

# Electric Railway Journal

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## VALUABLE BY-PRODUCT OF THE WAR

Out of the turmoil and stress of this war is going to come a new solidarity in the country as a whole, and especially in the industrial and public service corporations upon which rests the prosperity of us all. Already we see indications that a seriousness and a sense of responsibility are beginning to pervade the personnel of the electric railways, in common with other groups of men organized for specific service. The result must be that internal problems can be more readily solved because employer and employee shall have been brought to realize their essential equality when matters of honor and courage are in question. There has been a great deal of unnecessary friction between capital and labor in electric railway companies during the past few years, but we sincerely hope to see, after the war has closed, that a better day for men and manager has dawned. These remarks are prompted by the accounts of patriotic mass meetings, flag-raising exercises and other group events held by electric railway companies during the past few weeks. One such meeting, at Hampton, Va., is described in this issue. The incident suggests that employees of all ranks will miss a great opportunity if they do not become better friends under the centripetal forces of this world's cataclysm.

## RELIEF NEEDED FOR UP-STATE ROADS

The general facts found by Professor Conway of the University of Pennsylvania in his analysis on page 1045 of the financial conditions of the up-State New York electric railway companies will hold true, we believe, with most electric railway properties in this country. Labor and material charges, as well as taxes, have greatly increased during the last five years, and owing to these conditions companies have been forced to provide for the added facilities required by the increased traffic during this period by bond issues rather than by increases in their capital stocks. The result has been, for all of the companies in New York outside of New York City during the last five years, an increase in railway operating revenues of 15 per cent and an increase in interest charges, rentals and "other deductions" during the same time of 51 per cent. These changes were accompanied by a reduction in net income available for dividends of 78 per cent and of net income to gross income of from 41.1 to 9.1 per cent, so that there was a reduction in the percentage of net income to capital stock of from 3.44 per cent in 1911 to only 0.77 per cent in 1915. The worst part of this situation is that the conditions which brought it about are not improving; in fact, they are getting worse. We believe that if the facts are placed before the public there

will be a general acquiescence in the only real relief possible, namely, higher fares. This, we hope, will be the result of the present New York State campaign.

**ECONOMY IN FUEL AND MAN POWER A NATIONAL DUTY** A significant development of the past week is the announcement by a number of steam railroads of curtailment of their services by the consolidation of some passenger trains, the elimination of others with small patronage and a reduction in the number of chair, dining and observation cars to be operated. These changes are not made to increase net revenues but to conserve the fuel supply and increase the capacity of the roads for coal, food, government material and troops, and they are being carried out to conform with the recommendations of the Railroad War Board at Washington, D. C. The general situation on the steam roads, so far as the desirability of conserving the available supplies of fuel and man power is concerned, is of course the same on the electric roads, and suggests similar steps on their part. While there will be no great increase in the amount of freight to be carried or government transportation to be undertaken on the electric roads, the experience of the British tramways indicates that the passenger traffic on our electric roads will be greatly increased during the war, partly as a result of the intensive industrial conditions and partly because of the reduction in steam railroad passenger service. This condition emphasizes the necessity of introducing as a war measure all methods in electric railway operation which will economize fuel and labor and will increase track capacity where that capacity is needed. There are many such methods available, and we are confident that the public will support the companies in introducing these measures as a matter of national defense, if the need for them is fully explained.

## STEEL WIRE TO THE RESCUE

When a great system like the Pacific Electric Railway finds that it can dispense with copper trolley wire and so make renewals at 12 cents a pound instead of 40 cents, other roads throughout the land will be eager to learn how the feat was accomplished. We believe that they can get all of the important facts from Mr. Anderson's article, published in this issue, telling of his successful installation of 100 miles of steel trolley wire, beginning as early as 1910. It is evident from earliness of this date that the introduction of steel was not a war measure, since copper was then selling around 15 cents a pound. The company put up the first steel wire simply in the hope that its lower first cost and presumably longer life would more than

offset its lower conductivity. This hope has been amply justified by time, for the steel on the first lines promises three to four times the life of copper except at accelerating points. While climatic conditions on the inland lines of the Pacific Electric are unusually favorable, salt air has had no terrors for galvanized steel. Certainly the service is severe enough. The Pasadena and Venice Short Lines are really suburban rapid transit rather than interurban lines; while the San Bernardino line is the company's speediest interurban. Mr. Anderson ascribes much of the success of the galvanized steel trolley wire to so simple a cause as the maintenance of uniform tension in the current collecting equipment. The availability of oxy-acetylene for welding splices is another factor. In spite of earlier discouraging trials of steel wire in the East, the success of the Pacific Electric Railway and the prohibitive price of copper will prove strong incentives to try again with better wire and better methods. The recent purchase of 50,000 lb. of steel wire by the Los Angeles Railway is the significant indorsement of a neighbor.

#### FUNCTIONS OF THE ASSOCIATION MANAGER

There seems to be a growing tendency to apply modern business principles to the management of local electric railway as well as other associations. The California Electric Railway Association and the Southwestern Electrical & Gas Association are good examples of this practice. The report of the California association appeared in our issue of two weeks ago. For this reason we shall speak more particularly of what it has done, although the same general principles apply to the Southwestern association as well.

Perhaps members of other associations who read this report marveled how so much could be done in so short a time and in a state practically as big as New England, New York and Pennsylvania combined. The secret lies in the method of organization for work. Instead of assigning to each task a group of active operating men, who often prove inactive as committeemen, the California association picked out an experienced railroad man who serves with the title of manager and receives instructions from and reports to the executive committee. Thus, when the association wanted jitney statistics, it did not rely upon haphazard voluntary cooperation, but rather upon having its manager make the gathering and co-ordinating of such data his chief business. If an injurious measure is before the Legislature, the individual members of the association do not work at cross purposes, but leave to the manager the duty of placing before the legislators, frankly and openly, the reasons why the measure should not pass.

Again, if one of the member companies needs help in waging some local campaign the manager may be available for several weeks' service. In sum, the California way is to leave as little as possible to the volunteer system of meetings with its frequent postponements, large percentage of absentees and high expense for traveling and time. The work is centered in a professional, so to speak, who is familiar with all sources

of data, who is untrammelled by the nightmare of local conditions, and who for the time being has no other object in life than to see that the California electric railways get their honest due.

For the same reasons that the city manager plan conduces to effectiveness in municipal affairs, the association manager plan should be effective in its field, but it requires extraordinary foresight in selecting the manager.

#### BECOMING BETTER ACQUAINTED WITH THE POWER PLANT

In connection with its campaign for economy in the generation and use of energy the ELECTRIC RAILWAY JOURNAL had occasion, a couple of weeks ago, to recommend that platform men and others be introduced to the power plant as far as possible. In making this recommendation it was realized that to carry out the fundamental idea underlying this suggestion something more than a mere hurried inspection trip through the plant is necessary. A modern power plant is such a complicated energy-generating machine that the lay visitor is apt to obtain but a confused, superficial and transient notion of what it is all about.

The task of giving the visitor a comprehensive idea of what a power plant is doing is simplified if his attention is directed to the routes of the several materials which pass through the plant in the course of its operation, making this term broad enough to include electricity, fuel, air and water. Such a plan has been followed in the article on the new Essex power plant of the Public Service Electric Company appearing elsewhere in this issue. This procedure not only enables one to grasp the relation of the different pieces of apparatus in the plant but also assists in visualizing the energy transformations, losses and possible savings. Take, for example, the circulating water for the condensers. It is obvious that this water must be screened to remove debris, it must be pumped through the condensers, the condensers must be arranged so it will come into intimate contact with the tubes containing the steam, and it must be discharged where it will not heat the incoming water. It is also apparent that all of the heat taken away from the plant in the circulating water is a clear loss, although, sad to relate, it is a necessary loss. Take, for another example, the air used in the combustion of the fuel. In the Essex plant a part of the air is first washed, cooled and moistened before it is drawn through the electric generators. Here it takes up most of the heat wasted in the generators, and then, supplemented with the necessary additional volume, is forced into the boiler furnaces. Here the greater part of it combines with the constituents of the fuel, producing intense heat, most of which is absorbed by the water in the boiler and superheated tubes. From the furnace the resulting assorted gases pass through the economizers, giving up a part of their heat to the feed water, and aided in their rush for the stacks, if necessary, by the induced-draft fans. As they leave the stacks the gases take away another considerable fraction of the energy

originally available in the coal, a source of waste which, like that in the circulating water, will always be with us.

#### THE 6-CENT FARE A NATIONAL ISSUE

It becomes more apparent every day that if the 6-cent fare campaign is to be a success, it must receive the participation of electric railway companies generally throughout the United States. It is inconceivable that the 6-cent fare should be charged in a third or a half of the cities of the country and a 5-cent fare in the others. It is true that there are now 3-cent fares in some cities, but they were granted under such exceptional conditions as hardly to create a precedent in other places. If now, however, the 6-cent fare should be granted, there would be tremendous pressure to bring it down again, unless a similar rise should be achieved generally throughout the United States.

There will be a political campaign next fall. It will be more municipal in character than state or national. The development of this electric railway fare question will give every city demagog in the country a chance to become violent in his denunciation of street railway companies and a chance to create fictitious issues. That situation must be met very candidly and frankly. It becomes all the more necessary that the public itself should be made to understand that an increase in fares is in the public interest. Only by doing so will the public stand for the increase which is asked.

Even if commissions grant some of the requests for increased fares, the fight is apt to be passed on to the various state legislatures. We doubt not that if requests for increases should be acceded to, many state legislatures would try to take away the power of commissions to grant just such increases. It will be remembered that in spite of the fact that many commissions had the power to say what the charges for passenger fares should be, many state legislatures have passed laws restricting steam railroad passenger fares to 2 cents a mile. That is a danger which undoubtedly confronts the street railway business and must be borne in mind in all that is said and done.

This question cannot be settled with reference to the needs of any one company. In many cities there are several companies, and the financial condition of these different companies varies. An increase in fares may be profitable to one of these companies and yet in another case barely make it possible for the company to live. Yet it is inconceivable that increases should be granted on certain lines in a city and not on other lines in the same locality.

The settlement of this issue is going to require the highest statesmanship of the public service commissions of the various states. Great courage will be required on their part to deal with it. There will be widespread popular clamor, though we predict that that clamor will slowly but surely subside in vociferousness. The fact cannot be escaped that 6 cents' worth of service cannot be given indefinitely for 5 cents.

As we see it, there are two fundamental facts in the situation which must be laid before the public candidly and persistently. The first is that the street railway of to-day is a very different kind of road from that on which the 5-cent fare basis was originally established, and that an increased fare is warranted in the public interest if the companies are to be permitted to keep up with the progress of the railway art. The second is that the cost of doing all business is now very much increased over what it was even a few years ago and that this new basis of costs promises to be fairly permanent. At any rate, the public, through its commissions and through the exercise of an enlightened public opinion, always has the opportunity to cut down the fares granted, should it be found that increased rates provide excessive profits.

It seems to us that the companies should bring continuously to the attention of their individual constituencies that the real point of importance is that the companies must be enabled to give a constantly improved service. Unless the public shows a disposition to be willing to pay for that improved service every inducement to provide it is automatically withdrawn.

The public need have no fear of its inability to protect itself from taxation through any unusual profits which might be derived from a slight increase in the individual fares.

The electric railway business is undoubtedly at the parting of the ways. The campaign may be long; it will certainly be arduous, for the opposition will be bitter in appearance even if not in fundamental fact. But the operation of the economic laws which now compel the actual payment from somewhere of the increased cost of the improved service now being given to the people of the United States can no more be circumvented than can be the operation of the laws of gravitation.

But the vital necessity is that every electric railway in the country be alive to the situation and take immediate steps to bring the condition to the attention of its local authorities. It is not a local issue; it is a national issue, for it involves the welfare of every community in the United States which is being served by electric railways.

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PUBLIC SERVICE COMMISSIONS exist not only for the protection of the traveling public, but also for the protection of the investor in public utilities. The duty of the commission both to the rider and to the investor clearly points to the need for specific action without delay.—PROFESSOR CONWAY *on the need for higher carfares in New York State.* (See page 1045 of this issue.)

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# Successful Use of Steel Trolley Wire by Pacific Electric Railway

The Present High Price of Copper, the Electric Railway's Staff of Life, Makes This Account of Timely Interest—About 100 Miles of Steel Wire Have Been Put Up by This Railway Since 1910 for Both Inland and Coastwise Lines of 600 or 1200 Volts and Direct or Catenary Suspension

By S. H. ANDERSON

Electrical Superintendent Pacific Electric Railway, Los Angeles, Cal.

WHEN the Pacific Electric Railway put up its first steel trolley wire on Feb. 20, 1910, we had no thought that five to six years later the price of copper would soar to such heights as 40 cents a pound. We simply felt that even with copper at 15 cents, it was worth while for us to experiment with steel as a substitute. As we have been told that our experiment has proved more successful than most others, we shall try to tell all that we have done and learned in this work, assuming that our fellow railway officials are anxious to try some 12-cents-a-pound steel in preference to 40-cents-a-pound copper.

To begin with, the Pacific Electric Railway has now in service of widely divergent character about 100 miles of No. 0000 double-grooved Roebling steel wire.

## WIRE PUT UP SEVEN YEARS AGO STILL IN USE

The first steel wire was put up on the south-bound local track of the Pasadena Short Line between Oneonta Junction and Sierra Vista, a distance of some 4500 ft. on a slight down grade. This was 600-volt direct suspension. This first wire was not galvanized, and it was butt-welded in the factory. Later, wire was ordered galvanized, the idea being that if the upper part of the wire was kept from being pitted by corrosion, moisture would have no damaging effect on the wire.

Considerable trouble was first experienced on account of the wire parting at the factory splices and a lap weld braze of 70 per cent section was made at the factory in place of the former butt weld. This eliminated considerable but not all of the trouble and it was necessary to devise a satisfactory means of welding the wire on the job when breaks occurred. The method is described later.

Seven years' service is a pretty fair test period on a

line with three to four-minute train service during rush hours. The presence of two long curves on the pioneer section gave opportunity also to study side wear.

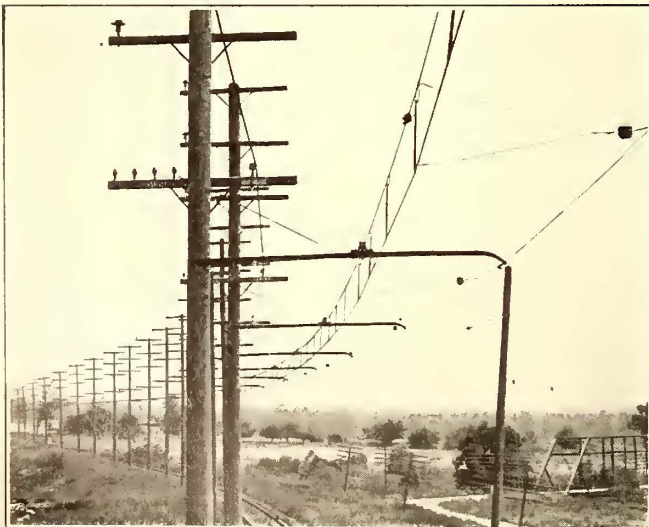
A recent inspection showed this wire to be in first-class condition on the whole. It had a smooth, polished surface on the underside, but no signs of wear were apparent at the clips, switch points or splices, contrary to the condition with copper trolley wire. Since the copper and splice at both ends of the steel wire had been renewed twice since 1910, and as the steel is good for at least four or five years more, the life of steel on tangents should be three to four times that of copper. However, at accelerating or feeding-up points we do not expect steel to last longer than copper, if as long. At this writing more than 60 per cent of the Pasadena Short Line, or 20 miles, is wired in steel.

## EXTENSION TO 600-VOLT CATENARY SERVICE

On May 17, 1912, we installed 4800 ft. of steel trolley wire on the inbound track of the Venice Short Line running west from Hauser. This is a high-speed catenary interurban line with three to four-car train service, and runs to the seashore. The section considered has an average grade of 0.2 per cent and contains quite a pronounced curve.

Inspection made a few months ago shows the following: On the tangents, where the service is the fastest, the original vertical diameter of the wire has been worn about 13 per cent; at the clips of the hangers, 22 per cent. The estimated future life on the tangent is three years. On the curve, the diameter has been reduced 22 per cent in the run and 29 per cent at the clips, and the estimated future life here is two years.

For about 500 ft. of the tangent beginning where the curve ends, as shown in the accompanying plan, the wire



VIEWS ON SAN BERNARDINO LINE OF PACIFIC ELECTRIC RAILWAY SHOWING OVERHEAD CONSTRUCTION WITH STEEL CONTACT WIRE

was worn to approximately 58 per cent of its original diameter. This 500 ft. was renewed in March of this year. This rapid wear has confirmed our conclusion that, because of the heavy arcing at accelerating points, the wear of steel is as great as or greater than copper.

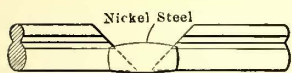
LATER INSTALLATIONS ON 1200-VOLT LINES

As galvanized steel trolley wire was giving us satisfaction right along, we kept on installing it until we have now approached the 100-mile mark. Perhaps, the most important installations are on our famous "Orange Empire" lines, the San Bernardino-Riverside line, 10 miles long, and Riverside-Corona line, 14 miles long. On these routes, long trains are operated at speeds of 60 to 70 m.p.h. The smaller current taken on this 1200-volt line produces less burning than on the 600-volt lines.

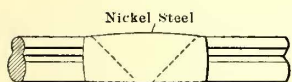
So far as we are able to determine, trolley wheels do not wear out any faster under steel than under copper. However, we believe that the chief reason for our success is that 75 per cent or more of the cars under this wire are equipped with pneumatic trolley bases which keep the tension absolutely constant to our standard of 35 lb.



Showing Two Ends Prepared for Welding



Nickel Steel Weld Half Completed



Nickel Steel Finished Weld

THREE STAGES IN WELDING STEEL CONTACT WIRE

Of course, the lower conductivity of steel makes necessary a larger number of feed-in points. On the San Bernardino line where we have 600,000 circ. mil of copper and the steel messenger in parallel with the trolley, the feed-ins are 450 ft. apart. Each tap consists of thirty-seven strands of No. 12 copper clamped to the messenger, carried down to the trolley wire and secured thereto with four-screw bronze ears.

We figured that on this line with any one substation out of service the maximum drop with copper would be to 500 volts and with steel to 422 volts. For direct suspension, we are gradually installing a tap at every other pole, that is, about 220 ft. apart.

Generally speaking, the maintenance on steel trolley is far below that of copper, since steel is much harder. The clips hold much better in the grooves, and the wire does not break if the trolley pole hits a span. We have not had a single break due to crystallization at the ends of ears, splices or switches. In most cases, steel wire that has been accidentally broken and "shorted" on the rail can usually be restrung, whereas copper wire would become annealed.

The linemen state that steel is easier to pull up and that it can be handled for double the length of copper without sagging. Steel wire does not cut out on the sides when out of alignment nor does it pound flat at clips as does copper. Practically all the wear is due to burning and arcing at acceleration points.

OXY-ACETYLENE METHOD OF WELDING STEEL WIRE

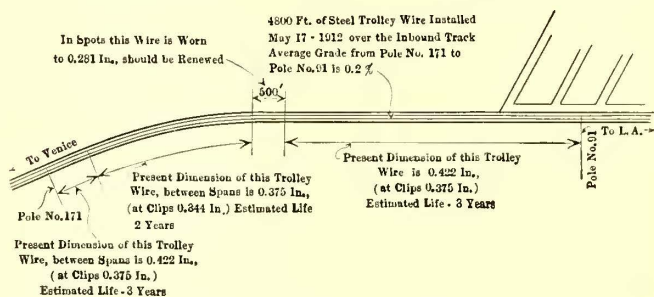
As the correct welding of splices in steel trolley wire is so important, the method developed on this system is worth description in some detail. The successive steps in making a weld are shown in the drawing above.

The equipment consists of a Prest-O-Lite outfit of gages, welding torch and tips. The torch is style H, and the size of the tip No. 5, this size being most satisfactory for our No. 0000 double-grooved wire. We first tried welding rods of Norway iron, but this led to crystallization. Our welding rods are now of 1/4-in. or 3/16-in. diameter nickel steel, which is also furnished by the Prest-O-Lite Company.

The three-part sketch shows the different stages of a weld. First the opposing ends of the wires to be joined are cut at an angle of 45 deg. and a space of 1/8 in. is left between them to provide for expansion. The flame of the torch, which is next applied, easily disposes of the galvanized scale which coats the wire.

As soon as both ends of the wire are at the melting point, the welding rod is introduced, great care being taken to keep both ends at about the same temperature. As the nickel steel is melted from the rod, it is fluxed with the steel trolley wire by means of the flame, starting at the bottom and building across and up. We found that we obtained a better application by running the welding steel around on the sides of the trolley wire; we also extended the natural top line of the wire for the sake of reinforcement but we do not regard this as essential.

As soon as all necessary metal has been added, the weld while still red hot is filed down to a smooth under-run and shaped up as much as desired. Then cold water is poured on the wire, beginning about 1 ft. on each side of the weld and running the heat toward the weld. Finally the weld is reached and wetted until perfectly cold. The average length of time to weld the wire in



RESULTS OF RECENT INSPECTION OF STEEL CONTACT WIRE ON VENICE SHORT LINE, PACIFIC ELECTRIC RAILWAY

the air varies from ten to fifteen minutes, according to accessibility.

BENDING, HEAT AND RESISTANCE TESTS

In conclusion, it may be of interest to mention some bending, heat and resistance tests which we made on June 24, 1912, shortly after receipt of the galvanized wire. The bending test showed that the wire could stand six right-angle bends in a vise before breaking on the seventh bend.

To find how much heat could be withstood and how much current could be carried, alternating current was passed through the wire until it was red hot. After cooling, the wire was found to be more flexible but still tough enough for use as trolley wire. It was given ten right-angle bends without breaking. Upon this direct current, averaging 750 amp., was passed through the wire for five minutes. At the end of this time it was heated to a cherry red and the galvanizing had burned off, but the wire was otherwise uninjured. This latter test proved that under normal service conditions the wire would not be damaged by high temperature. However, even if the galvanized coating was burned off by some heavy ground, this would not be so bad as the annealing of grounded copper. We calculated that the current-carrying capacity of this wire was just within the limits of the demand of our heaviest freight trains.

Our third test was to determine the resistance of the wire. Volt-ampere readings showed the resistance to be 0.000342 ohm per foot at 100 deg. Fahr., or 6.53 times the resistance of No. 0000 copper at 100 deg. Fahr. As the steel is 10.6 per cent lighter than copper, its resistance per unit of weight is 5.83 times that of copper.



Main Entrance to Essex Station

## New Source of Power for Public Service Railway

The Essex Power Plant of the Public Service Electric Company Furnishes an Excellent Example of the Latest Steam Power Plant Practice—In This Article the Routes of Fuel, Water, Air and Electricity Through the Plant Are Traced

THE Public Service Railway and the Public Service Railroad, the headquarters of which are at Newark, N. J., purchase their power from the Public Service Electric Company. The electric company has seventeen power houses well distributed over the State,

having a total capacity of about 200,000 kw. As the demand for railway and other power increased it has proved to be desirable to add a power plant which should embody the latest practice in order that energy may be generated at the lowest possible cost. This involved first a site which would have facilities for securing coal both by rail and water, an ample supply of circulating water for condensers, an area large enough for a substantial coal storage and a location from which power could be distributed all over the system with minimum loss. Such a site was found on the Passaic River

about 2½ miles east of the business center of Newark, and midway between it and the Marion power plant of the company. The Essex plant was designed for an ultimate capacity of about 200,000 kw., but the layout provided a gradual evolution on the unit system in such a way as to permit economical operation from the start. How this was done will appear from a study of the illustrations accompanying this article.

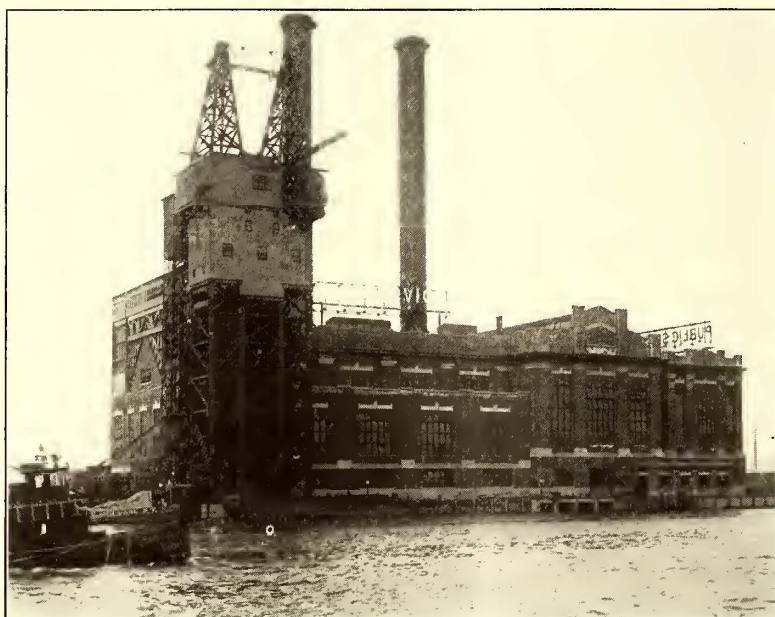
### GENERAL LAYOUT OF THE PLANT

The plant consists of four main sections; the turbine room, the boiler house, the switch house, and the coal bunkers and coal-handling equipment. The turbine room at present contains two 25,000-kva., 13,200-volt, 60-cycle, three-phase General Electric turbo-alternators. A 35,000-kw. unit of the same type is in process of installation, while a 50,000-kva. unit has been ordered for delivery in 1919. The turbine room is unusually spacious, as provision has been made for turbine units much larger than those now installed. All of the turbine auxiliaries are located below the main turbine room floor, which is thus left unusually free of obstructions.

The absence of switching apparatus in or adjacent to the turbine room also conduces to the general appearance of simplicity.

The boiler house is contiguous to the turbine room and is laid out on the unit system, with the firing aisles

at right angles to the axis of the turbine room. Each row of boilers contains four 1373 hp. (*i.e.*, 13,723 sq. ft. heating surface) cross-drum B. & W. boilers of the marine type. Under each is a sixteen-retort underfeed Sanford Riley stoker, the largest yet built. In the basement below the boiler floor are the forced-draft blowers, one for each boiler, the ash-handling apparatus, and the boiler auxiliaries. Above the boiler floor are the economizers of B. F. Sturtevant make, eight in number. These have each a heating surface of 7750 sq. ft. Two steel stacks are in place at present, having a



NEW PUBLIC SERVICE POWER PLANT—VIEW FROM PASSAIC RIVER SHOWING COAL-HANDLING STRUCTURE, BOILER HOUSE, TURBINE ROOM, SWITCH HOUSE AND SCREEN HOUSE

height of 250 ft. above the grate and an inside diameter of 16 ft.

The switch house contains six floors, and it is separated from the main building by a space 25 ft. wide. The two buildings are connected by a bridge. On the lowest floor are generator main oil switches with auxiliaries, lightning arresters, transformers and switching apparatus for the power-house 440-volt service, and a cable testing outfit. The next two floors above are principally occupied with reactance coils, storage batteries, and sundry switching apparatus. On the fourth floor are feeder and other oil switches and the electric kitchen, dining room and general offices. On the fifth floor are the group buses, more oil switches, conduits for the control circuits and more offices. The control room, with bench boards and instrument panels arranged on the radial plan, is on the top floor, as are also the offices of the load dispatcher and the station electrician. The generator buses with aluminum cell arresters are also on this floor.

At the northeast corner of the main building is the double coal tower, behind which is a coal bunker struc-

ture having V-shaped bunkers with axes set along the line of the boiler-room firing aisles. The double tower is 215 ft. high, and is equipped at present with one 600-hp. electrically-driven hoisting engine operating a 2-yd. clam-shell bucket at a hoisting speed of 1300 ft. per minute. The tower is complete for a double equipment of this kind and the second hoisting unit will be added in the near future. At the present time coal can be taken from a barge at the rate of 180 tons per hour and this rate can be increased by the use of a larger bucket, for operating which the equipment has ample capacity. From the tower the coal is transported to the bunkers on a Robins conveying belt.

With the general plan of the Essex plant in view, the routes of the several materials involved in its operation may readily be traced. These will be taken up in order as follows: Coal and ashes, from barge to dump; circulating water from the river and back again; the water steam circuit; air and flue gases from source to stack outlet, and finally the electrical circuits.

#### FROM BARGE TO ASH DUMP

As the coal is elevated from the barge it is dumped from the buckets into a hopper projecting from the side of the tower, clearly visible in the general view of the station, thence it falls by gravity into the crusher, and onto the belt conveyor already mentioned. The hoist is driven by an induction motor and the properties of the latter are used in forcing it to pump back power into the line when the bucket is descending. The main coal bunkers hold about 2000 tons and they are tapped into a 15-ton Robins weighing larry traveling in each firing aisle. The coal is weighed as it is drawn from the bunkers and the loss of weight is also noted as each boiler hopper is charged, thus furnishing a check on the coal consumption. Each hopper holds about 7 tons.

The stoker drive for each firing aisle consists of four 12-hp. four-speed motors, two of which drive jackstays, while two drive through Reeves conical variable-speed transmissions. The driving speed can be varied between 32 to 290 r.p.m., corresponding to coal feeds of 1600 and 15,000 lb. per boiler per hour.

From the furnaces the ashes are tapped into small cars running on an industrial railway below the boilers and hauled by storage-battery locomotives. For some time to come the ashes will be distributed in the vicinity of the plant, where the land lies quite low. It is planned to fill it in to a depth of 4 ft. so as to furnish a coal storage space well elevated above tidewater.

#### ESSEX POWER PLANT DATA

**Generating Capacity**—1917, 50,000 kw.; 1918, 85,000 kw.; 1920, 135,000 kw.; ultimate, 200,000 kw.

**Dimensions of plant as shown in general view:**  
Boiler House, 166 ft. x 116 ft., 106 ft. high.  
Turbine Room, 167 ft. x 90 ft., 113 ft. high.  
Switch House, 70 ft. x 117 ft., 95 ft. high.

**Boilers, eight in number**—13,723 sq. ft. of heating surface. Pressure 225 lb. per square inch, superheat 100 deg. to 150 deg.

**Furnaces**—Grate area, 200 sq. ft., ratio to h. s., 1:63½.  
Stokers, 16-retort, underfeed type, electrically driven.

**Economizers**—Eight in number, 7750 sq. ft. of heating surface, 56 per cent that of boilers.

**Generating and distributing voltage**—13,200.

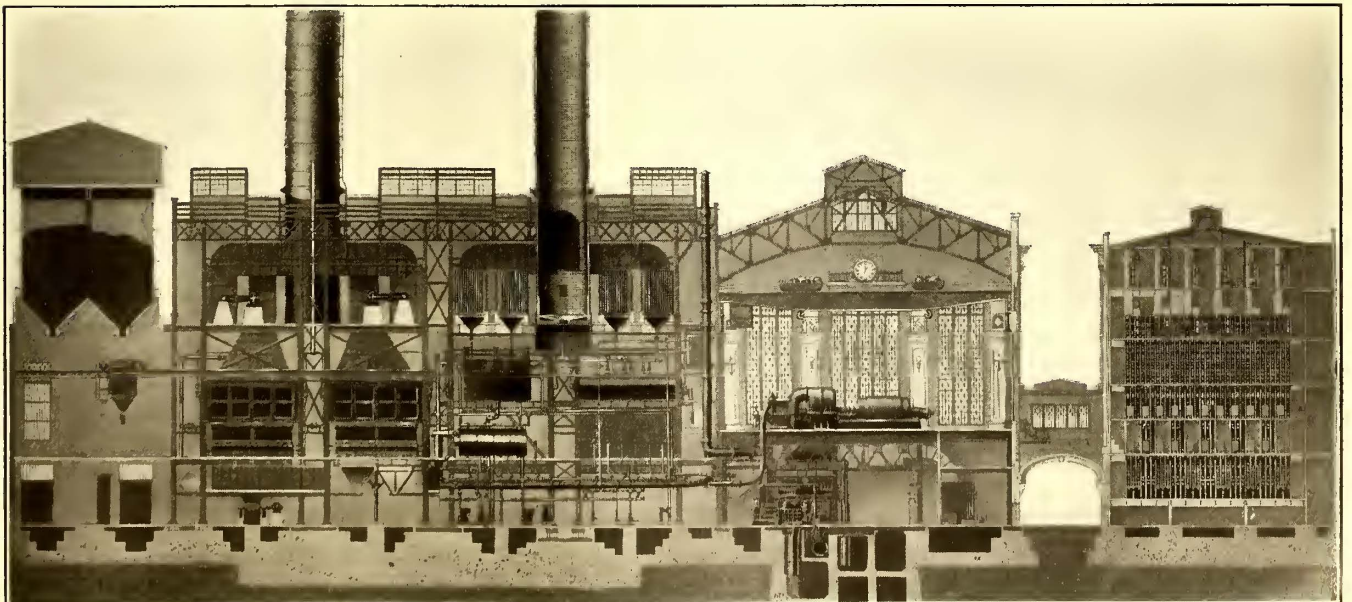
Eventually it is planned to utilize a considerable area for coal storage by means of a gantry crane. For the present a locomotive crane is being utilized to load and unload cars both for emergency coal supply from the adjacent railroad and for temporary storage.

#### ROUTE OF THE CIRCULATING WATER

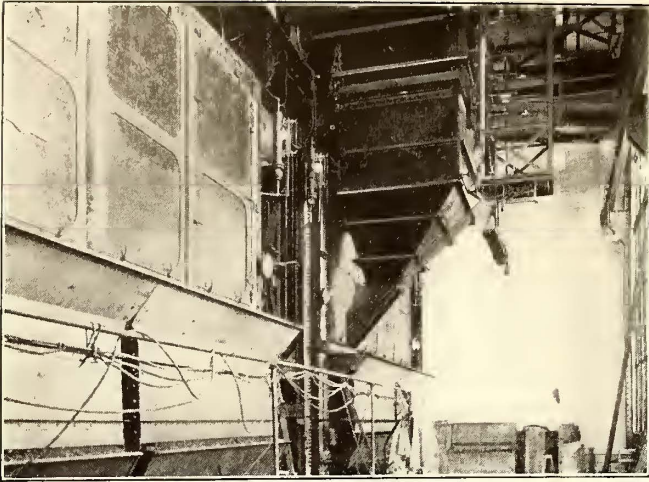
Circulating water for the condensers is taken in from the river through three intake tunnels each of cross-section 9 1/3 ft. x 8 ft. It passes through motor-driven revolving screens located in the screen house shown at the right in the general view, thence to the condensers through centrifugal pumps, each of 24,000 gal. per minute capacity, of which there are two for each unit, one motor driven and one turbine driven. Normally the turbine pump is operated but the electrically-driven pump is automatically added whenever the temperature of the discharge water rises above a given limit. Westinghouse surface condensers are hung directly below the turbines, rigidly connected thereto and supported on springs. Each of these contains 6434 1-in. tubes 12 ft. long, giving an area of 1.28 sq. ft. per kilowatt. The condensers are of the two-pass, radial-flow type. The discharge from the condensers passes out through two discharge tunnels 12½ ft. x 9 1/3 ft. in section which rest on top of the intake tunnels.

#### THE WATER STEAM CIRCUIT

From the storage tank where the condensate is collected and make-up water added the feed water first goes through two Cochrane open, metering, feed-water heaters, thence to the boiler pumps which it reaches at a temperature of about 164 deg. Fahr. The boiler feed pumps are turbine-driven and, by means of a Foster



NEW PUBLIC SERVICE POWER PLANT—SECTION THROUGH ENTIRE PLANT



NEW PUBLIC SERVICE POWER PLANT—CONSTRUCTION VIEW IN BOILER ROOM SHOWING WEIGHING LARRY



NEW PUBLIC SERVICE POWER PLANT—25,000-KVA. TURBO-GENERATORS, PRESENT EQUIPMENT OF TURBINE ROOM

regulator, a constant difference is maintained between the feed-water pressure and the steam pressure. A Copes feed-water regulator is also used to maintain the proper water level in each boiler. From the pumps the water passes through the economizers which raise its temperature to 244 deg. Fahr., at which temperature it is fed to the boilers.

From the boilers the steam flows to the turbines at 225 lb. per square inch pressure through headers and cross-connected steam lines, laid out to give as direct service from boilers to turbines as possible and yet to provide for emergency routes for the steam. The boiler superheaters raise the temperature from about 100 deg. superheat at normal load to 150 deg. at 300-per cent rating, to which they are designed to be forced.

From the condensers, in which a  $28\frac{3}{4}$ -in. vacuum is maintained, the condensate is removed by turbine-driven hotwell pumps which deliver it to large surge tanks through V-notch meters. The air in the condensers is removed by LeBlanc hurling air pumps, motor-driven, one for each unit. Each of these requires a 100-hp. motor.

#### ROUTE OF THE AIR AND OTHER GASES

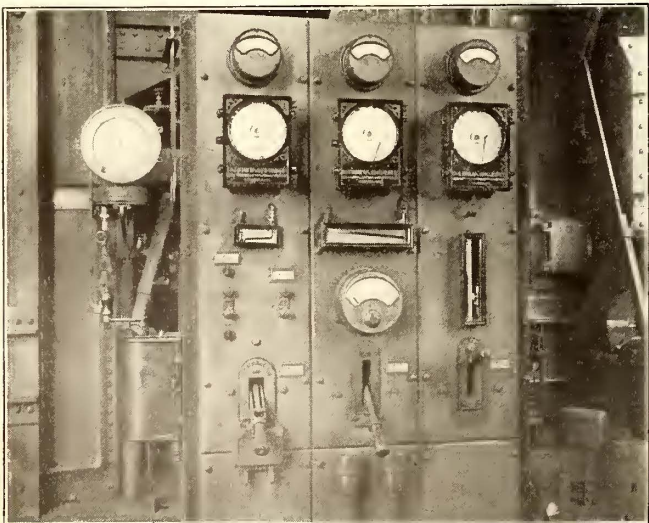
As the boiler air supply comes in part through the electric generators it will be necessary to trace this air from the point where it first enters the plant. Before passing to the generators all air goes through washers of the spray type built by the Spray Engineering Com-

pany, being drawn through these by the fans on the generator fields. On coming from the generators the air is directed into the stoker fan rooms where there is for each boiler a 150-hp. Sturtevant multivane fan, capable of delivering 60,000 cu. ft. of air per minute against a 7-in. water pressure. The air supply is controlled by a Mason regulator. While each boiler has its own fan, all of the fans in one row discharge into a common duct provided with dampers to permit adjustment of the fan capacity to the demand.

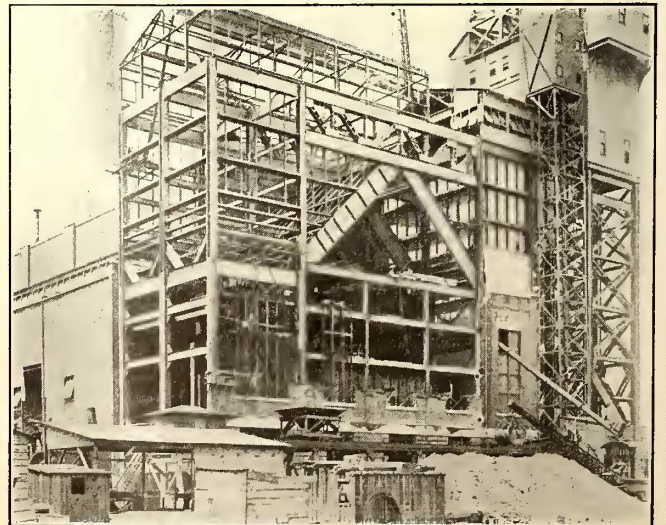
On leaving the boilers the gases may be directed to the stack by one of three routes. They may go direct to the stack, through the economizers to the stack, or through the economizers and the induced-draft fans to the stack. Dampers are provided to permit ready adjustment of the flue operating conditions to the demands of the load. The induced-draft fans, four in number, are each of 100,000 cu. ft. per minute capacity, against a 2-in. suction at the entrance to the economizers, requiring each a 100-hp. motor.

#### THE ELECTRICAL CIRCUITS

The electrical circuits in the plant can be considered in three general groups, one the 13,200-volt circuits from generator to feeder line, the second the low-voltage alternating-current circuits used for the power plant motors and lighting, and finally the direct-current circuits used for reserve excitation, control circuits, locomotive battery charging, etc.



NEW PUBLIC SERVICE POWER PLANT—CONTROL AND MEASURING APPARATUS FOR ONE BOILER

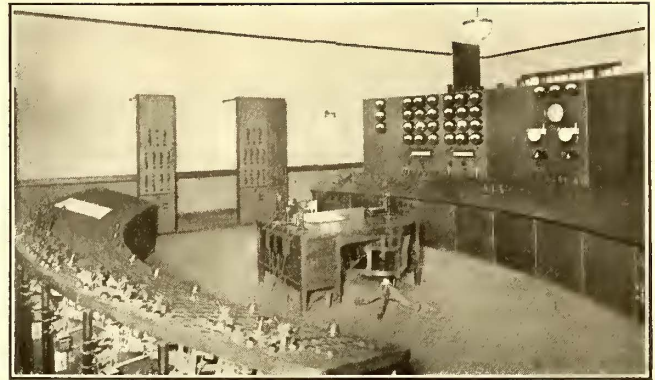


NEW PUBLIC SERVICE POWER PLANT—CONSTRUCTION VIEW SHOWING COAL BUNKER STEEL WORK

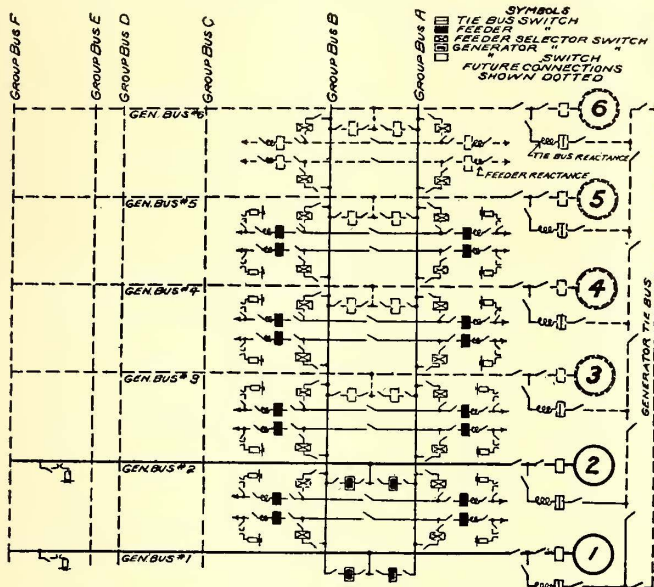


To begin with the generators, it should be noted first that each of these has a continuous volt-ampere capacity rating of 25,000 kva. and generates at 13,200 volts. The speed of these machines is 1800 r.p.m., and they are equipped each with a 100-kw., 250-volt direct-connected exciter.

The general arrangement of the electrical apparatus on the six floors of the switch house has already been



NEW PUBLIC SERVICE POWER PLANT—MAIN CONTROL BOARD ON SIXTH FLOOR OF SWITCH HOUSE



NEW PUBLIC SERVICE POWER PLANT—SIMPLIFIED DIAGRAM OF MAIN CIRCUITS

mentioned. The scheme of connection of this equipment is as shown in the accompanying electric circuit diagram, in which the important pieces of equipment are represented by conventional symbols. The switching equipment is laid out to give the maximum of flexibility, allowing for easy transfer of groups of feeders from one generator to another, the isolation of generators or groups of feeders, and the paralleling of generators and feeders, all with minimum risk to the plant through the effects of short-circuits.

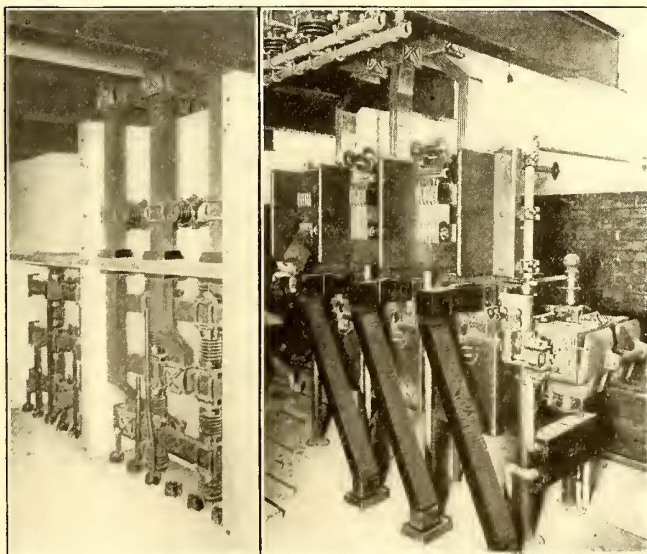
Eventually there will be six group buses with switches for connecting any one or more to any one or more generators, and there will be a looped generator tie bus for the purpose of paralleling the generators. For the present there will be but two group buses.

The route of the power from generators to feeders is this: Generator—generator switch—disconnects—

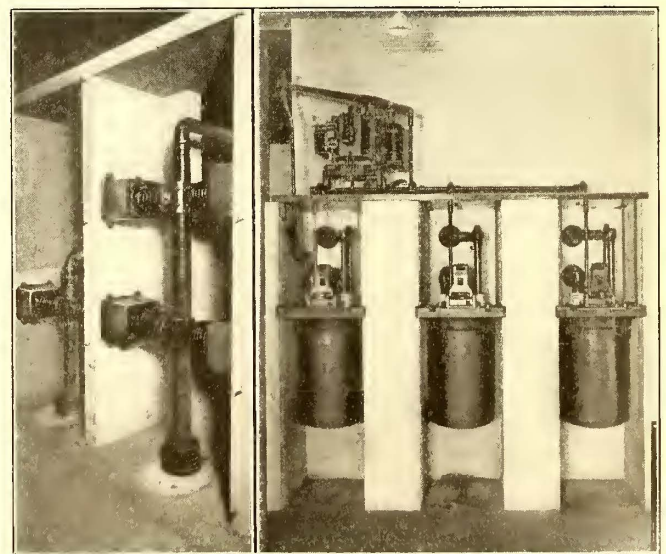
bus selector switch—group bus (through disconnects on each side of switch)—feeder selector switch—feeder switch—reactor—feeder line. Between the generators and the tie bus will eventually be the current-limiting reactors shown in the diagram which will be installed this year. Electrolytic lighting arresters, with horn gaps, are installed on all feeders and also on the generator buses.

Typical views of the switching and bus equipments are shown in the accompanying illustrations. The switches are solenoid operated. The generator selector switches are non-automatic, but the others are provided with relays respectively as follows: Generator main oil switches, reverse power relays operating on full load power reversal; tie-bus switches, inverse selective overload relays with high time setting, operating only in case a short-circuit is not opened by the feeder or feeder-selector oil switches; feeder-selector oil switches, time-element overload relays to operate only in the case of the failure of the feeder-oil switch; feeder-oil switch, time-element overload relays for radial feeders and special relays for tie feeders to other power plants. The high-voltage buses are of bare flat copper, and the generator and feeder selector leads are of copper tubing insulated with cambric and braided. The switches and buses are mounted in compartments of concrete brick, special attention being given to provide unusual mechanical strength.

The excitation of the generators is normally from the exciters mounted directly on their shafts. Auxiliary to this normal supply there is a 150-kw. motor-driven exciter which can be quickly substituted for the local excitation on any machine, and in addition an exciter



NEW PUBLIC SERVICE POWER PLANT—440-VOLT GROUP BUS AND CONNECTIONS—POWER TRANSFORMER OIL SWITCH



NEW PUBLIC SERVICE POWER PLANT—BRACED GENERATOR LEAD—THREE-PHASE FEEDER OIL SWITCH

storage battery is provided automatically to furnish excitation in emergency, while the spare exciter is being brought into commission.

HOUSE SERVICE POWER SUPPLY

In this plant the fullest possible use of electric power has been used for driving auxiliaries, most of which are operated by means of three-phase motors. This power is supplied through two 3000-kva. transformers, and a third will be added this year. The power circuits supply current at 440 volts. For lighting there are two 200-kva. single-phase transformers supplying current at 250 and 125 volts on the three-wire system.

“Safety Car” Operation

Importance, with One Operator, of Automatic Devices—Comparison of One-Man and Two-Man Service

AMONG the papers scheduled for presentation at the meeting of the Iowa Electric Railway Association on May 24-25 was one on “safety-car” (or one-man) operation, and the use of safety devices on such cars, by C. H. Beck of the Westinghouse Traction Brake Company. Owing to the abandonment of the convention, the facts given in the paper are released for publication by the association secretary and the author.

Mr. Beck said that automobile competition emphasized the necessity of the adoption for street railway transportation of lighter units, more frequent headway and a faster schedule. As an example of the possibilities of the light-weight safety car, the figures given in the accompanying table were presented. In this table line A is in operation, whereas line B is proposed for operation. The total car-hours per day were taken as representing 365 days of the year, because in many instances the extra service on Sunday equals the extra service on week days.

From this table it will be noted that the wages in the old service were 27 cents per hour and in the safety-car service 29 cents. The latter amount was a voluntary raise by the organization in question because of the economy effected and the desire to be fair with the operator, who contributes his share toward making such economy possible.

Present practice with the heavy cars now in use establishes 9 m.p.h. average speed as a first-class condition, and this is about the maximum that can be obtained, but with safety-car operation on a single track this figure can be raised to 10 m.p.h. with cars under as low a headway as five minutes. With switches and meeting points farther apart, the average scheduled speed could be still higher. On double-track lines, with safety-car operation, an average scheduled speed of 12 m.p.h. is easily maintained. In fact, one company, with experience with cars of this type, is proposing to operate at an average speed of 15 m.p.h. in a city where a great portion of the line is through what is called the “business district.”

It should be recalled that this increase in average scheduled speed is not secured by an increase in maximum running speed or free running speed but through efficient performance of all the individual factors which pertain to car operation and movement so that the factor of safety is not decreased.

It might be considered remarkable that service heretofore performed by two men can be combined and placed under the direction of a single person and still be accomplished in less time and with greater accuracy than before. This has been well demonstrated, however, in actual practice where the car operator is provided with all labor-saving devices demonstrated as practica-

	LINE A 3.32 Miles Long. 4000 to 5000 Passengers per Day. Safety Cars Now in Operation		LINE B 5 Miles Long. 8000 to 8500 passengers per Day. Safety Cars Proposed for Operation		
	Old Cars 18-Ton, 40-Passenger, Double Truck Cars	Safety Cars 6-Ton, 29-Passenger, Single Truck Cars	Old Cars 15-Ton, 26-Passenger, Single Truck Cars	Safety Cars 5-Ton, 30-Passenger, Single-Truck Cars, to Duplicate Old Service	Safety Cars 5-Ton, 30-Passenger, Single-Truck Cars, to Improve Old Service
Number regular cars in service...	3	4	9	9	10
Number extra cars in service...	3	5	2	2	5
Total.....	6	9	11	11	15
Minutes headway, regular cars...	15	10	7	7	6.3
Minutes headway, including extra cars.....	7½	5	5.7	5.7	4.2
Car-hours, regular cars.....	54	74	154	154	164
Car-hours, extra cars.....	21	34	6	6	30
Total.....	75	108	160	160	194
Car-miles, regular cars.....	485	698	1470	1470	1750
Car-miles, extra cars.....	179	299	55.86	55.86	190
Total.....	664	997	1525.86	1525.86	1940
Average kw.-hr. per car-mile.....	2.41	.99	2	.7	.7
Power cost per day at 1 cent per kw.-hr.....	\$16.00	\$9.87	\$30.51	\$10.68	\$13.58
Labor cost per day at 27 cents per hour, per man.....	\$40.50	.....	\$86.40	.....	.....
Labor cost per day at 29 cents per hour, per man.....	.....	\$31.32	.....	\$46.40	\$56.26
Car maintenance, 1.5 cents per car-mile.....	\$9.96	.....	.....	.....	.....
Car maintenance, 1 cent per car-mile.....	.....	.....	\$15.25	.....	.....
Car maintenance, ¾ cent per car-mile.....	.....	\$7.48	.....	\$11.44	\$14.55
Total labor, power and maintenance per day.....	\$66.46	\$48.67	\$132.16	\$68.52	\$84.39
Total labor, power and maintenance per year.....	\$24,257.90	\$17,764.55	\$48,238.40	\$25,009.80	\$30,802.35
Saving per year.....	.....	\$6,493.35	.....	\$23,228.60	\$17,436.05

ble. The operation of these devices involves the use of compressed air, as that is the most reliable and flexible medium obtainable for the performance of the various operations. With the old type of car and an average scheduled speed of 9 m.p.h., and average number of stops of six per mile, fifty-four stops are required per hour or practically one a minute. This means that the motorman is literally tied to the hand brake lever and has no opportunity to develop or expand his mental faculties. If this burden is removed a means for greater mental efficiency on the part of the car operator results.

From the viewpoint of safety, the apparatus should provide that an air-brake application occurs unless the operator holds his hand on the controller handle or performs some other conscious act. This has sometimes been referred to as a dead man's feature in the controller handle, but its use with safety-car equipment extends beyond the uses in which it was previously employed. With the modern pneumatic equipment, the brakes are applied, the sand is distributed and the doors and steps manipulated by one operation, or an emergency stop may be made in which all of these operations occur under the conditions consistent with emergency requirements, the doors and steps being either opened or permitted to remain closed but unlocked, so they may be opened by hand, as desired. These operations establish the safety car as a safer operating unit than any car heretofore in service on city lines, notwithstanding the fact that it is controlled by a single person. Time also is saved.

The foregoing remarks concern particularly the railway company and its patrons. There is, however, a more important consideration in that the entire nation is engaged in the conservation of energy and resources. The difficulty of securing men for car operation is becoming exceedingly great from day to day, and unquestionably will remain so. Moreover, the demand for men in the service of the nation becomes greater, so that the movement in favor of the safety car can properly be considered a patriotic and economic necessity.

# Up-State New York Lines Need Relief

Commission Data Show That Companies Must Curtail Quantity and Quality of Service or Secure Higher Rate of Fare to Avoid Financial Disaster

By THOMAS CONWAY, JR., Ph. D.

Professor of Finance, University of Pennsylvania, Philadelphia, Pa.

EVERYONE who has made a close study of the financial results of operation of the electric railways has realized for a number of years that a radical readjustment of fares was inevitable. Many have thought that the railways have unduly delayed an effort to secure relief from the rising "cost of living" and the decreasing purchasing power of the nickel. Whatever may have been the hopes and expectations of railway managers concerning better things in the future, the outbreak of the European War and the active participation of the United States in the conflict have forced their hands.

Electric railways are at the crossroads. They must either radically curtail the quantity and the quality of service which has been rendered to the public, or secure a higher rate of fare, if they hope to avoid financial disaster. The pending and expected applications before the New York Public Service Commissions, therefore, are of the greatest importance not only to the railways directly involved, but to the entire industry. They mark the beginning of a general movement, the outcome of which will determine the future of the electric railway industry and the status of its securities.

This article will not deal with the problem of the electric railways in New York City. To demonstrate the financial needs of these companies and the inadequacy of the present rate of fare should be comparatively easy. Their affairs have been subject to continuous supervision and inquiry by the First District Commission, while most of the properties have been recently valued by the commission in connection with reorganization matters.

## EARNINGS OF THE UP-STATE PROPERTIES

The up-State electric railways approach the problem under different circumstances. Practically none of these companies has been the subject of recent valuations. They operate under widely dissimilar circumstances, and the financial results of operation are not uniform. The suggestion, therefore, has come from some quarters that there is no general principle involved, and that each company must not only make its own application for specific relief but must establish that there is an unusual emergency demanding immediate action. While there is no doubt that the form of relief to be granted to the several up-State companies will differ to a great extent with individual properties, yet it is important at this stage to get clearly in mind that there is an emergency affecting all properties alike. This emergency warrants united action by the electric railways, and generous and prompt treatment by the Public Service Commission.

The financial results of operation of the up-State properties, which is the subject of this study, have been growing continuously less favorable throughout recent years. The results for each year from June 30, 1911, to June 30, 1915, inclusive, for which official statistics are available in the published reports of the Public Service Commission of the Second District, are as shown in the accompanying table.

Although gross operating revenue increased during

these five years more than \$4,000,000, net operating income, or the amount remaining after operating expenses and taxes had been deducted, increased only \$100,000. As a result of a decline in non-operating revenue, the combined gross income of the up-State properties showed an actual decrease during this period. To earn this gross income required a continuously increasing investment which, it must be remembered, was made only with the specific consent and approval of the Public Service Commission in each and every case. Interest charges increased almost \$3,000,000, while "other deductions," or rentals and interest on the floating debt, increased almost 50 per cent in these five years. The result was a most alarming decrease in net income from \$4,294,000 in 1911 to \$933,000 in 1915. If the figures for all the companies for the year 1916 were at hand the results would probably be even less favorable than those for 1915.

## DECLINE IN MARGIN OF SAFETY PROTECTING BONDS

The decreases in net income have been most disquieting to the security holder. The margin of safety for the bonds of the up-State electric railways, figured on the conventional method—that is to say, the ratio of net income remaining after satisfying interest requirements and rentals, to gross income—has shown an alarming decline, as follows: 1911, 41.1 per cent; 1912, 39.3 per cent; 1913, 19.9 per cent; 1914, 16.7 per cent, and 1915, 9.1 per cent.

As a rough average, a margin of safety of 40 per cent (assuming proper allowance has been made for the maintenance of property) is a fair showing. When this margin of safety steadily and rapidly declines, until the gross income is less than 10 per cent in excess of fixed charges, the corporations may, without exaggeration, be characterized as in a serious financial plight. What the showing for 1916 will be, when the commission publishes its completed figures, must, to a considerable extent, be a matter of surmise. That it will be not much, if any, more favorable than for 1915 is almost certain. The showing for the year ending June 30, 1917, must be even less favorable.

## LARGER REVENUES OR POORER SERVICE

Even though the entrance of America into the European struggle did not make practically certain still

FINANCIAL RESULTS OF OPERATION OF UP-STATE PROPERTIES, JUNE 30, 1911, TO JUNE 30, 1915

	1911	1912	1913	1914	1915
Railway operating revenue...	\$27,041	\$28,010	\$30,234	\$32,062	\$31,127
Railway operating expenses..	16,796	17,827	19,456	20,741	20,228
Net revenue—railway operations .....	\$10,245	\$10,183	\$10,778	\$11,321	\$10,899
Railway tax accruals.....	1,442	1,535	1,784	1,961	1,991
Railway operating income...	\$8,804	\$8,648	\$8,993	\$9,360	\$8,909
Other operations, net revenue..	642	660	683	735	709
Non-operating income .....	981	1,288	608	636	649
Gross income .....	\$10,427	\$10,597	\$10,284	\$10,731	\$10,267
Interest charges .....	\$5,293	\$5,441	\$7,009	\$7,656	\$8,027
Other deductions .....	840	981	1,220	1,338	1,296
Net income .....	\$4,294	\$4,174	\$2,055	\$1,737	\$933

Note.—The last three figures are omitted in all columns.

higher prices, and consequently less favorable operating results, there can be no question that the electric railway officials would be recreant in their duty to the security holders and to the public were they not, vigorously and persistently, to seek relief from the conditions above disclosed. Under the conditions now confronting them, they have no alternative. They are well within the truth when they state that they must either secure a higher return or, to live under present tariffs, must make a choice, in a large number of cases, between curtailing service or facing bankruptcy.

#### DECLINING RETURN UPON CAPITALIZATION

The average rate of return of the up-State electric railways upon their total capitalization during each of the five years from 1911 to 1915 inclusive compares as follows: 1911, 4.87 per cent; 1912, 4.91 per cent; 1913, 4.57 per cent; 1914, 4.28 per cent, and 1915, 4.01 per cent.

If a comparison is made upon the basis of the percentage which net income—available for the payment of dividends—after the payment of interest charges, rentals and other similar deductions, bears to the total capital stock outstanding, the showing is even more unfavorable: 1911, 3.44 per cent; 1912, 3.33 per cent; 1913, 1.75 per cent; 1914, 1.45 per cent, and 1915, 0.77 per cent.

The Supreme Court of the United States has on many occasions affirmed the right of a public utility to earn a reasonable rate of return upon the fair value of its property. Surely it cannot be contended that the above average rate of return is *prima facie* adequate. Of course, the opponents of fare increases will argue that there is no assurance that the value of the up-State properties is equal to their capitalization and that a considerable part of the capital stock is not represented by assets. It must be emphasized, however, that there is no proof of the gross overcapitalization of these companies, and that, on the contrary, there is much evidence to substantiate the existence of original value behind a good proportion of the outstanding capital stock.

It is important in this connection to note that the entire increase in capitalization of the up-State companies in the five years covered in the foregoing comparison has been in the nature of funded debt. The comparative amount of stocks and bonds outstanding in each year and the proportion which the funded debt bears to the total capitalization is as follows:

Year	Total Funded Debt	Total Capital Stock	Percentage of Funded Debt to Total Capitalization
1911	\$89,197,100	\$124,741,975	41
1912	90,723,100	125,216,742	42
1913	107,622,100	117,058,230	47
1914	131,220,025	119,517,230	52
1915	135,117,990	120,326,085	52
Increase—			Per cent increase or decrease
1911-15	45,920,890		51
Decrease—			
1911-15		4,415,890	4

#### GROWING DISPROPORTION OF BONDED DEBT

Experience points to the necessity of preserving a proper relationship between bonded debt and capital stock. The bondholder is a creditor who, in return for a low interest rate, demands protection against the risks incident to the operation of the business. The stockholder assumes the risk in expectation of a higher rate of return. One of the most disquieting features of the recent history of electric railways in the Second District of New York—in fact, throughout the country—has been the steady increase in the proportion of the total capitalization represented by funded debt. The same tendency has existed for some years in the case

of the railroads. It means an inevitable weakening of the security for the bondholders, for the amount of capital invested by the stockholders and the income from this capital, which furnishes protection to the bondholders, is steadily dwindling. It is a matter of common knowledge to public utility operators and investment bankers that the reason for the sale of bonds and the disuse of stock as a method of financing has been that stock could only be sold upon terms which were so disadvantageous to the company as to commend them neither to the corporation nor to the public service commission.

This movement cannot continue indefinitely, even if the rate of return upon each dollar of capital invested remained as favorable as formerly. With the declining rate of return, the time has come when the electric railways, with few exceptions, find that they are able to sell bonds upon continually less favorable terms. The most serious aspect of the entire financial problem to the public is the inability of the electric railway to command new capital, which means the inability of these utilities to provide additional cars, to extend tracks as the cities expand, or in other ways to keep pace with the country's progress.

#### HOW LABOR COSTS HAVE INCREASED

It is not the purpose of this study to dwell at length upon the unfavorable general conditions which have brought about the financial plight of electric railways, not only in up-State New York but throughout the country. Every element of operating cost has shown a steady and alarming increase. The census of 1912 showed that 63 per cent of the total operating expenses of the electric railways of the country represented payments for labor. Substantially the above proportion is represented by the labor bill of the railways in the Second District.

The reports of the several companies to the up-State commission enable one to measure the extent of the increase in labor costs during the last few years. Most of the companies in reporting wages, prior to the year ended June 30, 1909, based their figures upon the monthly compensation paid employees. The decreasing length of the working day and the consequent necessity for a larger number of men to handle the same volume of work made a comparison upon this basis very untrustworthy. With the year 1909, therefore, the majority of companies began to report wages upon an hourly basis. If the wages for motormen and conductors of those up-State companies which reported both for the years 1909 and 1915 are compared, the extent to which this important element in the cost of operation has increased can be seen. A similar comparison might be made for other classes of electric railway employees, but the results would be substantially the same as that shown for the platform men in the table on page 1047.

The data in this table, which covers considerably more than half of the total companies operating within the Second District (all of those reporting such data for these years), are worthy of study. Only three out of the thirty-three companies listed have avoided advancing wages of motormen and conductors. Each of these companies was paying, however, relatively high wages in 1909. Four companies have advanced wages in the seven years ranging from 1 per cent to 10 per cent; seven have advanced wages from 11 per cent to 15 per cent; eight from 16 per cent to 20 per cent; three from 21 per cent to 25 per cent, while eight companies have granted advances exceeding 25 per cent of the former rates.

Official statistics are not available concerning the increases in the costs of various classes of materials

AVERAGE HOURLY WAGES OF CONDUCTORS AND MOTORMEN

Name of Company	Motormen			Conductors		
	1909	1915	% Inc.	1909	1915	% Inc.
International Ry. ....	\$0.230	\$0.291	26	\$0.230	\$0.256	11
Schenectady Ry. ....	.244	.287	18	.239	.287	20
Buffalo & Lake Erie Trac. Co. ....	.187	.272	45	.159	.268	68
Hudson Valley Ry. ....	.220	.280	27	.220	.280	27
Yonkers R. R. ....	.226	.267	18	.228	.263	15
Westchester Elec. Ry. ....	.230	.268	16	.226	.266	17
Auburn & Syracuse Elec. R. R. ....	.205	.271	32	.205	.267	30
Western N. Y. & Penn. Trac. Co. ....	.180	.210	17	.180	.200	11
N. Y. & Stamford Ry. ....	.223	.267	20	.217	.257	18
Elmira Water, Light & R. R. Co. ....	.192	.211	10	.180	.201	17
Orange Co. Traction Co. ....	.197	.230	17	.197	.230	17
Niagara Gorge R. R. ....	..	.246	..	.200	.251	25
Kingston Consolidated R. R. ....	.209	.233	12	.203	.226	11
Syracuse & Suburban R.R. ....	.192	.250	30	.183	.250	36
Cortland County Trac. Co. ....	.170	.190	12	.167	.190	14
Peekskill Lighting & R. R. Co. ....	.186	.203	9	.186	.203	9
Elmira & Seneca Lake Trac. Co. ....	.189	.223	18	.186	.217	17
Buffalo Southern Railway	.190	.250	31	.190	.250	31
Wallkill Transit Co. ....	.200	.215	8	.200	.217	8
Corning & Painted Post St. Ry. ....	.189	.220	16	.187	.220	16
Syracuse & South Bay Elec. R. R. ....	.227	.285	25	.222	.283	27
Buffalo & Williamsville Elec. Ry. ....	.200	.206	3	.200	.206	3
Ogdensburg St. Ry. ....	.155	.168	8	.154	.168	8
Troy & New England Ry. ....	.200	.239	19	.200	.238	19
Eastern New York R. R. ....	.202	.221	9	.200	.200	..
Huntington R. R. ....	.180	.228	26	.170	.214	25
Hudson River & Eastern Trac. Co. ....	.200	.200	..	.200	.200	..
Glen Cove R. R. ....	.180	.227	26	.170	.214	25
Buffalo & Depew Ry. ....	.150	.200	33	.150	.200	33
Rochester & Manitou R.R. ....	.250	.250	..	.250	.250	..
Northport Traction Co. ....	.180	.212	18	.170	.195	15
Putnam & Westchester Trac. Co. ....	.187	.209	12	.187	.209	12
Adirondacks Lakes Trac. Co. ....	.210	.280	33	.210	.280	33

which are used by electric railways. It is a matter of common knowledge, however, that there have been large increases in the cost of coal, copper, steel, crossties and the other materials extensively used by such properties. The increases of the prices of these materials has been particularly great within the last few months and is largely responsible for the present very acute situation.

RELIEF SHOULD BE PROMPTLY GRANTED

The advances in wages have been due to conditions over which the electric railways had no control. There is no assurance that the present scale of wages will represent the high point. In fact, the rapidly mounting cost of living points strongly to the possibility of further increases, involving a proportionate increase in almost two-thirds of the total operating expenses of the average electric railway. It is the duty of the electric railway to retain a skillful, experienced working force, and this can only be done by paying the wages which such employees can secure in other industries.

It is largely because operating expenses will greatly increase in the immediate future that the electric railways are now asking for emergency relief. Such relief should be promptly granted. Valuations will require a period of several years, particularly in view of the fact that practically all of the properties must be valued at the same time. If years elapse before relief is granted, the credit of the electric railways will be destroyed or seriously impaired. It should be kept in mind that the public service commissions exist not only for the protection of the traveling public, but also for the protection of the investor in public utilities. The duty of the commission both to the rider and to the investor clearly points to the need for specific action without delay.

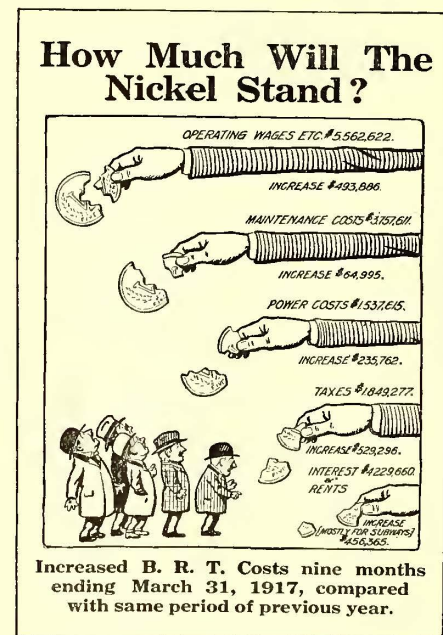
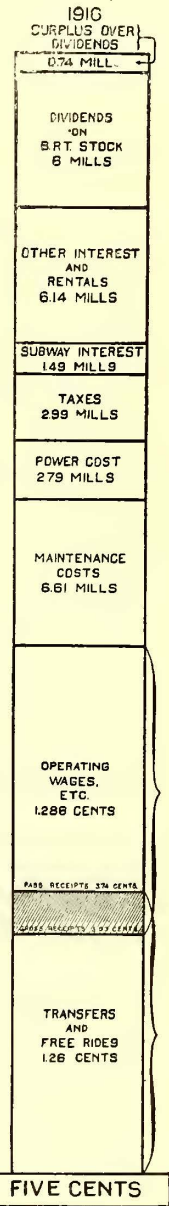
Alderman Henry D. Capitain, chairman of the local transportation committee of the Chicago City Council, has proposed that \$5,000,000 of the \$21,000,000 Chicago traction fund be used to purchase Liberty bonds. This was referred to the finance committee.

New York Fare Hearings Postponed

City Two-Cent Transfer Question to Be Taken Up June 18—Examples of B. R. T. Publicity

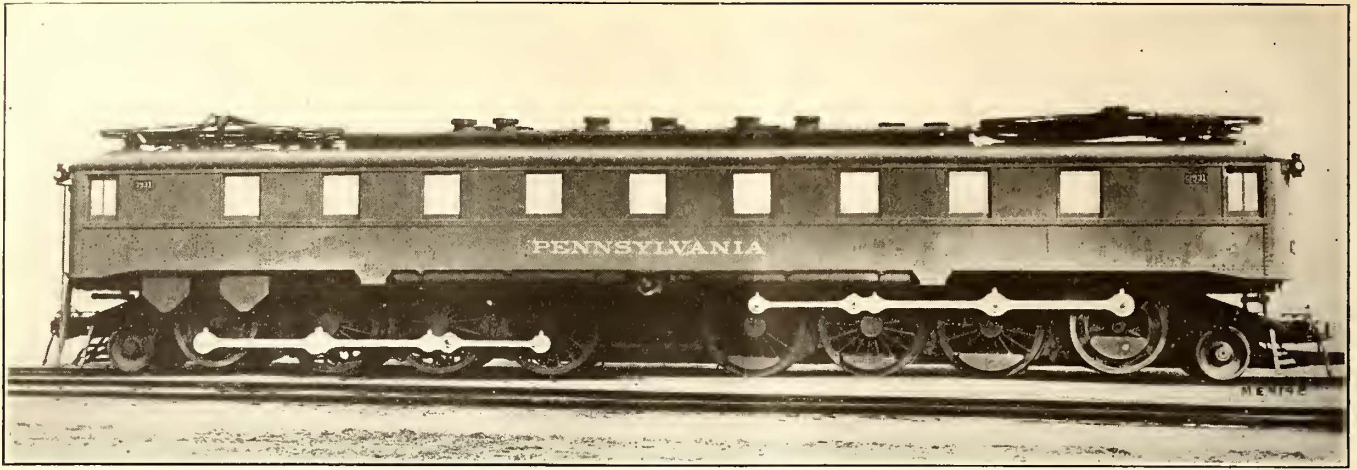
At the request of counsel the hearings upon the applications of street railway lines in New York City for financial relief were postponed from June 6 to June 18. From the appearances noted, it is evident that the companies' plea will meet with much opposition on the part of the city, civic organizations and labor unions. It is expected that each application will be taken up in turn, the Third Avenue Railway, the New York Railways and the Brooklyn Rapid Transit Company being the first three companies appearing. These railways, as before announced, have asked for a 2-cent transfer charge. The New York & Queens County Railway and the Second Avenue Railroad, whose applications were for general relief, have been directed to amend them to specify the form of relief desired.

In extending its publicity work to show the need of increased revenues, the Brooklyn Rapid Transit Company has been issuing car pamphlets discussing various phases of the situation. In one, entitled "Tearing the Nickel Apart," the illustration from which is reproduced herewith, the company discusses the various increased costs of operation shown. In another, entitled "How the Nickel Shrinks," the company used the accompanying illustration to show an analysis of receipts and expenditures per passenger in 1916. Still other recent pamphlets have been one on "Credit," showing how improvements depend on credit and credit on profits, and one on "Dollars per Minute," giving various transportation costs on a minute basis.



ILLUSTRATIONS FROM B. R. T. CAR PAMPHLETS

The "Credit" pamphlet gives the following essentials of a first-class street railway: Honest financing; high-grade construction and equipment; efficient and courteous operators; satisfactory volume of business; ample margin of profit; well-established credit, and liberal policy toward community needs.



PENNSYLVANIA LOCOMOTIVE—NEWLY COMPLETED UNIT DESIGNED FOR FREIGHT SERVICE OVER THE ALLEGHENY MOUNTAINS

## Novel Locomotive for the Pennsylvania

This Latest Type of Electric Locomotive, Which Has Been Built by the Pennsylvania Railroad for Trial Service, Has a Twin-Motor, Spring-Geared, Jack-Shaft Drive with Side Rods Coupled to Three Pairs of Driving Wheels for Each of Two Articulated Trucks

**W**HAT promises to mark an important step in the application of electric motive power to steam railroad service appears in the completion of a new type of electric locomotive for trial service on the Pennsylvania Railroad. The new machine, which was built at the railroad company's Altoona shops, and was electrically equipped by the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa., has been designed for hauling the heavy freight traffic over the Allegheny Mountains between Altoona and Johnstown, Pa. This run covers a distance of about 37 miles, including the famous Horse Shoe Curve, and the gradients are extremely heavy, the maximum being a 12-mile stretch at 2 per cent. The freight traffic over the division averages about 300,000 tons a day.

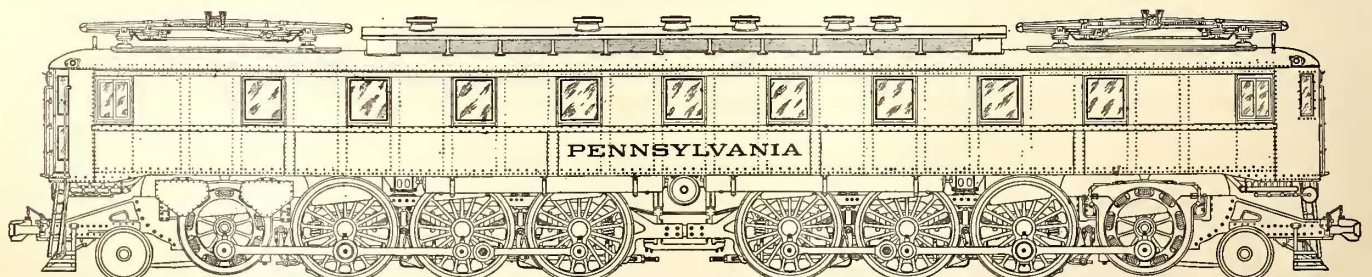
Opportunity for service trials on the Pennsylvania Lines exists on the Philadelphia-Paoli suburban division, which was electrified about two years ago at 11,000 volts single-phase, these being the power characteristics of the new locomotive. However, as this suburban division offers only limited chances for service tests on heavy grades and with heavy train loads, the engine possibly may be transferred later to the Bluefield Division of the Norfolk & Western Railroad for further trial. The latter road has, on its electrified division, conditions similar in many respects to those that will be encountered when the locomotive goes finally into regular service on the Pennsylvania Railroad's Altoona Division, that is to say, heavy freight traffic and steep grades. It should be noted here, however, that the Altoona Division has not yet been electrically equipped,

the proposed conversion having been indefinitely postponed on account of conditions arising from the war.

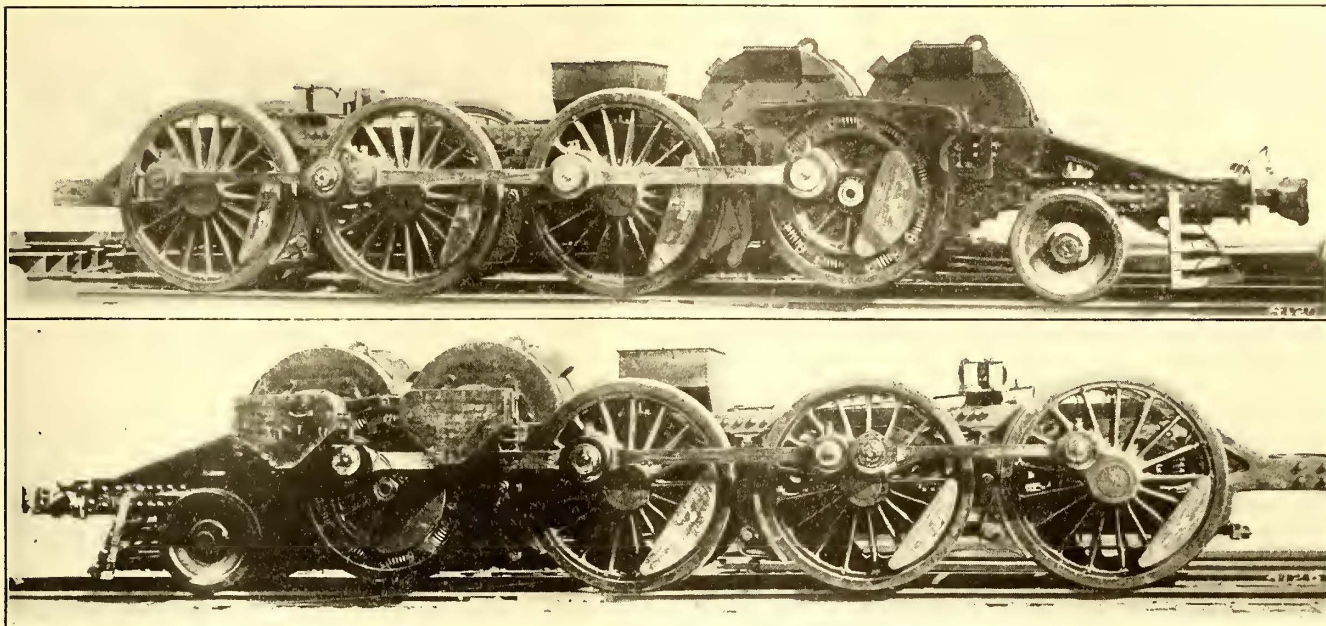
Electrically, the new engine is quite similar to the Baldwin-Westinghouse electric locomotives used on the Norfolk & Western Railroad. Energy is derived from an 11,000-volt, single-phase, 25-cycle overhead contact system through pantograph collectors. In the locomotive, the power is changed from single-phase, by means of a phase converter, to the three-phase form, and then is fed to induction motors of the slip-ring type.

There are four motors, each with a rating of 1200 hp., giving the locomotive a rating of 4800 hp. Two motors are mounted on each truck frame and they are geared to a jack shaft from which the three pairs of driving wheels are driven by connecting rods. Springs which are provided in the gears of these jack shafts are so adjusted as to give the effect of a solid gear up to a tractive effort equivalent to 25 per cent of the weight on drivers, thus producing the solid-gear effect under ordinary operating conditions. As shown in the accompanying illustrations, these spring gears, except for their great size, are of the standard type. However, the teeth are cut to a rather flat spiral, and as the gears on each end of the motor and jack shaft are cut right-hand and left-hand respectively the combined effect is that of herring-bone gearing.

A feature of the motor design, which has been planned to give the greatest possible core length for the armature, is the use of a hollow armature shaft through which leads are extended to collector rings at one end of the shaft outside of the pinions. Thus the full length



PENNSYLVANIA LOCOMOTIVE—ELEVATION SHOWING ARRANGEMENT OF JACKSHAFTS AND DRIVERS



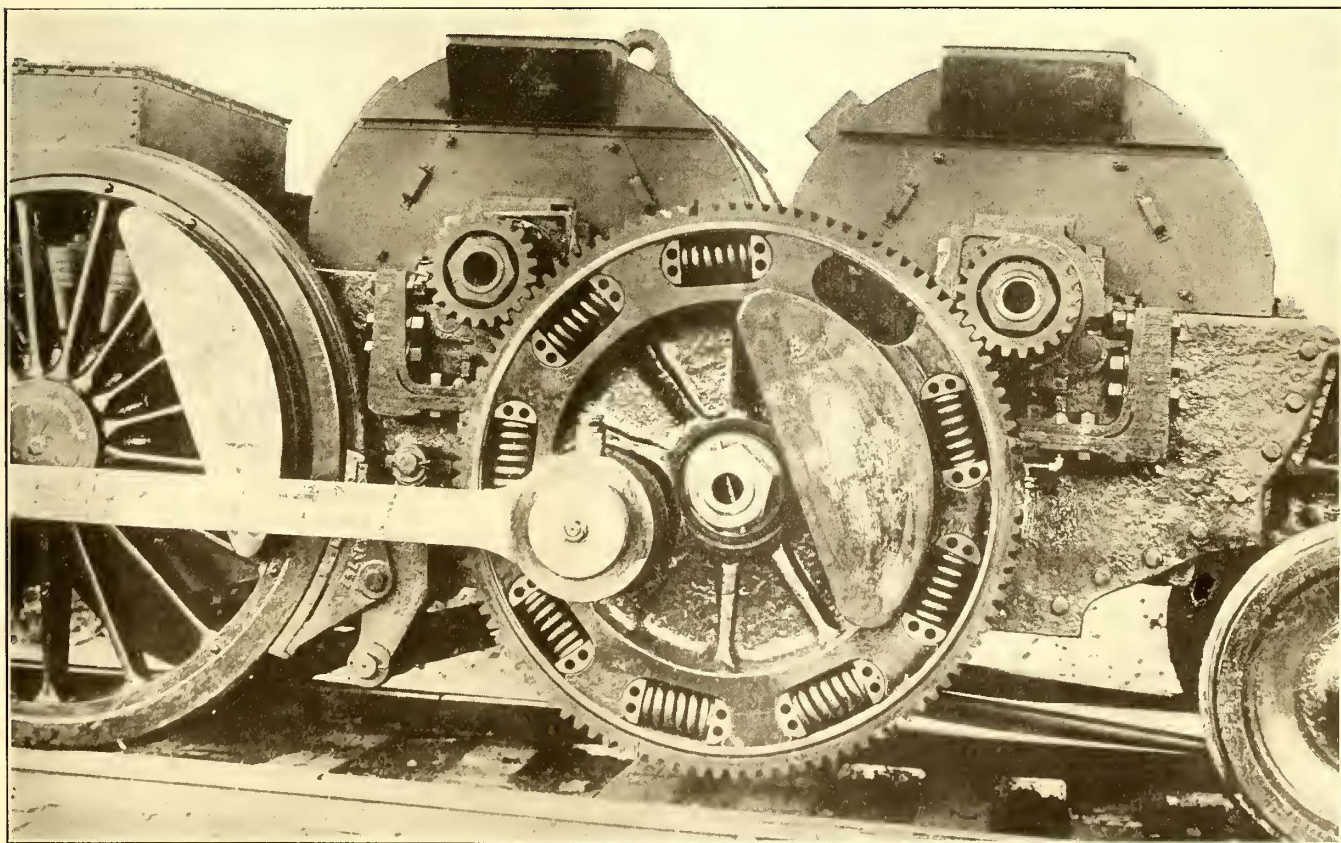
PENNSYLVANIA LOCOMOTIVE—VIEWS OF RIGHT AND LEFT SIDES OF HALF UNIT WITH CAB REMOVED

between clearance lines is utilized in the motor construction and the cost and weight of the motor are minimized.

There is provided only one normal operating speed, this being 20.6 m.p.h., obtained with the motors in parallel. This speed is the maximum that is considered safe for the heavy trains that these locomotives will be required to handle on the grades of the Altoona Division. A lower speed of 10.5 miles per hour may be obtained by connecting the motors on the same truck in "cascade," whereby the rotor windings of the two motors are coupled together with one motor's stator winding connected to the line and the other motor's stator wind-

ing short-circuited. This speed will be used only around yards and for other protracted slow movements, since cascade operation involves a low power factor. Intermediate speeds between zero and the maximum can be obtained by means of a water-rheostat control system similar to that in the Norfolk & Western locomotives, which permits a very close regulation of the tractive effort developed by the locomotive during acceleration.

Two of these engines, one pushing and one pulling, will be able to haul a 3900-ton train at 20.6 m.p.h. up the 12-mile grade of 2 per cent from Altoona to Gallitzin, and a 6300-ton train east bound up the 1 per cent grade from Johnstown to Gallitzin, a distance of 25



PENNSYLVANIA RAILROAD—VIEW SHOWING DETAILS OF SPRING GEAR AND MOTORS WITH HOLLOW SHAFTS FOR LEADS

miles. The tractive effort developed at the maximum speed is 87,200 lb.

The running gear of the locomotive is quite similar in general appearance to that used for steam locomotives, the gear wheels being connected by side rods to the three pairs of driving wheels on each truck. For an electric locomotive, however, the location of the motors is unprecedented, since they are placed ahead of the three pairs of drivers, or between the drivers and the guiding-truck wheels. The spring rigging on each truck is of the three-point-suspension type, one suspension point being over the pony truck and the other two over each side frame, toward the rear. The usual equalizers are provided over each box, together with elliptical springs between journals and helical springs outside of the first and third journals.

Features of the structural details include inward projections from each gear hub to form the jack-shaft journals, the jack-shaft bearings being made up of solid bronze bushings forced into holes bored in the frame casting. The center plate of each truck is located halfway between the first and second axles at an elevation of about the height of the top frames. Between the second and third axles an auxiliary spring support for the cab has been installed for the purpose of equalizing the loads on the various drivers, or, in other words, to counterbalance the excess weight in front due to the location of motors between the pony truck and first pair of drivers. The contact between the caps over these spring supports and the bottom surface of the cab is necessarily a sliding one.

Each motor truck includes a pony truck of the Pennsylvania Railroad standard type, with an elliptical spring located each side of the axle and supported on T-links. As the usual T-links alone will not provide sufficient lateral motion, a rocker casting supported by the elliptic springs has been added. The combination T-links and rocker permit sufficient lateral motion for curves of 275 ft. radius.

Articulation between the motor trucks is effected by a construction that permits each truck to rotate around the center of its center plate without restriction. The pulling and pushing strains between drawbars carry through the trucks, as well as the articulation, in a direct plane 34½ in. above the rails, and the cab is entirely relieved of these strains.

The principal characteristics of the locomotive are as follows:

Over-all length .....	76 ft. 6¼ in.
Total wheelbase .....	63 ft. 11 in.
Driving wheelbase .....	38 ft. 8 in.
Rigid wheelbase .....	13 ft. 4 in.
Over-all width .....	10 ft. 1 in.
Diameter of driving wheels .....	72 in.
Weight on drivers .....	193 tons
Diameter of pony wheels .....	36 in.
Weight on each pony truck .....	21 tons
Total weight of locomotive .....	240 tons
Tractive effort .....	87,200 lb.
Speed .....	20.6 m.p.h.
Horsepower at 20.6 m.p.h. ....	4,800
Train load on 1 per cent grade .....	3,350 tons

### Keeping Surface Railway Tracks Clear

THE New York Railways have sent copies of the poster reproduced herewith to heads of department stores, manufacturing establishments, trucking concerns and owners of motor trucks generally in connection with a campaign to secure co-operation in keeping the tracks clear. Some days previous to the sending out of the circulars President Theodore P. Shonts addressed letters to these men explaining the necessity for their assistance, and as a result hundreds of firms replied that instructions had been issued to drivers to keep off the car tracks whenever possible. Two of the large posters have been sent to each firm which has

# TO TRUCKMEN AND CHAUFFEURS

This Company is Cooperating with the City Authorities in Seeking to Improve Street Traffic Conditions.

✦ ✦ ✦

We ask you to help by keeping off the Car Tracks all you can.

✦ ✦ ✦

Street-cars must stay on the Tracks. They cannot ride around your car or truck. When the Street Car is delayed, you are causing inconvenience to the passengers.

Whenever there is room on the side of the Street

**Please Don't Drive on the Car-Tracks!**

POSTER USED IN NEW YORK RAILWAYS CLEAR-THE-TRACK CAMPAIGN

issued such instructions, with a request that they be displayed in shipping rooms in plain view of the actual drivers of trucks.

### A British Tramway in Wartime

1100 Men Enlisted Between 5 P. M. and 9 A. M. the Next Day—3000 Men Now with the Colors—Other Activities

A LETTER that has been received in this office from James Dalrymple, general manager Glasgow Corporation Tramways, who is one of the best known and most successful electric railway operating officials in Great Britain, is published below as an illustration of the spirit displayed by our British Allies in the world's war for the ideals of democracy:

"Ever since the war started our staff has done a very large amount of war work. In September, 1914, immediately after the outbreak of war, the city of Glasgow decided to raise a number of battalions. Out of our own staff we raised a battalion of 1100 men between 5 o'clock in the evening and 9 o'clock the following morning. These men have been in France for a long time and have been doing excellent work. The city, during the winter of 1914-1915, and throughout the whole of 1915, carried on an extensive recruiting campaign, and our office here became at that time and has since remained the center of all the recruiting activity in the city.

"We have now 3000 men with the colors, and our male staff, as you can understand, is now very much depleted, especially that portion of the staff of military age.

"Early in 1915, after losing about 2000 men, we started women as conductors, and shortly afterwards we put them on the front of the cars. We have now about 300 women driving in Glasgow and about 1500 conducting. They are doing the work very well; in fact, in a short time I expect that every man available for military service will be away from the department.



"Quite recently we formed a battalion of volunteers for home defence, and this battalion is practically all composed of members of our own department. In many ways the staff of the department has assisted the military authorities. At the present moment, the whole of the military recruiting staff in the city is housed in our office here. We give them the use of the premises free.

"I think you may take it that what applies to Glasgow applies equally to the tramway staffs in every city in the kingdom. I shall be glad to hear that in America the street railway managers and their staffs are throwing themselves heart and soul into this business, so that we may get it finished up at the earliest possible moment."

## Taking Care of Corner Stresses from Large D. C. Feeders

Insulators of Lignum Vitae Wood and 1½-in. Cold Rolled Steel Pins Solve San Francisco's Problem of Providing Required Insulating Qualities and Withstanding Crushing Stresses from Heavy Feeders and Heat from Overloaded Cables

By S. L. FOSTER

Chief Electrician United Railroads of San Francisco

IN the earliest days of electric street railroading with small cars, when the overhead feed wires were only No. 2, No. 1 or No. 0 B. & S., it was usually possible to get the wire safely around corners with the old standard electric light 1½-in. locust pin, bored and reinforced with a ⅜-in. carriage bolt down its center with a "deep-groove" glass insulator screwed upon it.

When, however, No. 0000 was adopted as the standard size feeder, this wood pin for corners had to be replaced with something stronger. In San Francisco in 1890 the substitute was a ¾-in. round wrought-iron pin, with a lead top threaded to correspond to the insulator. The glass insulator then proved to be the weakest feature of the combination and it was replaced with the composition corner-pin insulator.

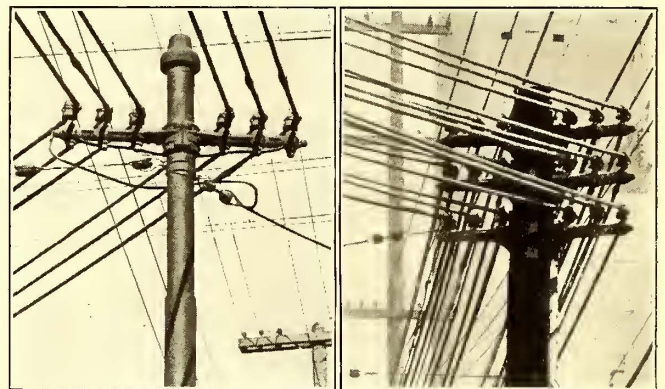
The advent of the 500,000-circ. mil cable and larger for overhead feeders showed up the defects in the ¾-in. pin and composition corner insulator. The insulator crushed under the pressure at turns or softened when the feeder was overloaded and became hot, and the ¾-in. pin bent under the corner strain.

At this point there were two very different methods adopted in different parts of the country. In San Francisco the old plan of turning the conductor on a single pin was adhered to, and the dimensions and strength of this pin were increased again. Elsewhere various forms of "feeder wire strain clamps" or "cable clamps" were brought out, whereby the strain of the feeder cable was removed almost entirely from the corner pin and transferred to the crossarm, and often ultimately to an anchor guy.

Before going further it should be stated that the San Francisco heavy feeder line standard includes self-sustaining iron poles at corners and cast-iron cross arms with cold-rolled steel pins cast into the arms. The self-sustaining pole permits the elimination of guys in connection with taking feeders around corners. When the use of the 500,000-circ. mil feeder had shown the ¾-in. iron pin and composition insulator to be inadequate for corners, the size of the pin was increased to 1½ in. and it was made of cold-rolled steel, and identical in size, shape and threading with the standard wooden pin with 1⅛-in. diameter top. This pin proved equal to supporting the corner strain resulting from taking any size feeder up to 1,000,000-circ. mil cable around it without feeder strain clamps and guys, but the insulator was yet to be developed that would have the insulating qualities needed, and stand the crushing strain of such a heavy

feeder at turns and the heat of an occasionally overloaded cable. This was accomplished by making the insulator of the well-known close-grained lignum vitæ wood.

Since the new standard of 1½-in. steel pins (1895) and lignum vitæ insulators (1904) were adopted not a pin has been broken nor has an insulator failed from crushing or burning on corners. Out of many thousands of the latter a very small number have failed on the



REINFORCED TUBULAR STRAIN POLE, AND BOX-GIRDER FEEDER-TURN POLE IN SAN FRANCISCO

straight line from checking or from internal defects in the wood, but after ten years of use nothing appeals to us in San Francisco as better for the purpose. Possibly where there is lightning these lignum vitæ insulators might not endure so long, or where there are ice loads on the feeders, extreme contraction strains or tornadoes the 1½-in. steel pins might not stand the strain so well. All that would be necessary in the last-named case, however, would be to increase the size of the corner pin to 2 in. and thereby increase the safe load by 137 per cent, as the strength of round pins varies as the cubes of the diameter. This increase in size of the pin to 2 in. would, however, necessitate redesigning the lignum vitæ insulator to accommodate the enlarged pin.

Following the old standard wood-pin design, the steel pins were constructed so that the center of the feeder on a corner applied the pressure against the pin at a point 4 in. above the crossarm. Under those conditions, allowing 60,000 lb. as the ultimate strength of steel, a 1½-in. pin would stand a pressure of 2500 lb. with a factor of

safety of two, as is conceded in the National Bureau of Standards' new safety rules to be sufficient for pins.

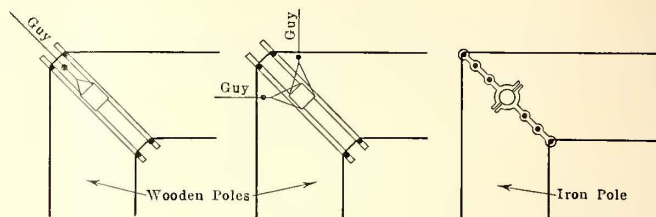
Under these conditions the bottom petticoat of the insulator is 2 in. above the iron cross arm. As 500 volts will not jump 1 in., and as the poles are not absolute grounds, it seemed to be quite safe to make this distance between insulator and arm 1 in., as in an actual case the bottom of the insulator had been only  $\frac{5}{8}$  in. above the iron arm at a corner pin for eleven years without producing failure.

With the pin thus shortened the load at the side score of the corner insulator was brought to within 3 in. of the iron cross arm and the safe load on the pin was made 3300 lb. with a factor of safety of two.

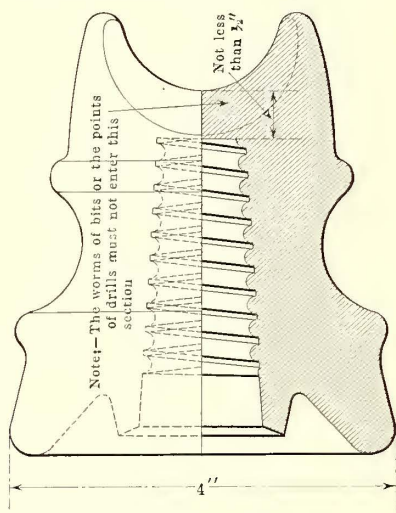
That this strength is ample is shown by the fact that the pressure against the side of the corner insulator at a 90-deg. turn, provided with two symmetrically arranged poles, each at the apex of an angle of 135 deg. included by the feeder, is as follows for the different

serves equally well for both feeder-cable uses, straight line and corners.

These *lignum vitæ* insulators had a severe fire test in the 1906 San Francisco conflagration where great copper cables were melted off and standard-pipe iron tubular poles were heated till they bent over the roadway. The wood insulators, though scorched and in a few cases charred, were ready for service after the ordeal, while



FEEDER TURN WITHOUT CABLE CLAMPS



LIGNUM VITÆ CABLE INSULATOR

the composition ones in all cases had swelled up under the heat and had become worthless for further use. As *lignum vitæ* wood was very scarce after this fire, in order to get the cars into operation as quickly as possible, insulators of the same shape were quickly turned at the mill from hickory and some from ash for straight line use to be replaced later by *lignum vitæ* ones.

The drawings reproduced show the construction and dimensions of this hardwood insulator that has "made good" in San Francisco for the past eleven years. That we have confidence in it and that it justifies this confidence is shown by the statement that at one substation there are forty-eight heavy positive d.c. 500-volt feeders emerging in three different directions without a guy in sight, and at another substation forty feeders go out in several directions without guys to hold them, and no feeder less than 500,000 circ. mil in size. Where a heavy feeder is to be dead-ended at a station, the dead end is made right around the insulator. When it is to

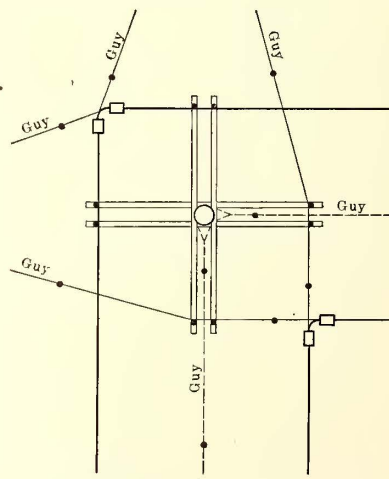
size feeders assumed to have the sag in a 100-ft. span set opposite them:

No. 0000 B. & S. double-braid weatherproof, 1 ft. sag....	710 lb.
500,000 circ.-mil double-braid weatherproof, 2 ft. sag....	950 lb.
1,000,000 circ.-mil double-braid weatherproof, 3 ft. sag....	1,125 lb.

The crushing strength of *lignum vitæ* is 13,000 lb. per square inch. In passing around one of these San Francisco designed insulators at an angle of 135 deg., included between the directions of the diverging parts of the feeder, a 1,000,000-circ. mil double-braid feeder covers  $1\frac{3}{8}$  sq. in., thus giving a factor of safety of twelve on the outside of the insulator. There are more than 7 sq. in. of area of contact inside the insulator between the wood and half the threaded  $1\frac{1}{2}$ -in. steel pin, thus providing a factor of safety five times as large on the inside of the insulator as on the outside against a factor of two as exacted by the new safety rules for insulators.

The dense texture of this *lignum vitæ* insures its freedom from absorbing moisture, and its insulating qualities under 500 or 600-volt d.c. work have proved almost entirely satisfactory.

This hardwood insulator was originally designed for the points where it was needed most urgently, namely, on the corners. It was given a round top. When it was found to be cheaper than the other types of straight-line feeder-pole insulators on the market and free from the gradual leaning over or yielding of the composition ones, it was provided with a score on the top and now



FEEDER TURN WITH CABLE CLAMPS

be held rigidly around an insulator at a turn, it is provided with a metal tie or "cinch clamp." The self-sustaining pole, the  $1\frac{1}{2}$ -in. steel pin and the *lignum vitæ* insulator carry the load and no head guys or drop guys are required.

An examination of the cross-section of the insulator will show that there is a  $4\frac{1}{4}$ -in. creepage distance from the center of the side score to the grounded iron pin inside the insulators,  $1\frac{1}{2}$  in. of which is always under cover and dry. In all our experience with these insulators there have been no cases of electrolytic injury to the feeder at the insulator, though there have been

cases where in our foggy climate feeders have been corroded badly out in the span at a small break in the weatherproof insulation.

When a cable clamp is attached to a feeder the clamp at once destroys the value of the weatherproof insulation, as in gripping the cable it must get through to the copper and thus demands a strain insulator between it and the crossarm. This clamp is now a bare live spot on the feeder and an element of danger. In foggy San Francisco such a combination invariably leads to leakage over the surface of the strain insulator to the grounded iron arm. The strand quickly corrodes at the cable clamp side of the strain insulator and the guy breaks unless replaced in time.

To get the best results it is absolutely necessary that these insulators should be made only of clear wood; for straight-line work the thickness of wood between the top of the pin hole and the bottom of the top score should be fully a half inch; that the pin hole should be bored with a bottoming drill and not with a bit having a worm at its end; that the insulator be given two good coats of linseed oil paint before being put out, and that the insulator be painted occasionally when in service. Some of them were exposed for about ten years without repainting in San Francisco without failure, but such treatment is inadvisable.

The use of the lignum vitæ insulator on corners in self-sustaining iron-pole work saves the cost of two cable clamps per feeder, two strain insulators, four pieces of guy cable, and the labor of installing them all and fitting and soldering jumpers; furnishes a cheaper, more durable and better looking job, permits more feeders to be accommodated on a given pole-head space and eliminates the danger of galvanized-iron guys corroding off at the positive side of the strain insulators from creepage of current.

In a case of a wood pole and two feeders as shown in the illustrations, its use at turns means one-half as many crossarms, one-half as many insulators, one-sixth or one-third as many guys, no cable clamps at all or strain insulators connected to feeders, no fitting of jumpers or soldering, a far neater looking piece of work and more feeders on the same pole-head space—in other words, less money spent for overhead material, lower labor and maintenance cost and a better looking job.

As a matter of fact, it is difficult to find a location in city work where feeders can be taken around a 90-degree corner on a one-pole turn. On account of the wide sidewalk, the curved curbstone and the cesspool at the apex of this curve, these corners are usually contrived by a two-pole turn. The argument for the single pins, single insulators, crossarms bisecting the included angle of turn and self-sustaining poles, as against the cable clamps, double sets of crossarms at right angles to the lines of the conductors and guyed conductors and poles, still applies in the case of the two-pole turn.

Of the two photos of typical feeder-turn poles shown, one is of a box girder station pole with its load of eighteen heavy cables, fourteen 500,000-circ. mil and four 1,000,000-circ. mil, about one-third of a substation's d.c. load. There are twenty-five of this type of pole on the system.

The other photo is of an outlying tubular line pole with six 500,000-circ. mil cables besides serving as a pull-off pole for a double No. 00, 90-degree curve. This pole is a standard-pipe, three-joint, 6-in., 7-in., 8-in. x 30-ft. pole, but is reinforced by a specially built steel beam inside as was described and illustrated on page 109 in the issue of the ELECTRIC RAILWAY JOURNAL for July 15, 1916. There are several hundred of this type on the system. Both poles are self-supporting and on both the lignum vitæ insulators are used, some of the round-

top and some of the scored-top type. Both of these poles have been in service about twenty years and are as good as when set, as they have been protected from internal corrosion by being filled with concrete and from external deterioration by regular painting.

## AMERICAN ASSOCIATION NEWS

### Flag Raising at Hampton, Va.

Under the auspices of company section No. 10 and of its flag-raising-day committee, impressive flag-raising exercises were carried out at the carhouses in Hampton a few days ago. Music by the Soldiers' Home Band, and addresses by Hon. Harry Houston, speaker of the House of Delegates, Gen. Joseph F. Smith, governor National Soldiers' Home, and Col. W. S. Copeland, editor *Daily Press and Times Herald*, were the features of the exercises.

In opening the exercises, E. C. Kelly, president of the section, read a brief report of the action of the National Railway Association in pledging its support to the Government. In his address, Mr. Houston paid a high tribute to President J. N. Shannahan of the company for the patriotism displayed in every undertaking of the community, stating that as much as a year ago the company had responded to the call for preparedness in furnishing armory facilities for the local battery. The other speakers also expressed appreciation of the work of the company.

At the meeting of the section held on June 1 the flag-raising-day committee reported that the exercises had proved very popular in the community, and that Newport News was arranging similar exercises. At the preceding meeting of the section, held on May 10, home gardening was the topic of discussion. A representative of the Hampton Normal and Agricultural Institute gave a talk on this subject and distributed leaflets containing garden hints to the members. At this meeting, also, Mr. Staenglen spoke on rail bonding.

### Bulletin on Coal Situation

The committee on national defense is sending out today the following bulletin to electric railway companies:

L. S. Storrs, president of the association and vice-chairman of its committee on national defense, acting for the association and the committee, has taken up with the coal production committee of the Council of National Defense the question of assuring to the traction utilities of the country a continued supply of fuel, and the committee makes this statement of the result of the conference with the approval of the National Council and at the request of F. S. Peabody, chairman of the coal production committee.

Mr. Storrs pointed out to Mr. Peabody that should a condition occur whereby the traction companies were, through lack of fuel, compelled to cease or interrupt their service, a great hardship would ensue for the communities served. The necessity of transportation service to the public was emphasized and the request was made that some plan for the preferential treatment of fuel consigned to public utilities be arranged on the same basis as that upon which fuel for steam railroads is to be handled during emergencies or when embargoes are in effect.

Mr. Peabody assured Mr. Storrs that such a plan for the preferential treatment of the public utility coal supply will be made effective, should emergency require it. It is, of course, essential in addition that each individual company insure as far as possible its own fuel supply by having on hand an ample reserve supply, particularly during the winter months. While it may at a later date be necessary to urge upon electric railways conservation of fuel by the elimination of such service as can be abandoned without serious det-

riment to the needs of the public, your committee feels that it can assure the companies that their needs will be taken care of and that there need be no fear of such a shortage as will necessitate the shutting down of public utility power plants.

Your committee intends to co-operate to the fullest extent with the coal production committee in conserving the fuel resources of the country and at the same time to co-operate with the individual companies, so that the traction lines can render the best possible service to their communities.

### Section No. 11 Issues Handbook

The joint company section of the Toledo Railways & Light Company has just issued a booklet which should prove suggestive to other company sections. It is of convenient pocket size, 4 in. x 6 in., and comprises thirty-nine pages of text.

A preface signed by T. J. Nolan, chairman of the executive council, gives certain general suggestions to employees and outlines briefly the development of the section organized on Jan. 23, 1917. Following this is a copy of the constitution and list of officers and committeemen. Next the functions of the executive council and officers are explained and the requirements for membership in the several associations making up the joint section are listed, including a table of membership dues. A full list of members with home addresses, arranged by departments, is also given. Finally there are blank forms for use in applying for membership, correcting entries, and withdrawing from membership, as well as a table of attendance at the educational classes during recent months.

## COMMUNICATIONS

### Riding Qualities Not Affected by Equalization

L. B. STILLWELL, CONSULTING ENGINEERS  
NEW YORK, June 7, 1917.

To the Editors:

Referring to W. H. Heulings's communication published in your issue of May 19, I wish to point out certain erroneous conclusions which he reached from reading my communication printed in your issue of May 5.

I do not lean toward a flexible side frame for any truck, but, on the contrary, stand straight up for the most rigid form of side frame. In my opinion, the necessary flexibility to secure proper equalization of weight on all four wheels of a truck should be provided for by the springs interposed between the journal boxes and the side frame, and by flexibility which is produced by the design of the transoms connecting the two side frames.

In his communication Mr. Heulings says: "The movement of the equalizer bar is restrained by springs which distribute the load." But the type of equalizer bar described by Mr. Bullock, and which is under discussion, rests directly on the journal box, and its vertical motion can in no possible way be restrained by springs or other means. In my opinion the name "arch-bar truck" is not applicable to the type referred to by me as having springs directly over the journal boxes. The name "arch-bar truck" is usually associated with the type having no journal box springs, and used principally under freight cars.

Mr. Heulings's suggestion that the skeptic should test the riding qualities of certain trucks of different design operating over the same roadbed was followed

up by Mr. Potter's invitation to the skeptic to continue his investigation to the New York, Westchester & Boston Railway and neighboring roads, where trucks with equalizer bars and trucks with springs directly above the journal boxes can be compared in similar service. If the skeptic wishes to continue his comparison on a steam-operated road, the Erie Railroad offers an excellent opportunity to compare the riding qualities of the "time-tested" equalizer-bar trucks and the riding qualities of trucks fitted with springs over the journal boxes. The popular verdict is that the latter design, which is used under the Erie Railroad's all-steel cars, rides better than the older type of truck under that company's steel underframe or wooden cars.

However, in making his suggestion, Mr. Heulings is really wandering from the subject of equalization to that of comparative riding qualities, which is a totally different matter, as the skeptic can easily prove to his own satisfaction by close examination of the trucks referred to by Mr. Heulings. Among these the trucks with hard riding qualities can still claim complete equalization.

F. M. BRINCKERHOFF.

### Engineers in the C. E. R. A.

TERRE HAUTE, INDIANAPOLIS & EASTERN  
TRACTION COMPANY

INDIANAPOLIS, IND., May 31, 1917.

To the Editors:

Some time ago you published an editorial suggesting a subdivision of the Central Electric Railway Association. I take it that in general the reason for a subdivision is to stimulate increased attendance of the engineers at the association meetings. However, if it amounted to anything at all, which no doubt it would, it would then soon develop into practically a separate association which would meet separately from the general association. As a result, other officials of the association, who would be interested in the engineering matters now occasionally discussed, would then not secure the benefit of such discussion.

It appears to me that a better plan would be the appointment by the association of a committee of engineers to keep in touch with other committees of the association, particularly the program committee for the purpose of arranging to have any subjects of interest to engineers incorporated in the program.

This committee could also recommend the appointment of other committees when necessary to which could be referred the standards of the American Electric Railway Engineering Association, and they could then either suggest adoption or changes as the case might be. The A. E. R. E. A. is doing excellent work, but many of the standards which it has proposed have not been generally adopted by member companies of the C. E. R. A. If such rules were referred to a committee which would be in touch with the American Association the reason for this condition could be investigated and a more general adoption of the rules would probably result.

A. SCHLESINGER,  
Superintendent Distribution and Substations.

### Publicity Agents Meet

An informal gathering of a number of publicity agents employed by electric railway companies took place this week at St. Louis at the time of the meeting of the Associated Ad Clubs of the World in that city. A pleasant time was enjoyed by all, but those present decided to postpone action upon establishing a formal organization until the next meeting of the American Electric Railway Association.

# Practical and Economical Solutions of Problems in EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

## One-Man Cars for Tacoma

Rebuilt Cars of the Single-Truck Type Have Become Popular with Employees and Public

BY K. C. SCHLUSS

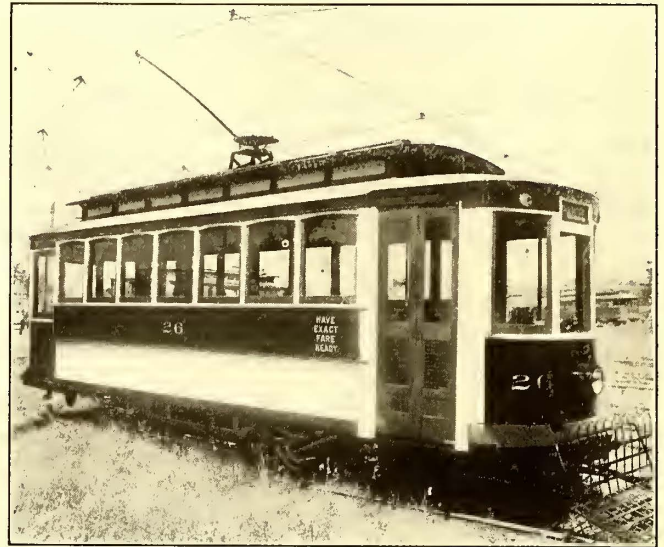
Superintendent of Power and Equipment Tacoma Railway & Power Company, Tacoma, Wash.

The Tacoma Railway & Power Company has recently rebuilt six of its old-style, single-truck, closed cars to make them suitable for one-man operation, the cost of reconstruction, inclusive of air brakes and prepayment facilities for double-end service, approximating \$1,300 per car. By operating this equipment at one-half the former headway a very great increase in traffic—approaching 100 per cent—has been effected, and the public is very well satisfied.

Originally the cars were of the convex-concave-side type, with monitor roofs and drop platforms. They were equipped with Brill 21-E trucks and GE-58 motors and were operated with hand brakes. The rebuilding included a minimum amount of alteration to the bodies and platforms, together with the addition of Westinghouse semi-automatic air brakes, pneumatically controlled doors and steps, air sanders which are operated automatically in emergency, dead man's circuit-breaker control and other safety features. This type of equipment has been described in detail in the *ELECTRIC RAILWAY JOURNAL* of Sept. 2, 1916, under the title "Equipment of the Safety Car."

The general dimensions and weights are given in the table in the next column.

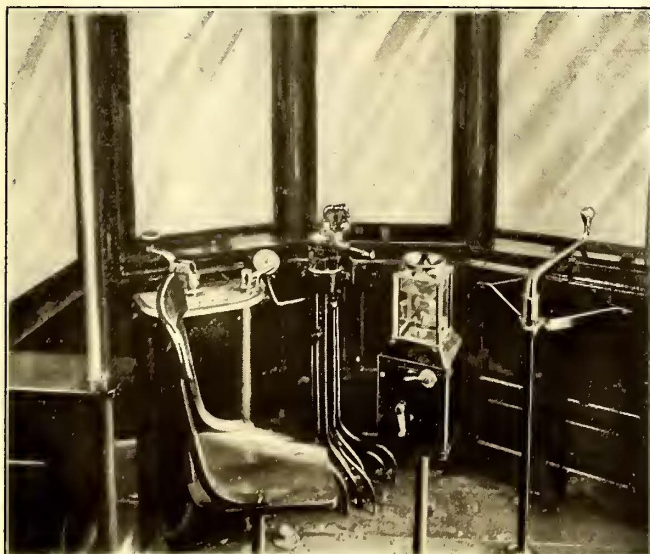
The weight of the air equipment complete, including safety devices, piping, hangers, etc., is estimated to be 1350 lb. This is slightly higher than usual for this type of car, due to the use of a larger compressor than



EXTERIOR VIEW OF REBUILT CAR

is generally required to operate the brakes and other apparatus. The company had on hand a number of Christensen AA-1 compressors and they were utilized on these cars. In order to conserve space a sheet-

Length over all.....	31 ft. 0 in.
Length of body.....	20 ft. 0 in.
Width at sills.....	7 ft. 1 in.
Width over all.....	7 ft. 10 in.
Height—rail to step.....	16 in.
Height—step to platform.....	12½ in.
Height—platform to floor line.....	10 in.
Height—rail to floor line.....	38½ in.
Truck wheelbase.....	7 ft. 6 in.
Seating capacity.....	29
Light weight of car complete.....	24,200 lb.



FRONT PLATFORM WITH FARE BOX, CONTROL AND BRAKE EQUIPMENT AND REVOLVING CHAIR FOR OPERATOR



INTERIOR VIEW OF ONE-MAN CAR, SHOWING LONGITUDINAL AND TRANSVERSE SEATS

metal housing was designed to replace the wooden box originally furnished with the compressors.

The principal changes made to the body proper include the removal of the bulkheads and the rearrangement of seats. The bulkheads are cut off at the height of the inside window sills, the lower portions being cased over and a 1-in. pipe stanchion extended from each section to the end plate which is arched to conform to the contour of the roof. The opening between the stanchions is 36 in. The preference of the public for cross-seats influenced the adoption of this type of seating plan so far as possible, but since the width between posts at the floor line is only 6 ft. 4 in. it was necessary to retain the longitudinal seat along one side of the car. All seats are upholstered with Pantasote.

The platforms originally had stationary steps and manually operated doors on both sides. These were removed, the left side of each platform being closed and a stationary window installed which corresponds in height and design to the vestibule windows. On the right side is installed a two-leaf folding door which swings out and against the body corner post. The clear opening of the door is 32 in. The folding step is supported by hinged brackets and operated automatically with the door. The doors and steps are operated entirely by air, excepting that with an emergency application of the brakes the door on the rear platform may be opened by hand, after releasing an ordinary door flush bolt which is located near the center of the door in plain view of anyone attempting to leave the car. The steps are lighted by a lamp above each door which is switched on and off automatically as the door opens or closes. This is accomplished by means of a contact connected to the door operating rod.

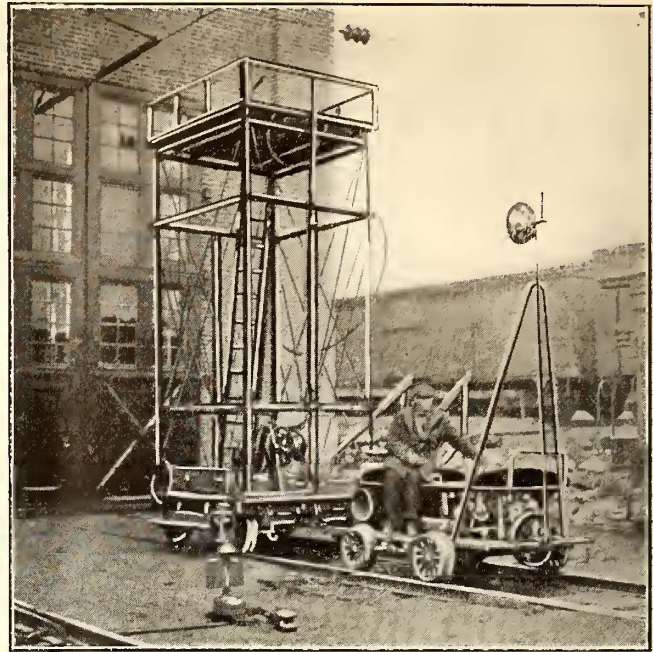
Miscellaneous equipment not previously mentioned consists of motorman's revolving stool, push buttons and buzzers for signaling motorman, Johnson fare boxes, International registers, "Golden Glow" headlights, rotary gongs and Earll trolley retrievers. Although the company's standard color for city cars is dark green, these cars are being painted maroon and cream to give them a distinctive appearance. One of the accompanying illustrations shows the arrangement of controller, brake valve, hand brakes, fare box and motorman's chair on the front platform, from which it will be seen that elaborate provisions for the operator's convenience have been provided. This has eventually resulted in making the one-man runs popular among the platform men, and in many cases they are claimed as preferred runs by senior men.

## Line Car Saves Railroad \$2,000 a Year

Gasoline-Propelled Maintenance Car Used on Hoosac Tunnel Electrified Zone of Boston & Maine

Before the Boston & Maine Railroad put in operation the lightweight gasoline-driven overhead maintenance equipment which is shown in the illustration, the line department used a tower mounted on an ordinary flat car. This required a steam engine, caboose, and a crew of eleven men to complete the equipment, while a foreman, two linemen and two groundmen are all that are required for the new outfit. The latter also gets to the scene of the trouble quicker, with the result that traffic delays due to line failures have been greatly reduced.

The motor car is driven by a four-cylinder Fairbanks gasoline engine, and is provided with an acetylene headlight mounted on a pipe standard on the front of the car. The reflector can be set at any angle, and is particularly useful in inspecting the wiring in the tunnel.



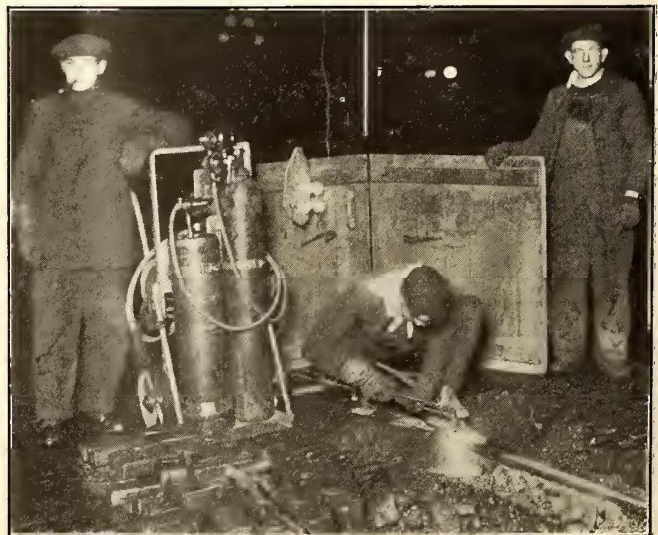
BOSTON & MAINE'S MOTOR-DRIVEN LINE CAR

The motor car will make a speed of 60 m.p.h. alone, and 20 m.p.h. when drawing the tower car.

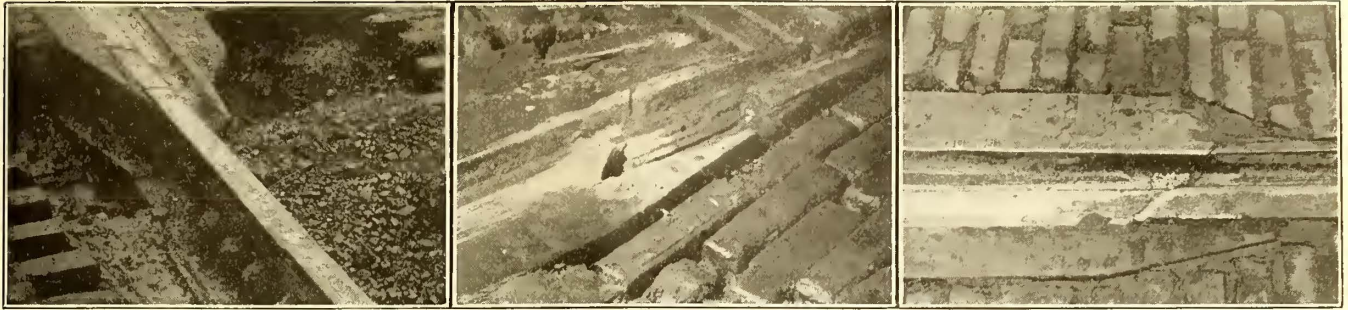
The latter has a lightweight wrought angle-iron framework braced with  $\frac{3}{8}$ -in. steel cable. It is 7 ft. square, and can be used at heights between 12 ft. and 18 ft. It is equipped with the usual maintenance equipment. To prevent tipping when the tower is in use the car is clamped firmly to the rails. The car has been in service for two years, and by economy in fuel and labor has saved \$4,000 for the company.

## Track Repairs Speeded Up by Use of Oxy-Acetylene Tools

The Puget Sound Traction, Light & Power Company has been speeding up its track repair work by means of gas-welding. The accompanying illustrations show the different steps in a recently completed job in which a Prest-O-lite welding and cutting outfit was used to cut out a broken section of rail and then build up the rail to give an even running surface. This job was done in about half the time which was formerly required to replace rails which had been broken.



TRACK REPAIR GANG WORKING AT NIGHT



THREE STEPS IN REPAIR OF RAIL—1, BROKEN SECTION BEFORE REPAIR—2, RAIL WITH BROKEN SECTION BURNED OUT—3, REPAIRED RAIL AFTER SEVERAL WEEKS OF SERVICE

The first of the three grouped pictures shows the broken section of rail on the near side of the switch mate, the switch mate itself not being broken. The second picture was taken after the broken section had been burned out, and the third picture of the group shows the section after it had been repaired and subjected to several weeks' wear.

This work was all done between midnight and 3 a. m. on account of the heavy traffic which passes the point in the daytime. One of the accompanying illustrations shows the gang at work on the job.

### Carbon Brushes Recut with Carborundum Wheel

Motor Brushes Made Into Compressor Brushes at Rate of 500 Per Day

BY E. R. PIKE

Assistant Superintendent Fifty-second Street Repair Shop  
Brooklyn (N. Y.) Rapid Transit System

Worn motor brushes are cut into smaller sizes and are used for compressors in the Fifty-second Street shop of the Brooklyn Rapid Transit Company. This is done by means of a carborundum wheel 12 in. in diameter and 3/32 in. thick, which is mounted as shown in the illustration and driven by a belt at a speed of 1860 r.p.m. A circular hood connected with a suction blower is mounted over the wheel to remove the fine dust, while heavier carbon particles drop through an opening in the table into a receptacle from which they are removed from the bottom. The guides on the table are adjustable so that any sized brush can be cut.



MACHINE FOR CUTTING CARBON BRUSHES

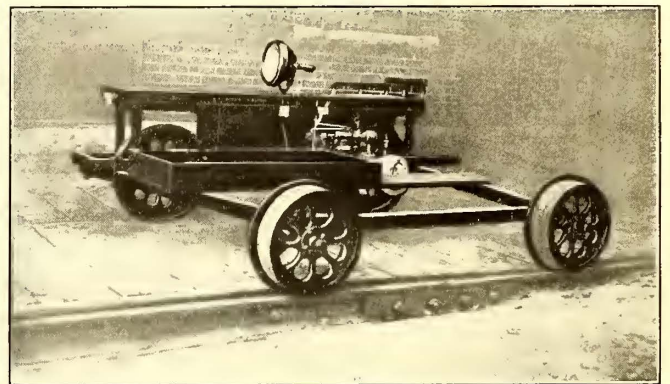
The motor brushes are of different lengths and widths but are all 1/2 in. in thickness. These are sawed into brushes 3/8 in. thick. Three or four cuts are necessary for each brush, one to shave it down to the proper thickness, and other longitudinal and transverse cuts, depending upon how badly the brush is worn. Recutting brushes without reducing the thickness was tried out but was found to be unsatisfactory, as many of the brushes were worn to such an extent on the flat side that recut brushes of a uniform size could not be obtained without reducing the thickness to 3/8 in.

As the recut brushes are used for the car air compressors no new brushes for these machines have been necessary in several years so that considerable economy has been effected. About 500 brushes can be cut in a nine-hour day.

### Gasoline-Propelled Inspection Car Gives Good Service

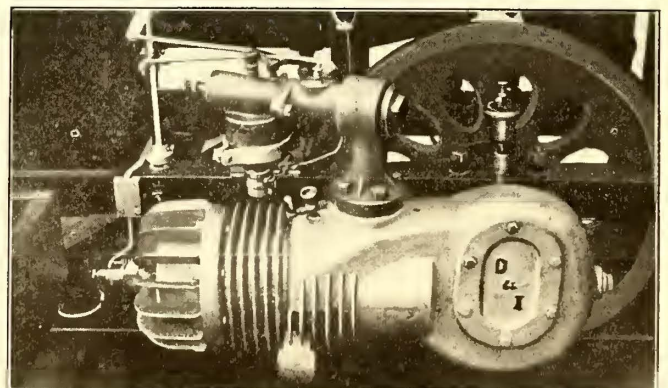
The Denver & Interurban Railway, Denver, Col., has constructed in its shops the gasoline-propelled inspection car shown in the accompanying illustration. The car has been driven 35,000 miles, and the only repairs necessary have been three sets of tires and two sets of engine bearings. It has given such excellent service that three more cars of the same design have been constructed. The cost of the car was \$125.

It is of rugged construction and will carry three men and their tools up a 4 or 5-per cent grade without diffi-



GASOLINE-PROPELLED INSPECTION CAR, DENVER, COL.

culty. The car is equipped with an incandescent headlight, the current for which is supplied by storage batteries. When not working at night the batteries are easily removed. The total weight of the car is 350 lb., and the single cylinder two-cycle engine which drives it weighs 75 lb. This engine was designed and built in the company's shops and is shown in one of the pictures, which also illustrates the method of attaching the engine to the truck frame.



ENGINE OF INSPECTION CAR SHOWING METHOD OF MOUNTING ON FRAME OF TRUCK

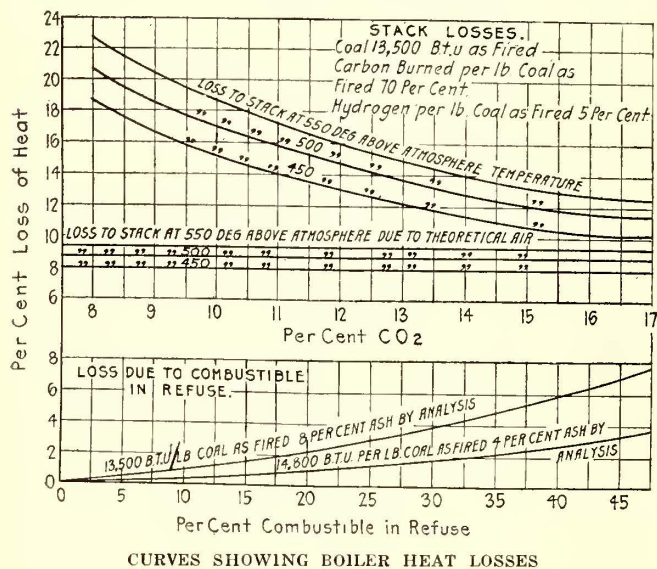
### Heat Losses in Steam Plants\*

#### Boiler Economy Effected by Control of Excess Air and Combustible in Refuse

BY H. F. LAWRENCE

Test Engineer American Engineering Company, Philadelphia, Pa.

In steam generating plant operation the heat losses due to excess air are the most important of any of the heat losses that can be controlled to any extent. The upper set of curves in the accompanying illustration shows the percentage of heat or percentage of coal which is lost through the stack for different temperatures of excess gases and percentages of CO<sub>2</sub>. The straight lines labeled "Loss to stack at 450 deg., 500 deg. and 600 deg. above atmosphere due to theoretical air" show the percentage of coal required for heating the furnace gases from atmospheric temperature up to the stack temperature. With no excess air, and perfect combustion these lines represent the heat lost through the stack for various temperatures. With different amounts of excess air indicated by various percentages of CO<sub>2</sub> the total heat loss through the stack is as shown by the upper



curves. The differences between the lower curves and the upper curves is the excess air loss.

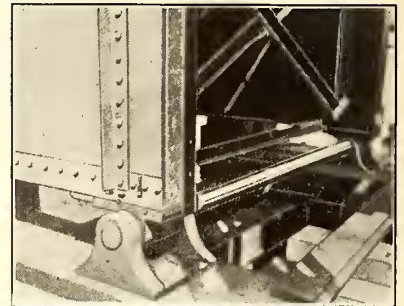
It should be remembered in the interpretation of these curves that 16 per cent CO<sub>2</sub> represents 12.4 per cent excess air, 14 per cent CO<sub>2</sub> represents 39 per cent excess air, 10 per cent CO<sub>2</sub> represents 87 per cent excess air, and 8 per cent CO<sub>2</sub> represents 123 per cent excess air. When the CO<sub>2</sub> is reduced from 16 per cent to 10 per cent, the heat loss is increased by approximately 6 per cent of the coal burned, provided, of course, that the exit temperature remains the same. The volume of gases is much greater with 10 per cent CO<sub>2</sub> than with 16 per cent, owing to the greater amount of excess air, and the temperature of combustion is lower; therefore the heat absorbed by the boiler is less, so that the final temperature is higher and the heat loss due to excess air is greater than is really shown by the curves. A difference of 100 deg. in the exit temperature represents a loss of about 2½ per cent.

The lower set of curves shows the losses due to the combustible in the refuse. This loss in coal containing 4 per cent ash is approximately only one-half the loss due to combustible in the refuse of the coal burning 8 per cent ash. The curves show it is more important to burn out the carbon in a high-ash coal than a low-ash coal. While this is simple, there is a point beyond which

it is not advisable to burn the combustible in the refuse, as large volumes of air are required to burn out the coke to a minimum, and the loss due to excess air greatly exceeds that which would have occurred had the combustible been dumped with the ash. The best plan of operation is to find this point by test or gas analysis and then operate accordingly.

### Railroad Constructs Temporary Drawbridge at Seattle, Wash.

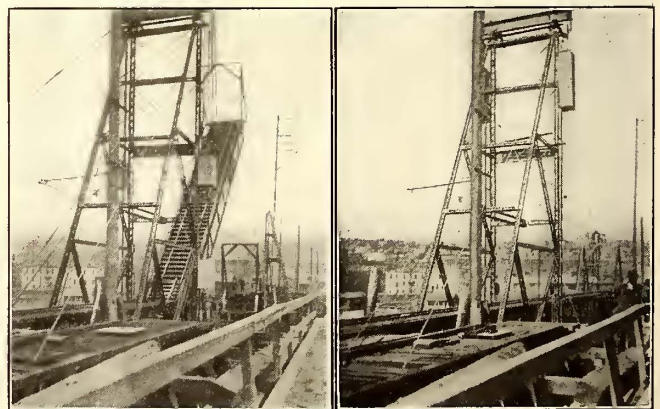
The accompanying illustrations show a jack-knife draw span bridge constructed by the Puget Sound Traction, Light & Power Company over Lake Union, Seattle, Wash. The bridge was necessitated by the delay in the construction of the new bascule span which is now in the course of erection. The railway has operated cars over a double-track trestle at this point for many years, but with the opening of the government canal leading to Lake Washington it became necessary to provide a waterway for vessels.



HINGE OF TEMPORARY DRAWBRIDGE

The temporary drawbridge is made of second-hand material and was built under the direction of the Stone & Webster Engineering Corporation. The span is composed of 90-ft. deck plate girders, 6 ft. in depth. The tower is 72-ft. high and over it pass two cables attached to the girders at approximately one-third the span. These cables run to the electric hoist housed in a building about 30 ft. back from the tower. The weight of the draw span is 30 tons and this is counterbalanced by four concrete weights, totalling 4000 lb. The weights are suspended in pairs, one above the other and work in relays. On starting to raise the span both weights are available and when the span has reached an angle of 22½ deg. with the horizontal the counterweight is diminished.

At the approach adjacent to the hinged end of the draw span there is a 7-ft. section of track which is also



TEMPORARY DRAWBRIDGE, SEATTLE, WASH., IN OPERATING POSITION AND WITH DRAW SPAN RAISED

hinged so that it can be raised before the span itself is started. This permits the span to tip up without damaging the approach. The span itself is carried on two piers of 50-ft. and 55-ft. piles. These penetrate the bottom of the lake only 6½ ft. on account of the hardness of the soil.

\*Abstract of a paper delivered at a recent meeting of station and operating committee of the Ohio Electric Light Association.

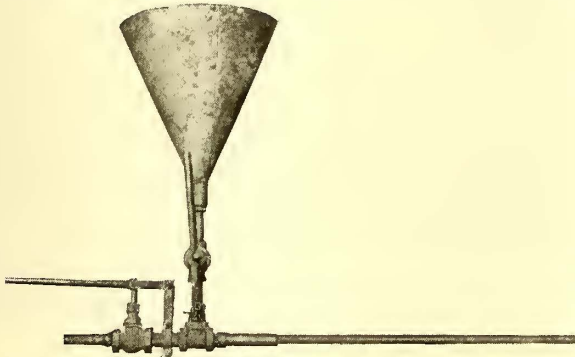


## Condenser Pipes Cleaned by Sand Blast

BY J. C. FALKNER

Chief Operating Engineer Richmond Light & Railroad Company, New Brighton, N. Y.

Cleaning condenser tubes is accomplished in this company's power house by means of the air-operated sand-blasting outfit shown in the illustration. The long pipe on the right is pushed into the condenser, and is slightly tapered so as to fit the condenser tube easily. The short section of pipe on the left is connected to the air supply and is provided with a lift gate valve. The sand is held in the large funnel, the flow being controlled by a gate valve. The top of the funnel is covered with cloth to prevent the sand being blown out and into the faces of the operators, in case both valves should



SIMPLE SAND-BLASTING OUTFIT USED FOR CLEANING CONDENSER TUBES

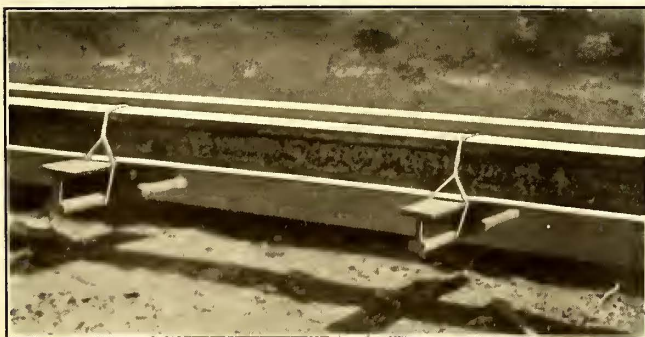
be opened at once. Two men operate the device, one guiding it and the other operating the valves.

As reported in the issue of the *ELECTRIC RAILWAY JOURNAL* for May 19, 1917, page 914, the National Electric Light Association gave sand blasting as an effective method of cleaning condenser pipes. However, as this report mentioned only the use of a high-pressure water jet for driving the sand, I thought that a description of the air sand-blasting method used by us would be of interest.

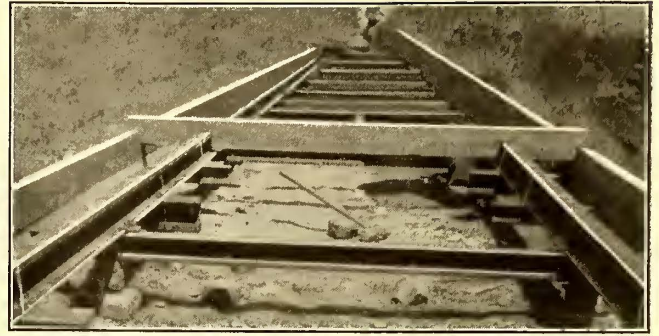
## Worn-out Rail Used as Steel Ties in Concrete Foundation

The Southern Traction Company at Sherman, Tex., is using a lot of its worn-out 30-lb. and 40-lb. rail as steel ties and rail bases in its new track construction, which is laid in a concrete foundation.

Long sections of the old rail are spaced every 9 ft. and serve as ties. They are placed with the bases up, as shown in one of the accompanying illustrations, and are fastened to the track rail by bolts passing through the



USING UP OLD RAIL AS STEEL TIES, SHERMAN, TEX.



SHORT TIES MADE OF 18-IN. LENGTHS OF OLD RAIL AND SPACED EVERY 3 FT. BETWEEN LONG TIES

base of the old rail and clamping onto the base of the new track rail. Spaced equally between the long ties are two 18-in. lengths of rail. These are also placed with the bases up, and are wired to the base of the track rail. After the concrete is poured the wires are cut. Two short sections opposite each other make virtually as good a foundation as a complete tie.

By this type of construction the company has avoided the cost of wooden ties and has used up a lot of worn-out rail for which there was no other use. The illustrations show the work being done on a section 2200 ft. long, and this type of construction is being contemplated for future track work.

## Special Tie Plate Holds Rail to Gage and Alignment in Addition to Supporting It

The Vaughn rail support, pictured herewith, is a device manufactured by the St. Louis Frog & Switch Company for serving at once as a tie plate and as a means of holding the rail to gage and alignment. It is made of open-hearth steel of special quality with a usual width of 7 in., thickness of  $\frac{3}{8}$  in., and length dependent on the size of rail base with which it is used.

The support is usually applied to wooden ties by means of two screw spikes, the ties having previously



TIE PLATE BEFORE AND AFTER CLAMPING TO RAIL

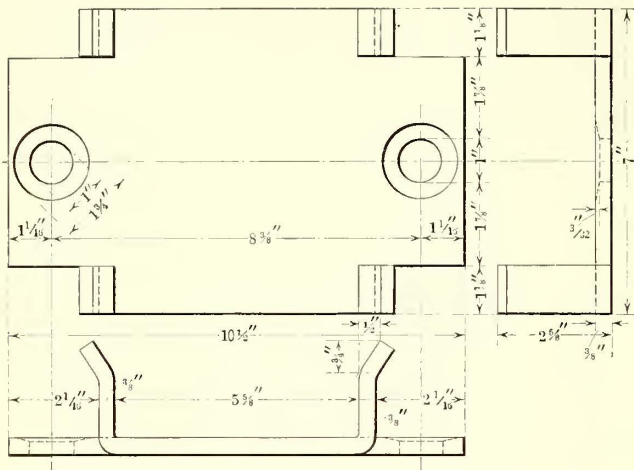
been bored to proper gage by mechanical means in the materials yard. In the field, therefore, it is necessary simply to screw in the spike. Another way of using the tie plates is to bore the ties and fasten the plates to them in the materials yard before sending them to the job. It is then claimed that the rail can be securely applied at less expense than spiking, by the cheapest class of labor, with the assurance to the engineer that his track will be properly gaged and supported. The bending over of the lips or projections on the plate firmly ties the rail base to the plate, so that this support not only holds the rail to gage, but also prevents creeping or rolling of the rail under traffic.

The Vaughn support has not been extensively used by the steam railroads, because it has been impossible to compete in price with the ordinary tie plate, but 500,000 have been manufactured for various electric railroads, principal among which is the United Railways of St.

Louis, Mo., which has installed several hundred thousand in the last five years. In 1912 this company used the Vaughn plate in laying about 2½ miles of 7-in., 103-lb. Lorain steel section No. 426 rail on oak ties, spaced 2-ft. centers, and about 5 miles of track with 100-lb. A. R. A. T-rail with oak ties, 2-ft. centers. Since the year 1912, the St. Louis company has laid approxi-

### Reinsulating Wire at Less Than One Cent Per Pound

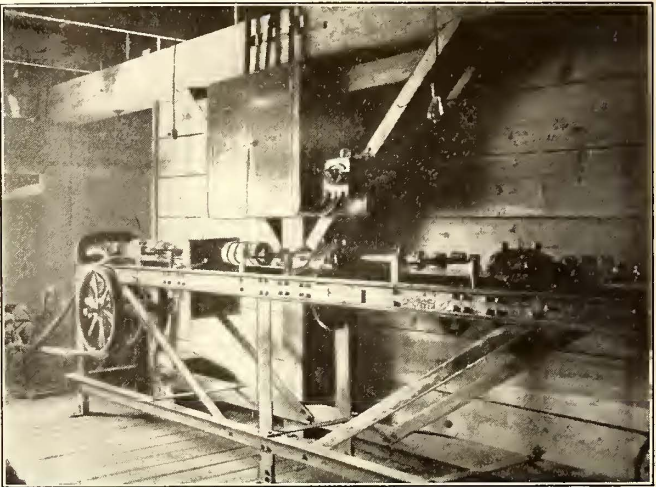
Shown in the accompanying illustration is a machine which is being used by the Washington Water Power Company, Spokane, Wash., for reinsulating wire. Since the purchase of this machine it is no longer necessary for this company to scrap any of its wire or other conductors on account of worn-out insulation. The machine straightens the wire and then winds it with a flat eighteen-strand cotton string. Before the advance



DETAILS OF SPECIAL TIE PLATE

mately 30 miles of track with 100-lb. T-rail on oak ties and used these tie plates. C. L. Hawkins, engineer maintenance of way, reports that sections of this track have been opened up at a number of locations, but that no instance has been found where a tie plate had become loosened, or where there was any excessive vibration when the cars passed over the track.

In the St. Louis construction the tie plates are fastened down with standard 7/8-in. x 6-in. screw spikes and the prongs hammered down over the rail base with a sledghammer and afterwards flattened by a special

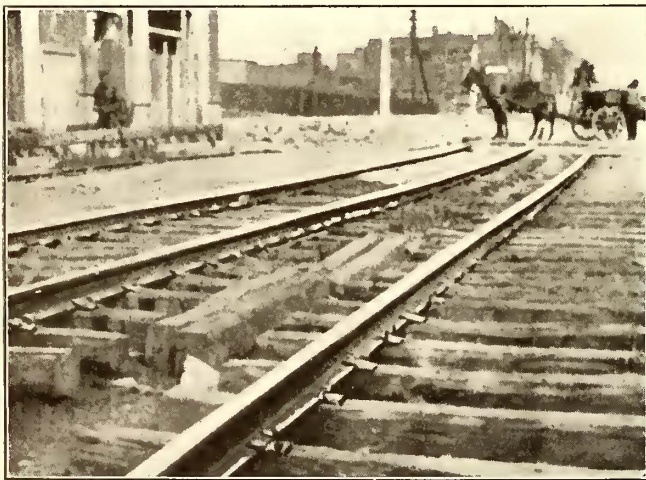


MACHINE FOR REINSULATING WIRE

in prices the company reinsulated its wire at a cost of less than 1 cent per pound and the original cost of the machine, approximately \$500, was saved during the first year of its service.

### Old Trolley Retriever Used to Coil Up Test Leads

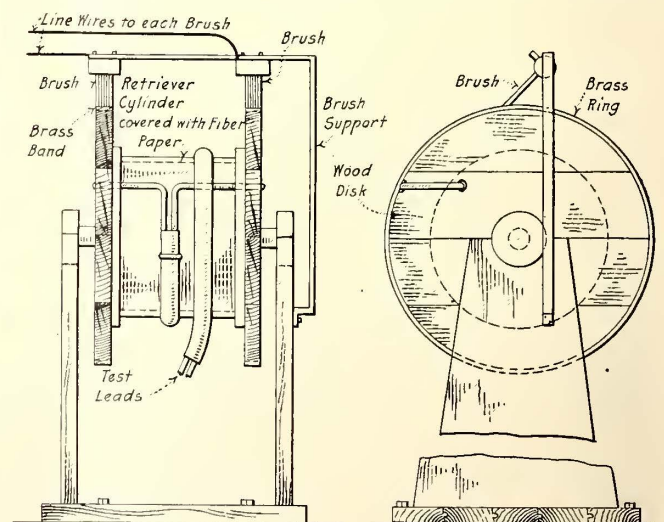
In testing motors and other electrical equipment in the shops the current is often taken from the switchboard by leads several feet in length. The Knoxville Railway & Light Company, Knoxville, Tenn., uses an old



SPECIAL TIE PLATES IN ST. LOUIS TRACK

tool. Little trouble has been experienced with the prongs breaking off when hammered down. A very low carbon steel, ranging from .10 to .20 carbon content is used in the manufacture of the plate and when properly cooled after forging, the steel bends without cracking. The tie plates cannot be taken out of the track and used over again, since the prongs will not stand the extra bending.

The above illustration shows an installation of these tie plates on a section of track under construction in St. Louis, Mo. In this case they were used with hewn ties.



OLD TROLLEY RETRIEVER MOUNTED TO COIL UP TEST LEADS

trolley retriever to keep such leads off the floor. Flexible leads are used and the current is supplied to them through two slip rings attached to the retriever. The leads reach 10 ft. when unwound, and when not in use the retriever promptly coils them on its drum.

# News of Electric Railways

Traffic and Transportation

Financial and Corporate

Personal Mention

Construction News

## Chicago Men Reject Increase

President Busby of the Surface Lines, in Answer to Union Demands, Grants Two-Cent Wage Increase but Refuses Eight-Hour Day Basis—Negotiations to Continue

In a letter dated June 2 to William Quinlan, president of Division 241 of the Amalgamated Association of Street & Electric Railway Employees of America, Leonard A. Busby, president of the Chicago Surface Lines, made answer to the demands of the union which were given in detail in the *ELECTRIC RAILWAY JOURNAL* of May 12, page 887. These demands included two principal questions, the first being the substitution of an eight-hour day for the present ten-hour day, and the second, a wage increase to a maximum of 50 cents an hour, intended to cover the shorter working hours and the increased living costs. In answer to the first, President Busby's letter reads as follows:

### MR. BUSBY'S ANSWER

"The average over-all time of our scheduled runs is now barely ten hours, and of this at least one hour is bonus time—that is, time for meals, and time for preparing for and closing the day's work—so that the actual time in operation of cars is nine hours or less, for which ten hours' time is paid. Our present working hours—an average day of ten hours, with a minimum of nine hours and a maximum of eleven hours—were fixed by mutual agreement in 1912 and again in 1915. There is no apparent reason at this time for the reduction of these hours, while on the other hand there is every reason why these hours should be maintained. We are engaged in raising an army of 2,000,000 men. A few days ago in this city at a public meeting the labor representatives of Great Britain stated that for every soldier at the front at least five additional men were required to supply him with arms, ammunition, food and clothing. An army of 2,000,000 men in the field means that upward of 10,000,000 others will be taken away from their actual work and employed in carrying on the war. The reduction of our working hours at a time when the country is mobilizing its full man power for the great conflict is, in our opinion, unwise and wholly unwarranted."

In taking up the matter of wage increase reference was made to the unprecedented wage increase which was granted to the trainmen in 1915. This was far in advance of later wage increases in other industries, brought out during the past year by war conditions. The present wages were shown to be higher than those paid to street railway employees in ten of the principal cities of the nation. The single exception to this is Detroit, where, owing to the concentration of the automobile industries, an unusual labor condition exists. On account of this the Detroit United Railway is unable to get enough men to handle its cars. President Busby said that the maximum wage of 40 cents an hour which has just been fixed in Detroit is by no means as advantageous to the employees from an earning standpoint, taking into account the working conditions and allowances for bonus time, as are the conditions under the present wage scale and contract in Chicago. Mr. Busby also called attention to the high rentals in Detroit and to the materially higher general living costs which prevail in Detroit as compared with Chicago. He said that owing to the combination of interurban rates of fare with city rates, the Detroit United Railway receives an average fare per passenger more than 15 per cent higher than the average fare in Chicago. Mr. Busby said further:

"The remedy in this situation is not in continuing to increase wages to meet inflated prices in food commodities, but in inducing the government to exercise its unquestioned power properly to administer food supplies to prevent speculation

and abnormal profit taking. There is now and will continue to be plenty of food in this country for all. There is no warrant for our present food prices. They must and will be reduced. Public opinion is being aroused, and since you presented your contract two weeks ago there has been a marked decrease in prices. We have undoubtedly seen the worst of this situation, and should look forward with confidence to a decline of the present prices to some reasonable basis under governmental direction. Were we to attempt to meet this situation by constant wage increases, which frankly we cannot do, the relief for you would only be temporary, and for this company and all other companies similarly situated the result would be bankruptcy.

"On the other hand, with a fixed rate of fare, the company is obliged to meet a heavy increase in operating expenses due to the increased cost of operating material and supplies. This increase on some articles ranged from 100 per cent to more than 200 per cent during the last eighteen months. The total increase in operating expenses, due to increasing costs of material alone, will be approximately \$500,000 and contract prices for next year are still higher.

"Last year, the best in our history, we had an increase of nearly 10 per cent in gross. Our operating material and supplies were purchased in advance at normal prices. We had a favorable year and earned 6½ per cent on our certified capital. This year the increase in our gross is less than half that of last year, and with the increased operating expenses mentioned, our net earnings are materially less than those of last year. These are facts which you can readily verify.

### NOTHING TO WARRANT WAGE INCREASE

"There is nothing, therefore, in the present situation, from the standpoint of the company, to warrant a wage increase. We have, however, endeavored to meet a difficult situation in a spirit of utmost fairness, and have decided to offer the men in the train service an increase of 2 cents an hour, applied uniformly to each grade in the present scale. A similar increase is offered to employees in the mechanical departments working about shops and car stations, as shown by the following scales:

WAGE SCALES		
Class	Present Rate per Hour	New Rate per Hour
Trainmen—Passenger Service:		
First three months	27 cents	29 cents
Second three months	29 cents	31 cents
Second six months	30 cents	32 cents
Second year	32 cents	34 cents
Third year	33 cents	35 cents
Fourth year	34 cents	36 cents
Fifth year	36 cents	38 cents
Motormen on sprinkler and supply cars.	32 cents	34 cents
Trolley boys on sprinkler and supply cars	23 cents	25 cents
Snowplows and sweepers.	36 cents	38 cents
Night cars	\$3 for 8 hours or less	\$3.20 for 8 hours or less
Car repairers, motor repairers, inspectors, dopers and body repairers:		
First year	\$2.40 a day	\$2.60 a day
Second year	\$2.70 a day	\$2.90 a day
Third year	\$3.00 a day	\$3.20 a day
Car placers:		
First year	\$2.40 a day	\$2.60 a day
Second year	\$2.75 a day	\$2.95 a day
Car cleaners, switchmen, terminal men, etc.:		
First year	\$2.10 a day	\$2.30 a day
Second year	\$2.40 a day	\$2.60 a day
Mechanics in west shops	2 cents an hour increase	

"This wage increase on the basis of the present hours will, when effective, show the following results to our trainmen:

"Regular trainmen, more than 7000 in number, will receive an average wage in excess of \$1,150 a year. Extra trainmen, more than 2000 in number, will receive an average wage in excess of \$950 a year. All trainmen, including regulars and extras, will receive an average wage in excess of \$1,000 a year. These men average ten hours a day paid time and not to exceed twenty-six days a month.

"We submit that this showing is not equaled by the earnings of street railway trainmen in any other large city in the United States. It would naturally be expected that such a wage scale would cause the train service to be regarded as a highly desirable employment, and such is the fact, even under present conditions. The number of applicants for positions in our train service is at present far in excess of our requirements.

"In this connection we desire to call your attention to the fact that the proposed wage increase, together with the increased cost of operating material and supplies, will impose a burden of more than \$1,250,000 a year upon the companies."

Mr. Busby's letter further states that any and all questions which either party may desire to submit to arbitration, provided this agreement is not accepted, will be arbitrated by the method provided under the present contract. The new contract submitted for the approval of the men is unchanged except for the wage scale. It will take effect as of June 1, 1917, and will run for a period of three years.

At a meeting on June 5 the union voted to reject Mr. Busby's offer and directed its committee to continue negotiations, but with instructions that nothing less than the original demands would be satisfactory to the union.

## Washington Strike Inquiry

A Few of the Important Points Are Touched Upon That Have Been Covered by Recent Witnesses Before the Investigating Committee

William F. Ham, vice-president of the Washington Railway & Electric Company, Washington, D. C., was a witness on May 23 before the committee of the Senate which is inquiring into the recent strike of the employees of the company. Mr. Ham said that in the absence of anti-strike legislation or compulsory arbitration the company considered the individual contract the best preventive of strikes. He again made clear the distinction constantly drawn by the officials of the company between refusal to deal with committees of the Amalgamated Association and willingness to treat with committees of the employees. He reviewed some of the strike history of New York last fall and cited the breaking of contracts there by the Amalgamated Association as indicative of the irresponsibility of that organization.

### COLLECTIVE BARGAINING DISCUSSED

Senator Pittman, chairman of the investigating committee, cross-examined Mr. Ham as to the attitude of the company toward any collective bargaining with the men. Mr. Ham protested against Senator Pittman's interpretation that when the letter of President King of the company was sent to the men on Feb. 27 the company had no idea of dealing with the men collectively. Mr. Ham said that if the men had advanced some proposition eliminating the union it might have been adopted. The only assurance that the company had received from the District Commissioners, who sought to bring the men and the company together, was that the men would accept a contract similar to that entered into with the Capital Traction Company. Mr. Ham also went at length into the workings of the relief association of the company.

At a subsequent hearing the committee inquired into the history of the drafting of the individual contract offered by the company. Among those who testified were S. R. Bowen, secretary of the company, and J. S. Barbour, its general counsel. Mr. Bowen said that his attention had been called to the individual contract by President King in the summer of 1916. He looked into the matter and passed a draft of it to Mr. Barbour. Mr. Barbour said that he had gone over the draft as presented to him by Mr. Bowen; that he had offered suggestions for changes, and that from that time on he had not seen the contract or discussed it with any of the officers of the company until it was presented to the men. Another feature taken up at this session was the question of representation of the public on the board of directors of the company. Mr. Barbour thought that the interests of the public were well cared for by the Public Utilities Commission.

Mr. Bowen was again a witness on May 26. He said that he could not advocate collective bargaining which recognized

the right of the men to strike in a body. He considered that employees of a public utility had no more right to strike in a body than had government employees.

At the hearing on May 29, at which President King was a witness, Senator Pittman, chairman of the investigating committee, said that it seemed to him that the company was contending that it was willing to enter into a collective agreement with the men if the union could be eliminated and at the same time knew that the union dominated the situation and could not be eliminated. George P. Hoover, counsel for the company, insisted that Senator Pittman was drawing a wrong conclusion from the testimony. Mr. Hoover contended that the company had been ready to go forward in good faith under the agreement of 1916; that the union had violated the agreement in issuing the pamphlet in which it stated that the company had entered into an agreement with the union, when it had not done so, and that the union had attempted to force non-union men into the union. He insisted that there had been no deviation in the policy of the company.

### PRESIDENT KING FAVORS STRIKE PREVENTION LEGISLATION

President King was a witness again on May 31. He was in hearty accord with the sentiment of Senator Pittman that it seemed desirable for Congress to take up the question of legislation calculated to prevent strikes in the future in the District. Mr. Vahey for the union read into the record the individual contract of the Indianapolis Traction & Terminal Company with its men. Mr. King admitted that it was substantially the same as that of the Washington Railway & Electric Company. He said that he knew about the Indianapolis situation and told Mr. Bowen, secretary of the company, to inquire into the matter.

There was no session of the committee on June 4. On June 5 Mr. Ham went into the matter of the re-employment of a motorman who had been in an accident, and employees of the company who had long been in its service reviewed the conditions under which they have worked.

## Chicago Traction Bills Passed

Four Bills Before State Legislature Passed by the Senate and Now Before the House

The thirty-year franchise bill for Chicago, the bill permitting the merger of the surface and elevated lines, the home-rule bill and the bill giving the city the right to construct subways have all passed to the third reading in the State Senate. There was little discussion of these bills at the third reading either by the supporters or by the opposition, and in no case was the necessary vote of twenty-six registered in favor of the bills.

The test vote permitting the merger of the surface and elevated lines went through the third reading by a vote of twenty-four to four. A similar test vote during the consideration of the home-rule bill resulted in its approval by a vote of twenty-four to seven. This measure had previously been amended to apply to the transportation interests in Chicago only and thus leave the other utilities under State control.

Former Governor Dunne and a delegation from Chicago who were opposing the traction plans were questioned by Walter L. Fisher, special counsel for the Chicago local transportation committee. Mr. Fisher argued in favor of the bills as offering the most promising immediate solution of the Chicago traction congestion. Mr. Dunne charged that the purchase price of \$70,000,000 fixed for the elevated roads by the Traction & Subway Commission was excessive by at least \$7,000,000, on which amount the city would be required to guarantee 6 per cent interest under the consolidation plan.

All four Chicago traction bills were passed by the State Senate on June 6. The vote on the measures was as follows: Home rule, twenty-eight to six; franchise, twenty-seven to fourteen; merger, twenty-six to eleven; subway, forty to five. It was intended to report the bills to the House on the morning of June 7. If the measures are passed by the House negotiations will be resumed with the City Council. Considerable time will probably elapse before a final ordinance is agreed upon. The ordinance so drafted must then go to a referendum vote.

## Bids Asked for Cascade Electrification

The electrification department of the Chicago, Milwaukee & St. Paul Railway at Seattle, Wash., recently sent out specifications for the electrical equipment, including locomotives, generators, etc., to be used in the electrification of the Cascade Mountain division, from Cle Elum west to Seattle and Tacoma. It is expected bids for this equipment will be in by July 1. In calling for bids the company specified that delivery must be made as early as possible, in order that the division may be completed and in operation by Oct. 1, 1918.

## Seattle Bridge Conference Results

### Some Recent Matters Up for Settlement Between Street Railway and City Reviewed Briefly

The City Council of Seattle, Wash., is considering an ordinance introduced by Councilman Oliver T. Erickson, fixing the rental to be charged the Puget Sound Traction, Light & Power Company for the use of bridges across Lake Washington Canal, at Fremont Avenue, Fifteenth Avenue, N. W., Tenth Avenue N. E., and across the West Waterway at West Spokane Street. The bill tentatively fixes the rental for the use of the Fremont Avenue bridge at \$804 a month, plus the cost of current used for the operation of cars over the bridge at the rate of 1 cent a kilowatt-hour. A. H. Dimock, city engineer, and A. L. Valentine, superintendent of public utilities, in a recent report, recommended a rental of \$7,586 a year, plus one-third of the cost of maintenance, or about \$633 a month. Mr. Erickson's bill also provides that if another street railway or the city itself should use the bridge for street railway purposes a pro rata amount shall be paid by the new tenant of the bridge, based on the number of cars in service.

#### CITY ABANDONS FIGHT

The city's fight for common user rights on Third Avenue with the Puget Sound Traction, Light & Power Company was virtually abandoned with the submission to the Council of the report of the conference committee, headed by Councilman Erickson, and the reference of the recommendations of the conference committee to the franchise and city utilities committees. The report indicates that nothing was accomplished at the several conferences with the officials of the Puget Sound Traction, Light & Power Company. A. W. Leonard, president of the company, refused to consider any proposition that included common user rights for the city lines on Third Avenue. The recommendations made by the committee follow:

"The corporation counsel, after a careful study, is of the opinion that the city may tender a rental proposal for crossing the Fremont Bridge, but that it could not be enforced, notwithstanding the company has refused to pay any portion of the cost of the bridge. He suggests that two methods of procedure are open for consideration. One is to revoke the company's franchise for failure to comply with its provisions. The other is to formulate a demand for a fair lump sum proportion of the total cost and a monthly contribution for maintenance and operation based on the franchise, and to bring suit in the case of refusal. In order that the company may have a rental proposal to consider, an ordinance of that sort has been prepared for introduction.

"The revocation of the company's franchise has not been considered by your committee. Such action presents many angles. Although the company has refused to comply with nearly all of its obligations, revocation may not be the best method of proceeding. The matter of enforcing a lump sum contribution with monthly charges for maintenance and operation will be considered while the rental ordinance is pending.

"In the matter of securing running rights on Third Avenue, the corporation counsel advises that it may be done by condemnation. This method would be tedious and the terms to be secured are an unknown quantity. Furthermore, we have already secured such rights on Fourth Avenue and would therefore recommend that further negotiations with the company on this matter be dropped."

## "Times" Tackles Toledo Traction

### Paper Discusses Local Traction Muddle in Terms Uncomplimentary to City Officials

The Toledo (Ohio) *Times* continues to discuss the street railway situation in terms that are far from complimentary to the Street Railway Commission and Mayor Milroy. It urges that something can and should be done at once to settle the controversy and that the city cease to await the pleasure of the commission in making its report to the Mayor. The paper doubts the feasibility of the community plan which has been worked out by the commission and believes that a substantial business proposition of some kind should be presented to the city.

The commission has never made a report of its work to Mayor Milroy and has as yet fixed no time for giving him official information along this line. The *Times* considers this as discourtesy. It argues that both the Mayor and the people are entitled to official information as to what has been done and should not be forced to depend upon newspaper reports. Two members of the commission are, by the way, the heads of Toledo papers.

The *Times* says that excess fares are being collected through the suspension of the workmen's 3-cent hours. This means that \$700 a day is being collected from workmen and transferred to the company's treasury. Of this one-half goes to a fund for the purchase of cars and for improvements, while the other is absorbed in an increase in the wages of motormen and conductors. The *Times* estimates that this excess, since April 10, 1916, aggregates \$287,700, or a return of 6 per cent on a capitalization of \$4,250,000. The *Times* does not criticize the company, but it does argue that the business should be placed upon a substantial and permanent basis of some kind.

#### PAPER RAPS TOLEDO COMMISSION

In commenting recently on the Street Railway Commission and its work the *Times* published the following editorial:

"The hostile attitude exhibited by Johnson Thurston toward the Rail-Light is so utterly at variance with the attitude of his 'co-commissioners' that it is evident there is no longer harmony within the organization. The *Times* has suspected as much for some time.

"It is apparent now that the 'car commission' as constituted will never agree on an ordinance to be submitted to the people and, this being the real state of affairs, Mayor Milroy should promptly relieve it from further duty. Then, if he is still of the opinion he expressed just after his election, he should try again. If he has kept in close touch with the street car situation of Toledo he should know that conditions are even worse than they were when he first appointed the committee. The car riders are not getting any better service and they are paying more for it. What they want is improved service and lower fares. The Dotson ordinance provided both. It was defeated largely through the efforts of the men who, because they claimed to know how to draft a better ordinance, were called upon by the Mayor to do the work. They have been at it intermittently for seventy-nine weeks and have produced nothing. There is no visible evidence that they intend doing anything. Whether they have deadlocked with Henry or with one another is immaterial. They have been on the job quite long enough to prove that they are either inefficient or disloyal to the city.

"What are you going to do about it, Mr. Mayor?"

On the evening of May 28 the City Council adopted the resolution providing for an amendment to the city charter which will allow the issuance of bonds for the purchase of the street railway property. The plan contemplates an issue of \$1,500,000 of bonds, from the proceeds of which a cash payment will be made. There will be another issue of similar amount which the company will be asked to accept. The amendment to the charter is to be voted on at the August primaries, while the question of issuing the bonds will be placed before the voters at the November election. In the meantime the city will be asked to furnish funds to provide for a valuation of the property.

## Relief Opposed in Rhode Island

Thomas Walsh, chairman of the committee on railroads of the City Council of Providence, R. I., has announced that the committee will oppose any plan for the city to release the Rhode Island Company from any of its many financial obligations. His statement followed a meeting of the committee held on May 31. Mr. Walsh said:

"The committee has decided absolutely against any change in the financial conditions of the franchise of the Rhode Island Company. The decision is final. No report will be made to the City Council, for we have nothing to recommend."

The obligations from which the company asked to be excused call for the payment annually of approximately \$200,000 into the city treasury. The records of the city auditor show the following payments for last year: franchise tax, 5 per cent of gross receipts, payable quarterly, \$110,000 a year; annual payment for sixty years, of interest at 4½ per cent, on one-third of the cost of widening streets, \$35,000 a year; maintaining parts of the streets between rails, \$50,000 a year.

## Storm Stops Interurban Service

In the recent tornado which swept southern Illinois and caused great ruin in Mattoon and Charleston, the city lines in Mattoon and the interurban railway connecting Mattoon and Charleston, both owned by the Central Illinois Public Service Company, were more or less damaged. Service was restored on the city line within a few hours after the storm had passed since only a small amount of overhead construction was damaged. Trees blown across the tracks had to be removed.

On the interurban line, however, nearly 50 per cent of the pole lines which carried the overhead construction and a three-phase transmission line connecting Charleston and Mattoon was blown down. A car which was on the line happened to be in a cut during the worst of the storm and received practically no damage. Service was restored over a portion of the interurban line on June 1, and through service between Charleston and Mattoon was begun on June 3.

The power house at Mattoon escaped injury. The station at Charleston was rather badly damaged. The walls and roof collapsed and the stack was blown over, but practically no damage was done to the station equipment. Service was restored in this plant on June 1.

## Commission to Govern City Utilities

### Cincinnati Rapid Transit Commission Seeks Jurisdiction Over All Utilities in the City

At a meeting of the Rapid Transit Commission of Cincinnati, Ohio, on June 1 a resolution was adopted requesting the New Charter Commission to include in the proposed city charter a provision clothing the Rapid Transit Commission with supervision of all public utilities. Chris Schott, who submitted the resolution, and E. H. Dornette were appointed as a committee to confer with City Solicitor Groom and Frederick S. Spiegel, counsel for the commission, as to the legality of such a provision. Should there be no legal obstacles, the committee will appear before the Charter Commission to recommend its adoption. While the Cincinnati Southern Railroad, which is owned by the city, is not mentioned in the resolution, it is understood that it will be included with other utilities as coming under the supervision of the commission, should the Charter Commission adopt the plan.

Chairman E. W. Edwards of the Rapid Transit Commission and Chris Schott constitute a committee which will urge delay in granting the Cincinnati, Newport & Covington Street Railway a franchise until it can be determined whether the proposed tracks on Walnut Street south of Third Street will interfere with the construction of the loop tracks.

Frank S. Krug, chief engineer of the commission, reports that he has a force of men making measurements of foundations of buildings on Walnut Street along the proposed subway route.

## Arbitration in East St. Louis

### This Method Adopted After Conferences Between Company Officials and Men Fail

A conference of the Mayors of several East Side cities, called by Mayor Mollman of East St. Louis for June 1, averted the threatened strike of 600 motormen and conductors of the East St. Louis & Suburban Railway, the employees of which had voted to walk out at 5 a. m. on June 2. The conference was held in the City Council Chamber, East St. Louis. It was attended by the officials of the railway, representatives of the car men's union, the Mayors of Alton, Edwardsville, Collinsville, Belleville and other East Side towns touched by the system. Both sides agreed to arbitrate the differences. Each side is bound to accept the finding of the committee. The committee is composed of Al Towers, representative of labor in Belleville, Ill., for the employees, and C. E. Smith, a civil engineer of St. Louis, for the officials. It was expected that a third arbitrator would be selected later.

The motormen and conductors wanted the flat rate system continued. This method of payment has been in effect since the lines of the East St. Louis & Suburban Railway were built. The officials of the company wanted to put a sliding scale into effect by which new men would receive less than veteran employees. The company contended that a man who had worked for years knew his run and his passengers and was worth more than a new man. The employees argued that if the old timers were paid the top wages they would be the first to go in case of a desire on the part of the company to reduce expenses. The question of wages is practically the only one for the committee to decide. At present all conductors and motormen on the local lines are paid 27 cents an hour and work between nine and ten hours. The men working on the interurban lines are paid 28 cents an hour. The local men are asking for 38 cents an hour and the interurban men for 48 cents an hour.

At the conference on June 1 Mayor Mollman of East St. Louis told the railway officials that the men were decidedly opposed to a sliding wage scale. He pleaded with the company because of the general industrial unrest on the East Side, not to delay a peaceful settlement by insisting on a sliding scale. After consultation the officials announced they would eliminate this feature from consideration. The representatives of the railway and of the motormen and conductors have been conferring for several weeks. A two-year working agreement between the company and car men expired on May 1. Heretofore this has been renewed within ten days.

C. E. Smith, selected by the officials of the railway as their representative on an arbitration committee, and Al Towers, chosen by the employees of the road to look after their interests, are holding daily conferences in an effort to settle the differences between the railroad officials and the employees. Up to June 7 the third member of the committee had not yet been named and no third party will be named if the differences can be adjusted without one. Thus far, however, there has been no indication of the possible outcome of the conferences between the two arbitrators. Meanwhile the operation of the railway line is being continued as usual.

## Rapid Transit Progress in New York

The Interborough Rapid Transit Company contemplated the beginning of service on the West Farms connection between the Second and Third Avenue elevated lines and the West Farms branch of the first subway on June 1, but found it necessary to report to the Public Service Commission for the First District that this operation must be postponed for upward of a month. After an examination of the new line operating officials of the company informed the commission that they deemed it unwise to begin operation without a complete set of signals to govern the running of the Second Avenue express trains which in the morning and evening rush hours will use this connection.

The Public Service Commission for the First District recently directed that operation of a portion of the new Jerome Avenue elevated line in the Bronx should begin on June 2 at 2.30 p. m. The portion placed in service is part

subway and part elevated railroad and extends from 149th Street and Mott Avenue north to Kingsbridge Road and Jerome Avenue. It is expected that the whole line will be placed in service in the fall in connection with the new Lexington Avenue subway, of which the Jerome Avenue branch is a part. The Lexington Avenue line forks in the vicinity of 135th Street and one branch extends to the eastward to Pelham Bay Park, while the other reaches north under Mott Avenue and other thoroughfares as a subway to 157th Street and thence extends as an elevated railroad over River and Jerome Avenues to Woodlawn Road and Van Cortlandt Park. It was arranged that regular passenger service should be begun immediately, passengers obtaining access to the line by way of the Mott Avenue station of the first subway, which is adjacent to the 149th Street station of the Jerome Avenue line.

Subway travel from the Pennsylvania Station to Times Square is possible now. A completed spur on the new Seventh Avenue line between those points was opened to the public on June 4. By use of the new spur the Grand Central Terminal and the Pennsylvania are brought nearer together, as passengers on one fare with little inconvenience can go from or to the old subway at the Times Square station, where a transfer station has been established.

The north headings of the new subway tunnel between Whitehall Street, Manhattan, and Montague Street, Brooklyn, were joined underneath the East River on June 2. The south headings will be "holed through" and joined within the next two or three weeks, according to reports made by engineers to the commission. This tunnel, which will eventually be operated as a part of the Broadway-Fourth Avenue subway system by the New York Consolidated Railroad, Brooklyn, has been under construction since 1914. A little less than a year more must elapse before the tunnel is completed and ready for operation. With the headings of the Whitehall-Montague Street tunnel joined, two of the four new rapid-transit tunnels under the East River being built as a part of the dual system of rapid transit will be well on the way to completion.

## Conference Held in Philadelphia

The suggestion of Senator McNichol made at Harrisburg, Pa., on May 29 in regard to the pending transit bills for Philadelphia has been adopted. He recommended at that time that the representatives of the city and the Philadelphia Rapid Transit Company get together and confer further with respect to the differences between them. The first of these renewed conferences looking toward an agreement for the operation of the city-built high-speed lines was held on June 1. It was participated in by E. T. Stotesbury, Ellis Ames Ballard, and A. L. Drum for the company and Joseph Gaffney, chairman of the finance committee of the Councils; City Transit Director W. S. Twining and William Draper Lewis, the city's legal adviser, for the city. They engaged in what was said to be a "full, frank, free and friendly discussion" of the points at issue and the pending legislation. The result was announced to be "satisfactory progress for the city's interests."

**Increase in Wages on Morristown Line.**—The wages of all the employees of the Morris County Traction Company, Morristown, N. J., except the executive heads have been increased about 10 per cent.

**Kansas Road to Purchase Power.**—A contract has been closed by which the Union Traction Company, Coffeyville, Kan., will purchase energy from the Kansas Gas & Electric Company, which has power plants at Independence, Cherryvale and other points.

**Increase in Wages in Davenport.**—Employees of the Tri-City Railway, Davenport, Iowa, will soon receive an increase in wages of 1 cent an hour, effective on June 1. Under the new scale trainmen will receive 27 cents an hour the first year, 28 cents an hour the second year and 32 cents an hour the third year. For overtime the men receive the regular scale plus 7 cents an hour.

**Seek a Voluntary Increase in Wages.**—Officials of the local branch of the Amalgamated Association at Cleveland, Ohio, are preparing a table of price increases on foodstuffs

since the contract of the men with the Cleveland Railway was signed in May, 1916, with the idea of showing the company why a voluntary increase in wages should be made. Under the contract the men received an increase of 1 cent an hour, beginning with May 1, this year.

**Summer Engineering Courses at Wisconsin.**—The nineteenth annual summer session of the College of Engineering of the University of Wisconsin will be held at Madison during the six weeks' period beginning June 25. Special courses will be given in chemistry and in electrical, steam and hydraulic engineering, gas engines, machine design, mechanical drawing, mechanics, shop work and surveying. All the courses are open to engineering students.

**Electric Operation of Corvallis Line on July 1.**—The work of completing the electrification of the 40 miles of line of the Southern Pacific Company between Whiteson and Corvallis, Ore., has been further delayed by inability of the manufacturers to deliver the electrical apparatus. According to J. H. Dyer, assistant general manager of the company, the line will be ready for electric service about July 1 unless some delay not now apparent should arise.

**Preparing for Arbitration at Alliance.**—Charles R. Morley, president of the Cleveland, Alliance & Mahoning Valley Railway and the Stark Electric Railway, has selected J. H. Alexander of the Cleveland (Ohio) Railway as arbitrator in the wage dispute which was one of the factors in the strike recently settled. The men demanded an increase of 5 cents an hour. President Morley offered an increase of 2 cents an hour to the men on the Cleveland, Alliance & Mahoning Valley Railway and 3 cents an hour on the Stark Electric Railway.

**Increase in Wages in Phoenix.**—Word was received at Phoenix, Ariz., on May 16, that the increase in wages of 5 cents an hour asked for by the employees of the Phoenix Railway has been granted by Gen. M. H. Sherman, president of the company, in Los Angeles, as a result of conferences with S. H. Mitchell, general manager. General Sherman is reported to have stated that while the resources of the company would not permit the increase, he would send his personal check to cover the increase for a period of three months, during which time it is hoped that a plan to make the advance permanent may be worked out.

**Condemnation of Duluth Line Threatened.**—Immediate steps for the condemnation of the Duluth (Minn.) Street Railway, under the exercise of the right of eminent domain, have been ordered by the Duluth City Commission. Frank Crasweller has been appointed a special attorney for the city to take whatever steps may be necessary to carry the commission's resolution into effect. The resolution provides for payment of "a fair price as a going concern." The action by the city in this connection is generally regarded as a counter move by the city in the so-called 10-cent fare case involving suburban lines, to which reference has been made previously in the *ELECTRIC RAILWAY JOURNAL*.

**Rushing the Railroad Rate Hearing.**—Testimony in the railroad rate hearing is proceeding before a special examiner, as well as before the full Interstate Commerce Committee, and the hearings on the petition of the railroads for a 15 per cent advance in freight rates are being rushed to allow all the parties to put in appearances before June 7, when the case against the carriers is to be closed. Next week representatives of shippers in diversified industries from several sections, as well as state railroad commissions, will present additional protests, and on Thursday and Friday the carriers will introduce testimony in rebuttal. Final arguments for all interests will be heard June 9, 11 and 12.

**Further Seattle Bridge Conferences Probable.**—As an alternative to a suit against the Puget Sound Traction, Light & Power Company, Seattle, Wash., the majority of the members of the City Council has agreed to a proposal that the company pay \$1,000 a month for the use of the Fremont Avenue bridge. This included \$804 a month as a rental equivalent to the company's share of construction and \$196 for the cost of operation. It is possible that the new proposal will result in a renewal of conferences between the company, on one hand, and the Councilmen, Superintendent of Public Utilities A. L. Valentine, and Corporation Counsel Hugh M. Caldwell on the other. At the committee confer-

ences Councilman R. H. Thomson alone dissented. He expressed doubt as to whether the company could in fairness be charged for the operation of the bridge.

**Public Service Commission for Porto Rico.**—Congress, by an act approved on March 2, 1917, provided for a public service commission in Porto Rico. A new Legislature and the public service commission for which provision has been made will be organized on Aug. 13, 1917. This public service commission will supersede the executive council and the committee on franchises and public service corporations in the granting of franchises, privileges and concessions, and will have jurisdiction over rates, rules and regulations, service and protection from competition. The public service commission will be formed by the following six heads of Porto Rican departments: Attorney general, treasurer, commissioner of the interior, commissioner of education, commissioner of health and commissioner of agriculture and labor, together with the auditor of Porto Rico, who under the law is not considered as a head of department, and two commissioners to be elected by the voters of Porto Rico, a total of nine. The commission will choose its own personnel.

**Sixty-ninth Street Terminal, Philadelphia, to Be Improved.**—Increased terminal facilities for West Philadelphia and a station almost twice the size of the present Sixty-ninth Street terminal are projected by the West Chester Traction Company and the Philadelphia Rapid Transit Company. A new station that will handle twice the number of persons, eight tracks for the West Chester Traction Company in place of the five now in use, expansion and extension of the Philadelphia Rapid Transit Company terminus and moving the West Chester turnpike 60 ft. to the south are some of the improvements contemplated to handle the increasing growth of traffic at the point where Delaware County adjoins the city. To increase the size of its terminal required the purchase of additional land to the south of West Chester turnpike. Some of the property holders demanded such a price for their land that the company was forced to begin condemnation proceedings. The Sixty-ninth Street station is one of the most important suburban electric railway terminals in the East.

**Norfolk Franchise Conferences Resumed.**—Several conferences have been held recently at Norfolk, Va., between representatives of the City Council and officers of the Virginia Railway & Power Company. The first of these was between officials of the company and members of the gas and electricity committee. Henry W. Anderson, counsel for the company, saw no hope for a readjustment of the light and power rates downward. He predicted an increase of \$500,000 in operating costs to the company in Norfolk alone for the coming year. At a subsequent meeting with members of the franchise committee Mr. Anderson was asked to prepare a definite proposition that would embrace universal transfers, uniform paving obligations and a re-routing plan. The city, on the other hand, if members of the committee voiced the sentiments of the Council, would be willing to abandon its request for six tickets for a quarter, and would concede abolition of reduced fares. Partly to compensate for the expense of uniform transfers and the construction of new lines, regulation of jitneys was promised.

## Program of Association Meeting

### Central Electric Railway Accountants' Association

Under date of June 5 President O. A. Small of the Central Electric Railway Accountants' Association sent the following letter to members:

"After due consideration by the officers and executive committee the meeting scheduled to be held in Fort Wayne, Ind., on June 8 and 9 is hereby cancelled.

"In the cancelling of this meeting the officers and executive committee of the Central Electric Railway Accountants' Association do not intend that the organization will be of any less value to its members than it has been heretofore, but that the energy of the association will be devoted to the various problems which present conditions have presented before us."

# Financial and Corporate

## Annual Reports

### Newport News & Hampton Railway, Gas & Electric Company

The income statement of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., for the year ended Dec. 31, 1916, follows:

Railway revenue .....	\$414,518
Gas revenue .....	142,779
Electric light and power revenue .....	253,891
Ice revenue .....	202,523
<b>Total operating revenues .....</b>	<b>\$1,013,711</b>
Railway expenses .....	\$229,824
Gas expenses .....	75,425
Electric light and power expenses .....	109,896
Ice expenses .....	143,397
<b>Total operating expenses .....</b>	<b>\$558,542</b>
<b>Net operating revenues .....</b>	<b>\$455,169</b>
Taxes .....	35,519
<b>Operating income .....</b>	<b>\$419,650</b>
Non-operating income .....	3,273
<b>Gross income .....</b>	<b>\$422,923</b>
Income deductions .....	234,491
<b>Net income .....</b>	<b>\$188,432</b>

The total operating revenues of the company in 1916 showed an increase of \$97,540 or 10.65 per cent over those of 1915, while the net operating revenues gained \$63,503 or 16.21 per cent. The earnings in all departments showed increases because of good business conditions in the company's territory, owing to activity in shipbuilding and shipping. The revenues of the railway department increased \$58,895 or 16.56 per cent in 1916, while the operating expenses rose \$2,574. The gas revenues gained \$9,860 or 7.42 per cent; the electric light and power revenues, \$39,112 or 18.21 per cent, and ice revenues, \$18,672 or 10.16 per cent.

The operating expenses of the combined departments rose \$34,036 during the year, but the operating ratio fell from 57.25 per cent in 1915 to 55.09 per cent in 1916. The gross income gained \$57,048 or 15.59 per cent, while income deductions decreased slightly on account of the retirement of bonds. As a result the net income showed a gain of \$58,468 or 44.98 per cent. Of this \$71,208 or 7.03 per cent of the gross revenues was credited to the reserve for depreciation, extraordinary renewals or purchase of bonds, as compared to \$25,079 in 1915. The capital expenditures in 1916 were \$151,671, of which \$102,239 was for the railway.

### North American Company

The comparative income statement of the North American Company, New York, N. Y., for the calendar years 1915 and 1916 follows:

	1916	1915
Interest received or accrued .....	\$450,131	\$488,804
Dividends received .....	1,824,278	1,438,028
Profits and compensation for services .....	29,920	28,671
<b>Total .....</b>	<b>\$2,304,329</b>	<b>\$1,956,503</b>
Salaries, legal expenses, net rentals and all other administrative expenses .....	\$77,961	\$77,780
Taxes .....	33,334	10,576
Interest paid or accrued .....	17,491	25,821
Sundry accounts written off and reserves .....	13,625	33,549
<b>Total .....</b>	<b>\$142,411</b>	<b>\$147,726</b>
<b>Net income .....</b>	<b>\$2,161,918</b>	<b>\$1,804,777</b>
Dividends paid and accrued during year .....	1,489,665	1,489,666
<b>Balance carried to undivided profits account .....</b>	<b>\$672,253</b>	<b>\$315,111</b>

The gross income of the North American Company from its holding of stocks and bonds of the various electric light and power and electric railway companies showed a good gain in 1916, and after providing for all expenses and interest charges, the company earned 7.25 per cent on its capital stock as compared with 6.05 per cent in 1915.



Business conditions in the territories in which the company is interested showed a substantial improvement, but the subsidiaries had to bear increased expenses.

In the Wisconsin group the two companies of interest in the electric railway field are the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company. The operating revenues of the Milwaukee Electric Railway & Light Company for 1916 amounted to \$6,961,151, an increase of \$989,436 or 16.57 per cent. The operating expenses, taxes and reserves increased \$766,442 or 18.40 per cent, and interest charges decreased \$34,176 or 4.31 per cent, so that the net income increased \$305,021 or 29.25 per cent. The increase in operating revenues in the railway department was \$700,455 or 17.91 per cent. Expenditures for construction during the year amounted to \$1,005,631.

The operating revenues of the Milwaukee Light, Heat & Traction Company for 1916 amounted to \$1,852,071, an increase of \$371,446 or 25.09 per cent. Operating expenses, taxes and reserves increased \$288,648 or 29.14 per cent, and the net income decreased \$178,754 or 33.98 per cent. The increase in operating revenues in the railway department was \$144,252 or 16.70 per cent. The expenditures for construction during the year were \$286,482.

To take up the railway property in the Missouri group, the United Railways of St. Louis, it may be said that the operating revenues of this company for 1916 amounted to \$12,641,293, an increase of \$960,093 or 8.22 per cent. The operating expenses, including taxes and reserves, increased \$376,933 or 4.23 per cent, and the interest charges rose \$54,712 or 2.10 per cent, so that the net income increased \$621,977 or 234.24 per cent. Expenditures for new construction during the year amounted to \$283,420.

During the year the securities owned by the North American Company were revalued by a committee. The amount at which the 184,000 owned shares of common stock of the United Railways of St. Louis was carried on the holding company's books was reduced to \$1. The net decrease in book value was \$2,600,000, which was charged to the "contingent security depreciation reserve" created in 1914, leaving a balance of \$50,000 to the credit of such reserve.

### Canadian Earnings for 1916

According to the annual returns to the Comptroller of Statistics, the gross earnings from operation of Canadian electric railways for the year ended June 30, 1916, totaled \$27,416,284. The gross in 1915 was \$26,922,899, so that the last year showed a gain of \$493,385 or 1.8 per cent. The 1916 result was still less than that of 1913 or 1914, but greater than that of any preceding year.

In 1915 the passenger earnings had decreased \$2,301,639 or 10.9 per cent, and the freight earnings \$141,869 or 12.6 per cent. This showing, however, was bettered in 1916, for the passenger earnings gained \$57,639 or 0.3 per cent and the freight earnings \$236,722 or 24.1 per cent. All the other earnings items showed increases with the exception of the rent of land and buildings and the sale of power. The latter dropped \$44,866 to a total of \$59,325.

The operating expenses for 1916 at \$18,099,905 represented a decrease of \$31,937 or less than 0.2 per cent. The operating ratio in 1916 was 67.24 per cent as compared to 67.40 per cent in 1915. The details of operating expenses

were not received from certain corporations, items being lacking for \$3,713,996 of the operating expenses in 1915 and \$3,707,053 in 1916. With this in mind, it may be pointed out that in the last year maintenance of way and structures decreased \$78,346 or 7 per cent; maintenance of equipment \$186,662 or 12 per cent, and operation of cars \$180,272 or 2.5 per cent. On the other hand, operation of power plant increased \$73,662 or 2.5 per cent, and general expenses \$346,624 or 19 per cent.

The net earnings from operation for 1916 at \$9,316,379 showed a gain of more than 6 per cent. After adding \$2,928,573 for miscellaneous income and making deductions of \$7,358,283, the net income amounted to \$4,886,669. Reserves took up \$1,535,071 of this, and dividends \$2,834,906, so that the surplus for the year totaled \$516,690.

The number of fare passengers carried in 1916 was 580,094,167, as compared to 562,302,373 in 1915. The total of freight hauled was 1,936,674 tons, as compared to 1,433,602 tons in the preceding year. The paid-up capital for 2248.57 miles of single track in 1916 was \$154,895,584, as compared to \$150,585,342 for 2102.95 miles in 1915.

### Report of Virginia Commission

The total transportation revenue of the nineteen electric railways under the supervision of the State Corporation Commission of Virginia amounted to \$5,083,341 for the fiscal year ended June 30, 1915. This showing involved the following decreases: Passenger, \$384,087 or 7.42 per cent; parlor, dining, special and baggage, \$7,336 or 41.70 per cent; mail, express, milk, switching and miscellaneous, \$16,629 or 24.87 per cent, and freight, \$95,822 or 29.61 per cent. Revenue from other railway operations fell off \$23,710 or 29.87 per cent, and the total revenue decreased \$527,587 or 9.31 per cent.

The total operating expenses decreased \$320,128 or 9.14 per cent to \$3,181,576. Maintenance of way and structures dropped \$51,535 or 10.04 per cent; maintenance of equipment, \$85,607 or 21.13 per cent; conducting transportation, \$539,619 or 28.35 per cent, and traffic, \$14,493 or 28.69 per cent. The net income for the year at \$1,164,671 showed a gain of \$17,809 or 1.55 per cent. The total number of passengers carried was 113,194,803, the revenue passengers being 95,895,127. The average fare for all passengers was 4.016 cents, a decrease of 0.024 cent, while the average fare for revenue passengers was 4.741 cents, a decrease of 0.029 cent.

### Maine Income Gains Slightly

The net income of the electric railways in Maine for the year ended June 30, 1916, showed a slight increase from \$629,448 to \$632,025. The dividends declared rose from \$402,797 to \$419,347, the percentage on capital stock increasing from 2.50 to 2.59 per cent. These figures are taken from the second annual report of the Maine Public Utilities Commission.

The operating revenues of all the companies totaled \$3,102,357 in the last fiscal year, with operating expenses amounting to \$2,033,587. The surplus increased from \$849,334 in 1915 to \$958,215 in 1916. Other comparative data regarding capitalization and income are presented in the accompanying table.

CAPITAL STOCK, INDEBTEDNESS, GROSS REVENUES LESS OPERATING EXPENSES (GROSS INCOME) AND DISPOSITION OF GROSS INCOME OF MAINE ELECTRIC RAILWAYS

Name	Capital Stock	Funded Debt	Other Interest-bearing Debt	Gross Income	Interest Deductions	Other Deductions Prior to Distribution to Stockholders	Net Income	Dividends Declared
Androscoggin Electric Company	\$2,000,000	\$3,140,500	.....	\$287,130	\$156,357	\$1,753	\$129,019	\$37,500
Aroostook Valley Railroad	256,400	887,432	.....	43,303	46,888	.....	8,585	.....
Atlantic Shore Railway	1,000,000	2,477,250	.....	60,710	118,475	.....	57,764	.....
Bangor Railway & Electric Company	3,499,936	2,599,000	.....	358,223	129,873	89,961	138,388	144,997
Benton & Fairfield Railway Company	20,000	33,000	.....	1,948	1,650	.....	298	.....
Biddeford & Saco Railroad	100,000	150,000	.....	18,212	6,000	.....	12,312	10,000
Calais Street Railway	100,000	100,000	.....	10,131	5,000	.....	5,131	5,000
Cumberland County Power & Light Company	4,996,800	5,339,000	.....	932,589	254,180	413,546	264,861	138,000
Fairfield & Shawmut Railway	30,000	30,000	.....	1,660	1,560	.....	100	300
Lewiston, Augusta & Waterville Street Railway	3,000,000	3,659,000	6,000	261,538	179,482	12,916	69,139	36,000
Oxford Electric Company	80,000	166,000	.....	15,948	6,917	12	9,018	4,065
Rockland, South Thompson & St. George Railway	.....	.....	.....	.....	.....	.....	.....	.....
Rockland, Thomaston & Camden Street Railway	400,000	800,000	20,000	75,055	32,971	90	41,993	20,000
Somerset Traction Company	30,000	75,000	.....	1,591	2,290	.....	*698	.....
Waterville, Fairfield & Oakland Railway	500,000	.....	.....	25,351	.....	.....	25,351	23,485

\*Deficit.

## Indiana Tax Figures

The State Tax Board of Indiana, which has just completed its first spring session, shows the total valuation of interurban railways of the State as \$26,228,335, a decrease of \$113,366 under the 1916 valuation. The interurban lines show a total loss of 17.47 miles of main track in 1917 over 1916 and a gain of 15.97 miles of second main track. A gain of 9.71 miles of side track was reported and a loss of 18.50 in rolling stock mileage. These figures resulted in money valuation gains and losses as follows: Main track, \$243,038 loss; second main track, \$102,080 gain; side track, \$28,500 gain; rolling stock, \$628 loss. The total improvements on right-of-way were valued by the board at a loss of \$280 over last year's total. The total valuation of interurban improvements on right-of-way this year was \$1,106,877. Only three interurban railways were raised in valuation on main track, the Hammond, Whiting & East Chicago Railway, the Interstate Public Service Company and the Southern Michigan Railway. The Indianapolis Traction & Terminal Company was valued at an increase of \$85,338 over last year, due to natural increase in trackage. The Indianapolis Street Railway valuation showed a loss of \$150,426, due to a rearrangement of tracks. The Terre Haute, Indianapolis & Eastern Traction Company was valued at \$81,543 less than last year's total, due to a shortening of the tracks of the company.

## Connecticut Returns for 1916

**Total Revenues Increase \$1,445,387 and Net Operating Revenue \$811,324**

The fifth annual report of the Connecticut Public Utilities Commission contains the following summary of operating revenues and expenses of electric railways in the State for the two years ended June 30, 1915 and 1916:

	REVENUE		
	1915	1916	Increase
Passenger revenue .....	\$14,063,141	\$15,336,166	\$1,273,024
Freight revenue .....	618,387	769,258	150,870
Express revenue .....	82,589	90,589	8,000
Other transportation revenue.	93,419	90,527	*2,892
Station and car privileges....	59,062	63,340	4,277
Rent of tracks and terminals.	55,347	60,598	5,250
Power .....	86,178	93,263	7,084
Other operating revenue.....	40,444	40,217	*227
<b>Total operating revenues...</b>	<b>\$15,098,572</b>	<b>\$16,543,960</b>	<b>\$1,445,387</b>
	EXPENSES		
	1915	1916	Increase
Maintenance of way and structures .....	\$1,986,638	\$1,859,325	*\$127,312
Maintenance of equipment...	1,121,545	1,222,640	101,095
Traffic expenses .....	8,023	18,605	10,582
Conducting transportation expenses	5,615,749	6,189,924	574,175
General and miscellaneous expenses .....	1,336,427	1,411,951	75,524
<b>Total operating expenses...</b>	<b>\$10,068,384</b>	<b>\$10,702,447</b>	<b>\$634,063</b>
<b>Net operating revenue.....</b>	<b>\$5,030,188</b>	<b>\$5,841,513</b>	<b>\$811,324</b>

\*Decrease.

The total operating revenue increased \$1,445,387 or 9.5 per cent during the year ended June 30, 1916. All classes of operating revenue showed increases except those from miscellaneous sources. Operating expenses rose \$634,063 or 6.3 per cent. Of this increase \$574,175 was on account of expenses of conducting transportation. All items in the operating expense group increased except maintenance of way and structures. The net operating revenue for the last fiscal year showed a gain of \$811,323 or 16.1 per cent.

The amount paid for taxes of all kinds was \$124,871 less than for the year previous, the total amount paid being \$971,753. Interest charges on funded and floating debt increased \$17,454. With other miscellaneous deductions from income the total deductions for the year were \$4,937,704, leaving a net corporate income of \$2,846,019. Against this was charged \$62,755 for reserve and special charges and \$1,355,804 for dividends. The surplus as of June 30, 1916, was \$2,691,181, an increase of \$491,029 over the surplus of the year before. On the same date the cost of road, equipment and general expenditures totaled \$90,759,894, an increase of \$286,225. The expenditures on account of leased lines totaled \$15,794,327, this amount being an increase of \$811,706.

## Cleveland Costs Soar

The operating report of the Cleveland (Ohio) Railway for April shows an income of \$827,079, an increase of 6.67 per cent over the same month last year. The cost of maintenance was \$115,989, or \$32,795 more than the allowance. However, a surplus of \$5,384 is shown in the operating fund. An increase of 1 cent an hour in the wages of motor-men and conductors took place on May 1 and the surplus in the operating fund will in all probability be more than taken up by this. Wages aggregated \$28,000 more than in April, 1916.

The number of car-miles operated was 2,888,077, an increase of 7.64 per cent over April last year. The number of passengers carried was 32,499,228, an increase of 6.13 per cent over the corresponding month last year.

Some doubt as to the fate of the interest fund has been caused by the report. It shows a decrease of \$9,871 as compared with the March figures and is in contrast with a surplus of \$75,305 for April, 1916.

Employment of many inexperienced men is said to be one of the principal causes of the increase in accidents, as shown by the reports of the company for the past several months. Damage claims for April exceeded those of a year ago by \$22,366, and for the first four months of the year there was an increase of approximately \$80,000 over the same period in 1916.

## Permits Railroad Merger

The Thompson bill permitting the merger of railroad corporations under certain conditions was signed by Governor Whitman of New York on June 7. It provides that a business corporation owning two-thirds or more of the capital stock of a railroad corporation or of each of two more railroad corporations, may become a railroad corporation with the consent of the holders of two-thirds or more of the capital stock, and may merge the railroad corporations. The bill also regulates the procedure and the rights of minority stockholders and creditors. The signing of the Thompson bill will permit the consolidation of the surface and elevated roads in Brooklyn and simplify the intercorporate relations between the Brooklyn Rapid Transit Company and its subsidiaries.

**American Public Service Company, New York, N. Y.**—Confirmation has been obtained of the reported sale of the American Public Service Company to the Insull interests of Chicago. The company controls a number of public utility properties in Texas and Oklahoma, among them the Marshall (Tex.) Traction Company.

**Bay State Street Railway, Boston, Mass.**—The Bay State Street Railway has been authorized by the Massachusetts Public Service Commission to issue \$117,100 of first preferred stock at par, \$91,000 of Boston & Northern Street Railway and \$27,000 of Old Colony Street Railway 4 per cent bonds, the proceeds to be used to pay floating debt.

**Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.**—The Illinois Public Utilities Commission has granted permission to the Chicago, North Shore & Milwaukee Railroad to issue \$658,000 of first mortgage bonds.

**Northern States Power Company, Chicago, Ill.**—The Northern States Power Company has completed the purchase of the Northwest Light & Power Company, the Renville County Electric Company and the Minnesota Valley Power Company, all operating in southern Minnesota, communities having an aggregate population of 26,000. The total capacity of the various power stations of the three utilities aggregates 2400 kw. One of the plants is operated by water power, having a capacity of 400 kw., which is capable of being increased to 900 kw. The communities in which the companies operate are connected with the power plants by transmission lines aggregating 200 miles in length, and will be connected into the general transmission systems and large water powers of the Northern States Power Company. The gross earnings of the companies acquired for 1916 were \$198,000 and the net earnings \$89,000.

**San Francisco-Oakland Terminal Railway, Oakland, Cal.**—The San Francisco-Oakland Terminal Railway has announced that it has deposited funds with the Wells Fargo Nevada National Bank to pay the coupons due on July 2,

# Traffic and Transportation

## Washington Jitneys Without Bonds

### Jitney Men Go to Supreme Court for Injunction Against Interference—Some Operate Cars for Contributions

Since the bonds issued by the Casualty Company of America were declared void the jitneys in the State of Washington have continued their fight for permission to operate until satisfactory bonds can be issued. This situation was referred to at some length in the ELECTRIC RAILWAY JOURNAL for May 26, page 980.

An appeal has been made to the Supreme Court from a recent decision of Judge Gilliam denying an injunction applied for by E. A. Hatfield, president of the Seattle Auto Drivers' Union, to prevent Prosecuting Attorney Lundin from prosecuting operators who were without a \$2,500 bond as required by law. Hatfield petitioned for an injunction to stay the State's hand following the announcement of State Insurance Commissioner Fishback that the Mutual Union Insurance Company, formed by jitney men to write surety bonds for the benefit of its members, would not be recognized until a cash security of \$250,000 is posted at Olympia. Commissioner Fishback has been ordered by an alternative writ of mandate issued by Chief Justice Ellis to show cause why he does not issue a certificate to the Mutual Insurance Company. He refused to accept notes as assets for the required security. The petition sets forth that in a formal opinion Attorney-General Tanner has held that the members have insurable interest and that the surety bonds can be written if the law is complied with in other respects.

### MEN OPERATE "FREE BUSES"

The Puget Sound Traction, Light & Power Company, Seattle, has obtained from Judge Everett Smith in the King County Superior Court, an order to restrain twenty-five jitney drivers from operating along streets included in the company's franchises. As a result of Judge Smith's order, twenty-five jitneys have been operating "free bus" cars for which no fare is solicited, but passengers are expected to "contribute." Inside the cars the following notice is posted: "Donations accepted for our fight with the traction company."

Counsel for the jitney men made an unsuccessful attempt to have Judge Smith dissolve the order. They contended that Judge Gilliam's action in permitting them to appeal to the Supreme Court was a stay to further proceedings. Judge Smith, however, ruled that the criminal proceeding did not bar a civil action and denied the motion. James B. Howe, counsel for the traction company, argued that the company, in bringing suit, was demanding protection of its franchise rights.

The "free bus" plan now used pending the hearing in the State Supreme Court was established as a precedent one year ago in West Seattle, when a jitney driver was arrested for operating without a bond. At a trial in Judge Frater's court, he was fined 1 cent, which Judge Frater announced he himself would pay.

Jitney operators in Spokane have been denied a temporary injunction against city and county officials to forbid the enforcement of the bonding law. In refusing the injunction, Judge Hurn in the Superior Court ruled that the city has authority to regulate street traffic, and that legislative enactment requiring that jitney bus owners give bond is not unconstitutional or prohibitive. The order will require that jitney buses in Spokane cease to operate when the last of the bonds expire in November, unless some means of furnishing bonds is found.

A number of jitney drivers in Everett have been arrested for operating without bonds. Drivers were released on bail. The jitney men in that city plan to join Seattle drivers to take the matter to the Supreme Court.

1916, on the general consolidated 5 per cent bonds of the company due Jan. 2, 1933, of the Oakland Traction Consolidated Company.

**West Penn Railways, Pittsburgh, Pa.**—The Pennsylvania Public Service Commission has ratified the consolidation of the West Penn Traction Company and all its subsidiaries, and the shareholders have been notified that they may now receive in exchange the certificates of the merger company. The capital stock of the new company consists of \$10,000,000 of 6 per cent cumulative preferred stock and a like amount of common stock. The officers of the new company are: Samuel Insull, president; John F. Gilchrist, vice-president; Raymond B. Keating, vice-president and secretary; Williston Fish, vice-president; H. S. Swift, treasurer. The plan of consolidation was referred to in the ELECTRIC RAILWAY JOURNAL of May 5, page 845.

## Dividends Declared

- Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¼ per cent, preferred.
- Brooklyn (N. Y.) Rapid Transit Company, quarterly, 1½ per cent.
- Ironwood & Bessemer Railway & Light Company, Ironwood, Mich., quarterly, 1¾ per cent, preferred.
- Memphis (Tenn.) Street Railway, 2½ per cent, preferred.
- Tri-City Railway & Light Company, Davenport, Iowa, quarterly, 1½ per cent, preferred.
- West Penn Traction & Water Power Company, Pittsburgh, Pa., 1½ per cent, preferred.

## Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, AURORA, ILL.						
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income	Income
1m., Apr., '17	\$163,746	*\$116,957	\$46,789	\$35,642	\$11,147	
1 " " '16	154,830	*106,269	48,561	36,528	12,033	
4 " " '17	633,263	*469,522	163,741	143,088	20,653	
4 " " '16	594,470	*407,546	186,924	146,225	40,699	
BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.						
1m., Apr., '17	\$85,496	*\$73,224	\$12,272	\$27,716	†\$15,373	
1 " " '16	78,445	*73,041	5,404	28,024	†22,447	
4 " " '17	330,978	*287,552	43,426	110,367	†66,581	
4 " " '16	290,842	*267,512	23,330	94,960	†70,854	
CONNECTICUT COMPANY, NEW HAVEN, CONN.						
1m., Apr., '17	\$776,809	*\$622,600	\$154,209	\$95,965	†\$80,504	
1 " " '16	744,170	*546,678	197,492	98,009	†122,525	
4 " " '17	3,090,911	*2,470,162	620,749	383,811	†296,487	
4 " " '16	2,878,552	*2,050,194	828,358	391,911	†527,290	
FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.						
1m., Apr., '17	\$219,531	*\$148,232	\$71,199	\$49,574	\$21,625	
1 " " '16	203,175	*135,056	68,089	48,723	19,366	
4 " " '17	932,456	*603,673	328,783	198,435	130,348	
4 " " '16	861,788	*574,841	286,947	195,396	91,551	
HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.						
1m., Apr., '17	\$524,053	*\$244,504	\$279,549	\$217,880	\$61,669	
1 " " '16	503,689	*209,981	293,708	214,117	79,591	
4 " " '17	2,107,514	*954,778	1,152,736	869,179	283,557	
4 " " '16	1,981,711	*857,506	1,124,205	853,982	270,223	
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.						
1m., Apr., '17	\$27,447	*\$25,821	\$1,626	\$7,982	†\$6,294	
1 " " '16	27,135	*24,098	3,037	7,979	†4,903	
4 " " '17	104,758	*111,210	†6,452	31,943	†38,215	
4 " " '16	98,555	*92,297	6,258	31,940	†25,528	
NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.						
1m., Apr., '17	\$48,100	*\$43,915	\$4,185	\$8,139	†\$1,167	
1 " " '16	44,833	*43,965	868	\$4,759	†2,558	
4 " " '17	178,628	*185,234	†6,606	\$29,002	†30,805	
4 " " '16	162,852	*215,087	†52,235	\$26,930	†72,679	
RHODE ISLAND COMPANY, PROVIDENCE, R. I.						
1m., Apr., '17	\$459,618	*\$423,993	\$35,625	\$119,610	†\$57,459	
1 " " '16	444,826	*311,539	133,287	118,902	†41,338	
4 " " '17	1,827,938	*1,551,858	276,080	477,119	†144,695	
4 " " '16	1,735,208	1,353,771	381,437	439,043	†112,722	
WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.						
1m., Apr., '17	\$20,254	*\$23,573	†\$3,319	\$2,033	†\$5,327	
1 " " '16	20,071	*21,151	†1,080	1,755	†2,813	
4 " " '17	70,666	*88,429	†17,763	8,088	†25,744	
4 " " '16	72,689	*82,369	†9,679	6,951	†16,531	

\*Includes taxes. †Deficit. ‡Includes non-operating income. §Includes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

## Portland Election Favorable

### Jitney Legislation Most Important Feature of Constructive Program Put Through on Monday

The city of Portland, Ore., went on record decisively for a broad constructive program and sound business administration at the election there on June 4. Commissioner George L. Baker was elected Mayor over Commissioner W. H. Daly, the municipal ownership, union labor, "jitney" and Socialistic candidate. The ordinance requiring a \$2,500 jitney bond was carried by 32,000 to 16,000. The charter amendment proposed by the jitney interests to permit free and unrestricted use of the streets by jitneys without franchise or bonds was defeated by practically the same vote as for the bond requirement.

The four so-called "Carver" jitney franchises calling for operation of regular motor-bus service with fixed routes, definite schedules, transfers, heavy bonds and other satisfactory regulations was carried by a heavy vote. These franchises will give the districts now without transportation facilities a service supplementary to, and not competitive with, the street railway lines. The defeat of Mr. Daly, together with the election of two substantial business men for city commissioners and the elimination of unregulated jitney service, which Mr. Daly, as commissioner, has made possible for the last two years, is taken to presage better times for Portland. The ordinance forbidding picketing was passed by a narrow margin.

## Atlantic City Jitneys Lose

The jitney men of Atlantic City have continued an uphill fight against the City Commissioners and the Atlantic City & Shore Railway since they were compelled to cease operating on Atlantic Avenue some time ago. Vice-Chancellor Leaming, from whom S. Cameron Hinkle, counsel for the jitney association, obtained a rule to show cause why city authorities should not be restrained from enforcing ordinances excluding jitneys from Atlantic Avenue and raising the jitney license fee to \$50 per annum, refused an injunction and dismissed the proceedings. The court's action sustains the contention of Joseph B. Perskie, assistant city solicitor, that the proper recourse for the jitney men is to review the constitutionality of the ordinances before the Supreme Court.

Application has been made by the jitney men to the Supreme Court for a writ of mandamus compelling the City Commissioners to receive the petitions, containing more than 4000 signatures, which call for submission of the ordinances to the people under the referendum clause of the commission government act. The city contends that the ordinances were not drawn under commission plan authorization and consequently are not subject to the referendum test.

## New Automobile Law

### Recent Legislation in Connecticut Affects Operation of All Motor Vehicles

Connecticut's new automobile law, most of the provisions of which became effective on June 1, is expected to prove helpful in regulating more satisfactorily auto and jitney traffic since it embodies many changes in the old laws. All jitney owners in the future, in addition to paying the regular motor vehicle fees, must obtain a special license at a fee of \$2, and operators a special license at a fee of \$5. Cities and towns are given the right to regulate jitney routes and public stands. The interior of all jitneys must be lighted at night and no passengers will be allowed to ride on the running boards.

A new rule is established whereby every driver of a motor vehicle must give way at street intersections to any vehicle approaching from the right. This replaces the old rule giving north and south traffic the right of way. Applicants for licenses in the future will have to submit to a road test. A speed of 20 m. p. h. through thickly settled portions, if continued for a quarter of a mile, shall be evidence

of reckless driving and 25 miles an hour will be so considered on roads where the houses are less than 100 ft. apart.

All commercial vehicles are required to carry reflectors if their construction is such that a driver's view to the rear is obstructed, and a motor truck must make way for any vehicle approaching from the rear. The fees for trucks have been increased to \$100 for each ton above 8 tons.

The new law deals severely with drunken drivers, the minimum penalty for a first offense being the suspension for a year of all licenses and registrations of the convicted party, while a second offense will mean suspension for five years. An automobile owner arrested for drunkenness, even when not operating a car, may lose his license, as the new law requires that courts report all convictions for drunkenness of men who own or drive cars. The law also includes regulations for headlights and other provisions of a minor nature.

**Near-Side Stop Adopted.**—The Columbus (Ga.) Railroad has abandoned the far-side stop. The company believes that near-side stop operation involves less danger to the public at crossings.

**Universal Transfers in Bellingham.**—The Puget Sound Traction, Light & Power Company, Bellingham, Wash., has introduced the universal transfer system. The destination point is punched instead of the receiving line.

**Seattle W. C. T. U. Opposes Smoking in Cars.**—The City Council of Seattle has received a petition from the Federated Women's Christian Temperance Union, representing the eighteen local unions of the city, to prohibit smoking on all public conveyances.

**Electric Heaters for Cars in Waco.**—The City Commissioners of Waco, Tex., have ordered an ordinance to be drafted requiring the Texas Electric Railway, which owns and operates the street car lines in Waco, to heat its cars with electric heaters instead of oil stoves.

**"Have You Forgotten Anything?"**—The San Francisco-Oakland Terminal Railway, Oakland, Cal., has found it worth while to equip all of its cars with a small sign reading, "Have You Forgotten Anything?" The idea resulted from the large volume of business which the lost article department has been handling. A check will be made to see whether the sign effects any decrease in the articles left in cars and boats.

**Holyoke Street Railway Seeks Increased Revenue.**—L. D. Pellissier, president of the Holyoke (Mass.) Street Railway, has petitioned the Public Service Commission of Massachusetts to grant higher fares on the road or else to approve a rearrangement of fare zones in which passengers will be required to ride shorter distances than the present fares permit. A hearing will be held at the offices of the board in Boston on June 19.

**Traffic Committee Appointed in New Orleans.**—An investigation of transportation facilities in New Orleans, La., with a view to recommending remedies for street car congestion and to lay plans for improvement in the service is to be made by a committee named from members of civic and commercial bodies of the city. A representative of the city government and one for the New Orleans Railway & Light Company will be on the committee, which will report within a few weeks.

**New Transfers Used at Syracuse.**—The New York State Railways, Syracuse Lines, began on June 1 the use of a new style of transfer. Heretofore a different transfer was used for the morning and afternoon of each day of the month, which meant that sixty-two forms were necessary for each line. The new style is designed so that only one form need be carried in stock for each line. The station master will punch the month and the day of the month as before and the conductor will indicate the time of issue and the receiving line.

**C., M. & St. P. Issues Descriptive Booklet.**—A small illustrated booklet descriptive of the electrified divisions of the Chicago, Milwaukee & St. Paul Railroad has just been published. Much interesting information of a technical nature is contained therein, so presented as to be of value to the layman. The facts relative to the work of the powerful

locomotives and comforts of the service on the two trains, "The Olympian" and "The Columbian," are among those given to show that this electrification marks "the dawn of the electrical era in railroading."

**Information Booklet for Milwaukee.**—A handy little booklet has been issued by The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., entitled "A Street Railway of Milwaukee." It gives the location of parks, public buildings, depots, hotels, theaters, principal industries and other information in regard to the city. A map of the city street carlines is attached, with a key to street numbers arranged to indicate the shortest way of reaching any part of the city. The booklet is being distributed through hotels, business associations and other agencies and will no doubt fill a long-felt want.

**Serious Accident at Kenosha.**—What probably would have been a fatal accident on the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., on May 15, was avoided when one of the cars was derailed by a towerman on the Kenosha & Rockford Division of the Chicago & Northwestern Railway to prevent a collision with one of the steam trains. The accident occurred at the crossing of the two tracks near Prairie Avenue, Kenosha, Wis. The car tipped over on its side as it plunged into the ditch, and several of the thirty-two passengers aboard, together with its crew, were injured.

**H. & F. Fares Increase.**—In accordance with the new tariff filed with the Maryland Public Service Commission by the Hagerstown & Frederick Railway, Frederick, as reported in the *ELECTRIC RAILWAY JOURNAL* recently, the change in rates of fare became effective on May 30. The changes do not affect the fares in the local city lines in Hagerstown and Frederick except for the discontinuance of ticket books, the use of which represented only about one-quarter of the total fares collected. On the interurban lines the cash fare will be increased from 5 cents to 6 cents per zone and ticket books containing eighteen coupons will be sold for \$1. No increase was made in commuters' rates.

**Boise Valley Wants One-Man Cars.**—The Boise Valley Traction Company, Boise, Idaho, has asked permission of the Public Utilities Commission of that State to operate one-man cars, claiming that a saving of \$8,800 can be effected annually. It is proposed to remodel for one-man car operation the cars now being used on the city lines. In the application that was filed the company asked the commission to set a date for a hearing when the city authorities and others interested in the proposed change could be heard. A bill was introduced in the lower house of the Idaho Legislature at the last session which forbade street railway companies to operate cars with less than two men. The measure was not passed.

**Jitneys Barred From Busy Corner.**—The Selectmen of Greenfield, Mass., have made the following traffic rule as a measure of relief from the congestion of automobiles and jitneys at the corner of Main and Federal Streets: "No owner or driver of a vehicle engaged in carrying passengers from whom fare is collected shall stop or stand on Main, Federal, Clay Hill or High Streets, except for the purpose of receiving or discharging passengers, and then only at such places as may be designated by the Board of Selectmen and for such time as may be sufficient to enable the passengers to get off or on such vehicle." The Selectmen will designate the places at which jitneys may receive or discharge passengers.

**Companies Ask to Discontinue Tickets.**—Two petitions for the discontinuance of ticket books on the street railways centering in New Bedford, Mass., have been filed with the Public Service Commission of that State. The first asks for the discontinuance of a twenty-ride book which is sold at \$1 on the New Bedford & Onset Street Railway. It is said that passengers riding from New Bedford to Onset have taken unfair advantage of the use of these tickets to obviate the necessity of paying a cash fare in each zone. The second petition, made by the Union Street Railway, asks for authority to discontinue the fifty-ride monthly ticket books which are sold for \$8 for use between New Bedford and Fall River. The cash fare between the two cities is 20 cents.

**Ferry Service to Relieve Seattle Congestion.**—The Seattle Port Commission is negotiating with the Puget Sound Traction, Light & Power Company for an exchange of transfers, to provide ferry service between the foot of Marion Street and Harbor Island and the west side of the west waterway. The proposition presented by the commission was for the traction company to receive 3 cents out of each 5 cents. No agreement has yet been reached. The object of the proposed ferry is to relieve the congestion in traffic on West Spokane Avenue, where 15,000 men employed in the shipyards and manufacturing plants on Harbor Island must be transported. The commission will make the same proposal to the City Council or to the public utilities department for transfer privileges with the city's Lake Burien line.

**Play Safely with the New Man.**—As a safety-first suggestion W. H. Parr, an employee of the Louisville (Ky.) Railway, recently submitted the following: "Remember the new man. So many employees are at work in our shop that every man must be careful in his work at all times. The carhouse foreman cannot do it all. The inspector cannot do it all. Careful work is the surest safeguard. Just be careful and remember the new man. You know the unsafe places and the unsafe ways, but he does not. Your first duty to the company is to prevent accidents. A few words of advice in time may save some one from a painful injury. Do your share. We are all paid to observe the rules. Is there any excuse for not obeying them? Carelessness is one crime where punishment is quick and sure. So it is up to you first, last and always."

**Pacific Electric Lowers Fare.**—Upon the request of the Railroad Commission of California, the city of Pasadena has dismissed its suit to require the Pacific Electric Railway to lower its fare from 10 cents to 5 cents for points along the East Orange Grove Avenue line between the old and new city limits of Pasadena. The company agreed to the change in its fares after it had received assurance from the commission that the act would not establish a precedent and force the acknowledgment that the addition of territory necessitates extending the 5-cent fare to that territory. It stated that lowering the rate in this case would make no appreciable difference in revenues because most of the people in the new territory had walked to the 5-cent fare limit and because there is little likelihood of an extension of the line on account of the nature of the territory served.

**Automobile Traffic Puzzles Louisville.**—Officials of the Automobile Club of Louisville, Ky., have become aroused by the failure of the city officials to enforce the traffic laws and are taking the initiative in the matter. An invitation to the club from the Board of Public Safety to assist in framing revised regulations has been received with interest and representatives of the club are resuming the study of traffic regulations. Except in the center of the city when the traffic police are on duty there is a general disregard for the provision that requires automobiles and other vehicles trailing street cars to stop when the cars stop to take on or let off passengers. Glaring headlights are used without molestation. Cars are parked freely on the forbidden side of the streets, while slowly-moving vehicles disregard the provision requiring them to hug the curb and invariably ride the rails.

**Consolidated Will Not Ask Increase.**—The Worcester (Mass.) Consolidated Street Railway, according to a statement given out by General Manager Page, will not ask the Public Service Commission for authority to increase its fare to 6 cents in accordance with the general movement for more revenue. He said that in Springfield, where it has been decided to ask for the 1-cent increase, the transportation conditions are quite different. Mr. Page expressed the attitude of the company as follows: "I have confidence that we have seen the worst of the high cost of living and of materials. The investigation of conditions being conducted by the federal government will, I expect and hope, bring relief from the burden to the public. The Consolidated officials are sitting tight on the lid, keeping down expenses as much as possible, and hope to be able to continue giving the public satisfactory service until the turn for the better comes in business conditions and we can go into the market for improved equipment."

**Street Cars Versus Autos.**—The following letter was received by the Pine Bluff (Ark.) Company from an auto driver who adores trafficless autoing, so says *Public Service*, that company's publication: "Gents: It occurs to me 'and while I'm talking my opinions good' that to facilitate the proper kind of auto traffic you should use an advance guard in the operation of your street cars, the duties of this man should be to walk along, say 50 ft. ahead of each street car, and as autos approach the car track for this guard to signal the motorman to stop—you might install a wireless set on each guard and car so these signals can be transmitted quickly in order not to delay auto traffic. I'm working on a patent 'hurdler' for street cars so they can hurdle autos as an important time saver. As each street car carries, say ten to twenty passengers, and each automobile the large number of 'one' to 'five' you can readily see auto traffic must not be interfered with by street cars."

**Accidents on Increase in New York.**—Forty persons were killed in New York City by motor vehicles during the month of May as compared with twenty-seven for the corresponding month in 1916, according to the monthly traffic accident report of the National Highways Protective Association. The total number of deaths from traffic accidents was forty-seven, three of which were caused by trolleys and four by wagons as against four by trolleys and ten by wagons in May, 1916. In the State outside of New York City twenty-six persons were killed by automobiles, two by trolleys and one by wagon. Of those killed in the city twenty-five were children and in the State eight. Eight were killed at highway railroad grade crossings in the State during the past month. Regarding the increase in the number of deaths by automobile accidents, Colonel Edward S. Cornell, secretary of the association, said: "There is only one way to put a check on this slaughter, and that is by a law requiring all who drive automobiles to have a license, based on qualification, instead of limiting this requirement to chauffeurs, as is done at present."

**Commission Discusses Grade Crossing Order.**—A hearing was held on June 6 by the Public Service Commission of New York, First District, to consider the proposal of the commission to order railroad crossing gates on the lines within its jurisdiction to be kept closed constantly between midnight and 5 a. m. Reports were received covering inspections of the operation of crossing gates which were conducted by the commission. The problem seems to lie in the failure of gatemen to keep awake at night to attend to duty properly. Keeping the gates normally down except when raised to permit the passage of vehicles would be virtually prohibitive on highways having a heavy vehicular traffic. Among alternative measures recommended were the use of a clock-punching system, irregular inspections of the men on duty supplemented by discipline, and the use of semaphores interlocked with the gates to give a stop indication when the gates are up. The commission will co-operate with the police department in making a more thorough study of the crossings to determine how generally it would be practicable to operate the gates normally down as proposed.

**Rerouting Complaint Dismissed.**—The Public Service Commission of Pennsylvania has announced that it has dismissed the complaint of the Central Germantown Avenue Business Association against the Philadelphia Rapid Transit Company relative to the rerouting of cars operating on routes known as 23 and 55. The complaint was directed particularly against the rerouting so that the cars do not now, as formerly, pass along portions of Germantown Avenue between Glenwood and York Streets. Commissioner Ryan dissented, it was said, when the decision of the other members was made known, but his reasons are not given. The contentions of the complainants were based on the fact that the cars on routes 23 and 55 in going northward did not pass their places of business and that on account of this fact business had been diverted elsewhere. It was also claimed that the rerouting was illegal in that the charters fix the routes. The commission holds that it cannot be said that the increasing or decreasing facilities on certain streets as long as service is maintained is in violation of the charter obligations of the respondent company and its underlying concerns.

## Personal Mention

Phillip Matter has been elected a vice-president of the Union Traction Company of Indiana, Anderson, Ind.

Elihu S. Rowley, heretofore day dispatcher at the Light Street carhouse of the United Railways & Electric Company, Baltimore, Md., has been promoted to the position of instructor of conductors.

A. J. Davis has been engaged by the Kansas City (Mo.) Railways to manage a new express department. The company expects to be prepared to give express service on its lines in the near future.

F. D. Burpee, superintendent of the Ottawa (Ont.) Electric Railway, has obtained leave of absence for military service. He is now a major in the 207th Battalion, which was recruited in Ottawa and is now overseas.

H. W. Huston, general foreman of the Elyria shops of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, has resigned to take a similar position in the Erie shops of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y.

Paul A. Zinsheimer, head of the stock and bond department of the Railroad Commission of California for five years, has resigned to accept a position with the Union Trust Company, San Francisco, Cal., as assistant to I. W. Hellman, the president.

Allen G. Hoyt of the National City Company, New York, N. Y., which is affiliated with the National City Bank of that city, has been elected a vice-president and a director of the Washington Railway & Electric Company, Washington, D. C. Mr. Hoyt was formerly president of the American Public Service Company, New York, before that company was acquired by the Insull interests of Chicago.

H. E. Brandli, the new general manager of the Meridian Light & Railway Company, Meridian, Miss., has led a movement among the employees of that company to form a mutual get-together club. At the organization meeting held recently a committee was named to draft a set of by-laws and a constitution. The motto selected for the organization is "Public Service—the Best That Can Be Given."

Darwin R. Cafferty, instructor of motormen for the elevated lines of the Interborough Rapid Transit Company, New York, N. Y., has received an indefinite leave of absence on account of ill health. Mr. Cafferty began his service with the company forty years ago as a locomotive operator on the Third Avenue "L." Before his departure he was the guest at a banquet attended by fifty-six of his fellow workers.

Melvin H. Fowler, line foreman of the Bay State Street Railway, Boston, Mass., stationed at Chelsea, has the distinction of being the first man enlisted as an officer in the federal merchant marine service. Mr. Fowler was appointed after a large number of applications had been rejected by the United States Shipping Board. Until he is assigned to duty he will attend training school at Harvard University under government officers.

N. B. Rhoads, superintendent of the electric and railway departments of the Jackson Light & Traction Company, Jackson, Miss., has been ordered to report at New Orleans for service in the navy as assistant paymaster. He will rank as lieutenant, junior grade. Mr. Rhoads was in naval service for three years and has since been on the reserve list. Will Brown, manager of the gas department, will assume charge of Mr. Rhoads' departments.

C. C. Collins accepted a position recently as traffic manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio. Mr. Collins' career as a railway man was begun in 1890 and has been largely concerned with traffic problems. In that year he became chief clerk in the traffic department of the Columbus & Eastern Railroad. This road was later merged with the Columbus, Sandusky & Hocking Railway upon its completion and Mr. Collins was made division freight agent at Toledo. When the road was

## Construction News

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

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

### RECENT INCORPORATIONS

\*Henryetta-Dewar-Kusa Traction Company, Henryetta, Okla.—Incorporated to construct and operate an electric railway between Henryetta, Dewar and Kusa. Capital stock, \$350,000. Incorporators: Barclay Morgan, G. W. Burnett, J. J. Harrison, H. R. Christopher, L. E. Drummond of Dewar, and Morton Henderson, Kusa.

### FRANCHISES

Rialto, Cal.—The Railroad Commission of California has authorized the Pacific Electric Railway to construct spur tracks and sidings at grade between Riverside and Date Streets, Rialto.

New Orleans, La.—An ordinance has been introduced into the Council to amend the franchise of the Orleans-Kenner Electric Railway so as to permit freight to be hauled over the road in Jefferson Parish. The purpose is said to be to permit the line to haul material for reconstruction and repairs to its road.

Gardner, Mass.—The Northern Massachusetts Street Railway has asked the Board of Selectmen of Gardner for permission to relocate its track on Lake Street to conform with the grade and alteration of the street.

Woburn, Mass.—The Bay State Street Railway has received a franchise from the City Council of Woburn for the reconstruction and extension of its double track on Main Street.

Passaic, N. J.—The Public Service Railway has asked the Board of Commissioners for permission to construct an extension of its line through East Main Avenue from Park Place to Central Avenue.

South Amboy, N. J.—The Jersey Central Traction Company has received a franchise from the City Council to construct and operate an electric railway in South Amboy.

Brooklyn, N. Y.—The Brooklyn Rapid Transit Company has applied to the Board of Estimate for a franchise to construct a line on Van Wyck Avenue, the dividing line between Richmond Hill and Jamaica, from Fulton Street south to Rockaway Boulevard.

Ithaca, N. Y.—The Ithaca Traction Company has asked the Public Service Commission for the Second District of New York for its approval of franchises recently granted by the Common Council to that company and the Central New York Southern Railroad for extensions in Ithaca.

Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has refused the proposition of the City Council relative to an ordinance giving the company a franchise in Poland Avenue and East Woodland Avenue to connect with the present Poland Avenue line via the South Avenue viaduct. The company states that, owing to present conditions resulting from the war, it will be unable to make any extensions not already authorized.

Portland, Ore.—The Portland Railway, Light & Power Company has received a twenty-five-year franchise from the County Commissioners to construct and operate a transmission line along the Columbia Highway.

Woonsocket, R. I.—The Rhode Island Company has received a franchise from the City Council to construct tracks on Page Street between Clinton and Social Streets.

Pleasant Valley, W. Va.—The West Virginia Traction & Electric Company of Morgantown has applied to the Town Council of Pleasant Valley to construct and operate an electric lighting system for a period of fifty years. The company has also applied for a fifty-year franchise to construct and operate a waterworks system in the town of Edgewood.

sold to the Pennsylvania lines in 1898, Mr. Collins engaged in business in Porto Rico. Upon his return to Ohio and following a short connection with the Detroit, Toledo & Iron- ton Railroad he was appointed general express and passenger agent of the Columbus, London & Springfield Railway, Springfield, Ohio, the position he held until 1907. At that time he entered the service of the Western Ohio Railroad, Lima, Ohio, and a year later was made traffic manager of the system. He resigned this position in 1911 to take a similar one with the Lehigh Valley Transit Company, Allentown, Pa. Mr. Collins was one of the organizers of the Central Electric Railway Association and has displayed an active interest in its affairs.

J. P. W. Brown, superintendent of the lighting and power departments of the Nashville Railway & Light Company, Nashville, Tenn., has been advanced to the position of assistant general superintendent, a position newly created by the company. Mr. Brown started his career with the Cumberland Electric Light & Power Company about twenty years ago. When this company was absorbed by the Nashville Railway & Light Company, two years later, he was made superintendent of light and power. While the departments have been under his direction the number of customers served has increased from 300 to 16,000. These years of successful service with the company have paved the



J. P. W. BROWN

way for his recent well-deserved promotion. Mr. Brown is a native of Nashville and a graduate of the engineering department of Vanderbilt University. He has for many years been prominently identified with civic affairs of his community and is a member of the Commercial and Hermitage clubs and other local organizations.

### Obituary

Augustus Wolff, superintendent of motive power of the United Railways & Electric Company, Baltimore, Md., died on May 17 at his summer home at Kensington Road, Ten Hills. His death was due to a stroke of paralysis which he suffered about three weeks previously. Mr. Wolff began his railway career as a helper to the engineers on the old Brooklyn, Bath & West End Railroad. He later became master mechanic for the Atlantic Avenue Railroad, and when these lines were merged into the Brooklyn (N. Y.) Rapid Transit Company became chief construction engineer. In 1903 he went to San Francisco, Cal., to accept a position as superintendent of motive power for the United Railroads of that city. Mr. Wolff went to Baltimore to act in a similar capacity for the United Railways & Electric Company in 1908, after having renewed his connection with the Brooklyn Rapid Transit Company for a short period. He has been the head of the United Railways & Electric Company motive power department continuously since that time and was regarded as one of the most valuable and loyal members of the organization.

The car men's safety committee of the San Diego Electric Railway, San Diego, Cal., recently issued a statement enumerating the benefits of the mutual safety plan used by that company to reduce to a minimum street car accidents. The safety-first movement was inaugurated by William Clayton, vice-president and managing director of the company, and judging from the salient features of his plan, it is obviously far-reaching in its effect. Three per cent of the gross earnings of the company, which was the amount formerly used to cover all accident claims, is turned over to the car men. Out of this amount the men pay all accident claims and the balance left at the end of the year is divided among them. This naturally makes the men more careful to avoid accidents, which tends to safeguard the company's property and insure greater comfort and safety to the public.

## TRACK AND ROADWAY

**Pacific Electric Railway, Los Angeles, Cal.**—It is reported that an extension of the Victoria Avenue line may be built in Riverside to the Arlington Heights district.

**San Francisco, Napa & Calistoga Electric Railway, Napa, Cal.**—It is reported that this company will change its present line near Suscol. The change will eliminate a sharp curve  $\frac{1}{2}$  mile southeast of Suscol. Grading has been done and rails will be laid shortly.

**Wilmington, Del.**—Surveys of the proposed electric railway from Wilmington to Dover have been begun by Emory & Eisenbrey of Philadelphia. DeArmond Lindes, Philadelphia, is interested. [May 26, '17.]

**Chicago (Ill.) City Railway.**—It is reported that the Chicago City Railway will soon extend the Devon Avenue line from Western Avenue to Kedzie Avenue.

**Kankakee & Urbana Traction Company, Urbana, Ill.**—An extension about 1 mile long will be built by the Kankakee & Urbana Traction Company across one side of the new aviation field which the government has located adjacent to the company's right-of-way near Rantoul.

**Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.**—Work will soon be begun by this company removing its bridge over the canal feeder at the Centlivre brewery. The north track will be taken out and a temporary passageway made until the work of removing the bridge has been finished. Several cars of cinders have been dumped into the old canal bed and as soon as it has settled sufficiently the city will pave it. This action will eliminate a dangerous bridge.

**Kansas City-Western Railway, Kansas City, Kan.**—The Kansas City-Western Railway has begun the work of improving its lines in Leavenworth.

**St. Louis-Kansas City Electric Railway, Kansas City, Mo.**—A bill in equity asking that a receiver be appointed for the St. Louis-Kansas City Electric Railway has been filed in the Circuit Court by H. B. Cochrane and Ira G. Hedrick, engineers. The company was organized in 1909 with a capital stock of \$15,000,000 and only 1 mile of double track near Independence has been built.

**Great Falls (Mont.) Street Railway.**—The Montana Power Company, operating the Great Falls Street Railway, in a communication addressed to the City Commissioners, has gone on record as being unwilling to expend a large amount of money in the construction of a bridge at First Avenue North unless the city is also willing to build a similar structure at Fifteenth Street. The present bridge at Fifteenth Street will have to be replaced and the First Avenue North bridge is entirely inadequate for traffic. Should the city build only the First Avenue North bridge, the company would be compelled, in the near future, to build a private structure at Fifteenth Street to provide service for the north and west sides. The company estimates that the bridges could be constructed for about \$200,000 each. The company would be willing to participate in their construction to the extent of \$50,000 providing the city will construct both bridges and grant the railway rights over both for a reasonable term of years. The company is willing to extend its lines to the west side, although they would have to be operated at a loss for some time, but only on the conditions set forth.

**Atlantic Coast Electric Railway, Asbury Park, N. J.**—This company will reconstruct its tracks on F Street, Belmar, to conform to the new grade.

**Salem & Pennsgrove Traction Company, Salem, N. J.**—Plans are being made by the Salem & Pennsgrove Traction Company for the erection of a drawbridge at Salem.

**Interborough Rapid Transit Company, New York, N. Y.**—A portion of the new Jerome Avenue line of the Interborough Rapid Transit Company extending from 149th Street and Mott Avenue north to Kingsbridge Road and Jerome Avenue was placed in operation on June 2. Operation has also been begun on a portion of the Seventh Avenue subway from Thirty-fourth Street to Forty-second Street, where transfer can be made to the old subway. The new line also provides a rapid transit route by transfer between the Grand Central and the Pennsylvania Railroad stations.

**Shelby Northern Railway, Shelby, N. C.**—This company has awarded a contract to the Cleveland Construction Company of Shelby for the construction of its line from Shelby to Casar, via Fallston, 22 miles. Three frame trestles, total length 700 ft., will be erected in connection with the line. J. A. Vandegrift, Shelby, general manager. [Dec. 19, '14.]

**Scioto Valley Traction Company, Columbus, Ohio.**—Arrangements are being made by the Scioto Valley Traction Company to rebuild the light and power distributing system in Kingston. Material for the work, it is understood, has been purchased.

**Mansfield Public Service & Utility Company, Mansfield, Ohio.**—It is reported that improvements will probably be made on this company's lines in the near future.

**Brantford (Ont.) Municipal Railway.**—A committee has been appointed by the City Council of Brantford to interview the commission in charge of the Brantford Municipal Railway in connection with the proposed extension of the line into the Terrace Hill district.

**Port Arthur (Ont.) Civic Railway.**—An order has been placed by the Port Arthur Civic Railway for 250 pairs of continuous rail joints for 80-lb. A. S. C. E. section, to replace the present straight angle bars on its line on Main Street from Arthur Street to Bay Street.

**Toronto (Ont.) Railway.**—The Board of Control recently adopted the report of Commissioner Harris recommending the city to pay \$10,000 toward the new car line to be built at Ashbridge's Bay, east of Cherry Street. The new line is for the benefit of the employees of the Imperial Munitions Board in the new plant which is being erected at Ashbridge's Bay. The total cost of the line will be \$185,000, the bulk of which will be borne by the railway company and the Harbor Board. It is expected that the road will be ready for operation by July 15.

**Southern Pennsylvania Traction Company, Chester, Pa.**—Work has been begun by the Brubaker Paving Company, Huntington, W. Va., on the reconstruction of the tracks of the Southern Pennsylvania Traction Company from Saville Avenue, Chester, to Darby.

**Conestoga Traction Company, Lancaster, Pa.**—Plans are being made for extensions and improvements to this company's property at Lancaster.

**Montreal (Que.) Tramways.**—It is reported that the Mayor has approved the construction of a line to the top of Mount Royal. Plans will be prepared by the city engineer.

**Dallas Northwestern Traction Company, Dallas, Tex.**—Grading will be begun at once by the Standard Utilities Construction Company on this company's proposed line from Dallas to Slidell, via Denton. The right-of-way has been surveyed from Dallas to Slidell. [May 12, '17.]

## SHOPS AND BUILDINGS

**City Light & Traction Company, Sedalia, Mo.**—This company has completed a 1200-ton storage plant in connection with its ice-making plant.

**Piedmont & Northern Railway, Charlotte, N. C.**—A contract has been awarded by the Piedmont & Northern Railway to the Fiske-Carter Construction Company, Greenville, for repairing its freight station at Greenville, recently damaged by fire.

**Northwestern Pennsylvania Railway, Meadville, Pa.**—The carhouse of the Northwestern Pennsylvania Railway at Meadville, containing fifteen cars, was recently destroyed by fire. The loss is estimated at \$80,000.

## POWER HOUSES AND SUBSTATIONS

**Fort Wayne & Decatur Traction Company, Decatur, Ind.**—Plans have been prepared by the Fort Wayne & Decatur Traction Company for the erection of a substation, 23 ft. x 60 ft., in Decatur.

**Columbus, Delaware & Marion Railway, Cincinnati, Ohio.**—This company plans to make additions to its power plant, doubling its capacity.

**Eastern Texas Electric Company, Beaumont, Tex.**—An addition is being built to the Port Arthur power station by the Eastern Texas Electric Company. A new 4000-kw. turbo-generator will be installed.



# Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases

Market Quotations

Business Announcements

## Reducing the Selling Cost

Accessory Manufacturer Seldom Comes in Contact with Purchasing Agent—Mechanical Department Should Keep Manufacturers' Literature

BY L. W. HORNE

General Manager Horne Manufacturing Company, Brooklyn, N. Y.

With reference to an article which was published in the April 14 issue, page 720, giving my views on selling costs, I have noted with interest the comments pertaining to this subject by W. V. C. Buckeley, purchasing agent of the Columbus Railway, Power & Light Company, and E. C. Johnston, purchasing agent of the East St. Louis & Suburban Railway.

It is evident from the articles of the two officials above mentioned, which appeared in the issues of May 5 and May 12 respectively, that purchasing agents in general are paying more attention to the art of purchasing than officials of the mechanical department. This is only natural, as they make a specialty of this phase of the railway company's business. The writer and other representatives of this company seldom come in contact with the purchasing agents, and it was therefore my primary intention to direct my original remarks to the officials in charge of the mechanical department.

The majority of the devices manufactured by this company are specialties, generally purchased in conjunction with new cars. It is in connection with specifications on new cars that we find our selling expense to be high, and it is difficult to say whether any real remedy will ever be found. For instance, a road is reported to be ready to purchase new equipment. We try not to bother the company until details of car bodies, trucks, motors and air brakes, which constitute the vital items, have been decided upon. We then call their attention to our specialties. This subject is handled by the master mechanic if the road is a large one, or by the general manager if the road is small. Frequently, after the specifications are decided upon the purchase of the cars is postponed for many months, and in some cases more than a year. When the railway company is ready to place the order for cars it is necessary for the manufacturer to go over the entire subject again with the railway official in charge. After the car builder has been selected the supply house must then concentrate a third effort on the car builder in order to obtain the order for the material specified as quickly as possible, as competitors will naturally continue to work with the railway company in order to get the specifications changed, during the period that the car builders are making ready to construct the cars.

In regard to renewals or repair parts for our specialties, we find that our bulletins are often mislaid in the master mechanic's office, because this official frequently has not proper facilities for filing. As all of these special parts are specified by the mechanical department, the purchasing agents must rely upon that department for information as to the manufacturer, part numbers, etc. There is a device that we manufacture which has been on the market for the past eighteen years. A certain company desired repair parts for this device but was unable to locate the manufacturer. It then made up pattern equipment at a cost of \$50, and made a few castings from the pattern in order to keep its cars in service. These parts could have been purchased from us for \$3 each.

It is possible that I have been too frank in discussing this subject, but I am trying to obtain better recognition for the manufacturer of railway specialties, and am urging that more attention be paid to catalogs and other printed matter sent for the information of officials of the mechanical department.

## Not All the Fault Lies with the Manufacturer

Railroads Should Be Accurate and Specific When Placing Orders—Packing and Shipping Instructions Important

Charles Christopher, storekeeper of the San Francisco-Oakland Terminal Railways, is not inclined to place all of the blame for misunderstood orders, misrouted shipments and delayed deliveries upon the shoulders of the manufacturer. The adage that "The customer is always right" really is unjust, he says, in many instances.

Despite the long distance to Oakland from most of its supply companies and despite a badly unsettled market, Mr. Christopher has few complaints to make about service or deliveries. Of 15,000 items kept in stock, he was short only eighty-six when interviewed on April 30. Even these items were not needed for thirty or sixty days, as they had been put down on the "short" list when the requisition for the last pieces in stock had been filled. So satisfactory a condition could be due only to a most careful watch of demands upon the stockroom.

Mr. Christopher said that if railways wanted prompt service they should make it a point to order things by the manufacturers' catalog numbers and use the manufacturers' names for the articles desired. Further, they should give precise packing, rating and routing instructions. For example, if castings are ordered sent in barrels or boxes, the rate will be less than if they are sent wired together; and, again, the weight of the shipment often is a deciding factor as to whether freight or express transportation should be chosen. It is unfair to the manufacturer to order blindly and then hold him at fault for errors. The fundamental trouble is that many railways look upon the storekeeper and his assistants as mere counters, weighers and checkers. A good stock man can save his company thousands of dollars annually because of his specialized knowledge of markets and transportation, and this entitles him to a position above that of a simple clerkship.

Incidentally, it may be added that a surprise visit to the storerooms of the San Francisco-Oakland Terminal Railway revealed one of the best-kept plants in the country. Even such minor parts as bolts and nuts are neatly stacked instead of being thrown into the bins. A framed typewritten card over each compartment gives an entirely adequate description of the contents.

## Don't Set Your Own Standards

Middle Western Purchasing Agent Questions Big Companies Suggesting Their Own Particular Size of a Catalog as a Standard

BY S. S. DUNBAR

Purchasing Agent Union Traction Company of Indiana, Anderson, Ind.

The article by Mr. Rice of the General Electric Company, appearing in the issue of April 28, page 808, and the facts given in the issue of May 5, page 854, from various companies regarding the so-called standard sizes of catalogs, are illuminating, if anything can be illuminating which indicates such dark prospects in the way of the adoption of standard sizes of catalogs. Mr. Rice takes the very general attitude of many individuals in practically stating that the General Electric Company is in favor of a standard size of catalog, provided its standard size is adopted; and the same idea is voiced in the extracts from the expressions quoted from other advertising managers for large

companies. It might be suggested that the Technical Publicity Association line up some of the larger members.

Mr. Rice indicates that the paper manufacturers should make sizes satisfactory to the standards of the buyer, but it is desirable that smaller manufacturers use standard sizes as well as the big fellows, and the small manufacturer certainly cannot order printing in large enough quantities to have the paper made to order. The 8½-in. x 11-in. catalog page will cut from an existing standard size adopted by the paper mills. The great majority of people use this size, and it is convenient and of good appearance. If the size is reduced ½ in. each way, *i. e.*, to 8 in. x 10½ in., and the same margin is retained (and often a large margin is used with the smaller size sheet), there is less writing space on the smaller sheet by a great deal more than the 10 per cent which Mr. Rice points out as being saved in using the 8-in. x 10½-in. size in place of the 8½-in. x 11-in. size.

It has not been the idea of the writer to argue for the 8½-in. x 11-in. size particularly, but if every man says a standard is all right so long as you adopt "mine," we shall not get any standard. It is hoped that this matter will be kept alive until some results are obtained.

## Westinghouse Gross and Net Increase

Completion of Munition Orders Contributed Largely to Result, but Sales Billed and Net Income for Regular Products Showed Big Increases

The income statement of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., for the year ended March 31, 1917, follows:

Gross earnings sales billed.....	\$89,539,442
Cost of sales.....	72,077,751
Net manufacturing profit.....	\$17,461,690
Other income.....	1,386,546
Gross income from all sources.....	\$18,848,237
Deductions from income.....	768,348
Net income available for dividends and other purposes.....	\$18,079,888

The gross earnings and net income for the year were greatly in excess of any previous year in the history of the company. The completion of large orders for munitions contributed largely to the results for the year, although sales billed and net income for the regular products showed large increases over any preceding year. The amount of taxes—federal, state and county—paid or accrued during the year was in excess of \$2,000,000. The value of unfilled orders on March 31, 1917, for the regular products was \$39,776,739, as compared with \$22,097,995 on the same date of last year.

The net income for the year was \$18,079,888.83, thereby increasing the surplus of \$9,246,707.03 as of March 31, 1916, to a gross surplus of \$27,326,595.86. Dividends were declared for the full year at the rate of 7 per cent per annum upon the preferred stock and upon the common stock at the rate of 6 per cent for the first and second quarters and at the rate of 7 per cent for the third and fourth quarters. For the purpose of increasing the reserve account, the sum of \$5,000,000 was appropriated from surplus. The net surplus as of March 31, 1917, was \$18,105,298 as compared with \$9,246,707 on March 31, 1916.

The property and plant account showed a net increase during the year of \$1,499,805. Depreciation of buildings and equipment and expenditures for extensions, renewals and betterments of plant and equipment was written off during the year to the amount of \$6,473,066. Investments in other companies increased during the year \$2,493,825, which chiefly represents additional shares of the Electric Properties Corporation and Canadian Westinghouse Company acquired during the year.

By the sale in February, 1917, of \$15,000,000 additional common capital stock and the conversion of over \$3,000,000 of bonds, the total outstanding capital stock was increased during the year to \$74,812,650. The balance, \$2,247,000 of the convertible sinking fund 5 per cent gold bonds issued in 1915, outstanding on Oct. 1, 1916, were called for redemption on Jan. 1, 1917. All but \$71,000 face value of these bonds were converted into common stock, par for par, before the redemption date.

The annual report states that with the exception of the contracts with the British Government for the manufacture of Russian military rifles which are being carried out by the New England Westinghouse Company under a modified contract, the company has no uncompleted munitions contracts for foreign governments on its books, all such contracts having been completed or canceled.

## Handling Sales in the Orient

American Salesman After Long Trip Recommends Foreign Sales Be Handled Through Export Houses

James G. Drought, Chicago sales manager of the U. S. Graphite Company, has just returned from an eight months' trip through the Orient, where he visited Japan, China, the Philippines, Russia and Hawaii for the purpose of promoting the sale of his company's motor and generator brushes. When interviewed as to suggestions which might be of interest to other manufacturers who received inquiries from traction properties in the far East, Mr. Drought made the definite statement that the best method of handling individual sales would be through some of the large special organizations which make a business of importing supplies for the Oriental trade. There are large distributors, some with offices in New York, who are well equipped with staffs of engineers and salesmen in the far East. The problem for the American manufacturer, particularly the one with a limited foreign trade, is greatly simplified after he has made working relations with one of these well-established organizations. Most of these organizations have branches or correspondents in New York, and the American manufacturer can lay the goods down in New York and receive his money without the work, worry and risk of making foreign deliveries.

## Effect of War on Carbolineum Business

American Manufacturers of Carbolineum Grades of Wood Preservers Fulfill Trade Requirements

By E. E. PERSHALL

General Superintendent Kettle River Company, Minneapolis, Minn.

One of the largest benefits gained by American industry from the world war is the enforced development of the manufacture of certain commodities heretofore not produced in a large way in this country. Carbolineum grades of wood-preserved oil offer a notable example. Until three years ago the manufacture of these oils for wood preservation was confined largely to Germany, and German oils dominated the American market. However, the cessation of German exportation with the beginning of the English blockade gave the American users prospects of a German carbolineum oil famine. But the American manufacturers, recognizing the opportunity which the situation afforded, immediately commenced the production of the carbolineum grades of creosote oil, and to-day the American oils fulfill the requirements of the trade both as to quality and quantity.

One of the reasons why the German oil was so well established in America was its alleged secret process of manufacture. The oil was said to include chemicals compounded by secret processes known only to the Germans. Americans then engaged in the wood-preserving business found it more profitable to act as local representatives for German agents than to attempt to compete.

### EXPOSING THE GERMAN CLAIMS

The German claims were known to our chemists to be part of clever sales schemes. The United States government tests had proved the perfect wood preserver to be the high boiling creosote oil distilling above 300 deg. C., providing that the oil was a pure coal-tar distillate. There was nothing mysterious or unusual about either the formula or the coal. Experts knew that America had the proper coal.

The foreign-trade conditions in 1914 gave us a chance to find a market for American oil. All shipment of German carbolineum wood-preserving oil to this country had been stopped. This was our opportunity, and we at once erected

stills and other machinery used in the production of the German carbolineum grade of wood-preserving oil. Since 1914 carbolineum grades of oil have been manufactured which pass the specifications prescribed by the United States Signal Service and the United States Navy.

THE AMERICAN OIL

We have had no trouble in finding a market, and if we had not been able to manufacture this oil the American trade would have found itself facing a wood-preserver famine. Instead of embarrassment because of a lack of oils fair deliveries for three years have been given by a well-organized sales department. Our trade-marked oil is known as "K-R-Wood Preserver." I do not think that German oils will ever again be able to compete seriously in the American market.

British Westinghouse to Be Controlled in England

By resolution of stockholders the control of the British Westinghouse Electric & Manufacturing Company is to pass from America to a group of capitalists in Birmingham, England. This change is made as the result of the policy of British industry to become independent of foreign capital control. The American interests, it is said, have no desire to part with their holdings, but they appreciate the reasons for the change. They will retain a minority interest in the British company.

The control will pass under an option given last December. Since under British law a company cannot buy its own shares, a holding company is being formed to buy the shares and debenture stock held in America, the price to be paid being approximately £1,250,000 in first lien 5 per cent bonds and £100,000 in ordinary shares for an original investment said to be £1,820,000. The ordinary-share provision gives the American interests half the profits of the holding company beyond 6 per cent. The return to them under the new plan, it is reported, will be the same as at present. Through purchase of securities of the British company by the new holding company, about £750,000 of new capital is to be secured by the former.

NEW YORK METAL MARKET PRICES

	May 3	June 9
Prime Lake, cents per lb.	31	32 1/2
Electrolytic, cents per lb.	31	32 1/2
Copper wire base, cents per lb.	36	36
Lead, cents per lb.	9 7/8	11 1/2
Nickel, cents per lb.	50	50
Spelter, cents per lb.	9 1/2	9 3/4
Tin, Straits, cents per lb.	58 1/2	60 1/4
Aluminum, 98 to 99 per cent, cents per lb.	60	63

OLD METAL PRICES

	May 3	June 9
Heavy copper, cents per lb.	24 1/2	28
Light copper, cents per lb.	21 1/2	25 1/2
Red brass, cents per lb.	18 1/2	19 1/2
Yellow brass, cents per lb.	17 1/2	18
Lead, heavy, cents per lb.	7 3/4	8 3/4
Zinc, cents per lb.	7	7
Steel car axles, Chicago, per net ton.	\$41.50	\$42.50
Iron car wheels, Chicago, per gross ton.	\$24.00	\$34.00
Steel rail (scrap), Chicago, per gross ton.	\$31.50	\$37.50
Steel rail (relaying), Chicago, per gross ton.	\$39.00	\$42.50
Machine shop turnings, Chicago, per net ton.	\$11.00	\$15.50

CURRENT PRICES FOR MATERIALS

	May 3	June 9
Rubber-covered wire base, New York, cents per lb.	36 1/2	36 1/2
No. 0000 feeder cable (bare), New York, cents per lb.	36 1/2	36 1/2
No. 0000 feeder cable stranded, New York, cents per lb.	33 3/4	33 3/4
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton.	\$40.00	\$40.00
Rails, heavy Bessemer, Pittsburgh, per gross ton.	\$38.00	\$38.00
Wire nails, Pittsburgh, per 100 lb.	\$3.50	\$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	\$3.85	\$4.00
Steel bars, Pittsburgh, per 100 lb.	\$4.00	\$4.25
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	\$6.35	\$6.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	\$7.55	\$8.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	\$4.35	\$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	\$4.15	\$4.15
Cement (carload lots), New York, per bbl.	\$2.12	\$2.40
Cement (carload lots), Chicago, per bbl.	\$2.16	\$2.31
Cement (carload lots), Seattle, per bbl.	\$2.60	\$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	\$1.21	\$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	\$1.22	\$1.22
White lead (100 lb. keg), New York, cents per lb.	10 3/4	11 3/4
Turpentine (bbl. lots), New York, cents per gal.	52	44

ROLLING STOCK

Wisconsin Electric Railway, Oshkosh, Wis., is reported to be in the market for ten city cars.

Union Street Railway, New Bedford, Mass., is reported to be in the market for six cars.

Gary & Interurban Railroad, Gary, Ind., through Ford, Bacon & Davis, has purchased two motor and four trail cars from the McGuire-Cummings Company.

Terre Haute (Ind.) Electric Traction Company on May 21 had one car completely destroyed by a fire which started in its local carhouse.

Cincinnati (Ohio) Traction Company is reported to have placed an order with the Cincinnati Car Company for 100 cars.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, is reported to have purchased four cars from the Cincinnati Car Company.

Trenton & Mercer County Traction Company, Trenton, N. J., has received permission from the Public Utility Commission to sell twenty old summer cars.

Nipissing Central Railroad, North Cobalt (Ont.), Canada, has purchased three second-hand cars from the East St. Louis, Columbia & Waterloo Railway, East St. Louis, Ill. These are 50-ft. interurban cars and will be used until new equipment can be ordered and built.

Saskatoon Municipal Railway, Saskatchewan, Canada, is in the market for three single-truck double-end cars. The cars desired are 33 ft. long over all with a seating capacity of thirty-two passengers. The equipment per car wanted includes two 40-hp. motors, controllers, hand brakes, center aisle reversible cane seats, forced-draft heaters, etc. The weight of each car should not exceed 35,000 lb.

Worcester (Mass.) Consolidated Street Railway, noted in the May 5 issue as being in the market for a number of cars, has specified the following details on seven box express cars:

Number of cars ordered,	4 Motor, 3 Trailer	Couplers . . . . Tomlinson MCB
Date order was placed,	May 19, 1917	Fenders or wheelguards. Pfingst
Date of delivery . . . .	Nov. 15, 1917	Gears and pinions,
Builder . . . . .	Osgood-Bradley	Forged steel, heat-treated
Type . . . . .	Box express	Hand brakes,
Weight (total) . . . . .	28 tons	Horne double acting (Motor)
Boilster centers, length,	26 ft. 6 in.	Blackall vertical staff,
Length over bumpers. 45 ft. 0 in.		(Trailer)
Length express compartment,	35 ft. 8 1/2 in.	Heaters . . . . . Electric
Width over all. . . . .	8 ft. 4 3/8 in.	Headlights,
Rail to trolley base,	11 ft. 7 3/4 in.	Crouse-Hinds "Melobeam"
Body . . . . .	Semi-steel	Journal boxes . . . . Symington
Interior trim . . . . .	Sheathed inside	Lightning arresters,
Roof . . . . .	Arch	Motors. . . . Four West. No. 306-
Air brakes,	G. E. straight and automatic	CV, inside hung
Axles . . . . .	Forged Steel	Enamel . . . . . Sipes' Enameloil
Bumpers. . . . .	Rico anti-climbers	Sanders . . . . . Murphy
Control, type. . . . .	K-35-G-2	Retrievers . . . . Wilson No. 2
Designation signs,	Ill., "Freight"	Trolley base . . . . U. S. No. 13
		Trolley wheels,
		Railway standard
		Trucks. . . . . Wason, arch-bar
		Ventilators . . . . . None
		Wheels . . . . . 33-in. cast iron

Northern Ohio Traction & Light Company, Canton, Ohio, which is having twenty-five vestibuled pay-within cars built for it by the St. Louis Car Company, has specified the following details:

Number . . . . .	25	Designation signs,
Builder . . . . .	St. Louis Car	Illuminated, St. Louis Car E.
Type . . . . .	Vestibuled pay-within	S. S. Co. mechanism
Seating capacity . . . . .	40	Door mechanism,
Weight (total) . . . . .	36,840 lb.	Hand-operated, St. Louis Car
Truck centers, length. 19 ft. 0 in.		Fenders. . . . Railway company's,
Length over bumpers. 41 ft. 4 in.		standard
Length over vestibule. 40 ft. 4 in.		Gongs. 12-in., bronze pneumatic
Width over posts. . . . .	8 ft. 2 in.	Hand brakes . . . . . Ackley
Height, floor to ceiling,	7 ft. 6 in.	Hand straps,
Height, sill to trolley base,	8 ft. 5 1/4 in.	Rico sanitary straps
Body . . . . .	Steel sides with	Heaters . . . . Peter Smith No. P-S
	wooden superstructure	Headlights . . . . Crouse-Hinds
Interior trim,	Honduras mahogany	Journal boxes. . . . St. Louis Car
Headlining . . . . .	3/16-in. Agasote	Motors. Two GE. 204—outside
Roof . . . . .	Turtle-deck	Paint . . . . . Murphy A B C
Underframe . . . . .	Steel	Registers . . . . International R-5
Air brakes . . . . .	Westinghouse	Sand-box with Reliance sand
Axles . . . . .	St. Louis Car	trap valve
Bumpers . . . . .	Rico anti-climbers	Sash fixtures. . . . O. M. Edwards
Car trimmings . . . . .	Bronze	Seats. . . . Cross and longitudinal,
Cables . . . . .	St. Louis Car	Hale & Kilburn
Conduits . . . . .	St. Louis Car	Seating material. . . . Rattan
Control, type. . . . .	G. E. K-35	Springs . . . . Pittsburgh Steel Spg.
Couplers,	St. Louis Car, Hovey type	Step treads . . . . . Mason
	St. Louis Car, Forsyth No. 88	Trucks. . . . St. Louis Car 106A
Curtain fixtures.	Forsyth No. 88	maximum traction
Curtain material,	P'antasote No. 77	Ventilators . . . . . Automatic
		Wheels. . . . 33-in. driver, 21-in.
		pony
		Special devices. Faraday buzzers

### PROFESSIONAL NOTE

John A. Beeler, consulting engineer, who has been located for the past year at 60 State Street, Boston, has moved his headquarters to the Vanderbilt Concourse Building, 52 Vanderbilt Avenue, New York City. While in Massachusetts he was engaged upon a number of important investigations and reports for the Bay State Street Railway and other companies. Mr. Beeler was formerly vice-president and general manager of the Denver Tramway System, and while with this company he demonstrated his ability to instill enthusiasm and develop the loyalty of his employees to a remarkable extent. Although there was a large number of men on the property, no strikes or labor troubles arose during his management of twenty-five years. The employees were made to realize that their prosperity was dependent upon the success and prosperity of the company. The result was a most courteous, polite and painstaking lot of men who by their bearing and treatment of the patrons established a friendly relation between the public and the company, much to the latter's benefit in every way. Mr. Beeler's experience as a constructing engineer and successful manager especially qualifies him to render valuable service where a practical solution of operating problems and difficulties are involved.

### TRADE NOTES

A. M. Collins has been appointed sales manager of the Detroit office of the Western Electric Company.

Draeger Oxygen Apparatus Company, Pittsburgh, Pa., has moved from Pittsburgh to Penn Avenue and Hay Street, Wilkinsburg, Pa.

Ollard Trolley Wheel Company, Tacoma, Wash., has been incorporated with a capital of \$20,000. The company will manufacture trolley wheels.

Van Dorn & Dutton Company, Cleveland, Ohio, has opened a branch office at 524 Wells Building, Milwaukee, under the management of James Gibbons, formerly manager of the Baltimore branch.

United States Electrical Manufacturing Company, Los Angeles, Cal., is putting out a new electric grinding motor, fully inclosed and provided with ball bearings. It can be supplied for bench mounting or with a special pedestal.

H. W. Johns-Manville Company, New York, has moved its Pittsburgh showrooms and sales offices to the ground floor of the Westinghouse Building, corner of Ninth Street and Pennsylvania Avenue.

Walter A. Zelnicker Supply Company, St. Louis, Mo., announces that it has secured the services of Charles H. Trapp. Mr. Trapp was formerly associated with James Stewart & Company of St. Louis and also with Terrell Croft, consulting electrical engineer, St. Louis.

Wagner Electric Manufacturing Company, St. Louis, Mo., announces the appointment of F. T. Coup, formerly connected with its Chicago office, to take charge of its Milwaukee office in its new location, the First National Bank Building.

George W. Goethals announces his association with Charles C. Jamieson, Robert E. Graham, George H. Houston, John C. Jay, Jr., and George M. Wells, consulting engineers, 40 Wall Street, New York. The name of the company will be Goethals, Jamieson, Houston & Jay, Jr.

E. C. Woodbury, for a number of years with the Standard Underground Cable Company as assistant to the manager, has resigned from that company to manage the Southwestern business of the Belden Manufacturing Company of Chicago.

Ohio Brass Company, Mansfield, Ohio, has received an order through a New York export house for overhead materials amounting to approximately \$10,000. The materials will be used in rehabilitating the properties of the Mexico Tramways, Mexico City, Mexico.

Asbestos Protected Metal Company, Pittsburgh, Pa., announces the temporary closing of its Atlanta and St. Louis offices. This has been made necessary because J. R. Nichols, Atlanta manager, entered the Officers' Reserve Corps at

Fort McPherson and F. C. Easterby, St. Louis manager, entered the Officers' Reserve Corps at Fort Riley, Kan.

Underwriters' Laboratories, Chicago, Ill., announce as additions to their casualty council the following: Col. Lewis T. Bryant, Commissioner of Labor of the State of New Jersey, Trenton, N. J.; Lew R. Palmer, Department of Labor and Industry, Harrisburg, Pa., and A. H. Young, director of the American Museum of Safety, New York.

Bridgeport (Conn.) Brass Company has extended to its employees a liberal plan for the purchase of Liberty bonds. It will carry the subscription of any individual in its employ for fifty months, that is, the employee may pay for his bond in instalments of 2 per cent per month of the value of his subscription. In addition the company has made a large subscription in its own name.

Monitor Controller Company, Baltimore, Md., manufacturer of automatic starters and controllers for all kinds of motor-driven machinery, announces the opening of a new office in Buffalo, N. Y., at 718 Ellicott Square, under the direction of William G. Merowit. This office will have charge of business in the western New York territory, also Canadian territory adjacent to Toronto and Hamilton.

Railway Safety Device & Manufacturing Company, Parsons, W. Va., has been incorporated with \$100,000 capital to manufacture locomotive spark arresters, safety mail cranes, and other railway specialties. The corporation was formed by Frank M. Glenn and Otis A. Miller of Parsons, Robert E. Jackson and Everett G. Livesay of Princeton, and J. A. Visquesney. The corporation has purchased 10 acres of land as a site for a foundry.

Sangamo Electric Company, Springfield, Ill., announces the opening of a San Francisco office at 37 Stephenson Street, in charge of L. A. Nott, district manager. This office will represent the Sangamo company in northern California and that part of southern California not handled by the Sangamo company's Los Angeles office. Mr. Nott is well known to the electrical fraternity on the Pacific Coast, having been connected with the Standard Underground Cable Company for many years and later with the K. P. F. Electrical Company, which association he will continue. The Sangamo company will now carry a complete stock of meters, repair parts, etc., in San Francisco, and will be prepared to service its meters in this territory. The Los Angeles and southern California district office in the San Fernando Building, Los Angeles, will continue under the direction of J. C. Monahan, district manager.

### ADVERTISING LITERATURE

Van Dorn & Dutton Company, Cleveland, Ohio: A folder. "Three Trumps," referring particularly to its gears, electric tools and weldless wire chains.

Dayton (Ohio) Manufacturing Company: Catalog No. 213, describing and illustrating the latest patterns of washstands, water coolers and water and dry closets.

National Tube Company, Pittsburgh, Pa.: Classification and list adopted on June 1 on the cost of black and of galvanized malleable iron fittings made by this company.

Pennsylvania Metallic Tubing Company, Chicago, Ill.: A thirty-two-page bulletin describing and illustrating the various uses of Penflex metal hose. Contains tables giving data on vacuum tubing, fireproof tubing for light pressures and tubing for high pressures.

Crouse-Hinds Company, Syracuse, N. Y.: Catalog No. 201, 116 pages. Includes ten different types of Imperial luminous arc headlights and eleven Imperial carbon-arc headlights for electric traction service, headlights for harbor and river service, headlights for electric mine locomotives and wiring equipment, supply parts and wiring diagrams for all of the above-named headlights. Also catalog No. 202 on Imperial incandescent headlights for railway and mining service, including six types each with regular filament Mazda lamps for city service, eight types for city and interurban service and seven types for high-speed interurban service. Wiring diagrams, wiring equipment parts, and numerous catalog number indexes for all the above headlights are given.