

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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Rochester Saving Coal, Washington May Follow

THIS issue contains two articles which are of great interest at this time when necessity for saving fuel by everyone is of such paramount importance. One of these articles describes the steps which have actually been taken in Rochester by which, through a few changes in schedules and in operation, 17 per cent of the fuel used to operate electric cars has been saved. This amounts in Rochester to about 100 tons a day.

The other article on the possibilities of coal saving by electric railways is the Renshaw-Lambert-Layng report on their Washington investigation, of which some results were given out by Director Allen of the War Board at the Albany hearing on Jan. 4. This report, of which a copy was submitted to the Public Utilities Commission of the District of Columbia early last month, has just been made public by the War Board. Briefly, it shows that Messrs. Renshaw, Lambert and Layng have applied to the Washington situation a number of the principles of economical service described by Mr. Layng as desirable, in his article in our issue of Jan. 5. The result is that these engineers estimate that in Washington 25,790 tons of coal per year might be saved without impairment of the service to any considerable extent, and their estimates have been checked and approved by a committee of the National Research Council.

At the present time, when the attention of everyone is on fuel economy, exact information of this kind is most valuable to both electric railways and the communities which they serve. It should be of great assistance in calling the attention of both to wasteful practices which ought now certainly to be abolished in the interests of national economy.

Don't Forget the Medal Competitions

IT IS NOT too early for companies to begin planning to capture the Anthony N. Brady safety medal, to be awarded by the American Museum of Safety, and also the medal with which the American Electric Railway Association will recognize conspicuous merit in the papers presented this year before the company sections. Conditions in the electric railway field have of late been conducive neither to large expenditure on safety work nor to literary productivity. Viewed from another angle, however, there should be at least a reasonable incentive, even in 1918, to enter these competitions. If a railway has made a creditable accident record under circumstances like those obtaining at present the award of the medal will mean more to this particular company this year than it would two or three years ago. Similarly in the other competition, while the upset condition

of everything has undoubtedly interfered with company section meetings, the very stress of circumstances has caused some excellent and timely papers to be presented already and it is not too late to have more of this kind prepared. The depressing influence of the war and the absence of the usual association meetings will make it difficult to maintain interest in competitions of any kind for a time, but if they are good in peace time they should be doubly useful now.

Safe Axles for Electric Railway Cars

IT IS FAIR to say that the constant possibility of axle breakage is one of the chief causes of worry of the man responsible for the upkeep of rolling stock. The fundamental necessity of sound axles is evident. At the same time it is not good engineering to put more material into an axle, or into anything else for that matter, than is necessary to allow a proper factor of safety. A correct understanding of the principles which are involved in the safe operation of axles is therefore essential if the risk of breakage is to be minimized and the steel is to be economically disposed.

Compared with that of most structures the theory of the car axle is extremely complicated, in spite of its apparent simplicity. This is due to the nature of the stresses to which an axle is subjected. The hammer blows which it gets when the car passes over track irregularities, the bending moments due to rounding curves, etc., all combine to stress the outer fibers to a great and uncertain extent. The effects of these stresses must be determined from experience, but soundly to interpret the results of experience with a view to safety and, next in importance, economical use of material requires a knowledge of axle theory.

In view of the above facts this journal takes unusual satisfaction in presenting to its readers a series of three articles on interurban car axles by Norman Litchfield, the second of which is printed this week. These articles epitomize the results of years of practical and scientific study of the subject. Mr. Litchfield's point of view is that experience has shown that if certain maximum fiber stresses are not exceeded axles are long-lived. Analysis by well-known principles of mechanics, based upon experimental data and assumptions vindicated by experience, shows how the axle material should be distributed to produce the lowest possible maximum fiber stress. A combination, therefore, of analysis and empirical information must inevitably form the safest possible basis for axle practice. This position is logical—it leaves no place for rule-of-thumb. The best proportions for an axle to fulfill a given set of requirements are not to be settled by sentiment, opinion or compromise. They are logical deductions from the application of ascertainable laws.

We hope that Mr. Litchfield's articles will stimulate the readers of this paper to blow the dust from their old text-books on mechanics and dig deeply in the theorems which may possibly have failed to interest them during school days. This ought to be done, for here is a problem on the solution of which their highest success in part depends.

Commissions Should Be Recognized as Part of the Industry

IN THE development of the principles of public utility regulation, the larger commissions have built up extensive staffs of technical experts. In number of men and in ability, these engineering and transportation staffs are comparable with those of the largest public utility companies within the jurisdiction of the commissions. In some respects, even, these men have a better opportunity to understand the fine points of public utility operation than if they were connected with an operating company because their daily work takes them to many systems and gives them a wider field for observation.

In most cases these staffs have been built up almost entirely by men who have received their original training in railway work with operating companies. Indeed, there are several cases where commission officials have been invited to accept the highest executive offices in railway companies, as well as the converse, namely, where prominent public utility officials have resigned to enter into commission employ. These cases are bound to become more common in future because commissions will naturally desire to strengthen their forces by the best material available. The result of this situation is that there has been introduced, almost insensibly, into the electric railway industry a third component to supplement the two parts into which the industry has always traditionally been divided, namely, into operators and manufacturers.

We believe that every railway man as well as all others who have the best interests of the railways at heart will welcome this condition. The better the public utility commissions understand electric railway practice and the abler their technical staffs, the better and fairer will their regulation be. But it would help if there was a more general recognition by the companies of the fact that the commissions and their staffs form a component part of the industry and one from which help in solving their technical problems may be expected.

How can this be done? One opportunity is in association work, if the time ever comes when association activity can recommence and be conducted as it was before the declaration of war. Fortunately the constitution of the association puts no bar in the way of such wider participation in the work of the association by representatives of public utility commissions. Members of the staff of any commission, as well as the commissioners themselves, can join the association as individual members. But we believe the association could well go farther than that. These men should be led to understand that they are especially welcome at association gatherings, and their place in the industry could well be recognized by the appointment of individuals on various committees.

At one time there was considerable opposition to the

admission of manufacturers to full membership in the association and to their appointment on association committees. This has now largely disappeared, and most of the important committees of the American and Engineering associations now include members from the manufacturing sides of the industry. The War Board is the principal exception to this rule; just why we do not know, but even here its important fuel conservation report was prepared by manufacturers.

The same good results which followed the recognition of the manufacturers as an important part of the industry by the association should follow the extension of a similar recognition to the commissions. After all, it makes little or no difference whether a traffic expert or transportation engineer is with an operating company, with a manufacturing company, or with a commission if he understands his business and can offer help to improve conditions.

The ELECTRIC RAILWAY JOURNAL does not intend to preach anything which it does not practise. We welcome contributions from technical men connected with commissions on problems in the industry just as much as we welcome discussions on the same subjects from operating officials. We endeavor to make the paper as much a paper for commissions as for railway men and to discuss commission problems, so far as they relate to electric railway matters, as we do problems directly connected with electric railway operation.

Greater Output and Higher Efficiency the Goal

COAL saving, though important, is not the only objective before electric railway operators. As more men in this country are called to engage in military service, those in the remaining "essential industries" like railroading must see that there is no diminution in the effectiveness of the properties in their charge, because of this man scarcity.

If ever there was a time when the electric railways—and everyone else—had an opportunity as well as a duty to practise efficiency it is now. Efficiency is being forced on us every day. Whether the subject is willing or unwilling, he gets his share. From the smallest home, where we are being educated to the most economical use of fuel and food, to the greatest corporation—these principles are being preached daily. The executive who was too dense or too cautious to put theory into practice before can hardly escape this war-time education to avoid waste, which is forced upon him by circumstances.

From this universal demand for greater individual output and greater individual efficiency no one is exempt, from the president down. The larger problems, of course, fall to the executive for solution, but the microscope must be applied to every department to discover where corrective measures are necessary and practicable.

Nor will the wise manager be content to put the brakes on extravagant expenditures. Opportunities are at hand on almost every property to get new business—to increase gross revenues. In some cases it is the first real opening for taking on freight business, turned aside for the present by steam roads. Once secured this business need not be lost. Motor truck transportation agencies are already going after it.

In still more cases the opportunity lies in the education of the platform employees. Many "fares" are driven to the necessity of walking or to competitive companies by failure of conductors or motormen to give them a chance to get aboard. Others are lost by lack of interest where a crew delayed by blockade idly awaits the wrecking wagon instead of trying to remove the cause.

The executive who does not learn his lesson from the present emergency may never have another chance. These critical times will be the making or breaking of many a system. It behooves all to "speed up." It is "our present and immediate task."

Duplication of Service Must Be Eliminated

WHILE the tidal wave of jitney competition which swept over the country from the Pacific to the Atlantic a couple of years ago has receded to a marked degree, the jitney is still seriously affecting electric railway earnings, notably in the Middle West and on the Pacific Coast. This fact is emphasized by the testimony presented at recent rate hearings before both the Indiana and California commissions and reported in contemporaneous issues of this journal.

We are told by those best in position to know that to win the war will require the utmost in service from both the human and material make-up of the country. This above all is not a time for competing businesses. Co-operation must be the order of the day. With this thought in mind the federal government recently took over the major transportation facilities of the country. Men engaged in useless work—useless as far as winning the war is concerned—must turn their energies to useful work. Yet we see municipalities permitting competition in local transportation systems—competition which duplicates not only precious man power, but precious fuel and munition power as well. It is not the intention here to discuss the respective merits of the electric railway and the jitney as means of local transportation. Let the matter rest on duplication of service only. The question may fairly be put up to any municipality, "Which will you have, electric railways or jitneys? You can have one of the two but not both." Can any sane man doubt what the answer would be?

The trouble is that the public is particularly prone not to worry about crossing a bridge before it gets to it. It only wakes up when the ruins finally crash. Within the year this has been well illustrated by the sudden awakening of public interest in the local transportation systems of several communities after these systems had passed under the auctioneer's hammer to the junk man. It is (not should be) a matter of community patriotism that where two competing transportation systems exist one must be eliminated. Which shall it be? In a final show of hands there would be no question as to the answer. But community patriotism must be aroused on this point. In the matter of "that the people may know" most of our railways have possessed an amount of lethargy quite comparable to that possessed by the public in matters of community interest. The problems of the railways must be stated freely and frankly. After all, they are the people's railways. Sane, wide-open publicity is about the only hope for those railways which are now going to the wall on account of jitney depredations.

Labor and Capital Should Come Together

ONE of the most striking developments of the war has been the changed condition of labor in Europe. It is impossible to disregard the significance of the fires raging socially in Russia and seemingly kindling in Austria and even Germany, or the power which labor now has in England. In our own country Charles M. Schwab said ten days ago that the worker was to dominate the world.

A more temperate statement, but somewhat along the same lines, is that of former Supreme Court Justice Hughes, who said before the New York Bar Association last month: "Individual privilege [in the future] will have to show cause before a public to which old traditions are no longer controlling—a public trained in sacrifice—which will enforce its own estimate of the common right." And again he said, "The present exercise of authority over the lives of men will hereafter find its counterpart in a more liberal exercise of power over the conduct, opportunities and possessions of men."

Mr. Schwab and Justice Hughes had the courage to recognize the changing order. Many employers, however, will undoubtedly refuse to do so and will declare that labor already has too much and that no one shall dictate to them how they shall conduct their enterprises. Similarly, there are extremists among labor. If these two are left to lead us out of difficulties, the country will suffer. It is for the moderates on both sides to compose the differences.

In the electric railway field the situation presents a different aspect than in industrial work, as far as wages are concerned, because the rate which companies can charge for their service is restricted while the wages which they may be forced to pay, either because of market rates or through arbitration agreements, have no such limit. One step to place electric railways on an equal footing with other large employers of labor would be to have a flexible fare, depending in amount on the wages paid or, better still, on the entire cost of operation. Such a plan is recognized in the new Philadelphia franchise as well as in the Cleveland Talyer plan. Still another step would be to make the wages in turn depend upon the three main factors which should control them, namely (1) the cost of living, (2) the efficiency of the workmen either individually or in groups and (3) the profits of the company, the influence of each factor on the total wages to be determined in some equitable manner.

This much is certain. In the period after the war, or perhaps before the close of the war, there must be some plan evolved to cover the relations between electric railway employers and employees which will be more logical and more just than the present one of a struggle of might.

Soon there will meet in Washington a Labor Policy Board. It will hold the balances for our general industrial peace. There must be give-and-take—compromise. Both sides must surrender much that they value highly. Far-seeing employers are ready to make sacrifices. So, too, are the forward-looking labor leaders. The interests of the country demand that both sides look carefully to it that they be not misrepresented.

Above all, let both be prepared for large concessions. In that direction lies peace and the country's good.

Combining Loads to Gain Economies of Large Units and High Diversity Factor—I

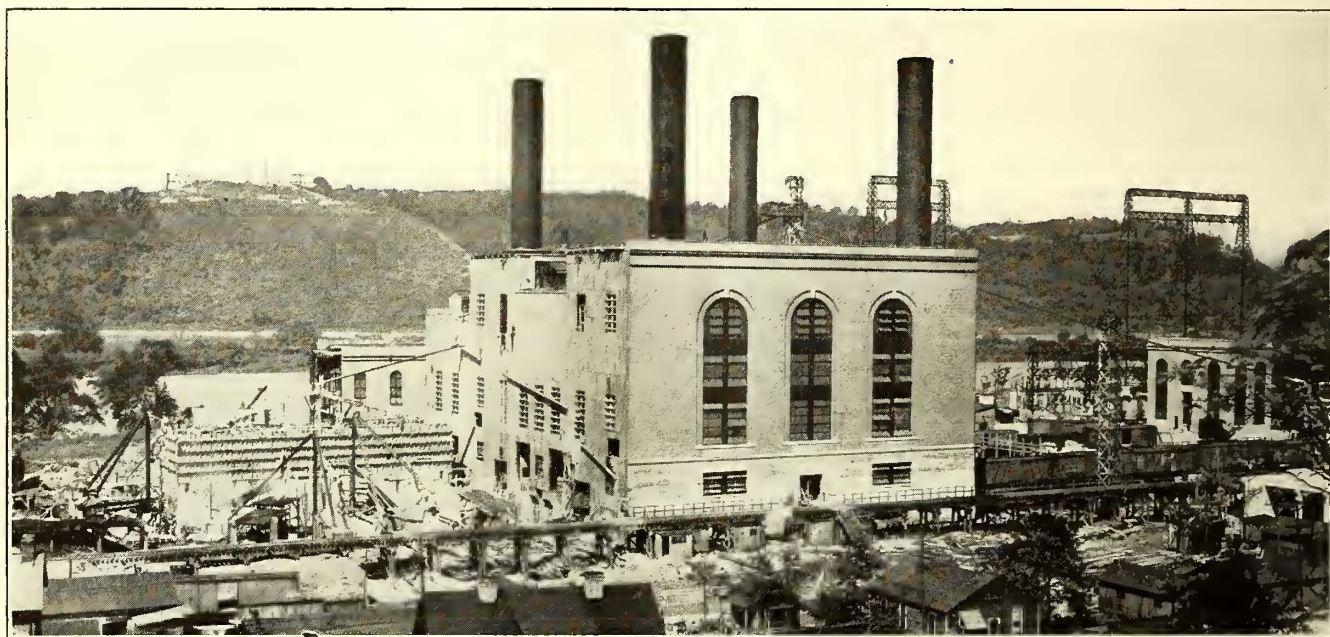


FIG. 1—GENERAL VIEW OF WINDSOR POWER PLANT

THE centralization of the power-generating facilities of one of the great industrial sections of the country into a single plant of enormous capacity, situated at the most advantageous location to serve the territory, is the idea behind the joint construction of the 200,000-kw. Windsor (W. Va.) power

plant of the West Penn Power Company, a subsidiary of the West Penn Railways, and the American Gas & Electric Company. It is considered to be, in a sense, a pioneer project in that it is the first steam station to be built as a bulk supply source of electrical energy. The economies to be realized from extremely large units, the diversity factor resulting from the combination of loads spread over a large territory and including a wide variety of industry, and the strategic location relative to the raw materials and loads, were the desiderata which led these two important companies to combine their generating facilities and thus make an arrangement which would supply steam-generated electrical energy so cheaply that it could be economically distributed over wide areas. The scheme when completed will compare favorably as to energy cost with the large hydroelectric developments of the West, which distribute their output through long distances.

The West Penn Power Company, which is the energy supply company for the West Penn Railways, and the

West Penn Power Company and American Gas & Electric Company Place Their Combined Demands on Huge Jointly Owned Generating Plant—New Power House of Six Units and 200,000-Kw. Capacity Is Strategically Located with Reference to Loads and Coal and Water Supplies, and Embodies Many New Features of Design

American Gas & Electric Company combined, supply practically all of the commercial and electric railway energy requirements of southwestern Pennsylvania, northwestern West Virginia and eastern Ohio, a particularly rich industrial section in the valley of the Ohio River. The American Gas & Electric

Company supplies light and power service to Scranton, Pa., Newark and Canton, Ohio, Wheeling, W. Va., and a number of other communities and industries in this section. The West Penn Power Company supplies energy to the 322.56 miles of electric railway and more than 400 cars of the West Penn Railways, and commercial energy to numerous towns along these railway lines and elsewhere in this territory. The loads of each company are superimposed on those of the other at the common power plant. Each company takes its supply of energy from the station through its individual outdoor step-up and metering substation and transmits it out over a network of high-tension lines serving the many communities and industries and electric railways in the three states.

One of the important problems in connection with this new plant was the selection of the most advantageous location, all things considered. The site finally chosen comprises 58 acres of inexpensive real estate along the Ohio River from which an adequate and de-

pendable supply of reasonably good water is obtainable. The station thus situated is but 2000 ft. from a coal mine producing fuel with a heat value running around 13,500 B.t.u. per pound, and is on the Pittsburgh, Wheeling & Kentucky branch of the Pennsylvania Railroad, affording direct transportation from other coal mines, should the one at the power plant be shut down. It is practically at the load center of the territory served, and is about midway between the Eastern and Central time belt, whereby the advantages of diversity resulting from serving loads thrown on the power-house at times differing by one hour are added to the more usual diversity advantages from the wide variety and character of load supplied.

GENERAL LAYOUT OF WINDSOR STATION

In general the Windsor plant is laid out on the unit plan with four boilers and one 30,000-kw. turbo-generator per unit. These four boilers are arranged in pairs on opposite sides of a wide firing aisle, the four boilers thus occupying about the same space in the longitudinal direction of the plant as the turbo-generator they serve, which is set with its axis parallel to the firing aisle. The firing aisle between the boilers is 47 ft. wide with a 12-ft. opening in the floor through the center of the aisle. The space underneath the floor is used for a huge coal-storage pit, from which coal is handled through the floor opening by means of a crane and bucket hoist, directly into the coal bunkers.

The turbine room occupies a central position in the plant, as the boiler room is on one side and the switch-

ing in an intermediate floor and making an office for the chief engineer and load dispatcher on the second floor. All the main operating rooms are on the same floor level, which was located at an elevation of about 35 ft. above the ground on account of the wide variation of

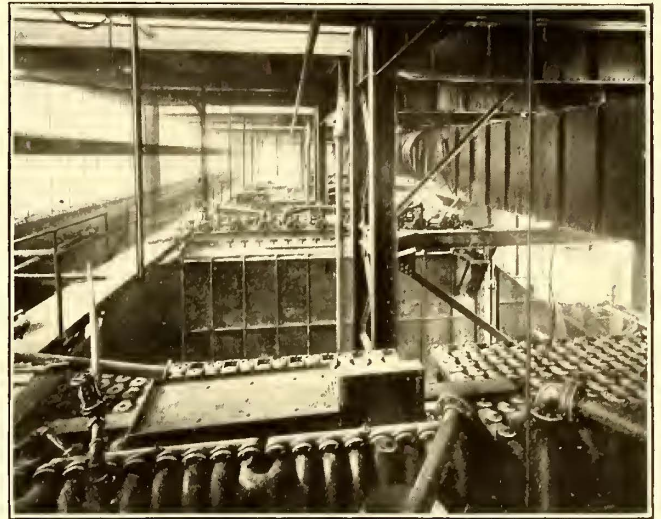


FIG. 3—TWO SECTION ECONOMIZERS OVER BOILERS

the water level in the Ohio River. This uniform floor level will greatly facilitate the operating conveniences in a plant of so large capacity. The high elevation of these floors necessitated running all tracks into the building on trestles. These were costly at the outset,

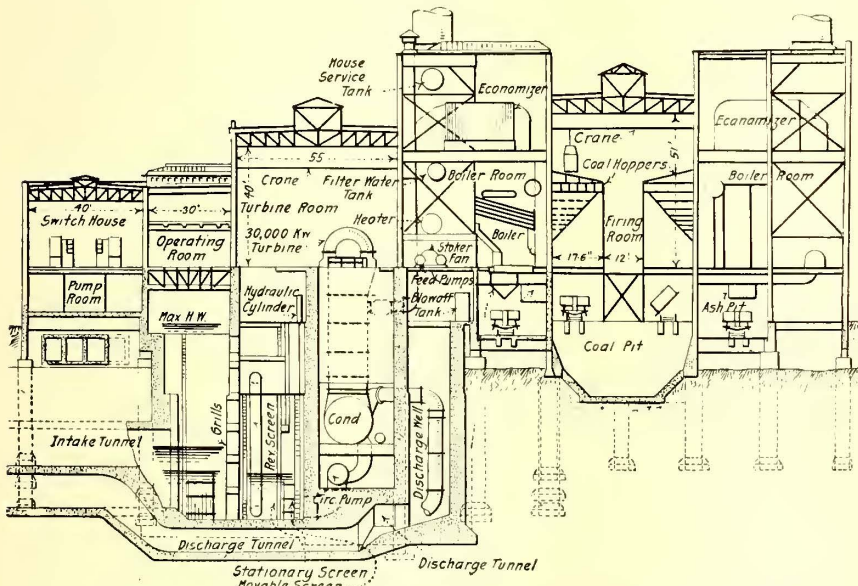


FIG. 2—CROSS-SECTION THROUGH WINDSOR PLANT SHOWING COMPLETE ARRANGEMENT OF EQUIPMENT

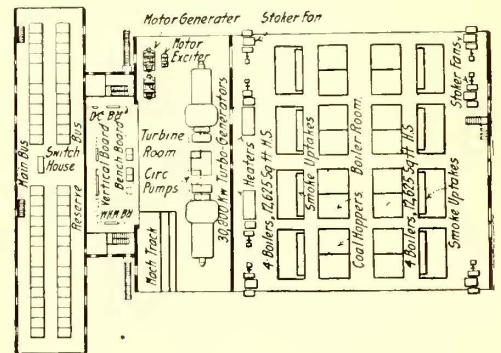


FIG. 4—SIMPLIFIED PLAN OF WINDSOR PLANT SHOWING COMPLETE LAYOUT OF TWO UNITS OF STATION EQUIPMENT

board operating room and switch house on the other. The switchboard operating room is built directly over the intake well and is supported on 6-ft. steel trusses which span the space between the turbine room wall and the wall of the switch house, but which are placed in such a way as not to interfere with ready access to the well for the necessary frequent cleaning. This space over the intake well has been further utilized by put-

ting in an intermediate floor and making an office for the chief engineer and load dispatcher on the second floor. All the main operating rooms are on the same floor level, which was located at an elevation of about 35 ft. above the ground on account of the wide variation of

but the space beneath them will make an economical ash dump for several years to come. Two of the 30,000-kw. units are now in operation, and it is expected that two additional units will be completed in 1918. The last two units to make up the present-planned ultimate capacity of nearly 200,000 kw. will be installed shortly thereafter. All of these turbines will be placed in a single row through the turbine room

with axes parallel to the length of the building. The boilers to serve them will be set in two rows as described above, with steel stacks on each side, one for each three boilers. When completed with the six units installed, the over-all dimensions of the power house will be roughly 295 ft. x 280 ft.

The present article covers, in addition to the general features already mentioned, the boiler room and coal handling equipment. In a later article the turbine room, water supply, electrical and control equipment, electrical distribution system, etc., will be taken up.

FEATURES OF BOILER-ROOM DESIGN

Each of the boilers in the Windsor plant is of the Babcock & Wilcox cross-drum type with 12,625 sq. ft. of heating surface. Each is equipped with a separate economizer and with both induced and forced

cause of their proved efficiency in burning West Virginia coal, and because of their heavy overload capacity.

The Sturtevant high-pressure-type economizers, which have 8625 sq. ft. of heating surface, are arranged in two sections, eight tubes wide and thirty-six tubes long, in order to secure what is believed to be a maximum heat transfer arrangement. This also allows the space between the two sections to be utilized for a by-pass duct and a duct connecting with the double-suction fan behind the economizer. Such an arrangement of the economizer makes possible a narrower construction and one more readily accessible for repairs and cleaning.

The dampers installed in the uptake are so arranged that in one position they close off the economizer and open up a by-pass duct, and in the other position they open the path through the economizer and cut off the by-pass. The gases pass from the economizer and induced-



FIG. 5—GENERAL VIEW OF OPERATORS' COLONY

draft so arranged and controlled that the pressure in the firebox is practically zero. The induced draft fan is set over the boiler and inserted between the economizer and breeching. It is driven by a 60-hp. motor. The forced-draft or stoker blast is supplied by a blower installed behind the furnace. It is driven by a 100-hp. motor and was designed to give a pressure equal to $6\frac{1}{2}$ in. of water. Hand regulation of the dual draft arrangement is employed to gain the proper proportions of fuel and air.

The boilers are equipped with Westinghouse underfeed stokers with fourteen retorts per boiler. Steam is supplied at 250 lb. pressure and 250 deg. superheat. All boiler settings are incased in steel to prevent air leakage, and each boiler is equipped with a Diamond Power Specialty Company soot cleaner.

The two pairs of boilers on opposite sides of the firing aisle which go to make up a single bank are interconnected by means of a steam pipe which is carried over the aisle up close to the roof, in order to clear the crane-way. This connects with a steam header which in turn connects with the turbine. These headers for the separate banks of boilers are connected together to allow interchange of steam from the boilers of one unit to the turbine of another unit. An arrangement which provides an extra large furnace and insures a good combustion of fuel is brought about in the boiler setting by placing the drum $26\frac{1}{2}$ ft. above the firing-aisle floor.

Coal is supplied to the stokers from the bunkers along the front of the boilers by gravity. The underfeed type stokers were chosen for use in the Windsor plant be-

cause of their proved efficiency in burning West Virginia coal, and because of their heavy overload capacity. The Sturtevant high-pressure-type economizers, which have 8625 sq. ft. of heating surface, are arranged in two sections, eight tubes wide and thirty-six tubes long, in order to secure what is believed to be a maximum heat transfer arrangement. This also allows the space between the two sections to be utilized for a by-pass duct and a duct connecting with the double-suction fan behind the economizer. Such an arrangement of the economizer makes possible a narrower construction and one more readily accessible for repairs and cleaning.

METHOD OF HANDLING COAL

One of the interesting features in connection with the boiler end of the plant is the plan which has been utilized for the handling of coal and ashes.

Coal is secured under a long-term contract from a mine owned by the Richmond Coal Company, situated about 2000 ft. from the power house. The mine cars bring the coal out of the mine and dump it into a crusher which delivers the coal into bunkers below, from whence it is drawn by gravity into standard-gage, side-dump cars. These cars, owned by the central station company, are then taken into the power house on a track which extends underneath the boiler-room firing-aisle floor, where the coal is dumped into a concrete pit extending the entire length of the boiler house. The fact that these cars are standard gage is considered important, since in an emergency it will permit the shipment of fuel from other mines without transferring from one car to another.

The pit underneath the firing aisle measures about 35 ft. wide by 24 ft. deep below the tracks, and extends the entire length of the boiler room. Its capacity is about 2500 tons. From this pit the coal is lifted by means of a 3-yd. grab bucket and overhead traveling crane, weighed by a device on the crane and dumped into the individual hoppers serving each boiler. This scheme of

Saving Fuel Through Operating Economies

Committee of Engineers Shows How More Than 25,000 Tons of Coal Can Be Saved Yearly on Washington Electric Railways

THE Electric Railway War Board has just made public the text of the report made last December by the committee appointed to investigate the fuel savings possible on the lines of the Washington Railway & Electric Company, and the Capital Traction Company in Washington, D. C. The experts who prepared the report consisted of Clarence Renshaw and M. B. Lambert of the Westinghouse Electric & Manufacturing Company, and J. F. Layng of the General Electric Company. The committee's recommendations involve the use of skip, or stagger stops, the elimination of such car-mileage as can be spared without hardship to the public, the reduction of heat in cars, the operation of the most economical power houses or power plants, and the staggering of office hours of government departments. The War Board also made public an indorsement of the report dated Jan. 3 and signed by L. B. Stilwell, W. F. Durand and Comfort A. Adams, as members of a sub-committee of the National Research Council, also letters from John A. Beeler and Louis Brownlow, consulting engineer and chairman respectively, of the Public Utilities Commission of Washington, to whom the report had been submitted. Mr. Beeler, writing under date of Jan. 7, said there was no question in his mind but that the proper and intelligent application of the methods

Coal Savings Possible	
The report by Messrs. Renshaw, Lambert and Layng estimates that an annual saving in coal of 25,790 tons could be made by the Washington electric railways, as follows:	
Source of Saving	Tons Per Year
Skip-stop plan	9,400
Double berthing and modifying rapid-transit stops....	600
Eliminating unnecessary mileage in non-rush hours.	3,220
Reducing heat 50 per cent..	2,250
Shutting down small plants to effect the same load reduction as would carrying all Capital Traction Company's load by Potomac Power Company	9,700
Staggering office hours of government departments	620
Total	25,790

advocated in the report would conserve fuel and energy, as estimated, while the rapid transit facilities afforded the public in the district should be improved because of the decreased time required to make each trip. Mr. Brownlow expressed the belief "that changes of the nature suggested can be put through so as to effect savings at least as great as those indicated."

The report of the committee is substantially as follows:

The Washington Railway & Electric Company (the Potomac Power Company) averaged during the year ending October, 1917, approximately 9500 tons of coal per month with an economy of approximately 1.9 lb. per kilowatt-hour, and generated an average of approximately 11,000,000 kw.-hr. per month. About 52 per cent of

this output was used for lighting, 13 per cent for the three interurban railways (W. B. & A., W. & Va. and W. & O. D.) entering Washington, and 35 per cent for the city and suburban lines of the Washington Railway & Electric Company.

The Capital Traction Company, at its Georgetown power house, averaged approximately 2800 tons of coal per month with an economy of approximately 2.6 lb. per kilowatt-hour, and generated an average of approximately 2,200,000 kw.-hr. per month. At its Chevy Chase power house it averaged approximately 460 tons per

(Concluded from page 266)

handling the coal permits of the storage of a rather large quantity of fuel within the power house without great expense, since it was possible to construct the storage bin of concrete rather than of steel. A large coal-storage yard will be provided near the plant in the near future.

A standard-gage track underneath each row of boilers permits of the dumping of ash from the hoppers under the furnaces directly into dump cars for removal. This arrangement is clearly shown in the cross-section of the plant.

Owing to the necessity of radiating great quantities of heat from the large turbine units the design of the power house was made especially liberal with regard to light and air. The large amount of heat radiated is saved in part, however, by conducting the warm air from the generators to the basement of the boiler room, where it is taken up by the stoker fans and delivered to the furnaces.

In the early construction stages of the building the difficulty of securing a solid footing under the boiler room and switch house was met by sinking caissons. It is interesting to note, however, that it was unnecessary to carry out this method of construction beneath the remainder of the station, since it was possible to utilize the walls and foundations of the deep condenser wells and intake crib to support the superstructure. The condenser well walls also serve the further purpose of foundations for the turbo-generators.

Sargent and Lundy, consulting engineers, of Chicago, were the designers of the Windsor station, and they also have charge of the construction work. The high-tension yard of the American Gas & Electric Company was engineered and constructed by the Electric Bond & Share Company. The sub-contracts for the building foundations, high tension yard foundations, and the railroad trestle foundations were all awarded to the Foundation Company of America. The sub-contractor for the steel work was the Riverside Bridge Company.

month with an economy of 4.1 lb. per kilowatt-hour, and generated approximately 240,000 kw-hr. per month. The entire output of both of these stations is used for railway purposes.

Owing to the way in which the streets are laid out in Washington street corners occur at very irregular intervals. Not only are some corners very close together, but the average number of street corners per mile is high. Assuming the Georgetown line of the Washington Railway & Electric Company to be typical, the possible stopping points average about thirteen per mile, and even in the non-rush hours it is considered necessary to make a large proportion of these stops. Observations on several city lines in the middle of the day showed that the cars were making from 8.6 to 9.5 stops per mile. While owing to the limited time the committee did not personally investigate the suburban lines, it is understood that the number of stops on these, considering the character of the lines, is proportionately excessive.

A peculiar custom in Washington is the making of what are called "fire stops." In front of the buildings in which fire protective apparatus is housed and before crossing certain streets which are commonly used by fire apparatus the cars are required to stop. The cars of the two companies make approximately 53,000 of these stops every day. Some of these fire stops would, of course, have to be made in any case to take on or let off passengers, but assuming that one-half of them would have to be made for this reason, even if the fire ordinance was not in effect, it is estimated that the coal consumed by making the other half of these fire stops is at least 880 tons per year.

In order that any rational skip-stop plan may be put in effect, it will be necessary to eliminate these fire stops. From a rough study of the Georgetown line of the Washington Railway & Electric Company, it is estimated that the number of stopping points on the various lines can be reduced approximately 40 per cent, and that the number of stops made will then be reduced approximately 25 per cent as compared with those made at present without any hardship to the public. This reduction in the number of stops should effect a saving of at least one-eighth of the coal used for railway purposes, equivalent to 780 tons per month, or 9400 tons per year.

Even on the basis assumed, the number of stopping points on city lines still would be a little more than eight per mile, or slightly less than 660 ft. apart. Even allowing for some irregularity, no persons on this basis should have to walk more than about 400 ft. beyond the point to which he would go at present (the average would be very much less than this). Even this maximum distance would mean a walk of only 1½ minutes.

The committee believes that the use of skip stops in Washington would effect great improvement in the service and greatly reduce the street congestion.

In most cities where the skip-stop plan is used no stops are skipped in the downtown district. In Washington, however, it is very necessary and desirable to skip stops in this district and the outlying ones, and the above estimate has been based on doing this.

Another practice which is noticeable in Washington is the way in which a car will often make two or even

three stops at a single corner. If one car has stopped at the corner a second car will often stop behind it. This car will not take on or let off passengers, however, but will wait until the first car moves on and will then pull up to the corner to load or unload. Under such circumstances, the second car should take on or let off its passengers at the original stop behind the first car and it should then go on when ready without stopping at the corner.

It is also the custom to stop all cars at rapid-transit crossings. The committee suggests that at such crossings one or the other line have right of way and that under normal circumstances the cars should merely slow down instead of actually stopping.

It is difficult to estimate just what the above two changes would save, but the saving would amount to at least 600 tons per year, and in combination with the skip-stop plan would give a total saving of 10,000 tons.

ELIMINATION OF UNNECESSARY CAR-MILEAGE

While short-line or turn-back cars are employed to a considerable extent in Washington, there seems to be a tendency, as in other cities, to run an unnecessary number of cars to the far end of certain lines, in some cases giving six-minute headway where ten or twelve-minute headway would be sufficient. A considerable saving in coal can be effected without any hardship to the public by eliminating this unnecessary service.

On the Capital Traction Company's lines, for instance, during the non-rush hours one-half the Colorado Avenue cars of the Fourteenth Street line could be turned back at Decatur Street, and on the other end could be turned at First and B Streets. It is also believed that all of the cars of this line which now run to Decatur Street could be turned back at Park Road. Further the F and G Street cars of the Pennsylvania Avenue line could run only between Twenty-sixth Street and Pennsylvania Avenue, N. W., and First and B Streets, S. E. One-half the Eighth and F Street cars of the Georgetown line could be run to Union Station only instead of to Eighth and F Streets. In addition to the above, there are certain savings which could be made in the early morning and late evening hours.

On the lines of the Washington Railway & Electric Company the committee did not pick out specific cases, but assumed that the same proportion of the total daily mileage could be eliminated in a similar way.

The elimination of this unnecessary mileage would save approximately 1300 tons of coal per year for the Capital Traction Company and 1920 tons for the Washington Railway & Electric Company, or a total of 3220 tons. In addition some dead mileage could be saved during the rush hours, but no attempt was made to estimate the extent of this.

The difference in the average energy consumption per car-mile for the seven months in which heat is used as compared with the five months in which heat is not used is 0.58 kw.-hr. per car-mile for the Washington Railway & Electric Company, and 0.4 kw.-hr. for the Capital Traction Company. Assuming that 85 per cent of this difference is due to the use of the heaters, the total coal for heating purposes is 4500 tons per year for the two roads.

A test made by the Capital Traction Company on Dec. 5 showed that the output of its plant during the

rush hours (7.30 to 10 a. m. and 4 to 7 p. m.) was approximately 36.5 per cent of the output for the day. Using this figure for a basis, it is assumed that the car-mileage during rush hours is roughly one-third of the total. The heat used during rush hours should, therefore, require approximately 1500 tons of coal per year, and by eliminating the heat entirely during this period and using it as at present during the remaining time this amount of coal should be saved.

If, instead of cutting off all heat during rush hours, one-half the heat were cut off for the entire day, the saving would be approximately 2250 tons of coal per year instead of 1500 tons. The committee believes that if reasonable judgment is used and competent supervision is given to the matter of cutting off heat, instead of working on an entirely arbitrary basis, one half of the coal now used, or 2250 tons per year, can be saved, with practically no discomfort to the public.

OPERATION OF MOST ECONOMICAL POWER HOUSES OR POWER PLANTS

As already indicated, the Washington Railway & Electric Company, on account of the much greater capacity of its station and the higher load factor of its output, is able to operate with 1.9 lb. of coal per kilowatt-hour as compared with 2.6 lb. and 4.1 lb. respectively for the two stations of the Capital Traction Company. If the entire load could be carried by the Washington Railway & Electric Company's plant and the others shut down a considerable saving in coal would result. Making suitable allowance for losses in transmission, the saving in coal from shutting down these plants is estimated at approximately 2300 tons per year for Chevy Chase and 7400 tons per year for Georgetown, a total of 9700 tons.

To permit the stations of the Capital Traction Company to be shut down, however, would require the purchase of rotary converters with transformers, etc., for the Chevy Chase plant as well as the building of certain high-tension lines. The capacity of other high-tension lines would have to be increased. Some of these would be underground lines and would require new ducts as well as new feeders.

The Capital Traction Company's power houses, although less economical than those of the Washington Railway & Electric Company, are still very efficient. The difference in the unit coal consumption is brought about by the smaller size of the power stations and also because the load factor is that of a purely railway load as against that of a combined railway and lighting load on the other plants. In Washington there are many plants which are now operating in hotels, government buildings and elsewhere which are reported to require 8 to 10 lb. of coal per kilowatt-hour. Many of these plants are already provided with Washington Railway & Electric Company's service and use this service during the summer. A much more rational plan for conserving the coal supply of the nation therefore would be to shut down these small plants rather than that of the Capital Traction Company. It might even be desirable to use the plants of the Capital Traction Company to supplement the Washington Railway & Electric Company's plants, and thus provide more power, as the Capital Traction Company's plants are

not fully loaded. This would permit the shutting down of more small uneconomical plants than would otherwise be possible.

The committee understood that the coal burned by the total of such plants in the city is much greater than that of the Capital Traction Company. To be conservative, however, there was included in the summary of coal which can be saved only the amount which could be saved by eliminating the power stations of the Capital Traction Company (9700 tons), although it is the idea that this would be saved not by shutting down these stations but as indicated above.

STAGGERING OFFICE HOURS OF GOVERNMENT DEPARTMENTS

From the best information available there are nearly 50,000 government department employees who are dismissed each day at 4.30 p. m. The two railway companies together operate 271 cars during the midday non-rush hours, the number being gradually increased to 390 at 4 p. m. and to a maximum of approximately 545 at 5 p. m. There is thus an increase of 155 cars after 4 p. m. which can, in a general way, be attributed to the necessity for carrying the department employees.

At present it seems probable that most of these 155 cars make only about two round trips. If the office hours were staggered so as to begin at fifteen minutes intervals from 8.30 a. m. to 9.15 a. m. and to close correspondingly from 4 p. m. to 4.45 p. m., considerable relief could be obtained in street congestion and a saving effected in coal. At the same time the committee believes that the change would not be so radical as to cause hardship to the employees or to interfere with the necessary relations between the several departments or between the general business community and the departments.

It is estimated that on such a basis the rush-hour cars could make three trips instead of two, and that 100 additional cars would be sufficient for carrying the load on the same basis as it is now carried by the 155. Thus the peak load of the Capital Traction Company would be reduced at least 10 per cent, or about 900 kw., and that of the Washington Railway & Electric Company lines about 1470 kw. With this reduction in peak loads there would be less coal required for carrying banked boilers, estimated roughly at 620 tons per year. It might, of course, be that the railway companies would want to operate a greater number of cars than the above in order to carry the people more comfortably than at present and to lose fewer fares from crowding. If this were done the gain obtained would be in the shape of better service rather than in a saving of coal.

By staggering the office hours a greater amount than this the saving might be increased somewhat, but any greater staggering would interfere too much with the business of the departments and the lives of the employees to be feasible at the present time.

SUMMARY

Summarizing the above, the total weight of coal which the committee believes can be readily saved by changes in the operation of the two railway systems, which could be easily effected without impairing the service to any appreciable extent, and by staggering

the office hours of the government departments by an amount sufficiently small to be easily practicable, is as follows:

Source of Saving	Tons Per Year
Skip-stop plan	9,400
Double berthing and modifying rapid-transit stops	600
Eliminating unnecessary mileage in non-rush hours	3,220
Reducing heat 50 per cent	2,250
Shutting down small plants to effect the same load reduction as would carrying all Capital Traction Company's load by Potomac Power Company	9,700
Staggering office hours of government departments	620
Total	25,790

If heat is shut off during peaks instead of being reduced 50 per cent all day, the saving would be 1500 tons instead of 2250, and the above total would be correspondingly reduced.

Rochester Lines Save Coal

Through Co-operation of Chamber of Commerce and Local Fuel Administrator, Various Operating Economies Are Introduced

BY JAMES F. HAMILTON

General Manager New York State Railways, Rochester Lines

A GOOD example of what can be accomplished by co-operation is shown by the results attained on the Rochester Lines of the New York State Railways in the efforts lately made towards conserving fuel.

The ELECTRIC RAILWAY JOURNAL has already mentioned the appointment, on Jan. 3, by the Public Service Commission, Second District, State of New York, of a committee to study the possibilities of fuel conservation on electric railways, as well as the recommendations drafted as a result of a meeting of this committee in Rochester on Jan. 10. These recommendations were in turn forwarded to all the railway companies in New York State under the Public Service Commission, Second District.

In starting action in the city of Rochester the company realized that any efforts it might make would be futile unless it had the support and co-operation of the directors of local industry and commerce. The Rochester Chamber of Commerce and its energetic secretary, Rolland B. Woodward, presented the means by which this co-operation could be secured. In fact, to Mr. Woodward and Local Coal Administrator M. R. Miller, also a member of the Chamber, are due the real credit for the steadiness and speed with which the electric railways and the industries of Rochester were induced to work uninterruptedly toward the same economic end. It also must be recorded that every meeting held by the Chamber of Commerce for this purpose was unanimous in its action, and this could not have taken place unless the executive heads of all of Rochester's great industries had been unselfishly anxious to assist.

As a preliminary to effective action, the Chamber of Commerce appointed a committee under the chairmanship of J. T. Hutchings, vice-president of the company which furnishes Rochester with its electrical power as well as gas, who at once started the work of the committee.

To the end of reducing the number of cars operated in the rush hours, a study was made as to the location of all the factories, manufacturing plants, department stores, etc., as to the number of persons employed in

them and as to their requirements as regards street car service.

The city of Rochester is peculiar in the fact that its geographical and business centers practically coincide. Most of the transferring from one line to another is done in this common center. It was soon learned that the opening and closing time of the various industrial plants, stores, etc., was the important factor to be considered.

Within twenty-four hours, a tentative schedule was made whereby the opening and closing time was staggered in such a manner as to permit cars to secure full complements of passengers at both ends of their routes. This change in schedule received the ready support and co-operation of all interests and has been in effect fourteen days. It has enabled the company to discontinue the use of twenty cars during the morning rush hours and thirty cars during the evening rush hours. The accompanying table shows the actual hours adopted.

SAVING IN HEAT AND LIGHT

Another surprising result which has been attained has been the saving of from 30 lb. to 50 lb. of coal per car per day ordinarily used to heat the cars, making a total saving of approximately 225 tons per month. All cars on the Rochester system are equipped with coal boxes which were filled each night at the various stations by the mechanical department. As the crews of

STAGGERED HOURS OF OPENING AND CLOSING ROCHESTER'S INDUSTRIAL PLANTS

Industries	Opening Hours		Closing Hours	
	A. M.	P. M.	Previous	Present
Symington Mch. Corp., E. Main	7.00	8.00	3.00	4.00
Ritter Dental Mfg. Co., West Ave.	7.30	7.00	5.30	5.00
Taylor Instrument Co., Ames St.	7.30	7.00	5.30	5.00
Gleason Works, University Ave.	7.00	7.00	5.40	5.40
Symington, Anderson Gun Plant, University Ave.	9.00	8.00	5.00	4.00
Amer. Woodwkg. Mch. Co., Lyell	7.00	7.00	5.00	4.50
Gen. Ry. Sig. Co. (office) West Ave.	8.00	8.00	5.30	5.30
Stromberg-Carlson Tel. Mfg. Co., University Ave.	7.00	7.00	5.30	5.00
Todd Prot. Co., University Ave.	7.25	7.25	5.00	5.00
Gen. Ry. Sign. Co., West Ave.	7.00	7.30	5.15	5.45
Eastman Kodak Co. (1st section), Lake Ave.	7.30	7.10	5.25	4.55
Bausch & Lomb Op. Co., St. Paul	7.30	7.30	5.30	5.30
Eastman Kodak Co. (2nd section), Lake Ave.	7.30	7.10	5.30	5.15
Eastman Kodak Co. (3rd section), Lake Ave.	7.30	7.30	5.30	5.25
Eastman Kodak Co. (4th section), Lake Ave.	7.30	7.30	5.30	5.30
Eastman Kodak Co. to Charlotte, Rochester Folding Box Co., Charlotte	7.30	7.30	5.30	5.15
Retail stores	7.30	9.00	6.00	6.00
Clothing manufacturers	7.15 } 7.30 }	7.30	5.15 } 5.30 }	4.45

cars then filled the stoves whenever they deemed it necessary, more coal was consumed than was absolutely required.

The saving in coal mentioned was accomplished by locating coal boxes at certain points on the system and stationing a man at each location, assigned with the duty of seeing that sufficient coal is placed on fires in such cars as passed his station. This arrangement caused the fires to be coaled at regular intervals and by proper supervision the former waste was eliminated.

Another material result was attained in the saving of coal by following the recommendations of the committee in the matter of lighting cars. By minor changes in the wiring of our cars involving a very slight expense, we have succeeded in reducing by approximately 50 per cent the amount of electric cur-

Indiana Freight Rates Up 15 Per Cent

Commission Recognizes Superiority of Interurban Service—Shows Comparative Steam and Interurban Costs—Allows Emergency Rates

ANOTHER important decision just handed down by the Indiana Public Service Commission concerns charges for freight haulage. In its ruling of Jan. 18 the commission placed the interurbans of the State on an equality with the steam railroads as to freight rates. Although evidence at the hearings showed conclusively that the interurban cost of freight carrying is higher relatively than that of steam railroads, still the new rates will mean much to the traction systems. The increases amount to approximately a 15 to 20 per cent—and in some cases more—advance over former rates. The new rates also make for greater uniformity and less discrimination than did the old rates, established in 1908.

COMPARATIVE COSTS

A study of the compilations made by respondents regarding the terminal and road haul costs, the commission said, showed a surprising difference in operating cost as between interurban railways and steam railroads. In the commission's opinion, it is reasonably fair to assume that the average of less-than-carload revenue and cost is represented by third class. It, no doubt, varies on different interurban lines, but it is a sufficiently average approximation to warrant its use in rate computations.

A comparison of the third-class rates, as shown by the cost figures of respondents, with the third-class intrastate rates for steam railroads, shows that the operating cost of handling classified freight is less to interurban railways than to steam railroads for distances of less than 50 miles, and considerably greater

(Concluded from page 270)

rent used for lighting the cars. Although a noticeable change was made in the illumination of the cars, it cannot be claimed that our cars are unsafely lighted now, for no changes were made in the lighting of platforms or vestibules. At the same time, many pounds of coal will have been saved.

SAVING IS 100 TONS A DAY

The economies cited resulting from the reduction in the heating and lighting of cars, the staggering of the hours of industrial plants and the consequent increase of the load factor of our power stations, made a saving of approximately 17 per cent, or 100 tons of coal per day, and it is expected that a still better showing may be made in the future by additional economies of a similar nature.

We did not find it advisable to inaugurate the skip-stop or stagger stop on our lines because of local conditions, but the study conducted on this plan has resulted in the elimination of a number of non essential stops.

It is with pleasure that I state that our employees are co-operating in every way possible in the fuel conservation movement and that we are receiving the hearty support from the manufacturing industries, the city officials, our Chamber of Commerce and other civic bodies.

for distances above 50 miles, as shown by the accompanying table.

The interurban figures in this table represent the third-class rates justified by respondents' cost figures, if applied on an assumed operating ratio basis of 60 per cent. The figures in the last column represent the third-class rates authorized by the commission for steam carriers operating intrastate.

The hearings showed that the cost of equipment used by the interurbans in rendering freight service is very much greater per unit than is the cost of equipment of the steam roads. The record is also conclusive to the minds of the commission that the volume of business carried is very much less in the case of the interurban. Both of these matters demand consideration of greater investment in rendering service.

SUPERIORITY OF INTERURBAN SERVICE

Laying aside analysis of costs and return on investment, however, the commission stated that uppermost in its mind was the question of the justice of requiring the interurban railways to render at a lower rate the same service as that rendered by the steam railroads, if not better. The record indicated that the service of

	Interurban Railways	Steam Railroads
5 miles	\$0.972	\$0.125 per 100 pounds
10 miles .....	.9855	.13 per 100 pounds
20 miles .....	.112	.145 per 100 pounds
40 miles .....	.1646	.18 per 100 pounds
60 miles .....	.2172	.20 per 100 pounds
80 miles .....	.2699	.215 per 100 pounds
100 miles .....	.3309	.23 per 100 pounds

this character rendered is not only equal but superior to that of the steam railroads. The superiority of interurban freight service, the commission said, is quite generally recognized by shippers and commissions.

In conclusion the commission stated that it would not be able, in all probability, to justify the new rates for operation during normal times. It would, therefore, deal with the interurbans as it did in its recent order for the steam railroads, by putting into effect "war-time emergency rates," these to be limited to a period of one year from the date of order. Present abnormal operating costs are thought by the commission to be temporary.

The companies covered by the order are the Terre Haute, Indianapolis & Eastern Traction Company; Ohio Electric Railway; Union Traction Company of Indiana; Indianapolis & Cincinnati Traction Company; Chicago, South Bend & Northern Indiana Railway; Southern Michigan Railway; Fort Wayne & Northern Indiana Traction Company; Fort Wayne & Decatur Traction Company; Interstate Public Service Company; Louisville & Northern Railway & Lighting Company; Louisville & Southern Indiana Traction Company; Indiana Railways & Light Company, and Indianapolis & Louisville Traction Railway.

The Missouri Public Service Commission has issued a 163-page booklet, giving in the form of annotations, of sufficient thoroughness to serve as a digest, a complete statement of the points ruled upon in formal adjudications affecting the public service commission law of that State. At the close of the work appears a table of cases, arranged according to reports, volumes and pages, from which the case title of any decision shown can be readily obtained.

Public Control; Guaranteed Dividend; Higher Fare for Rehabilitation

Massachusetts Public Service Commission Recommends to Legislature Plan Whereby Stockholders, Car-Riders and Taxpayers Can Help to Restore Boston Elevated Railway—In Report on Operation Mr. Beeler Points Out Possible Operating Economies of \$1,200,000 a Year—Says System Needs \$2,700,000 for Rehabilitation Annually for Five Years

THE transportation system of the Boston Elevated Railway is not meeting the public needs, for the property has not been kept in good, modern operating condition, the net earnings are shrinking, the service is poor and the credit is gone. Such is the opinion expressed by the Massachusetts Public Service Commission in a special report on Feb. 2 to the State Legislature.*

In order to avoid a receivership, the commission recommends the adoption of public control and the use of public credit. It would, in short, have the stockholders place the property in the hands of trustees representing the public, and then have the municipalities served guarantee a 5 per cent dividend for two years and 5½ per cent thereafter. The sale of the Cambridge Subway to the Commonwealth would provide \$9,000,000 of new funds. The ordinary costs of service would be met by a 5-cent fare, deficits being covered by the municipal guarantee. An extra cent, however, could be charged by the trustees in order to meet the extraordinary costs of depreciation and rehabilitation. The commission is preparing a draft of the necessary legislation to accomplish these changes.

In the commission's opinion, such a plan has the advantage over any other that has been suggested for these reasons:

"It definitely establishes the status of investors. It creates public confidence in the administration of the company's affairs, and conditions favorable to the effecting of all feasible operating economies. It provides, at relatively low cost, a sure source of new capital. It takes care of depreciation. It makes possible, without inflation, whatever rehabilitation of the property is practicable under present conditions. It distributes the burden in the emergency fairly between car-riders and the whole community, and it makes it certain that any increase in fares which may be made will be used to insure better service at lower operating cost."

The commission's report is submitted in two parts—the first containing a statement of the essential facts, and the second discussion and recommendations. The first part covers the organization of the company, its finances and rate of return, and similar basic facts. Expenses and charges during the last two years, it is shown, have been increasing at a faster rate than earnings, and this tendency has been even more marked in the months since June 30, 1917. And during the coming year, it is said, the situation is likely to grow worse.

The first part also includes a summary of a report by John A. Beeler in regard to management and operation.

Shortly after the Public Service Commission was authorized on June 15, 1917, to continue the study of the Boston Elevated Railway, it engaged Mr. Beeler to make a special investigation. Mr. Beeler's examination began in July and ended in November. His report, constituting with exhibits a printed book of 279 pages, has now been made public in connection with the commission's own report.

MR. BEELER CRITICIZES EQUIPMENT AND TRACK

In summarizing Mr. Beeler's report the commission notes the following conclusions in regard to physical property: Mr. Beeler finds the rapid transit track in good condition, but the surface tracks are in poor shape. He says: "There are miles of rails that are crooked, broken, patched, repatched and welded, with joints that have been cupped, built up, hammered out and built up again. The general condition is, in fact, bad. 'Slow orders' are now in effect covering 34 miles of main line track."

Rolling stock is in about the same condition. In Mr. Beeler's opinion, "outside of the comparatively few stepless, center-door cars, which are modern, efficient and attractive in every respect, the equipment on the streets of Boston is either semi-obsolete or completely so." Most of the surface cars, judged by modern

*The present report of the Massachusetts Public Service Commission to the State Legislature originated in this way. As a result of the plea of the Boston Elevated Railway for financial relief, a special recess commission was organized by legislative resolution about the middle of 1916 to report to the Legislature on the needs of the property. The commission was composed of the Lieutenant-Governor of the State as chairman, the President of the Senate, the Speaker of the House, two members of the Senate, four members of the House, and the full boards of the Public Service Commission and the Boston Transit Commission.

After long and careful consideration of the company's brief, abstracted in the *ELECTRIC RAILWAY JOURNAL* of Sept. 30, 1916, the special commission on Feb. 1, 1917 (*E. R. J.*, Feb. 10, 1917), recommended that the Legislature grant certain measures of relief which did not involve any direct burden on the public. These measures included abolition of the compensation tax and State acquisition of the Cambridge Subway. The commission noted certain objections to a fare increase and recommended that action be deferred. It suggested that the Public Service Commission investigate and report by February, 1918, upon the company's efficiency of management and that the Boston Transit Commission report at the same time upon the prospective rapid transit needs for the next decade.

The most important recommendation of the special commission—namely, State acquisition of the Cambridge Subway—was not adopted by the Legislature because of executive opposition. Certain lesser recommendations, tending to improve the financial condition of the company, were followed, and provision was made by special legislative act for further inquiry by the Public Service Commission along the lines above indicated. The report now made by this body should, therefore, be regarded as a continuation of and supplement to the report of the special commission in 1917.

The 1917 report of the special recess commission and the present report of the Public Service Commission deal with the electric railway situation only in Boston. These reports should not be confused with one under way for the whole State of Massachusetts. By legislative resolution a "street railway investigation commission" was created near the middle of 1917 to study the general problems of electric railway administration and financing and to report to the 1918 Legislature. The report of this body, just presented and briefly described in the News Section this week, indorses a service-at-cost plan suggested by Massachusetts investors. The approval of this plan, for State-wide use, by the Public Service Commission was noted in remarks of Chairman F. J. Macleod reported in the *ELECTRIC RAILWAY JOURNAL* of Feb. 2.

standards, are uneconomical and inefficient. Many of them are in need of paint and have not been kept clean or in good repair. The wooden cars on the rapid transit lines are "fast approaching the day when they should be retired and all-steel cars substituted." Service on these lines is frequently interrupted by equipment defects.

Power stations and apparatus on the whole are in excellent condition. Many of the other buildings, however, are not well suited for present railway use, some of them being inheritances from horse-car days. Carhouses and shops are widely scattered and often of unsatisfactory design. "A material reduction in the cost of maintenance could undoubtedly be made by new shops and consolidation of departments," if the company's financial condition warranted the expenditure.

Mr. Beeler's findings in regard to the physical condition of the Boston Elevated Railway, briefly indicated above, are said to be largely confirmed by the commission's own inspectors. Furthermore, it says that it does not understand the company to contest their general accuracy.

Mr. Beeler believes that a much larger sum should be appropriated each year for depreciation. For 1916 his report places this amount at \$2,247,995, or about 4.4 per cent of the book value of depreciable property. Compared with the expenditure actually made for depreciation purposes in that year, the additional amount which should have been spent or set aside is placed at \$1,508,073.

The company, the commission says, offers no specific objection to Mr. Beeler's estimate of depreciation requirements. In the commission's opinion, it is clear that depreciation has been neglected. Whether or not Mr. Beeler's estimate is correct, however, is a more difficult question. It is not wholly certain, the commission states, that past experience may be taken as a trustworthy guide for the future. The useful lives assumed by Mr. Beeler for the various classes of property are as follows:

Class	Life
Track and line.....	18 years
Cars and car equipment.....	22 years
Power plant buildings and equipment.....	25 years
Shops, car houses and equipment.....	25 years
Elevated stations.....	50 years
Subway and tunnel equipment.....	25 years
Signals and telephones.....	20 years
Bridge betterments.....	50 years
Engineering and superintendence.....	24.6 years

According to the commission, these lives are similar to those usually employed in depreciation estimates and take into consideration obsolescence and inadequacy, as well as wear and tear. If cars are properly repaired they can be made to last almost indefinitely; but it is assumed that at the end of twenty-two years they will be obsolete in type and ripe for replacement. The same is true of power plants and shops. It is not easy to believe, however, that the new and modern cars which are

now being received will reach the end of their usefulness in twenty-two years, or that the new power station in South Boston will be ready for the scrap heap at the end of twenty-five years.

The general conclusion of the commission is that Mr. Beeler's estimate is generous. It represents a standard which a company might well maintain in times of prosperity, although the commission is inclined to believe that it would prove, in practice, somewhat higher than necessary to keep the property in reasonably modern condition. As long as war-time conditions prevail, it would be consistent with the public interest not to require so high a standard to be maintained. If the company were able to appropriate one-half as much for depreciation as Mr. Beeler estimates, it would be doing far more than it had ever done in the past.

The greater portion of Mr. Beeler's report deals with operating conditions. While he considers the existing management "virile and aggressive" and has high praise for the work of many departments, he believes that service can be improved and large savings effected in operating expenses if certain changes are made. Briefly stated, these are as follows:

1. *Changes from Surface Car to Rapid Transit Operation*

Certain subways and elevated structures are now used by surface cars. These are the Tremont and Boylston Street subways, the East Boston tunnel, and the elevated and viaduct from North Station to Lechmere Square. By an analysis of operating expense Mr. Beeler shows that it is much more costly to operate surface cars than rapid transit trains, and the accommodations are inferior. On the other hand, in the case of the rapid transit and surface subway lines the overhead charges, representing rentals actually paid and a return of 6 per cent on the investment, are enormous. Out of each \$1 of receipts 71.4 cents on the rapid transit lines and 79.6 cents on the surface subway lines are absorbed for that purpose, as compared with 14.7 cents on the street surface lines. The cost of subways and tunnels is so great that they ought to be utilized in the most efficient way. He therefore proposes to substitute trains for surface cars wherever feasible.

Under his plan, three-car trains would be operated from the Kenmore terminal of the Boylston Street subway to the North Station on a two and one-half minute headway during normal hours and a two-minute headway during rush hours. From the North Station the trains would go alternately to Lechmere Square over the viaduct lines, and to the South Station over the Atlantic Avenue line, giving five-minute service during normal hours and four-minute during rush hours on each. A simple terminal would be built at the Kenmore station, and passengers using the Beacon Street and Commonwealth Avenue surface lines would transfer at this point. Cars now entering the subway at the Public

Proposed Relief for Boston Elevated

Municipal guarantee of 5 per cent dividend for two years and 5½ per cent thereafter.

Control by board of trustees representing public.

\$9,000,000 of new money through purchase of Cambridge Subway by Commonwealth.

Deficit below ordinary costs of service under 5-cent fare to be met by municipal guarantee.

Six-cent fare chargeable at will of trustees, the extra cent going into a fund to meet extraordinary costs of providing for depreciation and rehabilitation.

Garden would loop back through Park Square and Church Street, passengers transferring to the subway trains. Cars now entering the subway at Pleasant Street would turn back at the Boylston Street station; and cars using the viaduct line, at Lechmere Square, where a terminal station would be constructed.

Mr. Beeler discusses the advantages and disadvantages of this plan at length and finds that the former greatly outweigh the latter. Perhaps the two most important advantages are that it would make possible a great improvement in the service on the Washington Street tunnel line and also go far to eliminate the confusion and congestion at Park Street. At the latter street the present congestion is caused chiefly by the cross-currents of passengers seeking cars at different berths. The number of seat miles operated through the subway would be increased by the proposed plan, and confusion would be avoided, since passengers could board the first train available instead of waiting for some particular car.

The plan contemplates raised platforms, flush with the car floor, at all stations in the Boylston Street and Tremont Street subways, and the introduction of the third rail. The company will soon have, with the rapid transit cars already ordered, sufficient equipment for the purpose, and the total expense, including the stations at Kenmore and Lechmere Square, is estimated by Mr. Beeler at about \$400,000.

2. Changes in Rapid Transit Operation

Service on the route between Sullivan Square and Forest Hills is now impaired by the fact that about every fourth train goes over the Atlantic Avenue line, instead of through the Washington Street tunnel. Crowds collect in the tunnel stations during this interval, the next train is overcrowded and delayed and the entire schedule slowed down. Trains move through the tunnel in bunches of three with loads badly distributed, while the Atlantic Avenue trains have excess capacity. By linking the Atlantic Avenue line with the Kenmore-Lechmere Square route, as above described, regular and dependable service could be given in the Washington Street tunnel.

3. Changes in Surface Car Operation

Mr. Beeler finds that from the point of view of the average car-rider, the most serious fault in the operation of surface cars in Boston is the extremely distorted headway on many lines. He recommends a rerouting of cars, based on the principles that main lines from outlying points should, in general, terminate at the nearest rapid transit station; that lines performing crosstown service should be maintained strictly as crosstown lines, and that lines crossing the congested business district should have the shortest possible routes. The rerouting recommended is set forth in detail for each district. Mr. Beeler believes that this plan would give more efficient service with less of the objectionable bunching of cars, and at the same time save a substantial amount of car mileage.

A further bad feature of present surface car operation is the amount of time consumed in lay-overs at the end of runs. Out of every hour eleven and one-half minutes are so used, or 19.2 per cent of the total active time. Mr. Beeler shows that this is much in excess of the percentage in other large cities. In his rerouting

plan the average lay-over is decreased from eleven and one-half minutes to eight and one-half minutes, resulting in an estimated saving of \$171,716 per year.

4. Power and Transportation Economies

The report states that power, although produced with great economy, is now wastefully used. Cars almost invariably are started with brakes only partially released, and, owing to the manner in which the rigging is adjusted, are operated most of the time with shoes touching the wheels. Motormen should be taught to use the controller properly and to throw off power and coast as often as possible. The use of a device for measuring efficiency in this direction, properly followed up, should result in a saving of about 20 per cent of the power consumed.

The cost of superintendence of transportation is very high. Mr. Beeler recommends in detail a new and less complex scheme of organization eliminating superfluous officials and cutting expenses about \$100,000 a year, at the same time bringing the management into closer touch with the men. It contemplates a reduction in the number of operating divisions, carhouses and rating stations, the merger of the inspection and instruction departments, and fewer starters and clerks.

Station employees in connection with prepayment areas cost the company \$400,000 in 1916. Mr. Beeler believes that many of these are unnecessary, and that, by a systematic reduction in the force, a saving of at least \$80,000 can be effected.

5. Further Suggestions

Other opportunities for economy are suggested by Mr. Beeler. Minor matters are wasteful methods in sanding track and removing snow, and the possible elimination of certain rapid transit stations which are little used. Of more importance is the method of issuing, collecting, inspecting and accounting for paper transfers. Improvements are recommended which Mr. Beeler believes will greatly reduce the present transfer abuse, thus conserving revenue. Suggestions are also made with respect to the methods of handling damage claims and in regard to the sale of unused real estate. In the case of the employees, the application of the principle of seniority to shop work is criticised, and the desirability of hearty co-operation between the men and the company is emphasized.

6. Summary of Estimated Savings

The estimated savings involved in his recommendations are recapitulated by Mr. Beeler as follows:

Equipment:		
Due to reduced mileage.....		\$91,551
Power:		
Due to reduced mileage.....	\$52,751	
Due to increased coasting.....	153,099	
		205,850
Conducting transportation:		
Superintendence	\$101,604	
Station expense	80,000	
Smoking cars	6,000	
Reduced mileage	456,546	
Reduced lay-overs	171,716	
		815,866
Injuries and damages:		
Due to reduced surface mileage.....		\$9,189
		\$1,202,456

It is stated that these savings would be largely due to the substitution of rapid transit for surface operating methods, and changes made possible thereby. Some of them could be made at once on the inauguration of the

new service; others, such as the savings incident to better use of power, could only be obtained gradually. No allowance was made for possible savings under Section 5 above.

REHABILITATION OUTLINED BY MR. BEELER

Mr. Beeler concludes his report by stating that examination of the physical property, especially rolling stock and track, furnishes convincing evidence that the system must pass through a thorough rehabilitation. In other words, renewals neglected in the past must be made and all abandoned property taken from the accounts. If such rehabilitation is not undertaken, he believes that the situation can only go from bad to worse.

Assuming that five years would be necessary for such rehabilitation, he summarizes the cost of the work as shown in the table below.

This estimate covers the approximate cost of placing roadbed and track in good average condition; of substituting modern, semi-convertible equipment for most of the old box cars and open cars now in use, and of improving shops and carhouses. The making good of impairment caused by discarded property would be an additional charge upon earnings.

Under Section 10 of Chapter 500 of the Acts of 1897, the amended legislative act under which the Boston Elevated Railway operates, the company was restricted from charging more than 5 cents, but it secured special protection against a reduction in the rate. This contract, the commission says, was not imposed upon the company against its will. Because of it, the company has not been required to pay the so-called "commutation" tax imposed upon all other electric railway companies or to carry school chil-

Track:	
29 miles per year for five years at \$35,000.....	\$5,075,000
Cars:	
New passenger cars.....	5,000,000
175 motor equipments at \$5,000 for center-door trailer cars.....	875,000
Power:	
Installation of power-saving devices on cars.....	150,000
Rapid transit system for Boylston and Tremont Street subways, etc.	400,000
Shops, car houses and miscellaneous.....	2,000,000
Total rehabilitation cost.....	\$13,500,000
Cost per year for five-year period.....	\$2,700,000

dren for half fare. On the other hand, the company has frequently accepted the provisions of statutes providing for new subways or tunnels, although it had the legal right, under the terms of the contract, to refuse to do so.

The question which the Legislature asked the commission is this: Should Section 10 be repealed? It is a contract, the commission now replies, which cannot be annulled without the consent of the company, but it is assumed that such consent will be given if the contem-

plated action is likely to improve the financial position of the stockholders. If the contract is to be abrogated, however, such action should be taken because the public interest makes it necessary.

In the present case, the commission avers, the public need is clear. Physically and financially the transportation system operated by the Boston Elevated Railway is now below par. The duty of the Legislature, therefore, is to take such steps as are necessary to secure for the metropolitan district the transportation facilities and service which are essential to its welfare, but, in so doing, to impose as small a financial burden as possible upon the community.

The plan suggested to the Legislature by the commission provides for direct public control, but at the same time retains the advantages of private ownership. It leaves the situation such that at any time in the future the present status may be restored without difficulty, if such a course should then be deemed wise. The plan follows:

1. The company shall remain a private corporation, subject to the laws of the Commonwealth, and there shall be no transfer of the ownership of its property, except in the case of the Cambridge Subway.

2. The stockholders shall, in return for the guarantee of dividends of 5 per cent upon their shares for two years and 5½ per cent thereafter and as long as this guarantee continues, in effect transfer their voting power to a board of trustees representing the public.

3. This guarantee shall be made by the cities and towns served by the company through the medium of the Commonwealth, it being made in the name of the Commonwealth but with the provision that any payments thereunder shall be assessed upon the cities and towns in proportion to track mileage.

4. This guarantee shall continue indefinitely, until the Legislature shall otherwise order.

5. The board of trustees shall consist of five members, two of whom shall be residents of Boston appointed by the Mayor of the city, two of whom shall be residents of the other cities and towns served by the company appointed by the Governor, the fifth member, who shall be chairman, to be chosen by the other four members or, in the case of inability to agree, by the chief justice of the Supreme Judicial Court. No trustee, however, shall be an officer of the company.

6. The trustees shall receive from the company salaries to be fixed by the Legislature and shall be permitted to engage in other business not inconsistent with their official duties; they shall become the directors of the company; and their term of office shall be three years, all terms expiring at the same time, so that there may periodically be a complete change of control, if deemed desirable in the public interest.

7. The plan shall take effect upon the acceptance of the statute in which it is embodied by two-thirds in interest of the stockholders at a meeting duly called for the purpose; the present contract between the State and the company, as far as it relates to fares, shall cease upon, but not before, such acceptance; and upon and after such acceptance, the voting powers now exercised by the stockholders shall be exercised by the board of trustees appointed as above provided. If deemed advisable, the transfer of voting power to the trustees might be made by written instruments signed by the stockholders or by deeds of trust accompanied by a deposit of the shares in exchange for certificates of beneficial interest.

8. It is proposed that the company shall be subject, ex-

No Ordinary Relief Sufficient

Any of the ordinary methods of providing relief would be insufficient. If the company merely receives the right to charge a 6-cent fare, there is no likelihood, under present financial conditions, that any large amount of capital would be forthcoming, except at excessive cost, or that any plan of rehabilitation would be adopted which would really go to the root of the difficulty.

Unusual conditions demand unusual remedies. The commission believes that in the present emergency private credit and private enterprise are unequal to the task and that no fundamental improvement can be accomplished unless the whole community puts its shoulder to the wheel and pulls the Boston Elevated Railway out of the slough into which it is rapidly sinking, the burden being shared by stockholders, taxpayers and car-riders.

—MASSACHUSETTS PUBLIC SERVICE COMMISSION

cept as may otherwise be specifically provided, to the supervision of the Public Service Commission.

9. It is proposed that new capital shall be provided in the manner recommended by the special commission last year—namely, by the sale to the Commonwealth of the Cambridge Subway, payment to be made in installments as funds are needed.

Under this plan, the commission says, transfer of control would be effected without any more disturbance of the affairs of the company than would be caused by the election of a new board of directors. The trustees could, and probably would, retain the present officers. Neither the city nor the State would alone control. The purchase of the Cambridge Subway would provide, at low cost, a fund of about \$9,000,000 to be drawn upon for capital purposes, and would make unnecessary any issue or guarantee of new securities for a considerable period of time.

In the opinion of the commission the plan proposed is fair and advantageous to the stockholders, and it is fair to the public. As for an appraisal of the Boston Elevated and West End properties, the commission has not felt that such is necessary in order to deal justly and wisely with the existing situation. According to the commission, there have been faults in management, extravagances and instances of bad judgment, but the company has provided a great and costly system of transportation and has continually enlarged the service which a passenger may receive for a 5-cent fare. If it has neglected depreciation and failed to keep its property in the best of condition, this has been due very largely to the attempt to satisfy two conflicting interests. On the one hand has been constant pressure from the public for new and costly rapid transit facilities; on the other has been the desire to meet the reasonable expectations of stockholders.

In renewing the recommendation of the special commission last year for the acquisition of the Cambridge Subway by the Commonwealth, the Public Service Commission answers the objections of the Governor as follows:

"There is nothing novel in public ownership of subways and tunnels in the metropolitan district. The policy was first adopted in 1894 and has been consistently followed ever since, except in the case of the Cambridge Subway. Manifestly it is desirable that the whole connected group of subways and tunnels in Boston should be publicly owned, rather than that a minor portion should be retained in private hands.

"Local transportation systems bear a less direct relation to the war emergency than do the steam railroads, but it is clear that a breakdown in the Boston Elevated system, or even serious congestion of its service, would diminish the efficiency of a population whose energies are being devoted in no small measure to war purposes. Any expenditures necessary to keep this transportation system in good workable condition and to prevent intolerable overcrowding and delay are justifiable, under existing conditions, and, if the credit of the Commonwealth is used either directly or indirectly to meet such needs, it would be employed in the common defense."

POSSIBILITY OF OPERATING ECONOMIES

Even under the commission's plan the problem will still remain of taking the necessary steps to rehabilitate and improve the property and of meeting the cost of providing the service, including the guaranteed return.

Upon the present basis, the commission states, there seems no prospect that the company will earn 5 per cent upon its stock during the current year. Any deficiency can be met in but three ways, through operating economies, an increase in fares or taxation.

Conceding that the investigation was "both thoroughly and intelligently" made, that "if the improved methods and practices suggested by Mr. Beeler could be adopted they would undoubtedly result in a considerable saving," and that "most of his suggestions, in principle at least, are sound," the company expresses the opinion that "the possibility of instituting many of the savings is somewhat remote," chiefly because of local conditions, and that a much larger expenditure of capital would be involved than has been estimated. According to the commission, the local conditions to which the company refers have to do with the attitude of the public and of its own employees. In other words, the view is that the necessary co-operation of the men could only be secured after long effort and that the changes in operation recommended in the report might not prove acceptable to the public.

The commission believes that Mr. Beeler has made a most valuable report. It has been printed for free circulation, and after the public has become acquainted with it hearings will be held with a view to definite action. It will be necessary in some instances to enlist the good-will and co-operation of the employees, in others to make certain capital expenditures, and in still others to receive the approval and help of the public. The process will be gradual, and various modifications and adjustments may prove necessary, but to the commission the prospects seem good that ultimately substantial economies can be effected, and that some can be secured at once.

WHAT REHABILITATION IS DESIRABLE NOW?

While economies of operation and of management will help, it is clear to the commission that they will not wholly solve the problem, especially if depreciation is provided for and rehabilitation undertaken. Under the circumstances, any construction of new subways may be dismissed from immediate consideration, and also any plan for the provision of new shops. The work now in progress on the Dorchester tunnel and the Everett extension, however, should be pushed to completion as rapidly as possible, and any new construction work ought to be undertaken which is incidental to such of Mr. Beeler's plans for the better utilization of existing facilities as may finally be adopted. Furthermore, every effort should be made to restore the surface track to first-class condition and to begin the gradual substitution of modern rolling stock for present obsolete equipment. Provision should be made for future depreciation, perhaps not so large a provision as Mr. Beeler recommends, but a far better provision than has heretofore been made, and discarded property should gradually be eliminated from the accounts.

Additions and betterments may properly be paid for out of the proceeds from the sale of the Cambridge Subway or out of the amounts taken from earnings to offset discarded property. Replacements, however, ought to be charged at once against income. The act of last year permits a different procedure. Under this statute replacements, such as would be involved in any extensive substitution of new rolling stock for old, may

be capitalized temporarily and charged off gradually over a period of not more than fifteen years.

The trouble with this plan, to the commission's mind, is that it temporizes with the situation. It will be far better for the public and for the company, if it can be done, to meet the cost of replacements directly from earnings, avoid any inflation of capital, even though it be temporary, and secure at once the full financial advantage from change of conditions. Any increased burden upon earnings could be fully met only in two ways—through an increase in fares or through general taxation.

HIGHER UNIT FARE SIMPLEST AND EASIEST WAY OF RAISING FARES

The commission feels that a straight increase in the present unit charge is the simplest way of raising fares and the one of easiest application. Strong arguments can be advanced for the "zone system," and in certain situations, particularly where the amount of short-haul riding is large, these arguments may have controlling force, as the commission has recognized recently in the Holyoke fare case. In the present instance, however, the rapid transit lines and congestion are embarrassing factors, and the disadvantage of a straight increase is less marked because of the preponderance of long-haul riding. The Boston Elevated system, as Mr. Beeler points out, is distinctively a long-haul system, and the facilities which it affords are so necessary to most patrons that a 6-cent fare would probably result in less decrease in riding than is ordinarily the case.

COMMUNITIES SHOULD SHARE BURDEN

In the commission's opinion, however, the communities served should share the financial burdens of the situation, and it recommends the following plan, to be used in conjunction with public control:

1. If the revenue derived each year from a 5-cent charge on each passenger and other sources of income is insufficient, after allowing 16 per cent for maintenance and depreciation, to pay all other operating expenses, interest, rentals, taxes and other charges against income, and dividends at the guaranteed rate, the deficiency shall be met under the guarantee by the cities and towns served in proportion to track mileage.

2. If the revenue so derived is more than sufficient to pay such expenses and charges and dividends at the guaranteed rate, the excess shall be applied to the following purposes in the order given:

- (a) To repay any amounts which may have been contributed by the cities and towns under the guarantee.
- (b) To meet any additional requirements which would otherwise be met by an increase of 1 cent in the unit fare, as below provided.
- (c) To meet the cost of extensions and improvements to the property, with the proviso, however, that if excess earnings should reach this point the board of trustees would be empowered, at its option, to reduce the unit fare below the 5-cent rate.

3. The board of trustees shall have power at any time, without recourse to the Public Service Commission, to increase the unit fare from 5 cents to 6 cents, the additional cent paid by each passenger to go into a special fund to be used only to make such further provision for depreciation and rehabilitation and for the gradual charging off of discarded property as the board of trustees, with the advice of the commission, shall determine to be necessary.

Under this plan, the 5-cent charge would be used to meet what might be termed the ordinary costs of service, the taxpayers making up any deficiency. The extraordinary costs of providing for depreciation and re-

habilitation would be met by the additional 1-cent charge. This makes it necessary to draw some line between maintenance and depreciation, and the standard of 16 per cent of gross receipts which has been adopted is about the amount which has been expended in the last two years for maintenance, exclusive of the sums set aside for depreciation.

Upon the basis of the number of revenue passengers in 1917, an additional cent charged throughout the year would yield \$3,810,173. It would furnish a large fund for rehabilitation purposes and would make it possible, if conditions were favorable, to complete the work within a reasonably short period of time. For every dollar spent in this way the public would benefit in better service and the company in lower operating cost.

Tramway Makes Good Fuel-Saving Record

EXTENSIVE generating economies and the co-operation of its employees, encouraged by a judicious bonus system, have resulted in a substantial saving in coal by the Denver (Col.) Tramway, as shown by a comparison of its records for the months of December, 1916 and 1917. In telling the public with posters and through the newspapers of the good showing made last month, the company directed attention to the current issue of *Tram-o-Grams*, in which it was explained how the saving was accomplished. The installation of new generating equipment has reduced the coal consumption during the last two years from 4½ lb. to 2½ lb. per

**Are you doing your bit
for the Fuel Admin-
istration? We are.**


We saved—


**3,000 TONS OF COAL
LAST MONTH!**

HOW?

**Read the Jan. 12 issue of
Tram-O-Grams**

**OUT
SATURDAY**





The Tramway power plant is saving 3,000 tons of coal per month through generating economies—
—yet used 6,218,875 kilowatt hours of electricity MORE last year for heating, lighting and operating Tramway cars than was used in 1915!

More heat, better lights, more power for more cars in 1917 with less coal consumed than in 1915.

At the request of the U. S. Fuel Administration we do not turn heat on in the cars until temperature goes down to 32° above zero, but at that point it goes on and stays on. In 1915 heat was frequently cut off during the rush hours.

In many Eastern cities coal shortage has forced the street railways to cut off heat entirely in the cars, in some only 75 or 85 per cent of the regular number of cars can be run.

See Tramograms on the cars today.

SAMPLES OF DENVER TRAMWAY FUEL-SAVING PUBLICITY

kilowatt-hour and decreased the amount of help necessary by reducing the number of boilers, although the length of working day was decreased and vacations for the men were also introduced. A system of bonuses by which the power-house employees share in the savings has induced the men to lend their efforts heartily in searching out all possible sources of economy, with the result that now the slogan is to "get it down to 2¼ lb. per kilowatt-hour." More scientific operation of the cars is also partly responsible for the reduced fuel record. The tramway company is said to be prepared to extend the bonus system to other than the power department as soon as the men make it worth while by increased efficiency.

Pittsburgh Railways Charging Higher Fares

New Fares Put on Trial Last Month Well Received by Public Despite Handicapped Service Due to Severe Winter—Two Rides for 11 Cents

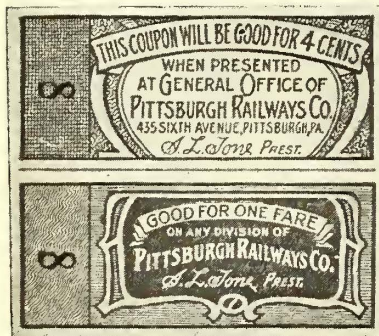
ON JAN. 22, following the thirty days' notice required by the State law, the Pittsburgh Railways put into effect two new rates of fare, as follows:

If the passenger pays a cash fare, he pays 6 cents for a single ride. He may, however, buy two tickets for 11 cents, or a strip of ten tickets for 55 cents, making the charge for a ride 5½ cents. These tickets are sold by conductors and also at a number of stores in Pittsburgh and in the different cities and towns through which the lines of the Pittsburgh Railways extend. These stores are glad to sell these tickets at cost, in view of the trade which is brought to them by this convenience. In the advertisement which the company carried in the daily papers announcing the increased fare, the names of stores in which tickets would be sold were published.

AVOIDING DIFFICULTY IN MAKING CHANGE

A fear sometimes expressed in connection with the establishment of a six-cent fare is that conductors will be delayed in making change, especially at first, when passengers are not accustomed to tendering the exact fare. It is thought that the use of tickets will materially reduce this delay. Another plan was also adopted

besides that of supplying conductors with \$3 in 1-cent pieces when he starts on his run. This plan is to issue a 6-cent ticket combined with a 4-cent change coupon, so that the combination can be sold by the conductor for 10 cents. A reproduction of one of these "change coupons,"



TEN-CENT CHANGE COUPON

with the 6-cent ticket attached, is illustrated herewith. These change coupons, by themselves, can be used as cash in payment of fares. That is to say, they will be accepted by conductors at a value of 4 cents with 2 cents additional in payment of a fare. Or two 4-cent "change coupons" and 3 cents in cash will be accepted by conductors as payment for two single-fare tickets of the value of eleven cents. In other words, the object of the company in issuing the "change coupon" is to avoid delays when passengers are boarding cars and because of the prevalent scarcity of pennies.

Before the plan was inaugurated the company carried advertisements in the daily newspapers giving all information, and explaining that passengers could assist in eliminating loading delays by using tickets of the two-for-11-cent kind or by having the exact fare in 6 cents ready, or by accepting the 4-cent "change coupon," if they should proffer a dime for fare.

These regulations have proved much less formidable in practice than they sound. As a matter of fact, the public has bought the two-for-11-cent tickets in enor-

mous quantities, so that the 6 + 4 combination remains simply an emergency relief for the conductor. Studies are now being made to secure the proper kind of locked, non-jamming fare box. At present, fares are collected by hand.

HIGHER FARES A SUCCESS

The company has reason to feel highly gratified at the way its patrons have appreciated the justness of a higher rate of fare, particularly as the unusually severe winter,

<p>INSTRUCTIONS TO CITY AND SUBURBAN TRAINMEN.</p> <p>GENERAL ORDER No. 645.</p> <p>January 18th, 1918.</p> <p>TO CONDUCTORS AND ALL CONCERNED.</p> <p>ALL DIVISIONS—</p> <p>PITTSBURGH RAILWAYS COMPANY:</p> <p>Commencing Tuesday, January 22d, 1918, the day fares are increased from 5 cents to 6 cents, or 5½ cents when tickets are used. Fare zones remain the same, except in the case of the Verona line, Route No. 708, which has been divided into two fare zones instead of one, the dividing line or fare point being Gandy Creek Station.</p> <p>Conductors will be supplied with a new type Series "A" ticket, put up in strips of ten (10) tickets, which conductors will sell to passengers at 55 cents per strip of ten (10). Conductors will also sell to passengers who make the request, two (2) of these tickets for eleven (11) cents.</p> <p>Conductors will also be supplied with single fare tickets (value 6 cents) to which is attached a "change-coupon" (value 4 cents), which the conductor will sell for 10 cents. These tickets will be put up in pads of 25 strips, each strip composed of five (5) tickets, each good for one six-cent fare, and five (5) "change-coupons" each redeemable for 4 cents.</p> <p>This "change-coupon" will also be accepted by the conductors as part payment for a fare, at its face value of 4 cents.</p> <p>CONDUCTORS ARE EXPECTED TO START THEIR DAYS WORK WITH \$3.00 CHANGE IN PENNIES, and where possible are to make change in all cases. When impossible to make change, they will sell to passengers for 10 cents, a ticket and coupon as described above. The passengers will detach the ticket and deposit same in fare box (where fare boxes are used) and retain the change coupon for future use.</p>	<p>An additional supply of these 4-cent "change-coupons" will be furnished, which the conductor is permitted to use in making change in case he runs out of pennies, or at any time when passengers are willing to accept them. A sample of this coupon is shown on page 8.</p> <p>Conductors must watch carefully to see that passengers do not pay their fare with this 4-cent "change-coupon" and must be careful to secure 2 cents additional from passengers when it is tendered. The 4-cent coupon is not a reduced rate ticket and must be accepted merely as if it were 4 cents CASH. Conductors cannot accept this coupon and 7 cents for two fares, nor can they accept 11 cents cash for two fares. They can, however, sell two tickets for 11 cents, or two tickets for TWO 4-cent coupons and 3 cents cash, or for ONE 4-cent coupon and 7 cents cash, and then permit the two tickets to be dropped into the fare box for two fares, but according to the Schedule which has been filed with the Public Service Commission, the principle must always be followed that the fare is 6 cents when paid in cash, and 5½ cents when tickets are used.</p> <p>The conductors on other than fare box cars must cancel by punch marks, the tickets as soon as he receives them from the passengers.</p> <p>IT IS IMPERATIVE THAT CONDUCTORS KEEP THEMSELVES SUPPLIED WITH THESE NEW TYPES OF TICKETS.</p> <p>Where fare is paid in cash it must be 6 cents and 2 cents for every additional one cent additional in tickets are used, which can be purchased as outlined above.</p> <p>Where the old style Series "A" cash tickets are presented, they will be accepted for fare upon payment of one cent additional. Conductors, however, will suggest to passengers who have these tickets, that they exchange them at the Main Office for the new type of ticket, or have them redeemed at face value.</p> <p>The Series "G" employee half-rate tickets will be acceptable for fare when one cent additional is tendered. Passengers presenting tickets of this type should be requested to have them redeemed at the Main Office and provide themselves with a new type ticket.</p> <p>Employees' Funch and Monthly Tickets will be accepted as heretofore.</p> <p>REDUCED RATE TICKETS.</p> <p>The McKeepert—33 for \$1.00 tickets, will not be accepted for fare. Passengers who are requested to have these tickets redeemed at the Main Office, either by</p>
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INSTRUCTIONS ISSUED TO TRAINMEN

car delivery delays, and the competition of munitions makers, has made it impossible to give the full service that the company desires. The very morning that the higher fare was inaugurated power was off the lines at various places for nearly three hours, yet the public accepted the situation with good humor. The passengers themselves gave short shrift to kickers.

An amusing instance of the effect of the new fare

<p>NOTICE</p> <p>THE NEW RATE of fare, 6c in cash or 5½c by ticket, will go into effect TUESDAY MORNING, JANUARY 22d.</p> <p>Tickets are now on sale by Conductors and at all stations of the Company.</p> <p>PLEASE PURCHASE TICKETS TO-DAY AND AVOID DELAY-ON TUESDAY.</p> <p>PITTSBURGH RAILWAYS COMPANY</p>	<p>NOTICE</p> <p>CONDUCTORS WILL BE SUPPLIED WITH PENNIES TO MAKE CHANGE AS FAR AS POSSIBLE, BUT, WHEN UNABLE TO DO SO A 4c CHANGE-COUPON WILL BE USED. THIS COUPON WILL BE REDEEMED BY THE COMPANY OR ACCEPTED FOR FARE WITH 2c ADDITIONAL.</p> <p>PITTSBURGH RAILWAYS COMPANY</p>
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POSTERS ANNOUNCING THE NEW RATE

on a flustered conductor is told. A passenger, wishing to make matters easy for this conductor, tendered a quarter and a penny so that he could get exact change. The conductor, confronted by this novel situation, insisted on returning the penny and making 19 cents change out of the quarter.

American Association News

War Board Met at Washington Headquarters on Feb. 1

Manila and Toledo Sections Held Big General Meetings with Music as a Feature

War Board Meeting of Feb. 1

THE American Electric Railway War Board met at Washington, D. C., on Feb. 1 and spent the day in routine business. All of the members of the Board were present and also President J. J. Stanley and Secretary E. B. Burritt of the American Association.

The organization of the traffic bureau and its proposed plans for utilizing the electric railway lines in the handling of government freight and passenger traffic, were thoroughly considered. Careful attention was also given to a request from the War Department of the government for recommendations of men for certain specific war duties.

Further details of the meeting will be given in a later issue of this paper. The Board will meet again on Friday, Feb. 15.

J. M. Bury Elected President of Manila Section

AT THE meeting of company section No. 5, held on Dec. 4, a number of business items were attended to, the principal one being the election of officers for the coming year. The result was as follows: President, J. M. Bury; vice-president, M. E. Chaves; secretary, J. G. Hess, Jr.; treasurer, B. Solano; director for four years, F. Santiago.

The preceding meeting, held on Nov. 20, was the occasion of the presentation of a very practical paper by B. H. Blaisdell, chief engineer power plant, on the subject "A Kilowatt-Hour and the Coal Required to Produce It." An abstract of this paper will appear in a later issue of the JOURNAL. As a compliment to J. H. Pardee, president J. G. White Management Corporation, and J. P. Ripley, railway engineer of the same company, who were present on a visit from the United States, the meeting was made an open one. Mr. Blaisdell's paper was extensively discussed and the gist of the discussion will be incorporated with the abstract of the paper.

At the November meeting, Eugene Wagor, traffic inspector, who won "honorable mention" in the 1917 competition for the best paper presented before a company section, was awarded the sum of 50 pesetas by C. Nesbitt Duffy, vice-president of the company, in recognition of the honor which the section received through Mr. Wagor by virtue of this award. It will be remembered that Mr. Duffy had promised 100 pesetas to any member of the section who should receive the medal. While no gift had been promised to the winner of "honorable mention," Mr. Duffy felt that Mr. Wagor had come so

close to winning the medal that he had earned this recognition.

In commenting upon the award to Mr. Wagor, Mr. Pardee called the attention of the employees to the fact that the motormen and conductors are the company's salesmen. The motormen present the goods for sale and the conductors collect from the customers before the latter get their goods. When the customers are satisfied they are glad to trade with the company again. If not, while they may have to trade with the company, yet they dislike to do so, and the relations between merchant and customer are not satisfactory.

After Mr. Pardee's remarks the meeting was entertained by selections from three different orchestras composed respectively of employees from the transportation, power plant, and shop and carhouses departments. The last-named orchestra performed on native bamboo instruments.

Safety Rally at Toledo

ON JAN. 23, in the Auditorium Theater, Toledo, Ohio, Marcus A. Dow, general safety agent of the New York Central Lines, spoke at a joint safety rally of the employees of the New York Central Lines, the Willys-Overland Company and the Toledo Railways & Light Company on the subject "Accident Prevention a Patriotic Duty." In connection with his talk on accident prevention Mr. Dow showed his safety film entitled "The Rule of Reason."

Mr. Dow summarizes the present safety situation in these words: "The prevention of accidents is important at all times both from a humanitarian and economic standpoint. To-day, however, with our country at war, it is of greater importance than ever that every consistent effort be made to conserve the lives of industrial workers and to prevent disabling injuries, because the killing and maiming of this vast army yearly is a serious drain on the man-power of the nation at a time when every available man is needed for the work that is to be done."

At the meeting the Overland Band played, and Hon. Cornell Schreiber, Mayor of Toledo, made a short address. Frank R. Coates, president of the Toledo Railways & Light Company, presided at the meeting.

Electric Railway as Usual a Public Benefactor

THE records of fifty years in the United States Weather Bureau show previously no such conditions as have existed recently in Chicago. The manner in which the street railway company kept open the main highways for vehicle movement of all kinds inspired many letters of appreciation and friendly editorial comment in the daily papers. Out of some 2000 miles of streets in the city, cars use one-fourth of the total. The fact that for days at a time no thoroughfares were open except those furnished with car lines brought thousands of vehicles onto the tracks. Snow was piled from 4 to 10 ft. high on each side of the moving cars and this left no roadway for other vehicles. The result was prolonged congestion and reduced car movement, the speed of course being reduced to that of the slowest vehicle.

LETTERS TO THE EDITOR

Publicity Always the Best Policy

SOUTHERN PUBLIC UTILITIES COMPANY

CHARLOTTE, N. C., Jan. 29, 1918.

TO THE EDITORS:

In the issue of Saturday, Oct. 14, 1916, the *ELECTRIC RAILWAY JOURNAL* carried a cartoon, the title of which was "The only time not to start a publicity campaign." This cartoon showed a street car carrying only the motorman and conductor, the center of attacks from the multitude along the street. Brick bats labeled "abuse," "demand," "lower fares," "complaint" and other things were being hurled at the car.

This cartoon and the accompanying subject matter attracted my attention at the time, and since then the lesson carried has been the guiding star in the policy of this company (Southern Public Utilities Company) in the matter of publicity.

Last week at Greensboro, N. C., I saw the value of the lesson more clearly than I had ever thought to see it. At that time and place representatives of the leading electric railways of North Carolina gathered for a conference on the matter of increased revenue. That additional revenue was a necessity was agreed upon before the conference, but the manner of bringing this condition of affairs into existence was the question to which these gentlemen at the Greensboro meeting addressed themselves.

One of the first things that the chairman of the conference [Robert Lee Lindsay, vice-president and general manager of the Durham (N. C.) Traction Company] said was that a comprehensive campaign of educational publicity was desirable. He commented upon the results of the fixed publicity policy of this company and that of the campaign recently waged in Greensboro by the North Carolina Public Service Company, under the direction of President Charles B. Hole, which brought about a ruling by the City Commissioners allowing that company to withdraw special rates and special tickets. He urged the inauguration of a campaign of education which would show to the people at large the necessity of being allowed to increase revenue.

This was thought to be a step in the right direction, but the representative of another company expressed the opinion that in the meantime his company and others would be losing money, that immediate relief is what is now desired.

Then the cartoon and accompanying subject matter, of which I spoke above, came again into my mind, and I realized more forcefully than ever before the accuracy of the position taken by the *ELECTRIC RAILWAY JOURNAL* nearly a year and a half ago.

Then again, as if in response to the demand of the occasion, the *ELECTRIC RAILWAY JOURNAL* in its issue of Jan. 19 of this year, carried a two-page signed statement, editorial, I suppose it might be called, along the same line. In this statement appeared this pertinent paragraph:

The ability of the electric railway industry as a whole to do a profitable business depends absolutely on the state of the public mind toward that industry.

It seems to me that this paragraph was written especially and particularly for those electric railways which have never undertaken the education of the public concerning difficulties under which they operate, the matter of increased cost of material, labor, and all other costs of operation in which the public will show a decided interest when given an opportunity.

This leads me to return to the suggestion of a central publicity bureau of the American Electric Railway Association for the assistance of railways in just this sort of situation. I believe great service can be rendered the individual railway by the association in furnishing data for use in advertising matter, and still am of the opinion that the railways do not make use of the service now offered by the association. What is needed, to my mind, is the education of the electric railway companies to the necessity and advisability of educating the public *before there is the necessity for decisive action*, such as appears now to be the case with electric railways in North Carolina.

By educating the public I do not mean begging the question, by pleading with the people to give the railways added revenue, or a fair deal in legislation, or many similar matters, but as shown in your signed statement (pink sheet, Jan. 19), "through its passion for fair play, justice and good sportsmanship."

And in conclusion I want to violate the proprieties a bit by suggesting that electric railway management officials over the United States would do exceedingly well to not only subscribe for the *ELECTRIC RAILWAY JOURNAL*, but to read it and study it carefully, and put into operation many of its most excellent suggestions *before there is a necessity* for such action as is indicated. I deem it well worth the while of the highest paid executive in the country to give careful attention to these suggestions. If acted upon at the proper time they will in many cases eliminate the necessity of drastic action, and often unsuccessful results therefrom.

The publicity campaign for the education of the people as to the exact situation confronting electric railways in North Carolina has already been inaugurated, and if handled in the proper way the results will be all that could be hoped for.

But the wrong time to start a publicity campaign, as so graphically shown in your cartoon, is when the public is throwing bricks through your windows.

LEAKE CARRAWAY,
Director of Publicity.

Shall We Go Back to Cradle Suspension?

NEW YORK, Feb. 4, 1918.

TO THE EDITORS:

I have read with interest the article on "Experience with Interurban Car Axles" by A. B. Metcalfe of the Empire State Railroad, Syracuse. His road is not the only one which is suffering from axle failures of the kind which he describes. The cause of these troubles, which brings other ailments in their trains, is the faulty design of mounting the dead end of the motor on the axle without any vertical cushion or side play. The result is that the axle is constantly subject to severe hammer blows. The Empire State Railroad is not the only corporation suffering from these defects. This trouble will continue until a more rational method of motor suspension is general.

JOHN DEE.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT

Auto-Tower Truck with Engine-Raised Tower

Three-Section Tower with Men in Place Raised in Ten to Twenty Seconds—Tower Can Be Raised and Lowered While Truck Is in Motion

BY S. L. FOSTER

Chief Electrician United Railroads of San Francisco

THE United Railroads of San Francisco has recently developed and put into successful service for rapid and efficient overhead trolley line work an interesting type of auto-tower that is believed to be unique in its labor-saving method of tower hoisting.

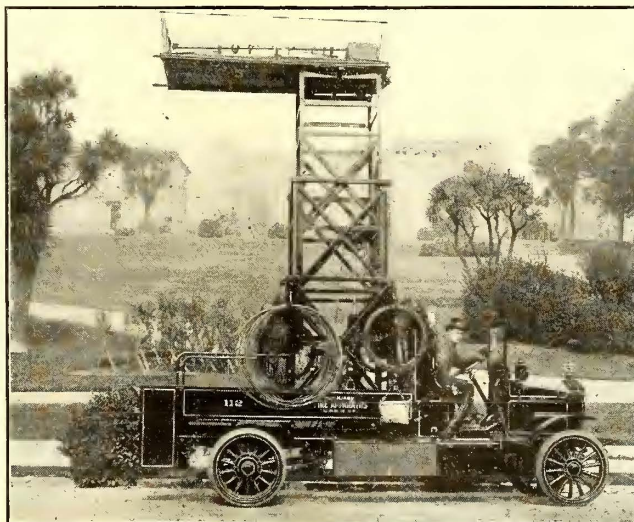
The vehicle consists of a three-section tower mounted on a 2-ton Pierce-Arrow worm-drive chassis, the tower being raised and lowered by the standard hydraulic hoist of the Pierce-Arrow dump body. This form of ram cylinder hoist for each foot of lift requires two feet of rope and lifts the front end of the dump body two feet. The steel cables from the ram cylinder are wrapped around the hoisting drum of the standard Trenton tower. In its $3\frac{1}{2}$ ft. of rise the hoist unwinds from the drum 7 ft. of its cable and at the same time winds onto the drum 7 ft. of the cable used to hoist the tower, thus raising the tower 7 ft. If a lesser or a greater rise of the tower is desired for this $3\frac{1}{2}$ ft. of ram-piston travel, the relation between the diameter of the part of the drum on which the hoist cable is wound and the diameter of the part on which the tower cable is wound can be readily altered to secure any reasonable result.

In operating, oil is forced under the piston of the ram cylinder by a pump actuated by a dog clutch. This is connected by gearing with the main automobile engine shaft and controlled by a three-way valve. The first of the accompanying photographs shows the chauffeur with his right hand on the handle governing this valve located at the side of his seat just behind the Stewart warning horn. The tower can be raised, lowered or held at any height without moving from the driving position. Further, it can be raised on the way to the work and lowered while en route departing—an impossibility with the hand-operated crank on the horse-drawn rig.

No oil reservoir is needed, as the oil pumped under the piston is drawn from above the piston, and, in lowering the tower, the oil is forced back into the original cylinder through a by-pass pipe. An automatic safety relief valve in the piston is opened when the piston of the ram cylinder approaches the head of the cylinder, thus preventing any excessive lift of the tower from inattention of the chauffeur.

There are many advantages in the three-section tower. It is stronger than the two-section type, as the light top section is reinforced by the intermediate section $2\frac{1}{2}$ ft. further up in the later three-section type than in the older two-section one, and the former is thus more resistant to strains from pulling out long lengths of trolley wire. Also, in this later type, the platform when down is 12 in. lower than with the two-section tower and when raised is 16 in. higher. These differences can be readily varied to suit the taste, as already explained. The construction of the three-section tower lowers the center of gravity, already lowered by the small-wheeled, heavy auto chassis, reduces the danger of overturning on rounding curves, permits higher speed and enables the workmen to reach the 22 ft. high trolley wires at steam railroad crossings and the tops of side poles readily.

There are also many advantages of the motor-driven hoist for the tower as compared with the old crank and ratchet appliances. It saves time and the physical energy of the men, raises the tower in from one-sixth to one-third the time, lowers it three times as rapidly and eliminates all danger of the crank handle slipping from the workman's grasp and breaking his arm or striking his head, as has happened in the past on the manually operated hoists of the horse-drawn wagons.



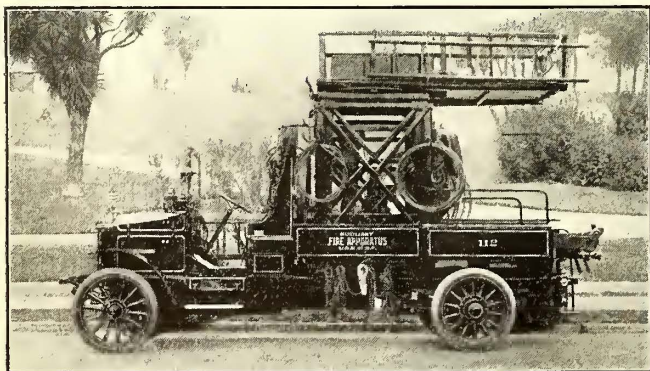
AUTO-TOWER TRUCK WITH TOWER RAISED

The men formerly engaged in tiring themselves out on the crank raising the tower and then leisurely climbing to the raised platform, now mount the platform when down and are elevated to their work without effort. Thus time is saved and the men are more alert and energetic in the work that counts. The loaded three-section tower can be raised by the hydraulic hoist in from ten to twenty seconds, whereas by hand the empty two-section tower ordinarily consumed from sixty to

seventy-five seconds. The hand crank means of hoisting is always available if the power mechanism fails.

Attention is directed to San Francisco's tropical winter background, seen in the illustration. The following features should also be noted: The portable forge at the rear of the vehicle in one picture and the suspended solder pot in the other; the "Desert Bag," in which the men carry their supply of fresh, cool drinking water; under the "Desert Bag" the long box, with its hinged side for ready emptying of scrap material; the box in the rear for the men's waterproof coats; the row of hooks for hand lines, tie wires, slings, etc., under the "Auxiliary Fire Apparatus" sign; the shielded siren under the license plate; the "spotlight" on the dash for night work on poles; the "J. M." fire extinguisher under the spotlight; the double hooks for two extension ladders along the side of the machine; the use of the ram cylinder of the hoist as a standard on which to install radiating, superimposed metal arms equipped with hooks of trolley wire for supporting and at the same time keeping separate and readily accessible various kinds of material like cap and cone bodies, curve hangers, pole bands, eyebolts, washers, links for use on porcelain insulators, linemen's "spurs," wood-strain insulators, frogs, 35-deg. angles, etc.; the double material and tool bins back of the tower and the charcoal bin under the floor; the tool boxes on the platform of the tower; the plentiful array of hooks all around on the lower tower section on which to hang blocks, bolt cutters, coils of trolley wire, strand, feed and cable wires, coats, etc. There is also a drawhead in the rear for ready attaching of tongues of formerly horse-drawn vehicles such as ornament hoist, derrick or trolley gig.

It should be stated that the departure from parallelism between the cables going from the sheaves at the top of the piston rod of the ram cylinder and the piston rod, as appearing in one of the photographs, was found to cause chattering of the piston rod when nearly out. This has been remedied since taking the photographs by installing two idler sheaves at the top of the ram



TRUCK WITH TOWER IN RUNNING POSITION

cylinder to hold these cables to true parallelism with the piston rod.

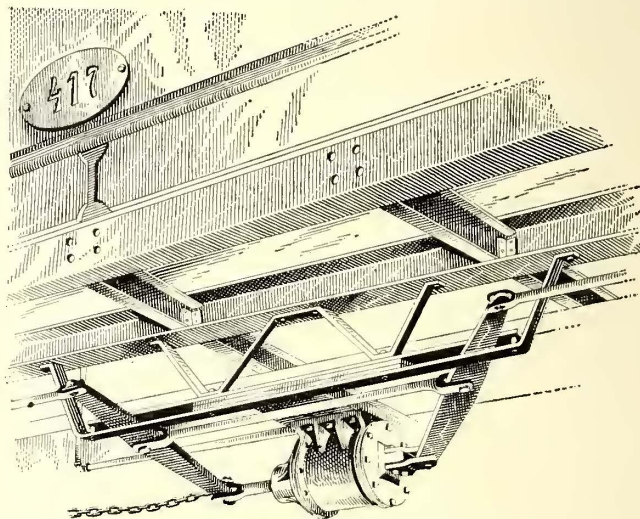
The standard Pierce-Arrow 2-ton chassis wooden protecting hood for the chauffeur was replaced by a two-bow top for use in our rainy winters and entire removal in our rainless summers, so that the chauffeur could the more readily hear the verbal or whistled orders from the men aloft. The swinging leaf of the tower is worked projecting over the rear of the vehicle for the same reason that the hood was removed, namely, to fa-

Insuring the Action of Brakes on Double-Truck Cars

BY F. J. FOOTE

Master Mechanic, Ohio Electric Railway, Columbus, Ohio

THE failure of one main brake rod on double-truck equipment when the loss of power prevents reversing the motors is likely to result in a serious accident, especially when it occurs on a down grade. To insure against this condition, we have installed on most of the cars of the Ohio Electric Railway a simple device, the



STOPS FOR BRAKE LEVERS IN CASE ONE MAIN BRAKE ROD FAILS

application of which can be seen from the accompanying sketch. Two 3-in. steel straps, $\frac{7}{8}$ in. thick, were bolted together with one or more similar straps of shorter length between them, and fastened to the car sills set on a level with the axis of the air cylinder. This provides slots in which the cylinder levers move during all normal braking, and in case a main brake rod fails, the motion of the lever it is connected to is definitely limited so that force can still be exerted on the other brake rod. In other words, it supplies a point of support for the affected cylinder lever to replace the reaction that would be transmitted from the brakeshoes through the disabled rod.

Such a device for this purpose is easy of application and inexpensive. The bracing can be done in different ways, using any suitable material which is on hand, the only requirement being that it be strong enough to withstand the severe strain.

cilitate verbal communication between men aloft and the chauffeur and also because in twenty-seven years of tower-wagon experience there has never yet been a case of injury to the driver by anything falling on him.

Two improvements possible on the auto tower as at present equipped are the application of a self-starter and the use of an as yet undeveloped device for heating a pot of solder. The device sought should be lighter and simpler than the heavy charcoal forge, but equally as satisfactory and as rapid in results in our windy climate. Gasoline consuming appliances have so far proved unreliable here, compressed gas consuming appliances unequal to the task and electrical appliances undeveloped.

Car Axles, Their Design, Manufacture and Service

PART II—ANALYSIS SHOWS THE DESIRABILITY OF ELIMINATING ABRUPT CHANGES IN SECTION

BY NORMAN LITCHFIELD

IN THE issue of this paper for Feb. 2 we discussed the method of calculating the maximum stresses in a car axle, illustrating the theory by applying it to one of the A. E. R. E. A. standard axles. Having thus determined the magnitude of the stresses the next point to be settled is whether, with a given steel, there remains a sufficient safety factor to give a safe axle, by that term meaning one which will be free from failure during its life as determined by the wear of the journal.

It is evident that we cannot state absolutely that the stress as figured represents actually the stress in the axle under the conditions in which it operates. We can, however, measure each axle by the method and determine by experience and analysis what stresses when so calculated have produced axles that have operated satisfactorily and what stresses have existed in axles that have failed.

LESSONS OF THE MASTER CAR BUILDERS' REPORT

The M. C. B. committee in the report referred to earlier reported as follows:

"Breakage may occur as the result of poor material, bad design in respect to shape, the spreading of an initial crack, or from repeated applied stresses above a safe limit. In Wöhler's celebrated series of experiments upon the effect of repeated stresses in small bars, he found that, where the strains alternated between tension and compression, the outer fiber stresses might be safely taken as 17,000 lb. per square inch for iron, and 23,000 lb. per square inch for steel, without limiting the life of the bar. But if the stresses exceeded these limits, fracture would always occur if the number of repetitions of stress were sufficient.

"Again, in large bars, such as car axles, where the extreme or outer fibers are a considerable distance from the neutral axis, and where the material is often far from homogeneous throughout, it is reasonable to suppose that strains are not transmitted symmetrically in all its parts, and some of the fibers may bear a larger proportion of the total stress than would occur in an even distribution. In this way the elastic limit may be locally exceeded with a very moderate total stress only. Professor Bauschinger determined what he called the 'natural elastic limits' of a bar in tension and compression. These limits he defined to be the limiting load to which a bar of the same material can be strained repeatedly in tension and compression without breaking, when the load is repeated sufficiently often, as determined by Wöhler. The 'natural elastic limit' is considerably below the elastic limit as ordinarily determined. The explanation of this fact as given is that the welding, forging or other manufacturing process to which a bar has been subjected temporarily raises its elastic limit, which is again lowered to its true value under the influence of alternating stresses.

"There seems to be no evidence to show that, when the fiber stresses are kept below the natural elastic limit, any apparent change in the structure will occur

before the axle is condemned by reason of being worn out at the journals.

"Taking the fiber stress calculated (as explained in the M. C. B. report) it was found that a large number of axles of one design had broken where the fiber stress was 28,000 lb. per square inch, these axles having been in service from four to nine years. Where the fiber stress was 23,000 lb. or less, the records show that axles have been practically free from failure by breaking."

The committee concludes that "if a fiber stress of 22,000 lb. per square inch is taken for the portion of the axle between the wheels, and the proper material is provided, a safe design will be the result without much surplus material."

Since the day of this very remarkable and original report the development of the automobile and the aeroplane, of ordnance, projectiles and armor plate, has caused tremendous strides to be taken in the manufac-

ture of steel and in the knowledge of the qualities best suited for different service. In the main, however, the basic facts given in that report remain true, namely, that metal in a given condition remains in the same molecular condition indefinitely, the so-called "crystallization" of steel being non-existent; and that the life of the axle under repeated alternating stresses increases enormously as the maximum stress

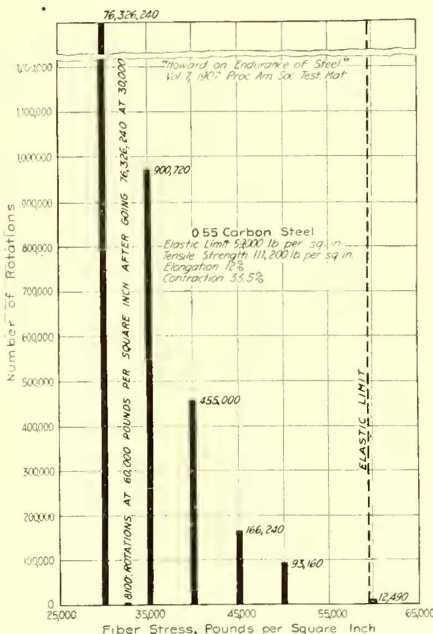


FIG. 3—DIAGRAM SHOWING PROGRESSIVE GAIN IN ENDURANCE OF STEEL AS LOADS ARE REDUCED

is reduced in proportion to the elastic limit of the material used. The latter fact is well illustrated in a paper presented by Howard before the American Society for Testing Materials on "Endurance of Steel," and printed in Vol. 7, 1907, of the *Proceedings* of that society. The graph given in Fig. 3, reproduced from that article, shows the progressive gain in endurance of steel under alternating (rotating) stresses as the loads are reduced, showing that with a load stressing the specimen to its elastic limit (60,000 lb. per square inch) the steel failed after 12,490 revolutions. When the load was reduced so as to give only 30,000 lb. per square inch stress (50 per cent of the elastic limit) the steel stood up for 76,326,240 revolutions without failure. The load on the same specimen was then increased to 60,000 lb. per square inch and the steel failed after 8100 revolutions.

Assuming, then, uniformity in the steel and proper design of axle, it is generally agreed that the life of the axle will increase as the ratio between the maximum stress and the elastic limit is increased. It then remains to determine how low a figure must be selected for the maximum stress. In the M. C. B. report this

was given as 22,000 lb. per square inch for the freight-car axle under consideration. It will be remembered that in the committee's calculation an increase in load equal to 26 per cent of the weight on the journals was included to allow for vertical oscillation. Twenty-two thousand pounds per square inch stress thus calculated is equivalent to 17,500 lb. per square inch without making allowance for vertical oscillation. For passenger-car axles it is considered good practice on steam roads to make the limit 15,000 lb. per square inch. This, it will be noted, is on the two assumptions of center of

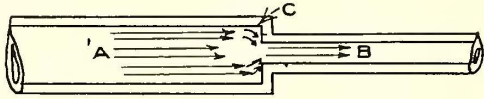


FIG. 4—FLUID ANALOGY OF ABRUPT CHANGE IN FIBER STRESS IN AXLE

gravity 6 ft. above the rail and centrifugal force just sufficient to overturn the car (40 per cent of the weight). For electric-car service, with its sharp curves, high acceleration and braking rates, gear vibration, etc., the lower center of gravity as found in Fig. 1 (page 235, Feb. 2 issue) should be considered together with force required to overturn the car.

A number of axles in electric service in which the stress ran between 22,000 and 23,000 lb. per square inch failed after about 250,000 miles, while another lot of same character of steel, in which the stress ran about 18,000 lb. per square inch, gave satisfactory service throughout their life.

STRESS INTENSITY SHOULD NOT CHANGE ABRUPTLY

Referring to Fig. 2 again (page 236, Feb. 2 issue), it is seen that the maximum stress in the electric railway axle shown is 17,654 lb. per square inch, or something less than that in the axles above cited which gave good service. A closer study, however, shows that the design is not a good one, on account of the abrupt changes in the intensity of the stress, particularly at the point of maximum stress, where it is 11,604 lb. per

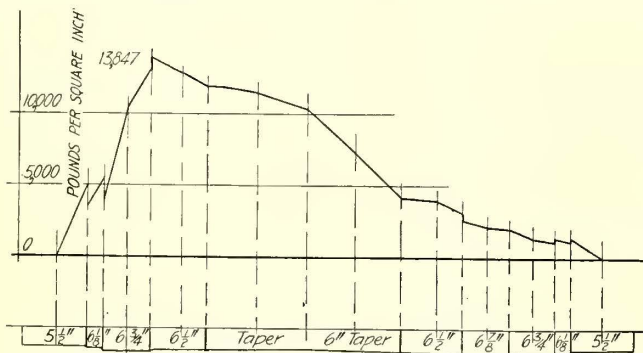


FIG. 5—STRESS DIAGRAM DRAWN FOR AXLE MODIFIED FROM A. E. R. E. A. DESIGN

square inch in the wheel seat and 17,654 lb. per square inch immediately alongside it at the motor bearing.

It may be asked why such a change in stress is undesirable. A good method which has been used to make this clear is the use of the analogy of the flow of water through an abruptly restricted section of pipe, as shown in Fig. 4. In the large pipe the velocity at A is V , which in the small pipe becomes V_1 , greater in inverse proportion to the squares of the diameters of

The Use of Ball Bearings on Electric Railways

Series of Tests Conducted on Berlin Street Railways Demonstrates Superiority of Ball Bearings Over Plain Bearings

THE Berlin street railways recently carried out a series of tests on cars equipped with ball bearings, as described in a late issue of *Electrotechnik und Maschinenbau*. These tests were made under conditions involving the various phases of street railway operation ranging from very low speed in heavy traffic to high-speed non-stop runs of several blocks between stops. The results of six round trips with four cars—one of which had plain bearings and the other three ball bearings—showed an average saving in energy consumed by the cars with ball bearings of 8 per cent over that consumed by the car with plain bearings.

The tests were continued during the night with the same car with plain bearings and two of the cars with ball bearings. Because of the absence of traffic and the elimination of some of the stopping at switches the consumption of energy during the six round trips was more evenly distributed and also somewhat less than during the previous tests. The results of the six round trips was an average saving, by the cars with ball bearings, of 8.8 per cent of the current consumed by the car with plain bearings. The tests continued with trailers showed an average saving of 7.6 per cent with ball bearings.

Repeated tests showed that the values for each of the cars fluctuated according to the motorman, the roadbed and the weather, and probably also because of different conditions in the various bearings. One of the peculiar results of the tests was the discovery that it took a motorman from a quarter of an hour to half an hour

the pipes. At C it is evident that there is a violent local action, due to the rapid change in velocity at that point. A small fillet does not make the transition gradual enough to prevent the likelihood of localization of stress at this point.

A modified design is shown in Fig. 5, which would require boring out the motor brasses to the amount shown, and enlarging the journals. The slight reduction in the wheel and gear seats is not sufficient to cause any loss in the holding power of these parts on the axle. The stress diagram given in Fig. 5, in comparison with that in Fig. 2, shows how much more evenly the stress is distributed than in the standard axle.

Such a design is desirable, for no improvement in material or even reduction in maximum stress will make up for poor design. Thus, where the conditions are such that it is impossible to increase the minimum section so as to bring the stress within the limits of good practice, special care should be taken in the design to eliminate sudden and violent changes of stress as far as possible, as well as to use extra-high-grade material.

The use of keyways is also very detrimental for a similar reason, and as experience has clearly shown in rigid service that they are not necessary in order to maintain tight fits of wheels and gears, they should be eliminated.

BALL-BEARING-EQUIPPED CAR AFTER EIGHT HOURS' CONTINUOUS SERVICE. BEARING TEMPERATURE 35 DEG. C.

	Immediately on Arrival of Car	After Five Minutes	After Ten Minutes	After Thirty Minutes	After Two Hours	After Two Days
Force required to move car, pounds	159.	154.	150.	151.	152.	150.
Friction resistance, pounds per ton..	11.7	11.4	11.1	11.15	11.2	11.1

PLAIN-BEARING-EQUIPPED CAR AFTER SIX HOURS' CONTINUOUS SERVICE. BEARING TEMPERATURE 43 DEG. C.

	Immediately on Arrival of Car	After Five Minutes	After Ten Minutes	After Thirty Minutes	After Two Hours	After Two Days
Force required to move car, pounds	408.	463.	485.	496.	489.	494.
Friction resistance, pounds per ton..	29.8	33.7	35.3	36.1	35.6	36.0

to become accustomed to the easier running of the car, and to judge his current consumption accordingly. Another unexpected result was the tendency of the motor-man to permit the car equipped with ball bearings to overrun stopping places, because of too late application of the brakes. It was also found that the energy saving depends to a great extent upon the distance between stops. With a run of two or three blocks the current can be cut out sooner, resulting in a longer period of coasting on the ball-bearing-equipped car than on the car not so equipped. As the length of run is increased the difference between the coasting periods of the two cars is also increased.

One of the most important advantages of cars equipped with ball bearings is the ease with which the empty cars can be rolled back and forth by hand in the terminals and repair shops. At the instant of starting the car the ball bearing shows its greatest saving in energy consumption, for once the car is in motion the saving is much less.

To determine experimentally the force required to move a car, a dynamometer was inserted between the pulling power and the car. The average of ten separate tests was recorded as representative of certain cars, and

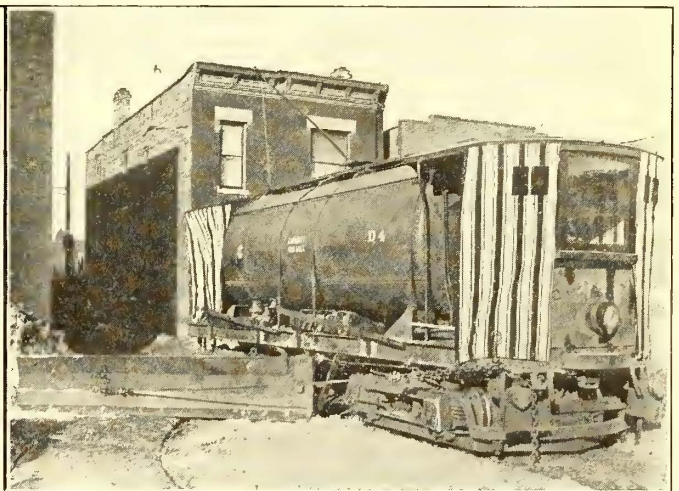
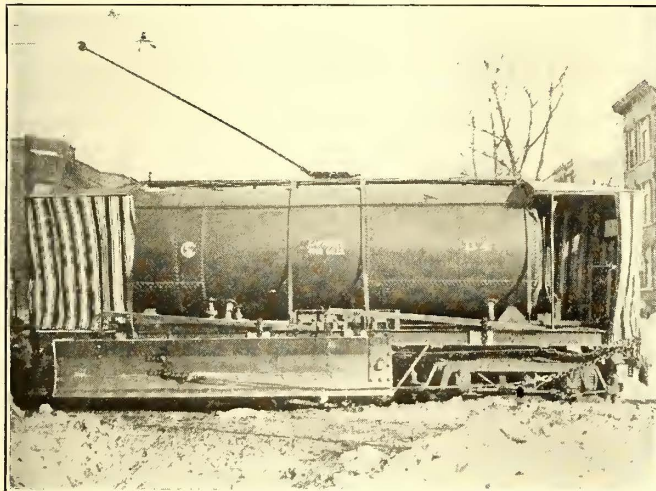
Comparison between the figures shows that on the ball-bearing-equipped cars greatest resistance occurred immediately after stopping, decreasing by more than 5 per cent within ten minutes, while the other car showed the smallest resistance while warm and increased by nearly 20 per cent within ten minutes.

Sprinklers and Work Cars Make Good Snowplows at Chicago

Wings Hinged to Car Side Sills Prove Effective as Supplementary Snow-Fighting Equipment on Chicago Surface Lines

THE snow equipment of the Chicago Surface Lines at the time the first storm broke this season consisted of ninety-six sweepers, ten power plows, forty-nine wing plows and eighty-one drag plows. These were so distributed as to give the best results in taking care of the thousand or more miles of single track within the city limits. The storms beginning on the night of Jan. 5 were of exceptional severity and the need of additional emergency equipment was impressed on the rolling stock and shops department of the company.

Lying in the various car stations were numerous sprinkling cars, put away for the winter months. Seven of these double-truck cars, equipped with four GE-80 motors each, have now been furnished with wing plows and added to the winter equipment. The wings are 15 ft. long and 30 in. high, the weight being 1500 lb. Each is constructed of 3-in. oak covered with sheet steel on the face. At the bottom is a steel plate 1/2 in. x 12 in. The wing is curved at the top and bottom so as to keep snow rolling when in action. It is best operated at an angle of 45 deg., being held in position by a 3/4-in. chain



SPRINKLER CAR EQUIPPED WITH WINGS FOR SNOW FIGHTING—AT LEFT WING FOLDED AGAINST SIDE OF CAR, AT RIGHT WING EXTENDED AT ANGLE OF 45 DEG.

the results show that with cars weighing 13.7 tons empty it took an average force of 10.6 lb. per ton and 37.8 lb. per ton respectively to move cars with and without ball bearings. These tests were made on cars which had been standing idle for two days.

Further tests made on the German railways to determine any change in the force required to move the two types of equipment after a period of continuous service gave the results shown in the tables above.

or cable. The stress on the plow when bucking heavy snow embankments is indicated from the fact that a 24-ft. chain was stretched 32 in. when in action.

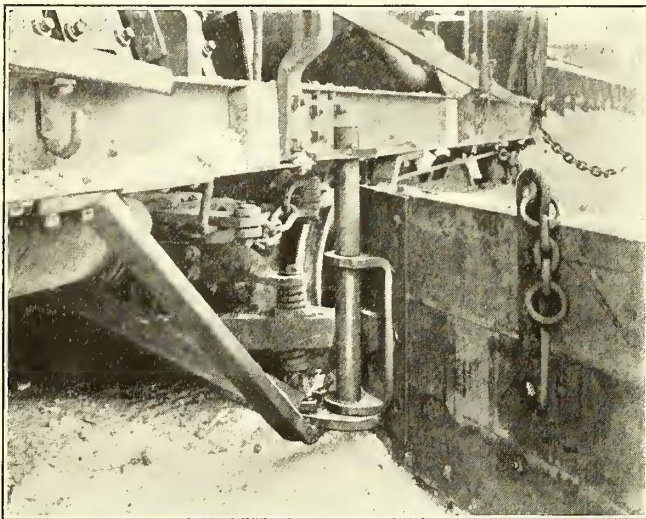
The hinge connection and heel of the plow are so arranged that the wing is hinged on a 2 3/4-in. shaft by means of a huge U-shaped forging. The wing is pivoted to this forging with a 2-in. bolt. This leaves the wing free to move up or down if it strikes an obstacle. The heel of the plow is carried 3 in. above the rail. One

of the wings is attached to each side of the sprinkler so that it can be used in either direction. The wings can be raised, when not in use, by means of a lever and swung in parallel to the car.

For the protection of the operating crew a movable vestibule has been placed on either end of the car. The entire storm equipment is easily detachable so that the car may be converted for summer use.

The first experiment in equipping the sprinklers was made with a shorter and lighter wing, the length being 14 ft. and the weight 1000 lb. To make this wing effective, however, it was necessary to put weight on the outer end. At first four men sat on it to keep it down while operating. Later 400 lb. of axles were attached to the extreme end to take the place of these men. With the improved type of plow this is unnecessary.

Another combination plow has been developed by the engineering department, consisting of two work cars permanently coupled, each having a wing attachment which can be extended from 12 ft. to 20 ft. The wing



HINGE OF WING ON SPRINKLER EQUIPPED AS AUXILIARY SNOW PLOW

of the forward car is arranged to sweep the top snow from heavy embankments. The wing on the next car, set closer to the rail, scrapes the snow nearer to the ground level.

To give additional power to this fighting machine two other work cars have been attached at the rear, thus giving a combined force of 640 hp. A buzzer system is installed permitting signals to be sent from the leader to the followers so that power may be applied or cut off on all simultaneously. This combination equipment, of course, is used only on the widest streets and in locations where snowbanks are unusually high. Some banks over 8 ft. high were pushed back from the tracks. It has proved quite effective in opening up lines in the sparsely-settled districts of Chicago.

Tests made in a number of small isolated power plants by the Arkansas Valley Railway, Light & Power Company have shown that from 12 to 20 lb. of coal per hour is required to produce 1 hp. This is contrasted with the development of a horsepower-hour from less than 3 lb. of coal in the modern steam turbine plant of the same company.

New Ticket Box-Cutter for Use on Interurban Lines

THE apparatus shown in the accompanying illustration is known as the "Potter Ticket-Box Cutter." In appearance it greatly resembles a transfer issuing box, but in this case is for indicating the destination on tickets of interurban lines.

The ticket stock is the same as that for transfers, and the names of the stations are placed in a vertical



TICKET BOX-CUTTER WORKS LIKE TRANSFER HOLDER

column in their proper order. To issue a ticket the pointer is placed on the name of the station to which the passenger wishes to travel, the ticket is drawn back over the sharp point and torn along the straight edge. This leaves a V-shaped cut to indicate the destination. The station at which the ticket is purchased is stamped on the back in the usual way. Either round-trip or one-way tickets can be issued in this manner.

Some of the advantages claimed for this arrangement are as follows: As one standard form serves for

GOOD FOR ONE CONTINUOUS PASSAGE	ILLINOIS TRACTION SYSTEM	NO BAGGAGE CHECKED FREE.	Form P 1
From Station Stamped on Back to Station Opposite Point in Margin Below			0000
VOID AFTER ONE DAY AFTER DATE OF SALE.			
Good only on Trains stopping at Destination. If not stamped by selling agent, or if more than one destination is shown this Ticket is void and not good for passage.			
St. Louis	ST. LOUIS	St. Charles	*
Madison	MADISON	Union	*
Vernon	VERNON	Union	*
Granite City	GRANITE CITY	Union	*
Hannibal	HANNIBAL	Union	*
Worren	WORREN	Union	*
St. Ann	ST. ANN	Union	*
Stanton	STANTON	Union	*
Litchfield	LITCHFIELD	Union	*
Litton	LITTON	Union	*
Hillsboro	HILLSBORO	Union	*
Savertville	SAVERTVILLE	Union	*
Belleville	BELLEVILLE	Union	*
Carlinville	CARLINVILLE	Union	*
Woodstock	WOODSTOCK	Union	*
Springfield	SPRINGFIELD	Union	*
Sherman	SHERMAN	Union	*
Bellevue	BELLEVUE	Union	*
Wilshire	WILSHIRE	Union	*
Belmont	BELMONT	Union	*
Lincoln	LINCOLN	Union	*
Union	UNION	Union	*
Burr	BURR	Union	*
Richmond	RICHMOND	Union	*
Minneapolis	MINNEAPOLIS	Union	*
Madison	MADISON	Union	*
Chicago	CHICAGO	Union	*
Bloomington	BLOOMINGTON	Union	*
Alton	ALTON	Union	*
Morton	MORTON	Union	*
Peoria	PEORIA	Union	*
St. Louis	ST. LOUIS	Union	*
Peoria	PEORIA	Union	*
Rate			Form P 1
AGENT'S STUB.—NOT GOOD FOR PASSAGE.			0000
From Station Stamped on Back to Station Named in Margin above			
STATIONS—ST. LOUIS, PEORIA and BLOOMINGTON.			
Licensed for use with Potter Patent Ticket Box and Cutter.			

SAMPLE OF TICKET USED IN BOX-CUTTER

all local and through tickets, any ticket stock can be reduced 75 per cent; tickets can be purchased in much larger quantities; the time necessary to issue one of these tickets is the same as that of issuing a card ticket from the case; as a duplicate agent's stub is retained for every ticket issued, accounting for general ticket-stock records and for auditors is materially reduced.

Patent protection has been applied for on this ticket cutter by its inventor, W. P. Potter, general passenger agent, Illinois Traction System, Springfield, Ill., on which system it is stated the cutter is working out very successfully.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

A Commissioner's Woes

Not Since Days of Mayor Gaynor and Mr. Whitridge Has New York Enjoyed a Letter Such as This

Seymour Van Santvoord, chairman of the Public Service Commission of the Second District of New York, resigned on Feb. 1, the day on which his term of office expired. In a letter to the Governor Mr. Van Santvoord said in part:

NOBLE ORDER OF HEAD-HUNTERS

"Even if under the stress of weightier matters you had overlooked the fact that my term of office expires on Feb. 1, it is inconceivable that the Most Noble Order of Head-Hunters has not recalled it to your mind, and thus I have been both surprised and disappointed that Your Excellency has not seen fit either to advise me when I am to realize the joy of welcoming my successor, or to honor me with any suggestion whatsoever of your wishes in the matter.

"With reluctance and regretfully I am thus compelled to assume that you have classed me with those who, for the sake of the salary, are willing to cling to an outworn honor and the shadow of a bygone service until the scales of expediency shall have been adjusted to that nice balance which, in the decadent days, appears to be a *sine qua non* in the choice and confirmation of the appointee to an important State office. Any such statement is as foreign to me as the idea is abhorrent; if a contrary impression has been created by my four years of painstaking and conscientious service—commonplace although it may have been in other respects—I can understand something of the chagrin, if not actual bitterness, with which Mr. Straus in acceding to your request nevertheless declared that a member of the Public Service Commission is indeed fortunate who can retire from office with even as good a reputation as he enjoyed when he undertook it.

LIFE 'ONE DEMD HORRID GRIND'

"I think it must be plain to you that no tawdry salary would permit me to stay lashed to this Ixion's wheel for one moment longer than the imperative sense of duty commanded. And no less from what I have implied than from what I have stated, you can readily understand that since for me life has become 'one demd horrid grind'—to borrow the weird but expressive imagery of the immortal Mantilini—I have been sustained alone by the Star of Hope which the Legislative Manual expressly states is due to arise in my official horizon on Feb. 1, 1918.

"Governor, Governor, why did you so

thoughtlessly, how could you so unfeelingly, refuse to a suffering soul, who has realized the vanity of human aspirations and the nothingness of human greatness, the long-coveted mandate, 'Thou faithful servant, go in peace'—or otherwise even, if only permitted to go without actual dishonor? What evil have I done that thou, my friend and respected superior, shouldst deliberately withhold the word of hope which would have cheered my drooping spirits and the ray of light which would have guided my eager steps toward that chapel of official forgetfulness termed 'ex' for the consolations of which, in the mercy of Providence you yourself may sometimes anxiously yearn.

"With unaffected sympathy for the sorrows of the next chairman, and with heightened respect for the sorrows of my predecessors, I remain—shall I say for the last time?

Carhouse Fire in Wheeling

The Bay Island operating carhouse of the Wheeling (W. Va.) Traction Company and twenty-nine double-truck air-brake passenger cars and one new work car, all 5 ft. 2½ in. gage were destroyed by fire, probably incendiary, at 2 a. m. on Feb. 4. The company is now operating about 75 per cent of service. The Jewett Car Company has had fourteen double-truck cars under construction for the company for some time and completion of this rolling stock will be hastened. The railway is looking for complete cars of broad gage for temporary use and will arrange speedily for the permanent replacement of the equipment.

New United Engineering Society Officers

The following officers were elected for the ensuing year, at the annual meeting of the trustees of the United Engineering Society, held on Jan. 24: President, Charles F. Rand, member of the American Institute of the Mining Engineers.

First vice-president, Calvert Townley, member American Institute of Electrical Engineers.

Second vice-president, Robert M. Dixon, member of the American Society of Mechanical Engineers.

Treasurer, Dr. Joseph Struthers, member of the American Institute of Mining Engineers.

Secretary, Alfred D. Flinn, member of the American Society of Civil Engineers.

Chairman of the finance committee, J. Vipond Davies, member of the American Society of Civil Engineers.

West Side Report Ready

Committee Which Has Been Considering Removal of Tracks from Surface Reports to Legislature

The report of the Commission on West Side Improvement, which was submitted to the Legislature of the State of New York on Jan. 31 recommends the appointment of a commission of seven members with ample power to build one or more tunnels under the Hudson River, either with public money or by some arrangement with private capital, and to make similar arrangements for a terminal on the West Side with zone connections, which the railroads serving this city shall build themselves or be compelled to use on a co-operative basis if built by others.

A bill repealing all of the laws heretofore enacted in relation to the West Side improvement was sent to Albany with the report and was later introduced into the Legislature. The purpose of repealing the present laws was to clear up all legal entanglements.

OUTLINE OF IMPROVEMENTS

A brief outline of the things the proposed commission should do in order that the West side problem may be successfully solved provides for:

A subway or elevated terminal system on the West Side extending south from Sixtieth Street to Canal Street or further as traffic conditions may require, with intermediate zone stations, the system to be used by all railroads.

One or more freight tunnels under the Hudson River connecting the terminal system with classification yards in New Jersey.

Tracks of the New York Central Railroad Company should not extend east of their present location and should be covered and depressed to a depth to be determined by engineers. All of the improvements along the river front from Seventy-second Street to Spuyten Duyvil should not be permitted to interfere with parks and residential features.

The tracks of the New York Central Railroad on the West Side should be removed from grade. Steam as a motive power should be eliminated.

Public Service Commissioner Hervey said that the report did not reach the kernel of the situation; that it involved the removal of all the safeguards which the Governor and Legislature had placed around valuable public rights on the West Side, and that if the report was accepted the whole subject would have to be reopened, with no prospect of anything being accomplished for some time.

New Franchise for Montreal Tramways

Review of Provisions of Contract for Thirty-five-Year Franchise Signed by Representatives of the City and the Company

In the contract prepared by the Tramways Commission for the city and the Montreal (Que.) Tramways, and signed by representatives of both, as submitted to the Quebec Legislature on Jan. 30, the company receives a franchise until March 24, 1953, for a surface railway system. The rights, privileges and franchises possessed already by the company in the city are annulled, and any that it possesses in other municipalities or will possess will be annulled by the mere fact of these territories being annexed to the city. In such cases the annexed territories would fall under the terms of the new contract.

COMMISSION FOR CITY

To obviate the incessant bargaining and bickering between the city and the company, a permanent tramway commission for Montreal is to be created, with jurisdiction over all the lines of the Montreal Tramways, or any of its subsidiaries, so far as finances, operation, extension and disputes are concerned. This commission, which will be appointed as soon as the new contract is put in force, is enjoined within sixty days to set a uniform fare within the city limits and an additional territory that will wipe out in various outlying districts the double fares now obtaining. The right of transfer may still be kept, but the commission is instructed to enforce transfers in which will be punched the exact point of transfer, instead of the latitude which the present transfers permit.

Among other changes made obligatory, or within the power of the commission to permit, are the formation of labor unions by the employees, the transportation of freight at times and under regulations of the commission, and the giving of an autobus franchise to the tramways whenever the commission feels that circumstances justify it.

CAPITAL VALUE \$36,286,295

The capital value of the company is placed at \$36,286,295, and the company cannot pay more than 10 per cent on this fixed capital. The amount per revenue car mile it can spend on operation costs will be fixed by the commission, and the establishment of various funds is ordained, as follows: A fund of \$500,000 to be created by \$100,000 instalments in five years to pay off old debts and excesses in the operating fund beyond the amount set each year by the commission; a maintenance and renewal fund; a tolls reduction fund; and a reserve contingency fund. An annual sum of \$500,000 is to be given to the city, and when everything else is provided for, including dividends of the company, the surplus is to be divided as follows: 30 per cent to the city, 20 per cent to the company and 50 per cent for the reduction of fares. Whenever the latter fund passes \$2,-

500,000 it will be applied to the reduction of fares, and that will continue to be the case through the life of the contract.

In the second article the Montreal Tramways Commission is created as a controlling permanent body. The third article gives it three members to be named by the Lieutenant-Governor-in-Council immediately after the contract goes into force. The president and vice-president will be named by the government as well. Any vacancy will be filled from Quebec in the same manner as soon as such vacancy is known to the government, but the fact of there being a vacancy will not prevent the other members from exercising their functions. Each member is to be appointed for ten years, but members can be removed for cause by the government.

APPEAL FROM COMMISSION DECISIONS

Two members make a quorum of the commission. The remuneration will be fixed by the government and paid monthly. The commission is allowed to make its own rules, which will be obligatory as soon as the Public Utilities Commission has approved of them and the city and other municipal corporations have been notified. Appeals from the decisions of the commission can be taken by either party to the contract or by any municipality interested to the Public Utilities Commission on all questions of law and of competence with reference to the contract and all decisions of the commission. The appeal thus taken is final except on questions of law.

RATES OF FARE

Fares in force from the date of the contract, in as well as outside of the city, which the company is authorized to collect, are to continue in force until they are modified by the commission. Within the uniform rate territory, as well as in other municipalities, the commission is to fix different tariffs for all passengers at certain hours of the morning or night, and it may fix higher tariffs for night hours from midnight to 5 a. m.

The commission may establish for school children or apprentices a lower tariff, which shall apply only during week days, from 8 a. m. to 6 p. m. for school children and for apprentices from 6 a. m. to 7 p. m. Children less than five years old are to be carried free.

The amount to be allowed for operation is to be based on revenue car-miles, exclusive of carhouse and car-yard miles. This sum will be known as the operating allowance, and will cover operating expenses and all taxes levied against the company. The expenses of the commission and defense and settlement of claims are also to be charged to this account, and the company is also obliged to hold a certain sum in reserve, to be determined later, for the settle-

ment of such suits and claims as may be carried over the operating year.

The commission is annually to determine the amount of the operating allowance. If in each year the company has not exceeded its operating allowance then the commission is to permit the company to take out of gross revenues a sum to be known as the operating profit, which is to be equivalent to one-eighth of 1 per cent on the total average capital value for that year, and such operating profit is to belong to the company. If, on the other hand, there has been an excess expenditure, this must be covered from gross revenues, or if more than one-eighth of 1 per cent, it must be made up from the guarantee fund.

NO DIVIDENDS OVER 10 PER CENT

During the life of the contract the company is prohibited from paying dividends in excess of 10 per cent. The city is to receive out of gross revenues over and above all other amounts to which it may be entitled, the sum of \$500,000 a year during the continuation of this contract, payable quarterly. A contingent reserve fund is also provided for by the deduction of 1 per cent from gross revenues, until such fund shall amount to \$500,000.

A tolls reduction fund is to be instituted, and if at the end of any year this fund exceeds \$1,000,000 the commission may reduce the fares on the tramways. Reduction of fares is to be obligatory when the tolls reduction fund reaches \$2,000,000, such reduced fares to remain in force until such time as the commission deems it necessary to increase them again. If the tolls reduction fund continues to increase, and reaches a further sum of \$2,500,000, fares are to be further reduced.

RIGHT OF EXPROPRIATION

On March 24, 1953, and at the expiration of every subsequent five-year period, the city is to have the right, after six months' notice given to the company within the twelve months immediately preceding March 24, 1953, to appropriate for itself the railway plant, etc., of the company within and without the limits of the city, by paying the value fixed by arbitrators and 10 per cent over and above the estimate. Such arbitrators are to be appointed, one by the city, one by the company and the third by a judge of the Superior Court sitting in and for the district of Montreal.

Should the city exercise the right conferred upon it by the purchase clause, it is agreed that the valuation of \$36,286,295, fixed by the present contract, shall in no way bind the arbitrators in establishing the purchase price payable by the city. The purchase price is also to comprise all privileges, rights and franchises of the company in any municipality wherein the assets so acquired are situated, and the city is not to pay for the value of such privileges, but is to have the right to operate the system of tramways so purchased in any municipality in which railway property of the company is located.

Advisory Council on Labor

New Body Will Formulate Program and Recommend Administrative Machinery on Every Phase of Employment Problem

Reports from Washington indicate that the recent appointment of an advisory council to the Secretary of Labor is of far more importance, broadly speaking, than some of the events to which the daily papers have given far greater space. The council is expected to determine the policy which shall keep labor and capital working together during the war. Incidentally, if the work of its members is far-seeing—as the constitution of the council gives warrant for expecting—it should have a tremendous influence on the socio-economic conditions under which we shall live after the war. Briefly the program includes:

THE PROGRAM

1. A means of furnishing an adequate and stable supply of labor to war industries. This would embrace:
 - (a) Satisfactory system of labor exchanges.
 - (b) A satisfactory method and administration of training of workers.
 - (c) An agency for determining priorities of labor demand.
 - (d) Agencies for dilution of skilled labor as and when needed.
2. Machinery which will provide for the immediate and equitable adjustment of disputes in accordance with the principles to be agreed upon between labor and capital and without stoppage of work. Such machinery would deal with demands concerning wages, hours, shop conditions, etc.
3. Machinery for safeguarding conditions of labor in the production of war essentials. This to include industrial hygiene, safety, women and child labor, etc.
4. Machinery for safeguarding conditions of living, including housing, transportation, etc.
5. Fact-gathering body to assemble and present data collected through various existing governmental agencies or by independent research to furnish the information necessary for effective executive action.
6. Publicity and educational division which has the function of developing sound public sentiment; securing an exchange of information between departments of labor administration; and promotion in industrial plants of local machinery helpful in carrying out the national labor program.

The first four divisions cover matters familiar to all manufacturers, contractors and engineers. Subdivisions (b), (c) and (d) of function (1) represent activities made necessary by the war. The true significance of the establishment of the body is appreciated when attention is directed to the sixth division, and when one recalls the activities of the labor division of the British Ministry of Munitions and the influence that its work of the same broad scope has had on industrial England.

Incidentally, it may be said that the council last week recommended to the Secretary of Labor (1) the organization of a board to formulate an arrangement for ending strikes, and (2) the centralization in his department of the industrial service divisions of the various branches of the war machine. Both plans have been approved by the secretary. The first of them is absolutely essential if co-operation is to replace strife.

The council is headed by John Lind, former governor of Minnesota, and

envoy to Mexico, representing the public. Waddill Catchings, president of the Sloss-Sheffield Steel & Iron Company, and of the Platt Iron Works, and A. A. Landon, general manager of the American Radiator Company, represent the employers. Labor's members are John B. Lennon, treasurer of the American Federation of Labor, and John J. Casey, former member of Congress. Dr. L. C. Marshall, of the University of Chicago, is the economist member and Agnes Nestor, Chicago, represents women.

Rapid Transit Plan Explained

Engineer Makes Address Outlining Plans for Future Transit Construction for Detroit

H. M. Brinckerhoff of Barclay Parsons & Klapp, New York, N. Y., who reported on a system of rapid transit for Detroit, addressed the members of Detroit Engineering Society recently.

By maps and lantern slides he illustrated the subway and overhead rapid transit system which he claimed could be completed by 1950, at which time he predicted Detroit would have a population of 2,000,000 and a ground area of 150 square miles. Mr. Brinckerhoff is reported to have said:

\$29,000,000 OUTLAY

"It is not expected to put through this project, which would mean an initial outlay of about \$15,000,000 by the city and \$14,000,000 by the local railway, at this time when war has raised the costs of all construction work. But it takes years before a plan can be fully worked out and agreements signed. By that time the war will be over.

"If rapid transit facilities are not provided people will be forced into tenements. Woodward Avenue cars are now carrying 4,640,000 passengers per track-mile per year. The only line carrying more is the New York subway with 4,970,000. Forty per cent of the riders on Woodward Avenue travel more than 3 miles, which places it in the rapid transit class.

SURFACE CARS FOR SHORT HAULS

"We need the surface cars for short hauls, with transfers to both subway and overhead lines for longer hauls, these latter lines also taking care of the interurban lines. By a partnership agreement between the city and the Detroit United Railway, operating the local city railway lines, the proposed system, which will give maximum service to all, will be completed in thirty years and in time will all revert to the city."

Mr. Brinckerhoff's plan is for subways on Woodward Avenue from the river to the boulevard, a short cross-town spur at Gratiot and another at the boulevard; elevated railroads to continue the subways up Woodward

Avenue and out Fort, Michigan, Grand River, Gratiot and Jefferson, with additional lines running from the river to the boulevard on the west side and from the boulevard out Hamtramck on the east.

Toledo Report Filed

Twenty-five Year Franchise Proposed for Community Traction Company With 6 Per Cent Return.

The Street Railway Commission of Toledo, Ohio, filed its report with Mayor Cornell Schreiber on Feb. 1. It has been two years in course of preparation. The signatures of the members of the commission are attached, with that of Judge Ralph Emery, who acted as attorney, but the name of Henry L. Doherty, chairman of the board of the Toledo Railways & Light Company, does not appear.

The report provides for a twenty-five year franchise to be granted to a so-called community traction company, which it is proposed to organize to succeed to the ownership of the railway property of the Toledo Railways & Light Company. The stock is to be held by trustees for five years, and during this period Toledo citizens may purchase it on the installment plan at \$10 per share.

6 PER CENT RETURN PROVIDED

It is proposed to fix the rate of fare so that the stockholders will receive dividends of 6 per cent on their holdings, with a premium of 10 per cent in the event the city purchases the property. A sliding scale of fares from a 5-cent maximum, with free transfers, down to ten tickets for 25 cents, with a 1-cent charge for transfers, is provided. The dividends and margin for the purchase of the property will have to be worked out between these two extreme limits.

Provision is made to the effect that the city may lease, operate and eventually own the street railway property by paying 25 per cent of the purchase price down and 2 per cent annually on the principal and 6 per cent dividends to the stockholders.

Railway Taxes Lifted

The prosperity of Japan is such that taxes are being reduced on local transportation in the cities. Mr. Shoda, Minister of Finance, announced on Nov. 29 that all railroads and electric railways in the Empire, exceeding 100 in number, had presented a petition for relief from transportation taxation, and that the Ministry had decided upon its cancellation. A bill for doing away with this tax was introduced in the last Diet, but did not pass. The tax was levied among the first of special war measures to raise revenue during the Russo-Japanese war, and has remained in force for twelve years. The receipts therefrom amount to \$2,500,000 annually, of which Tokio lines pay almost \$1,000,000. When the tax is cancelled, city tram fare in the capital will be reduced one-half cent on each trip.—*Financial America*.

Recommends Service at Cost for Massachusetts

Committee Which Investigated Electric Railway Situation Reports to Legislature in Favor of Plan Proposed by Investors

The street railway investigation commission, appointed last year to study the electric transportation situation in Massachusetts, filed its report this week with the Legislature. The chief recommendation of the majority of the commission is that a service-at-cost plan be adopted under which fares would automatically rise as income declined and vice versa. The plan should embody the following fundamental features, the report says:

1. Establishment of a sliding scale of fares, so arranged that when the schedule of fares in operation does not yield a revenue sufficient to pay the cost of the service the next higher schedule of fares shall become effective, and when the fares yield a revenue greater than the cost of the service, a corresponding decrease in the rate of fare shall be made.

2. Creation of a reserve fund, which shall serve as a balance wheel in the system, so that a rapid fluctuation of fares due to seasonal or other conditions may be eliminated.

3. Establishment of a depreciation and maintenance fund, so that the electric railway properties shall be kept up at all times to the proper operating efficiency.

4. Provision for the rehabilitation, extension and improvement of lines during a period of years following the acceptance of this plan.

5. A director to be appointed by the governor of Massachusetts to the board of directors of each electric railway operating under this plan.

6. Supervision of the electric railway accepting this plan by district representatives, appointed by the governor or by the Public Service Commission; expenses of such supervision to be borne by the companies, but in no case to exceed a certain fixed percentage of operating expenses.

7. Provision for arbitration proceedings relative to certain conditions which might arise.

8. Provision whereby the State, or any political subdivision thereof, may purchase the entire property of a company, accepting this plan, at its determined investment value, or under any other provision of existing or future statutes.

9. A return to the investors of 6 per cent per annum on a fixed investment value. The amount of such investment value to be determined by the Public Service Commission and to include such sums as have been prudently and honestly invested and conserved with proper diligence, due consideration being given to the present physical condition of the property. The investment value from time to time to be increased by such sums as the commission shall certify have been prudently spent and are properly chargeable to capital.

10. The acceptance of such a plan to be optional with the individual companies.

11. Legislation allowing the Boston Elevated Railway (including its leased lines) to accept this plan.

12. In case the service-at-cost plan is accepted by any company, such funds as the Public Service Commission shall consider necessary for the establishment of the reserve, depreciation and rehabilitation funds or for improvements immediately necessary, shall be raised by an issue of capital stock, either preferred or common.

OTHER RELIEF RECOMMENDED

The investigating commission further recommends:

1. That jitneys be declared common carriers and placed under the supervision of the Public Service Commission.

2. That electric railway companies be allowed to operate motor vehicles (not running on rails or tracks) as auxiliaries or feeders.

3. That authority to grant permits to electric railways to become common carriers of newspapers, baggage, express matter and freight, now vested in local authorities, be transferred to the Public Service Commission.

4. Abolition of the commutation or excise tax and passage of an act requiring electric railways to maintain in good repair but not to renew or replace the paving, upper planking or other surface material or the base thereof between the rails and tracks, and in the case of unpaved streets for 18 in. outside the rails.

5. That if a municipality refuses to grant an electric railway permission to alter its tracks in order that a more improved type of equipment may be used, the right of appeal shall be had to the Public Service Commission.

6. If an alteration is made in the location of electric railway tracks in highways, no portion of the expense shall be borne by the railway except when such alterations are made upon petition of the railway.

7. That electric railways shall not be obliged to bear any expense in connection with alterations, strengthening or construction of bridges or the approach thereto.

Messrs. Gibbs, Hays and Forbes signed the report but presented dissenting statements advocating reduction in subway and tunnel charges now paid by the Boston Elevated. Messrs. Worrall, Bunting and Donovan filed dissenting reports. Mr. Bunting advocated public ownership, the majority having held that such would be unwise at this time. Mr. Worrall submitted a "service-at-cost" plan of his own which provides for a railway commission of three members appointed by the Governor.

As a result of its investigation, the commission concluded that the following causes have contributed to the present unsatisfactory situation relative to the railways of Massachusetts: Depreciation of the purchasing power of

the nickel; growth of the automobile business; taxation and highway maintenance requirements; improvement of facilities; non-paying lines; failure to provide for depreciation and obsolescence, and lack of co-operation between the railways and the public.

In connection with the recommendation of a service-at-cost plan, the commission did not present a definite bill, since it did not deem it expedient, at this stage, to submit a bill limiting the plan to any particular set of provisions.

Coal-less Monday Order Continues

Public Utilities Show Savings in Coal of from 21 to 25½ per Cent from Order

Dr. H. A. Garfield, the fuel administrator, William G. McAdoo, director general of railways, and several State fuel administrators who met in Washington for conferences on Feb. 4, 5 and 6, have decided to continue in effect the orders preventing industry on Mondays, notwithstanding the fact that previous authoritative information to the Washington correspondents had been that the order would be rescinded.

In making public this decision continuing the order, Dr. Garfield called attention to the fact that a "change in weather conditions" which is hoped for of a favorable character must take into consideration the question of the possibility of floods when the thaws followed the present period and condition of snow and ice. Flood conditions, he said, must be figured in weather conditions, and the apprehension now exists in Washington that flood conditions may tie up transportation of coal as badly as snow and ice have tied it up.

In referring to the effect of the closing order Dr. Garfield said, in part:

"The effect of the closing order is not easily measured statistically, the more so because of extraordinary weather conditions, but the State fuel administrators reported that substantial savings had been effected. The most exact estimates were submitted by the secretary of the National Committee on Gas and Electric Service. These figures were furnished by the electric light, power and gas companies of twenty-nine of the largest cities of the country. The weighted average of the saving during the five days from Jan. 17 to 22, inclusive, was 21.2 per cent, while the saving for Monday, Jan. 28, was 25.5 per cent of the amounts usually consumed. Mr. Garfield is also informed by the secretary of the National Committee on Gas and Electric Service, Mr. Elliott, that the public utilities concerned did not consume on other days appreciably more than the normal amount of coal as a result of the shutdown. It is estimated that the public utilities reporting furnish a fair index of the general saving in the communities involved."

In consequence the Monday closing order will be continued until such time as the change in weather and resulting improved transportation conditions war-

rant its suspension. A close watch will be kept upon conditions, however, and further consideration will be given to the subject as soon as there is reasonable assurance of relief. It is also hoped that, with the shut-down on Monday, Feb. 11, and the closing in many States on the day following, Lincoln's Birthday, it will be possible thenceforth to rely upon embargoes and the preference in movement of food and fuel ordered by the director general of railroads.

Strike in St. Louis

Trainmen of United Railways Demand More Pay and Recognition—Joined by Shop Workers

The striking employees of the United Railways, St. Louis, Mo., on Feb. 5 awaited action from the board of directors of the company who were in executive session. It was not expected that the result would be known until late on Feb. 5, possibly not until Feb. 6. Pending the meeting of the board of directors on Feb. 5 the railway refused on Feb. 4 to send representatives to the conference called for the afternoon of Feb. 4 in the Mayor's office.

It is stated that the company is opposed to the recognition of the union, but is willing to arbitrate the question of wages and hours. It was announced on Feb. 5 that many men who went out were asking to be taken back. Some of these men were assigned cars immediately. Ninety-two cars out of the normal 1100 were being operated on the principal lines on Feb. 5. During the morning hours, car windows were smashed, trolley wires were cut and spikes driven between the track and the guard rails in an effort to derail cars. Rioting occurred at several points and many persons were hurt. It is understood that the strike could be adjusted quickly but for the question of the recognition of the union by the railway.

The electrical workers and more than 250 shopmen joined the trainmen on Feb. 5. They demand eight hours and a new wage scale.

Legislation to Protect Women

It seems more than likely that the employment of women as conductors on the surface lines in New York City and as guards in the Brooklyn subways will result in the passage of legislation in their interest at the session of the Legislature now in progress. Already several bills looking toward these ends have been introduced. The measures are all more or less along the same general lines. They would fix the hours of labor and prescribe an age minimum. The bill introduced in the Senate by Mr. Nicoll would, for instance, provide:

"No female minor under the age of twenty-one years shall be employed in the operation of any street, surface, elevated or subway railroad within this State, and no woman employed in the operation of any such railroad shall be

allowed or permitted to work more than nine hours in any one day, or more than six days or fifty-four hours in any one week, or before 6 o'clock in the morning or after 10 o'clock in the evening of any day, nor shall any woman be knowingly so employed within four weeks after she has given birth to a child."

News Notes

Paving Case Goes Against Company.—The Supreme Court of Ohio ruled on Feb. 1 that, under the Tayler franchise, the Cleveland Railway is liable for the cost of paving the Superior Avenue viaduct. The court said that if there was any doubt about the construction or application of the franchise the city should prevail. The court held that the replacing of blocks constituted repair and not repaving. For this reason the company must stand the cost.

No Hearing on Tax Appeals.—Upon agreement between Frank S. Katzenbach, Jr., counsel for the Trenton & Mercer County Traction Corporation, and Charles E. Bird, counsel for the City of Trenton, N. J., there will be no hearing in the matter of the appeals being taken by the company from the assessments of the property for taxing purposes. Both attorneys appeared before the Mercer County Tax Board and offered that the testimony taken in the case of the appeals last year be considered the same as having been taken in the present case. The 1916 appeals are now before the State courts. The company lost in the 1915 appeals.

Municipal Railway Appropriation Bills Go Over.—At a recent meeting of the City Council of Seattle, Wash., two appropriation bills introduced in Council on Sept. 17 transferring \$12,000 from the general fund and the light department depreciation fund respectively for the completion of the Ballard extension of the municipal railway were indefinitely postponed. Judge Calvin S. Hall, in a suit brought by Theodore S. Hall, held that money could not be appropriated from either of these funds for the construction of a railway. It was on this decision that the plan to extend the railway was temporarily held up until utility bonds authorized for the purpose by the Council could be marketed.

Navy Still Needs Binoculars.—The navy is still in urgent need of binoculars, spy glasses and telescopes. Several weeks ago an appeal through the daily press resulted in the receipt of more than 3000 glasses of various kinds. But this number is wholly insufficient. Articles should be forwarded by mail or express to Hon. Franklin D. Roosevelt, assistant secretary to the navy, Naval Observatory, Washington, D. C., by whom they will be acknowledged. Those not suitable for naval

use will be returned to the sender and those accepted will be returned at the termination of war, although it is impossible to guarantee them against damage or loss. The government will pay \$1 for each article accepted, which sum will constitute the rental price or in the event of loss the purchase price of such article.

A Painter the Latest Regulator.—Alderman W. H. Zeiser, a painter by trade and chairman of the committee on railways of the new Board of Aldermen of Louisville, Ky., has proposed a bill for the appointment of a city street railway commissioner to act as technical adviser to the city in matters affecting fares, quality and quantity of service, and transfers, etc., the installation of separate accommodations for white and colored passengers or the operation of separate cars, the creation of a board of arbitration to settle differences between the commissioner named above and the company, and a stipulation that the city, on failure of the company to obey the board of arbitration, shall deprive it of use of the streets.

Plea for Minnesota Line.—W. L. Luce, head of the Electric Short Line Company, known as the Luce Line, a gasoline-electric line extending from Minneapolis to Hutchinson, Minn., has asked the Senate committee on interstate commerce at a hearing in Washington to take over the line along with other railroads. Mr. Luce fears that if the line is not taken over by the government the company will lose practically all the through business. Because the line is now a mile shorter than one steam line and 15 miles shorter than another between Minneapolis and Hutchinson it has been getting delivery of through freight to and from all Chicago lines. It is Mr. Luce's belief that with these long lines taken over by the government the physical advantage would count for naught. The Luce line is 60 miles operated and 75 miles right-of-way.

Association Meeting Programs

Wisconsin Electrical Association

The annual convention of the Wisconsin Electrical Association will be held in Milwaukee, Wis., on March 27 and 28, with headquarters at the Pfister Hotel.

Midwinter Convention of A. I. E. E.

The American Institute of Electrical Engineers will hold its sixth midwinter convention at the United Engineering Societies' Building in New York City, on Feb. 15 and 16. After the opening remarks of President E. W. Rice, Jr., president of the General Electric Company, the first session will be devoted to discussion on the rating and selection of oil circuit breakers. The other sessions will be largely taken up with scientific matters. Mr. Rice will speak also at an informal dinner at the Café Boulevard at 6.30 p. m. on Friday.

Financial and Corporate

War Finance Bill Presented Plan for Federal Financing Corporation —Currency Comptroller Says Utility Credit Must Be Preserved

The war finance corporation bill prepared by Secretary McAdoo was introduced in Congress on Feb. 4. As noted last week, this bill contemplates the creation of a \$500,000,000 corporation to make loans and advances to essential industries and otherwise assist in private financing.

In commenting upon the bill Mr. McAdoo says:

"Many instances have been brought to the attention of the Secretary of the Treasury and of the Federal Reserve Board where railroads, public utilities, power plants, etc., have been prevented from obtaining the necessary advances to enable them to perform vital service in connection with the war because the bank credits, ordinarily available to them, are being absorbed by the government itself.

"It is believed that the proposed bill has been wisely and conservatively conceived as a war measure to give relief from this condition during the period of the war. The banks of the country would, no doubt, scrutinize with the utmost care both the loans themselves and the security therefor, and would exercise their individual judgment upon the borrower's credit before assuming a liability for the amount of the loan. They would be under the necessity of advancing, out of their own resources, 25 per cent of the amount loaned. The bill would authorize advances to a bank of only 75 per cent of the amount loaned by the bank to a war industry.

"It is confidently believed that the mere existence of the machinery which this bill would establish would of itself maintain confidence to such an extent that the aid of the corporation would only in relatively few cases be called for, and that the banks would be able to take care of the requirements of this class of borrowers and be ready to do it knowing that in case of need loans of that character would be available for rediscount.

"The provision permitting direct loans by the corporation in exceptional cases for not more than five years is intended to provide for those rare cases where it may be made to appear to the corporation that a meritorious borrower is being unwisely discriminated against by the banks.

"The bill provides for approval by the corporation, through a system of licenses, of issues of securities in excess of \$100,000 with a view to preventing the use of capital in unnecessary expenditures during the period of the war. This is of great importance in order to conserve the supply of new capital and make it available for gov-

ernment loans and essential war purposes."

In his report for 1917 the Comptroller of the Currency, John Skelton Williams, emphasizes the importance of maintaining the efficiency and credit of utilities. If such enterprises are allowed to sink into inefficiency, he states, much of the most important war work of the government will be crippled or paralyzed. Continuing, Mr. Williams says:

"The first and most direct relief to the utilities can be given by the state commissions and municipal and local authorities, with the broad-minded cooperation of the people generally. It is essential that forbearance and consideration be exercised by these, and that the corporations also be permitted to make such additions to their charges for service as will keep them solvent, protect their owners against unjust loss, and give them a basis of credit on which they may obtain the funds with which to meet the strain put on them by the government's needs. The breaking down of these corporations would be a national calamity."

Another Road Junked

The Alton & Jacksonville Railway, Alton, Ill., went out of business on Jan. 31, and the entire property will be sold as junk by its owner, John J. Cummings, Chicago. The last car left Alton at midnight, and it was said that wreckers were prepared to tear up the tracks at Jerseyville the following day.

The road, which is about 21 miles in length, said to represent an original cost of \$500,000, never succeeded as a financial venture and five years ago a protective committee of bondholders forced a receivership. Later Mr. Cummings obtained the property. The Illinois Public Utilities Commission last December issued an order directing the road to cease operations.

The case of the company before the commission was reviewed in the *ELECTRIC RAILWAY JOURNAL* of Feb. 2, page 248.

New Bay State Issues

Judge Dodge of the United States Court on Jan. 31 issued three orders in the case of the Bay State Street Railway, Boston, Mass., in the hands of W. B. Donham as receiver, as follows:

1. The receiver is authorized to execute the permanent equipment 6 per cent collateral gold notes to the Old Colony Trust Company, as trustee, and is authorized to set aside and deliver the permanent notes in exchange for the temporary receipts for such notes now outstanding to the amount of \$1,308,000.

2. The receiver is authorized to settle suits or claims for personal injuries or damages to property arising out of

accidents or occurrences prior to the appointment of the receiver, the amount not to exceed \$50,000 in the aggregate.

3. The receiver is authorized to pay out of funds on hand \$30,000 of the principal of the mortgage of the Brockton & East Bridgewater Street Railway maturing on Feb. 1 and also the sum of \$39,240 interest on the car trust notes of the Bay State Street Railway due on Feb. 1.

Another Seattle Tax Proffer

**Puget Sound Company Repeats for
1917 Its 1916 Offer, Now Being
Reviewed by the Courts**

The Puget Sound Traction, Light & Power Company, Seattle, Wash., proposed to the city of Seattle on Jan. 23 that it pay \$72,443, representing 2 per cent of its gross railway earnings for 1917, under the same conditions that payment of \$64,387 for 1916 was tendered a year ago. These figures indicate that the company's gross earnings for 1917 were \$3,622,175, as compared with \$3,219,389 for 1916.

In December, 1915, after the company had petitioned the Public Service Commission to be relieved of certain of its franchise obligations, including the payment of 2 per cent of its gross earnings to the city, the paving of rights-of-way, and any portion of the cost of bridges, a conference with Mayor H. C. Gill resulted in an agreement that planking should be done in lieu of paving, and that in the event the relief sought was granted by the Public Service Commission the amount of gross earning tax for that year should be refunded.

On Jan. 13, 1917, the company tendered payment of \$64,387 with the stipulation that the litigation started by the city to force compliance with the paving provision be dismissed, or withdrawn until final adjudication of its petition for relief. This payment was for 1916 earnings. The Council refused to accept payment under those conditions as agreed to at the conference with the Mayor in 1915, and the amount was returned to the company. The city then brought a suit to recover the amount. Payment of the 1917 tax is tendered under similar conditions.

The Tacoma Railway & Power Company and the Pacific Traction Company, both subsidiaries of the Puget Sound Traction, Light & Power Company, operating in Tacoma, Wash., recently tendered the City Comptroller of Tacoma a check for \$11,111, covering 2 per cent of the gross earnings on their passenger traffic, and 5 per cent of their freight and power business during the last six months. The \$11,111 exceeds the previous semi-annual payment to the city by about \$500; while the passenger earnings showed an increase for the city of \$1,000, the freight and power earnings show slight decreases. The company apparently is not through with its protest made to the Public Service Commission last year, in which it was attempted to show that the city's tax on the gross earnings of the local companies was illegal.

New British Financing

Government Borrowings in 1917 Completely Overshadow All Other Capital Issues for that Period

With the continuation of strict supervision by the Treasury over new capital issues in Great Britain, the record of 1917 borrowings published by the London *Economist* is one almost entirely of government loans. Indeed, the amount of new capital raised for industrial purposes was only one-half of 1 per cent of the total.

The tramway and omnibus lines in 1917 raised £100,000 of new capital, as compared to nothing in 1916 and £432,500 in 1915. The accompanying table gives the details of 1917 new financing:

	1917 CAPITAL ISSUES IN GREAT BRITAIN	
	1916	1917
British government loans	£554,071,100	£1,297,819,700
Colonial government loans	6,000,000	13,870,700
Foreign government loans	15,000,000	nil
British municipal loans	495,000	nil
British railways	1,679,000	nil
Foreign railways	384,000	nil
Mining cos.—		
Australian	7,500	nil
Other mines	15,000	nil
Merchants, etc.	102,500	nil
Manufacturing	1,449,300	1,377,900
Rubber	15,600	3,100
Oil	1,573,500	1,125,000
Iron, coal, steel, etc.	1,275,000	881,500
Electric lighting, power, telegraphs, etc.	102,400	214,000
Tramways and omnibus	nil	100,000
Motors	381,300	554,200
Gas and water	16,400	nil
Hotels, theaters, etc.	7,000	nil
Patents	27,000	nil
Docks and shipping	800,000	nil
Banks and insurance	275,000	1,500,000
Miscellaneous	1,259,800	1,149,900
	£585,436,400	£1,318,596,000

New York Earnings

Revenues of the Metropolitan Carriers Show Increase, but the Net Income Stands Still

Operating expenses, taxes and interest costs are still eating up gains in operating revenues. One indication of this is the reports of electric railways operating in New York City. Returns to the Public Service Commission for the First District show that the financial results for the quarter ended Sept. 30, 1917, with changes from 1916 were as follows:

Railway operating revenues	\$26,188,616	*\$2,518,396
Operating expenses	14,804,537	*1,804,977
Net corporate income	2,261,221	†721

*Increase. †Decrease.

The railway operating revenues of the Hudson & Manhattan Railroad for the quarter ended Sept. 30 amounted to \$1,016,368, an increase of \$100,749; net corporate income, \$104,940, an increase of \$7,279. Interborough Rapid Transit Company—operating revenue, \$8,909,808, an increase of \$519,719; net corporate income, \$628,673, a decrease of \$619,727. Manhattan surface roads, including the New York Railways, the Third and Second Avenue lines and oth-

er carriers—operating revenue, \$5,404,480, an increase of \$945,231; net corporate income, \$285,176, an increase of \$440,782. Brooklyn Rapid Transit System—operating revenue, \$8,288,813, an increase of \$434,505; net corporate income, \$1,176,738, an increase of \$37,015. Bronx surface roads, including the Yonkers and Westchester lines—operating revenues, \$1,472,270, an increase of \$518,819; net corporate income, \$54,717, an increase of \$192,906. Queens surface roads (except B. R. T.)—operating revenue, \$743,151, a decrease of \$39,706; net corporate deficit, \$32,395, a decrease of \$22,655.

Milwaukee Purchase Proposed

Electric Railway & Light Company Desires to Take Over Light, Heat & Traction Company

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has filed an application with the Wisconsin Railroad Commission for authority to purchase the equipment and business of the Milwaukee Light, Heat & Traction Company, the property of which it now operates.

HOW THE COMPANY IS CAPITALIZED

The company says in its petition that it has negotiated for the purchase of the property for \$12,271,321. It is set forth in the petition that the bonded indebtedness of the Milwaukee Light, Heat & Traction Company is \$4,921,493. The company owes the Milwaukee Electric Railway & Light Company the sum of \$4,502,167. It has outstanding in notes unpaid the sum of \$600,000. Other liabilities aggregate \$113,969. The Milwaukee Electric Railway & Light Company proposes to issue \$2,312,716 in common stock, with which to make up the purchase price of the property, the purchasing company assuming the bonded indebtedness and other liabilities of the company.

PROPERTY VALUE \$12,271,321

The valuation of the property of the Milwaukee Light, Heat & Traction Company is based on that made by the Wisconsin Railroad Commission on Jan. 1, 1914, plus \$2,100,681 spent on improvements and betterments since that date. The petition sets forth that the true value of the property to be purchased is \$12,271,321, subject to the funded debt of \$4,921,493 and the other outstanding liabilities, and the petition concludes with the prayer that the Milwaukee Electric Railway & Light Company be authorized to purchase the property at the price named and to issue additional stock to the value of \$2,312,716.

HEARING TO BE HELD SOON

The Railroad Commission will hold a hearing on the petition within a short time.

The Milwaukee Electric Railway & Light Company has also filed a petition for authority to issue \$4,000,000 of bonds for the purpose of refunding bonds soon to fall due.

Changes in Missouri Line

Several New Directors and a New Chairman of the Executive Committee Elected

The annual meeting of the Kansas City, Clay County & St. Joseph Railway, the Missouri Short Line, was held in Kansas City on Jan. 14 at which time changes in the board of directors and the executive committee were made as noted below:

Thomas A. Reynolds, formerly chairman of the executive committee, has been elected vice-president of the National City Company. He has resigned as a director of the railway and as chairman of the executive committee. Allen G. Hoyt, New York, was elected a director, and was also elected chairman of the executive committee succeeding Mr. Reynolds. C. C. Chappelle, New York, has resigned from the executive committee. William L. McKee, New York, succeeds Mr. Chappelle on the committee. Robert Maydock was elected a director of the company succeeding Clement R. Ford, Boston, Mass., who has gone to war. Others of the thirteen directors were re-elected. The officers of the company re-elected were as follows: Phillip Saltonstall, president; John R. Harrigan, vice-president and general manager; William S. Tuley, secretary and treasurer.

A Turn for the Better

Stockholders of Central California Company Assessed, but Prospects for Future are Greatly Improved

The directors of the Central California Traction Company, San Francisco, Cal., have imposed an assessment of \$5 a share on the 1,000,000 of preferred and 2,675,300 shares of common stock outstanding. This assessment, which is payable immediately, becomes delinquent on Feb. 25, with March 20 as the sale day. A letter to the shareholders says:

PROSPECTS FOR THE FUTURE

"After years of unprofitable operation, due to unjust jitney competition and other reasons, the business has taken a turn for the better. Jitneys have been regulated and an agreement between our company and its bondholders has become effective, which reduces their interest demands. Our freight tonnage alone has increased about 35 per cent over previous years. As a result, for the first eleven months of the last calendar year, instead of a loss of \$88,101 during a corresponding period in 1916, we show a profit of \$6,011. We must further increase the earnings of the company.

"The government has asked our assistance in moving freight to, and relieving traffic on, trunk lines now under its control. To do this we must increase our equipment, improve our trackage and restore our credit by paying some of the floating indebtedness. These are the reasons that have actuated the board of directors in levying the \$5 assessment."

Financial News Notes

\$2,700,000 New Cleveland Stock.—Subject to approval of the State Utilities Commission, the Cleveland (Ohio) Railway soon will offer to holders of record as of March 1, an issue of \$2,700,000 new stock at par pro rata. The right to subscribe is to expire on March 15.

Move to Dismiss Receivership Suit.—A motion has been made in the United States District Court at St. Louis, Mo., by the United Railways, that city, and other defendants looking toward the dismissal of the suit filed by J. W. Seaman, seeking a receivership for the company. The company maintains that Mr. Seaman has alleged no valid cause for naming a receiver.

New Issues for Kansas City Railways.—The Kansas City (Mo.) Railways has been authorized by the Missouri Public Service Commission to issue \$1,151,830 of additional capital stock. This amount represents the improvements which have been made since May 1, 1915. The commission has also authorized the company to refund \$6,588,400 of 5 per cent bonds with two-year gold notes bearing 6 per cent interest and dated Feb. 1, 1918.

New West Penn Power Notes.—A. B. Leach & Company, Halsey, Stuart & Company and the Continental & Commercial Trust & Savings Bank, Chicago, are forming a syndicate to underwrite a new issue of \$1,500,000 two-year 7 per cent collateral gold notes of the West Penn Power Company. The new issue is to provide funds to complete the installation of power-generating machinery at the company's new plant at Windsor, W. Va., and for other purposes.

Rights and Privileges Sold.—The trackage and rights of the old San Angelo (Tex.) Power & Street Railway Company have been sold by the city of San Angelo to the San Angelo Light & Power Company for a cash consideration of \$600. The property of the old traction company recently came into possession of the city of San Angelo under an agreed judgment of the Tom Green County District Court. The purchase secures for the new street railway of San Angelo all the trackage rights and other privileges owned by the old company.

Beech Grove Line to Be Continued.—The Beech Grove (Ind.) Traction Company, which operates an electric railway between Indianapolis and Beech Grove, has continued in business. An arrangement has been made whereby Guy Rutledge, who had been operating a line of jitney buses between the city and Beech Grove, discontinued the bus line and became superintendent of the railway. A receiver was recently appointed for the company, as noted in the ELECTRIC

RAILWAY JOURNAL of Dec. 15, and it is said that affairs are working out well under the receivership.

Springfield (Ill.) Deal Disapproved.—The Board of Public Utility Commissioners of New Jersey has denied the application of the Union Railway, Gas & Electric Company to absorb the Springfield Railway & Light Company. Both are holding corporations, chartered in New Jersey, but the interests involved are mostly in Illinois, Indiana and Wisconsin. By the terms of the application the Springfield company would cease to exist and the stock would be cancelled, and the capital of the Union company, which is \$15,000,000, would not have been increased.

Meeting Bay State Coupons.—The committee representing the holders of 4 per cent refunding bonds due in 1954 of the Boston & Northern Street Railway and the Old Colony Street Railway, controlled by the Bay State Street Railway, Boston, Mass., have completed arrangements whereby the amount due on the Jan. 1, 1918, coupons will be advanced by the depository to depositing bondholders. Although receiver's certificates have been authorized for payment of this interest the sale of these has been delayed, and it has been deemed advisable to make the foregoing arrangement.

Unprofitable Road to Be Sold.—The property of the Parkersburg & Ohio Valley Electric Railway, Parkersburg, W. Va., is to be offered for sale at auction on Feb. 28 at Parkersburg. The sale is scheduled to take place at the Federal court house at 10 a. m. V. B. Archer is the special commissioner who will conduct the sale. The road extends from Sistersville to Friendly, a distance of 5 miles. It has been doing an unprofitable business, and last December Charles E. Williams, receiver of the company, in a petition to the United States District Court at Parkersburg, recommended that the line be dismantled and its effects sold at public auction.

Proposed Reorganization Upheld.—Judge M. T. Dooling in the United States Court at San Francisco, Cal., on Jan. 24 decided against the contention of two holders of the underlying bonds of the Northern Electric Railway, Chico, Cal., that they should be allowed better terms than were accorded them by the new reorganization plan. Proceeds from the sale are planned to be distributed as follows: 16 per cent to the holders of \$6,000,000 of overlying bonds; 59 per cent to the holders of \$3,800,000 of underlying bonds on the main line; 12½ per cent to the holders of \$750,000 in bonds on the Sacramento & Woodland branch, and 12½ per cent to the holders of the \$750,000 bonds on the Marysville & Colusa branch.

Lancaster Consolidation Proposed.—Application has been filed with the Public Service Commission at Harrisburg for approval of the consolidation of seven Lancaster County electric railways into a new corporation, to be known as the Conestoga Traction Com-

pany. The companies to be merged are Lancaster Traction Company, Lancaster Railway, Lancaster City Railway, Lancaster & Lititz Railway, Columbia & Ironville Railway, Columbia & Donnegal Railway and the present Conestoga Traction Company, which is a subsidiary of Lancaster County Railway & Light Company, having an authorized capital of \$1,500,000 of common stock and \$1,000,000 of 5 per cent cumulative preferred stock.

Financial Readjustment Likely.—It is reported that a new company is to be formed to take over the St. Paul (Minn.) Southern Electric Railway and to extend it after the war through southern Minnesota. The Interurban Construction Company held \$360,000 or a majority of the first mortgage bonds of the company. There are said to be \$72,000 of second mortgage bonds outstanding. Payment of interest on the first mortgage bonds was defaulted last summer. Committees of both classes of bondholders were then formed and a readjustment of the finances without the need of foreclosure now appears to be in prospect.

Changes in Lewisburg Property.—According to information just now available, the property of the Lewisburg & Ronceverte Electric Railway, Lewisburg, W. Va., was last June placed in the hands of R. M. Sell as receiver. This action followed an application to the Public Service Commission for permission to discontinue operation and abandon the line, the application being contested before the regulatory body. In the autumn certain business men in Lewisburg purchased the stock, assumed the liabilities and continued operation without the receiver. On Jan. 5, the property was sold under a trust deed held by local banks, and the same business men bought the road at a sum sufficient to cover all indebtedness.

Board Opposed to Lease Agreements.—Holding that the rental paid by the Morris County Traction Company, Morristown, N. J., to the Morris Railroad for about 2½ miles of lines between Madison and Morristown is unreasonable and inequitable, the Board of Public Utility Commissioners has refused to approve a trackage agreement entered into between the two companies on Oct. 2, 1913. The fact that this agreement had not been previously submitted to the board for approval as required by statute, was brought to light last November in the course of a hearing upon the application of the traction company for the approval of an issue of income debenture bonds. Before passing upon the proposed bond issue, the commission insisted that the company should seek approval of the trackage agreement. This was done on Dec. 5 last. The commission says that all expenses of operation should be borne directly by the traction company, if that company was to be credited with the entire amount of operating revenue, inasmuch as it would be practically impossible to determine what proportion of the gross operating revenues was assignable to the railway property.

Traffic and Transportation

General Relief Petition

Utilities of Illinois Consider Putting Their Case Before Commission in a General Application

One or two conferences have been held between the Public Utilities Commission of Illinois and representatives of important operating utilities, the result of which has been an informal understanding that the commission will entertain a blanket petition from all of the public service companies in the State asking for some sort of emergency relief because of abnormal war conditions. Should such relief be granted by the commission it is then understood that each individual case will be investigated by the commission and the justice of the new charges will be decided by that body.

It is regarded as likely that a blanket petition will be presented to the commission by the Illinois Electric Association as representing the electric light and power companies in Illinois the Illinois Electric Railway Association as representing the railways and the Illinois Gas Association as representing the Illinois gas companies. Meanwhile, applications have been filed with the commission by certain subsidiaries of the Illinois Traction Company asking for specific relief. These petitions are referred to elsewhere on this page, the names of the individual applicants and other facts being given.

APPEAL TO PUBLIC FOR SQUARE DEAL

All three of the associations mentioned previously have united in a direct newspaper appeal to the public of the State to give the utilities a fair deal in the matter of rapidly increasing costs of operation with a steady and inflexible revenue account. They point out that the utilities should be protected against losses which will ensue if they are not permitted to earn a revenue commensurate with their greatly increased operating expenses. The appeal has appeared in a number of prominent Illinois daily papers. It brings out pertinent facts with which a fair minded public should be acquainted if it is to see that the utility companies have a fair and impartial trial before the bar of public opinion.

High Water Stops Traffic

High water from the Ohio River caused the practical suspension of operation on all interurban lines in the vicinity of Cincinnati on Feb. 1. Water invaded the power station of the Interurban Railway & Terminal Company at Coney Island and the lines to New Richmond, Bethel and Lebanon were rendered idle. Service on the Cincinnati, Georgetown & Portsmouth Railway between Mount Washington and

Cincinnati was abandoned, although operation over the remainder of the line was maintained. Tracks of the Cincinnati, Lawrenceburg & Aurora Electric Street Railway were inundated in several places, but cars were kept in operation to Lawrenceburg. Aurora service was abandoned. Electric railway service in Cincinnati was interrupted, but every effort was made by the traction companies to handle passengers over the flooded points.

Another Fare Increase Allowed in Illinois

The Public Utilities Commission of Illinois has authorized a substantial increase in the fares of the Chicago & West Towns Railway, Chicago, Ill. The revised schedule was based upon a valuation of the road's property, but the usual careful field check was dispensed with. The evidence showed that the road was in the hands of a receiver, had never paid dividends, that the interest on the funded debt and receiver's certificates had not been met, and that there was little chance for the road earning a fair return upon any sum approximating a reasonable value. The order says, in part:

"From the foregoing it seems clear that petitioner has for many years furnished service to these communities without an adequate return upon its investment. To such a return it undoubtedly has right, and it seems only fair that opportunity be given petitioner to earn increased revenues by means of increasing the rates to be charged for its services."

The increased cost of material and supplies and of wages was considered in fixing the increased rates.

Advance in Class Rates

The Interstate Commerce Commission has ordered that the rates as specified in the recent application of the Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio; Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., and Fort Wayne & Decatur Traction Company, Decatur, Ind., be approved for filing without formal hearing. The companies petitioned the commission to approve the filing of class and commodity rates similar to the present effective steam railroad rates in the same territory for like distances which were established in conformity with the previous decision of the commission. This the commission approved on the ground that the rates proposed for the electric lines would result in a greater uniformity of charges in the territory affected. It is said that the new tariff for the electric railways means an advance in general of about 15 per cent.

I. T. S. Seeks Increases

Railway, Light and Power, and Gas Companies All Apply for Permission to Advance Charges

An increase in the rates for city railway service, as well as for electric lighting and gas service, is asked for in a petition filed by thirteen subsidiary companies of the Illinois Traction System, Peoria, Ill. The bill was presented to the Public Utility Commission of Illinois on Jan. 31. Henry I. Green, Urbana, Ill., counsel for the companies, filed the bill. A straight 5-cent fare is asked in every community served by railways except Jacksonville and Cairo, where a 6-cent rate is asked. The elimination of all coupon books and quantity sale of tickets at reduced rates is also included in the bill. The increase in electric lighting service proposed is from 6 to 20 per cent, depending upon the community, while an increase of from 5 to 25 cents per 1000 cu. ft in gas rates is asked.

THE THIRTEEN APPLICANTS

The companies uniting in the bill are the Peoria Railway, the Quincy Railway, the Urbana & Champaign Railway, Gas & Electric Company, the Urbana Light, Heat & Power Company, the Clinton Gas & Electric Company, the Cairo Electric & Traction Company, the Bloomington & Normal Railway & Light Company, the Danville Street Railway & Light Company, the Decatur Railway & Light Company, the Jacksonville Railway & Light Company, the Galesburg Railway, Lighting & Power Company, the Northern Illinois Light & Traction Company, Ottawa, and the Madison County Light & Power Company, Edwardsville.

EMERGENCY INCREASE ASKED

The petition recites that owing to the present abnormal conditions caused by the war the companies are in need of immediate relief in the form of increased rates for all public utility service rendered. The companies request further that the commission grant the emergency increase at the present time with a hearing at the discretion of the commission at a later date, when the local conditions affecting each company will be taken up. The companies agree to abide by the decision of the commission, and if any of the proposed rates are found unjustified they agree to make rebates to the consumers. Separate schedules are filed in the case of each company.

HEARING SET FOR FEB. 19

The commission has set Feb. 19 as the date for the hearing upon the petitions filed by the thirteen companies previously mentioned for an increase in rates.

After a full hearing in the case of the Danville Street Railway & Light Company, Danville, the commission has issued an order permitting the company to eliminate ticket fares. Heretofore eleven tickets were issued for 50 cents by the Danville company, or 100 tickets for \$4.

Failure of Service in Waterbury

Connecticut Commission Sounds Note of Warning—Commission and Public Expect Results Despite Unfavorable Conditions

As a result of its inquiry in the service furnished by the Connecticut Company in Waterbury the Public Utilities Commission has issued the following order:

"The Connecticut Company is hereby ordered and directed to furnish and provide at least forty cars suitable for winter service in and for electric railway service in the city of Waterbury and its suburban lines, on or before Feb. 5, 1918, and to furnish and provide eight additional cars for such service on or before Feb. 12, 1918, and within fifteen days thereafter to furnish and provide at least an additional 20 per cent of the number of cars hereby required, to insure reasonably adequate electric railway facilities for said service.

"The Connecticut Company is further ordered and directed on and after March 1, 1918, to maintain at least fifty-eight cars in good serviceable condition for said service."

In its finding the commission said:

"On Jan. 23, 25 and 26 a member of this commission was in Waterbury, examining into service conditions of the Connecticut Company. On Jan. 28 the Aldermanic committee of the city of Waterbury held an informal conference with the commission, relative to the Connecticut Company service in that city. During the last few days the commission has written to and had interviews with officials of said company, pertaining to said service.

SERVICE COLLAPSE

"From all of the foregoing it appears and is found that there has been a general breaking down—in fact, almost a collapse, of the electric railway service in Waterbury during the last week, and that the partial service now being rendered is wholly inadequate to the public need.

"Ordinary service conditions in Waterbury require at least twenty-four cars in commission during normal service hours and at least forty-eight cars in commission during the so-called rush hours. The maximum number of cars in commission during some of the days of the last week, including rush hours, did not exceed fourteen.

"The inadequacy of service is due to lack of proper maintenance of cars and equipment and lack of sufficient cars in serviceable condition for operation. We further find that the Connecticut Company has sufficient cars capable of being put into serviceable condition for winter use in the city of Waterbury.

"Owing to the condition which the Connecticut Company has permitted its plant and equipment to arrive at in Waterbury, and owing to the imperative demands for immediate relief, we deem it advisable to issue an order based on the facts already familiar to the commission, without the delay of formal petition and public hearing. We therefore ask the Connecticut Company to waive any informality and to accept the

finding as an official and binding order of this commission, and immediately after receipt thereof to notify this commission of its acceptance."

COMPANY HELD RESPONSIBLE

The letter of the commission to the company read in part as follows:

"Unusual conditions require unusual, special and even drastic efforts and remedies to meet them successfully. In this crisis of corporate and national emergency, an added duty and obligation rests upon your company, an obligation which is not met in the ordinary slow routine of applying the usual remedies, but by the prompt exercise of every possible and extraordinary means that may be used to correct the situation and prevent a similar recurrence at Waterbury or elsewhere in your territory.

"It appears from what information this commission has at hand, that the present principal difficulty in Waterbury is a general breaking down of the rolling stock, motors, etc., and the imperfect condition of roadbed (due largely to winter storms) for successful operation. This is a condition that proper care and maintenance would have large-

ly if not wholly prevented, and under ordinary circumstances would be entirely inexcusable.

"A person or corporation undertaking to do business at the present time, under the abnormal conditions, must be prepared to meet these conditions and compete with all adverse circumstances. This is particularly true of a utility company, especially when such company has had no financial handicaps placed upon it by public regulation.

"Our commission is very much disturbed over what has happened in Waterbury and what may happen in Bridgeport and other populous centers unless immediate and extraordinary remedies are applied. We insist upon and shall expect the Connecticut Company to use every means within its power promptly to restore at least normal service in Waterbury, to safeguard and improve its service generally, and to be so prepared to meet the abnormal conditions and demands as to prevent elsewhere any such breakdown as now exists in Waterbury.

"We realize the difficulties confronting the company and say what we have said in a friendly but authoritative manner and will be glad to co-operate or counsel with you if you desire, bearing in mind the familiar adage, 'Action speaks louder than words,' and that results are what our commission and the public have every reason to expect."

North Carolina Roads Need More Revenue

Informal Conference to Consider How Best to Secure Increased Revenues—Publicity to Play Its Part

Representatives of the electric railways in North Carolina met at Greensboro on Jan. 24 on call of Robert Lee Lindsay, vice-president and general manager of the Durham Traction Company, and spent the entire day considering ways and means of increasing the revenues. That the revenues need to be increased at the very earliest possible moment was agreed, but the manner of accomplishing this was the question which received the most serious consideration.

The conference was an informal one, but for the purpose of proceeding in an orderly manner Mr. Lindsay was elected chairman and Leake Carraway, director of publicity for the Southern Public Utilities Company, Charlotte, secretary. The representatives of each railway in attendance spoke of conditions prevailing in his city and pointed out the necessity for increased revenues.

RATES RAISED IN GREENSBORO

Charles B. Hole, president of the North Carolina Public Service Company, with headquarters at Greensboro, reported that he had placed the real situation frankly before the commissioners of his city, and that the commissioners had voted to allow the railway to withdraw from sale all reduced-rate or special-rate tickets, despite the fact that the franchise of the company specified that certain special-

rate tickets must be furnished by the company. He had proved that unless the rules requiring the sale of tickets were rescinded the company would continue to lose money. It was President Hole's opinion that when a railway went to the law-making body of a city with clean hands and showed the necessity for relief, there would be no difficulty in securing that relief. Mr. Hole advertised in the daily press the real situation that confronted the railway, and the people offered no objection to the action of the commissioners in allowing the withdrawal of special rates. He estimated that the withdrawal of the special-rate tickets would at least make it possible for the company to break even. The flat fare for Greensboro was referred to previously in the *ELECTRIC RAILWAY JOURNAL* for Jan. 19, page 158.

Mr. Lindsay reported that no special rates were in effect at Durham, but that his company was considering the advisability of making a charge for transfers. He admitted, however, that the layout of his system was such as to raise some doubt about the advisability of this procedure.

H. H. Carr, vice-president and general manager of the Carolina Light & Power Company, Raleigh, expressed the opinion that immediate relief was necessary and that, while a publicity campaign to acquaint the people with the

facts might be a good thing, railways in general could not wait the result of such procedure before asking for relief. He urged that the entire matter be laid before the State Corporation Commission at the earliest possible moment, with a request for some ruling which would prevent the further loss of money.

It was finally determined, however, to begin at once for the entire State a systematic campaign of educational publicity similar to that conducted by the Southern Public Utilities Company for the last three years. An arrangement was made for exchange of advertising matter between companies.

I. T. S. Flat Fare

On Feb. 11 Company Will Place in Effect Recently Allowed Two-Cent Rate

The new passenger tariffs recently approved by the Public Utilities Commission of Illinois will be inaugurated by the Illinois Traction System on its electric railway lines on Feb. 11.

The tariffs, which have been filed, provide for basing ticket fares at 2 cents per mile, and the discarding of the former 5-cent zone system. In its application to the commission the company showed that the new method of basing passenger fares would not increase the revenue and that all fares would be practically the same as at present, except that the change would remove certain discriminations established by the old zone system of collection.

Under the new tariffs the company is also authorized to collect 2½ cents per mile from passengers who pay a cash fare aboard the train, where they board the train at an open agency station. This is the same rule observed by steam railways, except that their cash fare charge is 3 cents per mile. The company anticipates that this rule will encourage buying of tickets at the stations and thereby greatly relieve conductors, who are now especially burdened because of war tax collections required on all cash fares. For the convenience of passengers whose destinations is a regular crossroads stop the company will place a new form of ticket in all agency stations.

Will Appeal Portland Case

The city attorney of Portland, Ore., will appeal to the courts from the recent order of the Public Service Commission, granting the Portland Railway, Light & Power Company the right to charge a 6-cent fare. Commissioner Kellaher introduced a resolution in the City Council, asking permission to engage another attorney to assist in the case, and setting forth that "there exists among the citizens of Portland a fixed belief that the action of the Public Service Commission is antagonistic to the interests of the citizens, and permits the company to violate its contract obligations, and is illegal and void."

Efforts Bent Toward Relieving Buffalo Traffic

More Intensive Use of Belt Line, Electrification of That Line in Immediate Future and Construction of Subways Urged

Immediate construction of a system of subway terminals in the congested business section of Buffalo, N. Y., is recommended by the municipal traffic board appointed by the Mayor to investigate the electric railway problem. Plans for the proposed subways and subway terminals have been prepared by the city engineer and the recommendations have the approval of the new street railway commission and members of the City Council.

John C. Brackenridge, who has been engaged by the municipal authorities to investigate traffic conditions on local lines of the International Railway, has been asked to consider the proposed subway plans and to report as quickly as possible to the Council. It is proposed that the subways be constructed by the city and leased to the International Railway at a figure which would carry the interest charges and eventually retire the bonds.

TWO SHORT SUBWAYS SUGGESTED

Two short subway systems have been suggested with loading terminals at Lafayette Square and Niagara Square in the heart of the retail shopping district. Cars would enter the subway on the east side of Main Street at a point about four blocks from Main Street and would continue through the subway to a point about four blocks west of Main Street. Loops would be constructed under Lafayette Square and Niagara Square and loading terminals would be built at these points. All eastbound and westbound surface tracks would be removed in the downtown section and the only tracks would be north and south. Thomas Penney, vice-president and general counsel of the International Railway, is a member of the municipal traffic board which presented the plans for the proposed subway.

In addition to making this recommendation, the board criticized the general layout of the company's lines. It said that the haphazard connection of lines at the time competing companies were absorbed in Buffalo was partly to blame for the present traffic situation. The general revision of electric railway trackage throughout the city is recommended.

The recommendations of the municipal traffic board are separate from the investigation of the electric railway problem now being made by Mayor George S. Buck and the municipal railway committee under the direction of Mr. Brackenridge. At the last meeting of the railway committee, the city attorney was directed to inquire into the procedure necessary to bring an action in the Supreme Court of Erie County to abrogate the franchise of the International Railway. In addition Mr. Brackenridge was instructed to find out what orders and recommendations of the Public Service Commission had been ignored by the railway.

In another report to the City Council on traffic questions Mr. Brackenridge said that the police department should make every effort to stop the wrecking of cars at industrial plants. He pointed to two specific instances where windows were broken and rolling stock otherwise damaged by passengers who were unable to board cars at the Pierce-Arrow Motor Company plant.

ELECTRIFICATION OF BELT LINE URGED

Electrification of the double-track steam belt line service around Buffalo is recommended by Mayor Buck. Several conferences have already been held by the Mayor with officials of the New York Central Railroad in regards to the electrification of the belt line service but no agreement has been reached. The Chamber of Commerce has sent an appeal to Director General of Railroads McAdoo urging him to require the New York Central Railroad Company to put on additional trains to carry workers to and from the large war industries in the district that is served by the company.

In replying to charges made by the Mayor, E. J. Dickson, vice-president of the International Railway, sent a long statement to the municipal railway commission showing how the company was making every effort to handle the transportation problem resulting from recent severe snow storms and the loss of forty-seven cars in the Forest Avenue carhouse fire. In his statement Mr. Dickson said:

"While the number of crippled cars is still large, we installed 244 pairs of wheels during the week ending Jan. 25; 322 armatures and 847 fields. In addition we have extra men inspecting motors, controllers, truck brakes and car bodies. All worn parts are being rapidly replaced. Many cars are out of service due to car-door failures, but we are now inclosing door mechanism with canvas shields. We have also had a large number of failures from broken journals and truck parts which were due to an accumulation of ice outside of the rails."

TYPES OF CARS DESTROYED

In explaining the types of equipment destroyed in the Forest Avenue carhouse, Mr. Dickson said that twenty-five cars were of the double-end type, the heaviest cars operated by the company on its city lines; eighteen were of the near-side pay-as-you-enter type and three were of a small size double-end type. Two large snowplows, two track sweepers and one work car were also destroyed. Mr. Dickson told the committee he did not believe it would be practicable to operate open cars because of the extreme cold weather. The members of the committee were assured by Mr. Dickson that they would be kept informed weekly of the condition of the company's equipment.

Meeting an Emergency

Open Cars to Be Operated for Ship Works As a Means of Immediate Relief

The Public Service Commission for the First District of New York, on the application of Capt. C. S. Bookwalter, district officer of the United States Shipping Board, has issued permission to the Richmond Light & Railroad Company to operate open cars for the transportation of shipbuilding workers from St. George, S. I., to the shipbuilding plants on the north shore of Richmond. The company has all of its other equipment in use, and in view of the present emergency the commission agreed to permit the operation of the open cars for the transportation of the thousands of ship workers. The full regular equipment of the company will be left in service for the conveyance of the regular passenger traffic of the line and efforts will be made to restrict the use of the open cars solely to the shipbuilders. The commission gave its approval on motion of Commissioners Charles Buckley Hubbell, after ex-Justice William L. Ransom, counsel to the commission, had stated that the company did not have sufficient closed cars to meet the abnormal demand.

Puts Song into His Work

Minneapolis Has a Ragtime Conductor Who Has Set the City to Singing His Rhymes

The left gate in; the right gate out,
And you've really nothing to worry about.

Thus blithely caroled "No. 1260," ragtime conductor on the Chicago and Fremont line. Not alone is "1260" urbane, polite and watchful, but he is entertaining. Women with fretful children wait for him; tired business men greet him with a smile and young girls chew their gum blissfully and try to remember his rhymes. Commonplace is discarded by the rhythmic "1260," for he is the true poet, seeking to scatter bits of happy and timely roundelay as a part of his daily toil.

The car approaches a transfer point:
Ladies and gents, this is the time
To change cars here for the Hennepin line
suggests "1260." Some one lagged a bit getting aboard:
Come on, good folks—don't be slow,
Hop on the car—come on—let's go,
is his admonition.

As the Chicago avenue curve is approaching, comes then the caution:
A curve is coming—to prevent mishap,
All those standing—grab a strap.

An old lady stood in the aisle, and near her a young mother with a child; "1260" threw a sharp glance in their direction, thought a second, and sang:
The gents will stand and the ladies sit down,
And we'll all be polite in this man's town.

Starting through the car, the happy "1260" reminded:

The conductor is coming to get your fare,
A nickel is needed—a dime for a pair.

Take one trip with ragtime "1260" and you'll always wait for his car. "Some" conductor—"some" songster.
—Minneapolis News.

Transportation News Notes

Skip-Stop Trial in Des Moines.—The Des Moines (Iowa) City Railway is giving the skip-stop plan a month's tryout on its University line.

One-Man Cars for Short Seattle Line.—The Seattle & Rainier Valley Railway, Seattle, Wash., has petitioned the City Council for permission to operate six reconstructed one-man cars. The petition has been referred to the public utilities committee.

Will Eliminate One Hundred Stops.—City Commissioner William Burk, of Trenton, N. J., and City Engineer Abram Swan have been selected by the City Commission to pass judgment upon the list of 100 stops the Trenton & Mercer County Traction Corporation intends eliminating to increase further the efficiency of its local service in the city of Trenton.

Metal Tickets for Dallas.—Metal tickets to be used by the Dallas (Tex.) Railways have been received by the company. They will be used as soon as the new cash fare boxes can be installed. The company received metal discs of three sizes, one for the regular tickets now sold at twenty-two for \$1, one for the half-fare students' tickets and one for the regular half fare tickets for children under twelve years of age.

Accident in Champaign.—A car of the Illinois Traction System which stalled on the University Avenue crossing of the Illinois Central Railroad, Champaign, Ill., was struck in the center by a freight train, pushed over the crossing and turned upon its side. All but two of the nine passengers were on the south side of the car, and to this is attributed the fact that there were no fatalities. Two men were seriously but not dangerously hurt.

Increase Asked by Marion Company.—The Marion & Bluffton Traction Company, Bluffton, Ind., has filed a petition with the Public Service Commission of Indiana asking authority to increase its rates for passenger fares from 2 cents a mile to 2½ cents a mile. The company has also asked authority to discount the round-trip fare to the extent of 5 per cent of the total charge of the fare both ways. It would charge 2 cents a mile for commutation books under this petition.

No Unrestricted Jitneys in Portland.—The City Council of Portland, Ore., on Jan. 23 agreed to support a proposal to submit the question of the operation of jitneys in Portland to a vote of the people at a special election in April. This action was taken after Commissioner Kellaher had received no support from the Council in his move to turn the jit-

neys loose at once, free of all regulation, as a result of the recent action of the Portland Railway, Light & Power Company in raising the city fare to 6 cents.

Crosstown Service Abandoned.—The Des Moines (Iowa) City Railway has abandoned crosstown service. For several years the company maintained crosstown service east and west. Delays in the service and the proposed rebuilding of lines this spring caused R. G. Smock, city railway supervisor, to recommend to the officials of the company that the crosstown service be eliminated. Lines are now operating individually on the Fair Grounds-Douglas Avenue and the Ingersoll-Valley Junction routes.

Free or Donation Buses Allowed.—According to an ordinance passed by the City Council of Tacoma, Wash., recently, free or donation buses will be allowed to operate in that city. The ordinance provides that all operators of the free or donation jitneys shall take out permits from the city clerk's office, and shall keep on file a bond of \$2,500. No fare is fixed, patrons or the buses donating whatever they please. The ordinance defining and regulating the new form of transportation in Tacoma was introduced by Mayor A. V. Fawcett. The measure received the unanimous vote of the Council.

Something a Little Different.—The uniform of the women employed on the cars of the Manhattan & Queens Traction Corporation, Long Island City, N. Y., is of navy blue cloth with a distinctly military cut, resembling the dress uniform coat of the Marine Corps though without the brass buttons. The collar is ornamented by gold initial letters of the company. There is a military cap and skirt to match the coat. The skirt is short enough to permit quick movements. Most of the other surface and tunnel lines are affecting a khaki uniform with wrap leggings for the young woman conductor or guard.

Increase in Fares for Washington Buses.—After careful consideration of the suggestions submitted in writing and of all the testimony adduced at a public hearing in regard to the operation of motor vehicles in Washington, D. C., the Public Utilities Commission of the District recently decided: "First, that the rate of fare to be charged by the operators of such motor vehicles should be increased; second, that this increased rate should apply within a definite area approximating that embraced within a radius of 4 miles from the White House; third, that an additional fare should be authorized to points outside of said area; fourth, that so much of Order No. 224 relating to the use of certain streets in the congested business area be amended so as to permit the streets mentioned therein to be used by motor vehicles during the hours of non-rush traffic on the electric railway lines." The commission entered an order on Jan. 2 in accordance with the finding at which it arrived.

Personal Mention

O. P. Chubbuck, superintendent of shops of the Illinois Traction System at Decatur, has resigned.

James A. Connell has been appointed auditor of the Albany (N. Y.) Southern Railroad, to succeed T. H. Blaikie.

J. S. Murphy has been appointed superintendent of the power station of the Ithaca (N. Y.) Traction Corporation to succeed C. B. Hudson.

H. F. Vokes has been appointed chief engineer of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., to succeed D. E. Crouse.

Robert S. Tomkins has been appointed assistant treasurer of the Public Service Railway, Newark, N. J., to succeed Robert D. Miller, deceased.

Edward Fitzgerald has been appointed roadmaster of the Central New York Southern Railroad Corporation, Ithaca, N. Y., to succeed J. J. Welch.

George Baker, formerly general superintendent of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., has been appointed assistant general manager of the company.

Seymour Van Santvoord, Troy, chairman of the Public Service Commission for the Second District of New York, retired from the commission on Feb. 1 by virtue of the expiration of his term.

J. R. Savage has been promoted from the position of chief engineer of the Long Island Railroad, New York, N. Y., and subsidiary companies to that of general manager, to succeed J. A. McCrea.

L. V. Morris has been appointed chief engineer of the Long Island Railroad, New York, N. Y., and subsidiary companies to succeed J. R. Savage, who has been appointed general manager of the company.

Weldon F. Weston has been elected first vice-president of the Mount Beacon-on-Hudson Association, which operates a cable incline railway to the top of Mount Beacon, N. Y. He succeeds Albert Merrill.

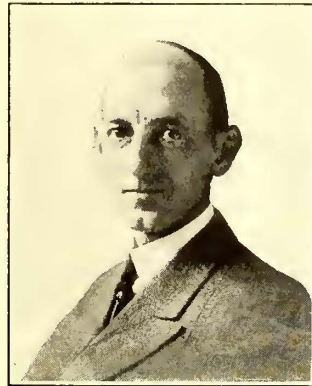
M. H. Aylesworth, a member of the Public Utilities Commission of Colorado, has been appointed assistant to S. R. Inch, the newly-elected vice-president of the Utah Light & Power Company, Salt Lake City.

James Harmon has been appointed safety manager for the Kentucky Utilities Company, the Interstate Public Service Company and other adjacent Middle West Utilities Company properties, with offices in Louisville, Ky.

Thomas F. Fennell, Elmira, has been named by Governor Whitman to succeed Seymour Van Santvoord as chairman of the Public Service Commission of the Second District of New York. He is now a Court of Claims judge.

Franklin T. Griffith, president of the Portland Railway, Light & Power Company, Portland, Ore., has been selected for the position of State Director of the United States Public Service Reserve, by I. W. Litchfield, associate director of the service.

W. C. Swisher, supervisor of safety of the Denver (Col.) Tramway, has resigned to assume the position of general claims attorney for the Kansas City (Mo.) Railways. He has been an employee of the tramway since June, 1910, and the work of his department has been very effectively handled under his direction. Mr. Swisher was born at New Madison, Ohio, in 1878. After he was graduated from the University



W. C. SWISHER

of Michigan in 1900, Mr. Swisher went to Colorado and began the practice of law in Victor. The following year he became connected with the Rock Island Railroad. He served in the office of the general claims attorney at Chicago, and two years later was transferred to Santa Fe. He was later appointed claim agent for the Texas lines, with headquarters at Amarillo, where he remained until September, 1909. Upon his departure from the Denver Tramway, officials of the company presented Mr. Swisher with a wrist watch as an expression of the good fellowship which has always existed between Mr. Swisher and his associates there.

Sydney L. Wright, president of the New Jersey & Pennsylvania Traction Company, Trenton, N. J., which controls the Trenton, Lawrenceville & Princeton Railroad, has been elected president of that company to succeed W. R. Wright.

J. D. Barnhart, formerly master mechanic at the Granite City shops of the Illinois Traction System, has been appointed superintendent of shops of that company at Decatur, in charge of repairs to all interurban equipment, succeeding O. P. Chubbuck.

Emil G. Schmidt, president of the Des Moines (Iowa) City Railway and the Interurban Railway, Des Moines, has been made vice-president of the German-American Patriotic Association, organized at Des Moines by the Iowa State Council of Defense.

Joseph W. Folk has sent to the Interstate Commerce Commission his resignation as the commission's chief counsel, to take effect before Feb. 15. Mr. Folk will return to his home in St. Louis to become general counsel of the Chamber of Commerce there.

A. F. Smith has been appointed engineer of maintenance of way of the Lehigh Valley Transit Company, Allentown, Pa., and the Phillipsburg (N. J.) Transit Company and the Easton (Pa.) Transit Company, subsidiary companies, to succeed Charles E. Jenkins.

George W. Strack, Jr., who has been a member of the bureau of safety's force of the Middle West Public Utilities Company, Chicago, Ill., for four years, has been made safety agent for the Central Illinois Public Service Company, controlled by the Middle West company.

Robert Tillman Johnson, inspector in charge of transportation of the Owensboro (Ky.) City Railway, has been appointed superintendent of the company. He succeeds G. Raymond Millican, who has been made superintendent of the properties of the Evansville (Ind.) Railways.

Roy Crandall, publicity agent for the Buffalo (N. Y.) General Electric Company, has been appointed advertising agent for the International Railway, Buffalo. This is a new position created by E. G. Connette, president of the company. Mr. Crandall will continue with the Buffalo General Electric Company. He was formerly engaged in newspaper work.

W. E. Titus, whose appointment as superintendent of the Easton (Pa.) Transit Company was noted in the *ELECTRIC RAILWAY JOURNAL* for Dec. 1, 1917, will act in a similar capacity with the Phillipsburg (N. J.) Transit Company, both companies being controlled by the Lehigh Valley Transit Company, Allentown, Pa. Mr. Titus succeeds H. H. Patterson with both companies.

George H. Losey, assistant general superintendent and electrical engineer for the Indiana Railways & Light Company, Kokomo, Ind., has resigned to become connected with the Great American Refining Company at Tulsa, Okla. Mr. Losey has been with the Kokomo company for the last ten years in various engineering capacities. He started in the meter department and advanced through a line of promotions. He was graduated in the electrical engineering course at Purdue University.

R. W. Tassie, who has been assistant electrical engineer of the Havana Electric Railway, Light & Power Company, Havana, Cuba, has been promoted to the position of electrical engineer, succeeding C. H. Sanderson. In his present position Mr. Tassie has charge of the electrical and commercial engineer-

ing work of the company. During the last six years, since he went to Havana, he has occupied several positions with the company leading logically to his present one. Mr. Tassie, who is a native of Australia, came to this country to study electrical engineering and graduated in the course in this subject at Cornell University in 1909. In his senior year he was elected to the Sigma Xi Society, an indication of his ability in scientific work, and he was very active in the Cosmopolitan Club, which is a powerful organization at Cornell. He has also recently been transferred to the grade of member in the American Institute of Electrical Engineers.

Obituary

Richard L. Jennings, a former superintendent of the old Brooklyn City Railroad, now included in the Brooklyn Rapid Transit System, is dead. He was latterly in the real estate business, but had been retired for some years. Mr. Jennings was born in Iowa eighty-six years ago. He entered railroad work in Brooklyn more than sixty years ago. He is said to have sent the first car out under electrical power in Brooklyn. Altogether, Mr. Jennings was connected with railroading for forty-five years. He was a Civil War veteran.

William Temple Emmet, a member of the Public Service Commission of the Second District of New York since March, 1914, died on Feb. 4. He was State Superintendent of Insurance for two years, beginning in February of 1912. Mr. Emmet was born in New Rochelle in 1869, was educated at St. Paul's School, Concord, N. H., and at Columbia University. He was admitted to the bar in 1891. He practiced in New Rochelle for several years and then opened an office in New York. He was active in politics both in and out of Tammany Hall for a number of years, but was defeated for the State Senate from the Bronx in 1903.

Fernand de Tranaltes, assistant engineer of construction of the New York (N. Y.) Railways, is dead. Mr. Tranaltes was forty-nine years old. He was graduated at Cooper Union with honors and began active service as leveller on the Union Pacific Railroad, later returning to New York to engage as engineer with the contracting firm of J. D. & T. E. Crimmins. In August of 1890 Mr. Tranaltes began on the preliminary surveys for the Broadway cable road and continued in the engineering corps of the railway during the construction of Broadway, Columbus Avenue and Lexington Avenue cable roads until about 1895, when he was recommended by the president of the railway to put through the construction of the electric railways on Staten Island. After completion of this work Mr. Tranaltes resumed work with the railway engineer corps of the New York Railways on construction.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Franchises

Tulsa, Okla.—Because of the opposition of First Street property owners to the construction of an interurban line on that thoroughfare, the Mayor and Board of City Commissioners refused to take any definite action in the matter of granting or denying the request of the Oklahoma Union Railway for a franchise through the city for the Sapulpa-Collinsville line. The board is willing to submit the matter to a vote of the people. In that case a decision will be rendered at either the primary or city election, both of which are held in April.

Chester, Pa.—Application has been made to the City Council of Chester by the Chester & Philadelphia Railway for permission to lay additional tracks on Crosby and Fourth Streets to relieve the traffic congestion which exists on the line between Chester and Philadelphia.

Track and Roadway

Arkansas Northwestern Railroad, Bentonville, Ark.—The Benton Chancery Court has issued an order directing the Arkansas Northwestern Railroad to remove its tracks and ties in Bentonville. Operation was suspended on this line some time ago.

Pacific Electric Railway, Los Angeles, Cal.—Surveys have been begun by the Pacific Electric Railway for an extension to connect the line from South Los Angeles with the line to El Segundo.

Connecticut Company, New Haven, Conn.—Plans are being considered by the Connecticut Company for the extension of its Dixwell Avenue line in Hamden.

***Macon, Ga.**—It is reported that government engineers are surveying along the right-of-way of the old Macon & Augusta Railroad to Camp Wheeler, about 5 miles.

Peoria & Chillicothe Electric Railway, Peoria, Ill.—At the annual meeting of the Peoria & Chillicothe Electric Railway held recently, assurance was given by officials of the company that the line between Peoria and Chillicothe will be built as soon as steel and materials can be purchased. E. A. Mitchell, Chillicothe, was re-elected president; John F. Lynch, vice-president; W. E. Emery, secretary; A. H. Black, assistant secretary, and E. A. Mitchell, treasurer. [April 28, '17.]

Des Moines (Iowa) City Railway.—The 1918 extensions to be made by the Des Moines City Railway were recently decided upon at a conference between the city engineer, the city car supervisor and W. L. Wilson, engineer maintenance of way of the company, as follows: The Crocker Street line will be extended on Twenty-fourth Street from Ingersoll Avenue to Center Street; on Center from Twenty-fourth to Thirty-first, on Thirty-first from Center Street to Crocker Street, on Crocker Street from Thirty-first to Forty-seventh Street. The Walker Street line will be extended from East Twenty-fourth Street to Twenty-ninth Street. The Euclid Avenue line will be extended on Second Street to Amherst Street, on Amherst from Euclid Avenue to Hull Avenue, on Hull Avenue to East Ninth.

Inter Urban Railway, Des Moines, Iowa.—Construction has just been completed of an additional mile of double track by the Inter Urban Railway on its Camp Dodge line. There remain but 3 miles of construction to make the entire line to Camp Dodge double-tracked.

Ware & Brookfield Street Railway, Ware, Mass.—J. Edward Brooks, president of the Ware & Brookfield Street Railway, ordered the discontinuance of operation on the Gilbertville and West Brookfield divisions on Feb. 3, as the line has been a losing proposition.

St. Paul Southern Electric Railway, St. Paul, Minn.—If the tentative plan for the reorganization of the St. Paul Southern Electric Railway goes through the likelihood is that the road will be extended through Southern Minnesota.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The City Commission has requested the Trenton & Mercer County Traction Corporation to remove its feed wires and cables running from the power house on Lincoln Avenue to North Clinton Avenue and install them underground. The commission asks that the work be done as soon as the weather permits.

Batavia (N. Y.) Traction Company.—It is reported that the Batavia Traction Company is considering the extension of its line to Horseshoe Lake.

Brooklyn (N. Y.) Rapid Transit Company.—At the direction of Borough President Maurice E. Connolly, work has begun on the completion of plans for the extension of a crosstown trolley line from the Williamsburg Bridge plaza in Brooklyn to the Queensboro Bridge plaza in Long Island City. In the preparation of these plans he has directed that consultation be had with the officials of the Brooklyn Rapid Transit Company and of the Manhattan & Queens Traction Company, both of which may join in the operation of the line if it is built. As soon as the plans

are completed application will be made to the Board of Estimate and the Public Service Commission for a franchise. It is proposed that the line start at the Williamsburg Bridge plaza and extend to Driggs Avenue, to Manhattan Avenue, to Greenpoint Avenue and here cross the Blissville Bridge to Van Dam Street, and through Van Dam Street to the Queensboro Bridge plaza.

Pittsburgh (Pa.) Railways.—An order was made in Common Pleas Court on Feb. 1 requiring the Pittsburgh Railways to remove its tracks and trolley poles from two lots owned by it on California Avenue, and an injunction was issued restraining the company forever from placing tracks, poles or buildings within 40 ft. of California Avenue.

Columbia (S. C.) Railway & Navigation Company.—This company has completed a survey for its contemplated interurban railway from Columbia, via Lexington and Saluda, to Greenwood, S. C., about 75 miles, but construction is deferred.

Dallas (Tex.) Railway.—Rails are en route to Dallas in sufficient quantity to allow for the extension of the Second Avenue and of the Colonial Avenue railway lines of the Dallas Railway. These extensions have been approved by the city and are expected to be the first the company will make under its new status with the city. The date of the arrival of these shipments, however, is problematical under the present condition of transportation lines. It is proposed to double-track Second Avenue from Parry Avenue to the city limits and to double-track Colonial Avenue, where the double-track now ends, to the city limits. All of the trolley wire on its Oak Cliff line is being replaced by new wire.

Houston (Tex.) Municipal Railway.—It is reported that the Houston Municipal Railway will build a 60-ft. plate girder bridge, 400 lin. ft. of standard trestle and 1000 lin. ft. of temporary trestle in connection with its proposed 4-mile line from a connection with the International & Great Northern Railroad to the plant of the Sinclair Gulf & Refinery Company. R. E. Sands, city engineer. [Jan. 26, '18.]

San Angelo Power & Street Railway, San Angelo, Tex.—The property of the San Angelo Power & Street Railway has been sold by the city of San Angelo to the San Angelo Light & Power Company. It is expected that the line will be placed in operation during this year.

San Antonio, San Jose & Medina Valley Interurban Railway, San Antonio, Tex.—The operation of electric cars has been temporarily discontinued by the San Antonio, San Jose & Medina Valley Interurban Railway, which operates a line between San Antonio and San Jose, and the company is operating automobiles until it can arrange finances for rebuilding the track and equipment.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—A large delegation of citizens of West Seattle recently appealed to the City Council

for better car service, with the suggestion of the construction of a railway line on Avalon Way, shortening the route of the Fauntleroy line, and cutting out a number of stopover switches. Several years ago, the Council granted the Puget Sound Traction, Light & Power Company a franchise on Avalon Way. This was vetoed by Mayor Cotterill, who was in office at that time. A second application was withdrawn by the company when Youngstown citizens filed objections. The situation has now changed so that the line can be built without interfering with Youngstown service. The delegation stated that the company has agreed to build the extension, if a franchise can be secured.

Seattle, (Wash.) Municipal Railway.—It is expected that operation of the Seattle Municipal Railway, Division A, into Ballard, over the Fifteenth Avenue N. W. bridge, will be begun during this month. Upon the opening of this extension municipal cars will be operated on Fourth Avenue as far as the County-City Building at Jefferson Street, by common-user agreement with the Seattle & Rainier Valley Railway. Because of the light construction of the Loyal Heights Electric Railway, which has been taken over by the city, it will be impossible to operate the city's large cars over that line, so that between the County-City Building and the north terminus at Thirty-second Avenue N. W. and West Eighty-fifth Street there will be a transfer of passengers to and from large and small cars at West Sixty-seventh Street and Twenty-second Avenue N. W.

Puget Sound Electric Railway, Tacoma, Wash.—On the Tacoma-Puyallup Short Line of the Puget Sound Electric Railway the damage done by recent floods and washouts was so serious that it may cause either rebuilding or abandoning the line. When the Short Line was built the company constructed breakwaters and strengthened the river banks to protect the interurban bridge near Tacoma. Pierce County later put through some improvements altering the channel of the river at this point, but took no precautions to protect this channel from future changes. The late floods cut an entirely new channel, however, destroying the approach, wrecking the bridge and leaving it stand useless over the abandoned channel. The loss is so great that the company now fears that it may have to abandon the Short Line, although this has not been definitely settled.

Tacoma (Wash.) Municipal Railway.—It is reported that the Tacoma Municipal Railway will be double-tracked from the east end of the viaduct to the Todd shipbuilding plant. Operation has been begun over the Taylor Way extension of the line from Eleventh Street on Taylor Way to Lincoln Avenue.

Lewisburg & Ronceverte Electric Railway, Lewisburg, W. Va.—The property of the Lewisburg & Ronceverte Railway has been taken over by local interests, and it is stated the line will be extended into Lewisburg.

Shops and Buildings

Southern Pacific Company, Los Angeles, Cal.—Plans are being made by the Southern Pacific Company for the remodeling of its timber-preserving plant at West Oakland, Cal., at an estimated expenditure of \$350,000. The improvement includes the reconstruction of the track layout, the filling in of a portion of the bay to provide room for expansion and the installation of modern timber-treating equipment.

Georgia Railway & Power Company, Atlanta, Ga.—Work has been begun by the Georgia Railway & Power Company on the construction of a new passenger station at Camp Gordon.

Lake Shore Electric Railway, Cleveland, Ohio.—It is reported that the Lake Shore Electric Railway is considering the construction of a new interurban station at the present site on Erie Avenue, Lorain. Plans drawn up some time ago by the company call for a \$65,000 station.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, William S. Twining, director, until 12 o'clock noon on Feb. 14 for the following work appurtenant to the Frankford Elevated Railway: Contract No. 541—Plumbing installations in station buildings at Torresdale Avenue and Tioga Street; Contract No. 542—Electric installations in station buildings at Torresdale Avenue and at Tioga Street. Copies of plans and specifications may be obtained upon deposit of \$10, to be refunded upon return of plans.

Wheeling (W. Va.) Traction Company.—The Bay Island carhouse of the Wheeling Traction Company, containing twenty-nine double-truck passenger cars and one work car, was destroyed by fire on Feb. 4. The company will replace the equipment at once.

Power Houses and Substations

Chicago, Milwaukee & St. Paul Railway, Chicago, Ill.—The substation of the Chicago, Milwaukee & St. Paul Railway at Cle Elum has been completed, and is ready for the machinery. The structure is 104 ft. x 75 ft., of concrete and brick. It will house two generator sets, two transformers and a complete set of switches to receive and distribute 100,000 kw.

Quincy (Ill.) Railway.—This company has installed a new 1000-hp. boiler in its power house.

Brooklyn (N. Y.) Rapid Transit Company.—The proposed addition to its generating station at Kent Avenue and Division Street, which the Brooklyn Rapid Transit Company proposes to erect, will be about 275 ft. x 303 ft., one and six stories high. The cost of the addition is estimated at \$500,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Snow and Ice Removal Equipment in Brisk Demand

Electric Roads Seemingly Slackers in Storm Preparedness—Scrapers, Cutters, Torches on Call

Surprising as it may seem, and accepting the word of several manufacturers and sales agents for the fact, the electric railways are as a rule poorly equipped to combat snow and sleet storms. Makers of this equipment add that orders for snowplows are usually placed in the spring or early summer, with deliveries in the late fall. Emergency calls are evidently not reckoned upon, for it is seldom that any snowplows are kept in stock. This winter, however, the demand was abnormal, and purchasing agents and traffic superintendents appeared to be dumfounded when, on inquiry, they found no plows were to be had until the regular selling season. This practice is ascribed to trade usage.

Other snow-fighting and ice-clearing equipment was on the market, however, and judging from reported sales a lively business was transacted. A company that specializes on good roads apparatus states it has had a very large demand for its snowplow attachment. In fact, this concern frankly says: "We stocked up with a very good supply of attachments. The demand, however, owing to heavy snowstorms that have prevailed in all sections of the country, has been abnormal. At the present time we are almost entirely out of stock. We are likely to do quite a lot of business within the next month or two."

Every appliance that would clear away snow and ice has sold this year more quickly than for many years. Scrapers and cutters were especially in demand. A horse-drawn machine, that removes snow as the wheeled and drag road scraper does in handling dirt, has been particularly efficacious on railways in city streets. The manufacturer said if conditions had been normal and he could have secured materials promptly, he would have sold several times as many machines as he was able to put out. "Unfortunately," he continued, "conditions this winter have operated to make it a difficult matter to do business. It has been hard to get materials, and the continual freight embargoes have made it almost impossible, in many cases, to deliver goods."

Yet another device, that is selling better than for many years, is a cutter of flanged teeth that can be attached to the under side of the snowplow beam. The attachment cuts down the devil-strip of ice between the tracks to a

point that will clear the motor boxes, and thus save energy and wear and tear on the boxes and cars. It is said to be used to a great extent on New England traction roads. It is designed for city street track work. There has been no advance in price since May last. Deliveries are shipped out of stock—made up in off season—and go via express, unless embargoes intervene.

THAWING OUTFIT SALES LARGE

Torches or thawing outfits have also been on brisk call. A company specializing on these goods states they are adapted for thawing out frogs, switches, derails, throw rods, air brakes and switch boxes, also melting ice from interlocking plants, pipe line and pipe carriers, brake beams and fenders. The last advance of 10 per cent in price was made on Dec. 1 last. Raw material is hard to obtain. Deliveries are fair—in two or three weeks by express now, when shipments are accepted. A longer time is required when special sizes are ordered, although five standard patterns are carried.

One maker of sleet cutters, of which mention was recently made in the *ELECTRIC RAILWAY JOURNAL*, observed that in his experience few electric roads take the obvious precaution of keeping a stock in their carhouses for immediate use when necessary. They take a chance. This condition or frame of mind is further illustrated in the case of one of the Eastern roads. When the late snow storms tied up its track the two snowplows of the company were too small—totally inadequate—to meet the emergency. Its cars could make no headway on the snow-filled roadbed and, in several instances, were stalled all night with belated passengers aboard. The Public Service Commission subsequently recommended the purchase of six efficient snowplows.

Car Wool Waste Higher

Supply and Delivery in Fair Condition—China Chief Source

Car wool waste, on certain grades, was advanced 1 to 2 cents a pound on Feb. 1. The supply is fairly good. With the close of the Russian and Mediterranean markets, the chief source of raw material, China is now the main reliance for the cheaper wools obtained from the fleece of its long hair goats. This description of waste is used for packing car journals, and it must therefore be superior in quality to cotton waste. The grade with a long staple is the best, and this is a by-product in the manufacture of the cheaper carpet wools and yarns. Deliveries are fair.

Devices for Averting Trouble with Frozen Air Brakes

Severe Cold Weather Has Increased Sales—More Widely Known and Used This Winter

Any device adapted to keeping equipment in operative condition at this time has seasonal interest. Manufacturers of an "air rectifier," which is a device for overcoming what is known in railway work as "frozen air" in air brake systems, report it as commanding uncommon sale during this unusually severe winter. Briefly, the device automatically supplies to the air-pipe system, when needed, the requisite amount of alcohol, or a similar non-freezing liquid, in the form of a vapor or spray. This lowers the freezing temperature of the fluids or vapors in the pipes and cylinders and keeps them from clogging.

This year the distributors of the device advise that recent orders have been received from the Omaha & Council Bluffs Street Railway; Gary & Interurban Railroad; Charles City Railway; Springfield (Mass.) Street Railway; Terre Haute, Indianapolis & Eastern Traction Company; East St. Louis & Suburban Railway; New York State Railways; Lincoln Traction Company; Mahoning & Shenango Railway & Light Company, and the Lackawanna & Wyoming Valley Railroad. The Philadelphia Rapid Transit Company is also reported as testing the system. Prices have not been increased recently and deliveries are subject to the embargoes in the Eastern territory.

The manufacturers of a widely-known air brake have an entirely different method of obviating frozen brakes, consisting of auxiliary pipes or air-storage tanks, with which electric surface cars are equipped. New as well as old rolling stock, on which air brakes are installed, may be so fitted up. This appliance has been in active demand throughout the winter and particularly now; and its use is increasing throughout New York State, Pennsylvania, New England, the Middle West and Northwest—wherever low or freezing temperatures are encountered. The coils, in connection with the cylinder or reservoir, keep the brakes in workable condition at all degrees of cold, as they are automatic in action. No change in prices has occurred, and deliveries are as dependable as freight congestions everywhere will permit, the very conditions that make for better business having greatly delayed delivery. However, this complaint is general

Car Equipment Material Moving Along Better Lines

Advance in Prices—Deliveries Blocked by Embargoes—Business Outlook Far from Pessimistic

Reports from many sources are more encouraging than for months before, and an observer finds it difficult to escape the conviction that business with manufacturers and distributors of railway material and accessories is improving. It is evident that traction companies have been reducing their buying disbursements to a minimum in order to make as favorable a financial statement as possible at the end of the year. A number of representative firms in the east state that January was better, from a selling point of view, than any month in the preceding half year. In car equipment and supplies buying is along more liberal lines, if such a term is permissible under existing conditions. Shipments in the Eastern territory are practically at a standstill on account of the embargoes from Pittsburgh to the seaboard. Deliveries are consequently problematical.

Transformers, converters, controllers and motors, with no change in price, are not deliverable under five months. Circuit breakers have been going up from time to time, the last advance being on Nov. 27. Some types have remained untouched, and no further increase in price is anticipated for the present at least. Sales are reported as heavy by a leading manufacturer, especially for large capacity breakers. Car hood breakers are selling fairly well, principally for replacements, maintenance and breakages. Deliveries are from three to four months slow, the embargoes being extremely bothersome along the Atlantic seaboard. Express shipments are from three to four times longer in reaching destination than normally!

A widely-known manufacturer of circuit breakers and other staples in electric railway accessories, while declaring the demand was strong, added the plant was so filled up with war material products of a special character that no orders for breakers were being accepted or even considered. Deliveries are behind six to eight months, and other railway appliances here on delivery fourteen months. The situation is deplorable in this respect, but it is beyond remedy just now.

CAR HEATERS HIGHER.

Recently a 10 per cent advance was put into effect on a certain make of car heaters, but heretofore the price in the experience of this firm, had not followed the upward revisions in the metal market. Deliveries by this concern are ordinarily from four to five weeks, either by freight or express. Shipments are suspended by the blanket embargo. In one instance this concern offered a large quantity of heaters to a railroad company for shipping eight times, to have it refused. Goods are ready to go out from the factory in a few days, but transportation facilities are lacking. A rush order for a Connecticut point was sent from New York by auto truck, the consignee paying all expenses. Suf-

ficient raw material is in stock, according to this producer, to take care of ordinary business; but if a large order came along it would be impossible to fill on guaranteed delivery. The cost of resistance wire is now said to be from 300 to 400 per cent higher than normally and difficult to obtain.

AIR-BRAKE DEMAND NORMAL.

Air-brake conditions are said to be almost normal so far as demand and supply figure. Several fairly large orders are being looked upon as certain to materialize in due course for replacements caused by the recent loss of rolling stock of several companies by fire and other accidents. The market in traction air brakes is active when the purchase of new cars is contemplated or decided upon, a situation the present time does not reflect. No price advance; have been made since October last and none is anticipated. Standard brakes are promptly deliverable out of stock, providing shipping facilities are available. On special sizes deliveries are at the convenience, to a considerable extent, of the factory.

For gears and pinions a brisk demand is reported. Traction lines usually carry a pretty fair stock, but sales are steady. No change in quotations are furnished, the difficulty being in getting material. Labor is the most troublesome factor at present. Skilled workmen are scarce. Deliveries are behind from five to six months and even a year. Goods go out as soon as fabricated. There is no reserve stock to draw on. In this line buying has been improving, the last half of January having been much better than the first two weeks. The outlook is also promising, an opinion probably based on a few railways having been conceded a higher fare.

Street railway metallic filament lamps of 23, 36 and 56-watt sizes are in fair delivery. An increase of 10 per cent was made on Jan. 1, as previously announced in the *ELECTRIC RAILWAY JOURNAL*. The demand is normal and steady, with a slight increase at points reached by direct factory shipment. Manufacturers are just about meeting the demand, accepting the statement of a large producer, who also stated that there was, however, no accumulation of stock and no diminution in production. Breakages figure largely in replacement. The purloining of lamps by passengers is also claimed as a factor, but this is being overcome to a certain extent by using a locked socket.

Car seats, only ordered for new rolling stock now almost impossible to obtain excepting on long delivery, are therefore not active. A sharp demand for second-hand seats is noted and the market is about cleaned up. In a few weeks an advance on the entire line of new seatings will be made, to become effective immediately as announced.

Fare boxes of the improved types are

gradually being installed in the metropolitan territory. The demand is increasing and manufacturers are looking for their general adoption on the principal lines. Deliveries are prompt if transportation can be engaged. A carload came in from the West recently in ten days which is good time. Prices are unchanged.

Slack adjusters and lightning arresters are selling well. A recent order for more than 4000 adjusters was placed last week by the Philadelphia Rapid Transit Company. The government recently closed a contract for 6000 lightning arresters of a special type to be sent to France.

Ventilators, cord, curtains, shades, springs and general hardware, glass and similar accessories, indicate normal conditions, dependent largely on the new rolling stock situation. About two weeks ago car curtains here advanced 5 per cent. Car springs are in moderate sale, the difficulty is to obtain steel. Deliveries are reported as dependent on the elasticity of embargoes and the release of shipping facilities.

Iron and Steel Production Hard Hit

Transportation Tie Up Resulting from Weather Conditions Cuts Output Practically in Half

With prevailing conditions in labor and transportation, the iron and steel producers have been particularly hard hit during the last few weeks. Weather conditions and embargoes have limited transportation considerably and reports are more pessimistic than they have been. The heavy and frequent snow falls since the beginning of the year have practically demoralized traffic, and mills are finding it more difficult than ever to secure supplies. Large steel companies have closed up work and others have been running under reduced schedules, while authentic reports state that not more than half the blast furnaces in Pittsburgh are in operation. Some reports, however, place production of not more than 65 per cent.

It is, of course, quite evident that with the supply of iron and steel becoming lessened that the loss will fall almost entirely on the private consumer. In other words, those working on government orders will be made to feel this curtailment of production the least in all probability. The delay, therefore, in production and delivery of iron and steel products may not be expected to be lessened for some time.

Catalogs Wanted

W. R. Wood, acting assistant general superintendent of rolling stock and shops of the Rio de Janeiro Tramway, Light & Power Company, Rio de Janeiro, Brazil, desires to have manufacturers' publications, catalogs, descriptive matter, etc. Considerable new work is reported to be under way at Rio de Janeiro. Mr. Wood was formerly connected with the Third Avenue Railway, New York, N. Y.

Rolling Stock

Sheffield (Ala.) Company is reported as having ordered new cars to meet the increased demands for transportation of workmen to the government's great new nitrate plant at South Florence, Ala.

Dallas (Tex.) Consolidated Electric Street Railway has just received the twelve new passenger cars, constructed by the American Car Company, St. Louis, Mo. which was referred to in the ELECTRIC RAILWAY JOURNAL of Nov. 17, 1917.

Philadelphia (Pa.) Rapid Transit Company, within a couple of weeks, placed an order for 100 city passenger cars, similar to the ones now in service, with the J. G. Brill Company. This rolling stock purchase may eventually total 150, but not 200, as mentioned in last week's ELECTRIC RAILWAY JOURNAL. The Government, as surmised, initiated the order for the convenience of shipyards in the vicinity.

Wheeling (W. Va.) Traction Company had destroyed by fire, probably incendiary, on Feb. 4, its Bay Island operating carhouse and twenty-nine double-truck air-brake passenger cars, and one new work car, all 5-ft. 2½-in. gage. The company is now operating about 75 per cent of its service. The Jewett Car Company for some time has had fourteen double-truck cars under construction for the company and completion will be hastened. The Wheeling Company is looking for complete cars of the above gage for temporary use and will arrange equipment for permanent replacement speedily.

Trade Notes

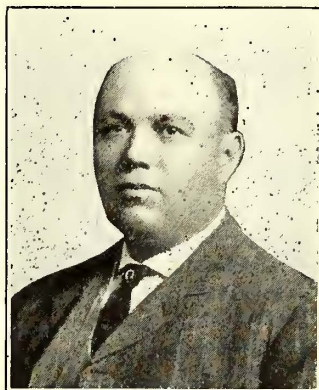
China Products Company, Zanesville, Ohio, has acquired the manufacturing plant, merchandise, tools, fixtures and raw materials of the Virginian Potteries Company. The property was turned over on Jan. 30.

Crescent Electric Manufacturing Company, Pittsburgh, Pa., recently bought the entire stock of the Pittsburgh Armature Works.

Automatic Railway Company, New York, N. Y., has been chartered with a capital stock of \$14,500 by L. H. Washburn, C. K. Allen and J. S. Wooster, 115 Broadway, New York City.

China Products Company, Zanesville, Ohio, has purchased the Virginian Potteries Company, its plant, manufactured products, tools, fixtures and raw materials. Possession was delivered to the new owners Jan. 10.

E. S. Fassett, formerly general manager United Traction Company, Albany, N. Y., has been elected director and secretary of Goldschmidt & Forbes, Inc., New York, dealers in metals and metal products. He will still remain sales manager of the New York Switch & Crossing Company, with which he has been connected for the last five



E. S. FASSETT

years, but he will resign his connection with the Habirshaw Electric Cable Company, New York, with whose sales organization he has been identified for the last two or three years. Mr. Fassett was president of the New York Electric Railway Association in 1908-1909. He resigned from the United Traction Company of Albany in 1912.

Westinghouse Lamp Company, New York, N. Y., has removed its advertising department from 165 Broadway (City Investing Building) to the Park Row Building, 21 Park Row, opposite the General Post Office. It has taken a suite of offices on the sixteenth floor.

Wagner Electric Manufacturing Company, St. Louis, Mo., announces the opening of a service station at Seattle, Wash., to take care of this branch of its business in the State of Washington and the Northwest.

Arnold Company, constructing engineer, 105 South La Salle Street, Chicago, has discontinued its New York office at 111 Broadway.

John D. Stout has been appointed Chicago representative for the Terry Steam Turbine Company, Hartford, Conn. Mr. Stout was at one time assistant engineer of the Terry company and was recently transferred from the New York office, where he was assistant manager.

War Trade Board, Washington, D. C., has announced new regulations regarding exports. After Feb. 1 a new application form will be used in place of all forms hitherto in existence. It will be the only application form in use. Copies of the blanks, with information pertaining to their purpose and other directions pertinent thereto, may be had on application to the board.

New Advertising Literature

Pyroelectric Instrument Company, Trenton, N. J.: Has circular No. 9 descriptive of Northrup millivoltmeter.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Leaflet 3986, descriptive of underfeed stokers, has been issued by the company.

General Electric Company, Schenectady, N. Y.: Bulletin 46,013, descriptive of switchboard-type instrument transformers, is being distributed by the company.

Manistee (Mich.) Iron Works Company: Bulletin 52, descriptive of Rees roturbo patent rotary jet vacuum pumps for surface condensers, is being distributed by the Manistee company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Vol. 1, No. 3, of "Railway Engineering Data." A reprint from the ELECTRIC RAILWAY JOURNAL on "Problems Confronting the Electric Railway Industry" is also being distributed.

RAILWAY MATERIALS

	Jan. 30	Feb 6 30-32
Rubber-covered wire base, New York, cents per lb.		
Wire, weatherproof (100 lb. lots), cents per lb.		
New York	29¼-34¼	28¾-34¼
Chicago	33¼-38 35	38.35
Wire, weatherproof (100 lb. lots), cents per lb.		
Chicago	\$55.00	\$55.00
Rails, heavy, Bessemer, Pittsburgh, per gross ton	\$57.00	\$57.00
Rails, heavy, O. H. Pittsburgh, per gross ton	\$57.00	\$57.00
Wire nails, Pittsburgh, per 100 lb.	\$3.50	\$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	\$3.90	\$3.90
Steel bars, Pittsburgh, per 100 lb.	\$5.00	\$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	\$5.80	\$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	\$4.85	\$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	\$4.35	\$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	\$3.95	\$3.95
Cement (carload lots), New York, per bbl.	\$2.25	\$2.25
Cement (carload lots), Chicago, per bbl.	\$2.31	\$2.31
Cement (carload lots), Seattle, per bbl.	\$2.65	\$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	\$1.31	\$1.31
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	\$1.32	\$1.32
White lead (100 lb. kegs), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	50	49

*None offering.

NEW YORK METAL MARKET PRICES

	Jan. 30	Feb. 6
Copper, ingots, cents per lb.	23½	23½
Copper wire base, cents per lb.	27	27
Lead, cents per lb.	6.75	7.00
Nickel, cents per lb.	50	50
Spelter, cents per lb.	7.92½	7.87½
Tin, Straits, cents per lb.	*85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb.	34-36	34-36

OLD METAL PRICES—NEW YORK

	Jan. 30	Feb. 6
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	17½	17½
Yellow brass, cents per lb.	13½	13
Lead, heavy, cents per lb.	5½	5½
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton	\$43.42	\$42.42
Old carwheels, Chicago, per gross ton	\$35.00	\$30.00
Steel rails (scrap), Chicago, per gross ton	\$35.00	\$35.00
Steel rails (relaying), Chicago, per gross ton	\$60.00	\$60.00
Machine shop turnings, Chicago, per net ton	\$17.00	\$17.00