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Railways Often Created Unprofitable Extra Traffic

THERE is a melancholy pleasure in delving through association transactions of a decade ago and seeing how little was really understood of traffic creation. The central idea seemed to be that of inducing extra travel for pleasure rather than for business. We read of how this park brought out the women and children, how the Elks were induced to ride to the trolley company's grounds at the rapacious price of 5 cents per head for 10 miles, how by a subscription of \$500 the United Pretzel Benders convention was persuaded to go to Smithville and use the trolley touring cars, etc. All of these schemes and many more like them created traffic, but for a long time operators did not realize that it was often a mighty expensive kind of traffic; that park overhead went on for twelve months and the business for only three and that excessive Sunday and holiday traffic was rich in accidents and tiring to men who also wanted a little holiday of their own. It is strange that so few realized that the most profitable traffic created is that which fills in the valley between the peaks and which can be obtained almost entirely on business grounds. And through what the modern one-man car has taught us, the formula is absurdly simple: Service and speed. The American has proved the best rider in the world, regardless of price, when service and speed are at his command. Therein lies the open secret of creating the short-haul, between-the-peaks traffic that costs less instead of more than normal riding.

Have Staggered Hours Come to Stay?

FOR years staggered hours for business have been the day dream of most electric railway managers. They have realized that any way of spreading the rush hour would be of benefit to both company and public because it would permit more and better car service with no additional cars. On routes where traffic is already congested, and this is the condition in most of our large cities, the addition of cars would reduce the speed of those on the street and give no additional seats per hour past a given point. Hence, from a theoretical point of view, the plan of staggered hours is an excellent one from every view point. It has not been adopted because it ran counter to one of the most serious obstacles by which any reform can be opposed, namely, established habit.

People are accustomed to leaving their homes in the morning and returning in the evening at certain hours, and the conduct of their households has been established on that basis. This habit is not affected by the daylight-saving plan, first, because the hours for rising

and other events are not changed, and, second, because everybody in the community is affected by the rule. But with the staggered hours the greater part of the working community has to begin work earlier or later than usual. In consequence, practically the only progress made in the establishment of staggered hours, up to within recently, has been where a large factory or group of factories has depended for its transportation upon an electric line of limited capacity. Here, changes of opening and closing hours of from fifteen to thirty minutes in individual factories or factory departments have sometimes been established, often grudgingly, by the factory managers. This reluctance to make changes, we believe, has been due not to any lack of willingness by the employers to co-operate, so far as they were concerned, but because they have not seen a strong demand for such changes from the employees for whose benefit the changes were primarily to be made.

Under the stress of conditions brought about by the present epidemic of influenza, however, there has been a marked change. The connection between the avoidance of crowds and the elimination of the rush hour is obvious. Washington was the first city to introduce the staggered hour system, but New York followed on Oct. 7. In some respects the change could be made more easily in Washington than in any other city because of the fact that so many of the people there work for one employer, namely, the government, which through its police powers can easily set the working hours of the rest of the population. When the plan of staggered hours was first suggested in Washington nine months or a year ago to relieve traffic congestion, much of the same inertia was encountered there as had been experienced elsewhere, but when its advantages as a precaution against the influenza epidemic were realized by the health authorities, action quickly followed.

The gain in Washington in the spread of openings of different government departments and business houses is marked. Formerly, with the exception of the Bureau of Engraving and Printing, which opened at 8 o'clock, all of the government departments as well as the business offices and stores began work within fifteen minutes, or between 8.45 and 9 a. m. Now, the opening hours extend from 8 a. m. to 10 a. m. or for two hours, exclusive of the Bureau of Engraving and Printing, and from 7.30 a. m. to 10 a. m. or for two and one-half hours, including that bureau.

In New York City the change can be considered little short of revolutionary, in view of the number of establishments involved. The situation in New York has an added complication because of the many commuters by steam railroad from New Jersey and other lines running into New York on which train schedules are much more rigid than on street railways. Nevertheless, the change

in New York is working smoothly, and while the people have not yet become accustomed entirely to it, no serious difficulties have developed. It was introduced in New York solely, of course, because of the prevalent influenza, but with the advantages shown we believe that some differentiation of hours will continue, even after the subsidence of the epidemic. So far as New York is concerned, the Board of Health has now established two precedents. The first is that it may summarily prohibit overcrowding of cars by limiting the number of passengers to be carried, as it did two years ago, and second, that it may make such prohibition practicable by ordering changes in business and industrial working periods.

Staggered hours are such a benefit to transportation companies that the latter should aim to give good service in the hours which were formerly the slack hours so as to prove to the public that the plan is really worth while.

Equipment, Brains and Skill Are Needed in the Power Plant

THE power end of the electric railway business is getting an unusual share of attention at this time because it is the physical movement of the cars by means of electric power that consumes fuel. The critical shortage in coal makes the people and their representatives, the government, very lenient toward any measure which will produce fuel saving. Thus there is added to the usual reasons for economical generation and use of electrical energy, and there are plenty of them, a very unusual one which is due to the war. The result will be that after the war the power plant, substation and transmission systems will show the effects of the strenuous efforts that have been made to keep them operating at high efficiency.

Several recent issues of the ELECTRIC RAILWAY JOURNAL have contained notable articles depicting the ways in which engineers and managers are meeting the needs of the hour in the power field. In this issue there is a rather remarkable collection of such articles which, taken together, form a power symposium of great interest. Of a general nature is a presentation of the power features of the Central Argentine Railway electrification. Although the power plant in this case is a small one, as power plants go in the United States, it is replete with modern devices for reducing labor and saving fuel. The high price of coal in the Argentine is sufficient reason for the latter policy. The substations are provided with devices for preventing flashovers, which have proved to be very successful. An ingenious plan is used for permitting the equalizing of load among substations.

In the field of the substation Walter C. Slade, superintendent of power and lines of the Rhode Island Company, discusses the automatic substation, particularly from the economic side. Although a firm believer in the "automatic," Mr. Slade does not consider it a panacea for all distribution ills. At the same time he sees a big future for it; first as a labor saver, second as an energy saver and third as a copper saver, to say nothing of minor points in its favor. Supplementing Mr. Slade's article is a brief account of one of the latest automatic substations, on the lines of the

Columbus Railway, Power & Light Company, in which some original remote control "stunts" are combined with the standard features. Other articles tend to round out the power phases of this issue.

Zone-System Experiments Have Been Postponed Too Long

DURING the last two years, when most electric railways have been brought nearly to the verge of bankruptcy because of rising cost of operation, nearly all of the pleas made to public service commissions for higher fares have been for relief in the form of an increase from 5 cents to 6 or 7 cents. The petitioners asserted either that a flat fare increase was intrinsically the best or that it was at least the most expedient, in that it would give immediately the necessary revenue and permit without hardship to the railways the long investigation that would be required before a zone system could possibly be adopted.

Sufficient time has now elapsed so that the results attained by some of these fare increases are known. Briefly they show that traffic has fallen off to a larger extent than most of the petitioners probably believed would be the case. There has usually been some gain in revenue but far lower in percentage than the increase in fare. Only the last week, for instance, we published the first month's figures for the 7-cent fare on the publicly controlled lines in Boston, where a 40-per cent increase in fare produced in August only a 12-per cent gain in revenue.

It is true that under the pinch of hard times pleasure riding has diminished, that army service has reduced the number of men at home who ride and that automobile competition is heavy. It is equally true that a zone system would not be immune to these influences, but a zone system at least would not add to these troubles a discrimination against the most profitable class of passengers carried by an electric railway and the class which can most easily walk—the short-haul riders. To sum up this phase of the situation, therefore, it must be admitted that while the increases in revenue which have been secured through higher unit fares have been better than no increases at all, they have not provided permanent relief or even established a method whereby such relief can readily be secured.

It is not surprising, therefore, that many electric railway companies are now turning to the zone system for relief; in fact, we believe that if half of the energy spent upon securing higher unit fares had been devoted to study and experiments with the zone system, the industry would be farther advanced. While not capable of curing all electric railway ills or probably applicable to all companies, the zone system presents promise for relief to many which should not be ignored. The difficulties of fare collection seem serious, but we believe that with the initiative and genius for overcoming obstacles which have characterized the industry in the past, they will be overcome. When traffic experts recently asked the superintendent of a large system about the practicability of collecting zone fares he answered: "You work out the zone limits and establish reasonable fares, and I'll guarantee to collect them." This is the spirit to win over obstacles.

The Call for Women by the Railway Mechanical Department

THE introduction of women into occupations previously filled by men was discouraged in many quarters during the first year that the United States was engaged in this war. Early in 1918 the Secretary of Labor of the United States was quoted as expressing the opinion that there was an ample supply of labor both for the army and for industry, and that the policy of the labor administration was to prevent the introduction of the women into new occupations, as long as men were available. This attitude was reflected in the position taken by many state councils of defense, official bodies and private associations. To-day, however, the needs of industry are becoming extremely acute and it is evident that the supply of men is not equal to the demand for labor. The Amalgamated Association of Street & Electric Railway Employees of America has changed its policy somewhat by recognizing the necessity of the employment of women under certain conditions.

While most of the discussion up to this time on the employment of women in railway work has related to their use on the platform, there are many places on an electric railway system where their services can be used to advantage. Of course before the war much of the cleaning of cars and the winding of coils, as well as a considerable amount of the clerical work in the offices of all departments was done by women, but since the war began and the labor shortage has increased, the opportunities for women have vastly increased, particularly in the mechanical department. This is shown by the records of the Brooklyn Rapid Transit Company whose practice in considerable detail in this regard is described in an article in this issue.

In Brooklyn the women who have taken up service in the mechanical department appear to come from other industries where the pay is less and the hours longer more than from a supply of new laborers entering the field. Most of the tasks on which they have been used up to the present time are those which do not require a great amount of technical skill but depend rather upon woman's natural sense of cleanliness, as well as on deftness of touch and rapidity of operation. There are many tasks of this kind in a railway car shop in addition to those in which women have been used extensively in the past, such as general cleaning, clerical work and stock taking. Thus, women have been used to good advantage in the disassembling and cleaning of the electrical apparatus, with its reassembling and testing after the several parts have been examined and painted or shellacked as needed. Work of this kind, which includes the inspection of the braking and other pneumatic equipment, calls for no small degree of intelligence.

For light bench and machine tool operation, which is also included in the scope of women's work in Brooklyn, it is obvious that the operators must be trained, so that it is too early yet in Brooklyn to form a definite conclusion as to women's usefulness, as the force of women whose service is measured by weeks and months is necessarily at a disadvantage when compared with one made up of men who have had years of service. In this connection, however, it might be said that the National Industrial Conference Board, in its recent research report No. 8, reaches the general conclusion that the efficiency of women as machine-tool operators depends more on their length of service than on the nature of the work. This conclusion is based on assembled information obtained from a large number of manufacturers in the metal trades who are using women extensively. Some of these employers report women as performing certain operations less efficiently than men, while others report the same class of work as being done successfully.

Some changes in shop organization, of course, are necessary where women are employed, as they seldom have the skill to set up the machine they use and they are unable to perform operations involving heavy work or lifting unless male helpers are provided. Additional accommodations must also be provided, such as wash, rest and lunch rooms.

The mixing of the women with men at work is necessary in most inspection and overhauling work. This has certain advantages, as the men can do the lifting and handling of heavy parts. In some states the work that women may perform is restricted. For instance, in New York, the law provides that women shall not lift weights in excess of 25 lb. and the grinding of metal parts is forbidden to women.

As a matter of safety and comfort some form of protective dress is essential. In the usual railway shop bloomers or overalls with a close-fitting cap to prevent loose hair from being caught are most generally used. When the reasons for wearing protective uniforms are properly explained usually no opposition is encountered. Objections are more easily overcome if the clothing is well and neatly designed.

Regarding the matter of wages it may be noted that the United States Department of Labor has declared itself in favor of equal wages for women performing the same work as men on government contracts and that a similar position has been taken by the Director General of Railroads in ordering the recent wage increases. There is a period of instruction and training, however, when women first enter railway work where their usefulness is comparatively small, and in justice to more experienced workers they should not receive the same compensation. But for light operation their employment by railways may be considered permanent.

A ONE-DAY CONFERENCE of the *American Electric Railway Association* will be held in the *United Engineering Societies' Building, 29 West Thirty-ninth Street, New York, on Friday, November 1, 1918. It will begin at 9.30 a. m. There will be a report from the Electric Railway War Board, and the subject of wages, revenues and finances will be discussed.*

Power Supply for the Central Argentine Electrification

This Power System Supplies Traction, Lighting and Sundry Power Requirements in the Electrified Zone of the Central Argentine Railway in the Suburbs of Buenos Aires, Argentina—It Has Made a Remarkable Record for Continuity of Service

IN LAST WEEK'S issue of the *ELECTRIC RAILWAY JOURNAL* an article was published giving the salient features of the electrification of the Central Argentine Railway excepting the power supply system. The provision for power supply is very complete, and includes a 15,000-kw., three-phase power plant, traction and other substations, and a complete alternating-current transmission and direct-current distribution system. Power is produced at 2500 volts, 25 cycles; is stepped up to 20,000 volts for transmission and is transformed to 800 volts direct current for traction purposes or other form as needed for lighting, power, etc. Supplementing last week's article, the following account of the power side of this installation will serve to complete the story of this modern electrification.

PROVISION MADE IN THE BOILER ROOM FOR COAL SHORTAGE

The boilers are designed for a working steam pressure of 210 lb. per square inch and 600 deg. Fahr. temperature. They are supplied with underfeed stokers and Green economizers of 200 pipes each. There are also four feed pumps, two of the centrifugal type driven by impulse turbines and two of the vertical reciprocating Nichols type.

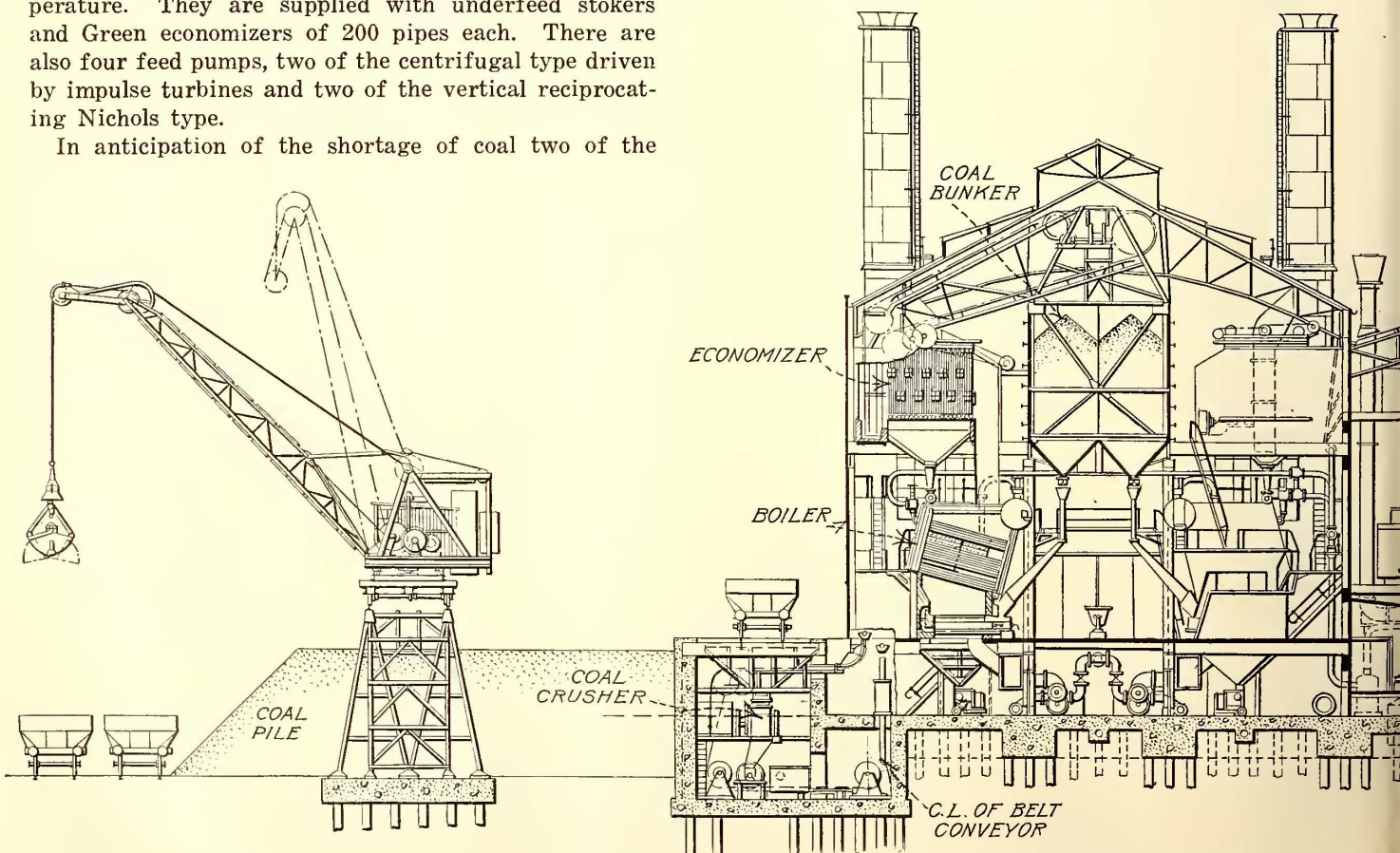
In anticipation of the shortage of coal two of the

boilers were arranged for oil firing and a complete equipment of the Wallsend-Howden system was provided, with the necessary storage tanks, filters and pumps. As the shortage of both coal and oil, due to war conditions, became more acute, other boilers were adapted for wood firing. The present situation will be understood by the statement that during a recent week the plant consumed 72½ tons of coal, 15½ tons of oil and 690 tons of wood. The calorific value of the wood is from a quarter to a third that of coal containing 15,000 B.t.u. per pound.

Water is pumped from the River Lujan to a reservoir, where it is treated with alumino-ferric to precipitate the sediment.

ALTERNATIVE ARRANGEMENT FOR COAL AND ASHES HANDLING

The storage and handling of coal is provided for by means of an elevated railway track running alongside the boiler house at firing floor level, a gantry running



VERTICAL SECTION THROUGH BOILER AND TURBINE ROOMS. SUBSTATION AND
For exact location see map on page 605.

parallel to the buildings and carrying a jib crane with a 2-ton bucket, and two sidings at ground level.

The coal can be lifted from the railway cars and filled either direct into two 15-ton receiving hoppers, or into bottom-discharge wagons which can be hauled along the elevated siding by a winch until they come over the receiving hoppers. In the latter case the coal passes through crushers to gravity bucket conveyors by means of which it is elevated to a distributing conveyor, which in turn discharges it into the coal bunkers located above and between the two rows of boilers. The coal bunkers are of 1000-tons capacity, and they are built of mild steel plates lined with reinforced concrete and with bottoms V-shaped in sections.

The stock coal is lifted from the trucks and stored below and around the gantry in a coal deposit floored with ties and constructed within range of the jib crane, which can work to a radius of 50 ft. The stock storage is 10,000 tons.

The ash-handling arrangements comprise a suction ash plant with two 38-hp. exhausters which take the ashes from the furnace ashpits through electrically operated crushers and specially heavy cast-iron pipes to an 80-ton steel ash bunker lined with reinforced concrete. This is erected at the end of the boiler house at such a height that railway trucks can pass underneath it to receive and remove the ashes. Alternatively the ashes can be taken from the ashpits by half-ton wagons along tracks laid on each side of the boiler house basement and deposited outside the site.

TURBINE ROOM ARRANGED FOR FLEXIBILITY

The generating plant is so arranged that provided one boiler is steaming any one of the turbo-alternators can be used to feed the main busbars and all station auxiliaries. The breakdown of any part of one generating unit will not prevent the operation of the re-

maining sets. Each of the four turbines has its own steam-driven oil pump for use in starting up, its own condenser with air and water extraction pumps, and an independent circulating-water pump. On the electrical side it has a self-excited exciter, direct coupled to the alternator shaft.

Leads from the alternator run direct to the "unit" transformer which supplies the unit distribution board at 440 volts. From this board are fed the motors which operate the auxiliaries definitely belonging to the generating set to which it is attached. The station auxiliaries common to the whole station, such as economizers and fan motors, are fed from a station distribution board made up in four sections.

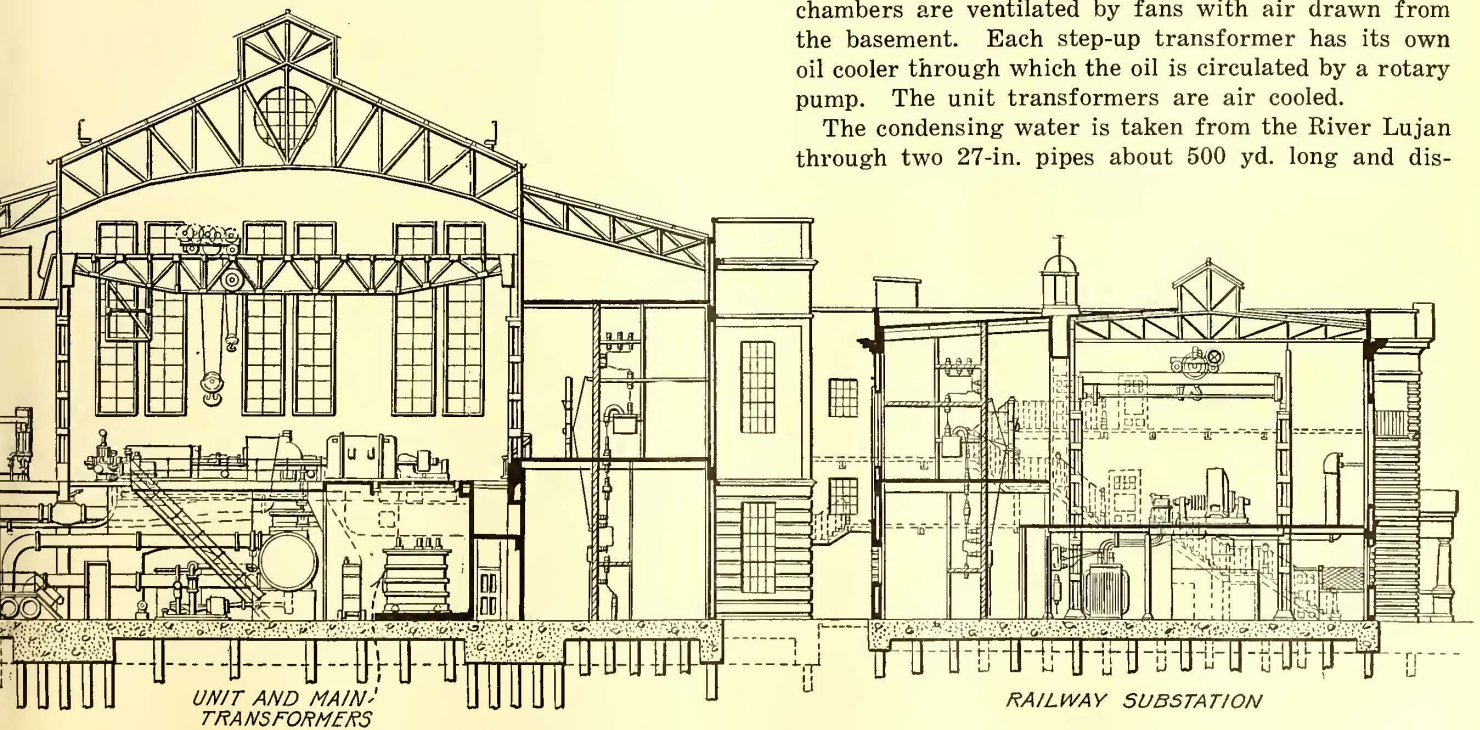
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The high and low-pressure portions of the turbines are in separate cylinders, the high-pressure cylinder being of cast steel. Each turbine is connected by an expansion pipe to the condenser situated below.

The alternators are totally inclosed and ventilated by fans on the rotors, which draw air from a basement through a dry-air filter and discharges it outside the turbine room. The combination of an alternator and a step-up transformer as one generating unit permitted the alternator voltage to be so selected as to give the simplest and most robust stator winding. The stator slots are completely closed and each contains but one conductor.

The step-up and unit transformers belonging to each generating set are housed in a separate chamber in the basement, with hatchways in the turbine-room floor through which they can be handled by the crane. These chambers are ventilated by fans with air drawn from the basement. Each step-up transformer has its own oil cooler through which the oil is circulated by a rotary pump. The unit transformers are air cooled.

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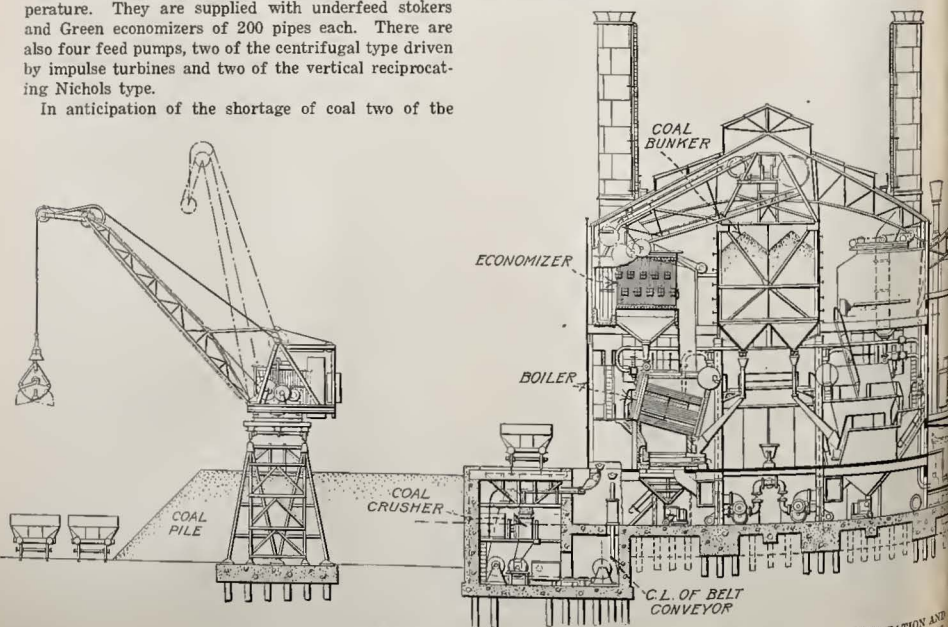
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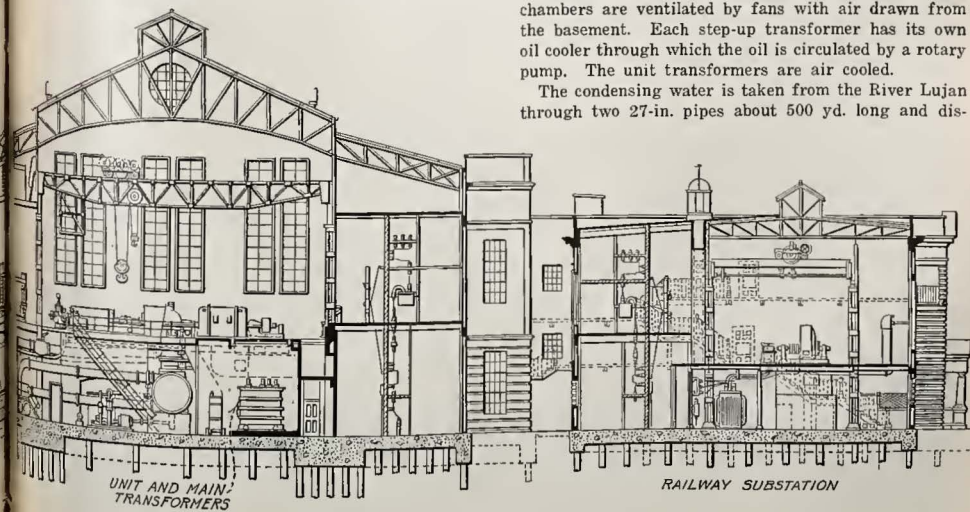
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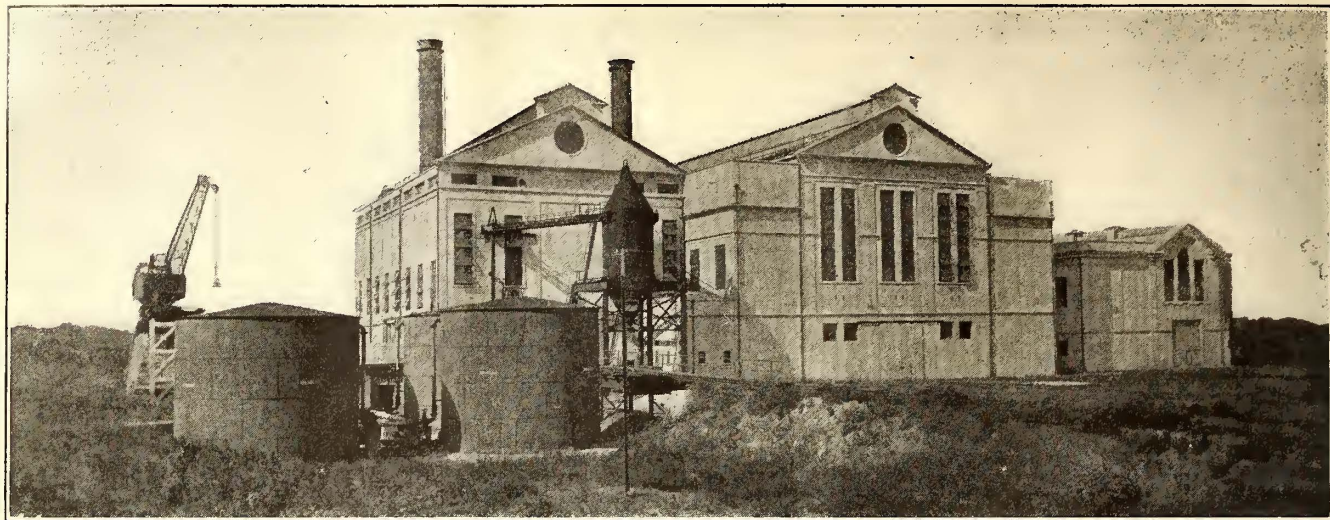
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COAL STORAGE OF THE CENTRAL ARGENTINE RAILWAYS POWER PLANT NEAR TIGRE. For exact location see map on page 646. ELECTRIC RAILWAY JOURNAL for Oct. 5, 1913



A MODERN POWER PLANT NEAR BUENOS AIRES, ARGENTINA

charged into the Rio Rosquetes, a small creek. The condenser shells are of cast iron and the tube plates are of rolled brass $1\frac{1}{8}$ in. thick. The tubes are $\frac{3}{4}$ in. external diameter and are of solid drawn copper No. 18 S. W. G. Aluminum blocks are fixed in the water chambers in metallic contact with the tube plates.

Centrifugal circulating pumps are used with bodies of cast iron and impellers of gunmetal. The circulating water pump motors are housed in a steel-frame, corrugated iron sheeted house erected on a wooden jetty projecting from the bank of the river. In addition to the main circulating-pump motors the jetty carries a centrifugal pump capable of delivering 300 gal. per minute against the head of 20 ft. or 95 ft. This supplies water through a 6-in. pipe either to the purified water reservoir or direct to the storage tanks in the pump house. Two motor-driven air exhausters are also located in the pump house, each capable of producing in three minutes a vacuum of 20 in. in any of the main pumps, including its suction pipe and discharge pipe up to the discharge valve.

SOME ELECTRICAL DETAILS OF THE POWER PLANT

All main switching in the plant is carried out at 20,000 volts, the main switch gear being located in a bay on the side of the turbine room opposite the pump house and boiler house. The operating gallery is about 4 ft. above the turbine room floor to give the operator a good view of the machines.

Each operating panel consists of two cast-iron plates built into a wall of molded concrete, 11 ft. high, faced with glazed tiles. This wall is set forward 3 ft. from the main panels and at the back carries the auxiliary wiring. On the generator panels the instruments are mounted on the wall above the upper cast-iron plates, and below them are the indicating lamps showing the oil switch positions. The operating levers, trip coils and time-limit fuses are carried on the plates, as are also the integrating wattmeters and several minor sets of switches. In front of the generator panels are pedestals carrying exciter equipment and the telegraph.

The main panels are formed of molded concrete cubicles 5 ft. wide, the main wall being 9 in. thick and the sides 4 in. These are separated each into five stories, occupied from the bottom up as follows: Po-

tential transformers, cable isolating switches and current transformers, oil switches, busbar isolating switches and busbars. The compartments are protected by screens of standard metal interlocked with the main switch so that they can be opened only when the switch is opened.

Permanent testing busbars are provided in the generating panels, a water resistance being furnished to take the load of the generator under test.

The unit distribution boards are built up of enameled slate panels and have the busbars mounted in front. Porcelain-handled fuses connect the busbars to studs which pass through the slate to the motor leads at the back.

When the scheme was under consideration the split-conductor system of feeder protection had not been sufficiently tried out to justify its adoption in foreign work of such importance. Accordingly the high-tension transmission system was arranged to consist of 20,000-volt underground feeders with three simple cores, and pilot cables for the protective devices.

The high-tension cables are $1/10$ sq.in. of section, and are of the three-core, paper-insulated, lead-covered, single-wire armored type. The pilot cables for the protective gear are 0.005 sq.in. in cross-section of the same general type, and the telephone cables are eight-pair, dry-core, air-spaced, paper-insulated, lead-covered, single-wire armored cables.

In general the three types of cables are laid in the same trench at a distance of about 1 in. from each other. Above the high-tension cable and about 4 in. from it is placed a creosoted plank. All joints in the high-tension cables were made in gunmetal sleeves, wiped to the lead of the cable, the sleeves themselves being surrounded by a creosoted wooden box with an iron cover. The sleeves were filled with compound. Wherever the armoring is interrupted the joint is spanned by a copper bond of 0.05 sq.in. section.

The direct-current feeders from the substations to the track and the jumpers spanning gaps in the conductor rail are of 1 sq.in. cross-section, paper insulated, vulcanized, bitumin sheathed, taped and braided. They are laid in fiber conduits filled with bitumen. They are supported in the conduits by fiber bridges, and a creosoted plank is laid over the conduits.

The line at present electrified is served by three traction substations and two general service substations. The former are located at San Fernando, about 1½ miles from the outer end of the line; at Olivos, about midway along the line, and at Palermo, about 2½ miles from the city terminus.

The traction substation buildings have steel frames and are walled with brick covered with reinforced cement plaster. The floors and roofs are of concrete reinforced with Clinton fabric, the roofs being flashed with $\frac{3}{8}$ in. of rock asphalt. Provision is made at the substation for housing the attendants.

Each traction substation building is divided into three main aisles; the center one containing the rotary converters, the side ones containing the high-tension and direct-current switch gears respectively. There is a loading bay at one end into which a siding comes, so that railway trucks can be brought under the overhead crane which traverses the whole building.

The basement contains the main transformer, the potential and current transformers, the high and low-tension feeders, the rotary field rheostats, the lightning arresters and the batteries. On the first floor are the rotaries, the 800-volt switch gear, a motor-generator and, on a raised gallery, the high-tension operating gear.

The high-tension gear is similar to that in the power station, the busbars being sectioned and interconnected by an oil switch. The two halves of the bars are fed by different cables.

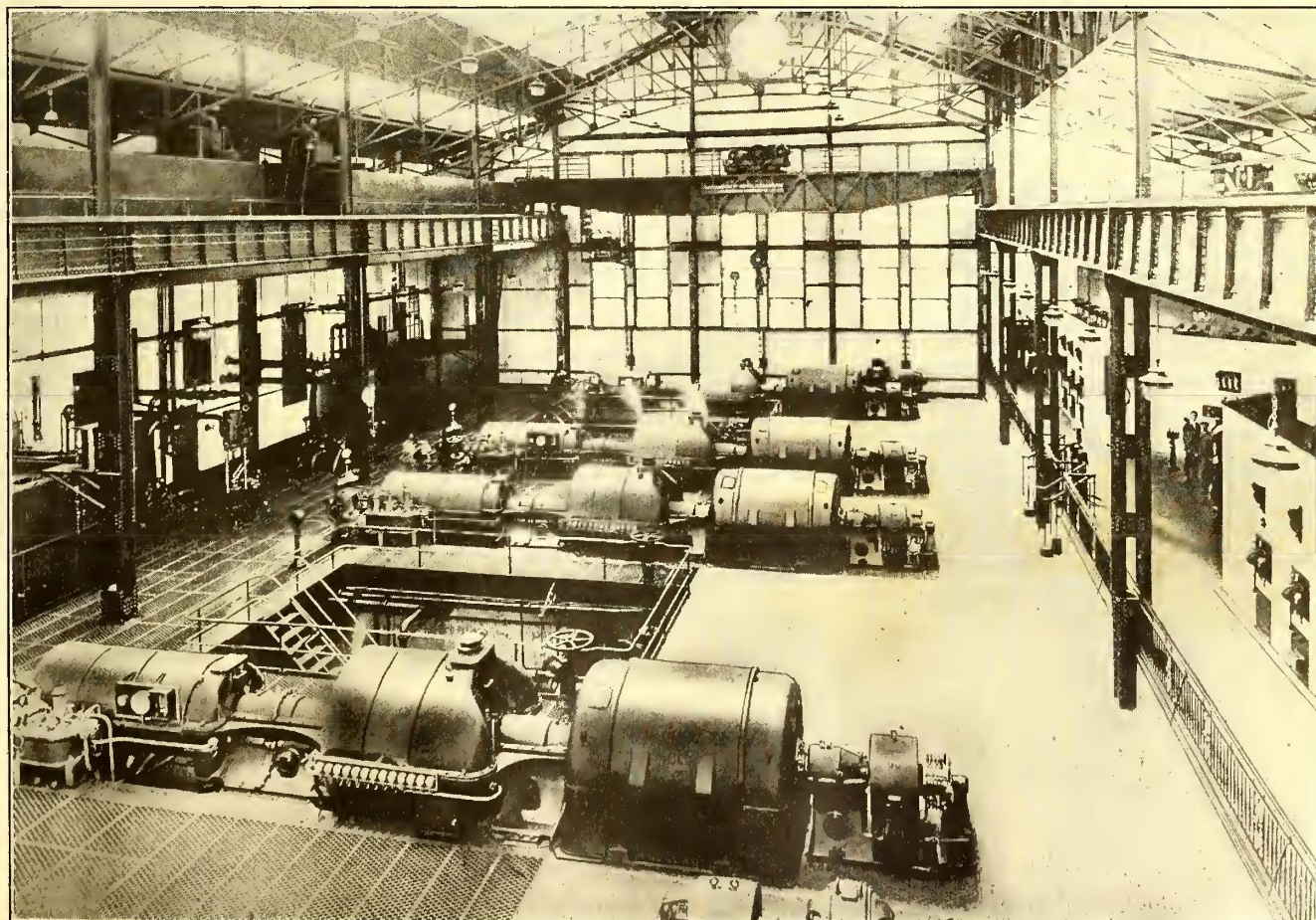
Each traction substation contains three rotary con-

verters of 1000-kw. normal rating. They are capable of carrying 1500 kw. for two hours, 2000 kw. for ten minutes and 3000 kw. momentarily. Each converter is served by three 375-kva. single-phase, oil-immersed, natural-cooled transformers. The substations also contain each a 10-kva. lighting transformer, a 5-kw. motor-generator set, an air compressor of a capacity of 39 cu.ft. of free air per minute at 60 lb. per square inch pressure, a ventilating fan of 25,000 cu.ft. per minute capacity and a 50-amp.-hr. storage battery.

PRECAUTIONS AGAINST FLASHOVERS

Special precautions have been taken to reduce flash-over on the rotaries. For this purpose the commutator cones have been covered with projecting fiber sleeves, and all earthed metal near the commutators is painted with a composition made up of one-half gold size and one-half linseed oil. In addition screens have been fixed between the brushholders to prevent flashing around the commutators. By these and other means the number of flashovers was reduced from an average of six per month during the first six months of operation to a rate of two per month.

In Olivos substation a panel is installed carrying two center-zero voltmeters, connected to pilot wires running to the negative busbars of all three substations. A permanent deflection of one of the pointers indicates to the substation attendant that there is a difference of potential between the busbars in two adjoining substations and that one substation is "motoring" the other. He can then instruct one of the substations to



TURBINE ROOM, CENTRAL ARGENTINA RAILWAY'S POWER PLANT

raise or lower its voltage until it is taking its proper share of the load.

Two substations are provided in the electrified section to give a supply for general purposes, one at the Retiro terminus and the other at the Victoria workshops. The former is designed to deal with the power and lighting requirements of the terminal station, train-yard and offices, and to give a supply for pumping and for operating the compressors of the pneumatic signaling system. The latter substation supplies power and light for the workshops, locomotive sheds, car sheds and repair shops at Victoria Station.

In the Retiro substation the internal design is similar to that of the traction substations. Space is reserved for two rotary converters which will be installed when the freight traffic in the yard and at the docks is handled electrically.

The Retiro substation contains motor-generator sets consisting of 440-volt induction motors, with output capacity of 400-kw. of direct-current power at 240 volts. With these are the necessary transformers and a 240-volt storage battery of 4000-amp.-hr. capacity. The Victoria substation contains only transformers.

The Victoria substation is a small building containing two banks of transformers with the necessary high-tension switch gear and low-tension panels.

The lighting of wayside stations along the electrified track is taken from the third-rail. The lifting circuits of these stations are arranged to take six 100-volt lamps in series.

Encouraging Short-Haul Traffic at Portland, Me.

ON THE Portland lines of the Cumberland County Power & Light Company cars operating on three routes with short runs carry passengers for a 5-cent fare, without transfer. Other cars operating in the



CAR WITH DASHER SIGN
INDICATING FARE

city area are run on a 6-cent fare basis, and in some cases the routes overlap in part. To encourage riding on the shorter-haul lines and to reduce local travel on the longer or 6-cent lines, cars operated on routes covered in part by either class of fares are provided with dasher signs as illustrated, whereby the public is saved inconvenience and

the railway service is the better maintained. Passengers are not kept off 6-cent cars, even for local riding, but the clear marking of both types of cars as respects fare unit throws the short-haul traffic on to the cars where it belongs. At the same time it enables a passenger who is in a hurry to take any car which he desires, provided he is willing to pay the extra cent for boarding the through car.

Long Interurban Line Completed Near Barcelona

Part of the Extensive Electrical Development in Spain Which Was Initiated by the Late Dr. F. S. Pearson

THE longest interurban electric railway in Spain has recently been completed between Barcelona and Rubi by the Cataluna Railways, controlled by the Barcelona Traction, Light & Power Company. The road is a part of the extensive hydroelectric development in the neighborhood of Barcelona initiated under the direction of the late Dr. F. S. Pearson. This development includes the local railway, light and power system in Barcelona, the interurban railway mentioned, two different transmission lines at 110,000 volts between Barcelona and the Pyrenees, 125 miles away, and three hydroelectric plants in those mountains with a combined capacity at present of about 100,000 hp. A fourth plant with an additional 50,000 hp. is now under construction.

The largest of these plants develops 56,000 hp. The second and third plants were constructed at Tremp and Pobla and have an aggregate capacity of about 50,000 hp. The former, by the means of the Talarn dam (more than 250 meters in height), is one of the largest concrete dams in the world. Altogether the investment is about \$60,000,000, and practically all the machinery, with the exception of the hydraulic turbines, which were made in Switzerland, was manufactured in the United States.

The first section of the electric interurban line was formerly operated by steam. This section has been extended so that the total length of the line when finished will be a little more than 20 miles. The line at present is running into Rubi and when completed will be operated as far as Tarassa, one of the most important textile manufacturing cities of Spain. The cars for the line were built in the United States, dismantled and shipped to Spain and there assembled. Ninety-pound rail is used with tie plates, creosoted ties and screw spikes with continuous joints. Catenary overhead construction is used. Six hundred volts is employed in the city proper and 1200 volts outside of the city. The cars are equipped with four motors of 125 hp. each, and bow collectors. There are five tunnels, all double tracked. The longest tunnel is a mile in length, and during its construction quicksands were encountered making the work exceedingly difficult. Some of the fills are more than 200 ft. high and $\frac{1}{2}$ mile in length.

The completion of the interurban railway, as well as the operation of the entire power and lighting system during the past three and one-half years, has been in the hands of H. P. Harrsen, who until 1915 was in charge of the Pearson railway and power interests in the City of Mexico.

In a recent discussion of the cost of oxy-acetylene welding at a meeting of steam railroad mechanical men some data were given to show that the average cost of welding by this process is about \$1 per cubic inch of weld. The data covered welds using from 1½ lb. to 2¾ lb. of welding metal, with acetylene at 3 cents per pound, oxygen at 14 cents per hundredweight, welding metal at 10 cents per pound and labor at 42 cents per hour.

The Automatic Substation Has Come to Stay

The Field for Automatic Control Is Almost Unlimited But It Must Be Used With Due Regard to Economic Considerations

BY WALTER C. SLADE

Superintendent of Power and Lines, The Rhode Island Company,
Providence, R. I.

WITH the price of copper about double that which prevailed before the World War; with an uncertain future to face as far as the re-establishment of normal prices is concerned, and with unparalleled advances in the wages of operating labor already allowed or of necessity to be granted, electrical engineers are confronted with serious distribution problems. They have been obliged and will be even more obliged to modify power distribution systems in a way that will, through conservation of construction material and operating labor, allow charges to be reduced sufficiently to offset in whole or in part the increased costs of construction, maintenance and operation.

It is perhaps the general belief that copper will never again be as cheap as it was prior to the war. Accordingly, new construction must be planned so as to save copper, and existing construction must be rearranged for the same purpose. This copper can be sold at a profit sufficient, in general, to compensate in part for the cost of the changes made. These remarks, of course, apply to the distribution copper necessary in any system of power distribution, and in particular to the great quantity of copper required for direct-current distribution feeders in the average railway system.

The use of additional substations is the one means of effecting these savings in material, provided that the capital, operating and maintenance charges combined are less with, than without, the additional substations. The substation, in the railway field at least, was never so important as at present.

AUTOMATIC CONTROL INVENTION WAS TIMELY

It is a strange but fortunate coincidence that almost at the commencement of the great war, E. W. Allen and Edward Taylor, with the co-operation of Bion J. Arnold, should have planned and applied successfully the first complete automatic control for railway substation equipment. When the automatic operation of the Union substation of the Elgin & Belvidere Street Railway was begun in December, 1914, the full importance of the achievement was incompletely realized. During less than four years this type of substation has come into prominence with surprising rapidity. It has supplied a demand in allowing marked reduction in operating cost and appreciable reduction in power consumption. It is now possible to save copper in distribution systems by the construction of an increased number of substations of reduced capacity previously found to be impracticable because of the cost of operating labor.

The use of the automatic substation is not confined to the railway industry alone, nor is it destined to occupy the whole field in any industry. The idea is, however, destined to find a place, in some cases a

large one, in every field where substations are employed or where it is desirable to operate equipment automatically.

Remote control of equipment is in some cases more desirable than automatic control, especially where the requisite control circuits are short, or where the grouping of the stations to be controlled is advantageously related to a central point of control. This would also apply to those urban railway substations which contain several machines at present designed for manual operation and which stations are frequently grouped about a generating station symmetrically as regards load densities. Doubtless such station equipments, if automatically controlled, would not have occasion to shut down completely even for a few minutes, except possibly during the early morning hours.

FREQUENT STARTING AND STOPPING OF MACHINES UNDESIRABLE

On the other hand, it would not be desirable to have large machines stopping and starting frequently throughout the day, as might happen with load fluctuations where two or more machines were operating automatically in the same stations. Occasional functioning of an additional machine would, however, not be objectionable and it would doubtless be called upon to serve daily during the peak-load periods. Equipments in city substations can be run automatically, nevertheless, as is being demonstrated in Des Moines, Iowa. In that city the substations, although at present containing single units, are designed for an ultimate capacity of two 500-kw. units to run in parallel.

Three remote-control lighting substations are in use on the system of the Detroit Edison Company, one of which has been in operation since 1912. There is also a remote-control railway substation on the lines of the New South Wales Government Tramways at Sydney, Australia, which was put into operation in 1914. In Cedar Rapids, Iowa, the Iowa Railway & Light Company has made arrangements to operate either automatically or by remote control the three 500-kw. water-wheel generators in its new hydro-electric station.

This application of automatic control at Cedar Rapids is of interest because it was the first attempt to operate water-wheel generators in parallel automatically. There is also elsewhere a small 100-kw. d.c. water-wheel generator in automatic operation, and a 3000-kva. synchronous condenser with automatic control.

Substations for railway service have in the past been manually operated. Conditions may make it advisable to continue in service many of them under manual operation. The size and importance of the station, the character of the service furnished, the fact that the station may serve also as a switching center, the magnitude

of the load to be handled and other factors will determine the matter. An attendant may be required for the performance of various duties aside from that of operating.

Aside from those stations now manually operated that could more advantageously be rearranged for operation by remote control, there are many others that should be rearranged for automatic operation, or at least reduced in capacity by removal of machines to more advantageous points. Thus some feeder copper could be removed and a higher potential could be maintained throughout the system.

Many substations of old construction, possibly located properly a decade or more ago, are inadvisedly located to-day. As traffic has grown the tendency has been to add equipment and feeder copper, but shifting load centers have often caused undesirable distribution losses. Increased operating cost proved a barrier to the addition of manually operated stations. This barrier does not exist to as great a degree with automatically operated stations. There are few distribution systems that could not be improved to-day by some use of automatic equipments.

THESE STATIONS ARE TYPICAL OF LATEST PRACTICE

The present status of automatic railway substation development shows remarkable progress. Aside from the installations previously referred to the following are of particular interest as being different from the substations in which single 600-volt converter or motor-generator units are controlled.

The 1200-volt automatic substation of the Milwaukee Electric Railway & Light Company at East Troy, Wis., contains four 300-kw. 600-volt converters, two of which are arranged to run in series. The two sets are, however, not arranged for parallel operation, one simply serving as a utility set.

The first installation of machines arranged to operate in parallel is in the substation of the Rhode Island Company at Oakland, R. I. This station, which will be described in a succeeding article, contains two 300-kw. 600-volt, synchronous converters, taking energy from a 25-cycle, 13,200-volt transmission line. One machine operates about eighteen hours a day, while both machines operate generally over the morning and evening peak periods and on Saturday afternoons and Sundays when the car service is increased. Both machines operate entirely automatically, and by means of a transfer switch in the control circuits either machine can be made to act as the leading machine. The writer is advised that in the near future two 600-kw., 1500-volt, motor-generator sets are to be arranged for automatic operation.

PORTABLE SUBSTATIONS LEND THEMSELVES WELL TO AUTOMATIC CONTROL

Automatic control is not confined to permanent substation equipment. Two portable substation equipments are already in operation. One of these contains a 500-kw. synchronous converter. It serves as a utility station as well as its main purpose in the summer season, for it is equipped for operation either on the 4400-volt supply of the Des Moines city system or on the 23,000-volt supply of the Interurban Railway where it is used to supply power on a spur track which leads to

a gravel pit. A third portable automatic station is in process of manufacture.

The portable substation, although primarily intended for emergency or seasonal use, has often been used in a fixed location for permanent use and has accordingly afforded quarters far too confined for sheltering the substation attendant day after day. It therefore furnishes an excellent field for the application of automatic control. Without the necessity of planning for the operator's comfort or discomfort, and of setting space aside for this purpose, it is entirely possible to construct portable substation equipments with necessary automatic control up to capacities of 1000 kw. to 1500 kw., limitations being set by the supply voltage and frequency.

Lightning protection equipment, at least that involving the electrolytic aluminum arrester, would probably have to be omitted from the car in case of the larger units mentioned. It could be easily supplied as a separate portable equipment where advisable.

Such portable equipment as that suggested would generally be serviceable in cities where the capacity of the portable automatically controlled unit would be comparable in magnitude with the capacities of the units in the permanent substations, and in some cases it might equal the total capacity of some of the smaller stations. Besides, a spare operator would not be required to operate the spare equipment which is an important consideration these days. Finally, it is interesting to observe that automatic control has not been confined to small units. In the near future it will be applied to units in capacities ranging from 1000 kw. to 2000 kw. These larger machines are in most cases interpole machines provided with motor mechanisms for raising and lowering the brushes automatically as required in starting. The human element in this important operation is therefore eliminated.

AUTOMATIC CONTROL ALREADY BECOMING STANDARDIZED

The type of automatic control developed by the General Electric Company was described in the *A. I. E. E. Proceedings* for September, 1915, by Messrs. Allen and Taylor, and also in the Sept. 18, 1915, issue of the *ELECTRIC RAILWAY JOURNAL*. This company has made a few minor changes in the control equipment originally described, and has applied the system of control to many types of machines, such as synchronous converters, synchronous condensers, motor-generators and waterwheel generators. The Westinghouse type of control differs from the General Electric mainly in that while in the latter a motor-driven controller and exciter are employed for determining the sequence of operations and at proper time fixing the polarity of the field of the machine to be started, in the former the sequence of operations is obtained through a suitable combination of interconnected relays and control circuits. In the Westinghouse control a pole on the machine to be started is automatically "slipped" in case the polarity should fail to remain established from the previous operation of the machine. In both systems relays of both the instantaneous and time-element type are employed, as well as thermostats for protection against overheating of bearings and resistor grids. The main difference lies in types of design and methods of operation. Both

systems employ the resistors to limit the output of the machine on overload or on external short-circuit. The Westinghouse system was described in the *ELECTRIC RAILWAY JOURNAL* of April 13, 1918. The system has been developed particularly for the railway converter substation and has in a short time found application in a rapidly increasing number of installations, some of which are now in operation.

Through the courtesy of C. M. Davis of the General Electric Company and R. J. Wensley of the Westinghouse Electric & Manufacturing Company the writer can give some data as to the present status of the automatic substation. There are twenty-nine equipments in operation and thirty-six equipments are in process of manufacture, giving a combined total of sixty-five. Of the equipments now operating, three arranged to control brush-raising devices on interpole converters. Of the forthcoming equipments eleven will control interpole machines and five will control motor-generator sets. About one-fourth of the equipments for synchronous converters will control interpole machines. The tendency for railway engineers to rearrange existing substation equipments for automatic control is clearly shown by the fact that thirty-one equipments out of the total of sixty-five, nearly one-half, are operating or will be installed in stations previously operated manually. In most if not all of the manually-operated stations that have been arranged for automatic control the old wiring and switchboard panels have been retained so that the stations may be operated with the old manual equipment if desired. In the newer stations, however, the designers have assumed that the automatic equipment will function reliably, so that only the automatic contactors and relays have been included. The additional expense for manually-operated switchboards has been considered unnecessary or at least not commensurate with the additional flexibility or dependability of the stations.

To furnish a perspective view of the increase in fixed and operating charges incidental to automatization let it be assumed that it costs about \$7,000 more to make an equipment entirely automatic than it does to install the necessary panels and switches for manual operation, not including machines of 1000-kw. capacity and larger. Taking interest, depreciation and taxes at 12 per cent, the annual charge is \$840. Expense of inspection labor chargeable to any automatic installation will vary widely depending on local conditions and on the point of view of the individual who is responsible for the maintenance of the stations. Assuming a salary of \$1,200 per annum

and allowing the equivalent of a day only per week per equipment for inspection work, an ample allowance, the calculated cost of the inspection becomes \$200. Maintenance expense for the automatic relays and contactors and other control equipment is difficult to estimate at this time, but for the sake of approximate calculation can be placed at \$250. The total of \$1,290 arrived at represents fixed and maintenance charges on the automatic part of the equipment and all of the inspection labor expense, applied only as above specified. Against these figures must be set the operator's wages for the manually-operated substation which to-day would amount per annum to hardly less than \$1,500 for a one-man station and \$2,600 for a two-man station.

MR. SLADE has had exceptional opportunities for studying the automatic substation question from several angles, and he is applying the correct principles on the lines of the Rhode Island Company as rapidly as economic conditions will permit. In the preparation of this article, outlining the present status of the automatic substation, he has had the co-operation of the engineers of the manufacturing companies. In a later article he will show how the principles touched upon are illustrated in the latest substation on this property.

From the point of view of the operator's wages, it would pay to automatize any two-man station but possibly not some isolated one-man stations. The majority of such stations are located on suburban or inter-urban lines where the schedule is either on the hourly or two-hour basis. It happens thus that the energy saving possible from the automatic shut-downs to be expected on such roads will permit automatization which would not be justified from reduction in the operating expense alone. The financial saving may, however, not be commensurate with the energy saving in those instances where electric energy is purchased on a basis of a service charge plus an energy charge. The present tendency of central stations to sell electric energy for power loads on this basis, combined with other unfavorable conditions, may preclude making the station automatic. It thus may be cheaper for the consumer to waste energy than to save it. In case of new installa-

tions in new substation locations it may be possible to remove sufficient feeder copper so that the added fixed charges created by the substation development are compensated for in part or in whole by the fixed charges saved in the copper removed from service. In one instance an automatic substation was built on a trolley line formerly supplied with power from a distant booster. Here the copper removed approximately offset the cost of the development, at war-time prices of metal. The voltage regulation is much better at the same time.

WHY THE AUTHOR FAVORS AUTOMATIC OPERATION

The writer is strongly in favor of automatic operation wherever possible. Dependable automatic equipment does not forget, whereas the "human element" is always present even in the experienced operator. To-day many companies are obliged to employ inexperienced men to operate important and valuable equipment, the tempor-

any loss of which would paralyze a part of the power system. More automatically controlled substations can be operated within a given area than could ever be operated economically under manual control. With a system of automatic stations advantageously laid out, in case of unforeseen accident a single machine or even a single station could be eliminated during repairs without affecting the system as a whole seriously enough to interrupt service.

ACCIDENT HAZARD REDUCED TO MINIMUM

Accidents are possible in any substation. Those due to neglect by the operator would be eliminated in the automatic station; other accidents would happen in any case. The automatic protective equipment is designed to limit and localize the accident damage, which it does in some cases more efficiently than an operator could do. Protection is provided against reverse current, overloads, heated bearings, overspeed, and other abnormal conditions. Some of the protective features alone are sufficiently valuable to warrant installation in manually-operated stations. That the value of the load-limiting resistors for example, is appreciated by some engineers is shown by the equipping of seven manually-operated stations with them to supplement the circuit breakers. Lightning may do damage in any substation including automatic stations, but this can be prevented or limited by generous use of good lightning arrester equipment on both the direct-current and the alternating-current sides of the station, and delays to service will be short if the few instruments or relays mainly subject to damage are duplicated in stock. Besides, an automatic station can be run manually when necessary.

One disadvantage of the automatic substation must be admitted. If the oil switch that controls the station is tripped due to overload much beyond that which the converting or generating equipment is designed to handle the station shuts down until the inspector arrives. The cause of the shutdown may be in evidence and justifiable, but again it may not be so. The rule is that the oil switch is set not to trip unless necessary to protect the station. The real delay occurs because an inspector is not always present to determine immediately the cause of the trouble, to take steps immediately to correct it and to place the station once again in operation.

AUTOMATICS CAN BE USED IN AS WELL AS BETWEEN CITIES

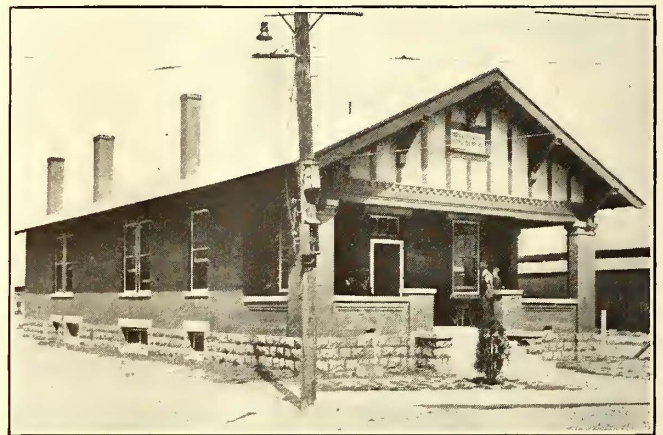
In the past automatic substations have been talked of principally as a proposition for interurban lines or suburban lines having infrequent service. It is the writer's belief that they are useful in some city service. In some cities the best plan lies in automatizing all of the substation equipment, excepting possibly that which may be located in the generating station. In any city certain divisions of the power distribution system, if not handled advantageously by remotely controlled substations, can be handled entirely satisfactorily by automatically controlled substations. This will allow the removal of unsightly feeder lines, thus postponing the day when the generally increasing cry for underground construction on the part of municipalities may have to be answered. When underground construction must come it will be a more attractive proposition to

build the few ducts required for the transmission service and the greatly reduced number of distribution feeders than it would be to accommodate the number of feeders that would have to be retained as well as future feeders for handling the output from the smaller number of large manually-operated stations. Another advantage in increasing the number of substations in many cities would lie in the fact that the negative track return would be divided into relative small subdivisions so that the over-all voltage drop from the outlying regions served by the individual stations would be reduced to maximum values much under the maximum values previously obtained. Negative feeder copper could consequently be removed in many instances.

Making It Pleasant for the Men at El Paso

FOR a property with only 166 trainmen, the El Paso (Tex.) Electric Railway has an unusually pleasant brick clubhouse to which a cost-price restaurant has been added. The bungalow style of the building is well shown in the accompanying illustration. Alongside the clubhouse the company maintains a fine lawn, a real luxury there, and also a tennis court. The clubhouse is for the use of all employees of the El Paso Electric Railway.

The main floor has the dispatcher's or trainmaster's office on one side of the lobby and the superintendent's on the other side. The remainder of the floor space



PLEASANT CLUBHOUSE ERECTED FOR EL PASO MEN

is occupied by the general recreation room, except that one rear corner is used for the office of the night cashier.

In one part of the basement are the toilet, shower baths and lockers. In another is the lunchroom. This is open from 7 p.m. to 7 a.m. and is in charge of one cook and one helper. The menu is printed on a blackboard. Simple food of the best sort is served; even individual bottles of milk are used.

The restaurant was opened on May 14 and is averaging \$20 a night. Purchases may be made with tickets only. At the end of every month a public accounting is made, and the prices are adjusted accordingly. The first month showed about \$100 surplus, or enough to pay for the help after caring for supplies and gas. Everything else is paid for by the company.

Women Help Relieve Labor Scarcity in B. R. T. Mechanical Department

To Help Win the War Women Operate Machines and Perform the Labor of Inspection and Overhauling of Car Equipment Which Was Previously Limited to Men

HE WHO RUNS and reads cannot fail to realize that women are assisting with all classes of work to help relieve the labor shortage and fill the breach in our man power left by the war. Electric roads were early to recognize the field they had for women workers as clerks, ticket sellers, station agents, conductors, car cleaners and the like. Now necessity has widened the field and women are found employed in the shops of the Brooklyn Rapid Transit Company on work that would not have been considered suitable for them a year ago. Up to Sept. 15 the mechanical department of the company had on its payrolls 120 women workers who were performing all classes of duties in the inspection, overhauling, maintenance and repair of electric car equipment. This enforced employment of women has brought new problems in shop arrangement and management. Sections have been partitioned off and screened from the sections where the men are employed to afford as much privacy as possible, and new locker rooms, rest rooms, wash rooms and lunch rooms have been built for the sole use of the women. The aptitude which these women have shown toward learning their new duties has surprised the shop foremen, and they have picked up the use of the necessary tools with remarkable quickness. The great majority of the women who have sought these new occupations are efficient, faithful workers who find the new lines of work very interesting. In assigning work to the various women applicants, great care has been taken to make certain that the duties do not require unusual

physical effort and that the strength of the employees is not apt to be overtaxed. Some of the duties which these workers are performing are as follows: Inspection, cleaning, oiling and adjusting of controllers of both hand and multiple-unit types; replacement of excessively worn small parts, such as contacts, fingers, arc deflectors, insulation shields and the like which can be done without dismantling the heavier parts. On cars which are in the shops for overhauling, women assist in dismantling and reassembling the smaller parts, and they clean, shellac or paint the different pieces. On multiple-unit equipments they check the sequence of operation of the switches and relays; and make certain that reverser and line switches func-

tion properly and that overload trips and circuit breakers can be properly reset. In this inspection one woman operates the control from the motorman's cab while the other, underneath the car, checks its operation.

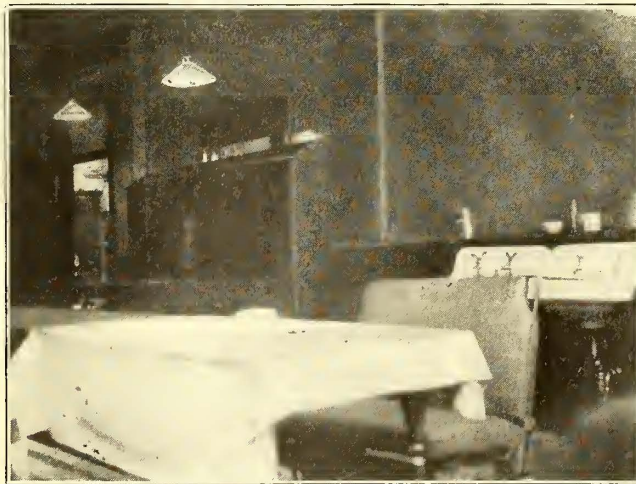
Air-brake parts, such as brake valves, feed valves, governors, whistles, etc., are also cleaned, oiled and tested on the cars in a manner similar to the treatment of controller parts. Women are also employed at the bench in cleaning, adjusting and resetting feed valves and governors. In cases where leaky valves are found, causing "creepage" of the air pressure, these are set aside to have valve seats reground or other repairs made by experienced workmen. After this work is finished the parts are again turned over to the women for testing and adjustment.

DOOR ENGINES ARE INSPECTED AND ADJUSTED

Another class of work on which the women are making good is in inspecting and overhauling electro-pneumatic door engines. Women inspectors test the operation of the doors, make adjustments, and oil moving parts and door races. Where trouble that requires the services of a skilled workman is found this fact is reported and a man makes the repairs. On cars which are in the shops for overhauling, women remove the inside panels at the engines, help dismantle the various parts, and clean, oil and put them in satisfactory operating condition. The inspection of lamps and signals is another class of work that has been taken up readily by the women.

As most of this trouble is due to broken or burned-out lamps, the women can replace the lamps and "O.K." the cars again for service in most cases without calling in the aid of an electrician.

In the several general shops, where cars are brought for painting, varnishing and general repairs or overhauling, the women are used to good advantage on various classes of work. That which they have taken up most readily and which they perform in many cases better than men comprises the various cleaning operations. Before a car can be repainted all parts must be thoroughly cleaned inside and out. A great amount of this work is being done as piecework and this system is working out to good advantage both for the employees and the railway. Other duties performed by



WOMEN'S LUNCH AND LOCKER ROOM AT SOUTHERN DIVISION INSPECTION AND OVERHAULING SHOP

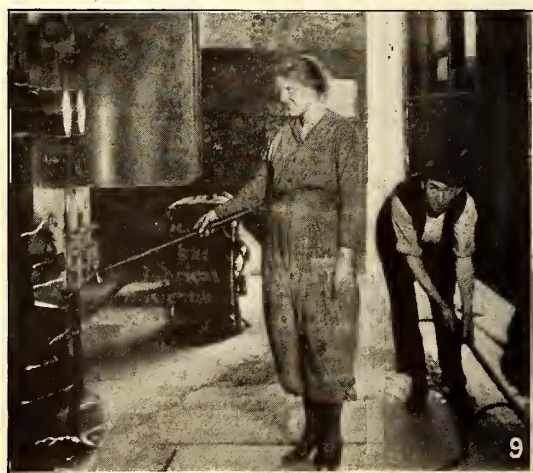


Fig. 1—Wiring master controllers and electrical portions of automatic car couplers.
 Fig. 2—Machining an armature shaft.
 Fig. 3—Cleaning and painting cars.
 Fig. 4—Filling a broom head for a surface snow-sweeper.
 Fig. 5—Women employees with regulation shop uniforms.

Fig. 6—Operating a drill-press.
 Fig. 7—Cleaning and priming hand straps.
 Fig. 8—Inspecting multiple-unit controllers.
 Fig. 9—Assisting in making a high-potential test on car wiring and equipment.

Women Employees in the B. R. T. Mechanical Department

women in the paint shop consist in removing curtains, scraping and burning off paint, re-painting floors, touching up and varnishing various parts, blacking off pipes and equipment parts, cleaning seats, painting hand straps, etc.

In addition they operate milling machines, drill presses, punch presses and boring machines. At the bench they file, chip and rivet various parts and perform any class of work not requiring a skilled mechanic. Broom heads are filled, fenders repaired, trucks are stripped for overhauling and various light repairs are made.

In order to comply with the recommendations of the Industrial Commission of the State of New York the railway requires that all women operatives doing shop work wear cap and overalls. These shop uniforms combine safety with comfort and are purchased by the employees at certain department stores upon order from the superintendent or foremen at a special price of \$4 for the complete uniform. As a further measure to promote safety and comfort while working, the wearing of high-heeled shoes is prohibited. In order not to impose a hardship on those entering the service a period of ten days is allowed for the provision of the necessary uniform.

Free transportation over the lines of the system by use of the departmental badge is provided. One of the rules of the transportation department requires that the badge be displayed on the cap of the employee while riding on a car. In order to provide an attractive head dress for the women a trench cap has been designed for their use.

In general the class of women applying for this work is of very high grade. Many have male relatives in the employ of the railway and in one case mother and daughter are now working in the same shop.

To 800,000 Patrons in Baltimore

SINCE the United Railways & Electric Company, Baltimore, Md., filed a petition on July 19 for a reasonable increase in fare, the company in a sustained publicity campaign has been trying to drive home the fact that the public is squarely and fairly confronted with the alternative of a service which will not meet

More Data on the Connecticut Company's Power-Saving Campaign

THE Connecticut Company has completed practically a year of its campaign for power savings, and data are now available showing the result. A preliminary note on this subject was printed in the issue of the ELECTRIC RAILWAY JOURNAL for June 15, 1918, page 1152.

The very substantial savings accomplished are the result of a number of factors. There has been excellent co-operation between the men and the management, not only with respect to the men on the cars but also those in the carhouses, bond maintenance men, and others. No small credit should be given to the work done to maintain the cars in the best possible condition. It will be remembered that the Arthur "power-saving recorder" is used on the entire Connecticut Company system, which totals approximately 1200 cars.

The accompanying table shows the result of the entire campaign, but some comment is necessary in order to explain the wide variation in results. On the New Haven and Hartford divisions the saving was increased

TABLE SHOWING ENERGY USED FOR TRACTION ONLY ON CARS OF CONNECTICUT COMPANY

Division	Kilowatt-Hours per Car-Mile		Per Cent Decrease
	1917	1918	
New Haven.....	3.147	2.563	18.56
Waterbury.....	4.115	4.008	2.60
Hartford.....	3.630	2.867	21.02
New Britain.....	3.088	2.826	8.48
Bridgeport.....	3.698	2.862	22.61
Meriden.....	2.795	2.200	21.29
Middletown.....	4.332	3.134	27.65
Stamford.....	3.645	3.263	10.34
Norwalk.....	2.862	2.308	19.36
Torrington.....	1.793	1.124	37.31
Derby.....	3.721	3.444	10.13
Average for entire system.....	3.498	2.875	17.81

by the introduction of skip stops, whereas other divisions at the time were not using the skip-stop plan. For instance, Bridgeport, which shows 22½ per cent saving, had no skip stops and was, in fact, operated practically the same as a year ago except for the power-saving campaign.

The poor showing which was made in Waterbury, relatively to the remainder of the division, is due to lateness in inaugurating the campaign. In fact, it is only now getting under way there, but it is expected soon to bring this division into line with the others. The data given in the table are of particular interest because the Connecticut Company's lines connect four large cities and serve territory embracing some seventy smaller towns and villages, thus comprising a diversity of operating conditions. These include congested city sections, high-speed interurban service and every kind of intermediate service.

The figures given are for the month of May, 1917 and 1918. During this month in 1918 the old braking-time recorders were still in use. All recorders are now being changed over to the type showing the length of time the power is on.

The monthly magazine *Concrete* is printing in its September and October issues the paper on "Effect on Concrete of Consistency and Mixing Time," read by Duff A. Abrams at the 1918 convention of the Concrete Institute.

<p>YOUR COST OF LIVING HAS INCREASED, AND SO HAS OURS. OUR ONLY INCOME—THE NICKEL—WILL NO LONGER PAY THE COST OF THE RIDE WE SELL YOU. T. A. CROSS, President, UNITED RAILWAYS & ELECTRIC CO.</p>	<p>OUR USEFULNESS UPON OUR ABILITY TO MAINTAIN THE SERVICE THAT YOU REQUIRE DEPENDS OUR USEFULNESS—IN FACT, OUR VERY EXISTENCE. THAT SERVICE CAN NO LONGER BE RENDERED FOR A 5c. CAR FARE. T. A. CROSS, President, UNITED RAILWAYS & ELECTRIC CO.</p>	<p>STRIVING TO MAKE ENDS MEET STREET CAR COMPANIES ALL OVER THE COUNTRY ARE GOING TO THE 6-CENT FARE—SOME TO 7 CENTS—IN AN EFFORT TO MAKE ENDS MEET. T. A. CROSS, President, UNITED RAILWAYS & ELECTRIC CO.</p>
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POSTERS USED IN BALTIMORE IN CAMPAIGN TO SECURE RELIEF FROM EXCESSIVE OPERATING BURDENS

its needs or a fare increase which will be commensurate with the higher costs of doing business.

Some of the striking car posters used are shown in the accompanying illustration. The company also told about relief granted in other cities.

Freight Transportation Without Rehandling

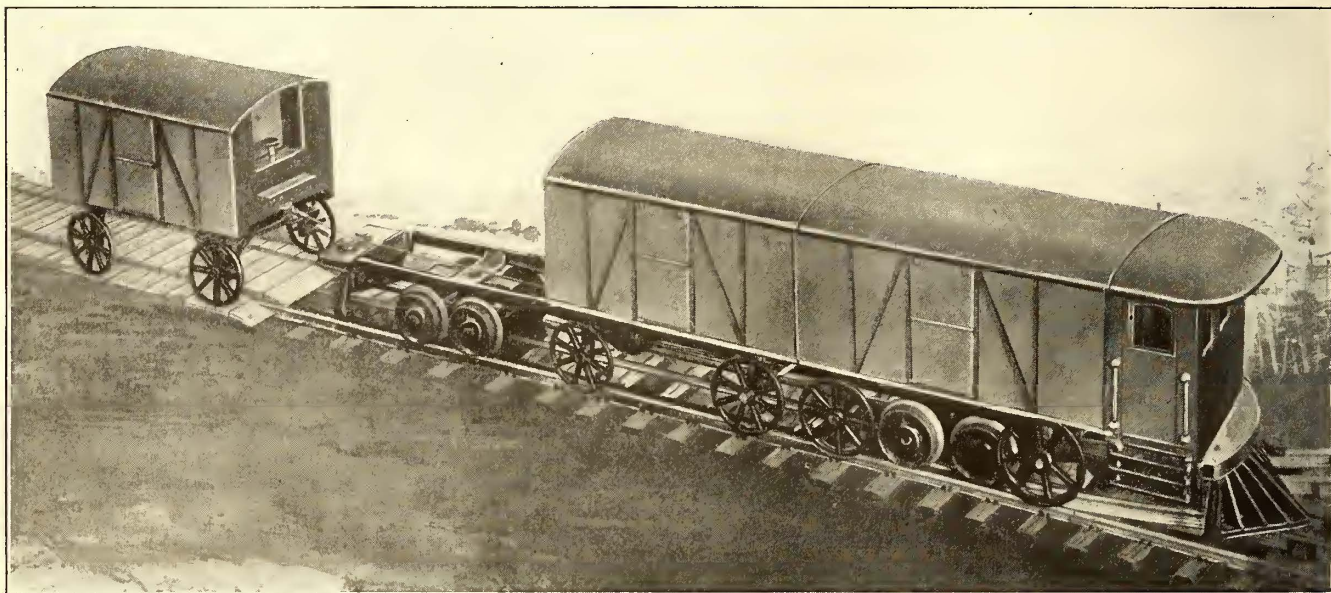
The Bonner Rail Wagon System Aims to Reduce Cost and Time of Freight Haulage by Using Containers on Wheels Which Do Not Require Warehouse Facilities

FOR the past three years much original research work has been conducted in the line of developing a new method of freight collection, rail haulage and delivery and of doing away with the rehandling of this freight while in transit. At the request of several railroad executives, a plan known as the "Bonner Rail-Wagon System" was submitted to a committee of manufacturing and operating engineers who have made a report as to the practicability of the system. This committee found the principles underlying the scheme to be sound, and recommended a full equipment and service

over the railroads. Finally there is the "auto hoss" for carrying containers over streets to their destination.

The "rail wagon" is constructed of steel and is mounted on four standard wheels. The body is approximately 16 ft. x 7 ft. x 7 ft. and of about 5 tons capacity. This can be either horse-drawn or motor-driven.

The carrier cars may be self-contained gasoline or electric motor cars, or trailers arranged for either electric or steam haulage. They will be built to master car builders standards and be capable of every needed interchangeability or service. One of these should be of



A CARRIER CAR PICKING UP A RAIL WAGON ALONG THE LINE

test of the system on the lines of the Public Service Railway of New Jersey. The service recommended was for freight haulage over the Passaic line from Hoboken to Paterson, a service over the North Hudson County lines, particularly the Palisade line as far as Coytesville, with pick-up and delivery service by "auto hoss" in the various districts. In addition a service would be given from the Hoboken section to and from New York and Philadelphia.

The attention of the United States Railroad Administration was directed to this system, its co-operation solicited and after investigation and reports from engineers under its control it is now deciding the question of releasing steel and other material necessary for the carrying out of this service test. A syndicate has been organized and funds subscribed to defray the expenses of this test, and it is expected that a company to be known as the Bonner Rail Wagon Company will be incorporated later to develop the system.

The necessary transportation equipment consists of three parts. First there is the "rail wagon," a van or container for the goods to be shipped. Second there are the "carrier cars," used to transport the containers

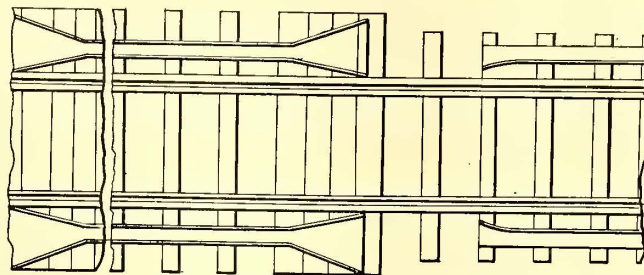
dimensions such as to enable it to carry two to four rail wagons. The rail wagons are loaded astride this specially designed carrier car.

HOW THE SYSTEM OPERATES

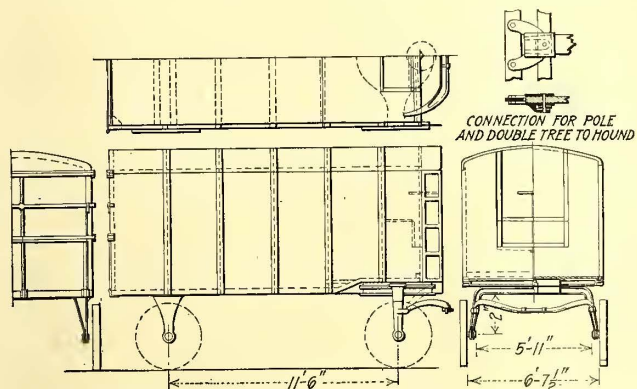
The accompanying illustrations show the different classes of vehicles which enter into the Bonner plan for freight transportation. The procedure in using these consists first of loading the containers. This is done at the point where the material is manufactured or produced. They are loaded by people interested in careful handling quick and safe delivery of the material. The containers, fully equipped with wheels, can then be drawn to the nearest railroad siding or electric line by horses if desired. The weight of these loaded containers—being less than the ordinary van—can be easily handled. The "auto hoss" has been designed to provide a more rapid and efficient means of haulage where necessary. The rail wagon is left at the railway loading point to be picked up by the first carrier car available. No freight or warehouse is necessary and the handling from truck to warehouse and reloading on freight cars are avoided.

The loading of the containers for either single-car or train operation is accomplished by the motive power used for propulsion. The rail wagon has no cross axles. It is drawn astride the tracks and while resting on its wheels the carrier car is run underneath it. Air cylinders, connected to the regular source of air supply used for braking, are employed in raising the rail wagons and give the necessary clearance of the wheels from the ground for operation over the line. The containers are automatically clamped securely in place to prevent movement and are then ready for transporting. For delivery to their destination, the con-

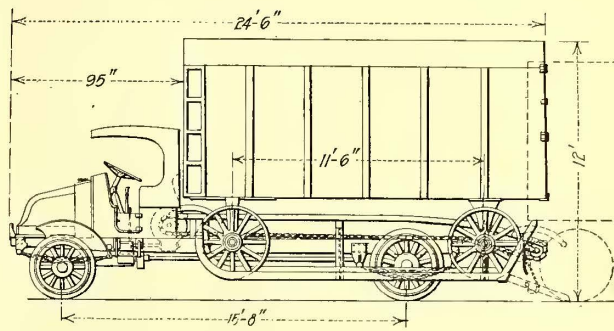
warehouses. Congestion will be avoided and no carrier cars will be tied up waiting to be unloaded. An analysis of the present cost of freight transportation indicates that at least 50 per cent is due to the rehandling, reloading and warehouse checking necessary and that freight cars are idle twenty-two hours out of twenty-four. The rail wagon will provide for freight in less-than-carload lots and also provide a van that can be loaded anywhere in city, town or country and be delivered anywhere without disturbing the contents. Colonel Bonner's idea in this plan is to minimize cost, save time and labor, eliminate muscle power by



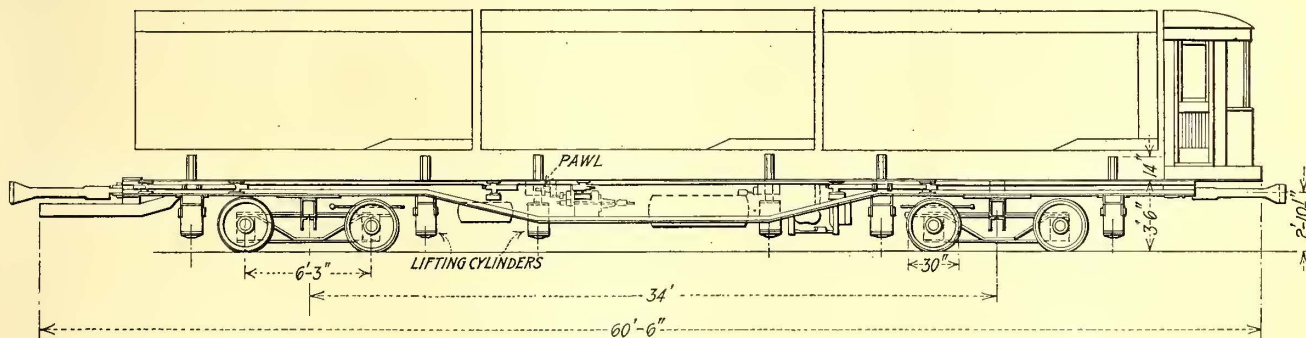
LINE-UP SWITCH FOR FACILITATING THE LOADING OF THE RAIL-WAGONS



THE "RAIL WAGON," A FREIGHT CONTAINER MOUNTED ON WHEELS



THE "AUTO HOSS" FOR RAPID PICK-UP AND DELIVERY OF THE CONTAINERS



THE "CARRIER CAR" FOR RAIL TRANSPORTATION OF THE CONTAINERS

tainers are dropped off the carrier cars either at the terminal yard or along the street or right-of-way, being lowered by the air equipment until the wheels rest on the street level, and the carrier car is withdrawn. After the carrier cars are pulled from underneath the rail wagons the latter are pulled to one side to clear the tracks. Here again no freight house is required and no additional handling of the freight is necessary. The material still in its container can then be hauled to its destination either by horses, motor tractors, or the "auto-hoss" as desired. When the "auto-hoss" is used this is, of course, available for independent work of any similar character when not used in carrying the rail wagons.

The great advantage of this system will lie in its ability to give quick transportation without rehandling and without the necessity for freight terminals and

substituting machine power and introduce system instead of confusion and disorder. Such a system ought to provide an easy means of utilizing the tracks of the electric railways for the collection and distribution of freight and as feeders to and from the steam railroads.

In the annual joint report of the express companies in the United States, just issued by the Interstate Commerce Commission, the total electric line mileage at the end of 1917 was given as 8801 as compared with 257,408 steam railroad mileage. During 1917 there was an increase of electric line mileage of 138. The Wells-Fargo & Company took over 200 more miles making its total 4431 and the Adams Express Company discontinued service over 64 miles. The other express companies reported practically no change.

Saving Money Through Accounting Without Impairing Efficiency, Accounting Departments Should Now Show "Productive" Power—Efficient Voucher Check Used in Mobile

By M. W. GLOVER

Secretary and Auditor Mobile Light & Railroad Company, Mobile, Ala.

THIS war has changed the order of many things. What was considered impossible a few years ago is now the natural order of business. Possibly before the war is over the accounting department may come into its own.

A few years ago it was the rule rather than the exception to treat the accounting department as one of the necessary evils connected with the operation of a railway. Sometimes the accountant was merely a

importance than they had imagined, and now the accounting departments of steam railroads usually have vice-presidents at their head and have no difficulty in enforcing their instructions. On the electric lines, too, the evolution of the accounting department has been progressing, and it is the exception rather than the rule for the accountant to be required to report to the head of the operating department, although this condition does exist on some lines.

ECONOMY AND EFFICIENCY THE WATCHWORDS

With the increase in authority and responsibility of the accountant, there should come a realization of the importance of practical economy and increased efficiency. The war has necessitated many changes, and every line, no matter how its earnings have increased, finds it necessary to do something to "stem the tide of rising costs" that we hear about in every line of business.

The difficulty in obtaining competent clerical help, even at increased salaries, makes it more necessary than ever to use every means of reducing the work of the accounting department. A certain amount of statistical information is absolutely necessary in every business to handle intelligently the conditions which arise, but there are many reports, not essential, which might be eliminated without any material loss. The use of mechanical devices for percentages, addition, multiplication, division, payrolls, addressing, etc., will save man-power, or rather woman-power, as man-power for clerical work is becoming a scarce article.

A TIME-SAVING VOUCHER CHECK

The voucher system is undoubtedly the best method of handling disbursements, but some voucher and check systems are so cumbersome that they cost more than they save. The accompanying illustration shows the voucher check and record voucher used by the Mobile Light & Railroad Company. It is a great time-saver. The invoices are listed below the check, the list being perforated so it may be detached before the check is banked. The address is shown in the lower left corner, and a "window" envelope is used for mailing.

The record or file voucher, made with a carbon sheet, shows the exact wording of the check and a list of the invoices together with the address. Below this duplicate section the record voucher shows the distribution of the payments and all necessary approvals. The invoices, if any, are attached to the record voucher. The making of the check and the record voucher at one operation is a great saving, and the use of the window envelopes is a measure of economy and prevents any error in addresses.

A loose-leaf or even a bound "operating expense" and "additions and betterments" ledger is better than a combination of these with the voucher record. This should contain columns for only the principal accounts. Subdivisions of certain accounts are necessary for even small roads, but sometimes this is overdone and unnecessary work results.

Statements furnished departments to enable them to know their financial results should contain all necessary information. If made too elaborate, however, they lose their efficiency, as they will probably be thrown aside or filed after a cursory glance.

VOUCHER CHECK AND RECORD VOUCHER USED BY MOBILE LIGHT & RAILROAD COMPANY'S ACCOUNTING DEPARTMENT

clerk in the superintendent's office with no title and less authority. If he could persuade the superintendent that certain things should be done to enable him to obtain the proper records, and it did not entail too much work, perhaps he was allowed to get the reports needed. As for permitting him, however, to issue orders as to how records were to be kept and what reports should be made, that was unheard of.

The evolution of the accounting department of steam railroads took place many years ago. The interstate commerce act had more to do with the proper recognition of the importance of railway accounting than any other one agency. Steam railway executives soon saw that their "unproductive" department was of more

Information furnished the accounting department should contain all that is necessary, but it is possible that some reports required may be eliminated without reducing the efficiency of the office.

A careful study of the work of individual clerks often results in the finding of more economical methods for routine work and in a saving of time. But efficiency must not be sacrificed to economy, and before radical changes are made results must be considered.

Money can be saved through the economical operation of the accounting department, but the fact should not be overlooked that money can be lost as readily if essential work is cut out in an endeavor to economize. Economy is a word very much overworked at this time. It is heard faintly in the halls of Congress and in directors' meetings, and yet often it is not thoroughly understood. It has been a well-known fact for years that municipal, state and even the national governments are run on principles far removed from economy and efficiency. Waste can be found on every hand, and electric railways must see to it that efficiency and economy are practiced as never before, but they must not sacrifice the former for the latter.

Accountants can aid materially in the program of

the country for the conservation of resources, and by studying closely local conditions can institute methods of economy which will not impair efficiency and which will result in a material saving in expense. This is now absolutely necessary for the salvation of electric railways. Economical practices instituted as a war measure need not be discontinued after the war. "A dollar saved is a dollar made" should be the slogan of the accounting department, and it will not be then considered the "unproductive" department.

Only two cities of Burma—Rangoon and Mandalay—have electric tramways. The Rangoon Electric Tramway & Supply Company carried 10,860,629 passengers in 1916-1917, as compared to 10,811,406 in 1915-1916. The car mileage was 1,435,286 and 1,446,512 in the two years, and the total receipts amounted to \$276,727 and \$279,435. The Mandalay tramway is operated by the Burma Electric Tramway & Lighting Company. During 1916-1917 it carried 2,676,900 passengers, as compared to 2,559,101 in 1915-1916. The total mileage run was 508,960 in 1916-1917 and 502,507 in 1915-1916, while the receipts were \$69,753 and \$65,860 respectively.

Reduction from Large Traffic Poster, Underground Electric Railways of London

(The company also issues a leaflet, giving the names and something about the habits of these animals and where they may be seen in and around London).

UNDERGROUND · AIDS TO · PERPLEXED · PARENTS NO! THE · ANIMALS · AND BIRDS · OF · LONDON

TO CHILDREN THESE ANIMALS AND BIRDS LIVE SOME IN THE PARKS SOME IN THE FIELDS SOME ON THE FARMS THAT SPREAD ALL AROUND. FIND OUT WHAT IT IS EACH PICTURE SHOWS AND THEN AS YOU ARE TAKEN OUT TRY TO SEE EACH AS IT LIVES. YOU CAN CUT OUT THE DRAWINGS AND COLOUR THEM.

COPIES OF THIS POSTER POST FREE 1/6 CAN BE OBTAINED ON APPLICATION TO THE ADVERTISING MANAGER ELECTRIC RAILWAY HOUSE BROADWAY WESTMINSTER

LETTERS TO THE EDITORS

Public, If Informed, Is Fair

MILWAUKEE, WIS., Oct. 4, 1918.

To the Editors:

Houston, Tex., as this is written, seems to be getting ready to repeat Buffalo's disastrous folly with regard to electric railway fares. The Buffalo chapter is not yet all written, but it is safe to say that the community's financial loss due to several days stoppage of street-car service was many times larger than an entire year's payment of the proposed extra penny of car fare.

Houston's city commission a short time ago passed an ordinance authorizing the Houston Electric Company to raise car fares from 5 to 6 cents for adults, and from 2½ to 3 cents for children. The ordinance was passed after the city's expert investigators had reported that a fare increase was indispensable in order to permit the company to increase the wages of its employees. The Mayor and all four commissioners voted for the ordinance and signed a report to the public justifying their action.

Officers of the Houston Central Labor Council promptly began circulating petitions for a popular referendum on the ordinance. They have procured the necessary signatures, as noted in the *ELECTRIC RAILWAY JOURNAL* of Oct. 5, and a referendum appears to be assured. The statement that the Labor Council's hostility to the fare increase is due chiefly to the fact that the electric railway men are not members of the Amalgamated Association may or may not be correct. It is a fact that in Houston, as in Buffalo, certain political and journalistic factors which make a business of fighting public service companies have done all they could to procure the referendum.

The Houston situation is noteworthy for having brought to the front a powerful newspaper advocate of fair play for electric railway employees and investors. The *Houston Post* has published several editorials which are models of honorable and intelligent journalism.

These editorials are worthy, did space permit, to be reprinted here in full. The electric railway industry might well collect them and give them country-wide distribution in pamphlet form, as a means of arousing newspaper editors generally to their plain duty with respect to the maintenance of electric railway service under trying war conditions. The following excerpts give the essence of the *Post's* arguments:

RATES AND EFFICIENCY

Houston's welfare is wrapped up in the welfare of the street car system of the city. And the future welfare of this city depends in large part on the ability of the street car interests to supply the expanding needs of the city's growth. Furthermore, this city's financial reputation depends upon the ability of the street car company to meet the obligations which the city in the past has allowed it to assume.

Should the street car company fail to meet those obligations, the ability to sell such securities of a Houston public service corporation would be seriously impaired. Capital does not easily forget; and the record for failure to meet obligations once made becomes history.

Houston cannot get along without the street car lines, and they must be extended to meet the necessities of future growth. Already such extensions are imperative if the workers along the ship channel are to be served as they

should be. No such extension can be made under present circumstances, nor will funds for them be available until the earning capacity of Houston street cars increase to the point of profits above operating expenses. Whether the increase now asked in street car fares will bring the income of the company to that point is extremely doubtful.

The company bases this request mainly upon the actual increases in operating expenses under war conditions.

No plea is made for profits.

Operators of the lines would offset the trebled costs of operation by adding 20 per cent to the fares paid them; and, so considered, the raise to a 6-cent fare is no advance worthy of the name.

Every material used in the street car lines either in repairs or extensions has increased from 200 to 400 per cent in cost. It is no mere matter of 20 per cent to them. And the company has paid the bill so far without aid from the people whom it serves.

Practically every wage earner in Houston is paid more than 20 per cent above his earnings three years ago. The street car company has been obliged to increase wages in every branch of the service. No fault was found with that necessary step. But it is not fair to ask that such increases be borne and the public not bear its proportion of the increased cost. The street car lines are asking no more than justice.

THE PROPOSED REFERENDUM

The proposed referendum may have value of an educational character, in the matter of indicating just how popular the electric railway corporation is, but it is worth absolutely nothing in so far as the real issue is concerned.

A unanimous vote of the people against an increase of rate would not settle the question of fair dealing or justice that is involved.

The matter of increasing the rate from 5 to 6 cents is one of simple justice based on ascertainable facts.

Not one voter who will vote against the ordinance granting a temporary increase will know or care a straw about the real issues. Some will vote against the increase because their living expenses are high enough already, some because they think the service is poor, some because they hate the corporations, some because they actually think the company is coining too much money, some because the electric railway service is not unionized, some for this reason or that.

How many of those signing the petition will investigate such facts as increased cost of labor, of materials, of operation? How many will care whether the company goes bankrupt or not? How many really hope it does go bankrupt?

The voter is not concerned about anything except the extra cent. Whether it be for car fare, railroad fare, beef, haircut, shave, wheat or anything else, leave it to the voter and he will say living expenses are too high now. He will vote against any and all raises with the single exception of a raise of pay for himself. That's the human nature of it. And the fare referendum will prove it.

The people did not want to pay heavier railroad fares, but the operatives of the railroads had to have more wages and it required more revenue to pay higher wages and other increased costs of operation. So the government investigated, ascertained the facts, and up went freight tariffs and passenger fares.

And the government investigated living conditions and other circumstances and now tells the Houston Electric Company to pay its men more wages—and the Lord knows they need more pay—and the company replies that it must have more revenue in order to comply with the government's request.

The City of Houston has fixed the fare temporarily at 6 cents and 3 cents in order that these wage increases may be granted.

One of the leaders of the movement to defeat the ordinance says that labor will not object to the increase if it finds that such increase is just. But who is to determine the justness of the increase?

The matter has already been investigated to the satisfaction of the Mayor and four commissioners, who have considered the real questions involved. Now it is proposed to determine the matter by those who have not investigated at all and who are not going to investigate but will vote against the company for reasons that are totally foreign to the controversy.

As a matter of fact, federal agencies ought to take over all public utilities during the war period and operate them so as to prevent injustice or bankruptcy. There is no such thing as charges that will be agreeable to the public. High

or low, such charges are never satisfactory. It is seldom that service is satisfactory.

The electric railways of the whole country have been in trouble for a year; many systems are threatened with bankruptcy, and many private investors in the securities resting upon such properties are in danger of losing their holdings. There ought to be some tribunal to investigate and decide all these cases on their merits, give full justice to public and corporations alike, and obviate such absurd proceedings as attempting to decide a matter of justice, growing out of intricate conditions of which the electorate has no intelligent comprehension, through the instrumentality of the ballot box.

The *Post* may be correct in predicting the defeat of the 6-cent fare by the voters of Houston. The *Post* is curiously indifferent to the most outstanding fact of American business when it suggests the inability or unwillingness of the people to deal fairly with public service companies, after being put in possession of the controlling facts.

If the masses of the American people had become so mentally and morally incompetent as that, the whole structure of American industry and government would long since have fallen into ruins. To the contrary, the American public is on the square, and it is the most intelligent public on earth.

That the American public in the war emergency fails to deal justly with public service companies—fails even in many instances to perceive the identity of its own pocket interests with those of such companies—is in my opinion wholly and solely the fault of the companies themselves. They have tried to do business without advertising, and the professional agitators have done their advertising for them.

My seven months advertising campaign in behalf of the United Railway of St. Louis between August, 1917, and February, 1918, provided convincing proof that even a very unpopular electric railway system, if it will come clean to the public with all of the facts concerning its rights as a business and its needs as a public service, and if it will repeat the publication of those facts often enough to make them a part of the community's common knowledge, cannot fail to get a fair and even a generous deal from the American public.

The electric railway business in the United States is getting exactly what it has coming to it, on its record of indifference to public opinion, expressed in its failure to try to win public favor as all other merchants win it. The business will get what public welfare requires that it shall get—revenues ample to pay for good service keeping pace with community growth—just as soon as it learns how to advertise as intelligently and persistently and liberally as other commercial institutions with comparable capital and volume of business.

A public service company that asks a state commission or a city council to grant it higher rates, however necessary to its solvency and to the public welfare, must be prepared to sell the rate increase to its public in advance of the order. Such a company asks more than human nature is ordinarily willing to grant when it asks public rate authorities to raise its rates and to assume the burden of public displeasure without any help on the company's part in making known the facts justifying such increase. The company that takes such an attitude is comparable to the husky beggar lying by the roadside who begs the traveler on horseback for alms, and then asks him to get down and put the gift into his hand.

FRANK PUTNAM.

The Woman Conductor Should Keep Her Job After the War

CLEVELAND, OHIO, Oct. 7, 1918.

To the Editors:

A number of electric railway companies have begun the employment of women conductors and others will have to do so. Biologically, there is of course a difference between man and woman. It makes man in a physical sense woman's superior. Exclude the difference so made and equality follows, not as a figure of speech in stating a conclusion, but rather as a demonstrated fact established by woman's work in every occupation she has essayed to enter as man's competitor.

There is nothing new in this. It has been going on for a long while. On account of its slowness and yet ever-steadiness, it attracted no more than passing notice. Too often when woman has been discovered doing an exceptional job, the entire subject has been dismissed with the remark, "Oh, yes, she is a wonder, she does her work exceedingly well, but it only proves she is an exception to the rule."

Through the shortage of man-power, coming as a result of the lunacy of Germany, women in large numbers have entered fields which until now have been denied to them. The movement being one out of the ordinary has therefore not only attracted but challenged attention. It has caused talk and discussion and made for investigation with the result that woman has more than proved her right to be considered man's equal, for in all work where order, neatness and accuracy are the essentials of success she has established the fact that in many instances she is man's superior.

Woman is not taking man's place during the war but rather, through the war, is taking her own place. None will appreciate this more fully than will Sammy, Tommy, Jacques and Fritz when they return. They will find that they have been displaced—that the jobs they once held by reason of sex are gone, and gone forever.

From what I have thus far stated, you will see that I am in favor not simply of women entering these new fields as a war necessity, but permanently holding many of the jobs she is now filling. But that is not all. I am for a further displacement of man, not as a war necessity, but as a matter of plain justice to woman.

To make clear what I am driving at, let me direct your attention to what you can observe each and every day: women driving taxicabs, while men watch fare boxes; women in dirty overalls wiping dirty locomotives—men in white shirts calling streets; women changing heavy material on machines—men with machines making small change; women doing dirty jobs in clean ways—men in dirty ways doing jobs that are clean.

When the pay-enter car made its appearance, the man conductor should have made his exit. The time for the cashier was at hand. The job should have been given to her. Had this been done the chances are that the subject to-day would not have been that which it is, but in all probability would have been "the dispensing with cashiers on street cars as a war necessity."

Though the jitney was an economic waste and a transportation curse, it nevertheless proved to be a blessing in disguise, for it gave us the one-man car. So the shortage of man-power is another blessing. It

is giving the operator a new field to pick from and giving to woman the job which is justly hers.

To all operators who have not yet made the change which must be made, let me say, don't discharge the man at the fare box. Let him keep the job which by loyal service he rightly owns, but let all future jobs go to women. As motormen quit or are dismissed, put him on the front end. If through the change he loses his seniority, make up the difference in pay. Recognize the justice of equal pay for equal work, whether performed by man or woman. At the same time, do not fail to recognize the inequality between the front and rear end jobs. Fix the pay accordingly.

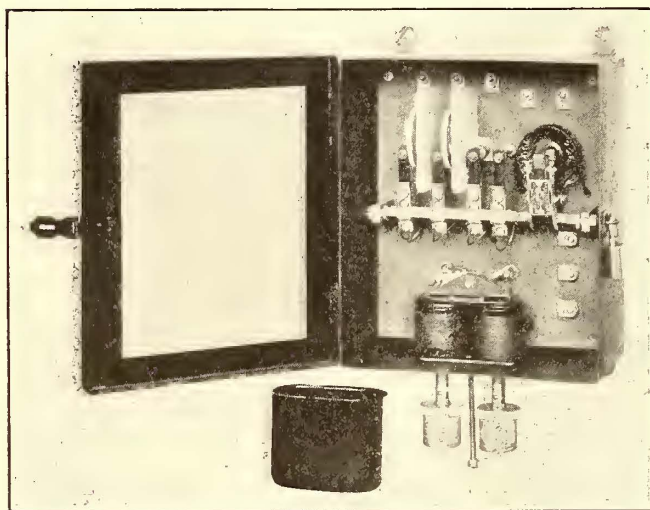
PETER WITT.

New Remote-Control Starter for Small Induction Motors

A DEVICE for starting small induction motors from a remote point by throwing them directly across the line has recently been placed on the market by the General Electric Company.

The device consists of a 25-amp., three-pole contactor with two inverse-time-limit gravity-reset overload relays mounted on a slate base totally inclosed in a strong sheet-iron case.

A small "start and stop" push-button station is used as a remote-control switch. Completion of the starting circuit, by pressing the "start" button energizes the coil of the magnetically operated switch, closing



ENCLOSED REMOTE CONTROL STARTER FOR SMALL SQUIRREL-CAGE INDUCTION MOTORS

the contacts, which throw the motor directly on the line. Interruption of the circuit or a radical decrease in voltage permits the contacts to reopen by gravity, thus stopping the motor which cannot start again until the "start" button is pressed.

The overload relays can be adjusted for various values ranging from normal up to 50 per cent above normal. They can also be adjusted over a wide range of time values. The relay trips automatically and resets by gravity.

The starter is known as the CR-7006 remote control switch, arranged for push-button control, and is applicable for use with motors up to and including 5 hp. 110 volts, and 7½ hp., 220, 440 and 550 volts.

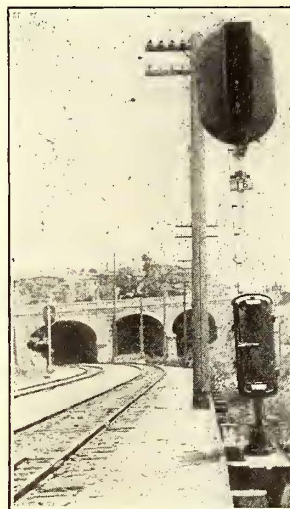
Block Signal System Improvement on Pasadena Short Line

Installation of "Follow-Up" or "Permissive" Signal Facilitates Rush-Hour Movement of Trains on Congested Sections

BY CLIFFORD A. ELLIOTT

Cost Engineer Maintenance of Way Department, Pacific Electric Railway.

AN ADDITIONAL indicating lamp has been recently installed beneath the three-position automatic block signals on a portion of the Pasadena Short Line of the Pacific Electric Railway. This lamp, which has a yellow lens, is connected in series with the lamp giving the red or danger indication. With both lights burning, the train is permitted to proceed under proper control into a block already occupied by a preceding train. Previously, when a train received a red indication it was required to stop and wait one minute before proceeding.



THREE-POSITION AUTOMATIC BLOCK SIGNAL.

Small indication lamp installed underneath to allow permissive operation.

The three different indications now provided are: Green, indicating that the track is clear for two blocks ahead; yellow, indicating that the second block ahead is occupied; and red and yellow, permissive signal, indicating that the first block ahead is occupied but allowing the train to proceed at reduced speed. The blocks for this section are from 200

ft. to 500 ft. in length, and many delays previously occurred, due to congested traffic conditions. Five signals on the outbound track and four signals on the inbound have been changed to the latest form.

This line uses a 2200-volt transmission system centrally fed, a substation being located 1.8 miles from the point of the beginning of the block signal system on the line. At junctions, crossovers, etc., additional signals are used to provide full protection to short cars or trains while taking crossovers.

This same method of signaling is also used by the Pacific Electric Railway on its new viaduct entering and leaving its main terminal passenger station in Los Angeles. This terminal was described in the issue of the ELECTRIC RAILWAY JOURNAL of Aug. 25, 1917, page 307. On the viaduct the permissive yellow signal is controlled from a signal tower. Normally, with a train in the block ahead the signal will show red to a following train. If conditions are such as to warrant the closing up of trains, the towerman can give the permissive indication by lighting the yellow lamp. This is so interlocked that it cannot be given except when the red light is burning.

United States Bureau of Mines, Washington, D. C., has prepared a resuscitation chart which is in poster form, 11 in. x 16 in. Copies can be secured from the Director of the Bureau of Mines, Washington, D. C.

Columbus (O.) Remote Control Substation Has Several Novel Features

Connections for Starting and Stopping Station Over Telephone Line and Device for Advising Dispatcher of Load Condition Included

ONE of the latest automatic substations on electric railway lines is that recently put into commission by the Columbus Railway, Power & Light Company at Columbus, Ohio. This is the substation mentioned by Messrs. Linebaugh and Burnham in their paper on "Protection from Flashing" delivered before the 1918 convention of the American Institute of Electrical Engineers, which was abstracted in the issue of the *ELECTRIC RAILWAY JOURNAL* for July 6, page 9.

The substation contains one 500-kw. 60-cycle General

test was made by short-circuiting the trolley wire and ground feeders at a distance of about 1000 ft. from the substation by means of a pole switch. This was down several times and the rotary showed no signs of distress, the arc chutes performing their functions perfectly.

The pictures show the general arrangement of rotary, control switchboard panels, transformer, drum controller, electrolytic lightning arrester cells, etc. Another photograph, showing the exterior of the building, indicates the extreme simplicity in housing which is possible with the automatic substation.

All substations on this property are under the control of the load dispatcher, who is located in the central part of the city. (See *ELECTRIC RAILWAY JOURNAL*, July 18, 1914, page 129). The dispatcher also has control of the automatic substation which, by arrangement

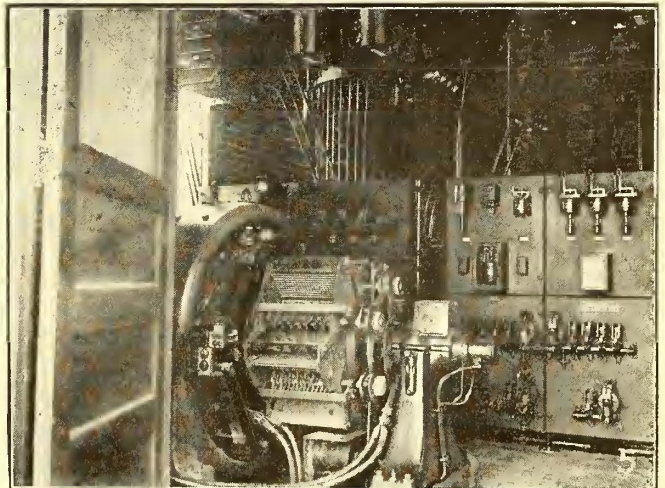
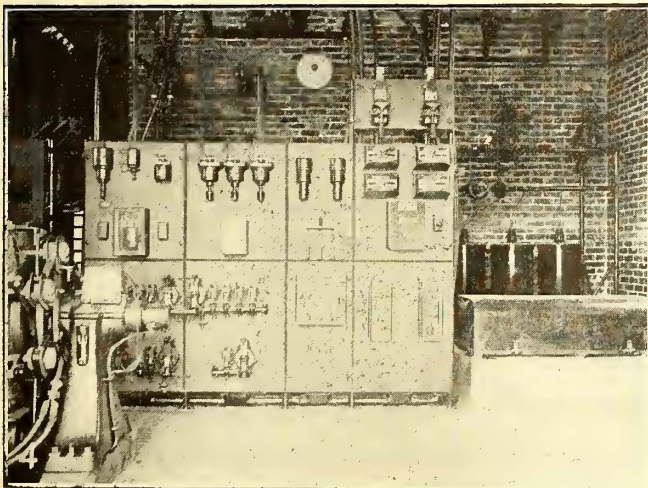
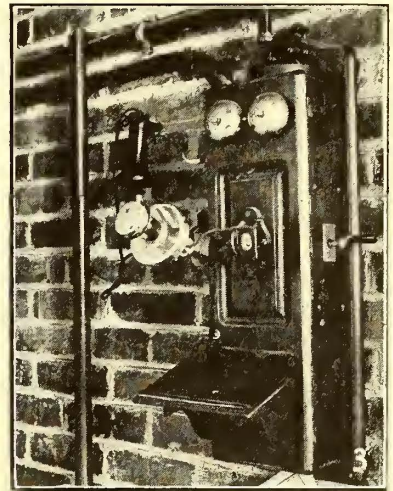
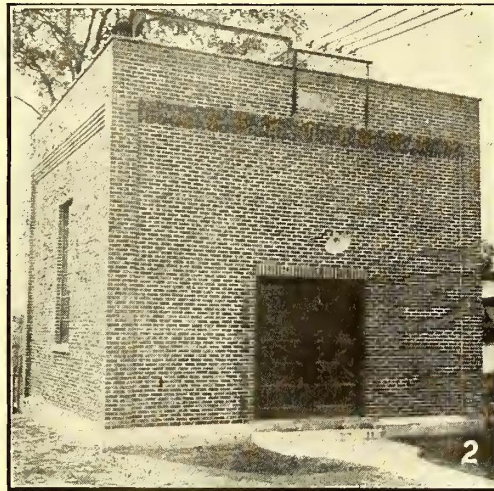
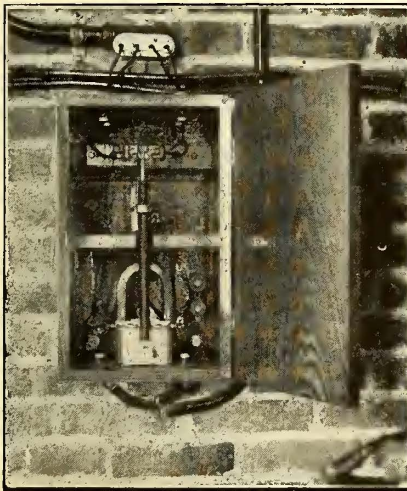


Fig. 1—Relay for use in remotely controlling the substation.
 Fig. 2—Exterior view of Columbus automatic substation building.
 Fig. 3—Buzzer mounted over telephone transmitter for use in indicating load on substation.

Fig. 4—Interior view of automatic substation (at left, commutator end of rotary converter and transformers; in center, switchboard and meter panels; at right, in rear, electrolytic lightning arrester; in foreground, drum controller on concrete base).
 Fig. 5—Brush barriers on rotary converter.

VIEWS IN AND ABOUT THE AUTOMATIC SUBSTATION OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY

Electric rotary converter and the standard auxiliary automatic control apparatus. The commutator of the rotary is surrounded by a new device for extinguishing the arc, consisting of barriers between the brushes which nearly touch the commutator surface, arc chutes to carry off any flashes that may occur and wire screens to assist in extinguishing the arcs. Details of this equipment will be found in the earlier article referred to.

When this equipment was first installed a flashover

with the telephone company, is effected over the telephone line. For this purpose a special relay was constructed by the power department, the actuating element of which is a magneto generator.

The relay is shown in one of the illustrations. It consists of the permanent field magnet and armature of the generator with a long rod of insulating material projecting upward from the latter. This rod carries a "damping" vane. At the upper end of the rod is a

contact device which when in one direction permits the energizing of the substation control circuit in such a way as to start the substation and similarly causes it to be shut down when the arm is in the opposite position. Direct current for the purpose of actuating the relay is sent over the telephone line from the load dispatcher's office.

When the substation has been started by the load dispatcher it operates entirely automatically.

A very ingenious plan is used to indicate to the load dispatcher the approximate magnitude of the load on the substation at any time. This consists of a buzzer hung directly over the mouthpiece of the telephone transmitter and connected in a circuit containing a battery and a contact connection on the rotating element of the station watt-hour meter. Every time that the rotating element makes a revolution an impulse of current is sent through the buzzer, so that the frequency of rotation is clearly indicated. By listening through the telephone line, from time to time, the load dispatcher has a gage of the load upon the substation by the frequency of the "buzzes" and thus can keep himself in touch with conditions therein.

An Opportunity for Engineers

IN A RECENT issue of the ELECTRIC RAILWAY JOURNAL brief mention was made of a government classification blank for engineers, prepared a short time ago by the Division of Engineering of the United States Employment Service, Chicago, Ill. This blank has met with such universal favor that it is reproduced for the benefit of those in the railway field who are not already familiar with it.

The blank accomplishes several purposes. One is to offer a means whereby engineers may place themselves on record with the government regardless of whether they now desire employment with the gov-

ernment elsewhere or not at all. Instead of being obliged to make application through an employment agency at considerable expense, it can be done in this way through the newly organized Division of Engineering, free of charge. The blank remains on file, and if at any future date the engineer desires employment, no further application or expense is necessary.

Second, the blank serves as a means of classification of the engineers of the country. The arrangement is clear and concise and has so definitely divided the various branches of engineering that it tells at a glance the qualifications of the registrant. If either the government or private employer is in need of a man of certain qualifications and training, this file of records shows just where he can be obtained. Thus at one and the same time the engineer has an opportunity to render himself a service by placing himself in a position to secure employment at desire and to perform a patriotic service to the government by placing his qualifications on record with the Division of Engineering.

In the light of the recent draft it might be wise for engineers subject to call to consider this blank seriously. Although it is not reported that any arrangements have been made to use this classification as an aid to induction into service, it is only logical to assume that the government might use such a valuable record to assist in placing men where they are best fitted to serve the country.

Application for the blank can be made at any local United States Employment Service office or direct to the Director of Engineering, 29 S. La Salle St., Chicago, Ill.

Skip-Stop Signs in Brooklyn

IN ACCORDANCE with the request of the Fuel Administration Brooklyn has adopted the skip-stop plan, and the new method of operation will be put into effect as soon as a sufficient number of stopping places can be marked. The company submitted its proposal for establishing skip stops on the various lines of the system to the Public Service Commission last spring, but it was not until almost the last of September that approval was given. The plan provides for marking the various locations at which cars will stop by signs painted on the poles of the line.

The work of marking the poles was started immediately upon obtaining the commission's sanction, and as fast as the poles of each line are marked by the employees of the line department the plan has been adopted on that line.

The poles are marked with a white band 12 in. wide and painted just under the lowest joint of the pole. Upon this band is stencilled one of the words, either "stop" or "station," depending respectively upon whether the cars are to stop at that point without signal or only upon signal by intending passengers. As pure white paint will not show up so clearly or last so long on black poles as will some other colors, the color is blended with a slight amount of yellow. The words "stop" and "station" are stencilled vertically on the poles and placed on the two sides at right angles with the curb line so as to be seen easily by persons walking on the sidewalk and approaching the pole.

GOVERNMENT CLASSIFICATION BLANK FOR ENGINEERS.				
EXPERIENCE		ENGINEERING		SALARY
Place number of years' practice in proper spaces below.		Indicate by X your special classification		Give figures on monthly basis
Consulting	Commercial	Designing, Drafting and Checking	Contracting	Construction—Supt or Foreman
Inspection, Testing and Analyzing	Operation, Valuation & Scientific Management	Surveying—Instrument Man	Drafting—Tracing	UNIV.
				MECHANICAL
				ELECTRICAL
				MINING
				CHEMICAL
				Architect, Salubrious and Technical, give special title
				Salary Desired
				Lowest Considered

CHECK YOUR EXPERIENCE ON SUB-CLASSIFICATIONS			
I CIVIL ENGINEERING 1—Bridges 2—Buildings 3—Railroad Concrete 4—Highways 5—Railways 6—Harbor Work 7—Dams and Reservoirs 8—Irrigation 9—Waterways 10—Montages 11—Water Supply 12—Sanitation 13—Ship Building 14—Structural Steel	5—Machine Shop Mch 6—Refrigerating Mch 7—Steel Mill Machinery 8—Textile Machinery 9—Light Automatic Mch 10—Marine Engines 11—Automotive 12—Internal Comb. Engines 13—Aeronautics 14—Gas Mining Equipment 15—Steam Plant Equipment 16—Heat. Vent. & Htg. Eqpt. 17—Industrial Plants 18—Railway Rolling Stock 19—Tanks	3—Light and Power Plants 4—Control Equipment 5—Motors and Generators 6—Transformers 7—Overhead Construction 8—Radio and Wireless 9—Railway Signaling 10—Telephones 11—Telegraphs 12—Testing Apparatus 13—Mining Engineering 14—Assayer 15—Drilling Machinery 16—Mills and Ore Dress Mch 17—Mineralogical and Geo. En. 18—Mine Survey 19—Mining Machinery 20—Coal 21—Open Pit 22—Ore Dressing Mills	11—Petroleum 12—Smelting and Equipment 13—Underground Mining V CHEMICAL ENGINEERING 1—Chemical Plant Equip. 2—Geners 3—Dye Stuffs 4—Explosives 5—Fertilizers 6—Gas 7—Oils 8—Glass 9—Soap 10—Hides and Leather 11—Iron and Steel 12—Paint 13—Photographic Supplies 14—Water Purification 15—Sewerage Treatment 16—Wood Products and Preservatives

Specials
 I am engaged in war work and will leave present location.
 My age is _____ and my draft classification is _____
 Print name _____
 Print address _____
PLEASE FILL OUT AND MAIL AT ONCE TO DIRECTOR OF ENGINEERING

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Labor Jurisdiction Denied

War Labor Board Holds Men Have Not Exhausted Means of Settlement Provided in Their Contract

Messrs. Taft and Walsh, joint chairmen of the National War Labor Board, on Oct. 2 denied jurisdiction in the case of the Birmingham Railway, Light & Power Company, Birmingham, Ala. In this case the employees sought increased wages and the company contended that the National War Labor Board did not have jurisdiction, because the agreement between the company and the Amalgamated Association specifically provided a means of settlement which the employees had not invoked. The decision of the joint chairmen sustains the contention of the company. It is of importance to all companies having agreements with their employees which provide for a method of settlement. Chairman Taft said:

CHAIRMAN TAFT QUOTED

"The section has come to a conclusion with respect to the case of the Amalgamated Association against the Birmingham Railway, Light & Power Company. We have concluded that it is our duty, under the principles applying to the board as set out in the proclamation of the President, to hold that the plea to the jurisdiction here is good—without going into other grounds or without discussing the merits of the other grounds—upon the ground that the contract offers an opportunity to either party to in-

voke a conventional tribunal, and that the complainant party has not invoked that tribunal. That comes within the letter of the rules excluding our jurisdiction. For that reason the complaint will be dismissed.

A TRIBUNAL OF CONCILIATION AND MEDIATION

"Our view in respect to the jurisdiction of this tribunal has been expressed once or twice. This is primarily a tribunal of conciliation and mediation. The power to intervene by mediation is one that is not limited exactly by the attitude of the persons with whom the mediation is undertaken. If we approach them, their attitude of resistance to our solicitations or suggestions or advice may not prevent our going on and looking into the merits of the question so far as we may, and making recommendations or suggestions. A mediator may visit a man in his office, and may continue his mediation until he is shown the door.

"But where we proceed to arbitration, the question is a different one. Here we are asked to go ahead and act in this matter as a section of the board which may proceed to arbitration, and here we find the facts to fit exactly the clause of our jurisdiction which excludes it.

COMPLAINT DISMISSED

"Therefore, the order will be that the complaint be dismissed, on the ground that the parties have not taken the course set forth in the contract."

New York Staggers Hours

Railways, Business Men and Merchants Quick to Comply With Health Board Order

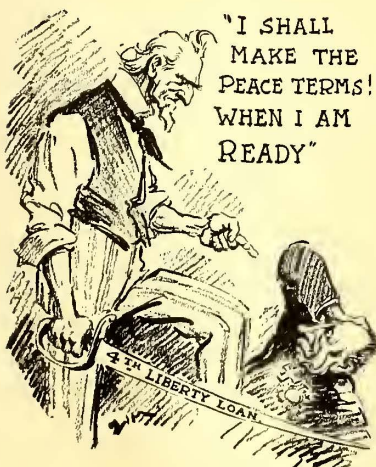
In order to lessen crowding during the prevalence of the influenza in New York City, the Health Commissioner issued an order during the latter part of the week ended Oct. 5, in which he proposed staggered hours for business.

CONGESTION DIMINISHED

Reports received on Oct. 8 by the Public Service Commission showed that the order regulating the opening and closing of offices, factories, and theaters had diminished congestion on the traffic lines in the late afternoon and night, but had shown no apparent effect upon morning travel. Both on the Interborough and the so-called New York Consolidated systems, the latter including Brooklyn lines, only slight changes were noticeable in the morning of the first day's tryout, but in the afternoon both companies experienced unusually heavy riding between 4.30 and 5 o'clock.

Full rush-hour service was begun on the afternoon of Oct. 7 on the lines of both the Brooklyn and the New York City systems at 4.30 o'clock. The opinion of the Health Commissioner on Oct. 7 was that the order was being pretty generally observed, but to insure that it should be carried out he asked the active co-operation of the Police Department.

More Liberty Bonds Mean Permanent Peace



SUPPOSE you had a small farm, a nice little wife and perhaps a growing family, and you wanted nothing in this world more than to be let alone and to live your life out just as God had ordained.

And then suppose that some armed force, which you had never had occasion to consider, suddenly invaded your land, killed your stock and then demanded that you get out. And then suppose that your young son resented this foreign intrusion and that the helmeted brutes, just to show their militaristic power, jabbed a bayonet through his chest. Then suppose the murderers took away for their own purpose the little maid whom you begot!

Would you spend a nickel for a cartridge to kill one of those despoilers? Or, if these things had come to you, would you not rather forget the price of a single cartridge, which might kill only one, and save until you could buy a bond that would kill fifty?

If you lend your country a hundred dollars, you are approaching one hundred dollars nearer world democracy, which means the equality of men.

The Hun is beginning to whine, but this is no time to stop fighting if permanent peace is to be secured.

Then act at once! Buy More bonds of the Fourth Liberty Loan!

Buffalo Strike Still Unsettled

All Efforts Fail to End Controversy in Which Wages and Fares Are Involved

Platform men employed by the International Railway, Buffalo, N. Y., who went on strike at 4 a. m. on Oct. 3, say they will not return to work unless they receive the wage award of the War Labor Board. This provides for a sliding scale of 43 to 50 cents an hour. In addition the men demand back pay based on this schedule dating from June 1, last.

All of the local and interurban lines of the company in Buffalo, Niagara Falls and Olcott are tied up by the strike. The company has been operating about a dozen cars on some of the downtown lines so as to comply with its franchise. They are being run by traffic supervisors. The strikers have not sought to prevent the operation of these cars. There has been no disorder.

RAILWAY WILLING BUT IMPOTENT

The railway has agreed to pay the wage award of the War Labor Board and has also tentatively agreed to pay the men their back salaries based upon the award from June 1, last, but owing to the restrictions of a 5-cent fare E. G. Connette, president of the company, says that it is financially unable to give the men this wage increase which would amount to approximately \$1,750,000 a year. The company asks the City Council to enact an emergency ordinance, allowing the collection of the 5-cent fare until a just and equitable rate is fixed by the Public Service Commission for the Second District. This emergency ordinance would not be subject to a referendum of the voters the same as the first 6-cent fare ordinance adopted by the Council and later rejected five to one by the voters.

Members of the Buffalo Retail Merchants' Association arranged a conference with the publishers of the city's newspapers and it was agreed at that conference that it is essential to the best interests of the city that the Council enact an emergency ordinance which would allow the railway to charge a 6-cent fare until a reasonable and just fare is fixed by the Public Service Commission. A special meeting of the Council was then held. Two members of the Council opposed the measure and one of these votes is needed to secure its enactment. As the railway has agreed to pay the wage award to its men if this ordinance is enacted, this would end the strike.

Newspapers which have been bitterly opposed to the International Railway now apparently see the folly of continuing the fight against a higher fare, especially in view of the fact that the company must have a higher fare if it is to pay the award of the War Labor Board and resume the operation of its cars. These newspapers are now assailing the two members of the City Council for not changing their attitude.

The two opposing members of the City Council, one of whom is the Mayor, who incidentally was elected on the platform of street railway reform and a 4-cent fare, have appealed to the Attorney General to bring an action against the railway to end the corporate existence of the company and apply to the courts for the appointment of a temporary receiver. This litigation is now pending.

After a long conference on the third day of the strike members of the City Council, representatives of the Chamber of Commerce, E. G. Connette president and other representatives of the International Railway, tentatively agreed upon a proposition which, it was believed, would bring an end to the strike, but the agreement was rejected by the board of directors of the railway. This agreement contained these conditions:

SETTLEMENT BASIS STATED

The Council to nominate a managing director, also a treasurer of the International Railway, subject to the approval of the board of directors.

The Council to have the right to nominate a majority of the board of directors. By-laws to be so amended that on questions concerning the creation of bonded debt or the sale of property, two-thirds vote of board necessary.

The Council to submit to the Public Service Commission the question of a reasonable fare during the period of the war and six months after peace.

No dividends to be paid on the preferred stock or the common stock of the railway until the determination of a fair rate of return by the Public Service Commission.

Valuation to be as of June 30, 1915, and actual cost of betterments made since.

The agreement reached between the company and the City Council—which would end the strike if one more member of the City Council casts his vote in favor of it—provides that the Council pass an ordinance stating that it is "immediately necessary for the preservation of the public peace, health and safety," which would provide that pending the determination by the Public Service Commission, of a reasonable rate of fare, the Council consents to a rate of fare of 6-cents and to such action by the Public Service Commission as is necessary to put such temporary increased fare into effect.

Pending the determination of what is a reasonable rate of fare it is proposed that the company shall give to each passenger paying a 6-cent fare a rebate slip for 1 cent, to be redeemed if the Public Service Commission holds a 5-cent fare is reasonable and just. The railway is also to elect a majority of the board of directors of the com-

pany as named by the Council, who shall serve during the life of the agreement. The Milburn agreement, which covers the franchises between the city and the railway, is not to be changed or affected except as temporarily provided for.

Application has already been made by the municipal authorities before Justice Louis B. Marcus in the Supreme Court of Erie County for a writ of mandamus to compel the International to operate its cars on the city lines. Members of the City Council say that if the writ is issued, the court may appoint a receiver or officer to see that the provisions of the writ are carried into effect.

The strike resolution of the company's employees demanded an increase in wages of all platform employees to the scale recommended by the War Labor Board, which is from 43 cents to 50 cents an hour. Wages of other employees, including shopmen, electrical workers, women car cleaners, etc., would be increased by the same percentage, provided, however, that if this percentage increase does not bring the minimum wage up to 42½ cents an hour, these employees are to be paid this minimum scale per hour. This scale would continue in effect until Feb. 1, 1919, and under the award of the War Labor Board the men could apply to the board for a readjustment in wages every six months thereafter if conditions warrant such a move. The men also demand back pay amounting to a total of approximately \$300,000 based upon the award of the War Labor Board dating back to June 1, last.

Government representatives who were sent to Buffalo brought word from the War Department and the War Industries Board that there would be no federal intervention in the Buffalo situation. The day before the strike was called, W. D. Mahon, international president of the Amalgamated Association, held a conference with federal authorities in Washington and the government agreed to pay the difference between the present wage scale of the men and the award of the War Labor Board for a period of one week so as to prevent a cessation of the city's transportation facilities and consequent crippling of the industries engaged on war work. Within a few hours after this offer was made, it was withdrawn by the government.

On the night that the strike was called all of the business interests of the city and representatives of the International Railway and representatives of the union conferred in the Chamber of Commerce. At that time the businessmen of the city offered to subscribe a total of \$75,000 to loan the company so as to pay the difference between the men's pay and the award of the War Labor Board for a period of one month so that some steps could be taken in the meantime to prevent a strike. The union delegates rejected the offer because no provision was made for receiving the back pay based on the award of the board.

Signal Corps Opportunities

Special Call for Graduate Electrical Engineers Experienced in Power or Communication Work

At the present moment there is a shortage of officer candidates having the required technical and personal qualifications available for signal corps officer training schools. While ordinarily officer candidates are taken from the enlisted personnel of the Signal Corps, a much smaller number having the necessary qualifications are available than are required. For this reason it is desired to secure by voluntary induction, for assignment to an officers' training school during the next two months, the services of a considerable number of electrical engineers who are available for full military duty, and who are between the ages of twenty years and nine months and forty-five years.

SIGNAL CORP SEPARATE

The United States Army maintains a signal corps as a separate organization. At present its duties are twofold; first, it is charged with the duty of developing and producing signal apparatus for the mobile army, for the air service, and for the coast artillery corps. Its second and principal duty is that of maintaining communication within the mobile army and along lines of communication. For this purpose two kinds of signal troops are employed; first, the so-called telegraph battalions which install and operate telephone and telegraph lines in the rear of the army. Second, the field signal battalions are organizations for service with combat troops.

In view of the technical nature of the duties of signal officers, the most suitable candidates for commission as such are electrical and radio engineers who have had experience in power or communication work. Graduates of four-year courses in electrical engineering, are regarded by military authorities as ideal candidates for commissions in the signal corps.

COMMISSIONS FOR THOSE WHO QUALIFY AS LIEUTENANTS

It is desired by the signal corps to receive applications for service from men who are qualified as outlined in the preceding paragraph. Such men will be individually inducted into the army and assigned as enlisted men to an officer candidates' training school, which is now being maintained by the signal corps. Those who have shown by their record that they are officer material will either be commissioned in the grade of second lieutenant at once or assigned to a course of further military instruction as officer candidates at a signal corps camp. Those who do not qualify as officer candidates will remain in the army in an enlisted grade and will be assigned to an organization of the signal corps.

Promotions in the army are now made by selection rather than by

seniority and the well qualified engineer need have no fear that his claims to promotion will not be recognized because some younger and less competent man outranks him with respect to the matter of length of service.

APPLY TO THE CHIEF SIGNAL OFFICER

Electrical and radio engineers who desire active service in the army with an opportunity to secure a commission should fill out an application for service blank which may be secured from the office of the Chief Signal Officer, Training Section, setting forth completely their military status, together with their experience and training. On being accepted for service, they will be inducted into the army in the grade of private and sent to an officers' training school with such prospects as herein outlined.

May Reject St. Louis Settlement

The United Railways, St. Louis, Mo., through its president and general manager, Richard McCulloch, will reject the thirty-one-year franchise settlement bill recently passed by the Board of Aldermen. Mr. McCulloch on Oct. 4 notified Mayor Kiel that the company would formally decline to accept the bill following a meeting of the directors on Oct. 8. Mr. McCulloch was quoted by the newspapers in part as follows:

"I was never enthusiastic about the ordinance. In the negotiations with the city we were traded out of about everything we really wanted. The company never had any great interest in the bill as finally passed.

"Negotiations with the city for the framing of a franchise ordinance were begun about two years ago. Since then conditions have changed greatly. We feel now that it would be no use for us to accept any ordinance which fixes a flat rate of fare. The rate of fare should automatically go up or down according to the increase or decrease in the earning power of the company. It has been demonstrated that under present conditions the company cannot pay its operating expenses, fixed charges and the salaries demanded by its employees at the flat 5-cent fare fixed in the ordinance.

"The ordinance named certain conditions in which the company was to be refinanced and gave the company a year in which to comply with these conditions. Under present circumstances it would be impossible for the company to do this financing.

"We suppose the next step after our rejection would be for Mayor Kiel to ask the Board of Aldermen to repeal the bill. That would open the way for new negotiations between the city and the company for the framing of an ordinance providing for a sliding scale of fares and giving the city the right to acquire the company's property under certain conditions."

The rejection of the bill would, of course, do away with the necessity of holding a referendum election on the ordinance.

New York Lines Need Money

Commissioner Whitney Suggests Surrender of Private Control—Mayor Wants Franchises Investigated

In a statement issued on Sept. 29 Travis H. Whitney, of the Public Service Commission for the First District of New York, discussed the surface railway transportation situation in that city. He expressed the belief that the increased costs of operation must be met either from increased fares or from taxes. In his opinion a change must speedily come if the service is to be even fairly adequate, and it should be radical enough to give the city greater control of the lines. He offered this suggestion:

"The free grant of the right to charge an increased fare should have public consideration. There should be a surrender by the companies of at least some of their rights as private companies—that is, a greater participation by the public in the direct management of the properties and not merely regulation, with all the legal refinements and delays that may be thrown around an order that a company does not wish to obey.

"Such public participation may take the form of municipal ownership and either municipal operation or operation by lease from the city; or by boards of directors made up in part of men appointed by public authorities; or by payment to the city of a share of the revenue arising from increased fares after necessary expenses are met, including increased wages necessary to procure adequate service, and with a joint board to administer the revenue.

OWNERS ANXIOUS TO SELL

"The owners of utilities in this city no longer oppose municipal ownership. The city faces the dangerous possibility that under the pressure of war necessities the advocates of municipal ownership and the needy owners of utilities will unite to burden the city with utilities, good, bad and insolvent, useful and useless, under agreements that will gratify public officials by promoting their political success and will bring the owners prices for which they will be duly grateful.

"This dangerous possibility should not stand in the way, however, of the city's acquiring upon sound terms surface lines that can properly be made integral parts of the city's rapid transit systems, either to collect and distribute passengers in outlying districts to and from rapid transit terminals or in handling short-haul passengers in central districts by transfer."

Mayor Hylan on Sept. 30 directed Corporation Counsel Burr to investigate all of the electric railways in New York City in order to discover whether they are living up to their franchise obligations.

Theodore P. Shonts, president New York Railways, operating surface railway lines, has offered to assist the investigation.

Boston and Providence Wage Findings

The War Labor Board announced on Oct. 3 that wage increases had been granted the employees of the Boston Elevated Railway and the Rhode Island Company, Providence, and also that recommendations had been made that these companies be permitted to increase their fares in order to meet the wage increases.

The award in the case of the Boston company becomes effective as from June 15 last and gives surface line motormen and conductors a wage from 43 to 48 cents an hour, while those on elevated lines will receive 45 to 50 cents.

On the Rhode Island Company lines the motormen and conductors will receive from 43 to 48 cents an hour, with a minimum wage of 42½ cents for other employees, effective from July 19 last. The wage increase on this line also affects women employees.

News Notes

Wages Advanced In Bridgeton.—The Bridgeton & Millville Traction Company, Bridgeton, N. J., has granted an increase of pay to its car crews, beginning on Oct. 1, the maximum being set at 33 cents an hour.

Wilmington Wage Dispute to Board.—Both the Wilmington & Philadelphia Traction Company and its employees have agreed that the matter of wages in dispute between them shall be submitted to the War Labor Board for settlement.

Strike at Springfield.—Employees of the Springfield (Ohio) Railway struck on Sept. 23, because the company refused to recognize Organizer Al. Jones of Cincinnati as a member of the employees' conference committee. People were compelled to walk back and forth to work and business. It is said that the employees will also ask a material advance in the wage schedule.

San Francisco-Oakland Resettlement.—The City Council of Berkeley, Cal., has been asked in a formal application from the San Francisco-Oakland Terminal Railways to adopt the resettlement franchise as agreed upon by the resettlement franchise commission. The request is in accordance with the terms of an amendment to the city charter adopted at an election a year ago authorizing the Council to adopt such an ordinance. After adoption by the Council the ordinance will have to be ratified by a vote of the people before it becomes effective.

Accident in New York.—A train of empty cars southbound on the elevated extension of the subway on Oct. 3 halted not far from Brook Avenue, the

Bronx, to allow for switching, about 5 a.m. The passenger-filled train following stopped behind it at the Jackson Avenue station. While the two trains were stopped a local train which left 180th Street bound for South Ferry, ran by the signal at the north end of the Jackson Avenue station and crashed into the train ahead. Two persons were killed and about twenty-eight were injured.

Higher Wages in Houston.—The new wage scale of the Houston Electric Company, granted at the time the increased fare was permitted, went into effect on Sept. 26. Motormen and conductors are now paid 38 cents an hour for the first three months, 40 cents an hour for the next nine months, and 42 cents an hour after one year's service. For the operation of one-man safety cars, the scale will be: First three months, 42 cents an hour; for three months' service or more, but less than one year, 44 cents an hour; for one year or more, 46 cents an hour. The increase in wages will amount to \$109,000 a year.

New Officers for Oklahoma Association.—New officers have been elected for the Gas, Electric & Street Railway Association of Oklahoma as follows: J. F. Owens, president; C. S. Thompson, first vice-president; J. W. Shartel, second vice-president; F. G. Tappan, assistant secretary; F. D. Insull, C. H. Kretz, J. F. Owens, J. C. Resler, F. D. Shaffer, J. W. Shartel and C. S. Thompson, directors. The Oklahoma Public Utilities Bureau, which is affiliated with the association, has as its chairman J. W. Shartel and its secretary H. A. Lane. In view of the problems now confronting the utilities it is proposed to make the association much more active than it has been in the past.

Columbus to Have Memorial Building.—The Columbus (Ohio) Exposition Company, which had planned to erect an exposition building in connection with the Columbus Depot Company's interurban station at the corner of High and Rich Streets, has decided instead to erect a magnificent structure which will stand as a memorial to the American boys who gave their lives in France and in grateful remembrance of those other thousands who fought there for the freedom of the world. A full square has been secured for the buildings. The depot company had already sold \$324,000 in stock, but the declaration of war delayed the construction of the building. The money paid on the stock has been invested in Liberty Bonds.

Aiding Selective Service Men.—For the purpose of assisting the employees of the United Railroads of San Francisco in filling out their questionnaires under the selective service act, W. M. Abbott, general attorney of the company, has organized a bureau which is open from 9 a. m. to 9 p. m. (Sundays excluded). All of the assistants and attendants have been sworn in as associate members of the Legal Advisory Board and are therefore authorized to administer the oath to the men and their dependents, and likewise to the

foremen or executive heads. If any department collects its men and their dependents at the place of work, the bureau sends out an assistant, thus avoiding the loss of time by the men. This does not apply to the platform men, who must come to the central bureau. The men leave their questionnaires with the bureau, which sees that they are delivered to the respective draft boards within the required time. This saves the men the time and trouble of making the extra trip to file the questionnaires.

Case Against Cincinnati Commission Dismissed.—By sustaining the demurrer of City Solicitor Saul Zielonka, Judge A. K. Nippert on Oct. 2 dismissed the case brought against the Cincinnati (Ohio) Rapid Transit Commission by Attorneys John C. Rogers and Eli Frankenstein to prevent the issue of \$80,000 of bonds to pay for preliminary work on the proposed municipal rapid transit line. The court held he had no authority to inquire into the manner of spending the money, that being within the discretion of the commission. He also ruled that promises made for campaign purposes are not binding, as the resolution carrying them may be rescinded at any time. This referred to the understanding that no money would be spent until the plans for the loop had been completed and passed upon by the voters. Attorney Rogers has now asked the city solicitor to bring suit to enjoin the amended franchise to the Cincinnati Traction Company, which went into operation recently. It is contended that the ordinance contains many illegal features, among which is the sliding scale of fares. Mr. Rogers declares that the features attacked are in contravention of the terms of the Rogers law, under which the revised ordinance was passed.

Programs of Meetings

Central Electric Railway Association

The fall meeting of the Central Electric Railway Association will be held in Indianapolis, Ind., on Nov. 21 and 22. The program has not yet been arranged.

New England Street Railway Club

The October meeting of the New England Street Railway Club, which was planned for Oct. 10 at the Relay House, Nahant, Mass., has been indefinitely postponed.

National Association of Railway Commissioners

The thirtieth annual convention of the National Association of Railway & Utilities Commissioners is to be held in Washington beginning Nov. 12. In the call for the convention attention is directed to the importance of a study of the condition of the railroads under government control. It is expected that the various state bodies, as well as the national association, will observe this matter closely and be prepared to make recommendation as to advisable courses after the war.

Financial and Corporate

82 Per Cent Decline

Nearly Four Hundred Lines Report Loss of \$12,700,000 in Net for First Half of 1918

During the first half of 1918 the electric railway industry showed a most serious falling off in earning power. According to reports received by the American Electric Railway War Board from 388 railways throughout the country, the net income in this period decreased \$12,773,036 or 82.16 per cent as compared to the result for the first half of 1917. The companies included operate approximately 30,500 miles of line, or about 63 per cent of the total mileage in the United States. The distribution of the companies is shown in the accompanying table.

The detailed comparative income statement of the reporting companies is presented herewith. In this connection it will be recalled that the ELECTRIC RAILWAY JOURNAL of Sept. 28, page 590, contained a similar tabulation for 293 companies. The loss in net income for these during the first half of 1918 was \$8,926,929 or 74.4 per cent.

These loss figures are indeed startling, but even they do not reflect the increases in operating expenses that are resulting and will continue to result from the wage awards of the National War Labor Board. It is now estimated conservatively that the operating expenses of the industry will be increased \$100,000,000 annually by the wage awards. The outlook is hardly rosy.

COMPARATIVE INCOME STATEMENT OF 388 ELECTRIC RAILWAYS FOR SIX MONTHS ENDED JUNE 30, 1917 AND 1918

	1918		1917		Increase	
	Amount	Per cent	Amount	Per cent	Amount	Per cent
Operating revenues	\$243,372,700		\$236,014,436		+\$7,358,264	+3.12
Operating expenses	171,792,760		154,496,687		+17,296,073	+11.20
Net operating revenue	\$71,579,940		\$81,517,749		-\$9,937,809	-12.19
Net revenue from auxiliary operations	7,490,047		7,248,316		+241,731	+3.33
Taxes	18,189,852		16,745,577		+1,444,275	+8.62
Non-operating income	3,767,470		3,336,074		+431,396	+12.93
Gross income	\$64,647,605		\$75,356,562		-\$10,708,957	-14.21
Reductions from gross income	61,874,248		59,810,169		+2,064,079	+3.45
Net income	\$2,773,357		\$15,546,393		-\$12,773,036	-82.16

DISTRIBUTION OF REPORTING COMPANIES BY STATES

No. of Mile-Companies age		No. of Mile-Companies age		No. of Mile-Companies age	
Alabama	1	60	Maryland	4	525
Arizona	3	47	Massachusetts	16	2,681
Arkansas	1	39	Michigan	6	404
California	18	2,791	Minnesota	4	578
Colorado	3	269	Mississippi	4	59
Connecticut	4	1,072	Missouri	9	947
Delaware	1	136	Montana	2	34
Florida	4	157	Nebraska	5	250
Georgia	6	387	Nevada	1	7
Illinois	50	3,157	N. Hampshire	6	117
Indiana	16	1,840	New Jersey	12	1,204
Iowa	10	239	New Mexico	1	3
Kansas	5	228	New York	37	3,117
Kentucky	5	366	N. Carolina	4	78
Louisiana	3	255	Ohio	32	2,719
Maine	7	433	Oklahoma	3	158
			Oregon	2	55
			Pennsylvania	44	2,621
			Rhode Island	1	400
			S. Carolina	1	37
			South Dakota	1	15
			Tennessee	6	357
			Texas	14	593
			Utah	2	215
			Vermont	1	10
			Virginia	5	361
			Washington	15	837
			W. Virginia	4	116
			Wisconsin	8	555
			Wyoming	1	5
			Total	388	30,534

Call for Redemption for Sinking Fund.—The Equitable Trust Company, New York, as one of the trustees under the mortgage of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., dated Sept. 1, 1911, is inviting proposals for the sale to it under the provisions of the mortgage of as many bonds secured thereby as will exhaust the sum of \$47,025, at a price not to exceed 105 per cent and accrued interest.

Would Sell Three-Mile Line.—The First National Bank, New Bremen, Ohio, of which Julius Bosell is president, is desirous of selling the Minster & Loramie Railway, Fort Loramie, Ohio, a 3-mile road. The railway was sold in May of last year for \$23,000 at receiver's sale to C. P. Gress, representing the bank, which acted for creditors of the company. The road was at one time operated by the Western Ohio Railway and was supplied with energy by that company.

Second Avenue Interest to Be Paid.—Pursuant to an order of the Supreme Court of New York, dated Sept. 26, the receiver of the Second Avenue Railroad, New York City, will pay the interest on \$3,140,000 of outstanding receiver's certificates at the rate of 6 per cent per annum for the six months period ended Oct. 1, 1918. Such interest will be payable at the Guaranty Trust Company. In this same order the receiver is authorized to issue new certificates to such holders of the old certificates as desire to receive the new ones in exchange. New certificates will be dated Oct. 1, 1918, and will be due Oct. 1, 1919, but will be redeemable at the option of the receiver on April 1, 1919, at par and accrued interest.

Tiffin Abandonment Postponed.—The Tiffin, Fostoria & Eastern Railway proposes to resume service in Tiffin, Ohio, after the passage of the ordinance by the City Council in which the city agrees to the terms by which the fare is raised from a 5-cent straight fare to a 10-cent cash fare, or six tickets for 40 cents, for a trial period of ninety days. Unable previously to come to terms on the fare matter the company had announced its purpose to remove all the rails in the city. The company proposed at first to maintain a cash fare of 10 cents and sell six tickets for 45 cents. The Council would not agree to this, but had an ordinance drawn up providing for a cash fare of 8 cents and six tickets for 40 cents. The compromise of a 10-cent cash fare with six tickets for 40 cents was then arranged.

Abandonment Hearing Oct. 17.—The Railroad Commission of the State of California has set a hearing for Oct. 17 on the application of the Los Angeles & San Diego Beach Railway, Los Angeles, Cal., for permission to discontinue service, dismantle the property, take advantage of the present high price of material to dispose of all the holdings of the company and effect a retirement from the field. The decision of the company to this end was

Financial News Notes

Receivership Lifted.—The receivership of the Cleveland & Chagrin Falls Railway, Cleveland, Ohio, has been lifted and Robert D. Beatty, who formerly acted as receiver and general manager, continues with the company as general manager.

Plan Reorganization of Ohio Road.—Bondholders have arranged to reorganize the Cincinnati, Milford & Loveland Traction Company, Cincinnati, Ohio, which has been in the hands of

a receiver for some time. The new company will probably be known as the Cincinnati, Milford & Blanchester Traction Company. The capital stock will be placed at \$400,000 and bonds will be issued to take care of the remainder of the cost of the property, purchased recently by the bondholders.

Binghamton Joins Receiverships.—It is reported that Federal Judge Ray has appointed William G. Phelps, president First National Bank, Binghamton, N. Y., receiver for the Binghamton Railway. The application was made on behalf of the Westinghouse Electric & Manufacturing Company. The Binghamton Common Council refused to suspend the company's franchise, which provides for a 5-cent fare. The Binghamton Railway operates 49.74 miles of line and does a general light and power business in Endicott.

brought about by high wages, the advance in the cost of supplies and materials, competition of the privately-owned automobile and the present existing tendency of people generally to abstain from travel. The hearing on the application will be held in San Diego. Opposition is expected from the citizens of La Jolla.

Receiver for Massachusetts Road.—Eliot S. Emerson, Cambridge, has been appointed receiver of the Plymouth & Sandwich Street Railway, Plymouth, Mass., by Judge Carroll of the Supreme Court on the motion of H. P. Converse Company, Boston, a firm of contractors, which is a creditor of the railway to the amount of \$88,771. The company has a suit pending before the full bench of the Supreme Court to compel the town of Plymouth to buy \$50,000 of the capital stock of the company, and if on Nov. 1 next it shall have completed a 4-mile extension of its tracks along the borders of the Cape Cod Canal in Bourne, it will receive \$35,000 from the canal company. This extension relieved the canal company from building a bridge or tunnel or operating a ferry to provide for travel across the canal, and will furnish direct connection with New York and other points.

Receiver for Connecticut Line.—Harrison B. Freeman, Hartford, Conn., was appointed temporary receiver of the Hartford & Springfield Street Railway, Warehouse Point, Conn., by Judge William S. Case of the Superior Court at Hartford on Sept. 30. The appointment was on the application of W. C. Mason & Company, Inc., a creditor in the sum of \$2,500. Mr. Freeman was the unanimous choice for receiver of those representing bondholders and creditors. Judge Case fixed the receiver's bond at \$50,000, and under the order of appointment Mr. Freeman has authority to operate the road for a pe-

riod of four months. The hearing on the confirmation of Mr. Freeman as receiver, and for the appointment of appraisers, will come before Judge Case on Oct. 14. The affairs of the railway were reviewed briefly in this paper for Sept. 28, page 591.

New York Central Control Denied.—Denying reports that the control of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., would soon be taken over by the New York Central interests, W. W. Foster, secretary-treasurer and general manager of the company's interurban properties, has issued a public statement in which he says: "The Buffalo, Lockport & Rochester is the only electric interurban line operating out of Rochester that is independent of the New York Central. Numerous attempts to obtain control of the Rochester & Syracuse line were made by the New York Central, but it was only recently, when the interurban line became involved financially, that control is reported to have passed to New York Central interests. Canadian capital is interested to a considerable extent in the Buffalo, Lockport & Rochester Railway and Canadian capitalists constitute a majority of the board of directors. There is no truth to the report."

Bay State Bonds and Notes.—According to information furnished by the receiver of the Bay State Street Railway, Boston, Mass., \$240,000 of mortgage bonds of the Newport & Fall River Street Railway, due on Aug. 1, 1918, have been purchased for the account of the receiver, and \$120,000 of 5 per cent plain bonds of the East Middlesex Street Railway, due on Sept. 1, 1918, have been paid and cancelled. The \$131,000 of equipment notes due on Aug. 1 were purchased by the receiver, and the interest on equipment notes due in August was paid. No receiver's

certificates are outstanding. The \$150,000 of first mortgage bonds of the Providence & Taunton Street Railway, which matured on Sept. 1, 1918, have not been paid, and the \$57,000 of serial notes of the Bay State Street Railway were not retired on Aug. 15. Judge Martin in the United States District Court on Oct. 4 issued an order for Receiver Donham to pay certain coupons representing interest on the bonds of the Brockton Street Railway and bonds of the Newport Illuminating Company and also to pay dividends at the rate of 6 per cent on the stock of the Chelsea & Boston Railroad.

Receiver for Cumberland Railway.—It was announced at Carlisle, Pa., on Sept. 20 that an agreement had been reached between attorneys for the Cumberland Railway of that place and the attorneys for security holders petitioning for a receiver for the company. The taking of evidence in the proceeding before the court had been almost completed when the announcement was made. Conditions were presented to the court that had been framed by the attorneys for both sides. It has been agreed with other things that the Cumberland Railway be declared insolvent; that C. H. Bishop, president of the Valley Railways; Walter Stuart, vice-president of the Farmers' Trust Company, Carlisle, and J. Harvey Line, an attorney of Carlisle, be appointed receivers; that the present officials of the company be restrained from interfering with the operation of the road by the receivers; that the receivers be permitted to continue the operation of the road and that all creditors, except the Farmers' Trust Company, trustee under the mortgage, be restrained from interfering with the operation of the road. The Cumberland Railway defaulted in the payment of interest due in July.

Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY						HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.					
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income	Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., July, '18	\$21,577	*\$12,163	\$9,414	\$4,023	\$5,391	1m., July, '18	\$29,509	*\$18,730	\$10,779	\$5,006	\$5,773
1m., July, '17	19,992	*10,426	9,566	3,548	6,018	1m., July, '17	31,927	*17,127	14,800	5,098	9,702
12m., July, '18	247,094	*127,966	119,128	44,782	74,346	12m., July, '18	335,059	*220,931	114,128	60,499	53,629
12m., July, '17	224,722	*109,727	114,995	42,354	72,641	12m., July, '17	340,201	*200,597	139,604	62,095	77,509
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						JACKSONVILLE (FLA.) TRACTION COMPANY					
1m., July, '18	\$11,966	*\$10,738	\$1,228	\$1,439	†\$211	1m., July, '18	\$71,731	*\$57,864	\$13,867	\$16,540	†\$2,673
1m., July, '17	15,560	*11,067	4,493	1,239	3,254	1m., July, '17	54,322	*36,387	17,935	15,730	2,205
12m., July, '18	114,955	*121,726	†6,771	16,069	†22,840	12m., July, '18	798,960	*562,000	236,960	193,855	43,105
12m., July, '17	125,866	*120,294	5,572	13,926	†8,354	12m., July, '17	659,770	*442,501	217,269	187,078	30,191
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.						NORTHERN TEXAS ELECTRIC COMPANY, FORT. WORTH, TEX.					
1m., July, '18	\$44,532	*\$34,835	\$9,697	\$6,535	\$3,162	1m., July, '18	\$251,534	*\$158,630	\$92,904	\$28,172	†\$74,315
1m., July, '17	40,500	*25,293	15,207	6,552	8,655	1m., July, '17	190,881	*116,601	74,280	29,148	45,131
12m., July, '18	490,079	*348,958	141,121	78,399	62,722	12m., July, '18	3,139,472	*1,789,296	1,350,176	342,654	†1,103,355
12m., July, '17	433,185	*259,179	174,006	78,734	95,272	12m., July, '17	2,123,306	*1,245,755	877,551	349,706	527,845
COLUMBUS (GA.) ELECTRIC COMPANY						PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., July, '18	\$97,806	*\$45,226	\$52,580	\$32,806	\$19,774	1m., July, '18	\$26,548	*\$21,088	\$5,460	\$8,263	†\$2,803
1m., July, '17	87,491	*35,953	51,538	31,075	20,463	1m., July, '17	25,180	*19,240	5,940	7,545	†1,605
12m., July, '18	1,188,710	*474,938	713,772	385,372	328,400	12m., July, '18	307,239	*229,984	77,255	95,435	†18,180
12m., July, '17	1,005,468	*381,253	624,215	344,726	279,489	12m., July, '17	308,693	*226,846	81,847	87,504	†5,657
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						PENSACOLA (FLA.) ELECTRIC COMPANY					
1m., July, '18	\$105,878	*\$56,484	\$49,394	\$12,847	\$36,547	1m., July, '18	\$44,388	*\$31,720	\$12,668	\$8,252	\$4,416
1m., July, '17	84,332	*45,682	38,650	11,760	†28,622	1m., July, '17	32,947	*18,274	14,673	7,805	6,867
12m., July, '18	1,039,675	*573,041	466,634	151,787	†334,218	12m., July, '18	428,959	*273,035	155,924	95,795	60,129
12m., July, '17	907,336	*491,431	415,905	121,803	†300,799	12m., July, '17	309,397	*178,785	130,612	93,102	37,510
EL PASO (TEX.) ELECTRIC COMPANY						TAMPA (FLA.) ELECTRIC COMPANY					
1m., July, '18	\$99,957	*\$70,955	\$29,002	\$7,048	\$21,954	1m., July, '18	\$86,826	*\$52,486	\$34,340	\$5,087	\$29,253
1m., July, '17	103,171	*66,712	36,459	4,940	31,519	1m., July, '17	78,623	*45,136	33,487	4,369	29,118
12m., July, '18	1,268,850	*836,912	431,938	79,253	352,685	12m., July, '18	1,011,844	*\$590,439	421,405	61,416	359,989
12m., July, '17	1,243,515	*767,016	476,499	60,494	416,005	12m., July, '17	1,001,735	*\$546,826	454,909	52,228	40,268

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

Traffic and Transportation

W. F. C. Impatient

Rebukes New Orleans Mayor for Not Carrying Out Promises Upon Which It Advanced \$1,000,000

A telegram was received by Martin Behrman, Mayor of New Orleans, La., from the War Finance Corporation on Sept. 30, requesting the city authorities to take immediate action looking toward an increase of fares and new rates for gas and electricity by the New Orleans Railway & Light Company.

COUNCIL MET ON OCT. 1

In view of the above telegram a meeting was called on Oct. 1 by the Commission Council at the request of the Mayor and an ordinance was introduced by Mr. Glenny, member of the Commission Council, allowing the company to increase fares to 6 cents and its rates for gas and electricity by 30 per cent.

Under the law the ordinance must lie over for a week before being taken up for final passage. The measure provides that the bondholders shall receive their interest, but that stockholders shall not receive any dividends until the loan of \$1,000,000 made to the company some time ago by the War Finance Corporation is paid. The ordinance specifically states that all of the increased net revenue derived shall be set aside and dedicated to the payment of this loan, and that the increased rates shall be permitted to remain in effect only until such time as this loan shall have been liquidated.

The matter dates back several months when the Mayor and other city officials urgently and repeatedly requested the War Finance Corporation to make a large advance to the company, representing that such advance was necessary to prevent interruption of war activities and to avert receivership. Many leading citizens joined in this request.

APPEAL REFUSED AT FIRST

The War Finance Corporation decided absolutely to refuse to lend the amount first requested or any amount unless the city agreed immediately to put into effect increases in fares and light rates that would produce adequate net earnings. Following this the Mayor furnished the War Finance Corporation with a copy of minutes of the meeting of the Commission Council at which the Mayor was authorized to carry into effect an agreement between the city and the company under which adequate net revenue would be assured to the company. Furthermore the Mayor telegraphed the War Finance Corporation on June 24 that the city had agreed to readjust rates immediately so as to enable the company to earn 6 per cent

net on a valuation of \$43,000,000. Upon receipt of this telegram, and in the firm belief that the city intended to put the necessary increased rates into effect immediately, the War Finance Corporation agreed to advance and did advance the company \$1,000,000.

After reciting these facts the War Finance Corporation, through W. P. G. Harding, managing director, in its letter of Sept. 30 said:

"Two months have elapsed since the loan was made but no increases in rates have been put into effect and the company has been operating at a heavy deficit. We cannot understand why you have failed to put these increased rates into effect and must insist upon your doing so without further delay.

"If you do not immediately put such rates into effect the company will be unable to continue to pay the increased wages awarded by the National War Labor Board and by your action you will jeopardize the security for the War Finance Corporation's loan made at your request. Your failure to make good your representation will be an exhibition of bad faith on the part of the city of New Orleans that will seriously injure your credit and standing.

"The honor of New Orleans is therefore involved and unless sufficiently increased fares and lighting rates are established by the city to insure reasonable wages to employees, adequate service, protection of your local financial situation, and the War Finance Corporation's loan the public will inevitably conclude that the city of New Orleans has repudiated a moral obligation incurred by its Mayor and other duly authorized officials.

EXPERT EXAMINATION MADE BY CORPORATION

"Our expert, Mr. Proutt, is in New Orleans making a thorough examination of the property, accounts and management of the New Orleans Railway & Light Company and is thoroughly qualified to estimate the extent of such absolutely necessary advances as will accomplish the desired object. He will place at your disposal all information so obtained.

"You should have no difficulty in making it plain to your citizens that the New Orleans Railway & Light Company cannot render services at war costs for the same rates and fares that prevailed prior to the war and that the moderate increases proposed are essential to the maintenance of railway and lighting services, the protection of the local financial situation, to the continuance of proper service to your war industries and to the compliance with the promises and obligations of the city of New Orleans upon the faith of which the War Finance Corporation extended aid."

Six Cents in Baltimore

New Rate Has Gone Into Effect There With Minimum of Discomfort Through Use of Tickets

The United Railways & Electric Company, Baltimore, Md., put the 6-cent fare rate into effect on Oct. 1. The schedule calls for a fare of 6 cents for adults; 4 cents for children between four and twelve years of age, and an increase in the charge for commutation tickets of 1 cent for each fare zone.

PUBLICITY'S PERSUASIVE POWER

A great deal of publicity had been given to the fare increase and patrons had been urged in the press, by car cards and otherwise to help start the new plan smoothly by presenting the exact change or car tickets when they boarded cars. T. A. Cross, president of the company, voiced his appreciation of the public's hearty co-operation in the following statement given to the newspapers:

"I certainly appreciate the manner in which the Baltimore public co-operated with our conductors to-day. Our reports indicate that most patrons had the exact fare or a ticket ready, and there were practically no delays.

"With this splendid spirit of help we can hasten the solution of many of our service problems. My observations and reports made to me speak well for the courtesy of our conductors, and I wish to thank them.

"The use of tickets is apparently a popular move. We have had many requests to increase the number of places where tickets may be bought, and we are now securing the co-operation of merchants to this end."

It might be mentioned that the demand for tickets was so great that the supplies furnished to the places that originally sold tickets were exhausted several times the first day.

To that original list of sales places have been added others until now tickets may be bought in any section of the city and in counties near by.

TICKET SALES HELP IMMENSELY

The sales places include newspaper offices, banks, cigar stores, drug stores, department stores, factories, etc.

At all of these points the tickets are handled without fee or commission, and solely through the desire of the proprietors to accommodate the public.

The tickets are also on sale, of course, at all the carhouses of the railway, at the Howard and Franklin Street waiting room, and at the cashier's office in the Continental Building.

The change in fare is in accordance with the tariff filed by the company with the commission on Aug. 28. The new schedule, of course, is subject to any action the commission may take on the petition for relief filed previously. A hearing on this application will be held by the commission in November. The necessity for raising the fares prior to action by the commission arose from the fact that before such a decision could be had an increase in wages went into effect on Sept. 1.

Park Advertised in Fall

The London (Ont.) Street Railway has made effective use of advertising in the promotion of traffic to Springbank Park during the past summer and has succeeded in prolonging the season substantially. Usually the park is dead by the second week of September, when the annual exhibition of the Western Fair Association is held. Assuming that advertisements published

1911, by the commission. Frank Miller, chairman of the commission, approved the suggestion, indicating that the commission may use the cent basis in settling the new fares.

The hearing was continued to Sept. 24 to allow city representatives time to introduce evidence showing why the increases should not be allowed.

The hearing is also under way on the company's petition for an increase

Wants Government to Act

Mayor George J. Karb of Columbus, Ohio, has forwarded a communication to President Wilson, advising that the government assume control of the operation of the railway lines of the Columbus Railway, Power & Light Company in the city. This step came as a surprise to the local officials and members of the City Council who have been endeavoring to handle the matter and prevent an increase in the rate of fare. Among other things Mayor Karb says:

MAYOR SEES NEED

"At the present time, and since the company made this change (change in fare) thousands of people are riding the cars without paying fares. The company claims that the final step taken was made necessary by the action of the War Labor Board in increasing the wages of its men. It has also pointed out the increased cost of all materials used by it in the service. Last winter, due to transportation troubles, the coal supply obtainable by the company was so limited that service had to be greatly reduced. The company had trouble, too, with its power plants with like results. The result is that much feeling was created against the company.

"Our city charter provides for referendum. If the Council should enact legislation to relieve the company, a referendum would undoubtedly be demanded and a campaign would but add to the opportunity for trouble.

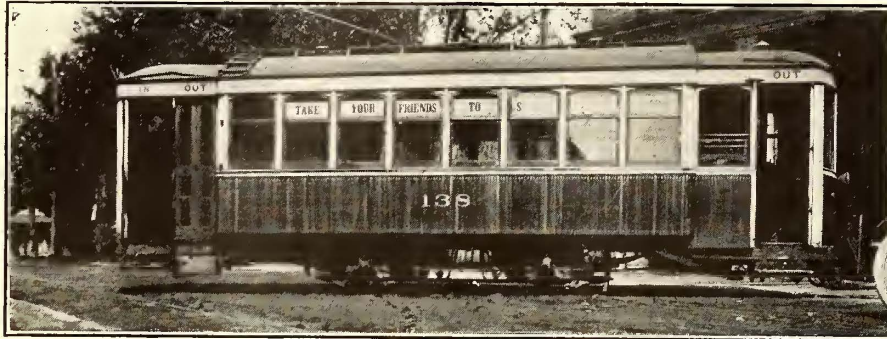
"As I have said, it seems to me that a situation has been reached when settlement of this question is not within the power of local officials and that preservation of peace, the question of justice as between non-paying and paying passengers, the maintenance of service and conservation of the property of the company, require the matter to be taken under control by the government during the existence of the war."

CITY ATTORNEY OBJECTS

City Attorney Henry L. Scarlett characterized the step as ill-advised. He contends that the company desires the government to take control of the road, since the rate of fare would then probably be increased. The trouble, he said, is that government representatives do not always understand the situation and a rate they would make might be unjust to the public.

Mayor Karb has advised all along that Columbus follow the lead of other cities and establish a temporary rate of fare to take care of increased expenses, but the City Council opposed this, apparently with the idea that the company could be forced, no matter what the ultimate result, to continue at eight tickets for a quarter.

The recent step of the City Council in considering a resolution calling for an investigation of the company's financial affairs is mentioned by Mayor Karb, but he feels that any result from this would cause too great delay. As the Mayor sees it, the situation needs immediate attention.



SASHES USED FOR ADVERTISING

in the newspapers during the summer had been read by many in the rural districts and near-by towns, and that thus a large amount of missionary work had been done, the company made a big bid for business with fair visitors. One advertising stunt was the utilization of the placards illustrated.

Printed in bold type on newsprint, they were posted on the inside of the upper sashes of the cars. The cost was small, but the effect was striking and their appearance neat. Every line in the city carried the message and, though the weather was most unfavorable, good results were secured. The photograph shows one of the cars in daytime. With the lights on inside they were quite as easily read at night. The first window, used for the route sign, was not covered.

Portland Interurban Rate Hearing

The Public Service Commission of Oregon recently undertook a hearing in Portland, with the view of determining if the application of the Portland Railway, Light & Power Company for an increase in its interurban passenger fares should be granted. Business men of Oregon City testified that a fair increase in rates would be favorably considered by the business people of that city. An increase of 10 cents over the present one-way fare of 20 cents was suggested. R. A. Leiter, attorney for the company, said that the company was entitled to a 6 per cent return on its investment. Such a return would approximate \$299,128. The return during the year ended June 30, 1917, was only \$71,503. It would be still smaller for this year.

Franklin T. Griffith, president of the company, at the hearing, recommended that the cent as the unit of currency receive official recognition. The present interurban fares are based on the nickel as unit. They were set in November,

of 25 per cent in freight rates on its interurban lines, and on the Willamette Valley & Southern Railway, operated by the Portland Railway, Light & Power Company. The proposed freight rate increase would parallel that of federal railroads, but basic rates are lower.

Atlanta Fare Appeal Denied

Judge George L. Bell, of the Fulton Superior Court has handed down a decision denying the petition of the Georgia Railway & Power Company, Atlanta, Ga., for a writ of mandamus to compel that body to assume jurisdiction in the matter of street car fare increases. The company desires to secure authority to charge a 6-cent fare with 2 cents extra for each transfer.

Several weeks ago the Railroad Commission handed down a decision granting electric light, power and gas rate increases to the company, but refused to consider the petition for an increase in car fares. The commission held that under the law it had no authority to alter the schedule of car fares in the city of Atlanta for the reason that those fares were fixed by a contract between the municipality and the power company which had been consummated some years before the organization of the commission on its present basis.

The company then filed with Judge Bell a petition for a writ of mandamus to compel the Railroad Commission to assume jurisdiction in the fare matter.

Luther Z. Rosser, Sr., one of the chief counsel for the company, stated that the case would be appealed to the Supreme Court of the State for a final construction of the law governing the situation. This appeal must be taken within twenty days.

Judge Bell handed down no formal opinion in explanation of his action, but merely issued the order denying the appeal.

Transportation News Notes

Galesburg Wants One-Man Cars.—The Galesburg Railway, Lighting & Power Company, Galesburg, Ill., has petitioned the Public Utilities Commission of Illinois for permission to operate one-man cars on certain lines in that city.

Amended Schenectady Petition.—The Schenectady (N. Y.) Railway has filed with the Public Service Commission for the Second District a proposed schedule of increased rates, which it seeks permission to put into effect on Nov. 1. The hearing on the original application of the company, set for Oct. 8, has been postponed until Oct. 23.

Skip Stops in Effect in Dallas.—The locations for skip stops have been made for all street car lines of the Dallas (Tex.) Railway, and the skip-stop system of operation was to be put into effect on Oct. 1. The system had been put into effect on several Dallas lines long before the request from the federal government, and the plan met with instant approval.

Six Cents in Mattoon.—The Central Illinois Utilities Company, Mattoon, Ill., has been granted a 6-cent fare in the cities of Taylorville, Mattoon and Charleston. The company is also allowed by the Public Utilities Commission of Illinois to withdraw from sale the twenty-five tickets which have been selling for \$1 and to place on sale twenty-two tickets for \$1.

Again Threatens Suspension.—The New York & North Shore Traction Company, Roslyn, N. Y., again threatens to suspend all service. Officials of the company say that unless the promise of a 7-cent fare is made very shortly by the city of New York all service will be stopped immediately. The plea of the company for an increase in fare has been before the city for some time. The period of grace set originally by the company expired on Sept. 30.

Penalty for Dare-Devil Riders.—The City Council of Camden, N. J., has adopted an ordinance placing in the disorderly class all persons found riding on the top of electric railway cars or in any part except the space designed for passengers. A fine of \$10 will be imposed in each case. The ordinance aims to prevent shipworkers and other industrial employees from climbing to the roof of cars and hanging on the bumpers and fenders.

War Increase for Springfield, Ill.—The Springfield (Ill.) Consolidated Railway has been authorized by the Public Utilities Commission of Illinois to increase local fares from 5 cents to 6 cents. The company is required to

sell nine tickets for 50 cents, this increased ticket rate comparing with six tickets for 25 cents and twenty-five tickets for \$1. The increase is to remain effective until six months after the close of the war.

Holyoke Wants Five-Cent Central Zone.—The Holyoke (Mass.) Street Railway on Oct. 2 filed with the Public Service Commission of Massachusetts a petition for the right to substitute for the present zone-fare system one based on mileage, calling for 2 cents a mile by the use of tickets and 2½ cents a mile cash fare, with a minimum charge of 5 cents. The zone system has been in operation less than six months. The proposed change would take effect on Nov. 1.

Chicago & West Towns Wants Seven-Cent Fare.—The Chicago & West Towns Railway, Chicago, Ill., on Sept. 28, asked an increase in interurban fare from 5 cents to 7 cents before Walter A. Shaw, Public Utilities Commissioner. Charles N. Hebner, auditor of the company, testified that during the last eight months the increase in wages was \$66,000, the increased cost of materials \$40,000, and the loss, through decrease in the number of passengers, \$45,000. He testified that even the 7-cent rate asked will not allow the company to pay dividends.

Traffic Suspended Following Explosion.—The Mayor and the Public Service Commission of the city of New York fearing the effects on submarine and bridge structures of the munition plant explosions in New Jersey on Oct. 5, shut off the traffic over and under the rivers. They had no opportunity to inform the public in advance of the curtailment of transportation facilities, and consequently considerable confusion resulted. Nearly 100 persons are reported to have been killed in the explosion and millions of dollars of damage was done to property in suburban New Jersey and in lower New York.

Trenton to Continue Tickets.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., will after Oct. 14 sell strip tickets at the rate of five for 30 cents instead of the six for 25 cents. The plan to sell tickets was decided upon because the public was accustomed to tickets. This will also relieve the conductors of making change for the extra cent. The tickets will be sold only at the office of the company. The company will have its large cars equipped with fare boxes. The tickets now in use will not be honored after Oct. 14, when the new 6-cent rate becomes effective under the order of the Board of Public Utility Commissioners.

Fare Increase Probable in Pittsburgh.—In commenting on the settlement of the matter of wages for the employees of the Pittsburgh (Pa.) Railways, the Pittsburgh *Dispatch* said in its issue of Oct. 3: "While no announcement has been made by the receivers of what effect the increase granted the men will have upon fares, all three receivers of the railway have said it will mean an

increase in fares, to make which an application will shortly be made to the State Public Service Commission. The increase most talked of is a straight 7-cent fare for Pittsburgh, replacing the 5 and 7-cent fare which is now in effect."

Miscellaneous Freight Increases Asked.—The Western New York & Pennsylvania Traction Company, Olean, N. Y., has applied to the Interstate Commerce Commission for increases varying from 5 cents to 15 cents in rates on merchandise package freight carried on passenger cars; an increase of half a cent a gallon on milk; an increase from \$1 to \$1.15 a month on newspapers tied in bundles, maximum weight 360 lb. a month, weight in excess to be charged 35 cents a 100 lb. and an increase of 5 cents each on baby carriages, go-carts, bicycles and tricycles.

Another Increase Needed Now.—A hearing will be held on Oct. 22 on the application of the New Jersey & Pennsylvania Traction Company, Trenton, N. J., for a 7-cent zone fare between Trenton and Princeton. The Board of Public Utility Commissioners of New Jersey has ordered the company to suspend the increase until Dec. 10 unless prior to this date the board should approve of the new rate. The company, which recently received an increase from 5 to 6 cents, announced that 7 cents would be charged in each zone on and after Sept. 26. The company is also asking for a 7-cent fare on its divisions in the State of Pennsylvania.

Smoking Stopped on Boston Elevated.—Special smoking cars and smoking compartments on the rapid transit system of the Boston Elevated Railway have been discontinued. While the public trustees have ordered the elimination of special facilities for smokers "temporarily," in response to an emergency request by the health authorities, it is unofficially reported that they may never be restored. This action of the trustees follows the recent recommendation of the Massachusetts Public Service Commission that the smokers be abolished entirely on the trains operating upon the elevated railway lines of the company and through the Cambridge subway.

Receiver Wants Seven-Cent Fare.—On Sept. 24, C. I. Cole, receiver of the Atlantic City & Shore Railroad, Atlantic City, N. J., again asked the Board of Public Utility Commissioners of New Jersey to grant an increase in fare. The present request is for a 7-cent fare. Last July the company asked for an increase from 5 to 6 cents to go into effect in August, but the board suspended the application. The company now asserts that its income is not sufficient to keep the road in operation, and that it is carrying fewer passengers because of the close of the summer season. The board has requested additional information regarding the need for more revenue.

Pennsylvania Line Wants Seven-Cent Zones.—The Public Utility Commission of Pennsylvania will hold a hearing on Nov. 12 on the application of the Northampton, Easton & Washington Traction Company, Easton, Pa., for another increase in fares. The company is asking for a 7-cent fare for each of the seven zones between Phillipsburg and Port Murray. The company claims that the expenses have increased and that there has been a falling off in traffic, 377,000 fewer fares being collected last year than in 1910, 1911 or 1912. A few months ago the commission granted the company permission to advance the zone fare from 5 cents to 6 cents.

Zone Fares for Government Line.—The Virginia Railway & Power Company, Richmond, Va., has issued a statement in regard to its plan to operate the Richmond-Seven Pines Railway for the government. The statement says: "Under the arrangement made with the United States Housing Corporation, the fares for transportation on this property will be under the zone system; one zone to be from Twenty-ninth and P Streets to Stop 23, and one zone to be from Stop 23 to Seven Pines. A single cash fare of 5 cents will be charged from any point in one zone to any point in the same zone, and an additional cash fare of 5 cents from a point in one zone to any point in the other zone."

Councilmen Undergo Change of Heart.—At the regular meeting of the City Council of Columbus, Ohio, during the week ended Oct. 5 Councilman Giffin submitted a resolution, requesting the Columbus Railway, Power & Light Company to furnish full information of its income and operating expense for the last two and one-half years. It is supposed this information is desired for the purpose of investigating the claims of the company for a higher rate of fare. The resolution, it is said, will have the support of Councilmen Westlake, Zimpfer and Alcott, all of whom have in the past opposed any change from the present rate of fare. The appeal of the Mayor to President Wilson in this matter is referred to on page 674 of this issue.

New Jersey Officials on Fare Study.—Thomas N. McCarter, president of the Public Service Railway, Newark, N. J., with H. C. Donecker, assistant general manager, M. R. Boylan, general auditor, and Dr. Thomas Conway, Jr., have returned from Pittsburgh, St. Louis, Milwaukee, Cleveland and other cities where they studied fare systems and methods of fare collection. Data were secured on the zone system in accordance with the recommendation for a study of this method made by the Board of Public Utility Commissioners of New Jersey. Mr. McCarter is chairman of the company's special committee on fares. The company has completed the work of taking a census of car riders on all the lines. Clerks are now classifying the data so obtained.

Exempt from Prosecution.—The Kentucky Court of Appeals on Oct. 1 rendered a decision to the effect that the South Covington & Cincinnati Street Railway, Covington, Ky., cannot be tried and convicted for maintaining a nuisance under an indictment found against it in the Kento Circuit Court, where it was accused of having failed to furnish a sufficient number of cars on the Rosedale line. In the absence of statutes and ordinances on the subject, the court held that a street railway, operating wholly within the State, is exempt from prosecution on this allegation. The claim was made that cars were overcrowded and the service was detrimental to the health and comfort of the passengers.

Michigan State Fare Case Begun.—Trial of the injunction case brought by the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., against the State of Michigan to prevent the enforcement of the state 2-cent fare law was opened recently before United States Judge Sessions. Attorney Chamberlain, for the railroad, said that when the steam roads were taken over by the government, passenger rates were increased to 3 cents a mile. Interurban roads asked for increases. They were refused on the ground that the State law governed fares. As noted in the ELECTRIC RAILWAY JOURNAL for July 27, page 173, the company filed suit to "test the validity and enjoin the enforcement of the statute of the State of Michigan fixing the maximum fare for railroads at 2 cents a mile."

Boston Fare Grades Established.—In order to meet the requirements of the statute providing for the public operation of the Boston (Mass.) Elevated Railway, which calls upon the trustees within sixty days after the establishment of the original rate of fare under the act to adopt and publish a schedule of eight grades of fare containing four rates above and four rates below the existing rate, the trustees have established the following schedule of grades of fare, but wish the public clearly to understand that the action involves merely a literal compliance with the provisions of the statute and does not change the present 7-cent fare: first grade below, 6 cents; second grade below, 5 cents; third grade below, 4 cents; fourth grade below, 3 cents; first grade above, 8 cents; second grade above, 9 cents; third grade above, 10 cents; fourth grade above, 11 cents.

Elevated and Surface Line Papers.—Each of the affiliated subway elevated and surface lines in New York City has a little paper of its own now. Some time ago *The Subway Sun* was established for posting in the windows of the cars of the Interborough Rapid Transit Company. Now that company has followed with *The Elevated Express* for posting in the elevated cars, while the New York Railways is using the *Green Car Traveler* as a means of carrying messages to its patrons. All these publications are issued over the signature

of Theodore P. Shonts, president of the companies. The two new papers are fashioned after *The Subway Sun*, a description of the contents and the purpose of which have been the subject of comment in the ELECTRIC RAILWAY JOURNAL previously.

Johnstown Wants More.—The Johnstown (Pa.) Traction Company is preparing a new tariff to be filed with the Public Service Commission, which will place fares on the 5-cent zone system and will become operative about Oct. 15. Main street will be a dividing line and two 5-cent fares will be charged from Morrellville and Coopersdale to Franklin or Moxham. Ferndale is included in the single zone to Main Street, but the 5-cent rate will not apply on Windber cars. There will be three zones, as usual, between Johnstown and Windber, but they will be increased to 10-cent zones, instead of 5, making the fare to Windber 30 cents and to Ferndale 10 cents on a Windber car. By using the city cars and the transfer privilege to the special Ferndale car, the fare to Ferndale will be only 5 cents. Evan M. du Pont, the president and general manager, explained that this step was necessary because of the increased cost of operating and the failure of the 6-cent fare to produce sufficient revenue. Those who are now paying 6 cents fare and are not exceeding one of the newly-created zones will save 1 cent on each fare hereafter.

A Disadvantage Turned to Account.—Justice Louis W. Marcus in the Supreme Court of Erie County, granted the petition of the International Railway, Buffalo, N. Y., discontinuing the injunction proceedings brought by agreement with the city to determine if the Public Service Commission for the Second District has the authority to consider the complaint by which the Council sought to have fares reduced from 5 cents to 4 cents. The company is now willing to have the municipal authorities proceed with its 4-cent fare case filed with the commission two years ago. The municipal authorities have always maintained that the International Railway could give good and efficient service with a 4-cent fare and therefore proceedings were started by the Mayor to bring the matter before the State utilities board. The railway questioned the board's jurisdiction in municipal rate cases where franchises are involved and an injunction was secured by the company which prevented the city from proceeding with its case. The present attitude of the company is that by discontinuing the injunction the city will be forced to go on with its case and then the company will have an opportunity to present its evidence as to the needs of a 6-cent fare before the commission. The municipal authorities will now undoubtedly withdraw the complaint. Henry W. Killeen, of counsel for the International Railway, is preparing to oppose any such move on the part of the representatives of the city.

Legal Notes

KANSAS—*Where Defect in Floor Could Have Been Seen, Injury Caused by It Not Prima Facie Evidence of Company's Neglect.*

The doctrine of *res ipsa loquitur* is properly applied in case of injuries to a passenger caused by the collision with another train, the breaking of a rail, or by some defect in the equipment of the train about which the passenger is presumed to know nothing, because he has no way of anticipating it. It has no application to a case where a passenger is injured by some defect in the floor of the car which is visible to the passenger and which causes the passenger to fall while attempting to alight from the train at a station. Hence, where a passenger of an interurban railway was injured because of a defect in the floor of the vestibule of the car in which her foot caught while she was alighting, it is error to charge that the injury is *prima facie* evidence of negligence on the part of the carrier. (*Cloud vs. Kansas-Oklahoma Traction Company*, 173 Pacific Rep., 338.)

MICHIGAN—*Parol Evidence of Meaning of "Reasonable Dispatch."*

Where bill of lading provides for transportation of goods "with reasonable dispatch," parol evidence of a conversation wherein carrier assured shipper before signing of bill of lading that goods would reach destination before certain time is admissible as bearing on carrier's understanding of what was a reasonable time, and is not objectionable as varying terms of bill of lading. (*Harmon vs. Michigan United Traction Company*, 168 Northwestern Rep., 522.)

MICHIGAN—*Injury from Temporary Road During Track Construction—Implied Invitee.*

Where an interurban railway in building a culvert temporarily leased a right-of-way over neighboring land to enable travelers to pass around the obstruction in the highway, a traveler injured by being thrown from his wagon on account of a hole in such temporary road was an implied invitee. (*Brown vs. Michigan Railway*, et al., 168 Northwestern Rep., 419.)

MISSOURI—*Newsboy Injured While Being Ejected.*

A newsboy who went on a car to sell papers was struck and injured by a conductor while being ejected and the company claimed that the conductor was acting without the scope of his authority, and evidence showed that there had previously been ill-will between the two. The court held that the railway was liable for injuries even in the case of such ill-will if it grew out of a former conflict which arose in

the line of the conductor's duties. (204 Southwestern Rep., 826.)

MISSOURI—*Report of Accident by Conductor Excluded as Evidence.*

In a street car passenger's action for personal injuries due to a premature starting of the car, the conductor's report of the accident to the company was properly excluded, being a report of his own conduct to his superior. (*Rogers vs. Kansas City Railways*, 204 Southwestern Rep., 595.)

NEW YORK—*Injuries on Track of High Speed Railway.*

An interurban railway was not liable for death of a boy, who went upon the track in front of a car approaching at 30 to 50 miles an hour, in a light snow, at a point where the motorman had no reason to anticipate the act. (*Benham vs. Schenectady Railway*, 171 New York Sup., 260.)

NEW YORK—*Injury to Passenger While Conductor Turned Switch.*

It was not negligence as a matter of law for a street railway company to have its conductor leave the car to turn a switch at the end of the route, as respects a passenger boarding the car while the conductor was so engaged. (*Clarke vs. New York Railways*, 171 New York Sup., 248.)

NEW YORK—*Public Service Commission Has No Power to Order 20 Per Cent Amortization Fund.*

Under the public service commissions law, which provides that the commission may establish a system of accounts to be used by railroad corporations or other common carriers and prescribe the manner in which such accounts shall be kept, the commission had no authority to require the preservation of 20 per cent of the gross receipts to establish an amortization fund for the renewal of a street railway when the existing equipment should be no longer capable of use. (*People ex rel. New York Railways*, et al., vs. Public Service Commission of First District, et al., 119 Northeastern Rep., 848.)

NEW YORK—*Employee Riding When Off Duty Is a Passenger.*

A guard employed by a transit company by the hour or trip, whose duties ceased on the arrival of his train at a certain station at 2.10 p.m., and who was not required to resume work until 4.58 p.m., but who remained on the train in uniform and in the passenger car to return on some personal business, though it did not appear that he had paid his fare, was a passenger, entitled to maintain an action for injury from a collision and to rest his case upon proof of the collision. In such a case, the guard was not entitled to any relief under the workmen's compensation act (Consol. Laws, chap. 67), which requires an applicant for relief to be in the service of the employer when injured, which requirement was not changed by the amendment by Laws 1916, chap. 622. (*Pierson vs. Interborough Rapid Transit Company*, 168 New York Sup., 426.)

New Publications

Directory of Engineers

Issued by the American Association of Engineers, Chicago, Ill., 6 in. x 9 in., cloth, 192 pages, price \$2.

Contains a brief synopsis of the experience and training of all members of the association.

American Wood Preservers Association Proceedings

Published by the association, F. J. Angier, secretary, Mount Royal Station, Baltimore, Md.; 262 pages. Price in cloth, \$3.50; in paper, \$2.50.

The volume covers the proceedings of the 1918 meeting and includes a number of papers of interest to electric railway maintenance-of-way engineers.

Saving Coal in Boiler Plants

By Henry Kreisinger. Technical Paper 205, U. S. Bureau of Mines. One copy from bureau, free; extra copies from Superintendent of Documents, Government Printing Office, Washington, D. C., 5 cents each.

A practical treatment of the subject intended for the fireman, engineer or owner of small or medium-sized, hand-fired plant.

The Diesel Engine; Its Fuels and Its Uses

By Herbert Haas. Published by the United States Bureau of Mines as Bulletin 156—Petroleum Technology No. 44. 133 pages. One copy free from Bureau of Mines; extra copies 25 cents each from Superintendent of Documents, Government Printing Office, both Washington, D. C.

This is a very extended study of the Diesel engine from a practical standpoint. Details of construction of several commercial engines are given and a comparison is made of the advantages and disadvantages of Diesel engine plants as compared with steam turbine plants. Some data regarding costs are given also.

Handbook of Mechanical and Electrical Cost Data

By H. A. Gillette and Richard T. Dana, McGraw-Hill Book Company, New York; 1716 pages with index. Price \$6.

This book is designed to be a companion volume to the "Handbook of Cost Data" by Gillette and the "Handbook of Construction Plant and Its Cost" by Dana. These three handbooks are written so as to overlap. In case the question should be raised, of what value are cost data when the prices of labor and material change so rapidly the authors have an answer ready. They show first that no printed prices are really "up to date," but if unit costs are given, old cost data can be serviceable if the present-day labor and material prices are substituted. The volume under review contains many figures from appraisals, operating records, etc., of steam plants, electrical distribution system and railways, with a discussion of general economic principles.

Personal Mention

Builds Road in Spain

After Completion of Improvements at Barcelona, Mr. Harrsen Returns to America—Formerly in Mexico

H. P. Harrsen, managing director since March, 1915, of the Ebro Power & Irrigation Company, the Sarria & Barcelona Railways and the Cataluna Railways, all of Barcelona, Spain, and all controlled by the Barcelona Traction, Light & Power Company, having resigned, has just returned to this country and will spend the coming winter at his home in Florida.

Mr. Harrsen was born in St. Louis, Mo., in 1875. After graduating from the public schools of that city he entered the employ of the Emerson Electric Manufacturing Company of St. Louis. His next position took him to



H. P. HARRSEN

Mexico as assistant superintendent of the Aguascalientes Electric Light Company at Aguascalientes, Mexico. Two years afterward, the tramway system in Mexico City, later incorporated under the name of the Mexico Tramways Company, Ltd., was acquired by an English syndicate and the company's first American general manager, Thomas H. McLean, appointed Mr. Harrsen his secretary.

Mr. Harrsen remained in Mexico until his chief, Mr. McLean, left to accept the position of vice-president and general manager of the Toledo Traction Company. Mr. Harrsen accompanied Mr. McLean to Toledo where he spent seven years with the Toledo traction system in different capacities, from clerk to superintendent. He next received the appointment of general superintendent of the Mexico Tramways Company, in which the late Dr. F. S. Pearson, head of various international companies, had become financially interested and was then president. During the following eight years

he became successively general superintendent, general manager and finally managing director of the Mexican Light & Power Company, president of the Pachuca Light & Power Company, and managing director of the Mexico Tramways Company.

In March, 1915, Dr. Pearson appointed Mr. Harrsen managing director of his Spanish company in Barcelona.

T. D. Moberg has been appointed chief accountant of the Rock Island (Ill.) Southern Railway to succeed George Homrig.

A. C. Colby has been appointed master mechanic of the Connecticut Company at Bridgeport and Norwalk, to succeed William F. McCoy.

L. F. Eberbach has been appointed secretary of the Fort Wayne & Decatur Traction Company, Decatur, Ind., to succeed Dick M. Vesey.

William Plaag has been appointed master mechanic of the Peoria Railway & Terminal Company, Peoria, Ill., to succeed William Hassman.

George F. Fisher has been appointed superintendent of the light and power department of the Cumberland County Power & Light Company, Portland, Maine, to succeed W. C. Billings.

V. H. Cos has been appointed chief engineer of power station of the Fort Wayne & Northern Indiana Traction Company with headquarters at La Fayette, Ind., to succeed J. Ross Sharp.

William L. Weldin has been appointed safety inspector and chief of guards for both the railway and lighting departments of the Wilmington & Philadelphia Traction Company, Wilmington, Del.

George Sprague, Jr., has been appointed assistant secretary and assistant treasurer of the Commonwealth Power, Railway & Light Company, with headquarters in New York, to succeed G. H. Bourne.

Fred H. Libby, superintendent of the commercial department of the Bangor Railway & Electric Company, Bangor, Maine, has also been appointed purchasing agent of the company to succeed Preston Mann.

L. E. Holderman has been appointed engineer of maintenance of way of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, South Bend, Ind., to succeed W. F. Carr.

William Bellmar has been appointed western division superintendent of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, with headquarters at Michigan City, Ind., to succeed W. C. Kambs.

I. L. Oppenheimer has retired from the presidency and active management of the Ohio River Electric Railway & Power Company, Pomeroy, Ohio, but will retain his financial interest in the company and will likely remain a member of the board of directors. In 1899 Mr. Oppenheimer, together with the late U. S. Grant, both then of Pomeroy, conceived the idea of building an electric railway to connect the towns of Middleport, Pomeroy, Minersville, Syracuse and Racine. Actual work on construction of the road was started in May, 1900, and on Nov. 15 of the same year the first car was operated from Middleport to Racine. Later the road was extended from Middleport to Hobson Station on the Kanawha & Michigan Railway which gives the road its present 12.07 miles of track, independent of switches. Mr. Oppenheimer has been a director and officer of the company since its organization, and in 1902 took over the active control of the road and retained the position up to the present time. In 1912 he was elected president of both the railway company and the Pomeroy & Middleport Electric Company, a subsidiary of the railroad



I. L. OPPENHEIMER

furnishing current for lighting and power purposes. From 1908 to 1912 he was located in Lexington, Ky., with the railway and lighting properties, but at the same time continued the management of both Pomeroy companies. He was also for a short time connected with the Norfolk & Portsmouth Traction Company, the Fort Wayne & Wabash Valley Traction Company and the Newport News & Old Point Railway & Electric Company. Ever since he became interested in the Pomeroy corporation, Mr. Oppenheimer has been active in the work of the Ohio Electric Light Association and was this year elected president of the association. He has made no definite plans for the future other than to take an extended rest and vacation.

Otto Gottschalk, who formerly was assistant superintendent of electrical equipment with the Interborough Rapid Transit Company, New York, N. Y., has been made master mechanic of the Richmond Light & Railroad Company, Staten Island, N. Y.

Oliver D. Davis, chief clerk of the freight department of the Detroit (Mich.) United Railway, has resigned to join the sales force of the Ohio Rubber Company's Detroit office. For fourteen years Mr. Davis has been connected with the freight department of the Detroit United Railway.

J. D. Dugan has been appointed superintendent of railway of the Vicksburg Light & Traction Company, Vicksburg, Miss., to succeed C. E. Warwick, who, as recently noted in the *ELECTRIC RAILWAY JOURNAL*, has become connected with the Eastern Wisconsin Electric Company at Sheboygan as railway superintendent.

Earl Lones, formerly general shop foreman People's Railway, Dayton, Ohio, has been appointed acting master mechanic to succeed Joseph H. Towle, who, as announced in the Sept. 21 issue of this paper, resigned to accept a position of assistant electrical engineer with the Railway Improvement Company, New York.

Harry Hartwell, formerly of the Pearson Corporation, but now connected with Chandler & Company, New York and Philadelphia, bankers, is in temporary charge of the property of the Ohio River Electric Railway & Power Company, Pomeroy, Ohio, succeeding I. L. Oppenheimer, who has retired as president and manager of the company, as noted elsewhere in this department.

C. Nesbitt Duffy, vice-president of the Manila Electric Railroad & Light Company, Manila, P. I., is chairman of the Liberty Loan campaign committee in Manila. The *Cable News American*, in commenting on this appointment, says, "Mr. Duffy is considered to be the best choice that could have been made for this place. His ability as an organizer and his energy and enthusiasm are without limit."

George S. McClure, assistant engineer of the engineering department of the Pacific Electric Railway, Los Angeles, Cal., has received a commission as first lieutenant, Seventieth Engineers, and is at Camp Humphries, Acotink, Va. Mr. McClure entered the employ of the Pacific Electric Railway on July 1, 1903, as chainman and was promoted to levelman two years later. In 1912 he became assistant engineer, which position he occupied until he entered the service of the nation.

Theodore P. Shonts, president of the Interborough Rapid Transit Company and the New York (N. Y.) Railways, at the invitation of the New York *Evening Post*, told in the magazine supplement of that paper for Sept. 21 about the effort being made by his companies to provide something like adequate service in these trying times. He emphasized the point that from a purely selfish outlook it was to the advantage of the railways to supply the riding public with adequate service at all times.

H. A. Crane, treasurer of the Northern Massachusetts Street Railway, the Connecticut Valley Street Railway and the Concord, Maynard & Hudson Street Railway, has also been appointed secretary of the various companies, with headquarters at Greenfield, Mass., to succeed R. M. Stoughton. Mr. Crane has been treasurer of the companies since the beginning of 1916, previous to which time he was connected with the banking firm of Bodell & Company, Springfield, Mass., and Providence, R. I. He was at one time assistant treasurer of the Massachusetts Agricultural College.

A. L. Linn, treasurer of the United Gas & Electric Corporation and the United Gas & Electric Engineering Corporation, New York, N. Y., has also been appointed assistant secretary of the latter company to succeed J. F. Muller, Jr., and secretary and treasurer of the American Cities Company and assistant treasurer of the Elmira Water, Light & Railroad Company, to succeed H. J. Pritchard. Before his connection with the United Gas & Electric Corporation and the United Gas & Electric Engineering Corporation, Mr. Linn was assistant to Horace E. Andrews, president of the New York State Railways and the Mohawk Valley Company, controlling the electric railways and the electric lighting and gas companies in Rochester, Syracuse and other cities in the central part of New York State.

John E. Cullen has been appointed an additional assistant to the president of the United Railways & Electric Company, Baltimore, Md. This appointment is in line with the policy of the company to enlarge its staff so as to hasten the solution of the many problems which have been created by the war. Mr. Cullen, who assumed his duties on Oct. 1, will pay particular attention to the question of public regulations and publicity. He is a Baltimorean, well known as a special writer and former city editor of the *Evening Sun*. He is a student of municipal problems, including transportation, and has an intimate knowledge of Baltimore. He has been engaged in newspaper work in New York City for the last three years, returning to Baltimore to accept this new work.

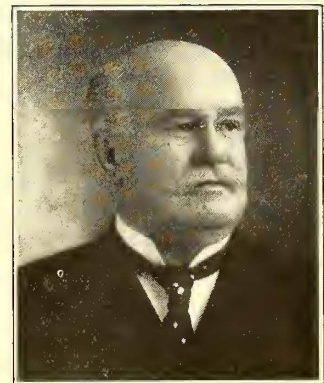
George Theis, Jr., president of the Arkansas Valley Interurban Railway, Wichita, Kan., and during the past seven months in active control of the properties of that company, has retired from active management in favor of Charles H. Smyth, general manager, who recently returned from the service of the American Red Cross Society in France. Mr. Theis has found it necessary to give up active management because of attention claimed by the many other affairs in which he is interested. In addition to being president of the Arkansas Valley Interurban Railway, he is president of the Midland Light & Ice Company, Dodge City,

Kan., of the Southwest Cracker Company, Wichita, Kan., and of the Theis Ranch Company, Englewood, Kan., and also a director in several banks. Besides all this he holds extensive interests in other commercial enterprises and railroads. He will continue with the Arkansas Valley Interurban Railway as president in an advisory capacity, with headquarters in the city of Wichita.

Obituary

Major Evans Dead

There are but few men in the electric railway field whose death will be felt as much as that of Major Evans, who passed away at his home, 50 Montgomery Place, Brooklyn, on Sept. 8, following an attack of pneumonia. Major Evans had been associated with the Lorain Steel Company for thirty-four years and during that time had taken an active part in electric railway matters where his sound common sense and geniality made themselves felt for the good of the cause. No man had more friends than Major Evans and his death will be sincerely mourned.



HENRY CLAY EVANS

Henry Clay Evans was born in Pittsburgh, Pa., on May 4, 1850. He was for many years connected with the Pennsylvania State Militia as a member of the Duquesne Grays and served on the staff of Maj. Gen. A. L. Pearson, with the rank of major. He took an active part in the organization of the American Electric Railway Manufacturers' Association and has been a member of its executive committee since 1906, having been re-elected in 1909, 1912 and 1915. He served as vice-president of entertainment during the year 1913. Major Evans was also a member of the Engineers Club of Boston, the Railroad Club of New York, the Crescent Athletic Club and the Lyres Club. He leaves a widow; a daughter, Mrs. Amidee T. Haviland, and two sons, Clay, an ensign in the United States Navy, and Whiting.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Buying Rails Under War Conditions

Purchasing Agent Must Recognize War Demands and Find Out Just What Material Can Be Utilized

From the observations of an experienced maintenance of way engineer the following side lights upon the purchase of rails for an electric railway serving an Eastern city and its suburbs appear of interest. In times past the company specified with no lack of bidders, the kind of rails it desired, the various deliveries promised were compared, prices noted, and the award made with the full expectation that the necessary rails would arrive not far from the expected date. Now the problem is to get any rails whatever and having gotten them, to lay them perhaps not by directly employed company labor but by contractors' forces. Sometimes even this installation can only be accomplished after the real or fancied objections of local municipal authorities to the type of construction forced by the war are overcome.

RAILWAYS MUST EXPLAIN NEEDS

The demand of our overseas forces for rails must first be met, and the railway purchasing agent who overlooks this patriotic necessity and goes to Washington with an appeal in his bag and a chip on his shoulder because the steel companies decline to accept his order as desired for fulfillment in specific detail is certain to experience an awakening. The question now is, can a particular company be supplied with rails of any section whatever capable of carrying its traffic? It is necessary for the company in every case to lay its cards face upward on the table and explain its exact needs to the manufacturers and to the government authorities controlling the production and shipment of rails.

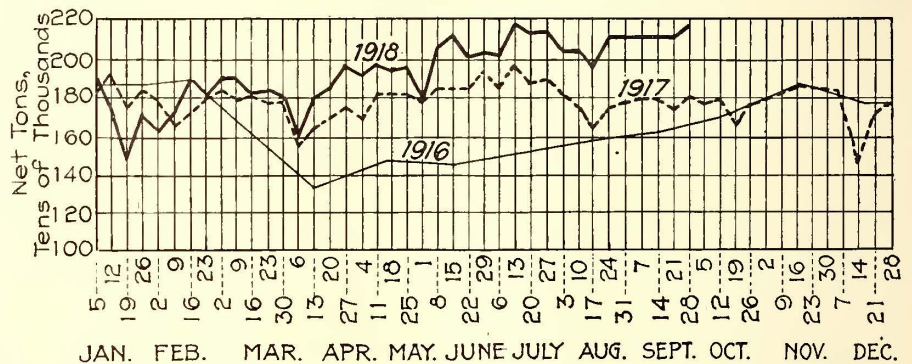
If the desired cross-section and quantity cannot be obtained, and the chances are that this will be the case generally except on the basis of exceedingly long deliveries, it will do no good to pound the table in a red-faced fashion and demand the material, even on the strength of being a buyer for an essential industry. The purchasing agent and his engineering colleague having charge of the road and maintenance conditions must take what they can get and be duly appreciative, and it is only a waste of energy and time to inveigh against the manufacturers and the government authorities for their inability to meet conditions beyond their control. The wise purchaser of rails finds out

what substitute sections and weights are possible on his system at the points where the proposed construction or repair work is to be done. He keeps track of the second-hand market (sometimes an operating company succeeds in picking up a real bargain in rails in this way), and when he sits down with the manufacturers and the government representatives he is ready to put the case before them in the clearest possible way; to show the necessity of the purchase in relation to the carrying forward of the war, and to decide promptly whether or not any "tag ends" of orders can be utilized, or whether by a change in specifications

Coal Production Again Increasing

Bituminous Output 2.5 Per Cent and Anthracite 12.1 Per Cent Greater Than Previous Week.

Bituminous coal production during the week ended Sept. 28 not only exceeded 13,000,000 net tons but also records the third successive week of increased production, according to the weekly report of the Geological Survey. The output during the current week (including lignite, and coal made into coke) is estimated at 13,043,000 net tons, an increase over the week preceding of 325,000 net tons or 2.5 per cent, and over the cor-



ESTIMATED AVERAGE TOTAL PRODUCTION PER WORKING DAY OF BITUMINOUS COAL, INCLUDING COAL COKE

the situation can at least be temporarily met. If the need of ship plates exceeds the demand for rails, the fact must be accepted with the best possible grace. It has been found that by being perfectly frank most will be gained, and the railway buyer can be assured from the experience gotten that everything that can be done to meet genuine maintenance needs on essential lines will be done.

Supply of Sweeper Rattan Short

The market of sweeper rattan is still in a most unsettled condition, with wide price fluctuations. Owing to the ruling of the War Trade Board reported in the Aug. 3 issue of the *ELECTRIC RAILWAY JOURNAL* and which is still in effect, no imports can be had and there is a great shortage of this material in the market. Prices are ranging from 38 cents a pound to 40 cents a pound with an extreme high of 55 cents reported by one dealer.

Demand at the present moment is not great but with next month the demand for supplies for winter operation is expected to begin in volume, naturally resulting in greatly diminished stocks.

responding period of 1917 of 1,863,000 net tons or 16.7 per cent. The average production per working day, during the week of Sept. 28, is estimated at 2,174,000 net tons, 9 per cent in excess of the average daily production for the coal year to date and 6.7 per cent in excess of the average daily requirements during the balance of the coal year to make up the deficit.

During the past six summer months, or the first half of the coal year, production of bituminous coal is estimated at 311,216,000 net tons. This output, which is 33,418,000 net tons or 12 per cent in excess of the production during the same period of 1917, but falls short of requirements during the current year to date by 10,897,000 net tons or 3.4 per cent, the increase in requirements this period over the output for the same period last year amounting to 44,315,000 net tons or approximately 16 per cent.

The production of anthracite in the United States during the week ended Sept. 28 is estimated at 2,071,000 net tons, an increase over the week preceding of 224,000 net tons or 12.1 per cent, and over the corresponding week of last year of 65,000 net tons or 3.2 per cent. The average daily production during

the current week is estimated at 345,000 net tons as against 338,000 net tons during the coal year to date and as compared with 330,000 net tons during the same period of 1917. Total production from April 1 to Sept. 28 is estimated at 51,651,000 net tons, an increase over 1917 of 1,072,000 net tons or 2.1 per cent.

Slack Adjusters in Considerable Demand

Carloads Lots Shipped—Activity Due to Shortage of Labor and Conservation Measures

Considerable interest is being reported in automatic brake slack adjusters, according to the manufacturers, due primarily it is believed, to labor shortage in electric railway shops. From all parts of the United States and Canada calls are reported to have come for information regarding the cost and requests for trial sets, as well as orders.

In some instances, railways which have installed adjusters have made an extended study of the savings effected, and it is reported that the Philadelphia Rapid Transit Company has even considered a reduction in air compressor service, due to the elimination of slackness in the brake rigging, and consequent saving in piston travel and compressor operation. In a number of other instances the reduction in brake shoe consumption has led to the purchase of adjusters, but the leading factor seems to be labor shortage.

GOVERNMENT PRIORITIES STILL CONTROL

There is some difficulty at the present time in securing materials, but it is said that practically all orders so far have been covered by government priorities, which has enabled the manufacturers to make up adjusters in quantities. One manufacturer even states that adjusters are being shipped in carload lots. In fact, installations have generally been made in considerable quantities, one railway company being reported to have purchased 5250 adjusters.

One uncommon phase of this market is the interest being shown by the electric railway transportation and claim departments. It is rather unusual for manufacturers to correspond with these departments on the subject of their equipment, but in this case one manufacturer reports considerable correspondence with claim departments on the subject of reduction in accidents caused by slack or bad-order brakes, and with transportation departments in reference to the point that the installation of the apparatus makes all cars handle alike in braking.

Prices remain about the same but are subject to change due to the variation in prices of steel shafting and malleable castings. Deliveries can be made in from two weeks to two months, depending upon whether standard types of adjusters are ordered and provided priority orders are received.

Kansas City One-Man Cars

The Kansas City Railways, as reported in our issue of Aug. 31, has purchased fifteen closed one-man safety passenger cars. The specifications follow:

Number of cars ordered.....	15
Name of road.....	The Kansas City Railways.
Date order was placed.....	July 17, 1918.
Builder of car body.....	American Car Company
Type of car.....	Closed one-man Safety Passenger
Seating capacity.....	30
Length over all.....	27 ft. 9½ in.
Truck wheelbase.....	Width over all, 8 ft.
Roof.....	Arch
Air brakes.....	Westinghouse and Safety Equipment
Axles.....	Hammered steel—cold rolled if available
Car signal system.....	Faraday
Control.....	K-10 double end
Couplers.....	Standard
Curtain fixtures.....	Curtain Supply Company, Rexall metal rollers
Curtain material.....	Pantasote-pattern K-2. Col. 86
Designation signs.....	1—Hunter illuminated, latest type
Door operating mechanism.....	Air and hand
Fare boxes.....	International, C-17
Fenders or wheelguards.....	American Car Company standard
Hand brakes.....	Brake staff steel with necessary ratchet wheel, dog and floor plate at bottom, 112 inch standard drop handle.
Heater equipment.....	Eight Peter Smith truss plank
Headlights.....	Golden Glow SM-95
Motors, type and number.....	Six cars, 506 A. M. 2; seven cars, G. E.-258 two-motor equipment with K-10 double-end control.
Sanders.....	Two sand boxes under seats each end of car
Sash fixtures.....	Single sash, drop in pockets
Seats.....	Seven American Car Company reversible cross seats, hinged
Seating material.....	Steel, cherry wood and rattan
Step treads.....	Feralun safety treads, 3 in. wide
Trolley catchers or retrievers.....	Keystone
Trolley base.....	U-S-15-B
Trucks.....	Brill Spec. 78-M-1, friction bearings
Ventilators.....	Eight small size, Utility Ventilating Company ventilators in roof
Wheels.....	Cast chilled charcoal iron, 24 in. diam. 2½ in. wide, flange 1 in. deep, 1 in. thick

Winnipeg Car Specifications

Specifications on the ten new motor cars recently ordered by the Winnipeg (Canada) Electric Railway, as reported in the ELECTRIC RAILWAY JOURNAL on July 13, are furnished by the builders, the Ottawa Car Manufacturing Company:

Name of road ..	Winnipeg Electric Railway
Number of cars ordered ..	10
Seating Capacity ..	46
Type of car ..	Double-truck, single-end, semi-steel motor cars
Roof ..	Arch
Weight of car body ..	1900 lb.
Length of car body ..	33 ft. 3 in.
Length of front vestibule ..	5 ft.
Length of rear vestibule ..	7ft. 6 in.
Length over bumpers ..	45 ft. 8 in.
Width over all ..	8 ft. 6 in.
Distance between bolsters ..	21 ft. 6 in.

Keystone illuminated side window signs are being installed on each rear window and front vestibule side window. The interior lighting arrangements include five shaded lights in the center of the arch roof, through a selection switch on the rear platform over the conductor's position. The cars have two-leaf vestibule doors, folding out and back, controlled by the motor-man and the conductor. Folding steps are operated in conjunction with the

folding doors. Hale & Kilburn light-weight seats are used, and the heating arrangements provide for Peter Smith No. 2-P-O hot-air heaters. Trucks, air brakes and motor equipment are supplied and installed by the railway company.

Raw Materials Control Production

War Requirements Are Now Sufficient to Almost Absorb All Steel and Copper Output

Raw materials for some time have been the governing factor in the production of electrical goods and railway material. To-day this condition exists in a still more aggravated form and is daily becoming worse. Production, great as it is, is limited and by no means large enough to supply fully all of the demand being made upon it at the present time.

It is daily becoming more evident that everything not absolutely essential to the winning of the war must be greatly curtailed in production. In fact, it would not be surprising if industries that have received priority classification of B or lower obtained only just as much steel, copper, brass or lead as is necessary to take care of actual war orders. That an industry receives a classification in the preference list by no means insures that industry that it will obtain the raw materials required.

The war requirements for steel, it is well known, are greater than the mills can supply. The same is true of copper. Production of copper has suffered considerably of late, largely through labor trouble. Lead supply also is low.

Consumers of copper must have permits the same as for iron and steel. Only this week the War Industries Board put the brass industry under control with respect to distribution of raw material.

Lumber Market Conditions to Be Studied

Every phase of the lumber industry relating to production costs, market and price conditions, is to be made familiar to lumbermen throughout the country by the National Lumber Manufacturers' Association. R. B. Goodman, acting president of the association in 1917, is chairman of the Bureau of Lumber Economics which has been organized. This bureau proposes to find out, among other things, the amount invested in the industry, how much timber there is in the country, and the amount owned and controlled by the industry, the value of the country's timber, and of timber controlled by the industry, cost of production, available supply of lumber as represented by stocks and production, and the supply collectively, the source, kind and volume of demand, and the price being obtained individually as well as by the industry as a whole.

Recent Incorporations

Anniston & Camp McClellan Transportation Company, Anniston, Ala.—Incorporated to construct a line from Anniston to Camp McClellan. Capital stock, \$160,000. L. L. Crump, Anniston, secretary. [July 27, '18.]

Franchises

Gloucester City, N. J.—The Emergency Fleet Corporation has received a franchise from the Common Council for the construction, operation and maintenance of a double-track electric line throughout various portions of the city, to provide additional transportation facilities for workers engaged in the various shipbuilding and other war plants in this section.

Mansfield, Ohio—The Richland Public Service Company has received a twenty-five year franchise from the City Council of Mansfield. The franchise provides for a straight 5-cent fare until Jan. 1, 1920, when, if fare regulation be deemed necessary, such action can be taken by mutual agreement or arbitration.

Waco, Tex.—The Texas Electric Railway has received permission from the City Council of Waco to remove its tracks on Speight Street from Fifth to Eighth Streets and to place the line formerly on South Fourth Street from Speight to Oakwood Cemetery on South Fifth Street.

Salt Lake City, Utah.—The Bamberger Electric Railway has received permission from the Public Utilities Commission of Utah to construct an extension to connect its main line with the spur track of the Oregon Short Line in North Salt Lake.

Track and Roadway

Augusta-Aiken Railway & Electric Corporation, Augusta, Ga.—A new double-track street railway, 3 miles long, will be built by the War Department through Camp Hancock. The Augusta-Aiken Railway & Electric Corporation will furnish the rolling stock and power and will operate the line.

Columbus (Ga.) Railroad.—Plans are being contemplated by the Columbus Railroad for the construction of an extension into the military camp near Columbus.

Lincoln (Ill.) Municipal Street Railway.—Work will soon be begun on the reconstruction of the tracks of the Lincoln Municipal Street Railway on Eighth and Union Streets. The old rails on the loop formerly connecting the Illinois Central station line with the Woodlawn line are being removed and will be used to build an extension to the Latham Mining Company to accommodate the miners.

Paducah Traction & Light Company, Paducah, Ky.—Improvements are being contemplated by the Paducah Traction & Light Company to its track amounting to about \$25,000.

Bangor Railway & Electric Company, Bangor, Maine.—A 113-ft. steel bridge will be built by the Bangor Railway & Electric Company at Six Mile Falls, at a cost of about \$12,000.

Kansas City (Mo.) Railways.—Contracts have been awarded by the Kansas City Railways for the extension of the second track on the Country Club line from Sixty-first Street Terrace to the south side of Sixty-third Street. Work has also been begun on the reconstruction of the Prospect Avenue line from Thirty-ninth Street to Swope Parkway. It is the intention of the company to construct a loop at that point. Plans of the company include the construction of loops at other terminal points as soon as possible.

Springfield (Mo.) Traction Company.—This company reports that it has just completed the reconstruction of its track on Nichols Street.

Cooke County Transit Company, Lewiston, Mont.—It is reported that plans are being made by the Cooke County Transit Company for the construction of its proposed line from a point near Gardner along the Yellowstone River to the Lamar River to Soda Butte Creek. Richard Zahner, Livingston, secretary. [May 11, '18.]

Missoula (Mont.) Street Railway.—A new steel and concrete bridge will be built

at once by the Missoula Street Railway over Rattlesnake Creek on East Pine Street. The contract for concrete work has been awarded to the Forseen & Settergreen Company, Missoula. Owing to the shortage of steel, the trestle work will be temporarily of wood.

Norfolk, Va.—The government has authorized the construction of a concrete viaduct over the trolley tracks across Maryland Avenue at the army base. The viaduct will be 1700 ft. long and 17 ft. high, and will include space for double street car tracks, two 8-ft. sidewalks and a 32-ft. roadway. The cost will be about \$300,000. A. O. Leach, supervising engineer of construction at army supply base.

Virginia Railway & Power Company, Norfolk, Va.—A concrete and steel draw-bridge will be erected by the Virginia Railway & Power Company across Tanner's Creek.

Power Houses, Shops and Buildings

United Railways & Electric Company, Baltimore, Md.—A contract has been awarded by the United Railways & Electric Company to Singer-Pentz Company, Baltimore, for the construction of a service station at Columbia Avenue and the Baltimore & Ohio Railroad tracks.

Menominee & Marinette Light & Traction Company, Menominee, Mich.—A report from the Menominee & Marinette Light & Traction Company states that it is completing the installation of a 1650-kw. hydroelectric unit at its Rapids power plant.

Great Falls (Mont.) Street Railway.—The Montana Power Company, which operates the Great Falls Street Railway, has awarded a contract to Fitzgerald & Staunton, for construction of an extension to the new wire mill of the B. & M. Smelter, and it is expected this line will be in operation by Nov. 1. All the wire for the overhead work, as well as the ground wires, will be made in the new wire mill to which the extension will be built.

Public Service Railway, Newark, N. J.—Plans have been prepared by the Public Service Railway for the construction of a new administration building to be located at its terminal at Broadway and Morgan Street, Camden, near the plant of the New York Shipbuilding Corporation.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Plans have been prepared by the Trenton & Mercer County Traction Corporation for the installation of a quantity of new generating equipment in its power plant to provide for increased operations. The company was recently ordered by the Board of Public Utility Commissioners of New Jersey to improve its service, and new rolling stock has been ordered and other improvements will be made in compliance with the ruling of the board.

Richmond Light & Railroad Company, New York, N. Y.—Arrangements, it is reported, have been completed by the Richmond Light & Railroad Company for extensive improvements and extensions to its plant and system. The United States government, it is understood, will finance a loan to the company of about \$600,000, to provide funds for the work.

Northern Ohio Traction & Light Company, Akron, Ohio.—The Canton Sheet Steel Company has promised a loan of \$45,000 to the Northern Ohio Traction & Light Company to finance the construction of an extension to its factory.

Webster, Monessen, Belle Vernon & Fayette City Street Railway, Charleroi, Pa.—A report from this company states that it will construct a small carhouse for the storage of an electric locomotive, to cost about \$3,000.

Nashville Railway & Light Company, Nashville, Tenn.—The City Commission of Nashville has entered into a contract with the Nashville Railway & Light Company for electricity to operate the municipal electric light and power system during the period of the war. The city has closed down its electric generating plant at the request of the United States government.

Texas Electric Railway, Dallas, Tex.—The Texas Electric Railway has purchased a site between Kentucky and Tennessee Streets, McKinney, and will soon erect an express terminal and build extensive trackage to care for its growing express and freight business. The improvements contemplated will cost about \$25,000.

Rolling Stock

Madison (Wis.) Railways has purchased five one-man cars from the American Car & Foundry Company.

Union Traction Company, Nashville, Tenn., is in the market for one double-end control 1200-volt motor car.

Springfield (Mo.) Traction Company, as noted in the ELECTRIC RAILWAY JOURNAL of Sept. 14, expects the arrival of twelve pay-as-you-enter, one-man cars about Oct. 10.

Webster, Monessen, Belle Vernon & Fayette City Street Railway, Charleroi, Pa., has purchased from the Cincinnati Car Company three semi-convertible single-truck cars.

Trenton & Mercer County Traction Corporation, Trenton, N. J., is calling for quotations on fifteen cars with specifications approximately as follows: Length over all, 45 ft.; length over body, 32 ft.; width over all, 8 ft.; seating capacity, 48; semi-steel; double truck; four 35-hp. motor equipment; 26-in. wheels; weight, about 35,000 lb.; air brake; non-registering fare boxes; wheel guards. It is hoped the contract will be closed at a very early date.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., expects delivery on Dec. 15 from the J. G. Brill Company, of an eight-wheel double-end Wasson nose-type, plow which can be equipped with M. C. B. couplers for locomotive work when the noses are dismounted. The purchase of this equipment is being financed by the United States Shipping Board, Emergency Fleet Corporation, in order to improve electric railway transportation facilities at the Bath, Me., shipyards.

Trade Notes

Shepard Electric Crane & Hoist Company, Montour Falls, N. Y., announces that it has appointed A. J. Barnes as export manager with headquarters at the main office. Mr. Barnes will also continue to be director of publicity.

Association of Chilled Car Wheel Manufacturers.—The meeting of this association scheduled for Oct. 8 has been postponed until Oct. 15. The convention will be called at 10 a. m. in the State Apartment of the Waldorf Astoria, New York City. George A. Griffin is secretary.

B. H. Tripp, special representative of the Chicago Pneumatic Tool Company on the Pacific Coast, has succeeded M. W. Priselser as district manager of sales for the Pacific Coast territory. His headquarters are at 627 Howard Street, San Francisco. The Los Angeles branch of the company, at 521 Title Insurance Building, comes under Mr. Tripp's jurisdiction.

Railway Improvement Company, New York, N. Y., announces the acquisition of J. B. Miller to its engineering staff. For the present Mr. Miller will make his headquarters at Boston, Mass. To accept his new position Mr. Miller resigned from the General Electric Company, where he had been employed in both the railway supply and publication departments.

E. O. Shreve has been promoted from assistant manager to manager of the San Francisco office of the General Electric Company. Graduating from the Iowa State College and receiving his apprentice work at Schenectady Mr. Shreve went West in 1906. He passed successively through the stages of salesman at the San Francisco office, manager of the Reno (Nev.) office, turbine expert at San Francisco, manager of the supply department at San Francisco, and finally to his present post.

New Advertising Literature

Alliance Machine Company, Alliance, Ohio: Catalog describing in considerable detail electric cranes of many varieties for use particularly about steel mills and power plants.

Indianapolis Switch & Frog Company, Springfield, Ohio: Treatise on electric welding for track and shop repairs and conservation of track and roadway for the prevention and cure of track disease. This bulletin discusses welding by electricity by three methods. Track joining and bonding is also discussed in this booklet, with directions on how to care for the welder. Instructions for applying welded joints and bonding plates are also given.