with the One-Man Car\*

BY CLINTON D. SMITH

General Superintendent Pennsylvania-Ohio Electric Company, Youngstown, Ohio

THE purposes of this paper are to point out the economies that have resulted from the operation of thirty-two Birney one-man cars upon the property of the Pennsylvania-Ohio Electric Company and to indicate the potential savings which are being realized from time to time. This type of car is being operated upon the New Castle and Sharon, Pa., lines of the property,

in Youngstown and Sharon. Attention is directed to the fact that on practically every street upon which the Birney cars operate the clearance is approximately 6 in. between the car and an automobile parked along the curb line. This fact is worth consideration in connection with the reduction in the number of accidents which has resulted from the use of the one-man car.

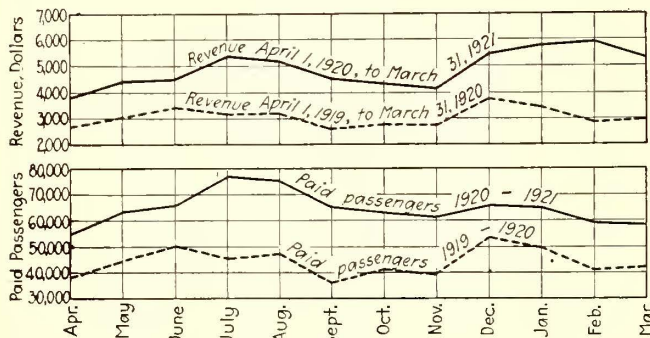


FIG. 1.—DATA FOR EAST HILL LINE, SHARON, PA., EQUIPPED WITH SAFETY CARS

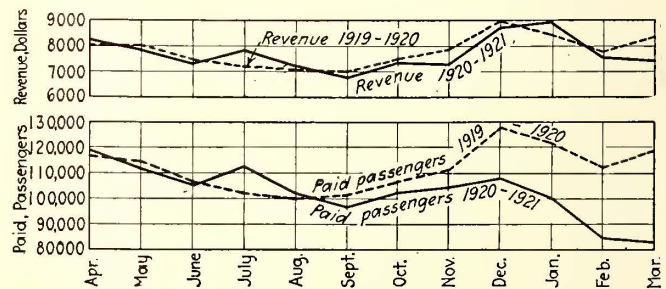


FIG. 2.—DATA FOR VALLEY LINE, SHARON, PA., OPERATED WITH TWO-MAN CARS

and in addition twelve cars are in service on one of the lines of the Youngstown (Ohio) Municipal Railway, a subsidiary of the company. These cities, from the industrial standpoint, are chiefly notable for their steel mills. They have populations respectively of 50,000, 20,000 and 135,000.

#### INTRODUCING THE ONE-MAN CARS

The larger number of Birney cars used by this company are operated in New Castle, the car-mileage of the line using the cars being 71 per cent of the total New Castle District mileage. In New Castle there are some extraordinary features in connection with the use of the one-man car which do not exist

In introducing the Birney cars in New Castle the company had to recognize: (1) that schedules were in effect that provided beyond question adequate service and that gave employment to seventy-six men on regular runs; (2) that the average length of ride was less than 1¼ miles and the maximum continuous ride was approximately 2 miles; (3) that there were severe grades on all lines, with a maximum of 9 per cent.

The first five cars were placed in operation in September, 1919, and provided a six-minute service where formerly a ten-minute service had been furnished, increasing the seating capacity by 84 per cent. Twenty-five additional cars were ordered and their use was gradually brought about in New Castle and Sharon. Some of the results, se-

dealer in a marketable product must study and apply the principles of salesmanship if he is to have large sales. This applies not only to the sale of commodities in general, but also to the sale of transportation.

Although there are many factors involved in merchandising transportation, frequency of service is a fundamental one inasmuch as it has the greatest effect on increasing the riding habit.

As to advertising transportation, our company has, since the initial newspaper campaign to introduce the safety cars, used the backs of the transfers for advertising. For example, in New Castle the following is printed: "New Castle—50,000 population—served by Birney safety cars—frequent riding permits better service." In the Shango Valley district we use the follow-

\*Abstract of paper read before Pennsylvania Street Railway Association, Harrisburg, Pa., June 17, 1921.

ing: "Birney safety cars provide frequent service—frequent use permits better service."

The persistent use of the term "safety" in connection with the Birney cars has had much to do with the increase in the riding habit. The use of this term places an obligation upon the railways operating the cars and upon the manufacturers of the cars to adopt any improved equipment which will add to their general safety, making them as far as possible accident proof.

#### MAKING THE SAFETY CAR SAFER

We have made three improvements of the cars used by our company with the idea of increased safety and economy. As some severe grades have to be encountered on the property, we are now installing Peacock brake drums on the shafts of the hand brakes on all safety cars. This will permit the hand brakes to be used not only for emergency purposes but also will make them serviceable. The second improvement has been the installation of safety features on the brake rigging to prevent accidents due to failure at that point. The third is the installation upon all cars

of the Lintern mechanical foot sander. This replaces at each end of the car one of the sand boxes formerly operated by air. It is operated by a pedal and guarantees the supply of sand whenever the supply in the box controlled by air has been exhausted.

#### A CAR THAT ATTRACTS RIDERS

Summarizing the features of the one-man car in respect to the sale of transportation, the following appeal to us is important: (1) The economical operation of the car permits more frequent headway; (2) the car, being the last word in modern mechanical electrical equipment, appeals to the people in the same manner as the modern department store and encourages the frequent use of the car; (3) appreciation of the fact that the car is fully equipped with safety devices tends to increase the number of rides per capita.

Finally as to accidents with the safety cars as compared with two-man cars our analysis indicates conclusively that there are fewer accidents with the safety cars. There has been a practical elimination of boarding and alighting accidents.

moving vehicles onto the car tracks. The resulting congestion recently became so serious that City Council passed new parking regulations whereby machines are permitted to stand for thirty-minute periods only and then only in certain districts. Parking is not permitted on any business street between 4:30 and 6 p.m. Enforcement of these regulations has been of material benefit, although a broken-down automobile, until it can be removed, will still cause the old-time congestion.

#### TOPOGRAPHY INVITES CONGESTION

The topography of the country limits the number of highways interconnecting the surrounding towns. Almost all of these carry car tracks and for years the railway has maintained many of the miles of paved roads in this district. Naturally, all kinds of vehicular traffic is attracted to these roads and the cars, though miles outside the city limits, are subject to more or less interference. Road improvement goes on from year to year by state and county authorities and some relief will eventually be had, but it will not be noticeable until drivers are educated away from the old routes and until more and better roads are completed.

Prior to 1918 cars on this system were operated on the pay-as-you-enter system for both inbound and outbound trips. During 1918 general congestion became so serious that something had to be done to get cars through the terminal district with less delay. It was decided to retain the pay-as-you-enter collection on inbound trips and change to the pay-as-you-leave system for the outbound trips. Checks show that the loading time had been reduced to about one-third. This manner of fare collection has some disadvantages, but delays incidental to fare collection occur at outlying points where congestion is slight and delays incidental thereto are reduced to a minimum.

#### LOADING PLATFORMS AND MID-BLOCK STOPS SAVE TIME

During the last year or two safety zones have been established at many points in the city and six loading platforms have been erected. The city should build additional platforms throughout the congested area, since their worth on the narrow streets has been proved.

Mid-block stops have also been used to facilitate getting cars through the congested area. At other points where the near side stop is retained there are "First Car," "Second Car," "Third Car" signs marking stopping places. Multiple loading and unloading have been found to save much time, particularly during the rush hours or in the handling of large gatherings at other times.

The automobile, from the traffic point of view, has done the street railway much injury. However, there is one point in its favor and that is, it is a fast moving unit and will not cause delays if there is enough street room for it to keep moving.

## What Automobile Traffic Means to Pittsburgh\*

BY C. K. MCGUNNEGLE AND M. T. MONTGOMERY

Assistants to the General Manager Pittsburgh (Pa.) Railways

PITTSBURGH'S narrow streets, steep grades and sharp turns are but the result of normal community growth without any conception of a definite plan. The result today is that the automobile traffic on these streets seriously interferes with the operation of street cars and presents a difficult problem for solution.

The central business district, known as "The Point," is extremely small, for, including street and alley space and wharves on the two rivers, it covers but 218 acres. Of this area the streets and alleys take up 63 acres and the railroad terminals 30 acres, leaving but 125 acres for commercial use. This area is but 30 per cent of the total as against an average for other cities of about 40 per cent. Traffic congestion is invited by the very arrangement of the streets, for practically none of them is continuous across the central business district. Many are on steep grades. Only one street is wide enough to permit two lines of vehicles between the car tracks and the curb.

Freight houses of the steam roads are so located on the North and South Sides and in the city itself that all trucking from one to the other must pass over the most congested city streets or take the long way round two sides of the triangle. As far back as 1910 vehicular congestion became so serious on the two main north and south streets, Wood and Smithfield, that the Pittsburgh Railways and the city of Pittsburgh entered into an agreement whereby the space occupied by one track on each of these streets was given

over entirely to vehicular traffic. In 1918 the one-way traffic movement was extended to take in Penn and Liberty Avenues between the city and Thirty-second Street. However, the increase in the number of automotive vehicles is fast overcoming the relief at first experienced.

In 1915 there were 131,000 automobiles registered in Pennsylvania. In 1920 there were 600,000, of which number 50,000 came from Pittsburgh. In July, 1917, a count, made between 7 a.m. and 6 p.m., of the number of vehicles entering and leaving the central business district, showed approximately 47,500. A similar count made in October, 1920, indicated the total had increased to 60,519. Into this mass of vehicular traffic sixty-one routes of trolley cars are run by the Pittsburgh Railways system.

The cars vary in size from those of the single-truck type, taking up 216 sq.ft. of street space, to the double-truck type which take up 428 sq.ft. A street car rider occupies about 4.5 sq.ft. of street space. Ford automobiles occupy 60.5 sq.ft. and Packards and the larger types of touring cars occupy 94 sq.ft., while trucks occupy from 132 to 190 sq.ft. Actual counts have established the fact that but 2.5 people, including the driver, form the average passenger load in Pittsburgh for pleasure cars. It follows, therefore, that an automobile passenger takes up considerably more street room than the car rider.

The difficulty in enforcing traffic and parking regulations has been a most serious drawback. Pittsburgh streets are so narrow that any form of vehicle stopped at the curb throws all

\*Abstract of paper read before Pennsylvania Street Railway Association, Harrisburg, Pa., June 17, 1921.

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## The Helical Gear\*

By W. H. PHILLIPS  
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AND  
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Westinghouse Electric & Manufacturing  
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THE problem of the designing engineer in the field of gearing is the transmission of heavier torques at higher speeds with lighter weight equipment and less deterioration. The progress that has been made in the line of gearing may be outlined as: (1) Improvement in materials; (2) application of heat treatment; (3) development of flexible gears; (4) development in the method of forming teeth, rotary-cut, hobbed, planed, blocked-out and ground; (5) application of helical gears.

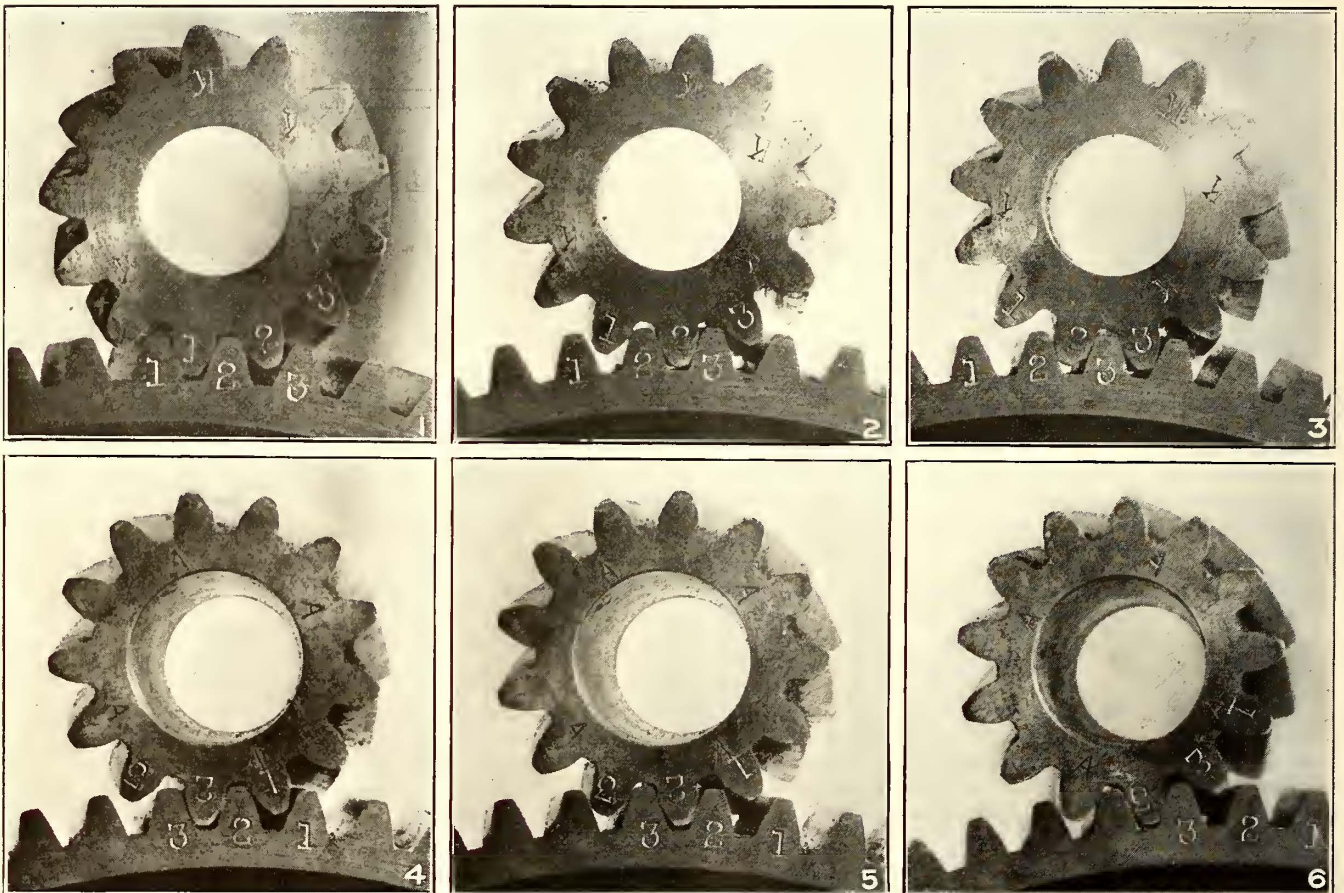
In electric railway service in cities

Where large capacity equipments are involved, such as locomotives and multiple-unit cars for terminal electrification on trunk lines, the flexible gear has been used to soften or dampen the vibratory action of the gearing due to the phenomenon mentioned and also to other causes. In city service this would be too expensive, although there are cases of interurban service where it could be used with advantage.

The helical gear overcomes inherent gear vibration by eliminating the so-called "stepping over" action. The operation of this type of gear can best

action from the tip of the tooth to the root is one of sliding and rolling. The percentage of rolling action can be predetermined, within reasonable limits, and the teeth can be designed to give a maximum percentage of rolling.

As a result of this rolling contact across the face there will be at any time (after the tooth has come into full mesh) tip, pitch line and base contact. This tends to maintain the original tooth form. In the case of the spur gear it is in contact across the face first at the tip and then progressively from the pitch line to the base. From the design of the involute form of tooth, there is pure rolling at the pitch line, while at the tip and the base there are sliding and rolling. The tendency is thus to greater wear at tip



SUCCESSIVE POSITIONS OF HELICAL PINION AND GEAR TEETH THROUGH THE CONTACT PERIOD

Fig. 1—Tooth 2 just entering contact.  
Fig. 2—Tooth 2 in contact near center of face.  
Fig. 3—Tooth 2 just leaving contact.

Figs. 4 to 6—Positions of reverse face of gear for tooth posi-

tions shown in Figs. 1 to 3 respectively. The "A" face of Figs. 4 to 6 shows the following in of the helixes across the face, the "K" face shown in Figs. 1 to 3, being in advance of "A" as regards the helix.

the pinion used in spur gear operation has from thirteen to sixteen teeth. In such a pinion for part of the time but one tooth is in contact with the corresponding gear tooth. It picks up its load across its entire face suddenly. It may be considered as a beam fixed at its root and loaded as a cantilever by the motor torque. The sudden load application produces two deflections, varying with the loading. Spur-tooth contact under load is unavoidably accompanied by shock and vibration.

\*Abstract of paper read before Pennsylvania Street Railway Association, Harrisburg, Pa., June 17, 1921.

be realized by thinking of it as made up of a number of thin spur gears twisted on the shaft with respect to each other. Helical gears transmit practically average motor effort with properly maintained bearings. The gears tend to wear evenly over the full tooth length, thus preserving the original tooth form.

The contact from the tip of the tooth to the root and across the face is the property inherent in helical gearing which produces the smoothness of gear action. The action of engagement from one side of the tooth to the other is practically one of pure rolling. The

and base. As the gear wears it is continually destroying the original tooth form.

As to helix angles, values from 5 deg. up to 20 deg. have been tried in all classes of railway service. From the results of service data an angle of 7½ deg. was prepared to meet all requirements, both for new and existing equipment. An angle that would provide approximately 13 per cent end thrust seemed desirable to give a cushioning effect.

The end thrust from a gear with 7½-deg. helix angle produces sufficient thrust to reduce the lateral movement

of the rotating element and provides a cushioning effect on the bearing when there is lateral movement. An oil film is thus maintained.

Most helical gears and pinions have a right-hand helix on the pinion and a left-hand helix on the gear. There is no particular virtue in this arrangement except for standardization. Where maintenance conditions make it desirable to reverse the gears this can be done without difficulty.

It has been felt for some time that the tooth form in general use in railway gearing is unsatisfactory. No improvements were suggested or considered, however, as a change would introduce two standards. With the introduction of the helical gear the full advantage of the latest developments in tooth form could be utilized.

With this condition in mind the tooth form adopted with the helical gear is of the so-called "long and short addendum type." This has the following advantages over the old form: (1) Increased strength; (2) greater rolling action; (3) more metal from root of tooth to bore of pinion.

The angle of approach is much smaller than the angle of recession in the new tooth, which tends to smoother tooth action. The new tooth is substantially stronger at the base, to the extent of from two to two and one-half times. Further, the rolling action of the new tooth varies from 55 to 70 per cent pure rolling, whereas the old 14½-deg. tooth gives approximately 40 per cent rolling in the involute zone. This is an increase of nearly 50 per cent rolling contact. A study of recent spur gear design has brought out several different types of long-and-short-addendum teeth. These all have specific advantages over the old form of spur gearing and are being given considerable publicity.

#### ACCURATE TOOTH FORM POSSIBLE

The helical gear is manufactured by the generating process, the tool being a ground hob and the cutting edges being of rack form. This method of tooth generation insures a high degree of accuracy.

Comparative tests made on the efficiency of helical and spur gearing showed a slightly higher efficiency for the spur gear, the difference between them being so small as to be considered negligible.

Obviously when vibration can be reduced the over-all efficiency of helical gearing will be much greater than that of spur gearing.

Extensive applications of helical gearing in electric railway service have been made with motors of from 250 hp. down to 25 hp. The gearing involved ranged from 2 diametral pitch to 43, and from 5½ in. face to 3½ in., with ratios of 25:48 to 13:74 inclusive. It has also been applied in several sizes on electric locomotives.

In most cases the helical gearing in electric railway service has been in operation from one to two and one-half years. The trial installation service mileage is approaching 400,000 with a

minimum of approximately 150,000. Records show that in service helical gear operation reduces motor maintenance, increases gear life, and reduces gear noise and vibration. The lateral wear on motor and axle bearings is no greater than in spur gear service.

With 20,000 to 25,000 helical gears and pinions manufactured to date, and with the increasing demand for them in initial installations and in changing over old equipment, it is obvious that the helical gear is with us and will help to solve the problem of quiet, efficient, long-life transmission.

## Equipment Men Discuss Problems

Information Brought Out of Value to Men Engaged in Car Maintenance—Reclaiming Worn Air Compressors, Causes of Freezing in Piping, Experience with Ball Bearings, Etc., Discussed

**G**ATHERING forty-eight strong at Akron on June 8, 1921, the Association of Electric Railway Men, comprising the equipment men of Ohio, Pennsylvania and West Virginia, joined in their usual informal round-table discussion of rolling-stock maintenance matters. The discussion was led off by a paper on the maintenance of air-brake equipment by J. F. Craig of the Westinghouse Air Brake Company. Mr. Craig described the essential details of the various types of air brake equipment as used in city, interurban, subway, elevated and electric locomotive service.

In the discussions that followed this paper it was brought out that there is a small amount of leakage at the power valve or foot valve used on safety cars. This leakage is most noticeable when the doors are open and the brakes are applied, as the operator at this time keeps his hand on the controller handle or his foot on the foot valve.

In reply to a question as to the practice of his company in reclaiming worn air-compressor cylinders, Mr. Craig said that it is rebushing cylinders and then reboring them to standard sizes. P. V. C. See of Akron said that his company is doing this work in an ordinary engine lathe. The necessary bushings are bought with rough bores and are finished after they have been pressed into position. I. E. Church of Pittsburgh said his company is using bushings with four feet, which are used to bolt the castings to the lathe faceplate for turning and finishing. This scheme has advantages in making it easier to set up the casting in the lathe and results in better boring.

Discussion regarding the types of air-compressor rings used brought out the fact that three rings of the snap type are now usually used. The ring near the end of the piston acts as a wiper and keeps the oil from getting into the air. Mr. Craig explained a method of checking air-compressor performance by use of an orifice testing device with a standard-size tank. The time necessary to raise the pressure from point to point is taken, with the compressor removed from the car. The general opinion was that it is more satisfactory to remove compressors for testing and that uniform voltage is essential; otherwise the speed of pumping will vary.

Discussion of remedies used to prevent freezing of the air system brought

out that a generous quantity of radiating pipe is of great assistance. Some companies have used anti-freeze devices with good results. Mr. Church described measures used by his company with success, which included the installation of piping having a diminishing size at each elbow from the reservoir to the first tank and from the second tank to the train line. The sizes gradually diminished from 1½ in. down to ¾ in. On some of the newer cars the size of piping used is diminished from 2 in. to ¾ in. in the direction of flow. In general, freezing is due to insufficient drainage or "pockets" in the piping. This led to a discussion as to the best location for the air intake. Some representatives felt that the strainers clog up to a greater degree when located inside the car than when underneath, and a case was cited where the strainer was found to be stopped with a kind of felt mat which probably came from the plush seats. In regard to the location of the strainer on the car roof, it was explained that this involves an additional length of pipe with greater possibility of leaking. Mr. Delaney of the General Electric Company said that his company is recommending putting the strainer inside the car as the greatest difficulty had been experienced from the dust when installed underneath. He said that the G. E. type of strainer should be cleaned about once in six months.

#### ELIMINATION OF KEYWAYS IN ARMATURE SHAFTS

In the discussion as to the necessity for using keys to hold pinions in position, the general opinion seemed to be that satisfactory results could be obtained without keys. A. B. Creelman of the Youngstown Municipal Railway said that his company has done away with keys in the pinions and so far has never had a loose one. Others said they had been following this practice with good results. This led to a discussion as to proper methods of installing pinions. In general most railways seem to be using the hot water method of heating pinions before they are installed. J. L. Crouse of the Westinghouse Electric & Manufacturing Company said that the Norfolk & Western Railway is shrinking pinions on by using gas heat, as it is impossible to get a sufficiently high temperature with hot water. They are removed in the same way.

Experience with the use of ball bearings was varied. Some expressed the opinion that they have proved very satisfactory, while others had found them unsatisfactory. It was pointed out that a new type of roller bearing which is adjustable has been recently brought out by the Gurney Company for electric railway use which eliminates the necessity for shrinking the race on the shaft. This has proved a particular source of difficulty in previous types.

There was considerable discussion in regard to the cause of side wear on brushes, and it seemed to be quite generally agreed that this was due to dirt principally. G. F. Randolph and P. D. Manbeck of the National Carbon Company said that to a certain extent this wear could be eliminated by using close-fitting brushes which would assist in keeping out the dirt which starts the wear. Mr. Creelman said his company is getting much less side wear on the brushes on cars operated on paved streets than on equipment with no paving. He said that he was convinced that the cause of this side wear is dust, as he is averaging 8,000 miles per brush in ventilated motors and 12,000 miles in closed motors.

In the discussion on methods of cleaning cars, one master mechanic stated that ONC cleaner, when diluted one part to seven or eight parts of water, will still bleach the enamel, where M-dock cleaner will not bleach but will

darken the enamel somewhat. Another master mechanic said that he is getting twice the life with Old Dutch enamel than he obtained with flat colors and that he is using clear water and a little soap for cleaning this. Another member suggested that he has been very successful in brightening dull enamel by using an ammonia solution one part to about eight or ten parts of water followed immediately with clear water.

The association was entertained at luncheon at the Portage Hotel by the Northern Ohio Traction & Light Company, after which the members made an inspection trip to the company's shop.

### Rail-less Transportation to Be Taken Up by New England Club

THE New England Street Railway Club has appointed a committee on one-man car, trackless trolley and motor bus operation. This committee is to study the possibilities of each form of transportation as it affects New England, and report at the February, 1922, meeting of the club. The personnel of the committee follows: Louis Pellissier, Holyoke, chairman; W. J. Flickinger, New Haven; H. F. Fritch, Eastern Massachusetts Street Railway; John Lindall, H. B. Potter, and H. W. Putney, Boston Elevated Railway; and Albert S. Richey, Worcester, Mass.

meeting the early part of July, at which time the report for presentation will be prepared.

### Committee on Reorganization to Meet

PRESIDENT GADSDEN has called a meeting of the committee on reorganization to be held in New York on July 8. At this meeting the committee expects to determine the changes in the constitution of the association necessary to carry out the reorganization plans under consideration and, if possible, to have its recommendations as to necessary changes in the organization in definite form. Members who have suggestions which they desire to have considered by the committee should forward them to President Gadsden, if possible, before this meeting.

### Two-Day Session of Power Distribution Committee

THE power distribution committee of the Engineering Association held a two-day meeting at the association headquarters, New York City, June 16 and 17. Various reports of the sub-committees appointed on the seven subjects were presented and final decisions were reached regarding the reports of the committees to be presented at the October convention. Those present were Charles R. Harte, the Connecticut Company, chairman; C. C. Beck, Ohio Brass Company; Ralph W. Eaton, public service engineer, Providence, R. I.; H. H. Febrey, American Steel & Wire Company; C. A. Harrington, Pennsylvania Ohio Electric Company; C. H. Jones, Metropolitan West Side Elevated Railway, Chicago; F. McVittio, New York State Railways; M. D. Rosevear, Public Service Railway of New Jersey; W. Schaake, Westinghouse Electric & Manufacturing Company, and F. J. White, the Okonite Company.

## American Association News

### Committee of 100 Postpones Banquet

THE Committee of One Hundred of the American Electric Railway Association has decided to postpone the banquet scheduled to be held in New York on July 8, the reason being the impossibility of obtaining the speakers desired. The event will be held some time in the fall, when it is expected that an interesting program can be arranged.

### Association Takes Up Study of Trackless Transportation

ON June 24 the newly appointed American Association committee on trackless transportation, of which H. B. Flowers, United Railways & Electric Company, is chairman, met at association headquarters to organize and discuss how the general subject of rail-less transportation could best be presented at the coming convention. The other members of the committee present were C. B. Buchanan, Virginia Railway & Power Company; Edward Dana, Boston Elevated Railway; C. J. McPherson, J. G. Brill Company; R. W. Meade, formerly with Detroit Motor-bus Company, and W. H. Burke, proxy for C. W. Kellogg, Stone & Webster Management Corporation. Absent mem-

bers were G. A. Green, Fifth Avenue Coach Company; H. L. Howell, National Railway & Appliance Company; A. W. McLimont, Winnipeg Electric Railway; H. A. Mullett, the Milwaukee Electric Railway & Light Company; Albert S. Richey, Worcester, Mass., and E. B. Whitman, Public Service Commission, Baltimore, Md.

A discussion brought out that about the only way in which something concrete could be put before the October meeting would be for sub-committees to handle different phases of the subject and then to collate these reports into one for the committee as a whole.

The report as planned will have a preamble on the field of the motor bus and a discussion as to the trackless trolley installation at Richmond, covering mechanical features, costs, and passenger loading limitations. General information as to the type of bus, costs of operation, depreciation, etc., will be shown for different operating motor bus companies. Similar statistics will be given for foreign systems as well as for those in Canada. An analysis will be attached as to what might be a fair differential for fares as between bus and rail cars. The report will also include an article on the desirability of a unified transportation system from the public service commission viewpoint.

The committee hopes to hold another

### Rhode Island Men Have Annual Outing

ON SATURDAY, May 21, the Rhode Island Company section held its fourth and most successful annual outing at the Warwick Club, Warwick, R. I., with an attendance of over 100 members. A program of sports was the feature of the afternoon, after which the members partook of a Rhode Island clam dinner. The outing was under the direct supervision of William B. Spencer of the transportation department and eight assistants from other departments.

On June 9 the last monthly meeting of the section for the current year was held. Superintendent Rounds of the Broad Street carhouse gave a talk on the duties of a carhouse superintendent. He stated that one of his duties was to provide enough service, but not too much, by means of trippers and extras. He said that he keeps informed of the riding on the various lines by encouraging the platform men to give him this information.



## Recent Happenings in Great Britain

### Prospects Better for Settling Miners' Strike—Tramways Burn Coal—Many Roads Inconvenienced

(From Our Regular Correspondent)

At the time of writing there are good prospects of an early settlement of the coal miners' strike which has been running its disastrous course since the beginning of April. Renewed negotiations between the mine owners and the miners' representatives are promising. On the other hand there is serious trouble in the engineering trade and in the cotton industry over wage reductions. Meanwhile, through the general dislocation caused by the coal strike the number of unemployed in the country has risen to about 2,000,000.

Several by-products of the strike are of interest in the traction field. Perhaps the most significant, as regards the future, is the substitution of fuel oil for coal in the power stations. This substitution has been carried out in many places in the country. One of the earliest changes of the kind was adopted by the London underground railways at their generating station at Chelsea. This is the largest purely traction station in the country. The large stocks of coal in hand were becoming exhausted and though some foreign coal was arriving by sea there was difficulty in getting it discharged owing to an embargo by the transport workers against handling imported coal. They thought it would help the cause of the miners.

In the ordinary way the Chelsea station needs to have fifty-two of its big water-tube boilers at work during the rush hours. The job was put in hand and was completed in about ten days of adapting the sixteen of the boilers for oil firing. This did away with the consumption of about 320 tons of coal a day. The oil is pumped from tank barges which bring it into the river creek beside the power station. The experiment has been successful and should necessarily arise more boilers will be converted. The landing of foreign coal, however, went on, either through the defection of transport trade unionists or through the employment of volunteers. The remaining trouble about the matter is that the coal from the continent of Europe is frequently of very poor quality for steam-raising purposes.

In a number of places in the country full tramway services have been maintained by adapting power station furnaces for oil burning, and in some cases where services had been restricted the advent of oil has enabled every required car to be put on the road. Hull was the first place to change over completely. Leeds and Newcastle municipal stations followed. (What about the tale of carrying coals to Newcastle now?) The Carville station of Newcastle Electric Supply Company has to a considerable extent been changed to oil burning. This is one of the biggest power stations in the country and supplies power for all sorts of purposes, including traction on the North Eastern Railway local lines. In quite a number of other towns the change is being carried out, while in still others experiments are being made. At the power station of

the London County Council Tramways everything has been made ready for effecting the change if necessary, but at the time of writing sufficient foreign coal has been available. Part of the auxiliary plant, however, is now oil-fired.

It has been found that at the present prices of coal and of fuel oil, and taking into account the relative calorific values of the two fuels, the oil is actually cheaper than the coal. Moreover, the supplies of oil are abundant and evidently easily obtainable. The cost of converting a furnace for the purpose of burning oil is small. It will thus be seen that unless there comes a very radical change in the relative prices of oil and coal there is little prospect of any reconversion of furnaces to coal burning. Thus once again the miners have been cutting off their noses to spite their faces. The whole situation is no doubt of deep interest to the great petroleum corporations of the United States and Mexico, especially when it is coupled with the announcement made in the end of May that all new ships of the British Navy will be oil-burning.

A really Gilbertian situation arose during the month of May in connection with the London County Council Tramways. With the object of supporting the coal miners in their strike, the executives of the trade unions of steam railway men and of general transport workers issued orders prohibiting their members from handling or transporting coal brought in from abroad. It should be clearly understood that the British Government did not arrange for this importation of coal for the purpose of breaking the strike, but solely in order to keep essential public services and domestic supplies going. None of the imported coal goes to manufacturing industries.

To a very great extent the members of these trade unions ignored the orders of their executives and unloaded and transported the coal freely. Where they refused they were suspended from employment and plenty of volunteers were available to take their places. The threat of a general strike against this arrangement was futile; the rank and file would not agree. At the power station of the London County Council Tramways at Greenwich, however, the cranemen refused to unload the foreign coal from the ships bringing it in. They were suspended and volunteers took their places. (Volunteers are easily

secured when hundreds of thousands of people are out of employment owing to the miners' strike.)

Then a number of employees in the station—some skilled and some unskilled—went on strike as a protest against the suspension of the cranemen. Apparently they did not see that if the cranemen had been successful in preventing the landing of coal the employment of the other workers in the station would be gone. These men's places were also filled.

The pig-headedness of the unions' executives concerned was next further demonstrated by their taking a ballot of all the London County Council tramway employees on the question of striking in sympathy with the power station employees. The ballot was duly taken but the trade union executive refused to publish the figures of the votes recorded. It is known, however, that there was a very large majority against striking; apparently it was so large that the executives were afraid to make it known. Over the country it is safe to say that the enthusiasm for strikes is dying. The grim realities of the industrial and economic situation have been borne in on the rank and file.

During May there was in many towns in England a gradual reduction of tramway services owing to the scarcity of coal. The London underground railways made various cuts for the same reason, despite the partial adoption of oil fuel already noted. A turn in affairs began, however, early in June. The transport workers and railwaymen's unions, realizing that their embargo on the unloading and transport of coal was futile, withdrew the prohibition notices to their members, and coal was thereafter handled freely. Larger supplies began to arrive from abroad. Partly on this account and partly because of the conversion of more steam locomotives to oil burning, the main line railways began to increase their services which had been so much restricted, and improvements also commenced in some of the reduced tramway services.

In the end of May the oil-importing companies reduced the price of petrol by 6d. per gallon, bringing the cost down to about 3s. retail. The reasons assigned are that prices have recently fallen in America owing to production overtaking demand, that the rate of exchange has improved, and that freight rates are easier. The reduction is specially welcome to motor omnibus undertakings, particularly to the London General Omnibus Company, which is the greatest consumer of petrol for traction purposes in the country. That company, instead of having to restrict its services like the tramways, has been extending them. It has also added a series of one-day towns by motor char-a-bancs through rural districts around London. A whole day's outing including luncheon and tea costs only 21s. On Whitmonday the company set up a new record, even for that holiday. By all its services it carried about 3,000,000 passengers.

# News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION  
PERSONAL MENTION

## Los Angeles Terminal Station Rehearing Resumed

The case of the four large railroads entering Los Angeles proceeding with the construction of a union terminal depot on the Plaza site as recommended by the commission engineers was reopened on June 16 in Los Angeles before President H. W. Brundige and Commissioners H. D. Loveland, H. Stanley Benedict and Erving Martin. A review of this ruling of the commission was given in the *ELECTRIC RAILWAY JOURNAL*, issue of May 7, page 868.

In asking for a rehearing of the case the companies affected have taken the stand that in instructing the various corporations to establish jointly this passenger terminal the commission was taking property without due compensation, and that its action, therefore, was not valid.

The companies further contend that the problem of establishing a union passenger terminal in Los Angeles, affects three transcontinental railroad lines, and is therefore an issue which only can properly be passed on by the Interstate Commerce Commission. The companies opposing this order of the commission consist of the Southern Pacific, the Atchison, Topeka & Santa Fé Railway, the Los Angeles and Salt Lake Railroad, and the Pacific Electric Railway.

### COMMISSION'S AUTHORITY DEFENDED

The city of Los Angeles has secured the services of Max Thelan, former president of the State Railroad Commission, to assist its city attorney to argue against the reconsideration of this issue by the commission or its transfer to the Interstate Commerce Commission. The right of the Railroad Commission to issue an order relating to a terminal depot in Los Angeles will also be championed by Hugh Gordon, attorney for the commission. In opposing the application of the railroads, the city attorney and special counsel, Thelan, take the stand that the commission has the power to make the railroads comply with its order.

In answer to this position, it is the contention of the attorneys of the railroads that any such power, if ever possessed by the commission, was removed from that body by the passage by Congress of 1920 of the Esch-Cummings act, a law governing railroad transportation and establishing the status of the railroads following the turning back of the corporations to private control after the war. In the event that the commission refuses to grant a rehearing of the case, it is expected that the companies will go before the State Supreme Court and there ask for a writ of review. Pending a deci-

sion on this petition for a rehearing of the entire case, it is understood that the opponents of the commission's order will not appoint representative engineers to a common committee for the purpose of working out the details of a union passenger terminal. This committee of engineers was authorized by the railroad commission at the time the original decision was handed down on April 26, 1921.

At this hearing on June 16 motions were made to strike out all reference to the Pacific Electric Railway in connection with the proposed union terminal, and to vacate the terminal order until such time as unquestionable jurisdiction can be established. Frank Karr, attorney for the Pacific Electric lines, suggested that the company which he represents be taken entirely out of the proceedings except in the matter of Aliso Street grade crossings. The companies all laid stress on the fact that they are anxious to proceed at once with such grade crossing elimination as belongs to each individual railroad, and desire to divorce the Plaza terminal question from grade-crossing elimination.

## Tax-Exempt Securities a Menace

Representative McFadden of Pennsylvania, chairman of the committee on banking and currency, told the House on June 23 that the subject of tax free securities was one of the most vital now before Congress. He is the author of the resolution providing for a constitutional amendment making it possible for the United States to levy an income tax on the interest received from investments in state and municipal securities. He considers exemption from taxation of the income from securities of this kind as an offense against economic law, social justice and the American spirit of fair play.

Mr. McFadden says that such opposition as exists to the elimination of tax exemption arises from the most part from an exaggerated idea of its advantages to the borrower. According to Mr. McFadden loss in tax revenue by the issuance of tax-free securities is appalling. He says that the railways and public utilities, accustomed to look to the wealthy investor for leadership in meeting their needs for funds, have had to go afield and establish new channels not yet adequate to their needs.

So far as action at Washington is concerned Congress appears to be marking time on the revision of the revenue act pending some disposition of the tariff measure in the House. Those close to affairs expect to see some speeding up, however, for it is generally agreed that the country is getting impatient and wants action.

## City Makes Counter Proposal to Security Holders

A tentative proposal on the part of the city to the security holders of the New Orleans Railway & Light Company was submitted to the Commission Council on June 22 by Commissioner of Finance Murphy. It is reported that a majority of the Commission Council has agreed to the plan outlined. Further consideration of it went over, however, until the next meeting of the Commission Council.

### PLAN INTENDED AS SUBSTITUTE

The plan is intended as a substitute to the program outlined recently by Commissioner Maloney of Public Utilities, suggesting the employment of engineering and utility experts. Briefly, it recognizes the justice of the valuation of \$44,700,000 placed upon the property by the Citizens' Advisory Committee of Forty and admits that any appeal to prospective investors will be useless without recognition of this valuation. It acknowledges that \$5,000,000 of new money will be required during the year following the reorganization of the company, and that thereafter \$2,000,000 a year will be required for five years. It directs that the company shall be domiciled in New Orleans with its affairs controlled by residents of New Orleans.

On the purely financial side there would be provision for a return of 8 per cent for the present on new money, with any sum earned beyond \$3,000,000 during the first year retained as surplus reserve. To the holders of present securities outstanding would go no more than 6.14 per cent, if earned. Further, the municipality would have authority to readjust the rate of allowable return, with an option in perpetuity on the property, at the base valuation of \$44,700,000 plus any new money invested, not counting the surplus of earnings. The city is also to hold an option at 107 a share on the common stock, which is to be reduced to \$4,219,300.

### REDUCTION IN FARE RATES

As part of the agreement the corporation upon the discharge of the receiver is to consent to reduction in rates and fare upon completion of the reorganization, which is to be effective by Oct. 15, 1921, and not later than Dec. 31. These reductions in rates would be as follows:

A 7-cent fare; not more than \$1.30 per 1,000 cu.ft. for gas; no increase in the schedule of electric rates.

All the rates just mentioned would continue until Jan. 1, 1923, unless conditions favor a lower basis of rates, in which event the rates would be further reduced.

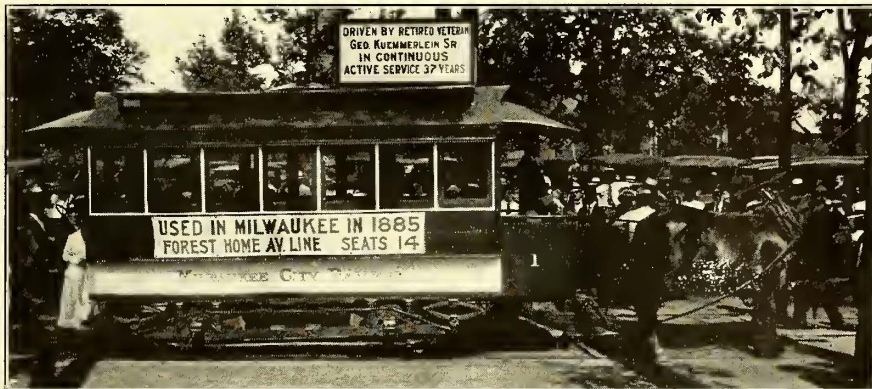
C. C. Chappelle, who has been acting for security holders in the company, had this to say:

All I can do under any circumstances is to see what can be done with the proposal in the investment market. I can only act as a connecting link between the city and the investor. But I should feel in duty bound to make every possible effort to carry through to success any proposition which in my judgment has a reasonable possibility of being sold to the investors.

I will say frankly, however, that it is a step forward to bring a positive program before the public for discussion and for official action. Out of it a solution may come; nothing could come from inaction.

### Railway Participates in City's Diamond Jubilee Celebration

Various stages in the development of the city of Milwaukee and of its industries were depicted in a historical parade and pageant in Milwaukee on June 18 in connection with the Diamond Jubilee of the city. The pageant was participated in by the Milwaukee Electric Railway & Light Company, which was represented both as a corporation and through the medium of its Employees' Mutual Benefit Association. It



PART OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY'S SECTION OF MUNICIPAL PARADE COMMEMORATING CITY'S DIAMOND JUBILEE

was planned to show the development of the industry and to have a fairly representative body of employees march in the parade.

The company had in line an early type horse-drawn street car followed by the latest type electric car. The horse car was driven by one of the company's veteran employees, George Kuemmerlein, Sr., the father of the present superintendent of transportation. Mr. Kuemmerlein, Sr., had been in active continuous service of the company and its predecessors for thirty-seven years. The horse car was last in use in 1885. It seats fourteen, and was in great contrast to the latest type of electric car, seating fifty-two and equipped with the latest safety and pneumatic devices.

The two cars were followed by the color bearers and band of the Employees' Association and then in the order given by a body of veteran company employees, a majority of whom had seen over twenty years of service; a body of trainmen, members of the Women's Auxiliary of the Employees' Association and finally in rows of eight representatives of the various departments of the company arranged by

trades. These were dressed in the uniforms of their occupation and carried the tools pertaining thereto.

The company representation in the parade was very effective and was highly commented upon along the route of the march.

### Electrification of Dan Patch Line Being Considered

The Minneapolis, Northfield & Southern Railway, formerly known as the Dan Patch line, has under way a project for electrification by overhead trolley. E. P. Burch, engineer, is making a careful survey of the whole subject. No date is suggested for taking up the project as the report is not yet ready.

The company now has five GE-205 gas-electric engines and three steam locomotives. One locomotive car is a private car, but the regular equipment has a combination baggage, smoker and coach, carrying ninety-four persons. Each of these cars is capable of hauling a trailer seating 104 persons. The ques-

### Telephone Announcers Tried in Boston Subway

The Boston (Mass.) Elevated Railway is experimenting at the Park Street Subway Station with telephonic announcers manufactured by the Loud Speaking Telephone Corporation. A set of five speaking trumpets, all electrically connected, has been installed on the north-bound platform, and plugs for the connection of the transmitting apparatus are located at various convenient points throughout the station.

The platform attendant, or starter, carries the transmitter about with him, plugging-in at any convenient socket when he desires to make announcements. He uses this equipment for announcing the destination of cars, the berths at which the various cars will stop in the station and for warning persons boarding the cars to let the passengers off first. In this way, by the distribution of the speaking trumpets the entire length of the platform, one man can keep a large and constantly shifting crowd informed.

The apparatus appears to have a special usefulness in times of emergency, when cars are delayed, or some accident requires rerouting or any other change in normal operation. At such times the natural impatience of passengers hinders the work of the platform man as everyone crowds around him trying to ask individual questions. With this equipment he can retire to an inclosed booth and keep repeating all necessary announcements, which results in equal service for all.

A number of officials of the Boston Elevated have witnessed demonstrations, and are reported to have been much pleased. If the present experiment proves successful it is not unlikely that the use of this apparatus will be extended to other stations on the subway and rapid transit lines. It has been suggested that when an open drawbridge on the main tunnel and elevated line causes a blockade, a frequent and unavoidable annoyance on this system, these announcers at various stations along the route could be used to inform the waiting passengers as to the cause of the delay and its probable duration.

### New Road Seeks Franchise

Application for a thirty-year franchise for the construction and operation of a single-track railway has been filed with the City Commission of Birmingham, Ala., by the Norwood Street Railway. An ordinance granting the franchise and authorizing the construction was attached to the application and is now being considered by the commission.

The proposed line will start at the end of the present Norwood line of the Birmingham Railway, Light & Power Company and will make a loop through the Norwood Boulevard development of the Birmingham Realty Company.

Construction of the road will cost approximately \$500,000, it was announced by officials of the Birmingham.

**Michigan Interurbans Crash.**—Two interurban trains of the Detroit United Railway crashed between Chelsea and Ann Arbor, Mich., recently and as a result five people are reported to have been killed.

Realty Company. It will be built by the Realty Company through the Norwood Street Railway, a holding company, and eventually will be transferred to the Birmingham Railway, Light & Power Company.

The proposed ordinance granting the franchise and authorizing the line also authorizes the transfer of the road to the Birmingham Company. It provides that plans and specifications must be placed in the hands of the city engineer in four months from the adoption of the ordinance and the road must be ready in one year. The Norwood bus line, which has been operated by a holding company, will be discontinued when the new car line is completed.

### Chicago Renews Attacks on Its Utilities

Evidently stirred to resentment by the loss of its pet measures in the Illinois Legislature, the city administration of Chicago has begun hostile action against the Chicago Surface Lines. Notice has been served on the companies to show before the Illinois Commerce Commission on July 13 why the present skip stop system for cars should not be abandoned. The city has also filed suit for \$3,500,000 against the Chicago Railways for money said to be due under an "implied contract." Mayor Thompson sent a special message to the City Council asking that an appropriation be increased for the purpose of continuing the fight against the surface and elevated railways for reduction of rates.

The suit against the Chicago Railways was for the city's share of the net receipts called for by the 1907 ordinance. Payments were tendered to the city when due but were refused because the city lawyers feared that by accepting these amounts they would acknowledge the existence of the 1907 ordinances. The city claims that these ordinances were abrogated when the companies permitted the utilities commission to increase their rates of fare above the 5-cent basis. The money is now claimed as compensation for use of streets, and the city is hoping for a decision which will turn over the cash without prejudicing its pending litigation against the companies.

Special Counsel Cleveland stated that he is preparing to ask the new Illinois Commerce Commission to re-open the rate and valuation cases of the surface and elevated companies.

### Court Asked to Decide When a Board of Arbitration Is an Arbitration Board

Whether the 250 conductors and motormen of the East St. Louis & Suburban Railway, East St. Louis, Ill., will accept a cut of 19 cents an hour, effective on July 1, was scheduled for consideration at a meeting on June 29.

Notice of the cut was posted by President W. H. Sawyer, following the granting of a temporary injunction by

Judge English of the United States District Court restraining a board of arbitration from continuing to consider the wage question after the company's representative on the board had resigned.

The court held that the resignation of C. E. Smith, a consulting engineer, practically ended the legal existence of the board. The resignation was due to the pressure of other business engagements.

President Sawyer offered to appoint a new member for the formation of a new board of arbitration, but this offer was rejected by the union (Amalgamated) which sent for one of the international officers who has arrived for the meeting June 29.

The motormen and conductors now get 70 cents an hour, flat. The cut brings the pay down to 46 cents an hour the first three months, 49 for the following nine months and 51 cents after the first year of service. It is the rate that was established by the War Labor Board in 1919, and was in effect until April of last year.



**Property of Railway Burns.**—Dighton Rock Park, built several years ago for amusement purposes by the Eastern Massachusetts Street Railway, was destroyed by fire on June 15. The park was located between Taunton and Fall River. The buildings in the park cost \$60,000 when erected, thirty-six years ago.

**Utility Commission Proposed in Louisiana.**—The Constitutional Convention has written into the new organic law of the State of Louisiana a section changing the Railroad Commission to the Louisiana Public Service Commission. The commission, composed of three members, is empowered to supervise, regulate and control all railroads, street railways and interurban railroads, gas, electric light, heat and power and other public utilities and to fix the rates.

**Foreign Countries Will Participate.**—Another step has been taken by way of preparation for the International Exposition to be held in Portland, Ore., in 1925. The Senate has passed a bill authorizing the President to invite foreign countries to participate in the exposition. The exposition is intended to celebrate the completion of the transcontinental and Pacific highways, the centennial of the invention of the electro-magnet and to exemplify the development of hydro-electric energy.

**Union Paper Praises Mr. Arkwright.**—The *Union Leader*, under date of May 21, has reprinted an article which appeared in the *ELECTRIC RAILWAY JOURNAL* of April 23, entitled "Don't Hate

Your Customers," by Preston S. Arkwright, president of the Georgia Railway & Power Company, Atlanta, Ga. The article is characterized as a common-sense talk made by the president of a progressive street railway. Further comment is made: "It is rare to find a railway president who has such a keen grasp of operating detail as to portray the importance of the occupation and the trials, difficulties and opportunities of motormen and conductors in the practical manner in which he presents them."

**Released From \$1,000,000 Bond.**—The Dallas (Tex.) Railway has been released from its \$1,000,000 improvement bond, made when it accepted the franchise in 1917 after extended negotiations between the city and the Strickland-Hobson interests. Release from this bond was voted by the City Commission on June 8 when it was shown by the company that it had carried out all pledges made in connection with the granting of the new franchise.

**Recommends Subway and Elevated Line.**—The annual report of Charles S. Butts, engineer of the Department of Public Utilities, St. Louis, proposes a subway for the Hodiament line from Union Market to Spring Avenue with elevated tracks from Spring to Maple Avenue as a step toward the establishment of a better rapid transit system. In the opinion of the engineer the entire project would cost no more than \$3,000,000. The report also suggests plans for the expeditious handling of passengers by the United Railways during the evening rush hours.

**Improvements Held Up in Seattle.**—In discussing the need of paving on certain business streets in Seattle, which has been held up on account of the necessity of new car tracks and rails, superintendent D. W. Henderson of the Municipal Railways said: "If the Municipal Railway had all the money that the jitney buses took from us in the last year, we would be able to pave First Avenue now. The jitneys are taking \$300,000 or more a year from the railway revenues. If we had that money, the \$325,000 First Avenue work could be financed."

**Jitney Petition Denied.**—The Public Utilities Commission of the State of Connecticut has denied the application of two operators to run automotive vehicles between Hartford and Manchester, a distance of 10 miles. The commission finds the existing transportation facilities of the trolley and steam road adequate to supply transportation requirements, except for about two peak hours each day, when auxiliary service would be a convenience. The applicant did not desire a certificate for this limited service. The commission prepared a lengthy decision covering the general controlling principles of competition, comfort, speed, general public requirements, permanency and continuity of service, etc. This is the first decision by the commission regarding public service motor vehicles to be made under the act of 1921 placing these vehicles under commission regulation.

# Financial and Corporate

## Importance of Adequate Junior Financing Urged

The bulletin of the Investment Bankers Association of America for May 28 contains the interim report of the sub-committee on electric securities presented by Lucien H. Tyng, vice-president of W. S. Barstow & Company, Inc., on the "Importance of Adequate Junior Financing." Mr. Tyng says that it has been found true of all classes of public service companies that too much of their financing has been done by sales of bonds.

A table which is included in the report prepared from figures by the *Commercial & Financial Chronicle* warrants, Mr. Tyng says, very careful study and consideration by everyone in the business of handling securities of public service companies. A company cannot create and sell bonds of the highest class unless a proper proportion of the financing is done by the sale of stock.

According to Mr. Tyng the best class of bonds should not exceed 60 per cent of the total value of the property of the company including intangibles, and it would be better for every class of security holders if the bonds were not in excess of 50 per cent of such value. This would leave 50 per cent to be raised by the sale of stocks which might be divided into 25 per cent preferred stock and 25 per cent common stock.

The interim report by Mr. Tyng is particularly significant in view of the discussion which was aroused at Chicago last February at the meeting of the American Electric Railway Association, at which financial topics were considered, among them "Present Mortgage Requirements," presented by F. K. Shrader of Halsey Stuart & Company, Chicago.

It is the opinion of Mr. Tyng that a determined effort is being made by all public utility managers at the present time to bring a number of the points made in his thesis constantly to the attention of the Public Service Commissions, so that the commissions will appreciate the necessity of companies being allowed to earn an amount sufficient to pay dividends that will encourage more stock investments.

He said that one reason why investment bankers had been reluctant to

handle stocks is that in the past stocks were issued in excess of the amount of values represented. This, however, has not been so since the Public Service Commissions have had control of the situation and this question is removed entirely by the practice which has fortunately now been adopted in so many states, namely, issuing no-par stocks.

## Constitutionality of Revaluation Law Questioned

E. W. Bemis has been chosen to represent the City Council of St. Paul, Minn., as expert in the hearings before the Minnesota Railroad & Warehouse Commission upon the application of the St. Paul City Railway for increased fares, requiring a new valuation of the property. The cost for the expert testimony is to be added by the street railway to the cost on which fares are based.

In the case of the Minneapolis Street Railway, the Council has no idea of employing a revaluation expert now, although Robert M. Feustal, New York, submitted his credentials. The city legal department plans to contest the constitutionality of the revaluation law at the outset by a motion to have the proceedings before the commission dismissed on the ground that it has no jurisdiction. This will enable a quick appeal, or the city may continue to submit its testimony on the revaluation of the railway property under protest until the constitutionality of the law is passed upon by the courts.

## D. & H. Trolleys Do Not Meet the Cost of Service

According to the annual report of the Delaware & Hudson Company for the year ended Dec. 31, 1920, its four allied trolley lines failed collectively to meet the cost of service. All of the roads failed to earn anywhere near the same net income as during the previous year.

The report contains a review of the fare situation on each of its allied lines. The accompanying statement prepared from this review shows the actual condition of the financial operations for the year as compared with 1919.

EARNINGS OF DELAWARE & HUDSON ALLIED TROLLEY LINES

	Revenues All Sources	Operating Expenses	Net Operating Revenue	Taxes	Net Operating Income
United Traction Co., Albany, 1920.....	\$3,253,973	\$3,149,206	\$104,767	\$217,816	\$113,049
1919.....	2,848,871	2,525,880	312,991	208,252	104,739
Per cent change.....	14.22	24.18	3.67	4.59	207.2
Hudson Valley Railway, 1920.....	1,099,072	986,998	112,074	55,025	57,049
1919.....	971,426	815,903	155,523	51,531	103,992
Per cent change.....	13.14	20.97	2.98	6.78	54.11
Plattsburgh Traction Co., 1920.....	33,122	29,625	3,497	1,783	1,714
1919.....	37,991	26,349	11,642	1,870	9,772
Per cent change.....	12.29	12.43	70.00	4.65	82.45
Troy & New England Ry., 1920.....	39,442	44,397	4,955	1,870	6,825
1919.....	36,429	35,589	840	1,550	710
Per cent change.....	8.27	24.72	690.00	20.62	86.20

Italics denote decrease.

## Seattle \$987,568 Behind

City Still Struggling With Problem of Meeting Interest and Debt Amortization Charges

According to figures contained in the memorandum financial statement of the city of Seattle, as of June 1, 1921, submitted by City Comptroller Harry W. Carroll, the municipal railway lines operated for the year at a total loss of \$987,568. The total operating expenses of the system are placed at \$4,908,122, to which are added depreciation amounting to \$677,178, and deductions from the gross income of \$865,660, covering interest on general and revenue bonds, amortization of discount on revenue bonds and miscellaneous interest, bringing the grand total of expenses to \$6,450,960.

Operating revenues are given as \$5,410,764, of which amount \$5,283,658 was derived from passenger car service. Miscellaneous revenues are placed at \$52,628, bringing the grand total of all revenues to \$5,463,392, this leaving a total net loss for the year of \$987,568.

In the profit and loss account, aside from the net loss above quoted, are losses of \$3,559 caused by minor adjustments, expenses, charges, etc., and losses of \$256,670 caused by delayed losses which accrued in prior periods, the largest item in this category being \$174,216 for losses on ways and structures retired from service.

### ACCURAL BASIS OF ACCOUNTING

Establishing a system of setting aside each month's share of the bond interest and redemption charges accruing, the City Council utilities committee finds that the municipal railway must make up \$425,625 for these two items. Against these charges, the railway had \$218,740 cash balance on hand, after deducting outstanding warrants, leaving \$206,884 to be made up.

The next interest payment on the \$15,000,000 of bonds taken by Stone & Webster in payment of the lines is due on Sept. 1, but the money should be set aside in August to permit of its delivery in New York by that date, according to Chairman Erickson. The first redemption installment on the \$15,000,000 bonds paid as the purchase price of the Stone & Webster lines will be due next March 1, the sum \$833,000 likewise to be set aside thirty days earlier. Chairman Erickson said:

The amount of interest charges accrued is \$213,208, and as the cash on hand exceeds that total we expect to have the interest money on hand in ample time to meet the Sept. 1 installment. Whether we will be able to make up the next eight months the \$212,416 accrued for redemption, but not set aside, is still uncertain. We may be able to do it without going on a warrant basis, as we did last February, when we set aside all receipts until we had enough to meet the interest charges.

**New Issue of Bonds Offered.**—Coffin & Burr, Inc., Boston, Mass., are offering at 84½ and interest to yield 7¼ per cent \$2,500,000 first mortgage lien and refunding gold bonds of the Alabama Power Company, Birmingham, Ala. The notes are dated June 1, 1921, and are due June 1, 1951.

## Answers to Accounting Questions

### Final Installment of Questions and Tentative Answers Under the Uniform System of Accounts for Electric Railways

The final installment of the tentative answers to questions raised in connection with the uniform system of accounts, prescribed by the Interstate Commerce Commission, recently made public, appears in this issue. These answers have been approved by the Committee on Standard Classification of Accounts of the American Electric Railway Accountants' Association, but as they have not received the formal approval of the Interstate Commerce Commission it should be understood that the decisions do not represent its final conclusions and that they are subject to such revision as may be thought proper before final promulgation in the accounting bulletins of the commission.

**T**HE case numbers covered below are from A-616 to A-626, and from B-102 to B-109, with certain omissions. The omitted numbers represent cases which either are not of sufficient importance to justify publication or involve questions upon which a definite conclusion has not been reached.

**Q. (A-616).** To what account should be charged the value of material lost in transit between a storeroom and a power plant, or between a station and the storeroom?

**A.** Loss of company material while in transit on carrier's own line is chargeable to account 77, "Loss and damage."

**Q. (A-617).** An employee whose pay is chargeable to account 63, "Superintendence of transportation," uses his own automobile in performance of his duties, the carrier assuming the cost of repairs and supplies for operation. To what accounts should these expenses be charged?

**A.** The cost of repairs assumed by the carrier shall be charged to account 38, "Vehicles and horses," and the cost of supplies to account 96, "Garage and stable expenses."

**Q. (A-619, b)** Postal letter carriers are transported on basis of a monthly rate fixed by contract with postal authorities. To what revenue account should the receipts be credited?

**A.** To account 101, "Passenger revenue."

**Q. (A-620, a).** The franchise of a street railway company requires it to keep in good order and repair the paving between and adjoining its rails. The municipality bore the cost of the original paving, and the railway company carries nothing in its property accounts with respect to such coat. The municipality later replaced the paving with an improved kind, and charged the railway company the cost of the improved paving in the paving strip. What is the proper accounting?

**A.** In the absence of a reserve to provide for replacement such portion of the cost of the new pavement as may properly be considered as applicable to the betterment should be charged to road and equipment account 511, "Paving," and the remainder, including the cost of removing the old paving to account 10, "Paving," in operating expenses. (See Cases 42 and 194 of Accounting Bulletin 14.)

**Q. (A-620, b).** The purchase price of a street railway property, including its unexpired franchise, exceeds the

appraised value of the physical property. The original franchise was free. What is the proper accounting for the excess payment?

**A.** The entire amount paid shall be charged to road and equipment account 527, "Cost of road purchased," for distribution as provided in the text of that account. In the distribution the amount paid in excess of the appraised value of the physical property shall be included in account 545, "Franchises," if the franchise may be regarded as the consideration for the excess payment and has an unexpired life of more than a year; and shall be amortized by monthly charges to account 91, "Amortization of franchises," as provided in the text of that account. Otherwise, the full amount of purchase price shall be distributed to the appropriate primary road and equipment accounts exclusive of account 545.

**Q. (A-620, c).** A street railway company incidentally furnishes steam power to an ice plant, charging therefor the estimated actual cost of fuel, water and labor and an arbitrary amount for use of boiler. What is the proper accounting for revenues and expenses?

**A.** The amounts received shall be credited to revenue account 118, "Power." The expenses shall be allowed to remain in the operating expense accounts appropriate for the carrier's own operations.

**Q. (A-621).** To what account should be charged the cost of testing meters used for measuring electric power furnished by a power company to the carrier's substation? These meters are owned two-thirds by the carrier and one-third by the power company.

**A.** Assuming that the carrier's proportion of the cost of the meters is carried in account 543, "Substation equipment," the expense of testing shall be charged to account 48, "Substation equipment."

**Q. (A-622).** Amounts billed against a carrier for work performed include cost of employees liability insurance. To what account should the payments be charged?

**A.** If the cost of work is chargeable to operating expenses, the insurance premiums paid shall be charged to account 93, "Insurance." (See Case 393, Accounting Bulletin 14.)

**Q. (A-623).** A carrier sells for \$390 certain poles which were charged to the property account at \$400, and with respect to which there is \$40 in the

reserve for depreciation. To what account should be credited the \$30 representing the difference between the sale price and the ledger value less accrued depreciation?

**A.** The adjustment of the estimated depreciation previously charged to operating expenses and the actual depreciation as determined at the time of retirement shall be included in the account in operating expenses appropriate for the cost of repairs to the property before retirement, which, in this case, is account 20, "Poles and fixtures."

**Q. (A-625).** To what account should be charged the pay of section men for time used in cleaning and sanding stock cars?

**A.** To account 67, "Miscellaneous car-service expenses."

**Q. (A-626).** To what account should be charged amounts paid to employees for personal property damage while on duty such as the breaking of eye glasses, the damaging of uniform, etc.?

**A.** To account 92, "Injuries and damages."

**Q. (B-102).** To what account should be charged the cost of rubber boots carried on wrecking tool car as a part of service equipment?

**A.** To account 78, "Other transportation expenses."

**Q. (B-103-1).** A carrier is reimbursed by a realty company for the cost of grading a street. What is the accounting?

**A.** The entire cost of the grading shall be charged to account 504, "Grading." The amount contributed by the realty company shall be credited to account 305, "Donations."

**Q. (B-103-6).** A carrier changing from the cable system to the overhead trolley system, and from narrow to standard gage track, removes a portion of the cable system. How should it account for the cost of removing the cable structure, and for the cost of the new tracks?

**A.** The book value of the portions of cable railway removed shall be credited to the appropriate road and equipment accounts and charged, less salvage, to the appropriate operating expense accounts. The cost of removing such cable railway parts shall also be charged to operating expenses. The cost of installing the electric railway track shall be charged to the appropriate road and equipment accounts.

**Q. (B-106).** To what account should be charged the cost of handling sand for use in sand boxes of motor cars?

**A.** To account 11, "Cleaning and sanding track."

**Q. (B-107).** To what account should be charged payments to a contractor for removing ashes from power station boiler room during a scarcity of regular help?

**A.** To account 52, "Power plant employees."

**Q. (B-109).** To what account should be charged expense of maintaining small portable buildings used by flagmen at grade crossings?

**A.** To account 24, "Buildings, fixtures and grounds."

### Interurban Merger Rumored

A consolidation of the Charleston-Dunbar Traction Company and the Charleston (W. Va.) Interurban Railroad may result from the sale of the Dunbar line to Isaac Lowenstein. Mr. Lowenstein purchased the road for other parties.

Fred M. Staunton, vice-president of the Charleston Interurban Railroad, said that negotiations are pending regarding the future of the Dunbar line, but was not prepared to admit that any definite plans have been consummated. Former Governor W. A. MacCorkle, president of the Charleston Interurban Railroad, said that he was not in a position to give any information concerning plans for the merger.

Mr. Lowenstein, the purchaser of the Dunbar line, is president of the Charleston National Bank. He took over the property from Fred. Paul Grosscup, candidate for the Republican nomination for Governor in the last primary election. The deal is said to have involved \$400,000.

### Roads at Providence Sold at Foreclosure

The properties of the United Traction & Electric Company, Providence, R. I., were sold under foreclosure at Providence on June 24. The roads included were the Union Railroad, the Pawtucket Street Railway, the Rhode Island Railway, the Pawtuxet Valley Street Railway and the Cumberland Street Railway.

They were bid in by Charles H. W. Mandeville, secretary of the joint reorganization committee, which has in its hands practically all of the outstanding securities of the companies liquidated. It is expected that the joint reorganization committee consisting of Colonel Samuel P. Colt, Stephen O. Metcalfe and Michael F. Dooley will assign the roads to the United Electric Railways as the successor company and that the owners of the stocks and bonds of the companies going into the reorganization will receive in exchange the securities of the United Electric Railways in accordance with the reorganization plan referred to at length in the *ELECTRIC RAILWAY JOURNAL* for Feb. 19, 1921, page 381.

### Utilities Oppose Depreciation Reserve Fund

The proposal of the Corporation Commission of Oklahoma to require all public service corporations in the State to set aside a depreciation reserve fund met with united opposition from the owners and managers of public utilities, at a hearing before the commission on June 21. The commission reserved decision.

The hearing was on proposed order No. 168 to compel each utility and other public service corporation to set aside a cash fund to cover depreciation of its property and prohibit it from paying out in excess of 6 per cent dividends

until this depreciation reserve fund was created.

The utility operators expressed themselves as in favor of regulation of their rates and matters affecting their service to the public, but declared unanimously that if a corporation commission or any other governmental body were empowered to direct the management of the company or to tie up its funds in such a manner as they could not be used in the business, they would be unable to finance a single improvement.

The testimony of John W. Shartel, vice-president and general manager of the Oklahoma Railway, the largest electric railway system in the State, was typical. He said that his company has not been able to declare dividends for several years but has used all its surplus and net earnings in taking care of depreciation of the property and in putting in new improvements.

In the opinion of Mr. Shartel the proposed order would probably tie up about \$200,000 of the funds of his company which otherwise would be put back into the property for improvement. He also declared that when he went to borrow money to build or extend interurbans or improve his city lines the banker would flatly refuse to make the loans.

### Interest Payment Planned

Frank Hedley, president and general manager of the Interborough Rapid Transit Company, New York, N. Y., announced on June 27 that the company would be able to pay the interest on the Interborough Rapid Transit 5 per cent bonds and the rental on the Manhattan Railway, both due July 1, provided earnings are maintained on a fairly normal basis.

## Financial News Notes

**Public Service Net Increases in May.**—The Public Service Railway, Newark, N. J., reports a net income of \$65,816 for May, 1921, compared with \$55,099 for May 1920. There were 38,456,479 passengers carried during the month. Of this number 31,285,489 were revenue passengers and 7,170,990 were transfer passengers.

**Interborough \$189,152 Behind.**—The Interborough Rapid Transit Company, New York, N. Y., failed by \$189,152 during May, 1921, to meet the cost of service. In May a year ago the company showed a surplus of \$26,152. The net corporate deficit for the eleven months ended May 31 is \$3,997,003 against a deficit of \$1,953,664 for the same period of 1920 and compares with the twelve months' deficit of June, 1919, which was \$3,810,340.

**Service Discontinued.**—The Eastern Massachusetts Street Railway suspended service on June 13 on the Woburn-Billerica line in accordance with a notice given out that jitney service would have to be withdrawn if operation of cars was to continue. The railway has provided for the needs of school children. The action of the company is not understood by the Mayor of Woburn, who stated that he had vetoed all jitney licenses in an effort to retain the railway service.

**Abandoned Line Runs Again.**—The Nassau Electric Railroad, a part of the Brooklyn Rapid Transit System, began operating the Ocean Avenue line on June 25 after a suspension of almost a year. The line runs between Bergen Street and Sheepshead Bay. Receiver Garrison has announced that the revenue would at least pay operating expenses from June 25 to Sept. 1, the vacation season when travel to the shore is heavy. The receiver reserves the right to discontinue service after Sept. 1.

**Carhouse Property Sold.**—The largest single piece of property in the downtown district of Long Beach, Cal., owned by the Pacific Electric Railway, was sold recently to H. E. Ware, a capitalist and investor of Long Beach for \$125,000. The property, located on the northeast corner of American Avenue and Fifth Street, was used as a carhouse and freight depot by the railway.

**Refunding Proceeding Completed.**—Kidder, Peabody & Company, Boston, Mass., and Charles H. Dilman & Company, Inc., Portland, Me., recently offered for subscription at 100 and interest \$600,000 of five-year collateral trust 8 per cent bonds of the Cumberland County Power & Light Company, Portland, which does the entire electric light, power and street railway business in Portland, Me., and vicinity. The new bonds are issued to retire \$614,000 of 7 per cent notes which matured on June 1.

**Master Commissioner Appointed.**—Richard Swing, Cincinnati, was appointed master commissioner with increased authority to determine the assets and liabilities of the old Cincinnati & Columbus Traction Company by Judge Stanley C. Roettinger of the Hamilton County Common Pleas Court during the week ended June 11. Mr. Swing will determine what assessment, if any, should be levied against stockholders, who are said not to have paid in full for their stock. He was appointed in a similar capacity about a year ago, but lacked sufficient authority to probe deeply enough into the affairs of the company and Judge Roettinger's appointment gives Mr. Swing the necessary authority to take testimony from claimants and stockholders. When the old Cincinnati & Columbus Traction Company failed, one of the largest creditors was the Union Savings Bank & Trust Company, Cincinnati, a bondholder for \$300,000. Stockholders of the company objected to the bank's claim.

# Traffic and Transportation

## Fare Five Cents

### Detroit Back to Old Rate, but Charges One Cent for Transfer—Temporary Arrangement

A new 5-cent rate of fare and 1 cent for transfer within the present one-fare zone went into effect on the Detroit (Mich.) United Lines on June 19. The City Council on recommendation of Mayor Couzens accepted the counter proposal made by the company after the city's plan of a 6-cent fare and ten tickets for 50 cents had been considered by the company and rejected.

In response to the Mayor's verbal request that the company begin to operate service in the one-fare zone on the fare schedule proposed by the city A. F. Edwards, vice-president of the Detroit United Railway, replied in a letter to the Mayor that the company did not believe the city's proposal would serve either the city's or the company's purpose. He stated that if the company is to try operation with a 5-cent paid fare, a 5-cent cash fare must be tried in place of the tickets suggested by the city. The proposal was made without prejudice to the rights of any or all parties and was subject to the one consideration that the company's and city's accountants should, with all due diligence, agree on a system of accounting acceptable to both parties. Under the agreement approved by the Council, the transfer charge will cover a transfer ride over the same routes as were previously in force.

### NO CHANGE IN GENERAL TRANSFER ARRANGEMENT

The very same transfer ride that could be obtained on the payment of a single fare will continue to be given for the 5-cent cash fare and the cent for a transfer. On the so-called double transfer routes the one transfer will serve the purpose. The 1-cent charge for transfers is not to apply on the so-called intermediate transfers, namely, where a person requires two transfers to reach his destination. In that case the charge is only 1 cent.

The new fare arrangement will not affect the city's attitude toward the redemption of rebate slips attached to strips of tickets sold by the company since June 9, 1920, according to Corporation Counsel Wilcox.

While the plan has not been in effect long enough to determine whether or not the company can operate successfully on a 5-cent fare, figures prepared by the city's auditors and presented to the Council show that the new fare rates will save about \$1,000,000 a year for car riders and will give the Detroit United Railway about \$180,000 more revenue than the city's proposal. It is stated that between 25 and 30 per cent of the riders now get transfers and will have to pay the 6-cent fare to ride

to their destination. According to figures presented by the Mayor, the Detroit United Railway will earn approximately \$200,000 a month above operating expenses under the new fare rate.

The agreement can be terminated at will by either party.

## Low Fare Experiment

### Cleveland Planning to Sell Two Tickets for Five Cents Good Down-town—Riding Off 11 per Cent

An experiment to determine whether an extremely low rate of fare will stimulate short haul car riders is to be made in Cleveland starting in July. The Cleveland Railway has asked the City Council to approve a plan for charging only a 2½-cent fare for riders in the down-town business sections of the city instead of 6 cents plus 1 cent for a transfer, which is the prevailing rate for the entire city.

The street railway committee of the City Council has already assented to the scheme as have also the directors of the railway. The City Council is expected to approve the change before it adjourns for its summer vacation.

The experiment is being attempted because ever since last December there has been a steady decline in the number of riders in Cleveland, until at present the reduction in the number of riders over last year amounts to 11 per cent.

The experiment is not a test of a zone system, railway officials point out, because it will merely take in the down-town section. As described by Paul Wilson, assistant secretary of the company, the experiment is being made for these reasons:

We want to learn whether this low rate of fare will revive and increase the car riding habit of Cleveland; second, whether it will thereby increase our receipts, and third, whether it will aid in eliminating pedestrian congestion in the down-town section. We'd rather have jammed street cars than jammed sidewalks.

Under the new rate of fare for the down-town section, two tickets will be sold for a nickel or four for a dime. No transfers will be given in connection with these tickets. The easterly limit of the low fare zone will be East Twentieth Street, the southeasterly East Fourteenth Street, and the westerly limits the east approach of the new high level bridge. The territory covering the low fare zone is a little more than a square mile in extent.

Cleveland is admirably suited to the experiment, because town-bound cars, that is, those headed toward the Public Square, are pay-enters, while out-bound cars or those headed away from the Square, are pay-leave variety.

Operation of the lines in May was conducted at a net loss of \$38,000 which caused a drop of \$22,000 in the company's interest fund, the fare barometer.

Both John J. Stanley, president of the company, and Fielder Sanders, City Street Railway Commissioner, believe that the experiment may result in thousands of additional car riders daily in the territory affected.

## Eight Cents in Spokane

### City Commission Resents Ruling by State Body and Threatens to Turn Jitneys Loose

The Department of Public Works of the State of Washington on June 14 issued an order granting the request of the two Spokane railways, the Washington Water Power Company and the Spokane & Eastern Railway & Power Company for an increase in fares from 6 cents to 8 cents for a continuous one-way passage.

Immediately the city authorities who have been opposing the raise of rates proceeded to put into execution their threat that they would let loose the flood of jitneys which they have held in check for the last several years.

There is unquestionably a strong popular resentment against the railways seeking an advance now. However, an effort is being made to effect some sort of a compromise between the railways and the city.

On June 16 a delegation from the Chamber of Commerce protested before the City Commissioners against the return of the jitney to Spokane streets.

The trainmen retaliated by threatening not to run any cars. They were counseled, however, by the officers of their companies not to do anything that might further complicate matters.

The whole matter now rests on the efforts of the Spokane business men who are trying to bring about a settlement before the jitney situation reaches a condition which must be disastrous both from the standpoint of Spokane and that of the railways.

The Board of Public Works is a department of the state government under the new administrative code of the state which has succeeded the former Public Service Commission.

The following tabulation gives the income statement for the Washington Water Power Company for 1920, based on the fares in effect during that year, and at the proposed 8-cent fare had the proper charges been made for electrical energy used in operating cars:

	Based on 6-cent fare	Based on 8-cent fare
	6-mill power	12-mill power
Operating revenues (gross) .....	\$1,085,345	\$1,364,480
Operating expenses..	699,419	789,904
Depreciation (retirement expense)....	152,955	152,955
Taxes .....	78,814	78,814
Total deductions from revenue .....	\$ 931,188	\$1,021,673
Operating income (available for interest) .....	154,155	342,805
Rate base .....	4,500,000	4,500,000
Rate of return.....	3.43%	7.63%

The commission says that the Washington Water Power Company has shown by the evidence to have actually lost money during 1916 and 1918 and to



have earned less than 1 per cent in 1917 and to have earned approximately 3½ per cent in 1919 and 1920, and the Spokane & Eastern Railway & Power Company has actually lost money during all of these years.

The commission estimates that the 8-cent fare will enable the Spokane & Eastern Railway & Power Company to earn \$113,605 more in the next twelve months than it earned in 1920, resulting in an allowance over operating expenses and taxes of \$6,306 to apply toward its depreciation reserve, but providing nothing for interest upon its investment.

In disposing of the contention of the city that the roads should consolidate the commission said that a physical consolidation was possible and undoubtedly some saving in operating expenses could be accomplished thereby, but there are legal and financial reasons why a consolidation cannot be effected within such time as will avoid the increase of rates now necessary.

President Huntington of the Water Power Company said in part:

If the Spokane public will read carefully the full text of the decision of the State Department of Public Works in the street railway fare case, we believe that it will not approve of the intention expressed by representatives of the city government of turning jitneys loose.

We believe that the public wants efficient railway service and is willing to pay the reasonable cost of providing it. For years before the war, when cost of labor, material and taxes were far below present levels, the railways earned little more than the bare cost of keeping them going.

The railway property of the Washington Water Power Company is one of the most economically operated properties of its kind in the country. No other property of its size in the country operates entirely with one-man cars. The saving from this practice alone is more than \$300,000 a year. If we operated with two-man cars we should have had to ask the Department of Public Works for a 10-cent fare at least. The public benefits directly, and in large measure, by such economies, and the company is entitled to consideration for the efficiency it has shown.

### Six Cents in Knoxville

The Tennessee Railroad & Public Utilities Commission has issued an order allowing the Knoxville Railway & Light Company, Knoxville, Tenn., to charge a 6-cent fare effective July 3. The original application of the Knoxville Company was for a 7-cent fare and a 2-cent transfer charge. This was denied, the commission holding that the company had not set up sufficient reason for such an advance.

### Referendum Threatened in Cincinnati

Members of a citizens' committee have begun to circulate petitions in an effort to bring about a referendum election to prevent the recent railway ordinance passed by the Council of Cincinnati, Ohio, from going into effect. Under the amended ordinance, as passed by the City Council, the Cincinnati (Ohio) Traction Company is compelled to reduce fares one-half cent on Aug. 1. If the citizens' committee should obtain 10,000 signatures of voters to the petitions and file the petitions with the Board of Elections before

July 14, the ordinance can not go into effect. The committee in explaining the motive for circulating the petitions said that the amended street railway ordinance did not insure any permanent lowering of the rates of fares.

### Emergency Rates Asked

**Minneapolis and St. Paul Railways Seek Temporary Increases Pending Final Adjustment of Valuation**

The Minneapolis Street Railway and the St. Paul City Railway on June 22 filed with the Minnesota Railroad & Warehouse Commission applications for new valuations for the two lines. They were in printed form and covered details of finance and service.

In the case of Duluth an application already has been filed for an emergency increase in rate of fare from 5 to 7 cents and four tickets for 25 cents. The hearing was set for June 28 as to justification for the new rate. In the case of Minneapolis an existing ordinance permits the railway to increase its rate from 6 cents to 7 cents or four tickets for a quarter, or if it wants a higher rate it may go right to the state commission. In an application soon to be filed the St. Paul City Railway will ask an emergency rate of fare. The present ordinance there, allowing a 6-cent rate, which now prevails, does not contain any feature like the Minneapolis grant providing for an automatic increase.

In St. Paul taxes are being paid on about \$16,000,000 of property and in Minneapolis a tax on about \$21,000,000, which amounts do not include all items to enter into the valuation. The valuations to be obtained will be a basis for the permanent rate of fare. Experts will be retained by both cities, but the company will pay the bill in each case.

Inasmuch as thirty days is allowed before hearing on a petition it would be Aug. 1 before the emergency rate, if allowed, will take effect in St. Paul.

At that time the 7-cent fare would be put in Minneapolis also, making the fares uniform in the two cities.

Except for an extension and construction now under way in Minneapolis the company expects to do no more work in 1921, notwithstanding \$1,000,000 of intertrack paving and \$600,000 more extensions have been ordered.

The companies desire the temporary rates to be effective until such time as the Railroad & Warehouse Commission may definitely determine the value of the property involved, at which time the company hopes that the commission will establish an equitable rate of fare assuring a reasonable return on the fair value of the properties.

It is pointed out that this is particularly important in view of the fact that both Minneapolis and St. Paul are asking for large capital expenditures, and until the commission has definitely fixed the value of the property it will be impossible to secure the needed money to make the improvements demanded. According to the Twin City Rapid Transit Company, which controls the Minneapolis and St. Paul lines, the one idea of the railway is to be placed in a position where it can furnish adequate service at cost and have its credit established so that it can secure the needed money to keep pace with these growing cities.

### Peoria Now and Twenty Years Ago

The story of Peoria's transportation growth and progress is told in the May issue of the *Peorian*, the official publication of the Peoria Association of Commerce. The old mule car was replaced in 1889 by the electric car which started the modern electric improvements on the Illinois Traction system. The accompanying announcements from the same publication give some important facts about Peoria in the twenty years of its development.

**INDEED "TIMES HAVE CHANGED"**

(From Peoria Star, Oct. 13, 1920)

**TIMES HAVE CHANGED**

Motormen and Conductors Elated  
Over Increase of Pay 20 Years  
Ago to \$11 and \$13.

Twenty years ago, as noted in the files of The Star, the Central Railway Co. posted notices in the car barns, announcing an increase in the pay of conductors and motormen of \$1 a week. This brought their pay up to \$11 and \$13 a week, depending on the length of service, which, it is stated, caused much satisfaction among the men.

	1900	1920	Increase
Wages	18½¢ per hr	59¢ per hr	218%
Fares	5 cents	7½ cents	50%

**Street Car Fares Have Not Increased in Proportion to Wages and Other Operating Expenses**

**Peoria Railway Co.**

## The Electric Railway —and Progress

Railroads are built with the object in view of serving some prosperous territory.

If the men who promote such a commercial carrier operate freight and passenger trains on frequent schedule, the terminal points benefit.

Peoria is so situated on the Illinois Traction System.

The northern point of the largest electric railway in the world, Peoria, taps the richest commercial and natural resource field in the state.

All Peorians have an equal advantage in partaking of the opportunities the Traction presents in Illinois.

## Illinois Traction System

(McKinley Lines)

### Circuit Court of Appeals Sanctions Higher Fare

A recent decision in the United States Circuit Court of Appeals authorizes the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., to put into effect a 10-cent fare and further enjoins the Railroad Commission from interfering with the collection of that fare.

The company a few months ago applied to the commission to increase its fare from 7 cents to 10 cents. After the commission had denied the request the company instituted injunctions in the Federal Court. The case was heard by three judges. The principal contention of the railway was that a fair return upon the value of the property could not be made at the 7-cent rate of fare.

### Renews Petition for Increased Fare

The Carolina Power & Light Company, Raleigh, N. C., has renewed its petition before the Corporation Commission for an 8-cent cash fare with four tickets for 30 cents. At a recent hearing the company claimed \$11,373 net earnings for the first four months of this year, which, it was stated, was insufficient to pay interest on bonds and dividend on a plant valued at \$828,741. This case was continued from last January, when the commission ordered the city of Raleigh to show cause, on May 1, why the rate should not be advanced. The present rate is 7 cents, with four tickets for 25 cents.

### Commission Rules on Cumberland County Fares

Announcement was made by the State Public Utility Commission that the Bridgeton & Millville Traction Company, operating in Cumberland County, N. J., had been allowed an increase in fare, from 6 cents per zone to 7 cents per zone, in Bridgeton and between Bridgeton and Millville; 7 cents per zone on the Bridgeton-Port Norris line between Bridgeton and Newport. The board allowed a charge of 8 cents per zone on what was characterized as the "non-paying" part of the system, south of Newport, between Newport and Bivalve. The rate to school children may be increased to 1½ cents a mile by the company.

The freight rates allowed by the board were 25 cents for the first 100 lb. or fraction of this weight, and 10 cents for each additional 100 lb. Where \$1.60 per ton is now charged by the concern, \$1.80 per ton was allowed by the board.

**Wants Higher Fares.**—The Athens Railway & Electric Corporation, Athens, Ga., plans to petition the State Railroad Commission for a 10-cent fare. The present rate is 6 cents.

## Transportation News Notes

**Interurban Rates Advanced.**—The Pacific Northwest Traction Company has announced increased rates amounting to 4 cents on each commutation book ticket issued on its electric interurban line between Seattle and the Everett city limits. Only book rates are affected by the increase.

**Two-Cent Advance in Fares.**—The Corporation Commission of North Carolina recently permitted the Salisbury & Spencer Railway, operating in Concord, to increase its rates from 8 to 10 cents. The company is controlled by the North Carolina Public Service Company and would have had to abandon service had the commission refused the petition.

**Four Cents a Mile Authorized.**—Judge Louis FitzHenry, in the United States Court, has granted authority to the Galesburg & Kewanee Electric Railway, operating between Kewanee, Ill., and Galva, Ill., to increase its passenger fare to 4 cents a mile. The distance between the two cities is 8 miles and the fare is now 32 cents instead of 28 cents.

**Commission Orders Summer Rates.**—The Public Service Commission recently issued an order directing the United Railways & Electric Company, Baltimore, Md., to put into effect a single fare between city points and River View Park after 1 p.m. on Saturdays, Sundays and holidays and after 7 p.m. on other days. The ruling is to continue until Sept. 18.

**Seven-Cent Rate Continues.**—The Missouri Public Service Commission recently extended the 7-cent fare on the lines of the United Railways, St. Louis. The 7-cent rate was allowed some time ago and the time is extended until Dec. 31, 1921. This extension is permitted on the showing of the receivers' financial report for the first four months of this year.

**Bus Route Planned.**—Applications to operate motor buses have been filed with the California Railroad Commission by the San Francisco-Oakland Terminal Railways and the Napa-Soda Springs Bus Company. The key-route system is planning to operate a route from Fortieth Street, Oakland, to Montclair. The other route now being planned is between the cities of Napa and Soda Springs.

**A Privilege for the Blind.**—For the accommodation of the blind, Supt. Gaboury of the Montreal Tramways has given out notice that passes will be issued authorizing a blind person and his guide to ride for one fare. Accordingly, conductors will accept one cash fare in payment of passage of two such people. The pass will be printed in both the French and English languages.

**Hearing on Fare Matter Scheduled.**—Exceptions have been taken to the ruling filed recently by the Interstate Commerce Commission to the effect that the fare over the Daisy Line between Louisville and New Albany be reduced to 8 cents. The case will be argued before the entire Commission on July 14, and until that time the company will collect the regular 10-cent straight fare.

**Court Upholds Railway.**—Federal authority recently sustained the right of the Chicago, Ottawa & Peoria Railway, Ottawa, Ill., to charge 10 cents for rides within the city of Ottawa. This decision rules out the petition of the city asking the Federal court to prohibit the company from charging 10 cents for rides which start and terminate in the limits of Ottawa. The company is also permitted to charge 3.6 cents per mile for passenger traffic.

**Responsibility Fixed for Long Island Wreck.**—The Interstate Commerce Commission deals at length in its summary of accident investigation reports for January, February and March, 1921, with the side collision between two passenger trains on the electrified Atlantic Avenue branch of the Long Island Railroad, near Autumn Avenue. The accident occurred on Feb. 13. It resulted in the injury of twenty-three passengers and one employee. The commission says the accident was caused by the failure of a motorman properly to observe and be governed by signal indications.

**Anti One-Man Car Legislation Fails.**—Efforts at Tallahassee to legislate Tampa's one-man cars—and those in St. Petersburg and other cities too, for that matter—out of business were finally frustrated by the tacking on of an amendment to the second section which practically kills the bill as effectually as striking out the enacting clause. The amendment has stuck through the final two readings in the House, despite efforts to knock it off, and on the final reading the bill was passed and sent to the Senate, where it is confidently expected it will either die in committee or pass as it stands. The amendment exempts from provisions of the act those cars specifically designed for operation by one person and known as "one-man cars."

**Increased Rates Announced.**—Increased passenger fares have been announced by the management of the Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont. One-way fare has been advanced from 2.5 cents a mile to 2.75 cents a mile; round-trip fare from 2.25 cents a mile to 2.47 cents a mile; monthly commutation books from 0.81 cents a mile to 1 cent a mile. In commenting on these changes A. Eastman, vice-president and general manager, said: "Only that we have enjoyed a splendid patronage and that operating expenses have been kept down to the lowest possible point consistent with safety this company would not have been able to continue operation during the past three years."

## Personal Mention

### Journal Editor to Aid in Preparation of Business Paper Course

Henry H. Norris, managing editor of the *ELECTRIC RAILWAY JOURNAL*, has been delegated by the New York Business Publishers' Association to assist in the preparation of a course of instruction for present and prospective employees in the field of business papers. The association has contracted with the Business Training Corporation of New York City to administer this course and Mr. Norris' first duty will be to supervise the preparation of text material. In this work he will have the assistance of a co-operative group of from thirty to fifty leaders in the business papers field. In the fall groups of students will be organized among the several publishing organizations and these groups are to be led by experts in the publishing field with whom Mr. Norris will co-operate during the initial period of the work. This new work will not interfere with Mr. Norris' connection with the *ELECTRIC RAILWAY JOURNAL* except that it will require a portion of his time for a few months.

E. A. MacMillan, formerly superintendent of the Stroudsburg (Pa.) Traction Company, and but recently returned from imprisonment in Soviet Russia, following his service with the British Railway Mission to Siberia, has been appointed assistant superintendent to the Atlantic City & Shore Railroad, Atlantic City, N. J.

Edward T. Stotesbury, who was long chairman of the board of the Philadelphia Rapid Transit Company, has accepted the chairmanship of the Committee on Finance of the Sesqui-Centennial Association of Philadelphia, to which he was recently appointed by Mayor Moore. His associates on the committee are: John Wanamaker, John H. Mason, Ellis A. Gimbel, and Mrs. Arthur H. Lea.

Fred B. Johnson, who recently retired from the Indiana Public Service Commission, has added his name to the list of those who, after severing their connections with the commission, immediately took up the practice of utility law. In an announcement Mr. Johnson states that although he will engage in a general practice he will specialize in utility matters. He states that in connection with Jesse I. Miller, of Washington, he will handle all matters before federal departments and bureaus in Washington, more particularly in connection with federal taxation questions.

Frank B. Musser, president of the Harrisburg (Pa.) Railways, is now in Edinburgh, Scotland, attending the convention of the International Rotary Club as the official delegate of his local

club, of which he is vice-president. He sailed from this country on June 1. At the close of the convention he will take advantage of the opportunity to tour France and Belgium. His plans were to return to the United States about July 15. His friends among the railway men who attended the annual meeting of the Pennsylvania Street Railway Association, which met recently in Harrisburg, missed his joviality at the sessions. To remind him that he was not forgotten, the secretary of the association was instructed to cable him the greetings and best wishes of the members.

John H. Moran, general auditor of the Boston Elevated Railway, was called to Rochester, N. Y., recently in the capacity of adviser to the arbitration board, whose duty it was to settle the controversy between New York State Railways and its employees in Utica, Rochester, Syracuse and surrounding cities who are members of the Amalgamated Association. The arbitration board was composed of Judge Arthur Sutherland of Rochester, an impartial member; B. E. Tilton, vice-president of the company, and James H. Vahey, Amalgamated counsel, representing the company and the Amalgamated Association respectively. As announced on June 18 the arbitration board reduced the wages approximately 11½ per cent, with a maximum hourly rate for the trainmen of 53 cents.

C. E. Davies has been appointed by the American Society of Mechanical Engineers as managing editor of the society's publication to succeed the late L. G. French, who was both editor and manager. Mr. Davies was graduated from the Rensselaer Polytechnic Institute with the degree of M. E., and for several years afterward specialized in industrial management work. He became associated with the Smith-Premier works of the Remington Type-writer Company, Syracuse, N. Y., in 1914. During the war Mr. Davies was in the Ordinance Department at the Frankford Arsenal. Mr. Davies joined the editorial staff of the society in March, 1920, as associate editor of *Mechanical Engineering* and assistant secretary in charge of meetings and publicity. The society thus secured to assist on its publication and to help with its meetings one especially trained in large diversified business undertakings.

R. M. MacLetchie, comptroller of the Alabama Power Company, Birmingham, Ala., has recently taken over the duties of treasurer of the property formerly discharged by R. A. Mitchell, who was vice-president as well. As comptroller and treasurer Mr. MacLetchie will have complete supervision of all finances and accounting of the company.

W. I. Boyer has recently been appointed secretary and treasurer of the Hot Springs (Ark.) Railway. He is stepping into the place formerly occupied by W. E. Johnson.

## Obituary

John I. Fistus, who had been associated with the transportation department at the main office of the Pennsylvania-Ohio Electric Company in Youngstown, died on May 15.

Joseph F. Devender, for twenty-eight years in the employ of the Brooklyn (N. Y.) Rapid Transit Company, is dead. Mr. Devender served in many capacities with the company, ranging from helper to general foreman in the line department, which position he held at the time of his death.

Michael J. Duffy, a veteran of forty years' service with the street car lines of Boston, died suddenly at his home in Roxbury, Mass., April 28. Starting in as a conductor on the horse-car lines he rose through the ranks, until at the time of his death he was assistant superintendent of Division 2 of the Boston Elevated Railway. His funeral was attended by officials of the company and by several hundred fellow employees and friends.

Will H. Bloss, manager steam railroad sales of the Ohio Brass Company, Mansfield, Ohio, died at his home in Mansfield on June 22. Mr. Bloss was born on April 4, 1869. After receiving his engineering training at the Indiana University he started his career in railroad work. At one time he was division engineer on the Santa Fé Railroad and later he held a position as chief engineer of the Indiana Union Traction Company. He went to the Ohio Brass Company in November, 1906, from the Buda Company of Chicago and was district sales manager in some of the Central States until about a year ago. From that time he had devoted his effort to electrification development and other steam railroad problems.

Lieutenant Daniel Sylvester, head of the traffic squad of the San Francisco Police Department, died on May 16. He was recognized nationally as an authority on traffic matters and was elected president of the National Traffic Officers' Association which convened at the Civic Auditorium in San Francisco last August. The convention came to San Francisco as a result of his efforts. To Mr. Sylvester belongs credit for many of the nation's traffic laws and since taking charge of the San Francisco traffic squad he had accomplished more in that direction than any other one man. In an effort to stir up interest in the larger cities of the country in a national and uniform law governing traffic in all of the states of the nation, Mr. Sylvester toured the country last year and visited forty-eight cities.

# Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE  
MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

## Prompt Deliveries of Heavy Track and Shop Tools

Prices Are Thought to Have Touched  
Bottom but Buying Continues  
Very Light

Excellent deliveries are quoted by manufacturers at the present time on heavy tools used on the roadbed and in shops, such as rail benders, rail saws, track drills, car movers, wheel presses, punches, shears, lathes, etc. Despite the present low level of production in this field producers are generally prepared to make immediate shipments on material that does not have to be made to specification. Where a product requires special manufacturing, work can be started as soon as orders are received, for back-order files have long since ceased to exist.

Substantial stocks of raw material are reported on hand which are gradually being made up into finished products of which a fairly large supply is also reported. Plants have either reduced their number of workmen or are running on part time, with operation ranging from about 25 to 40 per cent of capacity.

Manufacturers in this line apparently do not expect much improvement in business before the fall months. Lower labor costs may aid the steam railroad business somewhat as this class of buying has been even proportionately worse than electric railway demand. Steam roads have been so cramped financially, manufacturers state, that their buying of shop and track tools has been almost nil, whereas some of the electric roads have purchased up to about 25 per cent of their normal requirements.

Prices on track material such as rail saws, rail benders, track gages and levels, car replacers, etc., are said to have dropped about 20 per cent since the first of the year and are about 40 per cent below peak prices. Quotations on standard heavy shop products are down from about 10 to 20 per cent since the first of the year, and on special products selling prices are about 20 per cent below last year's quotations. The general view of manufacturers is that prices have about reached their bottom level.

## Market for Car Ventilators Not Very Active

Demand for car ventilators is light—in line with slack buying of new rolling stock on the part of electric railways. The outlook for future business is said to be fairly good, but not much hope of a reaction from the present dullness is held out before this fall. One of the newcomers among manufacturers of railway ventilating equipment reports

that because of the present condition of railroad buying the company has drifted into the building ventilation line, where its product is equally applicable and is meeting with good success.

Stocks in some instances are not carried where ventilators are a special product, but in others a fair surplus supply is held. Deliveries are generally very prompt although production is down to about 50 per cent of capacity. Working forces have been cut in half in some instances, too. Prices in this field were not advanced in line with many other products, it is stated, and therefore quotations at present are only about 5 to 10 per cent lower than last year.

## Quiet Market for Car Seats

Demand for Repair Seatings Is  
Inactive, Too—Rattan Prices Down  
25 to 30 per Cent

Activity in the car seat market at present is confined to the production of old orders and little else. Buying of new seats is very light; there has been some business emanating from St. Louis, Detroit and Canada in line with buying of cars there, but the general situation is dull. Even the repair market is inactive and producers are well stocked with rattan material as a result.

At this same time last year there was about six times as much business going through as there is at present, one producer reports. Steam railroads are not placing orders either, the export market is lifeless, and the motor-bus seat trade, which started to come to the front rapidly, has fallen way off. Some hope is placed in the inauguration of lower labor costs on steam roads as the turning point for better demand from that quarter. In this connection the item of high labor cost is probably the one factor that shows up the electric railway market more than any other, it is stated.

Production of car seat manufacturers is down low because it follows actual buying pretty closely. Stocks of finished seats are not carried, but customers' requirements as to delivery can be well met at the present time. Orders are filled in from two to four weeks depending upon their size.

Prices have come down considerably, a large seat manufacturer dropping the price on rattan, for instance, about 20 per cent the first of June. This makes a total reduction of between 25 and 30 per cent from the peak on that product. Slat seats are said to be close to bottom because the lumber market is well down.

Leather has receded considerably too, but imitation leather has been coming to the front on the grounds of price.

## Railway Buying of Jacks Is Light

Prices Are Down 20 to 25 per Cent  
and Production Is at One-Quarter  
of Capacity

Railway buying of lifting jacks has been limited this year, manufacturers report, and bids fair to remain so for the balance of 1921. Electric railways have purchased nothing at all in this line, some producers state, while others have received a small amount of business. Orders for the most part are not large individually and very often cover emergency requirements. Steam railroad buying has figured even to a less extent in the market. Unfavorable labor and financial conditions and the smaller volume of material to haul on transportation lines and in the automobile-truck field too have all aided in reducing sales of jacks. In general it is not expected that the balance of this year will record a very great increase in demand.

Prices on jacks used by railways are down from 20 to 25 per cent from the peak. This drop has been aided by a cut in wages amounting to 20 per cent in some instances. Raw material has also receded, in fact it is stated that this item is not expected to go enough below its present level to justify further lowering of prices. The main thing that would aid in bringing about additional lower costs on jacks, it is said, is greater production, for at the present time the industry is down to about 25 per cent of capacity operation. This decreased output of course entails bigger overhead expenses.

Raw material stocks in the field have been large in some cases but are being worked off without being replaced with new material, in view of present conditions. Fairly large stocks of the finished product are held in comparison with current buying, so that in general immediate shipments can be made. In view of the limited production, however, sudden orders for certain jacks occasionally exhaust the supply and then a delay of some weeks may occur before the stock is replenished.

## Strong Buying of Armature and Coil Winding Machines

Their Increasing Use Accounted For by  
the Elimination of Stocking Several  
Different Types of Armatures

Good buying of armature and coil winding machines is reported at present. Demand seems to be well distributed and is coming not only from railways in this country but also in good volume from foreign countries. The basis of this business, the amount of which seems rather surprising in view of general market conditions, is said to be the desire of railways to lower costs through doing away with the need of stocking complete armature and field coils. In some instances it has been found necessary to stock a dozen or more different types of these

where various motors are used. With the use of these machines only certain frames need be carried in stock as they can be made up as quickly as needed.

As this product is more or less of a specialty prices have not receded to any great extent, a drop of about 5 per cent from the peak having been made. Production is well up at present with deliveries being made promptly, or in about ten days to two weeks.

### Exports of Railway Material in First Quarter of 1921

Railway cars and parts with a total value of \$15,073,000 rank twenty-third out of a list of the 100 chief exports of this country during the first quarter of 1921, according to the foreign commerce department of the U. S. Chamber of Commerce. Steel rails with a total value of \$10,552,000 are thirty-first, railway switches, frogs, splice bars, etc., totaling \$3,336,000, are seventy-first; bolts, nuts, rivets, etc., follow in seventy-fifth place with a valuation of \$2,987,000; railroad ties are ninety-seventh with a value of \$1,926,000, and electric switches, in ninety-eighth place with a value of \$1,890,000, are the last railway item listed.

Comparison is also made on a few of the items that can be figured on a poundage basis, with the volume of exports in the first quarter of 1920. On this basis exports of steel rails increased from 28,529,000 lb. in the first three months of 1920 to 37,465,000 lb. in 1921, and bolts, nuts, etc., from 20,210,000 lb. to 30,937,000 lb. Likewise, exports of railroad ties in the first quarter jumped from a total of 700,000 ties in 1920 to 1,300,000 ties this year.

### Good Stocks of Car-Type Lightning Arresters

Lightning arrester sales, so far as the car-type are concerned, have been disappointing thus far, manufacturers report. This of course is a direct result of the light buying of new cars by electric railways. In anticipation of the usual seasonal volume of business in this line producers generally stocked up on car-type arresters, so that deliveries there are immediate. Central station buying is fairly good at present, however, though not up to the standard of last year, which was also below par.

On large types deliveries can be made in from two to eight weeks, the lower range being for arresters generally used and the longer delivery for highly special products. Stocks of the finished product on this type are not carried, but a good supply of parts is reported on hand ready to assemble. Prices are down 10 per cent, this drop being made earlier in the year.

### New Electric Railways in Japan

The Mushashi Electric Tramway Company, recently organized, according to the *Japan Advertiser*, will construct and operate a new electric railway from Tokyo to Yokohama, running approximately 1½ miles inland from the present railroad. The company will also furnish electricity to the villages along the route. Plans are being made, according to a translation from the Nagoya Shimbun, for the construction of a railroad between Nagoya and Yamada, a distance of 61 miles. Power is to be supplied by the Ibugawa Electric Power Company. Another line 30 miles long, around the Chita Peninsula, is planned by a company to be capital-

ized at 4,000,000 to 5,000,000 yen. A translation from the Osaka Mainichi Shimbun reports a project for the construction of an electric railway between Nagoya and Gifu. It is proposed to construct a double-track line paralleling the present steam railway, at a cost of about 7,000,000 yen.

### Rolling Stock

The United Railways & Electric Company, Baltimore, Md., is expecting to buy twenty gasoline motor buses.

Detroit (Mich.) Municipal Railway is considering the use of trackless trolleys as feeders to be used in conjunction with the regulation municipal ownership cars. Specifications and prices for furnishing fifty of the new type cars will be asked. If bids sufficiently attractive to justify the purchase of the trackless cars are received by the commission that type of car will probably be used on some of the lines in the less congested districts. It is the belief of the commission that the cars can be manufactured in Detroit. The approximate cost is estimated at \$7,000 each, and the maintenance is placed at 18 cents per mile as against 40 cents per mile for motor buses.

### Track and Roadway

Indiana Service Corporation, Fort Wayne, Ind., owing to poor business conditions, has postponed for about a year building an extension to the proposed big truck plant which is to be erected just east of Fort Wayne, Ind., by the International Harvester Company. But the Greater Fort Wayne Development Company—a million dollar concern—which was formed among Fort Wayne business men to build homes, etc., is going ahead with plans already formed for putting in streets for the plant. One of the things which the development company is pushing right along is the extension of the car lines of the Indiana Service Corporation to the plant. Recently a remonstrance was filed by residents of Pontiac Street against the double tracking of that street, so another route to the plant east of the city is being considered.

Seattle (Wash.) Municipal Railway may resume work on an extension in East Marginal Way and First Avenue South, sus-

### NEW YORK METAL MARKET PRICES

	June 1, 1921	July 1, 1921
Copper ingots, cents per lb.	13.25	12.87½-13.00
Copper wire base, cents per lb.	15.00-15.25	15.00-15.25
Lead, cents per lb.	5.00	4.40
Nickel, cents per lb.	41.00	41.00
Zinc, cents per lb.	5.20	4.75
Tin, cents per lb.	31.50	29.12½
Aluminum, 98 to 99 per cent, cents per lb.	28.60	28.00

### OLD METAL PRICES—NEW YORK

	June 1, 1921	July 1, 1921
Heavy copper, cents per lb.	10.75 to 11.00	9.50 to 10.00
Light copper, cents per lb.	8.25 to 8.37½	7.25 to 7.50
Heavy brass, cents per lb.	5.25 to 5.50	4.75 to 5.00
Zinc, old scrap, cents per lb.	2.50 to 2.75	2.50 to 2.62½
Yellow brass, cents per lb.	4.00 to 4.50	4.00 to 4.25
Lead, heavy, cents per lb.	4.25 to 4.50	3.50 to 3.62½
Steel car axles, Chicago, per net ton.	14.50 to 15.00	13.00 to 13.50
Old car wheels, Chicago, per gross ton.	13.50 to 14.00	13.00 to 13.50
Steel rails (short) Chicago, per gross ton.	14.00 to 15.00	12.00 to 12.50
Steel rails (rerolling), Chicago, gross ton.	13.50 to 14.00	13.00 to 13.50
Machine shop turnings, Chicago, net ton.	3.50 to 4.50	3.50 to 4.00

### ELECTRIC RAILWAY MATERIAL PRICES

	June 1, 1921	July 1, 1921
Rubber-covered wire base, New York, cents per lb.	16.00	16.00
Weatherproof wire base, New York, cents per lb.	15.50	15.00
Standard Bessemer Steel Rails, per gross ton.	45.00	45.00
Standard open hearth rails, per gross ton.	47.00	47.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill.	.....	.....
Rails, girder (grooved), per gross ton, f.o.b. mill.	.....	.....
Wire nails, Pittsburgh, cents per lb.	3.25	3.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	3.40	3.25
Tie plates (flat type), cents per lb.	2.75	2.75
Tie plates (brace type), cents per lb.	2.75	2.75
Tie rods, Pittsburgh base, cents per lb.	5.50	5.50
Fish plates, cents per lb.	2.75	2.75
Angle bars, cents per lb.	2.75	2.75
Rail bolts and nuts, Pittsburgh base, cents per lb.	4.50	4.50
Steel bars, Pittsburgh, cents per lb.	2.10	2.10
Sheet iron, black (24 gage), Pittsburgh, cents per lb.	3.85	3.60
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.	4.55	4.30
Galvanized barbed wire, Pittsburgh, cents per lb.	4.10	3.65

	June 1, 1921	July 1, 1921
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.70	3.25
Car window glass (single strength), first three brackets, A quality, New York, discount*.	82%	82%
Car window glass (single strength), first three brackets, B quality, New York, discount.	82%	82%
Car window glass (double strength, all sizes, A quality), New York, discount.	83%	83%
Waste, wool, cents per lb.	11 to 17	10 to 17
Waste, cotton (100 lb. bale), cents per lb.	.....	.....
White.	9.00 to 14.00	8.50 to 11.00
Clined.	6.50 to 12.00	6.00 to 8.50
Asphalt, hot (150 tons minimum), per ton delivered.	33.00 to 35.00	33.00 to 35.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton.	33.00 to 36.00	33.00 to 36.00
Asphalt, filler, per ton.	36.00	36.00
Cement, New York, per bbl.	3.20	3.20
Linseed oil (raw, 5 bbl. lots), New York, per gal.	.78	.76
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	.80	.78
White lead (100 lb. keg), New York, cents per lb.	.13	.13
Turpentine (bbl. lots), New York, per gal.	.65	.61

\* These prices are f.o.b. works, with boxing charges extra.

ended some time ago after expenditure of \$27,000. This was forecast when Superintendent of Municipal Railways D. W. Henderson was asked by Oliver T. Erickson, chairman of the Council utilities committee, to furnish an estimate of cost of completing the work. The line would give a direct route for South Park cars, now routed through Georgetown.

**Utah Light & Traction Company, Salt Lake City, Utah**, as a result of a reduction in the wages of its employees now has at its disposal \$125,000 for needed repairs to paved streets, track and for overhauling equipment.

## Power Houses, Shops and Buildings

**Union Traction Company, Anderson, Ind.**, lost a substation at Maxwell, Ind., by fire during a recent electrical storm.

**Connecticut Company, New Haven, Conn.**, will hereafter be furnished with power for the operation of its cars in Derby, Ansonia and Shelton from the Derby Gas & Electric Company. Formerly current was generated by the Connecticut Company's own plant in Shelton.

## Professional Note

**J. O. G. Gibbons and C. E. Brown** have formed a partnership under the name of Gibbons & Brown, consulting engineers specializing on power plants and industrial problems, with offices in the Ordway Building, Newark, N. J. Mr. Gibbons was formerly with Westinghouse, Church, Kerr & Company and is now engaged in private practice. For the past four years Mr. Brown has been a United States ordnance engineer.

## Trade Notes

**The Hi-Voltage Equipment Company, Cleveland, Ohio**, has developed a new type of lightning arrester for outdoor mounting.

**The Black & Decker Manufacturing Company, Towson Heights, Baltimore, Md.**, has recently placed on the market a portable electric grinder.

**The Walter Motor Truck Company, 927 West Sixty-first Street, New York City**, has developed a new line of electric road trucks of from 1,500 lb. to 7-ton capacity.

**The Independent Pneumatic Tool Company, Chicago, Ill.**, has put on the market the "Thor" electric drill stand for converting portable electric drills to drill presses.

**The Esterline-Angus Company, Indianapolis, Ind.**, has brought out a graphic alternating current ohm-meter for recording the resistance of liquids, the concentration of solutions, etc.

**The United States Steel Products Company**, which handles the export business of the U. S. Steel Corporation, has taken an order for \$400,000 of steel rails it is stated, from the Toronto (Canada) Transportation Commission.

**The American Insulated Wire & Cable Company, Chicago**, manufacturer of "American Brand" weatherproof and bare copper wire and cables, contemplates building a rod mill when building conditions are more settled.

**The Benjamin Electric Manufacturing Company, Chicago**, has recently placed on the market its type RR threaded fixtures for heavy-duty service which are especially adapted for use in railroad shops and yards and large industrial plants.

**The Adapti Company, Cleveland, Ohio**, announces that it has purchased outright the property and buildings formerly occupied by the Cleveland Refrigerator Company at East Seventy-second Street and Oakwood Avenue, Cleveland, where operations will begin about July 15.

**The Whitman Electric Manufacturing Company, Whitman, Mass.**, has completed two new kilns of its own with large Sager capacity. The company is getting out a line of porcelain specialties—rosettes, receptacles, etc.—and is in a position to make shipments on special porcelain material.

**John A. Roebeling's Sons Company, Trenton, N. J.**, is considering the construction of a new building for its copper wire and electrical galvanizing department. Plans at present are in a preliminary stage and no definite time is set for the completion of the work, the company announces.

**The Arrow Tool & Manufacturing Company** is the new name for the Arrow Tool Company, 200 Cannon Street, Bridgeport, Conn., manufacturer of tools of all descriptions. The company will continue as in the past to manufacture tools, dies and special machinery with no change in management.

**Belden Manufacturing Company, Chicago, Ill.**, manufacturer of electrical wires and cables, has issued bulletin No. 1, dated June 1, of the "Belden Bulletin." This bulletin will hereafter be issued to the trade monthly and will contain current net prices of the company's products. Bulletin No. 1 covers rubber-covered wires and lamp cords.

**Allis-Chalmers Manufacturing Company, Milwaukee, Wis.**, during the first three months of this year billed sales amounting to \$7,656,218 as against \$6,320,597 for the same period in 1920. Net profits after provision for federal taxes amounted to \$774,189. Unfilled orders on hand March 31, 1921, aggregated \$12,943,633, compared with \$19,442,791 last year.

**The Safety Car Heating & Lighting Company, New York City**, held a meeting of its board of directors on June 15 at which time the following officers were elected: W. L. Conwell, president; J. A. Dixon, R. Parmly and James P. Soper, vice-presidents; C. W. Walton, secretary and treasurer; William Stewart, assistant secretary and assistant treasurer.

**The Industrial Protective Company, Dayton, Ohio**, of which W. R. McLean was president, was dissolved as of June 30, and the Dayton office discontinued. With H. A. Fishleigh, Mr. McLean has organized the Fishleigh-McLean Secret Service Bureau, with offices at 720 Nicholas Building, Toledo, Ohio, which firm will continue the services heretofore supplied by its predecessor.

**The Elliott Company, Jeanette, Pa.**, announces additions to its sales organization as follows: R. H. Schmidt has been assigned to the St. Louis district office, W. E. Widau to the Cleveland office and R. S. Bellman to the Philadelphia district office. In addition to the Elliott company's products they will also handle those of the Lagonda Manufacturing Company, Springfield, Ohio, and the Liberty Manufacturing Company, Pittsburgh.

**The International Register Company, Chicago, Ill.**, through its sales agent the Electric Service Supplies Company, has leased 112 International portable hand registers to the Third Avenue Railway Company, New York City. These registers are attached to the fare box and used as an additional check on fares. About 250 of them were also placed with the Public Service Railway Company, Newark, N. J., earlier this year, for use on its safety cars.

**Empire Engineering & Supply Company** about trebled its capacity for making switchboards and panelboards when it moved into its new factory at Twentieth Street and Fourth Avenue, Brooklyn, N. Y., in May. The new building is 100 ft. x 160 ft., only one story in height but so constructed that two or three stories may be added as needed. The company reports a satisfactory volume of business in these types of boards with the shops running almost full time.

**The Royal Indemnity Company, 84 William Street, New York City**, after having worked for some months on a form of policy for the insurance of electric motors, etc., early this year received approval from the insurance authorities in New York State of the form of a policy which would indemnify for the electrical and mechanical breakdown of motors, generators, transformers, regulators and other electrical apparatus. The company guarantees the repair bills directly incidental to such troubles.

**The Triumph Electric Company, Cincinnati**, manufacturer of motors and generators, announces the removal of its Chicago office from 628 West Lake Street to 2814-16 Wentworth Avenue, where it has more spacious quarters. W. R. Bonham is manager of this office. The company has also moved its New York office, of which T. W. Kloman is manager, from 80 Cortlandt Street to the Knickerbocker Building, Forty-second Street and Broadway. The Wood & Lane Company, St. Louis, repre-

sentative of the company, is now established at 1016 Market Street, St. Louis, where it has large warehouse facilities and carries ample stocks of the various lines.

**The Stoker Manufacturers' Association** at its summer meetings, held in Stockbridge, Mass., June 14 to 16, elected the following officers: President, Maxwell Alpern, vice-president American Engineering Company, Philadelphia; vice-president, S. A. Armstrong, vice-president Underfeed Stoker Company of America, Detroit; treasurer, Richard D. Hatton, vice-president Laclede-Christy Company, St. Louis; secretary, J. G. Worker, vice-president Phoenix Manufacturing Company, Eau Claire, Wis. These officers, with the addition of R. Sanford Riley, retiring president, and A. G. Pratt, of Babcock & Wilcox Company, make up the executive committee.

**William Aldrich**, who has recently been in charge of the Southern territory of the Metal & Thermit Corporation, New York, has been transferred to its Western territory. From 1899 to 1908 Mr. Aldrich was associated intermittently with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. In 1909 he joined the former Goldschmidt Thermit Company, since when he has traveled in every State in this country, also in Canada, West Indies, Central America, Panama and the tropics in the interest of Thermit. Mr. Aldrich will travel extensively in the far Western States and will make his headquarters at the new South San Francisco office of the Metal & Thermit Corporation. William H. Moore, who until recently was assigned to the Chicago territory, now has charge of the Southern territory.

**The Link-Belt Company, 910 South Michigan Avenue, Chicago**, according to an announcement made by Charles Piez, president, has acquired all of the capital stock of the H. W. Caldwell & Son Company. At the same time Frank C. Caldwell has been elected director of the Link-Belt Company. Thus two experienced companies in the conveyor field have joined forces, with the result that the Link-Belt Company has added two lines, "Hellicord" conveyors and power-transmission machinery, to its line of manufactures. While the plant of the H. W. Caldwell & Son Company will continue to operate under separate corporate existence and under its present name, the joint facilities of the two companies and the broader avenues of distribution possessed by the Link-Belt Company should prove of distinct advantage to the customers of both, says Mr. Piez. There will be no modification of the policies of the Caldwell plant, no impairment of its service and no change in its product. The plant management will remain substantially the same as at present.

## New Advertising Literature

**Unaflo Engines.**—Bulletin No. 29 recently issued by the Ridgway Dynamo & Engine Company, Ridgway, Pa., describes its unaflo engines.

**Steam Tables.**—The Wheeler Condenser & Engineering Company, Carteret, N. J., has published the sixth edition of "Steam Tables for Condenser Work."

**Electric Glue Pot.**—"Glue Pot Service" is the title of a pamphlet issued by the Automatic Electric Heater Company, Warren, Pa., covering its electric glue pots.

**Mill-Type Motors.**—General Electric Company has issued bulletin No. 48121.1A, superseding bulletin No. 41821.1, entitled "Direct-Current Mill-Type Motors, type MD"

**Alternating-Current Engine-Type Generators.**—This is the title of the fifteen-page, illustrated bulletin No. 1115 superseding No. 1098 issued by Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

**Electrical Porcelain.**—"Standard Electrical Porcelain" is the title of a new catalog recently issued by the R. Thomas & Sons Company, East Liverpool, Ohio, covering its porcelain products.

**Wood Stave Pipe.**—The Redwood Manufacturers Company, Hobart Building, San Francisco, Cal., has issued catalog X, June 1921, "A Handbook of Information for Hydraulic Engineers Relating to Remco Redwood Pipe."

**Buffers and Grinders.**—The Valley Electric Company, 3157 South Kingshighway, St. Louis, Mo., has issued a circular describing and giving net trade prices on its complete line of portable electric buffers and grinders which it has just recently developed.