Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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The N. E. L. A.'s Contribution to Power Plant Literature

THE National Electric Light Association does a good piece of work for more than its own members in the compilation each year of treatises on power matters. The reports of its special committees are so complete that they are useful to all power consuming industries. This is particularly true of the report of the committee on prime movers, which has now come to be a veritable encyclopædia in its field. The 1921 report, abstracted elsewhere in this issue, is a voluminous document replete with data which are just as applicable in the electric railway field as in that from which they were collected. The American Electric Railway Engineering Association has a committee on power generation and other committees whose activities parallel even if they do not duplicate those of the N. E. L. A. committee. It might be in the interest of economy of money and effort for the corresponding committees of these two and other associations to get together in some way. A practical suggestion to begin with is that the Engineering Association committee on power generation bring up for discussion at Atlantic City some of the high spots in the N. E. L. A. report.

One excellent feature in the compilation of this report is the way in which manufacturers of power machinery and auxiliary devices are invited to tell what they are doing respectively to advance the art. While the N. E. L. A. takes no responsibility for these statements, it does act as the clearing-house for the information. At the same time the manufacturers' statements are brought up for scrutiny and woe betide any one whose expressed hopes for his product do not tally with service performance.

Nominations for Mayor Come Thick in June

LIVELY times appear to be ahead this summer for New York City. The politicians are working overtime, and the near politicians are doing the same. The day is already counted lost upon which some one does not arise to announce himself as candidate for Mayor at the fall election. There are reforms enough ahead for busy hands to carry out, but the one to which all aspirants look longingly is the traction issue. Mr. Hylan, the present incumbent, seeks to preserve the present 5-cent fare. Mr. Bennett, another aspirant, seeks to restore it. Whatever other hopes and ambitions Mr. La Guardia and Mr. Curran, receptive candidates, may have, they also see the traction issue as one of the outstanding questions calling for immediate attention. It seems strange that where there is such unanimity of opinion, there could possibly be so much confusion of thought.

Flimsy pretexts for making an issue of the traction question abound in the reasons advanced by all the prospective candidates, particularly in view of the law enacted by the last Legislature, but the present Mayor cuts the most lamentable figure of all with his claims of preserving the 5-cent fare. The surface lines have practically all been broken up and returned to their original owners, so that 10 and even 15-cent fares are in force in many places where the 5-cent fare prevailed. Moreover, many lines have been discontinued entirely. As for the free transfer, it has become practically a thing of the past except at mass transfer points on the rapid transit lines. The passenger on the subway or the elevated pays a 5-cent fare, but then on these lines, tied in for operation under contract with the city, there is a deficit of many millions of dollars a year exclusive of interest on the city's investment for construction. This latter charge is passed on to the taxpayers and thence to the rent payer, who, in New York, is groaning under a frightful load of increased valuations and increased tax rates. Theoretically, a 5-cent fare. Practically, no such thing. It is not considered good form in the present age to confess to being old fashioned, but if one judges the transit situation in New York on the generally accepted standard of the past it would appear that Mayor Hylan, in contending that he has preserved the 5-cent fare, is guilty on the count of fraud.

A Dangerous Precedent in the Making

UNDER present circumstances, municipal ownership and operation of the entire local transportation system of Detroit seems inevitable—for better or for worse. Thus is the continuous political fight centering about the Detroit United Railway for more than twenty-five years apparently to be ended in the course of the next few years. The people have spurned all offers made by the private company and voted for municipal ownership and for the bond issues necessary to build new lines and to purchase certain existing lines. The municipal program has gained great momentum and it is being pressed forward on a big scale. Undoubtedly, the piecemeal system of purchasing existing lines which is being followed, with the franchises expired on a large part of the D. U. R. trackage, will prove very advantageous for the city. This will enable the municipal authorities to develop quickly a municipal transportation system of importance. Only those lines particularly wanted will presumably be purchased for a time, but as necessity to pay two fares to the two separate companies becomes more widespread, there will probably develop a pressing demand for complete municipal ownership.

The speed with which the municipal system is now being built and acquired is evidenced by the prospect of a mileage increased from 18 at the end of 1920 to 130 at the end of 1921. The project having gained such proportions, there is not an encouraging likelihood that the tide toward municipal ownership in Detroit will be stopped.

When all the circumstances are considered perhaps this is the only solution of Detroit's traction turmoil. The entrance of new interests in the D. U. R., as recently occurred, may change the situation. But if not, the concern of the industry is that the outcome of this particular quarrel while local in origin is far reaching in influence. If by chance the Detroit municipal ownership venture should appear to be a success, it will establish a powerful precedent for the ceaseless use of municipal ownership advocates—the first important precedent in the East and the most important in the country. Furthermore, if there can be such a thing as a successful municipal street railway system, the policies being pursued by the present Mayor, Street Railway Commission and management will tend to make it so. J. S. Goodwin, general manager, has declared that he has been under no political dictation as to jobs, equipment or methods, and that he has been free to build a railway system as a railway man would, taking into account the legal and physical limitations imposed. The railway organization has been built up of seasoned railway men who have years of experience with private railway companies behind them. As for the construction of the physical plant, while it may not be the best the industry has known, it is at least as good as that which has been built in recent years by many privately operated companies.

So far so good. While the present Mayor remains in control perhaps the railway venture will be conducted largely as a business proposition, free from political influence. But when a new administration steps in, what then? What assurance is there that the new Mayor will not succumb to the great temptation to exploit the railway, with its large number of jobs, to take care of his political henchmen and to use it in furthering his political power?

This is one of the great weaknesses of the municipal operation of any utility, especially one having so large a payroll as does a street railway. It is a great point of danger to the interests of the public. And in order that the public may know that its best interests will be served by a private transportation agency, it behooves the private companies continually to demonstrate this fact by providing excellent service at low cost and adopting constructive methods of creating and maintaining good public relations and public understanding of the aims of the company. This is the only dependable antidote for municipal ownership. When such conditions prevail, there will be no widespread demand for it, nor indorsement of the views of the unscrupulous persons who spread pernicious propaganda based largely on high-sounding falsehoods.

Avoid Contentious Publicity

THESE columns have been replete for a number of years with suggestions about the great desirability of the electric railways fostering publicity about themselves and of following the open door policy about all matters of information pertaining to them. Most of the companies that have undertaken this means of improving their relations with the public have met with some success. One example, however, stands out conspicuously as a failure. In this particular city, a persistent and energetic campaign of publicity has been engaged in for several years, but the attitude of the public toward the company has gone from bad to worse.

There is much to support the opinion that the nature of the publicity distributed has helped to undo the company rather than to improve its relations. This publicity has been largely controversial, full of rancor and more destructive than constructive. While all that has been said in the company's publication is probably true and perhaps was mild as compared to the provocation, yet aside from venting the feelings of the utility, not much was accomplished. It seems to have been pretty well demonstrated that the public is not sympathetic toward this kind of publicity and that it is not effective in accomplishing the object sought. This comment is made simply to point out the obvious lesson.

Brake Rigging Is an Important Safety Link in Car Equipment

THE great advantages of electricity as a motive power for use in railway service are its convenience, its economy in power, and the increase in track capacity made possible by its use. This increase in track capacity comes directly from the use of higher schedule speeds, which, in short runs, are made possible through higher rates of acceleration and retardation. In fact, the more adequate the provision for rapid and easy acceleration and retardation, when stops are frequent, the better the purpose of the railroad is served. It is obvious also that the saving in time secured during retardation is just as valuable as that obtained during acceleration. When braking commences, a car may possess substantially the same energy that was put into it from the power plant during acceleration. This energy can be dissipated in seconds or in minutes, but the shorter the time the nearer the company comes to getting double value from the power house, so far as time saved is concerned.

The fundamental necessity of a brake, both as a safety and a capacity increasing device, needs no emphasis, and the link in the braking process which connects the power-receiving end with the power-delivering end is the foundation brake rigging. This is as vital an element in brake mechanism as any other. With an idea of bringing more forcibly to the attention of its readers the value of keeping the foundation brake rigging in a high state of efficiency, this paper has been publishing in the past six monthly mechanical issues a series of articles by H. M. P. Murphy, describing the essentials of brake rigging and the forces developed during braking. This series of articles was written with the definite purpose of presenting this subject to the men responsible for brake operation and maintenance rather than to provide data for construction or design. The information has been given in as simple language as possible, and the mathematical formulas employed should not be confusing to the average workman. The examples have been taken from actual cases now in operation on existing electric railways, and the many illustrations given should enable the reader to see the essentials of the various parts, the functions that they perform and the importance of keeping all in proper condition and adjustment.

The concluding article of this series, which is published in this issue, deals particularly with piston travel and its effect on producing short stops through the saving of time in having this properly adjusted. When all parts are in proper condition, the capacity or pull of the rail is the measure of retardation that can be developed. However, with improper adjustment and worn parts, the

condition of the braking equipment is the measure of the retardation developed. This shows the value of proper maintenance and adjustment in this vital connecting link of the braking system, if high braking efficiency is to be maintained.

Investment in Instruction Takes Little Capital

MORE and more of late one reads in the popular magazines and house organs of instances where the patronage of customers is lost through discourtesy, or, to say the least, through thoughtlessness, on the part of the person coming in direct contact with the public. People have reached the stage where courteous treatment is not only expected but demanded, and any lack of a "please-the-public" attitude means the loss of trade, business, etc. If the business is such that a person may transfer his patronage to some other concern, he does so, and probably the incident sinks into oblivion in his mind. On the other hand, any incivility toward him in the sale of a commodity in whose selection or use he has no choice incurs a more lasting enmity.

Here is where the electric railway business meets a problem difficult of solution. Platform labor, perforce, is unskilled, but the industry must have high grade salesmen to sell rides. Regardless of the excellency of service, good will cannot be created or maintained without the utmost co-operation on the part of the employees of the railway.

Electric railways are confronted by this dilemma more than any other utility. Power and lighting are mere matters of maintaining an unimpeachable service over which the managers have a definite control. This is practically their only public contact and the criterion by which the public judges. The telephone approaches the railways in respect to the circumstances requiring the maintenance of pleasant relations with its clientele, but the direct contact in this case is lacking. A speedy connection followed by a good wire is all that is asked or, in fact, expected.

To have the man on the rear end working not only mechanically but in spirit is possible and is being done. The Fifth Avenue Coach Company has accomplished wonders in furnishing a well-liked service by having its conductors cultivate public friendship. There are numerous other properties the managements of which enjoy this reputation, but they are not numerous enough.

Instruction of new employees is a subject to which ever-increasing thought is being devoted, though principally to the mechanical details of the duties required. In this schedule of instruction a place should be given to teaching the fundamentals of salesmanship, a term which includes not only the ability to sell rides but to make the rider glad and satisfied with his purchase. True selling ability instills a "come-again" feeling in the customer. It is a knack that must be cultivated and, when cultivated, capitalized. Now that the labor market is an employers' and not an employees', the men who, by training, can be developed into courteous and efficient salesmen should be sought. The support and confidence of the public can probably be no more quickly restored than through the trainmen, in whom has been instilled the paramount necessity of these virtues. Since the apogee of hardship has been passed, the time is now ripe to regain the public esteem in this respect and reap the valuable benefits therefrom.

Instruction of the sort mentioned requires only a very small capital outlay. This, with the fact that the returns are large, should make an appeal to railway men at this time.

The Function of Every Committee Should Be Clearly Defined

THE editors of this paper attend numerous committee meetings in the course of the year, many as guests, some as members. They thus gain a perspective of the inside work of several associations and secure "atmosphere" for their writing. The general impression gained from this salutary exercise is one of respect for the quality and quantity of the work thus done behind the scenes. At the same time committee activities often, nay generally, give evidence of lost motion through what might be termed "lack of definition of function or purpose."

It is a trite saying that in rifle practice a clear view of the target is essential to accuracy of aim, but the principle applies everywhere else, including committee activities. Hence before starting work, each committee ought to formulate its purpose, the needs of its clientele and the practical results which it can reasonably be expected to secure by consistent effort.

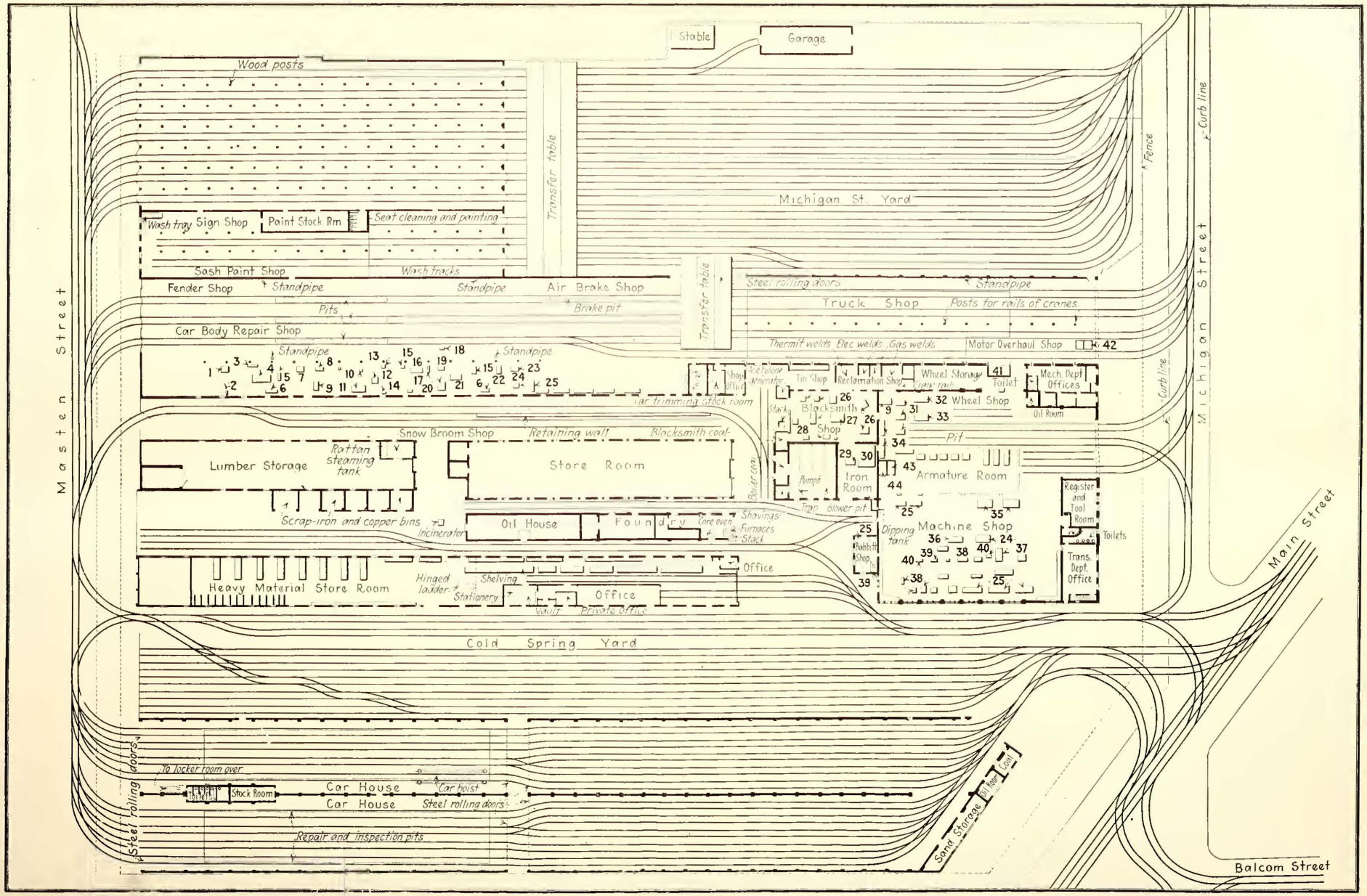
To be sure, many associations now set down lists of topics which committees are expected to consider, and this is all right as far as it goes. But it does not go far enough. Either the men who get up the lists, or the committees themselves, should define the point of view of the work. For example, take the heavy electric traction situation. It is a conspicuous case because committee work in this field is in the formative stage. Eight or nine national associations are active here. Their committees are duplicating work. They neither individually nor collectively have their purpose clearly defined. They need a central steering committee, for which the name "American Committee on Electrification" would be appropriate. This would help them in the work of definition and in the equitable distribution of their activities.

One of the first articles in the constitutions of most organizations begins: "The purpose of this association is . . . ." The same plan might well be followed by committees in their work.

Quotation from the Federal Electric Railways Commission Report

No. 25

THROUGH this system of financing and management (holding companies and banker control) the utilities have been largely controlled by persons living distant from the community affected by a particular electric railway, whose prime consideration has been to secure a return upon the property. This "absentee" management and control has not been successful in bringing about the proper spirit of co-operation between the local managers, employees and the public. Since the electric railway companies come into immediate daily contact with large numbers of people, it is of the utmost importance that the industry should gain and hold the respect, confidence and good will of its patrons. If the local public should invest its money in the stock and bonds of its local utilities there would be an improvement in the relations now existing between the corporation and the public.



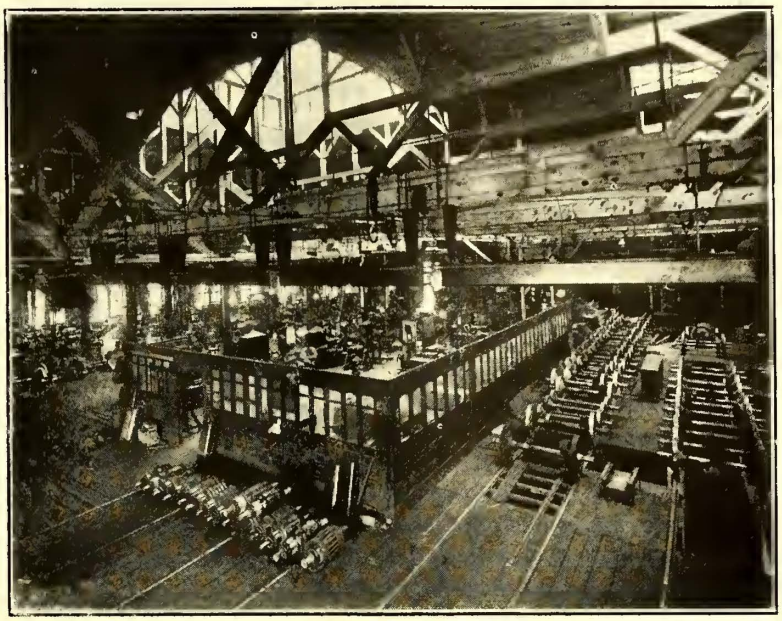
Plan of Cold Spring Shop Property of International Railway, Buffalo, N. Y., Showing the Location of Recent Improvements in Facilities

1—Resaw.
2—Stock saw.
3—Sheet metal rolls.
4—Double surface planer.
5—Automatic knife grinder.
6—Jointer.
7—Band saw.
8—Automatic mortising and boring machine.
9—Motor.
10—Mortising machine.
11—Sticker.
12—Pony planer.
13—Drill press.
14—Emery wheel.
15—Circular saw.
16—Boring machine.
17—Grinder.
18—Chain mortise.
19—Carver.
20—Sander.
21—Molder.
22—Tenoner.
23—Band saw.
24—Shaper.
25—Lathe.
26—Forges.
27—Hammer.
28—Oil furnace.
29—Shear.
30—Iron rack.
31—Boring mill.
32—Wheel press.
33—Wheel grinder.
34—Air compressor.
35—Wheel lathes.
36—Grinder.
37—Milling machine.
38—Drill.
39—Radial drill.
40—Saw.
41—Motor shell oven.
42—Motor shell dipping tank.
43—Armature and field baking oven.
44—Impregnating oven.

Shop Notes from Buffalo

Reclamation Shop Is Producing Attractive Savings—Dipping of Motor Shells a New Feature—Ingenious Plan for Portable Mounting of Electric Locomotive Control Apparatus Developed—Shop Layout Changes Here and There Tend to Facilitate Maintenance Practice

THE practices followed in the Cold Spring shops of the International Railway at Buffalo, N. Y., now operated by the Mitten Management, Inc., have been mentioned and illustrated in the ELECTRIC RAILWAY JOURNAL from time to time. Recent articles have covered dipping and baking of armatures and field coils (Feb. 21, 1920, page 286) and compressor maintenance (March 3, 1920, page 608). Although these shops have been in use for many years they are well adapted to modern maintenance practices and they are being constantly modified to meet changing conditions. The present article embodies the observations of a member of the editorial staff of this paper who visited the shops recently.



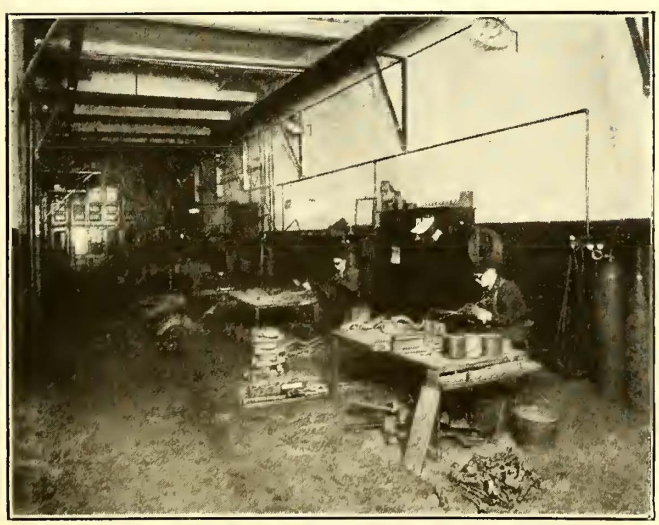
IN THE CENTER OF THE MACHINE SHOP IS HOUSED THE ELECTRICAL DEPARTMENT, IN AN INCLOSURE SET OFF BY A PARTITION MADE OF OLD CAR DOORS

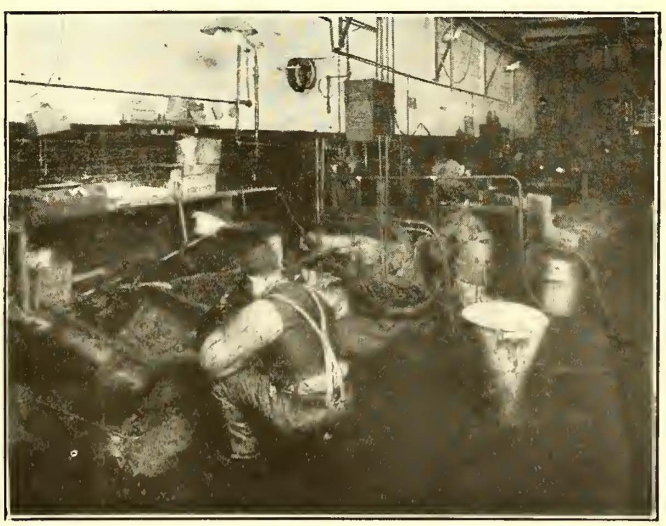
THE WELDING SHOP

The outstanding feature of recent changes is a welding shop where gas, electric and thermit welding is done in close co-ordination with the sheet metal and forge shops. The three shops are operated under the foreman of the reclamation department, who is thus able to subdivide the reclamation work among the three to produce the best over-all results. The welding and sheet metal shops occupy a long narrow room, 16 ft. wide, which was created by putting a concrete roof with skylights over a runway between the truck shop on one side and the wheel and blacksmith shops on the other. At present the 150 ft. of available length is divided up by means of light partitions thus: The tin shop has 32 ft.; the welding shop (including small office), 102 ft., and the motor-shell oven, 16 ft.

The reclamation or welding shop may be considered as divided longitudinally in half, one side being an 8-ft. runway and storage space, which is served by a trolley crane. On the other side are stalls separated by light, portable partitions, about 8 ft. high, for the three types of welding. The generator used to furnish acetylene for the gas welding is housed in a small "lean-to" adjacent to the tin shop.

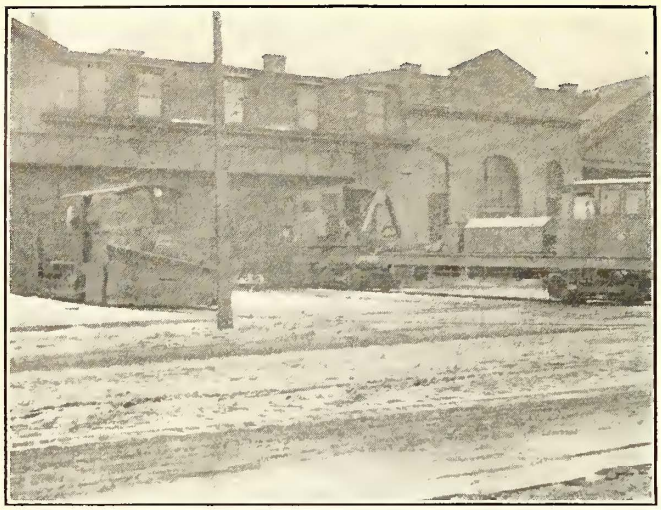
A summary of the work which has been done in the



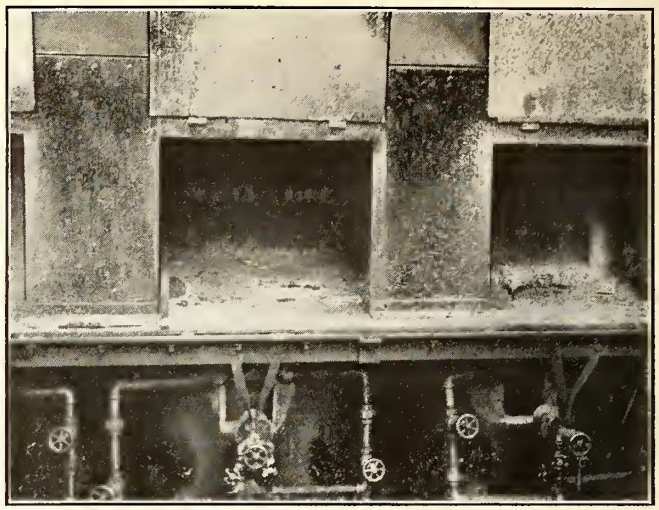


TWO VIEWS IN THE NEW WELDING SHOP

View at left is toward tin shop and shows crane and crane runway, electric welders in foreground and thermit welder in background. View at right shows thermit welder in foreground at work on the repair of a truck frame. The portable partitions between welders' stands were removed for the purpose of making these pictures.



MICHIGAN STREET FRONT OF COLD SPRING SHOPS
The photographer fortunately caught two important pieces of equipment just as they were being put away in the carhouse.



PART OF ROW OF BABBITT POTS
These are heated by gas or kerosene burners and have thermostatic control for babbitt temperature.

reclamation shop during recent months, as gaged by the dollars saved over costs of replacement without reclamation, is given in an accompanying table.

Among recent interesting jobs of welding two were those illustrated. One is a repair to a piece of manganese special trackwork, a switch in which the tread had been broken away. An insert was welded in to replace the broken part and a plate was welded on the side to support it, with the excellent result shown. The second job is the welding of oil boxes on the bearing housings of old motors built for grease lubrication, also illustrated. The routine work consists of the usual run of patching worn and broken gear cases, mending broken motor shells, etc. Thermit is used to a considerable extent on truck frames, the material being bought in large quantities. This is done in the interest of durability, on the principle that where much metal is to be added the thermit process is in the end economical, even if more costly at the time because the metal in the weld is of very high quality.

Dipping and Baking Progress

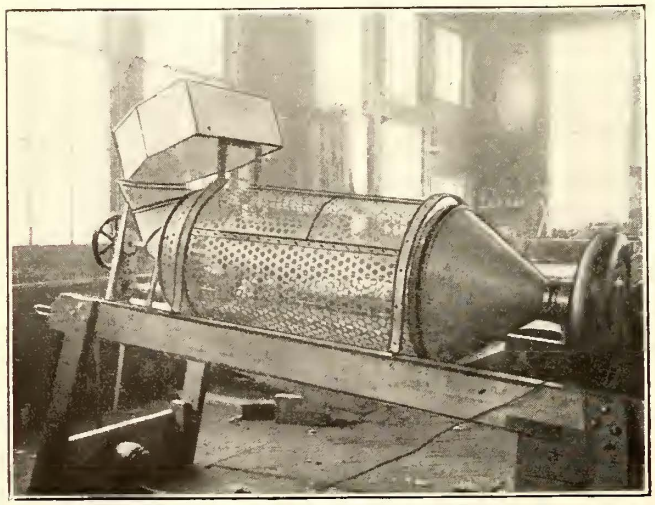
Supplementing former dipping and baking practice, as described in the earlier article referred to, the company is now subjecting small motor shells to this process and is preparing to do the same even with the largest motors. A heavy black varnish is used for fields and clear varnish for armatures. A special large dipping tank has been installed near the front of the motor overhaul shop.

In connection with the dipping and baking equipment used for armatures and field coils, located near the armature room, it is proposed to substitute a monorail crane for the one now in use, which requires the transfer of baskets of field coils from a crane bar outside the oven to one inside. The proposed monorail would run direct into the oven.

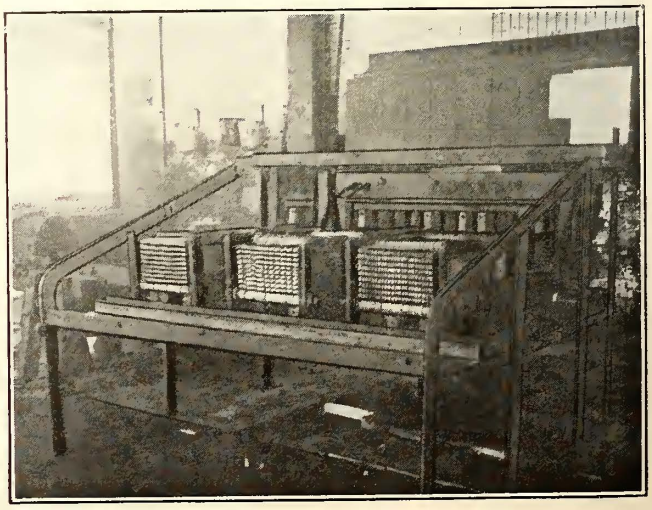
Some Rapid Pipe Threading

Among other recent time-savers is a double pipe-threading machine, which has been provided with an electric motor drive. This is installed in the air brake shop, where it is used for threading brake pipe, as well as conduit for use in rewiring cars, a job which is under way near by.

The spindles of the threading machine are geared to run at 75 r.p.m. and an inch of thread can be cut in about 6 seconds on a 1-in. or ¾-in. pipe. The thread cutting dies kept normally in the machine are those for the two most commonly used sizes of pipe, so that a pipefitter who needs a piece of pipe threaded can do this work with a minimum of time and effort.



THIS MACHINE SORTS PAPER TICKETS AND COINS BY MEANS OF A ROTATING PERFORATED DRUM AND A CENTRIFUGAL FAN



SLIDING FRAME USED IN MOUNTING CONTROL APPARATUS ON ELECTRIC LOCOMOTIVE. ROLLERS STILL TO BE ATTACHED

SUMMARY OF CASH SAVED BY THE RECLAMATION DEPARTMENT FOR THE YEAR 1920 AND PART OF 1921

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Electric equipment:														
Armature parts	$307.32	$124.50	$158.12	$219.29	$28.56	$172.70	$160.07	$54.68	$201.37	$281.12	$313.77	$174.19	$126.28	$193.40
Gear cases	732.52	911.96	626.69	903.14	1,498.35	1,447.79	1,220.99	1,322.35	742.91	2,199.67	1,490.04	1,122.91	1,952.66	1,422.25
Motor shells		715.00	615.00	830.00	345.00	865.00	1,015.00	1,885.00	745.00	335.00	260.00	624.50	130.00	390.00
Motor caps	20.79	36.96	25.41	6.93	16.17	20.79	13.86	13.65	35.72	44.16	11.55	56.75	3.60	9.00
Miscellaneous electric	8.77		71.85	40.33	65.54	148.59	52.93	34.78	136.79	145.44	146.26	223.42	156.88	65.69
Brakes:														
Air brake and compressor	69.70			9.61	35.91	55.89	55.90	14.74	111.67	64.02	176.30	91.20	123.49	15.51
Air tank and valves	35.30					72.00	36.00	177.90	140.75	224.67	70.60	143.87	19.40	5.12
Brake levers and miscellaneous	72.73	7.05	28.50	66.25	18.29	65.40	83.48	73.58	165.32	330.22	357.03	340.54	566.31	295.34
Car body:														
Seats, doors, steps, etc	416.46		47.38	137.58	118.48	272.85	224.72	239.60	301.96	514.37	432.52	439.17	269.42	565.13
Truck:														
Truck frames	1,592.00	2,982.00	4,176.00	2,500.00	4,176.00	4,156.00	2,926.00	2,102.00	1,648.00	1,037.00	1,490.00	4,116.00	1,754.00	6,502.00
Truck miscellaneous	33.85	24.85	285.32	495.21	70.73	164.57	271.33	261.73	436.78	568.25	1,054.90	787.65	868.43	460.77
Track:														
Track and service equipment	52.25		25.00	25.00	21.00	64.00	24.00	32.20	9.00	13.50	77.35	73.05	89.25	710.43
Tools:														
Tools and equipment	20.00	2.10	14.00	5.00	9.95	8.00	8.50	5.60	5.00	12.50	38.05	22.20	21.05	37.05
Miscellaneous welding and cutting with gas	113.10	310.69	299.66	251.28	329.87	818.81	838.21	714.19	759.34	813.66	448.64	395.75	618.46	789.84
Castings and forgings														
Total	$3,474.79	$5,115.11	$6,372.93	$5,489.62	$6,733.85	$8,332.39	$6,930.99	$6,932.00	$5,439.61	$6,583.58	$6,367.01	$8,611.20	$6,689.23	$11,461.53
1920—Grand total								$76,383.08						
1920—Average saving per month								6,365.25						

Mention of the conduit suggests that as cars go through for extensive overhaul they are being rewired in metal conduits in accordance with a systematic plan. This will be an important item in reducing car maintenance cost. In connection with this change in wiring, the jumper sockets for cars equipped to operate in trains are being mounted on the drawheads in the manner shown in one of the illustrations. This not only permits the use of shorter jumpers but reduces wear on the jumpers, which was excessive when the sockets were mounted on the bumpers.

Date.....

INTERNATIONAL RAILWAY COMPANY
MECHANICAL DEPARTMENT

CAR RECORD

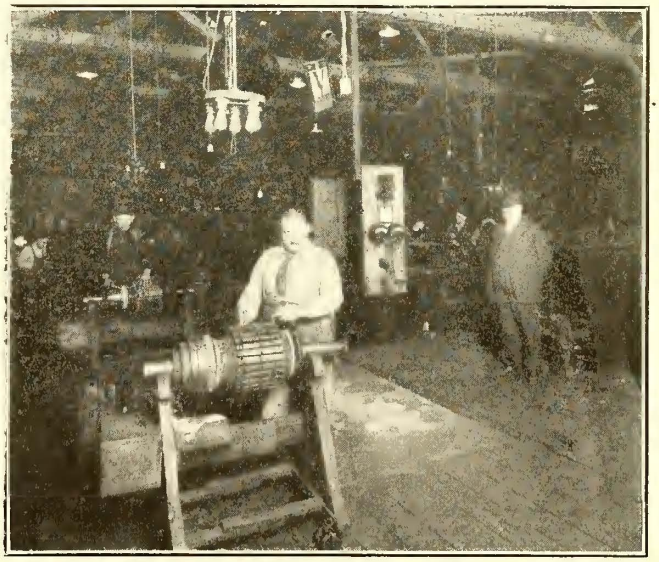
Date out of shop	*System painting*
Car No	*Control*
Height rail to first step	*Circuit breaker*
Height step to platform	*Fuse box*
Height platform to floor	*Heaters*
Air brake	*No. lights*
Air compressor	*Type motors*
Style lifeguard	*No. of motors*
Style trolley base	*Gear ratio*
Style headlight	*Diameter of wheels*
Style trolley catcher	*Type trucks*
Style signs	*Wheelbase*
Style seats	*King bolt centers*
Style upholstering	*Seating capacity*
Style registers	*Size of axles*
Style sander	*Total weight of car*

Inspector

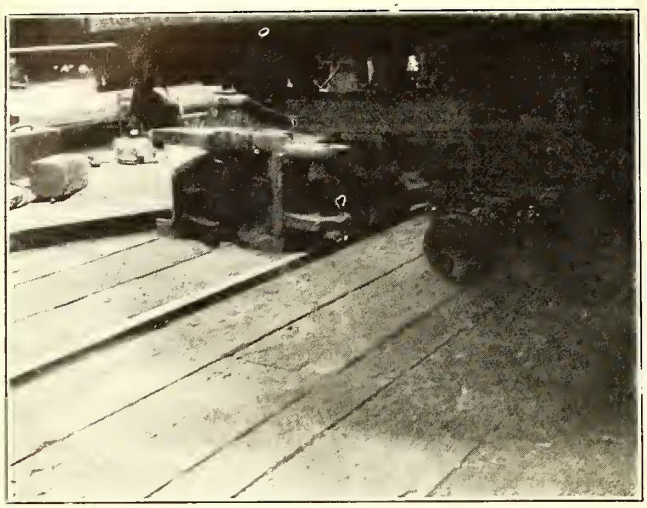
INSPECTOR'S RECORD OF CAR CHARACTERISTICS

An interesting job recently put through the shop was the remodeling of one of the Lockport line freight locomotives, which has been in service many years. This locomotive has the cab in the center with a projecting hood at each end to cover the auxiliary apparatus. The air apparatus is on one end and the resistance frames and connection board are on the other. All of the resistance frames and accessories have been mounted on a framework made up of strap steel, as illustrated, the whole mounted on rollers so as to roll on rails. The photograph reproduced was taken before the rollers had been put on, but shows the resistance frames in place. This gives a portable mounting, by means of which the whole group of devices can be drawn out into the cab for inspection and repair.

Considerable study has been given to the lighting of the shops, particularly in the armature and machine shop. An arrangement which has been found entirely satisfactory is to place 500-watt nitrogen-filled incandescent lamps, 20 ft. apart each way, and about 20 ft. from the floor. These are mounted in home-made funnel-shaped tin reflectors about 2 ft. across the bottom. The effect secured is very much like daylight and except for close work no supplementary, individual lamps are required. As will be noted in the general plan, the electric shop is partitioned off from the machine shop. The partition is made of discarded car doors which were mounted in simple framing. This provides a partition



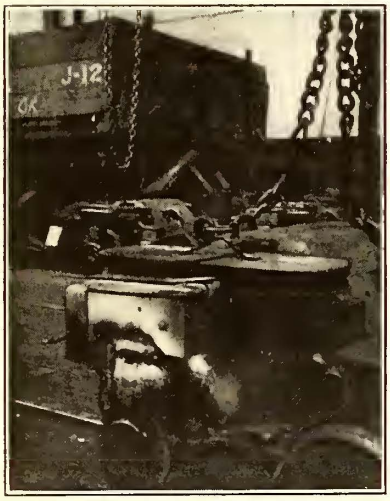
THE ELECTRICAL SHOP IS WELL EQUIPPED FOR ARMATURE WINDING AND TESTING



MOUNTING THE JUMPER SOCKETS ON THE DRAWHEADS REDUCES JUMPER TROUBLES

which is amply high to give the privacy necessary to efficient work, while at the same time the electrical department quarters are well ventilated and lighted.

In connection with the electrical shop, a feature of interest is a new testing switchboard, with a water rheostat mounted directly behind it. The rheostat consists of a wood tank, with suspended plates operated by a screw, which terminates in a handwheel on the front of the switchboard. The reclamation department is not the only one which makes use of welding and cutting apparatus. For example, in the rehabilitation job on interurban cars, mentioned earlier, it was found economical to use a gas torch in cutting out metal pieces which were scheduled for removal, such as brackets, straps, etc. These large cars are equipped with couplers which connect the air line as well as furnish mechanical coupling, although the electric lines are separate. It was found desirable to supplement the large couplers by extra drawheads to permit coupling city cars to the interurbans.



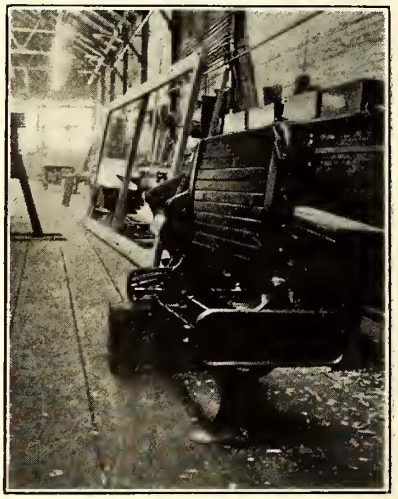
OIL BOX WELDED ON BEARING HOUSING OF OLD MOTOR

The practice of using slat seats and backs has recently been adopted. A photograph reproduced shows one of the seat backs as changed over from the cane-covered cushions formerly used.

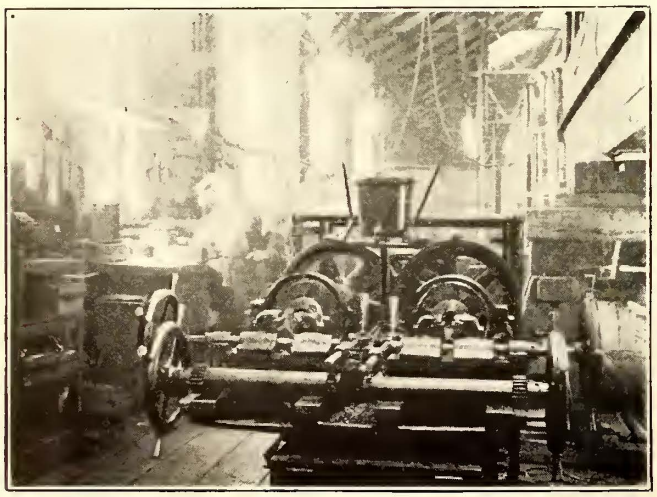
On the interurban cars also the Miller trolley shoe is used. This operates satisfactorily, but it is found that it must not be allowed to run too long so as to wear into grooves.

In the Forrest carhouse of the International Railway an ingenious jib crane has been installed to permit light repairs to be made. The crane was fabricated out of old 6-in. T-rails, two being used to form a column. The two rails for this purpose are placed side by side with heads and base reversed and bolted firmly together. The upright is set 4 ft. in a concrete floor and the upper end is secured to one of the beams forming the roof trussing. The boom, also made of two T-rails, is supported by a diagonal brace of rails below and a guy rod extending from the outer end to the upper support of the vertical column. The boom is hinged to the upright so as to give it range of action ample for the purpose for which it is used.

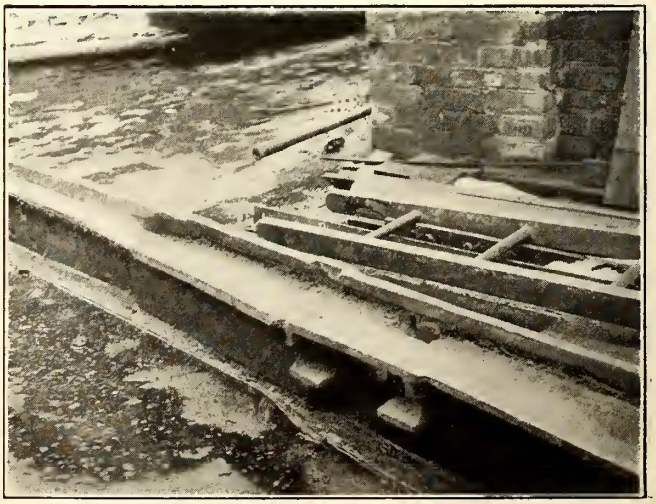
One of the accompanying illustrations shows a machine which has recently been developed in the shops for the purpose of separating the metal tokens and coins from paper transfers. It consists essentially of a motor-driven rotating perforated cylinder with a hopper at one end and a suction fan at the other. The perforations are just large enough to clear the largest coins, and inside are longitudinal veins which raise and drop the contents of the cylinder.



WOOD SLAT SEATS AND BACKS FOR INTERNATIONAL'S CARS



THIS MACHINE MAKES PIPE THREADING AN EASY JOB



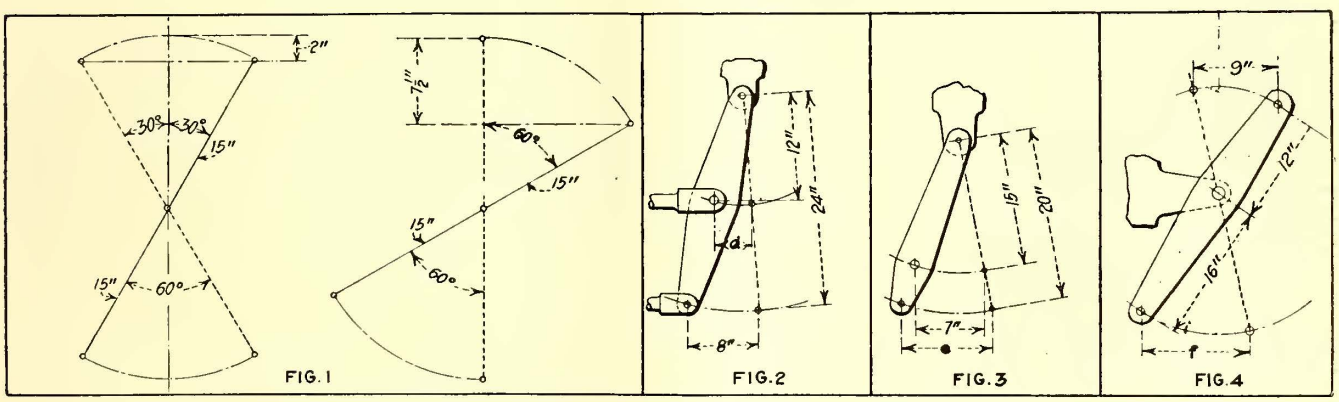
PIECE OF SPECIAL TRACKWORK REPAIRED BY ELECTRIC WELDING

Piston Travel and Shoe Clearance*

The Relation Between Piston Travel and Shoe Travel Is Determined—With a High Total Leverage Slight Shoe Wear Produces a Great Variation in Piston Travel Which Is Objectionable—Various Examples Illustrate Methods for Finding the Motion of Levers and Their Proper Release Positions

BY H. M. P. MURPHY

THE term "total leverage" represents the total number of pounds of brake-shoe pressure that are obtained for each pound of force exerted on the brake-cylinder push rod. Consequently it is clear that in order to obtain any desired degree of braking force or percentage of braking power on a given car, with a specified air pressure in the brake cylinder, the greater the value of the total leverage employed the smaller is the size of the brake cylinder required, and, therefore, in order to reduce the cost of installations and also to minimize the amount of compressed air used in an application of the brakes, it is always advisable to use as high a total leverage as is consistent with good practice. On the other hand a very high total leverage is objectionable because with it slight shoe wear produces a great variation in piston travel. The reason for this is explained below.



DIAGRAMS SHOWING MOTION AND POSITION OF VARIOUS LEVERS

The increase in piston travel due to the wear (or travel) of brake shoes is equal to the average amount of wear (or travel) of the shoes multiplied by the total leverage employed. For example, if in a certain brake system the average wear per shoe is 0.2 in. in a given time, and if the total leverage is 9, the increase in piston travel (due to the specified amount of shoe wear) will be equal to $0.2 \times 9 = 1.8$ in.

To secure the proper operation of the automatic brake, which depends largely on the relative volumes of the auxiliary reservoir and the brake cylinder, it is important to use a reasonably low total leverage and thus to maintain an approximately constant piston travel in spite of ordinary shoe wear. In steam-road service, where the cars receive attention at only long intervals and where the piston travel is not adjusted regularly, a lower total leverage is necessary than in electric railway service, where systematic inspection and maintenance can generally be relied upon. Moreover, in traction service the amount of air consumed per car would be excessive if the piston travel were long and the leverage low (a high leverage permitting the use of a small brake cylinder for a car of given weight) as brake applications are usually very frequent in such service. For these reasons it is customary to adhere as closely as possible to the piston-travel standards which have been fixed by the best practice, and which must be carefully maintained in service in order to secure satisfactory results. It is important to note in this connection that the standard piston travel should always be the average of the maximum and minimum values actually obtained.

A further reason for adhering to established standards of piston travel and braking power is that it is most essential to provide for clearance between the brake shoes and the wheels when the brake is released. Now, as there is always a certain amount of lost motion in a foundation brake rigging, the use of either a very high total leverage or an excessively short piston travel might easily result in the dragging of the brake shoes. Of course, if there were no lost motion between the push rod and the shoes the shoe clearance would be exactly equal to the piston travel divided by the total leverage. Thus, if the piston travel is 5 in. and the total leverage is ten, the shoe clearance would be five divided by ten, or ½ in. However, owing to the clearances in the pin holes and to the spring and "give" of the various parts of the rigging, the shoe clearance would actually be considerably less than this value.

Further, the piston travel obtained when a car is standing is usually an inch or two less than that obtained when a car is running, because the vibration and motion of the various parts provide for their better adjustment in the latter case. Consequently allowance should always be made for this inequality, as it is the correct "running" piston travel that must be maintained. Of course, if the brakes are applied while the

*This is the sixth and last of a series of articles on forces developed in brake riggings. Others appeared in the Jan. 15, Feb. 19, March 19, April 16 and May 21 issues of this paper.

train is in motion and held on till and after the stop is made and thus measured the piston travel will have the "running" value.

Determining the Motion and Positions of Levers

A very important consideration in the installation and adjustment of brake apparatus is the motion or travel of the various parts concerned. In dealing with this subject, the primary requirement is, of course, that the location and dimensions of all moving parts be so chosen that each lever and rod will always be unobstructed in its movements, even when the brake shoes are worn down completely and the brake-cylinder piston has traveled to its maximum limit. Otherwise the brake might easily be rendered totally ineffective. An additional requirement of good practice is that all levers, except the truck levers, should stand at right angles to their connecting rods when the brake is fully applied and the piston travel has the standard running value for the case in question. This applies particularly to the two cylinder levers. The connecting rods will thus maintain their required approximately parallel directions much more nearly than would otherwise be the case, for obviously when a lever is moved through half of a specified angle on each side of a perpendicular position with respect to the connecting rods, the resulting deflection of these rods will be much less than when the lever is moved through the same angle but not equally on both sides of the perpendicular. This is illustrated in Fig. 1.

In order to determine the travel or the position of any moving part of a brake rigging, it is merely necessary to remember that when a lever (or standard bell crank) turns about one of its three points as a center, the two other points travel in circular paths, and therefore the length of the path passed over by each of these points is in direct proportion to its distance from the center about which the lever turns.

To illustrate this principle consider the levers shown in Figs. 2, 3 and 4. In Fig. 2 the lower end point is known to travel 8 in., and consequently the distance, d, traveled by the middle point is found thus:

$$d = \frac{12}{24} \times 8 = 4 \text{ in.}$$

Again, in Fig. 3, the middle point is known to travel 7 in. and, therefore, the distance, e, traveled by the lower end point is found thus:

$$e = \frac{20}{15} \times 7 = 9\tfrac{1}{3} \text{ in.}$$

Also in Fig. 4, the upper end point is known to travel 9 in., and consequently the distance, f, traveled by the lower end point is found thus:

$$f = \frac{16}{12} \times 9 = 12 \text{ in.}$$

A general rule may now be readily stated as follows: When a lever or bell crank turns about one of its three points as a fixed center, and the travel of a second point is known, to find the travel of the third point divide its distance from the fixed center by the distance of the second point from the fixed center and multiply this result by the known travel of the second point.

In cases where a lever has no positively fixed point, as for example a cylinder lever or a live truck lever, the problem of finding the travel of a specified point can also be easily solved by the foregoing rule if each of the two points whose travel is given by the conditions of the problem is considered in turn as being fixed. In order to illustrate this method the following examples will be given:

Let it be required to find the total travel of the pull rod, in Fig. 5, necessary to take up 1 in. of shoe clearance on each pair of wheels. The clearances of 1 in. are represented in the figure by the distances BG and EM, the position of the mechanism before the brake is set being indicated by the lines ABC, CD and DEF.

It is obvious from an inspection of the diagram that the total travel of the pull rod is equal to the travel necessary to bring the left-hand shoes against their wheels plus the travel necessary to bring the right-hand shoes against their wheels. Now, assuming that the rigging is drawn in its release position ($ABCDEF$), consider that the point E is temporarily fixed and that the pull rod is moved to the right until the left-hand shoes are brought tight against their wheels, the lever, ABC, assuming the position AGH, the rod CD moving to the position HK, and the lever DEF taking the position KEL. Then, to find the distance FL (*i.e.*, that part of the travel of the pull rod necessary to apply the left-hand shoes) it is only requisite to find the distance KD, which is, of course, exactly equal to the distance HC, and, as A is fixed point, $HC = \frac{28}{21} \times BG = \frac{28}{21} \times 1$ in. $= 1\frac{1}{3}$, whence $KD = 1\frac{1}{3}$ in. and

$$FL = \frac{21}{7} \times KD = \frac{21}{7} \times 1\tfrac{1}{3} = 4 \text{ in.}$$

The point K, instead of E, may now be considered as a fixed point (which it actually is as it cannot be moved any further to the left) and the pull rod may be moved to the right till the right-hand shoes are brought tight up against their wheels, the lever KEL assuming the position KMN. The distance LN (*i.e*, that part of the travel of the pull rod necessary to apply the right-hand shoes) being found thus, as K is now a fixed point:

$$LN = \frac{28}{7} \times EM = \frac{28}{7} \times 1 \text{ in.} = 4 \text{ in.}$$

Consequently the total travel of the pull rod is

$$FL + LN = 4 \text{ in.} + 4 \text{ in.} = 8 \text{ in.}$$

Let it be required to find the total piston travel necessary to move each of the pull rods in Fig. 6 a distance of 5 in. as shown. The release position of the rigging is indicated by the lines ABC, BE and DEF. The piston travel necessary to bring the lever DEF into the position DKL may be found by considering point C of lever ABC as a temporarily fixed point and then causing the lever ABC to assume the position GHC, for the distance EK is equal to BH, and as D is a fixed point,

$$EK = \frac{16}{36} \times FL = \frac{16}{36} \times 5 \text{ in.} = 2\tfrac{2}{9} \text{ in.}$$

whence, $BH = 2\frac{2}{9}$ in.

and, therefore, the piston travel (AG) required to move the left-hand pull rod a distance of 5 in. is,

$$AG = \frac{36}{20} \times BH = \frac{36}{20} \times 2\tfrac{2}{9} \text{ in.} = 4 \text{ in.}$$

about the point H, till it assumes the position MHN. a fixed point (which it actually is as it cannot be moved any farther to the right) and the cylinder push rod moved out still further till the right-hand pull rod has traveled the required 5 in., the lever GHC revolving about the point H, till it assumes the position MHN. It is now clear that the piston travel necessary to move

the right-hand pull rod a distance of 5 in. is equal to *GM*, and as *H* is now a fixed point,

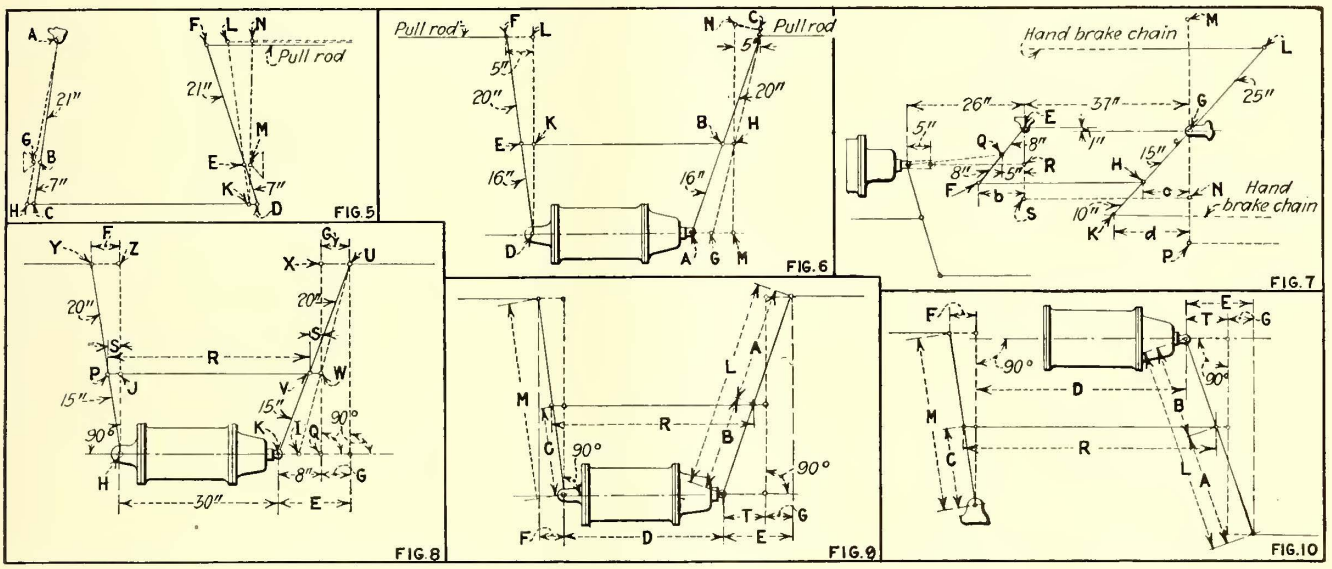
$$GM = \frac{16}{20} \times 5 \text{ in.} = 4 \text{ in.}$$

Consequently, the total piston travel required to move both pull rods 5 in. each is,

$$AG + GM = 4 \text{ in.} + 4 \text{ in.} = 8 \text{ in.}$$

Determination of the Proper Release Positions of Levers

In designing a brake rigging, the method generally preferred is to make the layout with the brakes in release position, the positions assumed by the parts concerned, when the brake is applied both with new and worn-out shoes and also when the piston travel has its maximum possible value (which is usually 12 in.), being carefully laid off, to make certain that no obstruc-



TRAVEL OF PULL RODS AND POSITIONS TAKEN BY LEVERS

tions to the proper motion of these parts will be met. In order to accomplish this, and also to determine the release positions which the various parts should have (as well as the lengths of tie rods, etc.), so that the main levers may stand at right angles when the brake is set and the piston travel has its standard value, it is merely necessary to apply the rule previously given for the motion of levers, etc. The following examples will illustrate the general methods employed for this purpose:

Let it be required to find the release positions of the two hand-brake multiplying levers applied to an electric car on which the piston travel is to be 5 in., if these levers are to stand at right angles to the center line of the car when the hand brake is fully applied. The dimensions and general location of these levers are shown in Fig. 7. The points *E* and *G* are fixed.

The first step is to draw the lines *ES* and *MP* through the points, *E* and *G*, so that they are perpendicular to the center line of the car. Next, lay off *ER* = *EQ*, *ES* = *EF*, *GM* = *GL*, *GP* = *GK* and *GN* = *GH*. Then the lines *ERS*, *SN* and *PNGM* represent the position which the rigging should assume when the brake is applied. The release positions of the levers may now be found with respect to the lines *ES* and *MP*. Let the lever *ES* be swung to the left till the point *R* has traveled the required 5 in., as shown, the lever assuming the position *EQF*. The distance *b*, which locates the release position of the lever *EF*, is found by aid of the rule for lever motion as follows:

$$b = \frac{16}{8} \times 5 \text{ in.} = 10 \text{ in.}$$

and as the rod *SN* has assumed the position *FH*, the lever *GNP* has swung into the position *GHK*, the distance *c* being approximately equal to *b*; that is,

$$c = b = 10 \text{ in.}$$

Consequently the distance *d*, which locates the release position of the lever *GK*, is found as follows:

$$d = \frac{25}{15} \times c = \frac{25}{15} \times 10 \text{ in.} = 16\tfrac{2}{3} \text{ in.}$$

Moreover, the proper length of the rod *FH* or *SN* should be just 37 in., as may be seen by an inspection of the figure, and the length of the chain attached to the cylinder push rod should be 26 in. minus 5 in., or 21 in. The lever *LK* or *MP* is designed to permit of the application of the hand brake from either end of the car. When the brake is applied from the right-hand end, the portion of this lever to be considered is *GNP* or *GHK*, just as if the portion *GL* or *GM* were not attached to it and when the brake is applied from the left-hand end of the car the portion to be considered is *LGH* or *MGN*, just as if the portion *HK* or *NP* were not attached to it. In either of these cases, it is evident that when a given force is applied to the hand brake chain concerned, the forces delivered to the points *H* and *N* will have the same values.

Let it be required to find the proper release positions of the cylinder levers shown in Fig. 8 so that when the piston travel is 8 in. both levers will stand at right angles to the center line of the cylinder, the total braking force and shoe clearance on each truck being the same and consequently half of the piston travel being used to apply the brakes on each truck.

First, draw perpendicular lines through the points *H* and *Q*, the latter being 8 in. (which represents the given piston travel) from the point *K*. The location of the center line of the connecting rod *PV* or *JW* is, of course, given by the dimensions of the levers, and the

distance PJ is equal to VW. Then considering the point U as temporarily fixed:

$$PJ = VW = \frac{20}{35} \times (\tfrac{1}{2} \text{ piston travel}) = \frac{20}{35} \times 4 = 2\tfrac{2}{7} \text{ in.}$$

Next, by drawing the lines HPY and KVU, the release positions of the levers are determined, for

$$F = YZ = \frac{35}{15} \times PJ = \frac{35}{15} \times 2\tfrac{2}{7} = 5\tfrac{1}{3} \text{ in.}$$

Also,

$$G = XU = \frac{20}{15} \times QI = \frac{20}{15} \times 4 = 5\tfrac{1}{3} \text{ in.}$$

and,

$$E = KQ + G = 8 \text{ in.} + 5\tfrac{1}{3} \text{ in.} = 13\tfrac{1}{3} \text{ in.}$$

The length of the rod PV or JW must clearly be equal to the distance HK plus the piston travel; that is, $R = PV = JW = HK + KQ = 30$ in. $+ 8$ in. $= 38$ in.

As the type of problem illustrated by this example is an extremely common one and must, therefore, be solved very frequently, a short method for determining the distances F, G, E and R (see Figs. 8, 9 and 10) will now be given.

Formulas for Determining the Proper Release Positions of Cylinder Levers

The following formulas are entirely general and apply to all cases where the total braking force and shoe clearance are the same on both trucks, whether the cylinder levers are or are not divided in the same ratio, or whether they have the same total length or not. The symbols used are indicated in Figs. 9 and 10, T representing in all cases the standard piston travel for the car in question, *i.e.*, T is the piston travel for which the levers are to be at right angles to the center line of the cylinder when the brake is set.

The formulas are:

$$G = T \times \frac{A}{2 \times B}; \quad F = T \times \frac{A \times M}{2 \times L \times C}$$

$$E = T \times \left(1 + \frac{A}{2 \times B}\right) \quad R = T + D$$

To show how the use of these formulas simplifies calculation, let it be required to solve the example given in the preceding paragraph and covering the construction of Fig. 8, where the following values are assigned to the various symbols:

$$A = 20 \text{ in.}, \; B = 15 \text{ in.}, \; L = 35 \text{ in.}, \; C = 15 \text{ in.},$$
$$M = 35 \text{ in.}, \; T = 8 \text{ in.}, \; D = 30 \text{ in.}$$

Substitution of the given numerical values of A, B, L, C, M, T and D in the formulas gives the desired results, thus:

$$G = T \times \frac{A}{2 \times B} = 8 \times \frac{20}{2 \times 15} = 5\tfrac{1}{3} \text{ in.}$$

$$F = T \times \frac{A \times M}{2 \times L \times C} = 8 \times \frac{20 \times 35}{2 \times 35 \times 15} = 5\tfrac{1}{3} \text{ in.}$$

$$E = T \times \left(1 + \frac{A}{2 \times B}\right) = 8 \times \left(1 + \frac{20}{2 \times 15}\right)$$
$$= 8 \times 1\tfrac{2}{3} = 13\tfrac{1}{3} \text{ in.}$$

$$R = T + D = 8 + 30 = 38 \text{ in.}$$

Thus the same results are obtained by this simple method as were found by the long process previously employed.

Progress in Prime Mover Design and Practice

N. E. L. A. Committee Returns a Bulky Report Indicating the Recent Improvements and Standardizations Effected in Power Generation

LAST week a brief report of the National Electric Light Association convention, held at Chicago from May 31 to June 3, was printed together with an abstract of the report of the committee on steam railroad electrification. The committee on prime movers, of which N. A. Carle is chairman, produced a masterful and inclusive compilation on practices and tendencies in steam power generation. The committee has not duplicated the efforts of other societies but has co-operated with them.

The report comprised more than 350 pages nearly as large as the pages of this paper. The function of this committee was stated to be "to investigate and report developments in the design, installation and operation of prime movers and accessory equipment for the production of power from fuel for the generation of electricity." The report covered the several phases of the subject as summarized below:

In steam turbines the maximum size of single-cylinder units is still limited to 45,000 kw., and there has been no appreciable change during the past year in steam pressures and temperatures, although it is felt that higher pressures and temperatures are a possibility for future application. The trend of European practice seems to be toward definitely higher speed, higher superheat and higher pressures. In addition there is a tendency to standardization of performances, ratings, tests guarantees and principal dimensions of turbo-generators. It is felt that similar action by American interests would be productive of much good.

Turbine lubrication is receiving much attention. It imposes complicated requirements on the manufacturer and the oil refiner. The committee offered for consideration a tentative general specification for turbine oils. As regards oil purification, the continuous system and the continuous by-pass system are the most effective.

The latest development in turbine foundation design is the three-point flexible suspension devised by Akimoff. Accurate static and dynamic balancing are recognized by turbine manufacturers as of prime importance. Machines which have been scientifically balanced show a marked improvement in their operation.

Manufacturers are working on the development of a closed system of generator ventilation, in which the same body of air is constantly recirculated. The basic idea is to obtain cleaner air than is possible by washing free air, and to reduce fire hazards.

In condensing equipment the regulation of the flow of circulating water to provide for seasonal variation in cooling water temperature is being considered. Such regulation would reduce power required for driving circulating pumps and avoid lowering the condensate to a temperature below that corresponding to the vacuum.

In plants whose supply of raw water is not fit for boiler feed, particular attention should be paid to condenser leakage. Where leakage is likely to be dangerous, such expedients as expanding the tubes into one or both tube sheets or using double tubes with an intermediate draining space have been proposed or adopted.

In boilers there is a tendency toward larger sizes,

higher pressure and higher superheat, although 300 to 350 lb. and total temperatures of 600 to 650 deg. seem to be as high as boiler designers are willing to go at present. The continued high cost of economizers has led boiler manufacturers to develop a boiler with a higher tube bank to get at least part of the saving which could be realized with an economizer.

Improvements have been made during the year in soot-blowing equipment, which while not entirely satisfactory is generally recognized as a necessary adjunct to the modern boiler.

On horizontal-tube boilers there is a marked tendency toward the use of baffles inclined at an angle of less than 90 deg. to the tubes. This plan is readily adaptable to furnace space requirements and desired flue-gas velocities.

The larger boiler units and the higher peak ratings with consequent fluctuations in rate of steaming are giving turbine manufacturers some concern because of fluctuations in superheat and consequent fluctuations in temperature of turbine parts. Several superheater manufacturers, anticipating this difficulty, are working on the design of separately fired superheaters.

The excessive cost of high-grade coal and consequent necessity for utilizing low-grade coal have forced manufacturers of stokers to adapt designs to meet new conditions. The successful application of forced draft to chain-grate conveyor-type stokers opens up to this type a field heretofore pre-empted by the underfeed stoker.

The packing and arching-over of coal in stoker hoppers can be practically eliminated by the use of power-operated agitators installed at the base of the hopper. On the principle that the supply of coal and air is proportional to the rate of steam, several manufacturers are offering systems which control stoker speeds and the speeds of fans and other auxiliaries, through a master controller actuated by differences in steam velocities. None of these systems has been in service long enough to justify unqualified indorsement.

Economizers and Other Power-Plant Auxiliaries

As to economizers, partially offsetting their high cost at present are such other considerations as excessive coal prices, high flue-gas temperatures and the improvements in economizers and fans. Relatively few changes have been made in the design of cast-iron economizers, but manufacturers of steel-tube economizers report many new developments. Considerable interest is being shown in the wrought-steel type on account of the higher boiler pressures now in use or contemplated.

Corrosion, internal and external, is the most serious problem confronting the operator of economizer equipment. It is generally agreed that where trouble is being experienced from internal corrosion some method must be used for freeing the air of dissolved gases. The remedy for external corrosion of tubes is to raise the temperature of the inlet water to the point where condensation of moisture does not take place under conditions of steady operation. Economizer leakage is another matter that requires care, especially in design and construction.

The most economical methods of maintaining heat balance in the larger stations are the house turbines in combination with a heater condenser and the straight electric drive with bleeding of the main units for feed water heating. The use of a house turbine lowers the cost of auxiliary switching equipment and reduces short-circuit current on auxiliary circuits. In general, American manufacturers of feed pumps limit pressure to 100 lb. per stage, although one is now building a single-stage pump, and in England a single-stage high pressure pump has been built for pressures around 400 lb. One pump manufacturer reports the installation of a complete plant for testing pumps with hot water under service conditions. This is a step in the right direction and should lead to beneficial results.

Practically no trouble was experienced from spontaneous combustion in coal piles during the past year, largely because coal stocks were low. As regards coal-crushing apparatus, some members of the association feel the manufacturers have developed crushers of large capacity at the sacrifice of uniformity of product. A decrease in peripheral speed of rolls would probably remedy this to some extent. Automatic coal samplers have not met with entire success on account of the difficulty of securing a representative sample.

Disposal of ashes by sluicing appears to be gaining in favor. A combination of sluicing troughs and sand pumps was reported from one plant.

Line Welds Must Be Made Carefully

A few years ago line welds were considered advisable in station piping to reduce the number of flange joints, but experience gained since indicates that they may be dangerously weak unless carefully made. There are several types of butt-weld joints in which the welds are reinforced with sleeves. Such joints have proved amply strong.

As to valves, practically all stations using steam above 200 lb. have standardized on steel-body gate valves with complete monel metal trim. Both hydraulically and electrically operated valves are being extensively used, a preference being shown for the electrically operated valve with the Dean type of control. Considerable experience has developed from leaking safety valves, often due to the carrying of the weight of the bent piping on the valve body. In many cases this can be overcome by installing a slip joint close to the valve outlets.

It is hoped that a standardized color code for identifying the several types of power plant piping can be agreed upon as a result of the committee's activity along this line.

The development of new types of boiler and turbine room instruments during the past year is promising. New instruments offered by manufacturers include: (1) Recording pyrometers for indicating boiler furnace temperature; (2) combined CO_2 and CO recorders; (3) multiple-type draft gages; (4) flow meters for indicating small rates of flow of liquids under pressure, such as bearing oil or jacket water; (5) meters based on the principle of the alternating-current potentiometer for detecting condenser leakage.

Evaporator Equipment Entirely Successful

On the subject of feed water purification, a questionnaire to member companies operating evaporators for feed purification indicated that evaporator equipment is successful and provides pure water at reasonable cost. The internal use of any substances in boilers seems to be coming into general disfavor. In general it will be found more satisfactory to treat the water in a separate treating apparatus.

Developments in the field of pulverized fuel indicate a continued interest on the part of engineers in this

method of burning coal. The Milwaukee Electric Railway & Light Company recently put into operation the new Lakeside plant, which will have an ultimate capacity of 200,000 kw. and which is designed for burning pulverized fuel.

Eliminating the restrictions imposed by the layout of old stations in changing over from grates or stokers to pulverized fuel equipment, the question of high boiler ratings does not seem serious. Such ratings are being obtained in new plants where boilers have ample combustion space and are designed expressly for burning pulverized fuel. The whole question of burning fuel efficiently is in process of solution and no one can foresee the ultimate end.

With respect to the burning of fuels other than coal, the committee report gives a number of suggestions regarding oil and gas burning. The burning of oil for power generation involves two economic considerations. Oil is used where it is the most efficient source of heat because of the absence of an adequate supply of cheaper fuel. It is used where such use affords a means of consuming an excess accumulation of crude oil, residues or distillates for which no other market is available.

Brake-Rod Testing

Breakage in Service of This Important Link in the Brake Rigging Is Made Improbable by the Testing of All Rods to Three Times the Stress to Which They Are Ordinarily Subjected

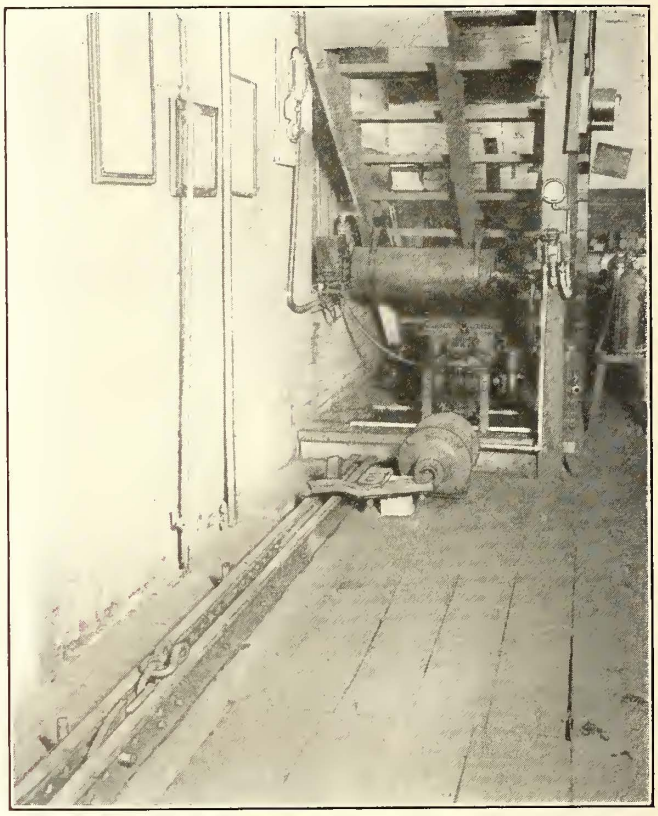
THE Washington Railway & Electric Company had two serious accidents due to breaking of air-brake pull rods, and it became necessary to give very close study to the condition and strength of the rods with a view to preventing a repetition of such occurrences. At first a test was made on all cars of the system by running the air pressure (which ordinarily is 70 lb.) up to 120 lb. and then, while the brakes were rigidly applied, rapping the brake rods sharply the whole length with a 2-lb. hammer. Several faulty rods were thus found and broken. The causes of the breaking were found to be crystallized metal, poor material and, in a few cases, improper welds. None of these causes could be located by a close inspection, as some of the welds looked perfectly good, but when broken showed the weld to be only 25 to 50 per cent good, and the poor material or crystallization showed up only when the rods were broken.

In deciding on improvements the first thing was to get some good, dependable steel for making new rods, and after several tests electric furnace steel was decided upon. This was found to be tough, ductile and easily welded. One of the tests made was to bend a piece double while cold and put it under the hammer.

The ordinary machine or soft steel which the railway had been using fractured under this test, but no amount of hammering would make the electric steel show the slightest sign of a fracture. In making new pull rods great care is taken in making welds and the metal is allowed to cool very slowly. Every completed rod before installation is put through a tension test in the special machine shown in the accompanying illustration, which was made in the company's shops for the purpose.

A separate air compressor and tank for this testing outfit were installed as the railway did not want to use the shop air line on account of the uncertainty of the air pressure being just what was wanted, namely, 100 lb. per square inch. The tank is small so as to allow the full pressure to be pumped up quickly and at the same time is large enough so when air is applied to the cylinder it does not appreciably lower the pressure.

The cylinder is 10 in. in diameter and the leverage is arranged to give 8,000 lb. pull on the brake rod under test, which is more than three times what the rod will get in service. The base to which one end of rod under test is fastened is made of two 50-lb. T-rails each 15 ft. long. The whole length of the web of these rails is drilled with 1⅛-in. holes to allow a 1-in. pin to be easily slipped through. The two rails are rigidly bolted together with the edges of the base



ONLY GOOD BRAKE RODS PASS THE TEST

touching, leaving a space between the ball of the rails in which a large link can be slipped and held in place with the pin. This link has a short chain, with shackle fastened to it, which is used to fasten the brake rod at that end. The other end of the brake rod is fastened to the cylinder lever. Brake rods up to 12 ft. in length can be tested on the machine. The piping between the air tank and the brake cylinder is as large as possible. An ordinary straight air brake valve is used to apply the air which is admitted directly to the brake cylinder.

The brake rod when under stress is rapped sharply with a hand-hammer, so as to show up any weak portions. In case a brake rod breaks under this test, a stop is provided which catches the lever, and a port in the side of the cylinder releases the air when the piston comes out beyond what it would under ordinary conditions. The pull rods on all cars passing through the general repair shops are tested on this device, and several defective ones have been found that would otherwise very likely have broken down in service and caused serious delays if not accidents.

N. Y. E. R. A. Meets at Lake George

The One Day's Session Was Devoted to Discussions on One-Man Car Operation and Taxation—Two Prepared Papers Were Presented—W. O. Wood Was Elected President for the Ensuing Year

ONE-MAN car operation and taxation occupied the attention of 250 members and guests at the thirty-ninth annual meeting of the New York Electric Railway Association, held in the Fort William Henry Hotel at Lake George on June 11. President T. C. Cherry, in speaking in his official capacity, referred first to a statement in President Harding's inaugural address that the war had left various burdens, and then listed the specific burdens which the war had left on the electric railway industry. These were: Increased floating debts, deferred maintenance, labor contracts covering unreasonably high wages, labor contracts containing burdensome working conditions, contracts for material at abnormally high costs, large investment in materials and supplies on hand, a demand for necessary capital expenditures, and loss of credit.

PRESIDENTIAL GROUP AT LAKE GEORGE CONVENTION
Left to right: W. H. Collins, T. C. Cherry, J. F. Hamilton, H. B. Weatherwax and W. O. Wood.

Fundamentally, Mr. Cherry said, electric railway transportation is a legitimate, sound business, but at present, while it is still legitimate, it is not sound, and the operators are confronted with the problem of restoring the industry to its par value. Nevertheless, it seemed to him that in the last two years the public mind has become more favorable to the industry. Instances have occurred where the city council has offered no objection to a fare higher than that stated in the franchise. This condition has been accomplished by educational work performed by operating men.

Mr. Cherry thought that the phrase "efficient operation" had been overworked. He suggested as a substitute the phrase "honest operation" and said that the manager who can effect intelligent economy in operation is performing his part in restoring the industry to its par value. Such a man can meet the employees of his property, the patrons of his road and the stockholders of his company without excuses.

Secretary-Treasurer William F. Stanton read a report covering the membership and financial situation showing the association to be in a flourishing condition in both respects.

One-Man Car Operation Discussion Proves Stimulating

The introductory paper on one-man car operation was read by W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company. It is abstracted elsewhere in this issue. He was followed by W. H. Burke, Stone & Webster, Boston, Mass. Mr. Burke's paper appears in abstract on another page.

R. B. Stearns, vice-president and general manager of the former Bay State System, who was present by invitation, traced the history of the application of one-man operation on that property. He credited it largely with the recent local improvement in financial status. This property was formed of seventy or more original railways covering a territory roughly 100 by 40 miles in extent and having 940 miles of track, of which 187 has been discontinued as unprofitable. Changing conditions, including the spread of the automobile, turned it from a profitable to a non-paying property, until in 1916 operating expenses took nearly or quite the entire revenue. Economies were about to be inaugurated when the company went into receivership. Later the property was acquired at a foreclosure sale by the Eastern Massachusetts Street Railway.

The State Legislature, finally appreciating the necessity for preserving electric railway service, passed legislation permitting operation by State trustees, having comprehensive powers. Taking advantage of the opportunity thus afforded, the public trustees were able to secure some money, which was partly spent in applying one-man operation. Safety cars were purchased and old cars were remodeled, a large amount of worthless rolling-stock being destroyed.

Service with the new cars was inaugurated in the spring of 1920 and by the close of the year 250 cars were in use. In the summer of 1920 400 double-truck cars had been converted for one-man operation, and they were put into commission as soon as the labor situation warranted. Men who had operated the small cars picked the large ones when privileged to do so under the seniority rule, indicating a satisfactory attitude toward them.

Starting with the operation of these cars in September, 1920, the company rapidly increased the number in use until today 93 per cent of all of the service operated on the system is one-man; 54 per cent with double-truck and 39 per cent with Birney cars. The remaining 7 per cent comprises two-man, double-truck cars, most of which will permanently require two men for various reasons including use in two-car trains. The system is now practically "saturated" as far as one-man operation is concerned. The Birney cars weigh, with track scraper, 16,500 lb. All of the company's one-man cars have been equipped, at a cost of $80 per car, with a device for making an emergency safety stop, as is required in Massachusetts. None of these devices, as far as known, has been used by a passenger to date.

As to one-man-operation savings, Mr. Stearns said that these amount to $1,250,000 per annum. The energy saving of 16,000,000 kw.-hr. with the small cars, with coal at $10 per ton, is $240,000 and the labor saving $400,000. This is about $2,500 per car, in addition to savings in track and equipment maintenance. The large cars save $600,000 yearly. The total number of men on the payroll is now 2,400 as compared with 4,700 or more a year ago. Of the difference between the present and former operating staffs, 1,300 or more represent trainmen.

The safety cars are giving good service under widely varying conditions, former schedules are being maintained, and two-man operation is an almost forgotten idea. No difficulty is experienced with fare collection in zoned territory. The safety cars are averaging 31,000 car-miles per annum and the large cars on special runs or in tripper service 20,000 car-miles.

Mr. Stearns also spoke of the labor and fare situations on his property, which have been covered in recent issues of this paper.

One-Man Service on Second Avenue Railroad

Charles E. Chalmers, receiver Second Avenue Railroad, New York City, who has been operating this property for more than a year, told of his efforts to meet high costs by remodeling cars and operating them with one man on the East Side in that city. Having no money wherewith to purchase safety cars he is making over double-truck cars as described in a recent issue of the ELECTRIC RAILWAY JOURNAL.

As the property comprises lines operating through districts with foreign-born populations there was at first some uncertainty as to the result. The first four cars were made for either one-man or two-man operation, but as they proved popular as one-man cars later practice has been to make them straight one-man cars at a cost of $315.30 per car. This cost will be saved in one year through accident reduction alone. The Second Avenue line was first equipped and for the first five months of the year showed earning power practically equal to the two-man cars on First Avenue even when the popular open summer cars were used on the latter. Selecting a day at random, Mr. Chalmers found on June 2 that the one-man cars took in $35.97 each and the two-man cars $34.62. The present plan is to change 100 open cars to a convertible type for all year one-man service. The one-man cars are faster, also.

With average wages of 62 cents per hour on the one-man and 57 cents on the two-man cars and a ten-hour day, the former saves $364 per day for fifty cars with night service or $133,152 per year.

Karl A. Simmon, Westinghouse Electric & Manufacturing Company, the next speaker, said the present single-end standard safety car weighs 15,300 lb. and the double-end car 15,800 lb. One great advantage of the standard safety car is that it can use standard equipment, and the history of the safety car motor shows that it has been manufactured in its present form for about five years, which is a fairly long time for a motor.

Changes in motor design mean changes in the machinery for manufacturing motors, and frequent changes increase the cost of manufacture. Where protection against cold weather has been introduced in the car, its weight has got up to about 17,000 lb.

Up to the time that the weight of the car did not exceed 16,000 lb. it was what might be called a "universal" car; that is, it could be used under almost any conditions of grade, etc. Above that weight the motors might be overloaded under arduous conditions of grade, acceleration, etc., as the motor capacity would then be less than 6½ hp. per ton. The weight in different forms of transportation, per passenger carried, varies from nothing, with walking, to about 2,200 lb. per passenger seat in a Pullman car. Within these two limits will be found the most economical weight.

George H. Tontrup, National Safety Car & Equipment Company, St. Louis, said that car standardization means not only a cheaper car but that the companies could more easily finance their car purchases. It had been shown that a light car can be built as strong as a heavy car. The very early safety cars weighed less than 13,000 lb. and they are still in good operating condition. If the railway companies want to make changes in the present standard car they should decide what changes they want and then standardize on those changes.

J. C. Thirlwall, General Electric Company, said that in the addresses of Mr. Gove, Mr. Burke and Mr. Stearns the delegates had heard from the users of about one-fourth of all of the safety cars in the country and they had testified to its success. The car is now recognized as being suitable even to very congested streets in large cities, as on lower Fulton Street in Brooklyn. Mr. Stearns was pioneering with the one-man car for interurban use. The speaker then gave the facts about safety-car interurban service on the Cincinnati, Milford and Blanchester Railway, described in the issue of this paper for May 28. He told about the system of fare collection on the line, which has twenty-two zones, and said that in the four months the system has been in operation there has been no over-riding, so far as the company knows. He said he had asked the car operators if the system of fare collection used had delayed them in the operation of the cars and they had replied that it had not and they preferred it, as they were "not bothered by conductors." One-man car operation of interurban cars was in about the same status now as city operation was three or four years ago, but the speaker saw no reason why one-man cars could not be used on interurban roads, unless possibly on the most heavy routes. He urged the use of safety devices on the cars if for no other reason than to satisfy the public. He also urged the use of a light car for its reduction on power consumption and declared that on the Cincinnati line mentioned the power saving was considered as great as the labor saving. This condition of affairs would be apt to occur on other interurban lines.

Discussion on Taxation

Ralph R. Rumery, consulting engineer of New York, then described the development of the last few years in taxation of the electric railway companies in New York State. He said that the principal state taxes were local taxes on real estate and the special franchise tax. The division of the money received from the state income tax among the various tax districts upon the basis of the assessed valuation of real property in each tax district provides an incentive to the local taxing body to increase local assessments. Certain firms of engineers are circularizing the state offering their services toward increasing corporation assessments, taking a percentage of such increases as their fee. In view of this situation, the companies should be prepared

to offer evidence as to proper assessment figures. Where the local assessments of corporation property are obviously too high, he urged that the figures be brought to the attention of the Bureau of Equalization of the State Tax Commission. This bureau has a corps of engineers whose duties are to assist in the correct valuation of property subject to local assessments.

There is a movement now, he said, to substitute for the special franchise tax a tax on gross earnings, which would bear with special severity on those companies with high gross but low net receipts. Moreover, the speaker said the history of gross earnings taxes was usually a gradual increase in the percentage of the tax. In conclusion he urged greater care in calculating depreciation for inventories. He said that most companies used the straight line method and referred to numerous instances where this method had given incorrect results.

H. C. Hopson, specialist in utilities, certified public accountant, etc., New York, said that there was a great variation in the policies in the different states in regard to taxation of public utilities, particularly electric railways. This fact should be borne in mind in any comparison of wages paid or fares charged, because with taxes as high as they are at present the amount of taxes to be paid has a marked effect on the fare which must be charged and on the ability to pay wages. He listed the taxes which the electric railway companies of New York have to pay as follows: State taxes: State, county and real estate city tax; tax on special franchise; gross earnings tax; tax on dividends amounting to 3 per cent on dividends in excess of 4 per cent; mortgage recording tax. Federal taxes: net income tax on issuance of capital stock. Special taxes: paving transportation tax; tax on interest on mortgage bonds paid on behalf of bondholders to avoid withholding; tax on issuance of capital stock. Special taxes: paving tax.

He declared that if the normal federal income tax should be increased, as is proposed, to say 15 per cent, it would have a serious effect upon the companies. Heretofore they had been but little affected by the federal income tax because of the large proportion of their capital which is made up of bonds. The National Industrial Conference Board had, however, recommended that public utilities should be exempted from increased income tax, but such recommendation had received no consideration by either of the last two Secretaries of the Treasury.

Local taxes, he said, were also becoming more arduous because formerly, with local taxes, a company could argue the merits of its case, but with the present elaborate reports which have to be rendered to the state tax commission and not required from individual property owners, the utility taxes are liable to be higher in proportion to the value of the property than those of other property owners. He urged the companies to appoint a committee on taxation to look up the practice in other states and what proportion of the tax burden other businesses in New York State were bearing. He believed that such a committee would find that the railways were bearing far more than their proportion of taxes. He continued that throughout the state there was a demand for better service, but the companies cannot get money to extend their service if they have to pay anywhere near such taxes as at present. Within the last few years railway taxes have greatly increased not only actually but relatively to gross and net receipts, although the properties often were decreasing in value. This has been the case notably with the so-called paving tax. At one time the cities believed that it was necessary only to pave the main streets. Now, with existing auto traffic it is thought that many more must be paved, and the time will come soon when practically all streets on which there are tracks will be paved. He cited the case of one road near Buffalo which is fighting to take up its tracks to avoid paying for paving two-thirds of a highway which will be used exclusively for automobile competition.

SECRETARY STANTON

In conclusion he urged that so long as the railways remained in their present financial condition, they should give greater attention to accounting statements based on actual receipts and disbursements, instead of confining their attention to operating revenues and expenses, kept as they were on the accrual basis, which, when not considered in connection with other portions of the accounts, often gave an incomplete picture of the financial condition of the property.

In this connection he also urged that the executives and financial officers make a greater effort to educate the operating officials about the financial condition of their property so that the tendencies to demands by municipalities, or recommendations by operating departments for expenditures which the company could not afford, might be more readily checked.

Election of Officers

At the conclusion of the discussion the following officers were elected:

President, W. O. Wood, president New York & Queens County Traction Company; first vice-president, Benjamin E. Tilton, vice-president and general manager New York State Railways, Syracuse, N. Y.; second vice-president, W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company. Executive committee: W. J. Harvie, general manager Auburn & Syracuse Electric Railroad; E. J. Dickson, vice-president International Railway; A. E. Reynolds, general manager United Traction Company, Albany, and C. E. Morgan, assistant general manager Brooklyn City Railroad.

After his induction as president Mr. Wood expressed an appreciation of the honor of his election and urged that in the future the association could well take into its inner counsels the manufacturing members and those in professional capacities. The meeting then adjourned.

The Banquet

The concluding feature of the meeting was the annual banquet, at which President Cherry was toastmaster. He read some "fake" telegrams purporting to come from men prominent nationally, and then introduced Hon. John A. Barhite, formerly Public Service Commissioner for the Second District, New York State.

Judge Barhite said that he was pleased to be able to address unofficially the men whom he had known through his work as commissioner. The public ideas regarding these men, he said, have changed, and the railway manager is coming to be known no longer as one who is "out to do" the public. One trouble with the railways today,

however, is their failure to insist fully upon enjoying the rights guaranteed them by the Constitution of the United States. They should devote more attention to explaining to the public what these rights are. The people should understand that the idea that the terms of a public service franchise are forever binding is not necessarily true, as there is a power which can change a franchise when constitutional rights are involved. It is too late, said Judge Barhite, to begin educational work when a crisis has arrived, as it is a process requiring time. There should be a constant effort to explain to the public the legal status of the electric railways.

Judge Barhite was followed by Dr. Willard Scott of Boston. His address covered the general theme of contrasts in various aspects of life and was illustrated with numerous witty anecdotes. The serious purpose of the address was to show that changes are inevitable and not necessarily to be deplored, but the problem for the individual to solve is one of adjustment or adaptation.

RAIN COMPLICATES ENTERTAINMENT PROGRAM

Outdoor sports were interfered with by inclement weather, but golf enthusiasts managed to play between showers, and many "conventionites" stayed over the week end. The ladies were well provided for with card games during the meeting, and an excellent orchestra played for dancing and general entertainment. The singing of the Manhattan Quartet during and after the banquet was greatly appreciated.

One-Man Car in Its Present Relation to Operating and Maintenance Costs*

BY W. G. GOVE
Superintendent of Equipment Brooklyn Rapid Transit Company

THE electric railway industry, to a greater degree perhaps than was or is the case in any other line of public utility, has since the period immediately preceding our entry into the recent world war been very generally occupied in trying to "make both ends meet." Operating and maintenance costs have mounted by leaps and bounds, taxes have been considerably increased and other burdens added, and only very recently has it seemed as though the "peak" had been reached. We are in general living in a post-war period of price and cost discussion, and although there has recently been a tendency toward lower price levels for materials entering into the maintenance of our properties, it must be kept in mind that as labor is usually a large part of the cost of producing supplies and equipment the process will be slow, as wages can be reduced only gradually. Four or five years ago most maintenance work could be considered upon a basis of 50 per cent labor and 50 per cent material cost. It has now been distorted more nearly to a 75 per cent labor and 25 per cent material basis. It is therefore obvious that the large and most important item is "labor," and it appears that we will have to face a disproportionate cost in this respect for some time to come, especially in localities where there has been no decrease in wages from the high peaks reached in 1920.

"One-man car operation" is a term with which we have become thoroughly familiar within comparatively recent years. The great step forward came through the introduction of the Birney safety car, approximately six years ago. In its production thorough consideration was given to the possibilities of reduced operating costs and with minimum weight consistent with reasonable strength. Its particularly novel feature was in provision for one-man control on a practical basis.

Its pathway of introduction was by no means easy, having been opposed by railway operators because of its diminutive proportions, by platform men through their unions because of the labor-saving qualities, and by the public because it just did not know. This combination of opposition did not apply in every instance, fortunately.

The foresight of those who devised the means of control, commonly called the safety features, contributed probably the greatest single measure to success, for it must be remembered that in the standard safety car we have a single unit with a uniform method of operation which has successfully met the operating conditions on approximately 250 different railway properties. Aside from this, in practically every instance where opposition to such operation was expressed it was on the basis of safety, and with the safety devices in evidence the opposition was overcome.

Another factor for which we are indebted to the manufacturers allied with our industry, rather than to those actually engaged in operation, is the perpetuation of standards in design. Unfortunately there is in evidence among our various properties an inclination to inject into the details of car design and construction too great a reflection of our personal views as gathered from our own property. As a matter of fact, while we are all producing and selling the same thing—street railway transportation—there was, before the advent of the safety car, practically no two lots of cars ever constructed over the same specifications, and in this practice there must have been a direct charge, for which we are responsible, to cover a tremendous range of development. Now there are in service nearly 5,000 safety cars of a single uniform type and the range of service delivered by them comprises cities of population varying from 20,000 to 2,000,000.

As to economies, it is difficult to express the items in the particular manner which might appeal to you individually. The platform saving is obvious. The track maintenance saving is prominently indicated, although I do not recall any figures on the subject. Boarding and alighting accidents are practically eliminated through the novel method of interlocking doors and steps with air brakes. Power costs are greatly reduced. It has been stated that a single safety car means a direct saving of from $1,800 to $2,600 per year, depending on the basis of comparison, and if we may presume an average of $2,000, it will be seen there is already in action a potential saving of $10,000,000 per year in our industry. Taken on any basis, the total will prove imposing.

In regard to the subject of relative sizes of cars necessary, I do not recall a single instance in the studies I have made of this subject where, with suitable track facilities, the standard safety car could not meet traffic requirements. The limit of its capacity may be directly ahead, but certainly it has not yet been attained. With the growing movement at hand looking toward the use of large cars under one-man operation, it will be possible to satisfy, at higher cost, the conditions which prohibit use of the small car.

The same principles of uniformity of equipment and operating methods and the same reasons for safety

*Abstract of address at meeting of the New York Electric Railway Association at Lake George, N. Y., June 11, 1921.

devices apply to the conversion of double-truck cars. The need is just as great, the human element equally fallible. Until recently the total number of double and single truck cars converted for one-man operation was about 700, but there has been a very decided increase in such activities, particularly in the East, and it is evident this means of effecting economy will expand greatly. I have within the last two weeks noted with particular interest the introduction of the one-man principle into the interurban service operating out of Cincinnati, Ohio, by means of single-end, double-truck cars, seating forty-seven and equipped with all standard safety devices. This operation is reasonably typical of interurban service.

Whether the rebuilding of existing cars and using existing motors of the older and heavier types is advisable depends to a great extent upon the length of time such larger cars are required for use. If required throughout the entire day the principal factor to be considered is the amount of power that will be consumed by the rebuilt cars due to their weight and larger motors as compared with new cars of the same capacity. These can no doubt be designed and constructed of considerably less weight per passenger capacity, and when equipped with new motors especially designed for the particular service will have a considerably lower power consumption.

A very few operating companies are advocating and one or two have purchased safety cars with an increased length of platform having both an entrance and an exit door. The number of points where both doors may be used to advantage, however, are so few as to make the excessive cost of construction and increased cost of power due to the added weight seem unwarranted.

The surface lines of the Brooklyn Rapid Transit System have had 206 standard Birney safety cars in operation for a year and a half. These are operated on thirty-five different lines with service varying from shuttle service, where but one car is used, to through lines, where a varying number of cars up to a maximum of twenty-one on a line is used. One of these through lines operates on lower Fulton Street in Brooklyn Borough, which is one of the most congested sections in any city in the country. These cars operate without the slightest difficulty and are interspersed with cars of both larger and heavier types at the present time.

When placing these cars in service the headway was changed on but few lines and on these lines it was shortened. With the use of the safety car fare boxes were placed in service, where on cars previously used fares were collected by the conductors. This has resulted in an increase of revenue, attributed in some cases to less stealing and in others to the fact that no fares are missed. The operators of safety cars in Brooklyn are paid an additional 5 cents an hour, so that the saving in platform costs has been on most lines 50 per cent less.

The general attitude of the public regarding the use of safety cars in New York City has been favorable and the attitude of the operators has also been generally satisfactory. No difficulty has been experienced in maintaining schedules even with the additional duration of the stops caused by the use of the safety car where full stops must always be made for both boarding and alighting passengers, where previously the cars used permitted "flying" stops as they were not fully vestibuled.

I have not given any actual data and statistics as to the weights, speed, power consumption, costs of operating, etc., of the safety car as compared with other types of cars, as no doubt these are known by you, such data having been published in the ELECTRIC RAILWAY JOURNAL and other technical publications as well as having been presented in papers that have been read during the past two or three years at the meetings of various railroad clubs.

In concluding, I wish to make plain that, at least to my way of thinking, the development of the "safety car" and the "one-man" principle has been and is one of the most promising fields for economy in our industry today and that the greatest credit is due to C. O. Birney, whose foresight and courage disregarded past practice and prejudice, and to the Stone & Webster corporation, whose faith in Mr. Birney's judgment and financial backing introduced the car first to compete with the jitney in the West and Southwest and later firmly established the car as a regular institution for general use. I also wish to point out that this is a prominent example of what can be done by active co-operation of the manufacturer, the purchaser and the operator in shaping standardization of design, which I referred to in a talk before this association a year ago. It is obvious that more prompt, complete and economical results in determining standards of design, construction and practice can be obtained for the industry than are obtained from committee work that, after all, merely scratches the ground. Members are prolific with advice for determining what others should do, but are often quick to find reasons why they cannot "practice what they preach."

I earnestly recommend to those intrusted with the operating of our properties, both within this state and elsewhere, the prompt, serious consideration of adopting and extending one-man car operation over their lines and not prejudge such as impracticable.

Development of the Safety Car*

BY W. H. BURKE
Stone & Webster, Inc., Boston, Mass.

THE development of the Birney car dates back to the time when the electric railway companies under Stone & Webster management, along with practically every other company in the country, found themselves operating a lot of heavy double-truck cars weighing from 1,000 to 1,500 lb. per seat, and when only half the seats were taken, this meant unit weights of from 2,000 to 3,000 lb. per passenger.

We decided that the companies were losing a great deal of short haul traffic and also longer haul business, which could be secured and profitably handled if it were possible to develop a very light-weight car with which we could afford to operate shorter headways. Then the jitneys came along and the matter was quickly brought to a head.

The first Birney car was a double-end car seating twenty-nine people and weighing 13,000 lb., or only 450 lb. per seat. Since then, a few minor changes in design have been made. The latest design of double-end car seats thirty-two and weighs about 15,300 lb., or 480 lb. per seat. The single-end car weighs 14,500 lb. and seats thirty-five, so that its unit weight is 415 lb. per seat. However, the latest car is the same in substantially all essential details as the first car built.

*Abstract of address at meeting of the New York Electric Railway Association at Lake George, N. Y., June 11, 1921.

Commercial operation of the Birney car was first started in Fort Worth, Tex., on Nov. 1, 1916. On that date the Northern Texas Traction Company replaced all of the two-man equipment on its Summit Avenue line with Birney cars, ten cars having been purchased for this service. By 1919 there were 1,200 of these cars in use in the United States, and by 1920 nearly 4,000. Today there are upward of 5,000 in use.

To a company contemplating one-man operation, two or three factors are of particular interest. Take first the matter of selecting and training operators. The men picked should be enthusiastic; in other words, they must be sold the one-man idea because they will have more to do than any one else in making the Birney car a success. Other requirements are alertness, adaptability and ability to concentrate. Courtesy is a prime requirement, and the men should have had a good record in two-man service. We have never followed the seniority rule in picking Birney car operators, and our experience has been that it makes little or no difference whether a man has previously been a motorman or a conductor provided he measures up to the requirements mentioned.

Here, briefly, is the plan adopted by one of our companies about a year and a half ago for training platform men, and it has worked out very satisfactorily. This company has about ninety one-man cars, 130 other city cars and forty-five interurban cars. We will assume that the man has come through the preliminaries and is reporting to an instructor to break in. For the first day he observes operation of a Birney car on the instructor's regular run. The next day they take a Birney car out on some outlying line where they won't interfere with traffic, and the student becomes familiar with the mechanical and electrical features, and learns to operate the car in a preliminary way; this covers starting, stopping, getting and keeping the car under control, taking switches, etc. This requires from three to five days.

The student next learns to operate the car on the instructor's run, and then is transferred to two-man tripper service. He first operates on the same end with the instructor and later operates each end with the instructor taking the other end. This continues until he has covered practically every city line. In this way he learns the various schedules, streets, transfer points, etc., and in fact gets a good idea of the system as a whole. Then he is O.K.'d for work, but the instructor still keeps in touch with him and helps him in every way possible.

The average breaking-in time under this plan has been 210 hours, the longest being 355 hours and the shortest 135. Under the plan formerly in force, the average time was a third longer and the man was not instructed nearly as completely as he is now. As for the older men, motormen and conductors, the company devoted two weeks last summer to breaking them in on Birney cars. Not one was disqualified by his instructor, and in only two or three cases did they quit of their own accord. This means that every platform man in this company's employ is a three-way man: he can operate a Birney car and either end of a two-man car and can do it on any line in the city. Furthermore, the matter of runs and the extra list problem are greatly simplified, and only one regular and one extra board are required for the city service.

The highest type of supervision and instruction is necessary in introducing the one-man operation, and the shop force should be instructed in maintaining the safety equipment. Usually a representative of the manufacturers will attend to this if desired. And here I want to say a word of appreciation of Mr. Beck of the Westinghouse Company and Mr. Thirlwall of the General Electric Company. They have contributed greatly to the success of the Birney car, and the industry owes them a unanimous vote of thanks.

As to the introduction of the car to the public, it is important, of course, to start it off with its best foot forward. Neither the public nor labor should get the idea that the company wants to hog all the advantages. Our companies have always shared the savings with the man through somewhat higher wages, and with the public in the way of better service.

We have never made it a practice to start one-man operation with anything but new cars of the standard Birney type. We feel that the service should be materially improved at first, except possibly in the largest cities on lines where the headways are already very short. Too much service is better than too little for a time, because it is service more than anything else that sells the car to the public. Above all, the Birney car should not be regularly overloaded. If it is, the public gets the idea that the company isn't "toting fair," and this causes dissatisfaction.

There was some labor opposition in the early days, because the men had the idea that the introduction of the Birney car meant that half of them would lose their jobs. It doesn't work out this way, of course, because the increased number of Birneys operated and the normal labor turnover will usually take care of this. In fact, I don't know of a single case where any of our companies has been forced arbitrarily to discharge any men as the result of one-man operation.

The psychology of the local public is a factor in introducing the car, and possible objections should be anticipated and met in advance as far as possible. We have found newspaper advertising of value, but believe it should be concentrated into two or three days before operation is begun. Otherwise, if there are any dissenters, it gives them just so much more time to formulate objections. Once the car is properly introduced it is its own best advertisement, and, practically without exception, we have found the press comments favorable. Some of the press comment is usually along humorous lines, and that helps, because so long as you can keep the public laughing you won't have much trouble.

As to the economics of the Birney car, the savings are very substantial. Without exception, I believe, we have found that with shorter headways earnings have shown a very substantial increase. Here are a few typical cases of the relation between increased earnings and increased mileage for a few of our companies:

	Per Cent Increase in Mileage	Per Cent Increase in Earnings
Tampa—one line	29	13
Tampa—one line	51	51
El Paso—one line	48	50
El Paso—one line	40	36
Houston (heavy jitney competition)	70	40
Tacoma—one line	20	25
Tacoma—one line	75	42
Tacoma—one line	3	17

We feel that it is very conservative to assume an increase in earnings and mileage at the ratio of 1:2, that is, with 30 per cent more mileage we will get 15 per cent more gross. No increase would be expected, of course, where headways are two or three minutes with

two-man cars and, therefore, short enough to get all the business there is.

The most obvious savings in expense are in platform labor and power. There is also a saving in maintenance, but until the Birney car is older it is impossible to say definitely what it will be in the long run.

There is a marked reduction in accidents in substantially all cases; step accidents are virtually eliminated. An analysis of our companies for the first five months of 1920 show the following results:

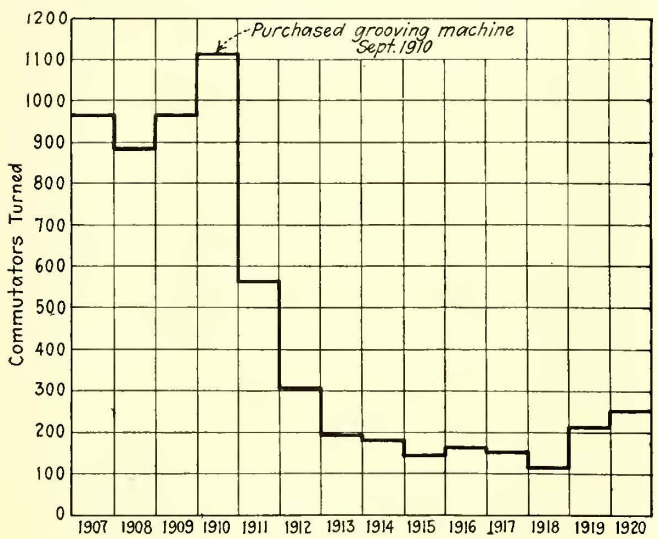
	One-Man	Two-Man
Car-miles operated per accident	18,100	10,800
Passengers carried per accident	88,700	73,800
Paid out in settlements for each 1,000 car-miles operated	$10 60	$15.00

As a broad proposition I think you can figure conservatively on a saving of not less than $2,500 per car per year with Birneys on a car for car exchange, and with a third more service, and the increased earnings which result the saving in net is around $3,500 per year for each Birney car purchased.

As regards the remodeling of existing equipment, we are now operating 100 rebuilt cars, quite a percentage being double truck. With Birney operation well established, we have found no objections on the part of any one to the use of rebuilt cars, and we feel that the operation of double-truck one-man cars has tremendous possibilities. After all, the step from single- to double-truck one-man operation is not as radical as the original change from two-man to Birney cars. In general, we believe that no valid objection can be raised to rebuilding double-truck cars for one-man operation if safety devices which are standard for the Birney car are used.

Slotting Increases Life of Commutators

THE effect of commutator slotting in reducing the number that it is necessary to turn for flat spots, rough surfaces, etc., is very forcefully illustrated by the accompanying graph showing the number of commutators turned by the Memphis Street Railway Company. This company purchased a General Electric

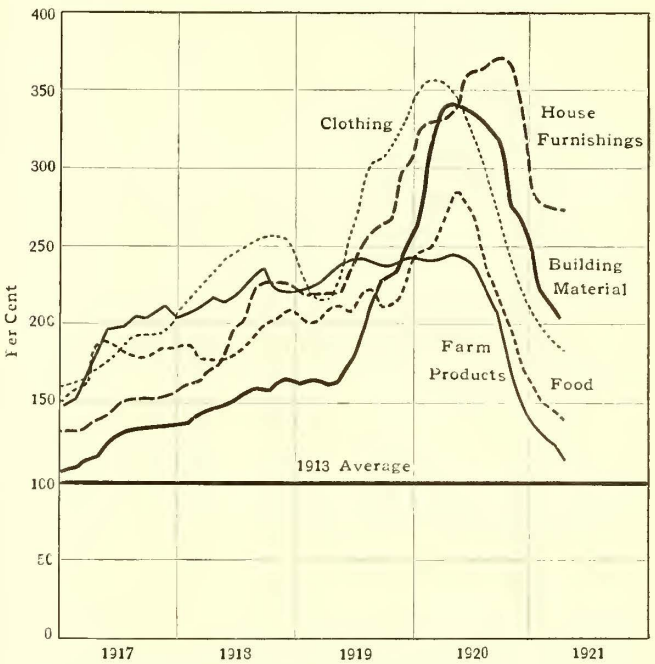


COMMUTATORS TURNED BY THE MEMPHIS STREET RAILWAY COMPANY

Company's commutator slotter in 1911 and began the work of slotting the commutators of all armatures. During the year 1911, 1,115 commutators were turned. The sudden drop in the graph after this year is very noticeable and in the year 1918 but 115 commutators were turned.

Cost of Living Chart

THE monthly review of the Federal Reserve Bank of New York for June 1 presents a series of interesting charts of prices, including the one reproduced, which shows wholesale prices of certain groups of com-



WHOLESALE PRICES OF CERTAIN GROUPS OF COMMODITIES IN THE UNITED STATES EXPRESSED AS PERCENTAGE OF THE AVERAGE FIGURES FOR 1913

modities in the United States, expressed in percentages of the average figures for 1913. Another chart shows wholesale commodity prices in the United States and England from 1790 to date. The United States figures have three peaks, namely, about 1814, 1865 and 1920, all approximately the same height.

Retail Prices of Foodstuffs Still Falling

THE United States Department of Labor through the Bureau of Labor Statistics has given out the changes in retail prices of food in nine principal cities of the United States. These changes are based on the prices of forty-three articles of food. During the month ended May 15, 1921, the retail cost of food in Bridgeport decreased 3 per cent; in Newark, 6 per cent; in New Haven, 5 per cent; in New York, 4 per cent; in Norfolk, 4 per cent; in Philadelphia, 5 per cent; in Providence, 3 per cent; in St. Paul, 8 per cent; and in Washington, 5 per cent.

For the year ended May 15, 1921, the decrease was 29 per cent in Bridgeport; 30 per cent in Newark; 31 per cent in New Haven; 29 per cent in New York; 30 per cent in Norfolk; 32 per cent in Philadelphia; 30 per cent in Providence; 37 per cent in St. Paul; and 29 per cent in Washington. For the eight-year period May 15, 1913, to May 15, 1921, the retail cost of food shows an increase of 39 per cent in Newark; 43 per cent in New Haven; 49 per cent in New York; 51 per cent in Providence; 44 per cent in Philadelphia; and 53 per cent in Washington.

The Bureau of Standards has recently issued its miscellaneous publication No. 46, describing the war work the Bureau of Standards.

Trackless Trolley Tested at Schenectady

Successful Demonstration of First Vehicle Built for the Virginia Railway & Power Company—Bus Has Seating Capacity Equivalent to the One-Man Safety Car

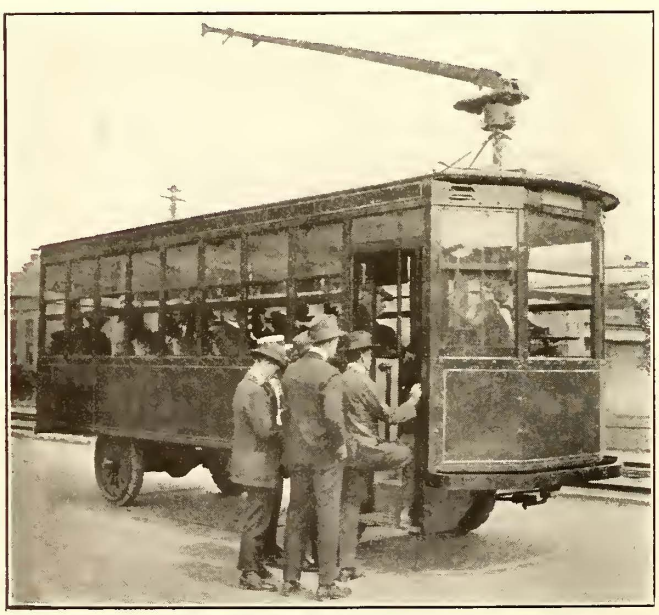
A DEMONSTRATION of the trackless trolley bus was given June 15 at the Schenectady plant of the General Electric Company, where a two-wire overhead system for the operation of this type of car was strung up over a route of about ½ mile. There were more than one hundred railway officials present to witness and participate in the demonstration, which caused much comment. The "Trollibus" operated throughout the day over a highway route having several kinds of paving, namely, brick, macadam and ordinary dirt and cinder road. The tests were declared in every respect successful. After the morning demonstration the party adjourned to the Mohawk Club, where a buffet luncheon was served.

The trackless trolley bus resembles in general size and appearance the present one-man single-truck safety car and seats thirty passengers. The equipment consists of a single railway motor and a controller arranged for foot operation. Two overhead wires on 14-in. centers supply the current, which is taken into the car by a sliding type collector, maneuvered by the motorman from his seat, and allows a leeway of 18 ft., or 9 ft. on each side, for passing other vehicles.

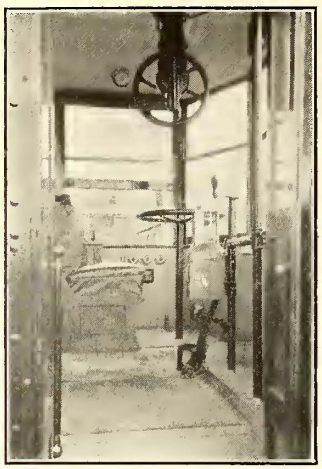
This arrangement allows two cars to operate in opposite directions on the same wire; on meeting, the operator can swing off to the side, disengage the collector or trolley pole and, after the other car has passed, can reconnect it with the trolley wire and proceed.

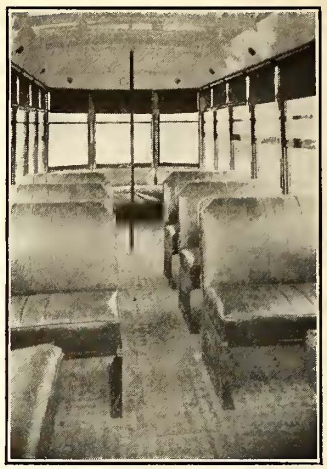
When running over the track area of the system; that is, in returning to the carhouse, the trolley bus is equipped with an adapter on the collector for connection with the standard overhead trolley wire and a shoe which fits into the track groove, thus giving the necessary ground connection.

The chief advantage of the trackless over the regular trolley system is the low initial capital investment. To install a single-track trolley line on an unpaved street costs about $35,000 per mile. On a paved street, where the railway company is forced to pay for the pavement between the rails and 2 ft. outside, the cost jumps to $75,000 per mile. The overhead trolley distribution system for a single trolley line costs approximately $4,500 per mile, and where a double set of trolley wires is strung the cost will be about $5,500 per mile.



GENERAL VIEW OF TROLLEY BUS, MOUNTED ON SOLID RUBBER CATERPILLAR TIRES





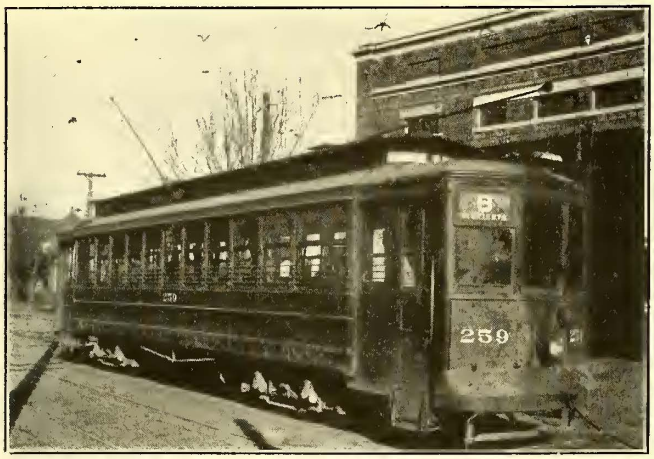
AT LEFT, OPERATOR'S COMPARTMENT, SHOWING OPERATING AND TROLLEY CONTROL MECHANISM; AT RIGHT, INTERIOR OF TROLLEY BUS, SHOWING SEATING ARRANGEMENT AND FINISH

As compared with the gasoline-driven motor bus the operating and maintenance cost is said to be much cheaper. From the standpoint of the rider, it is also claimed, it provides a service of equal reliability and comfort, and in many cases the operation is faster and smoother, especially where the streets are well paved and maintained. According to statistics given out by the General Electric Company, that portion of operating costs for gasoline and lubricating oil of the motor bus averages 5 cents per mile, whereas with the trackless trolley the cost of electricity is but 2 cents a mile. The maintenance of equipment, including tires, averages 9.5 cents per mile for the motor bus, as compared with 4 cents for the trackless trolley. Depreciation on the gasoline bus averages 3.4 cents per mile as compared with 1.9 cents for the trackless trolley. The saving in favor of the trackless trolley is therefore 10 cents per bus-mile. Figuring that the average bus runs 33,000 miles per year, this means a saving of $3,300. The first cost of a trackless trolley installation is higher than a gasoline bus, due to the overhead construction required. Interest, depreciation and taxes on this investment reduces the annual savings from $3,300 to from $2,500 to $2,700 per bus in service.

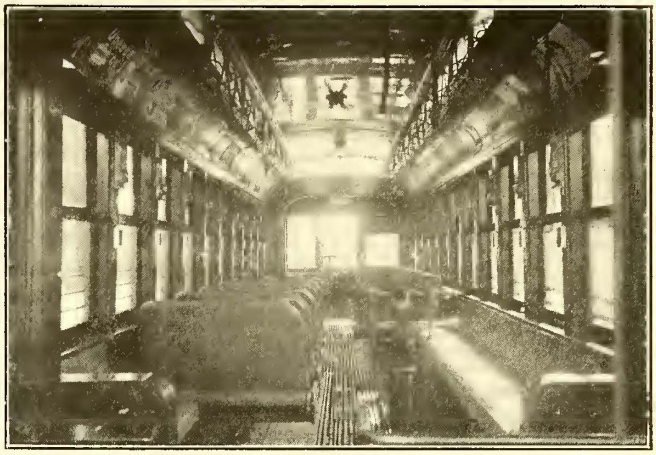
Following the tests at Schenectady a large installation is expected at Richmond, Va. Installations are also expected to be made at Staten Island, New York, Buffalo, N. Y., and other cities.

Trackless trolley cars have been in successful operation in some European countries for several years. One hundred miles of trackless system is in use in England, and in Italy several companies are operating over 40 miles of route.

Cars of this type are not new to the United States, but at present none is, so far as can be learned, in use. The general purpose of this car is not to supplant or take the place of the ordinary rail system for the business districts or thickly settled sections of a city, but to make it possible to operate trolley cars in suburban sections where the cost of laying and maintaining rails and ties would make the extension of lines impracticable.



EXTERIOR VIEW OF REBUILT CAR



INTERIOR OF CAR, SHOWING SEATING ARRANGEMENT

Little Rock Joins in Rebuilding Cars

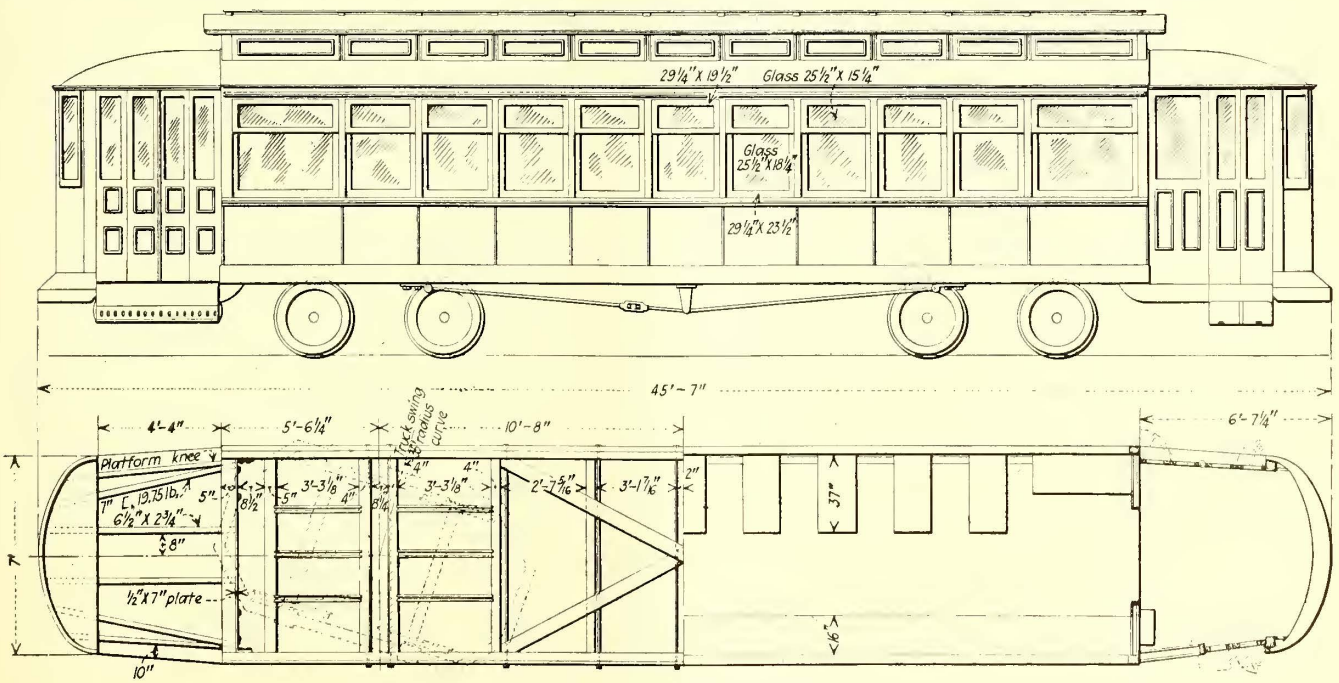
Old Summer Cars Are Made Available for All-Year Round Service—Increased Safety of Inclosed Cars Is a Factor Entering Into the Decision to Rebuild

THE Little Rock Railway & Electric Company has joined the movement of inclosing some of its summer cars in order to make them available for all-year round service. While some railway men who live in northern climes probably imagine that Arkansas is in the sunny South, where open cars may be used eight or nine months a year, the fact is that four months' service is about all that can be obtained from open equipment in that part of the country. Also, the Little Rock Railway & Electric Company has on an intensive and continuous safety campaign and it was decided that closed cars were very much safer than open cars; this was one element which entered into the decision to inclose some of these cars.

The cars which were chosen to be rebuilt were six fourteen-bench side running board cars which had been on hand for some time. Everything above the floor level was torn out except the sills and roof. The cars were cut off at the corner posts and new platforms were put on; these were 6-ft. platforms, drop extension. An accompanying illustration shows the supporting structure for these platforms. The old posts were built up by the addition of necessary strips to take care of windows and inside finish. The windows were arranged to raise and not to lower; that is, the window of the type usual on railroad coaches was designed and built in the shop of the company.

The original cars seated seventy on the fourteen cross benches. The present car seats forty-eight only. The body was too narrow to put full cross seats on both sides, so a seating arrangement using both cross seats and longitudinal seats was adopted, as shown in the accompanying illustrations. The longitudinal seats were built in the shops of the company, but Hale & Kilburn cross seats were purchased and used. The cars were completely curtained by the Curtain Supply Company.

The original floor in the car was left, with the strips removed, and a 4-in. pine floor laid on top of the old. Strips were placed in the aisle as usual. Twenty-gage galvanized iron was used to line the car below the window sill. Sheet iron was used on the outside. The entire car, both inside and outside, is enameled. The



PLAN AND ELEVATION OF REBUILT CAR

Little Rock Railway & Electric Company has decided that enamel is the thing to use as it lasts satisfactorily in that part of the country for three years, takes less time to apply and gives general satisfaction. The experience with paint and varnish there has shown that varnish must be applied annually to keep up the finish. As a matter of fact, it is figured that there is a 50 per cent saving in painting by the use of enamel over the ordinary paint and varnish. The color used is yellow, which has superseded the former pullman green of the company which was found to change to black after a short time in service.

The cars are equipped with four GE-57 motors, K-35 control, and Brill 27-G 1 trucks. Ohio brass air sanders were added as equipment to the car, as was also Ohio brass air brake equipment. National pneumatic doors and steps are used, manually operated. It was necessary, in order to provide the required room on the platform, to provide the hand brakes with folding handles, which were obtained from the Dayton Manufacturing Company. Ten heaters, arranged on two circuits, were installed in each car. The heaters used were No. 192 manufactured by the Consolidated Car Heating Company.

These cars were 42 ft. 8 in. long originally, and as rebuilt are 45 ft. 7 in. long.

The total cost of rebuilding these cars per car was $3,000. This work was done between Sept. 15, 1920, and Jan. 15, 1921.

Characteristics of Oxyacetylene Welding and Cutting Blowpipes

THE result of an elaborate series of tests tried out by R. F. Johnston, engineer-physicist, U. S. Bureau of Standards, Washington, D. C., for the War Department on commercial apparatus for cutting and welding by the oxyacetylene process form the basis of an article in the May issue of *Mechanical Engineering*. The tests were conducted for the War Department on apparatus submitted by manufacturers for that purpose.

The general conclusions from the tests were that there was a great deal of difference between the characteristics of different designs of cutting blowpipes and that there was no make of apparatus which was equally proficient and economical for all thicknesses of metal. Further, one of the prime essentials of a good welding blowpipe is its so-called gas ratio, which should be unity. Not any of the blowpipes tested proved capable of maintaining a gas ratio of unity during welding, although the welds were probably made with greater care than is usually exercised when such work is being done.

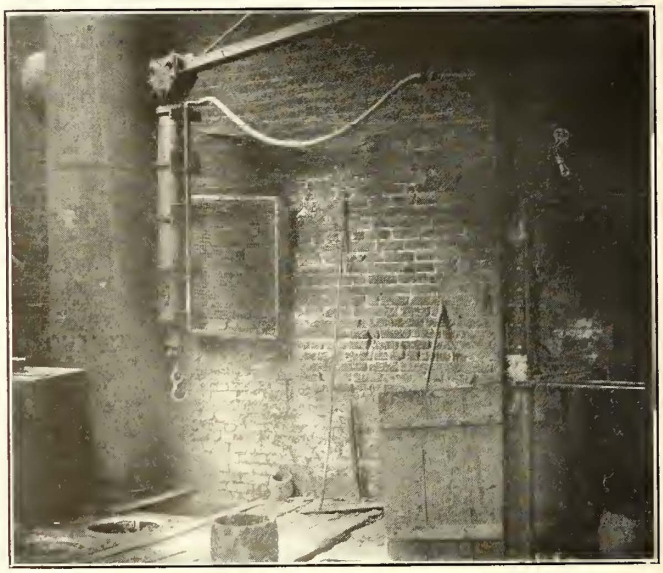
The important problem of "flashback" received extensive consideration. A blowpipe designed to be absolutely free from flashback caused by any form of obstruction, under all working conditions, will also be the eminently safe blowpipe and the one which, with ordinary care, will produce sound welds. Such a blowpipe will be so designed that, under all conditions of operation, even to a complete blocking of the gas exit at the tip end, there will be maintained a one-to-one volume delivery of each gas at identical pressures. Of the blowpipes tested, it was noted that those which were especially susceptible to flashback were the ones in which the oxygen was delivered to the blowpipe at a pressure very much in excess of that at which the acetylene was delivered.

An Inexpensive Air Hoist

Discarded 7-In. Brake Cylinders Are Used in the Brass Foundry of the Union Traction Company of Indiana for Constructing a Hoist to Lift Crucibles of Molten Metal from the Furnace to the Foundry Floor

BY J. E. HESTER
Master Mechanic Union Traction Company of Indiana

THE accompanying illustration shows an air hoist constructed of four 7-in. brake cylinders and other second-hand material taken from used material stock and from the scrap pile. This is in use in the brass foundry of the Union Traction Company of Indiana and is used for handling molten metal from the furnace to the molds. In constructing this hoist the brake



HOME-MADE AIR HOIST

cylinders were lined up by fitting soft wood blocks into the ends of the cylinders. The wood blocks were 7 in. in diameter, 2 in. thick and were slightly tapered from the center to both ends. A 3-in. hole was bored in the center of the blocks to facilitate their removal after lining up and before the heads were put in place. The cylinders are bolted together with four ½-in. rods threaded at both ends to receive the necessary nuts; ⅛-in. sheet asbestos was used as gaskets at the joints between the cylinders, and to guard against the cylinders getting out of line the joints were welded with an oxyacetylene torch. The pressure head used consisted of an old discarded steam cylinder head, which was machined to fit the lower end of the cylinder. This was provided with a stuffing box and the packing gland was made from an old discarded gland.

The piston consists of a head threaded to receive the lifting rod which extends through the piston and is fastened with a 1½-in. nut, which takes the strain and prevents the stripping of the threads in the head. The lifting hook used was secured from an old discarded pair of chain falls.

In the construction of the crane itself the upright member was made from a piece of old 60-lb. rail and the arm was made by bolting two pieces of ¼-in. x 3-in. x 3-in. angle iron with ¾-in. x 2-in. iron spacers placed 1 ft. apart. The arm of the crane is supported 8 ft. from the floor by means of a piece of ¼-in. x 4-in. x 4-in. angle bolted to the upright. The arm is trussed to the top of the upright member by a ¾-in. rod, which is

provided with a turnbuckle. The pivot bearing at the base of the crane was made from an old discarded car center bearing, the flanges of the male portion being machined off and riveted to the upright member by means of two angle irons and the female member of the bearing being bolted to the foundry floor.

The traveler which carries the hoist consists of two sides with pins from old motor suspension bolts. The wheels used were old coal conveyor wheels bored out and babbitted where they bear on the pins.

The air used to operate the hoist is secured from a Westinghouse steam-driven air compressor located in the central power station near the shops. The air line is connected to the hoist by means of a ¾-in. hose which allows the hoist to be moved the entire length of the crane arm. The air is controlled by a two-way valve.

A New Theory of Rail Corrugation

IN RECENT issues of *Verkehrstechnik*, published in Berlin, Germany, appeared an extended article by A. Wichert of Mannheim on the subject of rail corrugation. In this he describes and discusses a new theory which he has evolved and tested experimentally. Before doing so he summarizes the theories which he found in the literature on the subject as follows: (1) The development of corrugation is favored by lack of homogeneity in the rail material due to irregularities in the rolling process; (2) corrugations are hammered into the rails under the action of rhythmical jumping of the wheels; (3) corrugations are caused by vertical vibrations of the rail; (4) corrugations are caused by "sliding vibrations" of the wheels, dampened by friction, which occur within certain critical speeds.

The new theory is based upon the setting up of "friction vibrations" which are of frequent occurrence in daily life. The action of a violin string under the bow, the creaking of a door, the sound caused by rubbing a finger along a wet window pane, the squeaking noise of wheels in a curve or of brake shoes on wheels, all involve noises caused by vibrations, due to rhythmical change in coefficient of friction. According to Mr. Wichert's theory, corrugation of rails is due to these vibrations set up under sliding of the wheels on the rails, involving change in friction coefficient, which is maximum when two surfaces in contact are at rest with respect to each other and falls off rapidly as they move with respect to each other. A factor is also the elasticity of the car axle, which acts like a spring.

Mr. Wichert explains that under actual conditions friction vibration will occur only when the wheels are sliding, as, for example, when a heavy train is starting, during braking, when a car is on a curve, etc. At the points where the wheels slide, a crowding of the material of the rail takes place, followed by the ordinary wear due to rolling. This causes a rhythmical change in the surface of the rail. Tests have, in Mr. Wichert's opinion, proved that the crests of the corrugation are considerably harder than the depressions.

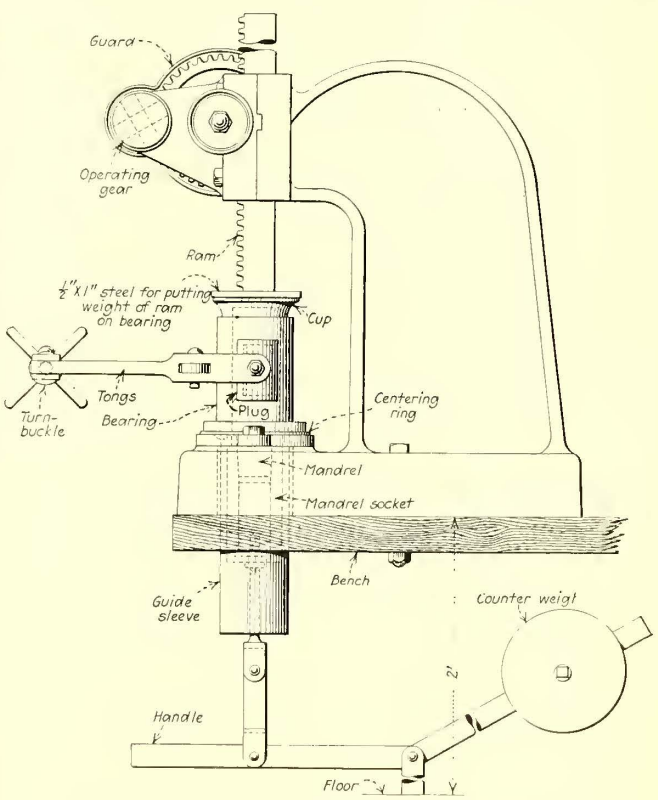
The lower and upper limits of speed at which corrugations are liable to be formed are respectively about 7½ and 17½ m.p.h. If it were possible to determine the factors controlling the speed limits, it should be possible to alter them by modifying the fctors. Mr. Wichert therefore takes up the matter of preventing rail corrugation. According to his theory the upper speed limit is set by the cessation of rhythmical gliding. If, therefore, an absolutely rigid, non-elastic axle were used. the upper limit would be at zero speed. Obviously then increase in diameter of axle should prevent friction vibrations and corrugations. Calculations and experiments show that axles 4.75 in. for a gage of 39.4 in. (1 meter), and 5.5 in. for standard gage should materially reduce the formation of corrugations. An elastic bedding of rails and ties is another safe way to cut down the possibility of developing friction vibrations. Experience has proved, Mr. Wichert says, that concreted tracks have a tendency to develop corrugations on account of their rigid foundation.

Mr. Wichert was able to check his theory experimentally by means of a special testing machine with which rail corrugations could be produced at will. It consisted of two axles, with wheels, mounted one above the other. The wheels of the upper pair were of the standard flanged type and were driven by a railway motor. The lower set, representing the rails, had special tires of rail cross-section. The lower wheels were pressed against the upper and rotated by friction with the latter. By means of levers, weights and springs the two sets of wheels could be pressed together and driven in a manner to imitate actual running road conditions.

New Armature Bearing Babbitting Press

ACCOMPANYING illustrations show a new type of armature bearing babbitting press, which is being marketed by the Columbia Machine Works & Malleable Iron Company, Brooklyn, N. Y. This press is a modification of the well known type of arbor press used in machine shops quite generally, differing only in that it is geared for a ratio of 3½ to 1 in order to provide increased pressure necessary for this particular purpose.

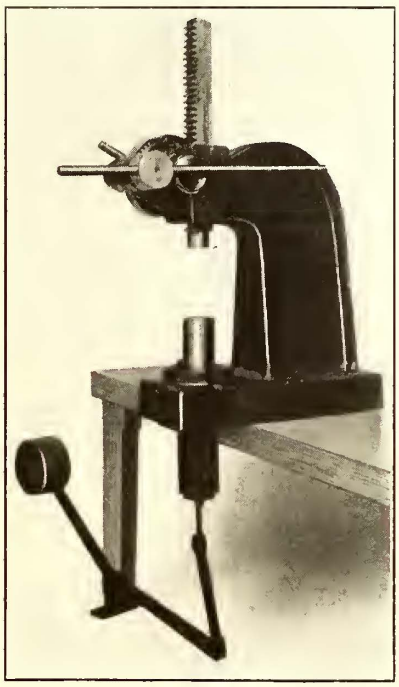
Some of the advantages which result from the use of this press in babbitting armature bearings are that as the mandrels, centering rings, pouring cups and other

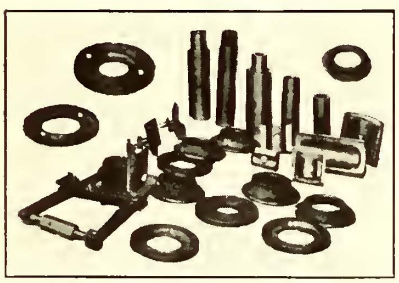


ARMATURE BEARING BABBITTING PRESS

devices necessary in babbitting are a part of this machine, much time and labor are saved in that the bearing is the only part which requires handling. The press and the mold are combined, so that the babbitt lining can be poured into the small space between the mandrel and the bearing with more accuracy than with the usual hand method.

The various operations necessary in babbitting an armature bearing with the aid of this press consist of putting the mandrel in its lowered position and the bearing in place in the centering ring, with the flanged end down. The mandrel can then be raised until stopped by the shoulder of the mandrel socket. The cup, really a pouring funnel, provided to facilitate the pouring, can then be placed on top of the bearing. A strip of steel approximately ½ in. x 1¼ in. should then be laid across the top edge of the cup and the ram brought down on this with light pressure on the handle bar. The plugs for closing the openings or windows in the bearing form a part of the tongs used for handling the bearing. These can be quickly placed in position and insure that the opening will be clean and smooth so as to require no further attention after the bearing is poured. After the babbitt lining has been poured in the space between the mandrel and the bearing, the ram is raised just high enough to remove the cup and then is lowered to force the mandrel down until free. A 2 or 3-in. movement is sufficient as the mandrel has a slight taper. The additional movement required can be done rapidly by means of the counterweight lever. The counterweight provided overbalances the weight of the mandrel so that it will stay normally in the up position. In the using of this press bearings should be thoroughly cleaned and tinned, of course, and both the bearing and the mandrel must be heated sufficiently so that the babbitt will not chill before reaching the bottom of the bearing. The press was designed primarily for babbitting electric railway armature bearings, but can be used for other purposes where considerable force is required, such as the forcing of bearings in and out of housings. Its capacity is 12,000 lb.





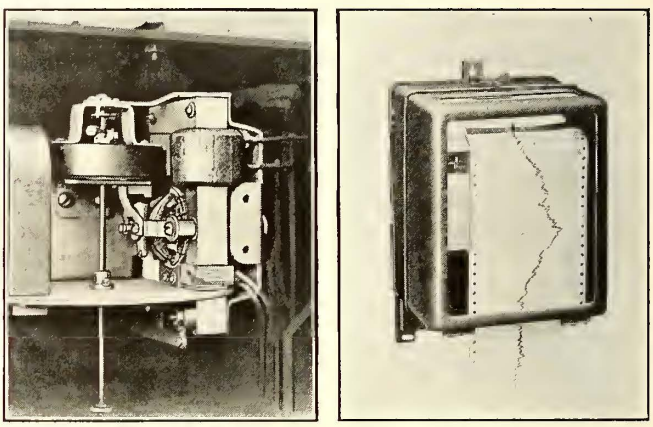
PRESS IN POSITION WITH THE VARIOUS DETAIL PARTS PROVIDED WITH THE OUTFIT

New Kilovolt-Ampere Meter

AN INSTRUMENT of the induction type, for measuring kilovolt-amperes, has been put on the market by the Esterline-Angus Company, Indianapolis, Ind. The instrument will ultimately be available in graphic, integrating, indicating and interval-demand types, but the graphic type has been developed first.

The measuring element of the new instrument is about the size of the element of a polyphase wattmeter. Each single-phase element consists of a pair of laminated poles carrying exciting windings, between which is pivoted a small armature. The armature maintains a fixed phase relation between the voltage windings.

The scale is uniformly divided throughout, and the instrument is said to be equally accurate throughout the entire range of power factor from unity to zero, either leading or lagging current. The meter records the true kilovolt-amperes of the circuit, regardless of the degree of unbalance. The three-phase instrument indicates the sum of the products of current per phase times corresponding voltage to neutral, which is the true kilovolt-amperes of a three-phase circuit.



NEW GRAPHIC KILOVOLT-AMPERE DEMAND METER—MEASURING ELEMENT OF KILOVOLT-AMPERES DEMAND METER

New Type Hand Brake

THE Minich Railway Appliance Corporation, Philadelphia, Pa., is marketing the Super-Safety Hand Brake, which consists of a vertical staff supported by a special cage. This cage is threaded to fit a nut supported by slots in this cage, so that it will move vertically. There are lugs on opposite sides of the nut which operate a U-shaped lever. A connection bar which takes the place of the usual brake chain is attached to this lever and to the brake rod. Round lugs are provided on opposite sides of the cage as a fulcrum for the U lever, so that when the staff is revolved and the nut raised the lever will revolve on these lugs and thus pull up and apply the brakes.

The fulcrum of the U lever is changed gradually as the brakes are applied, so that the power is comparatively low at the beginning, permitting the slack to be taken up quickly, but is increased toward the end of the application. Pawls are unnecessary to keep the brake applied. Some of the advantages claimed for this type of brake are that the ratchet wheel, plate, pawl, brake chain, staff, yoke and similar parts are eliminated, and as all stresses on the staff are vertical, this can be made shorter and lighter.

Letter to the Editors

"Get the Young Engineer While the Getting Is Good"

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
EAST PITTSBURGH, PA., June 11, 1921.

To the Editors:

The editorial which appeared in the ELECTRIC RAILWAY JOURNAL on June 4, 1921, under the caption of "Get the Young Engineer While the Getting Is Good," together with the article on page 1041 entitled "Master Mechanic Proves His Worth," aroused a great deal of appreciative interest among engineers here who are interested in the development and progress of electric traction.

It is becoming quite generally recognized that there are two especially important positions on the operating staff of each reasonably sized street railway company. They are that of the master mechanic, who has charge of maintenance and upkeep of rolling stock, and that of the transportation man, who is in charge of making up and planning schedules. Either one of these men is in a position, to use the slang of the street, to make or break the railroad, assuming that other managerial problems are solved to a reasonable degree.

The article on page 1041, which demonstrates that a master mechanic proves his worth, in reality proves a very old saying, namely, "As the boss is, so are the men." If the boss is a good mechanic and instinctively is satisfied only with good mechanical workmanship, is naturally tidy and orderly in his habits and knows how to encourage and get the best out of men working with him, naturally he will keep the cars and equipment in reliable working condition at the same or lower cost than the man who is not.

To a great many men who have been in a position to observe the operating and maintenance positions as they exist and who have tried to analyze the causes and reasons why cars and equipment are not maintained better, irrespective of the pressure and necessity for reduced costs and limited pay rolls, etc., the answer seems to lie in the lack of appreciation on the part of many administrative officers of the importance and economy of paying the right kind of a salary to attract the right kind of a master mechanic. Another reason is that the industry as a whole has so neglected this phase of its problem that men have not been developed very rapidly and, as a result, very few men are available who measure up to the job of master mechanic. Another reason, perhaps, is the general lack of interest on the part of administrative officers in the matter of encouragement and personal attention to the master mechanics, the repair shop and its problems. It is in only a small percentage of street railways that the administrative officers have shown the proper interest in the shop and its problems by making frequent visits, by holding conferences with the master mechanic and considering him an important officer in the organization. There are a great many properties where the master mechanic is not called in to attend the weekly or monthly conferences of the operating staff and, as a result, there is frequently a wide difference of opinion between the transportation department and the mechanical department which results in friction, lack of co-operation, etc.

This, of course, is not true on the well-managed and well-conducted properties. It might be stated that the apparent attitude of mind toward maintenance of equipment in general on the part of many executives is about the same as it used to be a few years ago on the matter of publicity, the development of favorable public opinion, etc. The latter, however, happy to say, has undergone a decided change. Today, without doubt, there is not an administrative officer on any railway who is not alive to the necessity and importance of proper organization to handle publicity continually for the purpose of developing public good will not only among the people in the community served but also among the employees. It seems, therefore, only necessary to continue the good work you are doing in the pages of the ELECTRIC RAILWAY JOURNAL toward arousing proper interest in the matter of engineering analyses and better mechanical workmanship and general maintenance of railway equipment because, after all, there is no factor so great as that of reliable and regular service with properly maintained cars and equipment in developing and maintaining the good will of the public. Large sums spent on publicity and literature will be rendered void and negative if they are not backed up by reliable and decent service, which your article on the "master mechanic" proves can be accomplished with the right man in charge of this work.

Recently a very prominent manufacturing engineer was discussing the matter of greater refinement in the mechanical construction of locomotives, taking the position that you could not get American maintenance staffs to follow the same degree of accuracy in workmanship and maintenance as that which obtains on many European properties. In order to prove this point he asked the question, "Why is it that although every master mechanic and operating officer on electric railways knows positively that if axles, axle caps and axle bearings and housings on railway motors were properly maintained the cars would make less noise by proper maintenance of gear centers, wear and tear on gears would be appreciably less and the vibration would be reduced to a marked degree and, finally, the maintenance of the entire car and equipment would be appreciably lower, yet there are only one or two roads in the whole United States that actually do this?" It was quite difficult to answer this question. The apparent reason seems to be that they have not had any definite example proving that this is so and in the absence of the necessary spare equipment in many cases have not been able to get the cars necessary to carry out such work. Furthermore, in most cases the master mechanic is not provided with a staff capable of making any such analyses.

This brings us up to the editorial which you have written, which suggests that they get the young engineer while the getting is good. This suggestion is very timely and a very important one.

It is very encouraging to note that quite a number of young engineers who became available for such work as a result of the industrial depression have been taken over by the progressive railway operators. It is further very encouraging to have been able to see one or two reports made by these young engineers showing the errors in maintenance and upkeep that they have discovered during the first month or two of their experience. It was quite clear that the one or two things that they had already discovered would more than pay for their expense during the entire year.

As previously mentioned, it seems only necessary to agitate this subject sufficiently until all railway operators become impressed with the great value and necessity of having a well trained, technically educated—either self-educated or from college—man as a member of their operating and maintenance staff. The title of "efficiency engineer" is taboo. Most railways have called them "transportation engineers" or "equipment engineers." But their job is the important thing. It is to study transportation schedules, etc., from an engineering point of view and also to study the cars and equipment or the tools the railroad has to provide such schedules and service, making analyses each day of operating costs and time-table costs and making suggestions each month in writing to the manager of the property.

It will, of course, be necessary for the operating managers to be somewhat indulgent with these engineers for a time and go to the necessary expense to make certain tests. For example, on the question of value of maintenance of gear centers, axle bearings, etc., several cars on a given line should be specially equipped for test and then operating records should be kept for six or seven months in order to prove the value of such maintenance practice. Again, consider the matter of dipping and baking armatures and field coils. This was first introduced several years ago, but it took time to convince a great many that the expense necessary to carry this out was justified. Today there is hardly an up-to-date road that is not following this practice.

There are actually a thousand and one things of an engineering nature that can be carried out on each road which, when once established, will save thousands of dollars annually and, above all, provide better and more reliable service to the public. This, after all, is the very best publicity in which a railway operating company can indulge.

MYLES B. LAMBERT,
Manager Railway Department.

Association News

Report of Equipment Committee Put Into Shape

A TWO-DAY session of the equipment committee of the Engineering Association was held at the association headquarters in New York City, June 13 and 14. The various subcommittees presented final reports with recommendations for consideration and discussion and various details were decided for including in the final report of the committee. Those present were Daniel Durie, West Penn Railways, chairman; W. S. Adams, J. G. Brill Company; R. H. Dalgleish, Capital Traction Company; James C. C. Holding, Midvale Steel & Ordnance Company; H. A. Johnson, Metropolitan West Side Elevated Railway; T. R. Langan, Westinghouse Electric & Manufacturing Company; C. N. Pittenger, the Steubenville, East Liverpool & Beaver Valley Traction Company; E. D. Priest, General Electric Company; C. F. Scott, General Electric Company; K. A. Simmon, Westinghouse Electric & Manufacturing Company, and C. W. Squier, ELECTRIC RAILWAY JOURNAL. The committee will report on twelve subjects and already a large amount of work has been accomplished.

Schedule Committee Meets

THERE was a well-attended meeting of the joint committee on the economics of schedules at association headquarters on Wednesday, June 15. The reports of three special committees were submitted and approved. The first, covering the definition of man-hours and car-hours, was presented by Mr. Stoll; the second, on variable running time, by Mr. Moser, and the third, on methods of improving handling of traffic in congested centers, by Mr. Sullivan. It was agreed that the final draft of the report should be prepared by Mr. Dana and presented to the executive committee by July 1. It was also agreed that the full report should be presented in abstract form, only, at the convention, in order to permit greater opportunity for discussion. The names of the leaders of the discussion will be determined at an early date.

The following were in attendance: J. V. Sullivan, sponsor, Chicago Surface Lines; Edward Dana, Boston Elevated Railway, chairman; H. C. Moser, Fifth Avenue Coach Company, New York City; J. A. Stoll, United Railways & Electric Company, Baltimore; Samuel Riddle, Louisville Railway; Donald Goodrich, Twin City Rapid Transit Company, Minneapolis; A. G. Neal, Washington Railway & Electric Company; J. M. Campbell, Atlantic City & Shore Railroad, and H. A. Otis, Chicago & Interurban Traction Company.

State Utility Information Bureau Work Discussed

WITH a view to establishing closer co-operation between the State Committee on Public Utility Information and the Advertising Section of the Division of Information and Service of the American Electric Railway Association, the directors of nine state committees and Labert St. Clair of the Advertising Section conferred in Chicago on Wednesday, June 1.

It was agreed that in the future copies of all information furnished on request by the advertising section to any of the various state directors would also be sent to all of the others. The state directors also agreed to submit immediately a series of questions on their local railway problems to the association's advertising section for answer. Such answers will be distributed to all.

Mr. St. Clair reiterated previous assurances that all information regarding the electric railway industry which the association has, or which it can obtain, is at the disposal of the state committees without charge. He also explained the plan of news distribution by the Advertising Section, making it clear that the section does not concern itself with supplying material to strictly local sources, but rather with seeing that news of national importance reaches the hands of the large press associations and the larger dailies. The directors of the state committees, he emphasized, are on a preferred mailing list of the Advertising Section and every attempt is made to avoid duplication of efforts.

H. M. Davis, director of the Nebraska committee, told interestingly of his efforts to bring about closer relations between the public utility managers and the newspaper publishers in his state. He said that in the last year he had visited virtually every town in Nebraska and urged public utility managers to use display advertising space for such of their material as was not of news value. As a result of his efforts, he declared, the utilities of Nebraska spent $118,000 in display space last year.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Detroit Conferences Renewed

Fare and Purchase Questions Considered at Meeting at Which New Spirit Prevails

Following the demand of Mayor Couzens that a new fare schedule of ten tickets for 50 cents or a 6-cent cash fare be put into effect on the city lines of the Detroit United Railway, it was announced that Allen F. Edwards, vice-president of the company, and Alex Dow, newly elected director, would confer on the matter with the Eastern bankers who are interested in the company. It has been indicated by Mr. Dow that the 5-cent fare will be adopted if it is possible for the company to operate on that basis. It is understood, however, that the arrangement would be temporary pending the revision of the accounting system of the company so as to obviate the wide variance between the company and the city on figures.

At the same time the matter will be taken up with the New York men interested relative to arriving at a satisfactory price for the lines which the city plans to take over under the day-to-day agreement. These lines approximate 25 miles in length.

The Mayor's demand upon the company followed a conference of city officials with Mr. Edwards and Mr. Dow at which the engineers for the company and the city were present. The letter from Mr. Edwards in which he agreed to confer with the Mayor stated that he "hoped for a full and satisfactory discussion of the fare question." This was termed by the Mayor the most friendly communication yet received from the company.

It is held that since the reduction in wages of employees put into effect by the company on May 1 the necessity for the higher fares has passed. Action on the original injunction is asked and also an order designating the value of the rebate slips which have been issued by the company with each strip of tickets sold since the high rate was allowed. The fixing of a time limit for the public in redeeming the rebate slips is also asked.

The appraisal of the lines to be purchased by the city by city's representatives has been completed and the city auditors have also gone over the cost to the company for the lines. Only tentative figures have been arrived at and there is a wide divergence between the city and the Detroit United Railway figures on the matter of depreciation to be charged off. The city appraisers figure depreciation at 24.25 per cent. The company figures it at 5.40 per cent. Following the first conference it was announced that a further meeting would be held after the company had been allowed an opportunity to study the figures furnished by the city's appraisers. A compromise on the percentage of depreciation to be allowed is expected to result.

Arbitrators Cut Interurban Wages

Arbitrators in the wage dispute between the Cleveland, Painesville & Eastern Traction Company and the company's trainmen have decided that the men will have to accept a reduction in pay to 43 cents an hour for the first three months' service; 45 cents an hour for the next nine months, and 48 cents an hour for men in service for more than a year. The men have been receiving 55 cents, 58 cents and 60 cents an hour. Thus the men are called upon by the arbitrators to accept the offer made to them by the company.

The three arbitrators, Charles Spaulding, Painesville; Charles Currie, Cleveland and Akron, and S. D. Hutchins, Columbus, in their report said an exhaustive investigation led them to conclude that the cost of living had dropped to such an extent as to make the wage reduction justifiable. The decision also fixes the same wage for trainmen employed by the Cleveland, Southwestern & Columbus Railway as the men on this road had voted to abide by the decree of the Cleveland, Painesville & Eastern Traction Company arbitrators. The award for the Cleveland-Southwestern men is retroactive to May 1.

Arbitration in Favor of Men

The arbitration board considering the wage dispute between the Wheeling (W. Va.) Traction company and its employees has decided the scale shall not be changed for another year. The men refused to accept a proposal for a 10 per cent cut in wages made by the company. Numerous conferences were held in an effort to effect a settlement without resort to arbitration, but these being unavailing the company selected R. D. Jennison, a former executive of the Elm Grove lines, as its representative on the board. The employees authorized Thomas Kady of McMechen, a well-known labor leader, to act for them. After two or three informal meetings these two chose the Rev. R. E. L. Strider of St. Matthew's Episcopal Church as the third and neutral arbitrator. The scale which now continues for another year is as follows: For the first three months 53 cents an hour, next nine months 58 cents and after one year 61 cents.

Franchise Revision Advanced

Only Minor Details Remain to Be Arranged at Cincinnati—Fare Reduction Prospects Good

With the exception of certain minor details every demand made by the officials of the city has been conceded by the Cincinnati (Ohio) Traction Company in a redraft of an ordinance modifying the railway franchise. The minor details will probably be adjusted at a conference to be held soon and the ordinance approved so that it can be presented to the City Council for action. A public hearing on the modifications to be made in the franchise is being arranged by the Council committee on street railroads.

Under the terms of the modified ordinance the city will agree to a deferment of the payment of the franchise tax until after Jan. 1. This is merely a technicality, since the company cannot be compelled, under the terms of the existing franchise to pay the tax until it has been earned. The tax has not been earned for the year 1920 nor for the first six months of the current year and is carried on the books of the company as a deficit.

The ordinance as modified provides, however, that all surplus earnings of the company must be paid into the city treasury each quarter, beginning April 1, 1921, and must be applied to the liquidation of the back tax due to the city. There is a stipulation that the company will be permitted to defer payments into the reserve fund until the rate of fare has fallen below 7½ cents.

The franchise requires the company to create a reserve fund of $650,000. Of this amount $250,000 has been paid into the fund of the company. If the provisions of the existing franchise are insisted upon, it was said, there could be no reduction in fares until the franchise tax has been earned by the company and further until the reserve fund of $650,000 had been completed. A clause in the modified ordinance provides that if the rates of fares are not reduced on Aug. 1 and Nov. 1 the ordinance becomes null and void and the conditions of the existing franchise again become operative.

The modified ordinance further provides that children under ten years as now will be conveyed for one-half the regular rate. All children of the public and parochial schools, however, between the ages of ten and eighteen years, are to be conveyed to and from school for 5 cents.

It was announced that in order that the car riders may avail themselves of the reduced fares by Aug. 1 it will be

necessary to pass the ordinance within the next ten days. Because of the referendum law the measure will not become effective until thirty days after it is signed by the Mayor and this will be just in time to permit the company to announce a reduction fifteen days before it will be operative, as is provided for by the terms of the franchise.

Amicable Agreement in Cooperstown

A new agreement was recently entered into between officials of the Southern New York Power & Railway Corporation, Cooperstown, N. Y., and a committee representing the Amalgamated Association without taking the wage matter to arbitration. The principal difference between this year's and last year's contract is that the highest rate was reduced from 45 cents to 40 cents an hour and time and one-half for overtime on the freight runs was eliminated.

The wages to be paid motormen and conductors for the next year will be as follows:

First six months—35 cents an hour.
Second six months—37 cents an hour.
Second year's service—39 cents an hour.
After second year's service—40 cents an hour.
Freight trains—2 cents additional.
Helpers—5 cents an hour under the hourly rate.
Snowplow motormen and conductors—47 cents an hour.
Operators of one-man cars—5 cents an hour over the passenger rates.

In the new contract the established policy of the company to maintain an open shop will be strictly adhered to, which means in the terms of the contract, that "each individual employee is left free to exercise his own discretion as to whether he will join a union or not." A section in the agreement allows for arbitration in the event of dispute between the company and its employees. The agreement will remain in force until June 1, 1922.

Wage Cost Must Be Reduced

W. H. Boyce, general manager of the Beaver Valley Traction Company, New Brighton, Pa., recently sent out a notice to his trainmen asking them to help out in the present extremity—to assume a part of the $93,000 loss which faces the company for the coming year. He tells the men in his circular of the various wage reductions throughout the country, and also reminds them of the company's generosity during the past three years when the men needed help in view of the increase in living costs. He adds further that it would seem that since the first of the year foodstuffs in the vicinity have decreased nearly 40 per cent and the company is asking hardly a third of that in wage reductions.

The Beaver Valley traction officials have met at various times with committees representing the men for a wage adjustment. The matter has now come to a head and the men will either have to accept the reduction, which amounts to about 7 cents an hour, or place the matter in the hands of distinterested arbitrators.

St. Louis' New Wage Contract

Old Men Continued at Former Pay—New Men Get Less—Other Conditions Modified Substantially

A new wage contract has been agreed upon by the receiver of the United Railways, St. Louis, and the carmen's union (Amalgamated) though the details especially in regard to working conditions have not been drafted finally. The entire matter must be passed upon by the United States District Court. After this has been done a digest of the terms of the agreement will be made public.

The old three-year contract expired on June 1, and the new agreement is retroactive from that date. The new contract is to run only until Jan. 1, 1922, and the pay of trainmen who were in the employ of the company on June 1 is not affected, these rates being 55 cents the first year, 60 cents an hour the second year and 65 cents the third year and thereafter. Under the new agreement new employees are to draw 50 cents an hour the first year, 55 cents the second year, 60 cents the third year, and 65 cents an hour the fourth year and thereafter.

Other employees in the carmen's union, except trainmen, were cut approximately 5 cents an hour—car placers from 48½ to 43½ cents, car cleaners from 44¼ to 39¼, while trackmen who were getting 49¼ are to get 42; others who were getting 48 are to get 41, and some who were drawing 44 cents now are to get 35 cents an hour.

Radical modifications have been made in the working conditions in the interest of the management. Extra men called on to work are to receive pay for five hours minimum instead of eight as heretofore, and if a man is assigned to complete a regular run when a regular man gets off before completing the run the motorman or conductor who completes the run is to get only straight hourly time instead of eight hours pay as formerly, and the regular man will be allowed pay only for the actual time he puts in.

The maximum time for regular runs is set at nine hours and the minimum eight hours, with 15 minutes allowed for pulling out and pulling in. Instead of time and a half for overtime as heretofore time and a quarter will be allowed.

An important clause in the new agreement is that there shall be no arbitration in cases where conductors are discharged for stealing. These arbitration cases caused considerable annoyance and expense to the management, though there has been arbitration in only about a dozen instances among the more than 200 cases where men have been discharged for stealing since the receiver took charge of the property two years ago.

Colonel A. T. Perkins, manager for the receiver, assisted by counsel, conducted negotiations for the new contract with Frank O'Shea, one of the international vice-presidents of the union, his lawyer and a committee of trainmen. There are approximately 5,000 members of the local union. At a meeting on June 11, 4,137 of the members voted on the new contract and accepted it, 3,809 to 328. When the drafting of the document is completed this week it will go to the Federal Court.

In limiting the new contract to a period of seven months Colonel Perkins has made it plain to the employees that there will have to be a considerable reduction in pay on Jan. 1 unless the fare is raised from 7 to 8 cents or travel increases greatly. The daily receipts now are running an average of about $2,500 a day less than they were at this time last year under the same rate of fare.

The question of a fare increase is waiting on the revaluation of the property by the Missouri Public Service Commission. The inventory was completed several months ago after more than three years of labor on the part of the commission's engineers and accountants. A hearing on the findings is set for September. In the meantime the commission is allowing 6 per cent on a tentative valuation of $50,000,000. The company expects to be able to show that this is away under the true value of the property.

In passing on the wage question Colonel Perkins told the men that there are some who are overpaid, others who are drawing about what they are worth, and still others to whom he would like to pay more money. Inasmuch as injuries and damages are costing the company about $3,000 a day, it is his theory that a good trainman is worth good pay. Under the new working agreement it will be easier to get rid of the bad ones than it has been in the past.

Voluntary Acceptance of Wage Reduction

Motormen and conductors of the Citizens' Traction Company, Oil City, Pa., voted unanimously on May 18 to accept a wage reduction of 10 cents an hour. The wage scale in cents per hour from Jan. 1, 1917, to June 1, 1921, is shown in the accompanying table.

WAGE SCALE OF EMPLOYEES OF OIL CITY TRACTION COMPANY

Period	1917 Jan. 1	1917 Aug. 31	1918 March 9	1918 July 31	1919 Sept. 10	1920 April 26	1921 June 1
First six months....	..	..	..	30	41	51	41
Second six months..	..	..	..	34	43	53	43
Third six months...	..	..	..	..	45	55	45
First year.....	24	26	30	..	..	..	..
Second year.....	25	27	32	36	..	One-man operator 5c. additional	One-man operator 5c. additional
Third year.....	26	28	34	38	..	..	..
Fourth year.....	27	29	36	40	..	..	..
Fifth year.....	28	32	..	..	..	..	..
Sixth year.....	30	..	..	..	..	..	..

Relief Program Enacted

Connecticut Legislators Come to Aid of Electric Railways by Carrying Out Governor's Recommendations

The 1921 session of the Connecticut General Assembly, which has just adjourned, was one of signal importance toward improvement of the electric railway situation in the State. Conditions have been distinctly unsatisfactory. With the Hartford & Springfield, the Danbury & Bethel and the Shore Line in the hands of the receivers and the Connecticut Company barely weathering the storm of adverse conditions aggravated by ruinous jitney bus competition, the legislators sat down with the plain evidence before them of a transportation crisis.

GOVERNOR LAKE in his inaugural message gave much attention to the problem and submitted detailed and constructive recommendations which showed his own critical investigation of the subject. He recommended, in brief, relief from the burdensome requirements of bridge construction and pavement costs levied on the trolley companies, rigid regulation of jitney buses and the granting of permission to electric railways to operate motor bus lines as connecting links or feeders to regularly maintained lines. This program was carried out by the Legislature in its entirety besides the enactment of several lesser measures all contributing to the general relief of trolley companies.

Paving requirements were covered in the passage of a bill by which companies were required to pave 8 in. on each side of the rails, making 32 in. for a single track and twice that amount for a double track. The demands heretofore have been 8 ft. 8 in. over all for single track and 19 ft. for double track.

Tax Relief Measures Passed

By another act the highway commissioner is empowered to determine what amount electric railways shall pay toward bridge construction. Formerly one-third the cost of construction had been levied on bridges located in towns, and an indefinite contribution toward the cost of those in cities, the sum to be determined by conference and agreement. The matter now rests wholly in the hands of the highway commissioner and the arrangement is regarded as quite satisfactory to all concerned.

On the subject of taxation two important measures were passed. The first reduces the state tax levied on electric railways from 4½ per cent of gross earnings to 3 per cent of gross. A measure to make the levy on net earnings failed of passage because of the improbability of its yielding any revenue to the State. The second taxation bill enacted is designed to enable the electric railways to clean up their back taxes within six years after July 1, 1922. Interest will be charged during these years at the rate of 4½ per cent and after that date at the rate of 8 per cent. A similar arrangement of interest charges was provided in a bill covering the Connecticut Company's indebtedness of $500,000 to the State for the cost of the Washington bridge between Milford and Stratford. These measures are expected to go a long way toward re-establishment of Connecticut street railways on a dividend basis.

Perhaps the greatest single element which has militated against the best interests of efficient and paying trolley service has been the unfair and irresponsible competition of jitney buses, which have made alarming inroads upon the revenue of both rural and urban lines. The Governor dealt with the subject at length in his messsage and took an uncompromising stand for strict regulation of the jitney. Early in its session the Legislature quickly disposed of the matter by vesting in the Public Utilities Commission the power to regulate the public motor bus as regards routes of travel and to exact responsibilities incumbent upon all common carriers. The jitney problem had been previously dealt with by localities with moderate success, but in this new law authority has been centralized and the matter is in hand. Immediately upon its passage the commission began hearings on the flood of applications for licenses to operate jitney buses here and there in the State but so far it has reserved its decisions in all cases.

Another bill authorizes electric railways to operate motor buses to supplement regular electric service. This is in accordance with the Governor's recommendation. So far the Danbury & Bethel Street Railway has announced its intention of expanding its service by this means; and it is also said that the Connecticut Company has under consideration a plan for supplementary motor service on its Hartford division.

Attention of the law makers was directed to the Shore Line Electric Railway and its difficulties, with the result that legislation was effected which means the restoration of service on at least a part of the system. Measures acted upon were for the incorporation of companies to acquire the property and franchise of the old company for the purpose of operation. What service has been rendered over the system recently, it is understood, has been under lease by the Connecticut Company. Part of the road, the section from New Haven to Saybrook, was sold for junk last fall, but the purchaser was reported by Receiver Robert W. Perkins to have defaulted in his contract and the deal was terminated after some of the track had already been removed.

Labor elements made an effort to get through the Legislature a bill to do away with the one-man car. It was unsuccessful, the one-man car having pretty well established itself in the various localities where it has been introduced.

Thus that part of the Legislature's business dealing with electric railways is a fulfillment of every recommendation made by the Governor; and further, as in the case of the tax relief bills, it carries out the recommendations made to the General Assembly by the Public Utilities Commission in the report of its inquiry into electric railway conditions as authorzed under an act of the 1919 sesson. The commission's program and that of the Governor coincided largely. The former recommended that electric railways be authorized to abandon non-paying lines, but to this end no legislative action was taken. It had also suggested that no interest be charged on deferred taxes.

Not one of these bills encountered noteworthy opposition. Committees expedited their work, debates were perfunctory and the Legislature's action throughout was characterized by a unanimity of action which pointed to a realization of the urgency of these corrective measures, which now have the Governor's signature.

Franchise Surrendered in Indianapolis

The Indiana Public Service Commission has formally entered on its records that the franchise of the Indianapolis Street Railway has been surrendered. The announcement that the company would surrender its franchise was made on June 3 by Dr. Henry Jameson, president of the board of directors. City officials have understood for some time that such action was contemplated.

Two of the biggest questions resulting from the action of the company are whether the company shall continue to pay its franchise tax of $30,000 a year, and whether the company shall continue to pave between its tracks as required by the franchise which now no longer exists.

The company has refused to pay its installment of franchise tax due April 1. Under the franchise it had until June 1 in which to make the payment but it continued to refuse. Mr. Ashby has announced his intention to sue for the payment, unless an agreement can be reached. It is the contention of the city that the company should continue to pay the tax, although not legally obligated to do so.

In the matter of paving, the company has been paving between the tracks and maintaining all such pavements. It now proposes that the city shall lay the pavements and the company maintain them. The city contends that the franchise arrangement should continue.

At a conference on June 8 the city and Dr. Jameson stated their respective positions in a general way, the only definite agreement reached being that pending final settlement of the question the company will take orders from the board of public works.

Wages Cut in Salt Lake

Reduction There Averages 12½ per Cent—Saving to Company Estimated at $125,000

A decision reducing wages of employees of the Utah Light & Traction Company, Salt Lake City, Utah, an average of 12½ per cent was handed down on June 8 by the board of arbitration in the wage controversy between the company and its employees. The awards of the arbitration board and the wages the men were receiving prior to the expiration of their agreement on April 30, 1921, are as follows:

	Wage per Hour—Old, Cents	New, Cents
Carmen—		
First year	57	50
Thereafter	64	57
Painters—		
First grade	68	59
Second grade	59	50
Helpers	50	41
Carpenters—		
First grade	68	59
Second grade	61	52
Helpers	53	44
Welders—		
First grade	68	59
Second grade	55	46
Helpers	50	41
Blacksmiths—		
First grade	68	59
Hammer men	55	46
Helpers	50	41
Machinists—		
First grade	68	59
Second grade	55	46
Helpers	50	41
Armature winders—		
First grade	68	59
Second grade	55	46
Helpers	50	41
Electrical Department—		
First grade	68	59
Second grade	55	46
Helpers	50	41
Barnmen and pitmen—		
First grade	61	52
Second grade	55	46
Helpers	50	41
Car cleaners	50	41
Welders (nine-hour day)	$5.65 to	$5.50
Switch repairers (nine-hour day)	5.25 to	4.50
Track cleaners greasers and teamsters (nine-hour day)	4.50 to	3.65
Bonders, railcutters and yardmen (nine-hour day)	4.50 to	3 65
Trackmen, first six months (nine-hour day)	4.50 to	3.25
Trackmen thereafter (nine-hour day)		3.65

The decrease is approximately one-half of what was asked by the officials of the company, and ranges from a decrease of 11 per cent to 18.9 per cent. The decision will reduce the annual payroll of the company approximately $125,000.

The award is retroactive to May 1, 1921. It will be included as a part of the working agreement between the company and its employees for the year ending April 30, 1922. The award is in the nature of a compromise by which both the company and the employees have agreed to abide.

The wage dispute arose early in April, when the company gave notice that it desired to reduce wages when the next annual working agreement with employees went into effect on May 1. The employees opposed the reduction, and both sides agreed to place the matter before an arbitration board for settlement.

The board has been in executive session since June 3. For a week prior to that time a public hearing was held and testimony from both sides was received by the board.

In the opinion of the members of the board of arbitrators the differential between regular and temporary track employees will enable the company to do more of the much-needed work on city pavements with the money set aside by it for maintenance and repairs.

Chicago Bills Still Pending

With only five days more left of the current session the Illinois State Legislature took a recess on June 11 having before it several important measures affecting the Chicago traction companies and other utilities.

Mayor Thompson's bill for the formation of a "transportation district" and a 5-cent fare was passed by the lower House and sent to the Senate.

The new utilities act had been in the Senate for several days and had been burdened with amendments until it did not much resemble its original form. It looks as though both measures were booked for some rough sledding, with the final outcome uncertain.

Owing to the fight made on the utilities bill by down-state interests it was amended so as to apply in the "home rule" section to Chicago alone and would require signatures of 25 per cent of the voters before being submitted to a referendum. This was said to be fatal to the measure. The Senators also voted to eliminate the section which would prevent the new commission from abrogating rate contracts between companies and municipalities.

Another bill filed late in the session would permit the consolidation of elevated and surface lines. Another would allow the proposed "transportation district" an indeterminate franchise for operation of utilities. Both these measures are said to be necessary to make Mayor Thompson's scheme a success.

Two Years of Bickering Ended

Wages Cut, Fares Reduced and One-Man Cars Sanctioned at Davenport—Future Prospects Bright

With one-man cars operating in Davenport, Iowa, fares reduced, and separate wage and working agreements signed with trainmen of Iowa and Illinois, the Tri-City Railway's two years of disputing with trainmen and City Councils has come to an end. Politics, class hatred and ignorance all acted as a deterrent to the utilities there in their attempt to obtain a reasonable rate for their services.

UNDER the agreement signed by the men a wage scale of 50 cents an hour for one-man car operators and 55 cents for trainmen on two-man cars goes into effect. The previous scale was 70 cents an hour on two-man cars, and prior to June 1 there were no one-man cars in operation. The company also refused the international trainmen's union recognition, but recognized the Davenport and Rock Island-Moline locals. Agreements were signed on June 13.

A court order authorizing the operation of one-man cars in Davenport was granted in the District Court by Judge A. J. House on May 19. The railway applied for a temporary injunction a few days before, showing in statements that it was impossible to make a reasonable return on the stock of the corporation with two-man operation. It was also shown that the average return for a four-year period had been only 2 per cent.

Meanwhile the men prepared to strike on the expiration of the wage scale on June 1. B. J. Denman, president of the Tri-City Railway, had announced some months before that the wage scale would be cut from 70 cents to 40 cents an hour on that date. A strike order was issued by the locals for June 1, but withheld when negotiations were taken up with the understanding that the men should work for 40 cents an hour, but that the wage finally agreed upon should be retroactive from June 1.

For a while the company refused steadfastly to recognize the union either as an international or local. A definite date for a strike was fixed, but this was set aside at the request of Harry M. Schriver, Mayor of Rock Island. He called the traction officials and union representatives together and proposed that Frank T. Hulswit, president of the United Light & Railways Company, Grand Rapids, Mich., of which the Tri-City Railway & Light Company is a subsidiary, should be called to the Tri-Cities.

Mr. Hulswit, then in New York, found that it would be impossible to reach Davenport before the date set by the union for a strike, so he instructed President Denman to proceed with negotiations. Meanwhile Vice-President R. Schaddelee of the United Light & Railways hurried to Davenport.

In two meetings which lasted many hours the traction troubles of two years were ironed out. The scale suggested by Rock Island's Mayor was adopted, the local unions recognized, and a working agreement satisfactory to both the company and the men arrived at.

In Davenport the 9-cent fare, with three for a quarter, was reduced to an 8-cent straight rate through the approval of the use of one-man cars and it is possible that a reduction from 9 cents to 8 would follow the granting of similar privileges to the company in Rock Island and Moline. Bridge line cars which cross the government bridge from Rock Island to Davenport are continuing with two-man operation.

Because of a Socialist administration in Davenport, which made a sport of

baiting the utilities, the railway was forced into the courts to obtain one-man service for that city. Several times attempts to come to an agreement with the City Council were halted at the last moment.

Hoping to "get something on" the railway and light corporation the city ordered a public audit of the company books. The accounts were promptly thrown open by the company to the auditors, who reported to the Council after several months of research. The figures completely backed up the claims of the company that it was virtually bankrupt.

In open Council meeting Henry Vollmer, ex-congressman and special counsel for the city, told the Socialist members that the companies were bankrupt and must be granted one-man service and a higher gas rate. City Attorney U. A. Schreechfield, Socialist, reiterated this statement and it seemed as though an agreement was about to be reached.

Despite this interpretation of the audit and appraisal, the Council refused to meet the company half way. A proposal for the adoption of one-man service and a reduction of fares was spurned. Unable to obtain redress from the city, the railway then took its case to the courts.

Brooklyn Wages to Be Reduced

A reduction in the wages of the employees of the Brooklyn (N. Y.) Rapid Transit Company to take effect on Aug. 6 has been determined upon by Lindley M. Garrison, receiver of the company. Mr. Garrison has sent letters to the various committees representing the employees whose wages were increased last August, asking them to get together and take up the matter and agree, if possible, on the amount of the reduction.

The receiver has sent the following letter to William S. Menden, general manager for the company:

> You will recall that in my notice to employees dated July 16, 1920, I made the most recent increase in rates of pay, practical upon an annual basis. This became effective on Aug. 6, 1920. That increase, added to previous increases, amounted to 35 per cent above the rates in effect on Aug. 1, 1919.
>
> Owing to conditions, which need not be recited, it is obvious that we can no longer continue at the present high scale. I have abstained, in view of the circumstances, from making any reductions until the lapse of a year from the time of the last increase. That year will be up on Aug. 6, 1921. The time has now come when this matter must be taken up, and I wish that you would in due course confer with the various representative bodies in order that a proper basis may be arranged for the wage scale after Aug. 6, 1921.

The so-called "representation plan" in Brooklyn was formulated by Judge Julius M. Mayer of the United States District Court in co-operation with Mr. Garrison. In November of last year the first elections were held and men who had been with the company for sixty days were allowed to vote. But it was specified that they take an oath that were not members of the Amalgamated.

The present rate of pay for motormen and conductors on the surface lines is 57, 59, 62 and 67 cents. On the elevated lines the conductors are receiving 59, 60 and 62 cents while the guards are receiving 53, 54 and 57.

Readjustment of wages has also been suggested by the officers to the men of the Interborough and the New York Railways.

Railway Man Killed in Accident—Others Injured

Spencer Vandenberg, manager of the Louisville Safety Council, died on June 14 at Norton Infirmary, Louisville, Ky., from injuries suffered Saturday when the automobile in which he was returning from a round-table barbecue ran into a tree. By the irony of fate Mr. Vandenberg was killed in an accident of the kind he was trying to educate the public to avoid.

Mr. Vandenberg was on the way home in the car of George Dehler, who asked several friends to ride with him. Mr. Vandenberg, Neil W. Funk, Frank E. Belleville, general auditor of the Louisville Railway, and John Carroll were also in the car when it ran into a tree at a sharp turn in the road near St. Matthews. Mr. Vandenberg was thrown against the tree. He suffered four broken ribs, a fractured left hip, injuries to the right leg, and cuts and bruises. It is believed that a broken rib punctured the lung and brought on pneumonia which terminated fatally.

Mr. Vandenberg went to Louisville in January from Schenectady to become manager of the Safety Council, engaged in the work of teaching the public to avoid accidents. His home was in Eastover. Mr. Vandenberg was formerly with the Schnectady Railway.

Mr. Funk is expected to recover. He is superintendent of the claim division of the Louisville Railway. He had expected to go on the C. E. R. A. boat trip. Among his injuries is a fractured hip.

Programs of Meetings

Final Arrangements for C. E. R. A. Summer Meeting

The program for the summer meeting of the Central Electric Railway Association, which will be held on board the S.S. *South American*, has been announced by Sam W. Greenland, chairman of the program committee. The summer cruise of the association will begin at Chicago, where the boat will leave from the Municipal Pier on Sunday morning, June 26, at 8:30 a.m. central standard time, or 9:30 Chicago time. It will leave Toledo Tuesday morning, June 28, at 11 o'clock central standard time or 12 o'clock eastern standard time, from the Toledo Railway & Light Company dock, which is adjacent to the White Star Line docks. The time of leaving Toledo was set back one hour by the committee on arrangements in order to permit various members to leave their homes Tuesday morning and arrive in Toledo in time to catch the boat. The details of the program follow:

Sunday, June 26, 11 a.m.

Song Service.
Address, by H. C. DeCamp.

Wednesday, June 29, 9 a.m.

Meeting of the Executive Committee.
"Automatic Substations," by C. A. Butcher, Westinghouse Electric & Manufacturing Company.
Discussion by Lawrence D. Bale, engineer of substations, the Cleveland Railway; Charles H. Jones, Chicago, North Shore & Milwaukee Railroad.

Thursday, June 30, 3 p.m.

"Merchandising Transportation," led off by the report of the committee on education and training of employees, by James P. Barnes, chairman, president Louisville Railway.
Discussion by Harry L. Brown, Western Editor ELECTRIC RAILWAY JOURNAL, Chicago; Bert Weedon, general freight and passenger agent, Interstate Public Service Company, Indianapolis; George H. Kelsay, superintendent of power and shops, Cleveland, Southwestern & Columbus Railway, Elyria, Ohio; W. S. Rodger, general traffic manager, Detroit United Railway; E. B. Gunn, master mechanic, Western Ohio Railway, Wapakoneta, Ohio.

SPECIAL CARS TO BE RUN

The proposal to run a special car from Indianapolis to Chicago on Saturday, June 25 is being considered.

Those arriving in Chicago on Saturday night may go direct to the boat and secure their staterooms and breakfast Sunday morning on the boat for $2.50. The boat will be at the pier after 6 p.m., Saturday.

For those who desire to make only the trip from Toledo to Chicago, a special car has been arranged, leaving Indianapolis on Monday, June 27, at 7:00 a.m., Peru, Ind., at 9:30 a.m., and arriving at Fort Wayne, Ind., at 11:10 a.m. A thirty-minute stop here will be made for lunch and the car will leave Fort Wayne at 11:40, Lima, Ohio, at 1:40 p.m., Findlay, Ohio, at 2:50 p.m., and arrive at Toledo at 5:05 p.m., central standard time in each case.

On the return trip a special car will be run from St. Joseph, Mich., to Indianapolis, leaving St. Joseph July 12.

Those planning to attend this meeting and cruise, are urged to send in their reservations to John Benham, 15 South Throop Street, Chicago, at once, in order that their names may appear in the printed souvenir distributed on the boat.

Railroad Mechanical Section Postpones Meeting

The annual meeting of the American Railway Association, mechanical division, which was to have taken place at the Drake Hotel, Chicago, on June 15 and 16, has been postponed to June 29 and 30, 1921. The meeting place has also been changed from the Drake Hotel to the Blackstone. The official circular of June 10 announcing the postponement says:

> Owing to present unusual conditions and inability of members to attend the meeting of the mechanical division, American Railway Association, called to be held in this city (Chicago), Wednesday and Thursday, June 15 and 16, 1921, the meeting has been postponed to Wednesday and Thursday, June 29 and 30, 1921.
>
> The sessions will be held at the Blackstone Hotel, Chicago, instead of the Drake Hotel as originally planned. It is suggested that members arrange for their hotel reservations without delay.

Financial and Corporate

Preferred Stock Offering to Be Continued

In the belief that it will be of advantage both to itself and to the communities served to have as many local stockholders as possible, the Monongahela Power & Railway, Fairmont, W. Va., will continue to offer its preferred stock even after the recent $2,000,000 offering of preferred stock has been taken. This offering was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 28.

A new department known as the "Investment Department" has been created to handle the sale of stock, bonds and other forms of securities offered. E. B. Smith is the manager of this department. He has eight salesmen in his organization at present. In addition to these regular salesmen, Mr. Smith is organizing the company's employees and has selected about fifty as an additional employees organization. Arrangements have been made with the banks in the territory served by the company whereby they will also assist in selling the stock. Thus the organization worked out for the handling of the stock includes eight regularly employed salesmen, about fifty employees and the banks, fifty-four in number.

Besides the offering being made direct to patrons through salesmen, advertising is being carried in ten newspapers, where every family is urged to become a "profit-sharing partner." In order to educate the public regarding the character of the company, extent of its property, kind of services rendered and its relation to the growth of the communities served by it descriptive matter and circulars have been mailed to patrons and customers and display cards announcing the sale have been posted in the company's ticket offices and waiting rooms. In connection with this offering the company has issued an interesting illustrated booklet, containing a map of the company's electric railway properties, proposed lines, power stations, gas lines, coal mines, etc.

TYPICAL NEWSPAPER ADVERTISEMENT

Although the outcome of this offering cannot at this time be clearly indicated, the sales made to date have been much in excess of expectations and indicate the success of the offering.

MONONGAHELA POWER AND RAILWAY COMPANY

POWER GAS RAILWAYS COAL

FAIRMONT, W. VA.

Dear Sir:

Arrangements have been made whereby we are enabled to offer our patrons the opportunity of owning an interest in this Company through the purchase of its Preferred Stock.

This opportunity to purchase stock is given because:

1. We want your good-will and co-operation.

2. Our own home people are entitled to the opportunity to invest in a home industry, to the support of which they all contribute and upon which the development of the community so largely depends; and especially since it affords an investment that offers a substantial return with a maximum security.

This stock may be purchased at a price showing a return of approximately eight (8%) per cent.

Your name and address on the attached postal card will bring you full information on this proposition.

Very truly yours,

MONONGAHELA POWER AND RAILWAY COMPANY

George M. Alexander, President

INFORMATION SHEET

MONONGAHELA POWER AND RAILWAY COMPANY

CUMULATIVE PREFERRED STOCK

Price:	$10.00 per share of $25.00 par value. This price subject to change and confirmation from this office
Dividends:	Payable January, April, July and October to shareholders of record the last day of previous month. 1½% is paid on each of the above dates or at the rate of 6% per annum on the par value of the stock. The company has paid dividends on its preferred stock continuously since organization.
Yield:	Preferred Stock purchased at the above price will yield a yearly return of nearly 8% on the investment
Market:	In the event you should find it necessary to dispose of your stock the company will handle the resale of it at the prevailing market price less a reasonable charge for handling.
Taxes:	The Preferred Stock is exempt from personal property taxes. Dividends are free from normal Federal Income Tax
Voting Rights:	Preferred Stock carries full voting rights.
Properties Back of the Investment:	Properties are described in detail in booklet, "Some of Our Properties" enclosed herewith.
Safety of the Investment:	The company supplies necessary service to the Public, Industry and Commerce. This service consists of Power, Interurban and City Railways, Electric Lighting and Gas. The Company also operates Coal Mines and a Gasoline Plant. The demand for this service is constantly growing
Maintenance:	All properties are maintained at a high degree of efficiency, as may be ascertained by personal inspection upon application to the Company

PARTIAL PAYMENT PLAN

Price:	Same as cash price, payable $2 share at time of purchase and $2 per month thereafter, with privilege of full payment at any time.
Interest:	6% per annum is allowed on all payments if payment in full is made. 3% interest is allowed in case of withdrawal of funds and upon surrender of temporary stock certificate and receipts for payments.
Receipts for Payment:	Temporary certificate is issued to purchaser when first payment is made, and further payments are endorsed thereon as made. Permanent registered stock certificates issued upon completion of payments. Interest on payments is also computed at the same time.

Further information will be gladly furnished by mail or by a representative of the Company.

APPEAL MADE DIRECT TO PROSPECTIVE PURCHASER

Toledo $260,672 Behind

Cumulative Deficit Increased by $56,371 in May—Prospects Greatly Improved

The increasing economy of operation of the Toledo railway lines, under Commissioner Wilfred E. Cann, is shown in the report for May, when the smallest monthly deficit yet sustained was reported. The net loss in operation for the month was $56,371. The total deficit accrued in four months is $260,672.

Chairman Henry Truesdall of the board predicted a fare increase to 7 cents in August. The service-at-cost ordinance provides for no fare change in the first six months of operation. Commissioner Cann believes, however, that fares will be back to 5 cents within a year.

During the month of June further anticipated savings should amount to $25,000, due to decrease in wages of carmen. The men last week ratified the agreement by which their scales were set at 45, 47 and 50 cents an hour. This is a cut of 10 cents an hour from the last year scale. This new scale was incorrectly reported in the ELECTRIC RAILWAY JOURNAL for June 11 to be 45, 57 and 60 cents.

The power rate has not yet been adjusted. Some believe it can be reduced nearly 50 per cent. Even a 10 per cent reduction would mean a saving of $24,000 on four months' operation.

Further rerouting plans have been approved. Service will be cut off the Maumee Avenue end of the Starr-Maumee line. Cherry cars will not run from the Union Station loop. A saving of more than $4,000 a month with little change in service will thus be gained.

No decision has as yet been made by the Common Pleas Court on the bus regulatory measure. The case is held up by a temporary injunction which bus owners secured.

In May, although railway passenger receipts fell off $2,631 as compared with the previous month, due to increased interurban rentals and car rentals, the net income increased $8,677. Operating expenses were cut $15,286 as compared with April. The monthly operating ratio also decreased from 90.60 to 83.46.

Commissioner Cann said the loss of 1.0544 cents per passenger during May should call for a further reduction in service but that the present schedules would be maintained. Average daily passenger receipts for the last four months are as follows: February, $9,500; March, $9,186; April, $8,988; May, $8,613. June shows a further decline over May figures of $325 a day.

Construction Company Denied Payment.—The application of the Interborough Subway Construction Company, an Interborough subsidiary, for a writ of mandamus directing Controller Craig to pay the company $1,750,000 as part of the cost of installing the multiple car door device, was denied recently by Justice Gavegan of the Supreme Court.

Answers to Accounting Questions

Another Series of Questions and Tentative Answers Under the Uniform System of Accounts for Electric Railways

Another series of tentative answers to questions raised in connection with the uniform system of accounts, prescribed by the Interstate Commerce Commission, has just been issued. As these answers have not received the formal approval of the commission, however, it should be understood that the decisions do not represent its final conclusions and that they are subject to such revision as may be thought proper before final promulgation in the accounting bulletins of the commission.

THE case numbers covered below are from A-589 to A-602, with certain omissions. Other installments will follow. The omitted numbers represent cases which either are not of sufficient importance to justify publication or involve questions upon which a definite conclusion has not been reached.

Q (*A*-589). To what account should be charged:

(a) Taxes payable on monies and other items the income from which is includible in account 208, "Income from unfunded securities and accounts?"

(b) Federal income and excess profits taxes?

(c) Internal revenue stamps for use generally in railway operations?

(d) A carrier's investment in war savings stamps and war thrift stamps?

(e) War taxes paid on telephone and telegraph messages?

A. (a) To account 215, "Taxes assignable to railway operations," or to account 218, "Miscellaneous taxes," in accordance with the texts of those accounts.

(b) To account 215, "Taxes assignable to railway operations," unless directly assessed on income from miscellaneous physical property, in which case account 205, "Net income from miscellaneous physical property," shall be charged or unless they are assessed on income from securities owned and are therefore chargeable to account 218, "Miscellaneous taxes."

(c) To account 215, "Taxes assignable to railway operations."

(d) To account 409, "Loans and notes receivable."

(e) To account 215, "Taxes assignable to railway operations," or to road and equipment account 549, "Taxes," as may be appropriate.

(See Cases 584 and 598 (a).)

Q. (*A*-590). An industry furnishes cars for movement of its employees from city points to its suburban plant. The carrier furnishes locomotive, crew and electricity, and hauls the cars over its own rails to the industrial plant, for which it is paid on the basis of locomotive trips. How should the revenue be credited?

A. To account 109, "Miscellaneous transportation revenue."

Q. (*A*-591). A carrier under contract to transport mail, during a temporary stoppage of its own transportation facilities, hires an automobile and driver to perform that service. To what account should the expense be charged?

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

Q. (*A*-592). What is the proper accounting for investment in and maintenance of turntables located at the entrances of shops?

A. The investment is chargeable to account 523, "Shops and carhouses," and the maintenance to account 24, "Buildings, fixtures, and grounds."

Q. (*A*-593). To what account should be charged:

(a) The cost of special work or curves made in the carrier's own shops?

(b) The cost of cut rails issued from stock to connect such items as switch mates, switches, frogs, etc., in the lead of a special work layout?

A. (a) To account 508, "Special work." Plain curves shall be treated as rails.

(b) If the cut rails are only sections of rail which are necessary to connect up the switch mates, switches, frogs, etc., with the last regular rail laid in the track their cost shall be charged to account 507, "Rails, rail fastenings and joints," but if they are of special character, not simply a section of ordinary rail, they shall be included in account 508, "Special work."

Q. (*A*-595, a). When electric light sockets and switches are installed as permanent parts of buildings, cars or conduits, should renewals be considered supplies as indicated in Case 216 in Accounting Bulletin 14?

A. In such cases they shall be charged for appropriate repair accounts.

(See Case 69, Accounting Bulletin 14.)

Q. (*A*-595, b). To what account should be charged the pay of employees under the supervision of the general treasurer who are stationed at car barns to receive conductors' collections?

A. To account 63, "Superintendence of transportation."

Q. (*A*-596, a). To what account should be charged repairs of oil pumps, oil tanks and permanent tank piping installed in an oil house at shops?

A. If this apparatus is for distributing oil for shop use, the repair expense for the tank and piping shall be charged to account 24, "Buildings, fixtures, and grounds," and that for the pump, if not a part of the tank, to account 36, "Shop equipment." If the apparatus is for oil used in connection with conducting transportation, all repairs shall be charged to account 24.

Q. (*A*-596, b). To what account should be charged repairs to a sand hopper and to the piping connecting the sand drier with the hopper?

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

Q. (*A*-597). To assist in retaining its employees a carrier built and operates a temporary rooming building. How should the revenue and expenses of this project be distributed?

A. Rents received from employees shall be credited to account 117, "Rent of buildings and other property." Building repairs shall be charged to account 24, "Buildings, fixtures, and grounds," and expenses of operating for employees' use to account 78, "Other transportation expenses."

Q (*A*-598, a). To what account should be charged:

(a) The cost of revenue stamps affixed to proxies sent in by stockholders for use at the annual meeting? (b) The cost of stamps affixed to notes classified as unfunded debt?

A. (a) To account 225, "Miscellaneous debits," (b) To account 221, "Interest on unfunded debt."

(See Cases 584 and 589.)

Q. (*A*-598, b). A carrier assumes the rent for an encampment site in order to induce school cadets to hold an encampment on its line. To what account should the rent be charged?

A. To account 81, "Parks, resorts and attractions."

Q. (*A*-599, a). At the direction of the court, pending a decision as to the legality of a fare increase, a carrier deposits daily with a trust company amounts equivalent to the difference between revenue based upon the former fare and the total of fares collected. What is the proper accounting?

A. The deposits with the trust company shall be debited to account 408, "Special deposits," and concurrently credited to account 446, "Other unadjusted credits." If final decision favors the carrier the amount shall be transferred from account 446, to account 101, "Passenger revenue," unless the decision is delayed beyond the current year and the amount is relatively large, in which event the carrier may apply for permission to use account 304, "Delayed income credits." If the increased fare is decided to be illegal accounts 408 and 446 shall be cleared as the refunds are made.

Q. (*A*-599, b). What is the proper accounting for equipment permanently retired from service but held for disposition?

A. It shall be written out of the property account and carried in a suspense account at an equitable valuation.

Q. (*A*-601). To what account should be charged the cost of metal fare tokens sold to patrons for use in lieu of tickets and coins?

A. To account 67, "Miscellaneous car service expenses." Tokens held in stores shall be carried in account 411, "Material and supplies," until issued for use.

Q. (*A*-602, a). To what account shall be charged the cost and maintenance of a pier to be used exclusively for handling powerhouse fuel?

A. The investment cost shall be charged to account 539, "Power plant buildings," and the maintenance cost to the appropriate primary accounts under general account III, "Power."

Cash-Fund Ordinance Pending

In consideration of the June appropriation ordinance for the Seattle (Wash.) Municipal Railway it was decided at a recent meeting of the utilities committee of the Council to set aside each month out of the earnings one-twelfth of the yearly charges for bond interest and redemption. The department's auditor suggested waiting until the interest and redemption dates before setting aside the cash needed to save going on a warrant basis earlier.

Superintendent D. W. Henderson, however, said the fund had $132,574 in cash on hand in the city treasury after allowance for outstanding warrants, and recommended setting aside the interest and redemption cash since there was a surplus on hand. The first item considered was setting aside interest and redemption on an issue of $775,000 general bonds, maturing from 1933 to 1938. As the state law does not require setting aside money for redemption of general bonds until seven years before maturity, it was voted not to set aside money for this purpose now. It was decided to set aside funds for interest on the general bonds, also for interest and redemption on the utility bonds.

As the matter stands at present, the railway did not set aside in March, April or May the $70,250 chargeable monthly for the redemption of the $833,000 issue of the $15,000,000 Stone & Webster bonds due next March 1, and on another small issue, and so owes that fund $210,750. The $70,250 for June for this purpose will be set aside. No money has been set aside for depreciation, the money being used to retire outstanding warrants.

Coal, Material and Labor Costs Decrease Earnings

According to the annual report of the Terre Haute, Indianapolis & Eastern Traction Company for the year ended Dec. 31, 1920, the company had, after paying operating expenses, taxes and fixed charges, $725,000 to meet dividend requirements, interest on notes, car trust equipment notes, sinking funds, etc. Gross earnings amounted to $5,316,288, an increase of 18.64 per cent over the previous year, while operating expenses, which were $3,805,565, were 23.38 per cent more than in 1919. This increase absorbed practically all of the gain in earnings due to advances in the price of coal, material and labor.

The tax rates were raised in 1920, so that the average rate on the entire system was $1.85 as compared with $1.26 in 1919. The result of this was that the amount paid out in taxes for the year increased 18.96 per cent.

The total amount spent for maintenance was $1,314,192, compared with $1,059,898 in 1919. The greater proportion was for maintenance of way and structures, which amounted to $694,274, an increase of $210,920 over the previous year. The total railway maintenance was $1,135,761 as against $946,122 in 1919.

Some idea of the amount of traffic handled can be had from the following statistics: During the year 9,719,308 passengers were carried on the interurban lines and 19,671,918 on the city lines, making a total of 29,391,226 passengers of all kinds. The freight tonnage handled was 134,342 in addition to 116,292 tons of express matter. The car-miles operated on the interurban lines amounted to 5,837,378 and on the city lines 3,424,961. The coal consumed at the power station was 261,239 tons, while the kilowatt-hours generated at the main power station were 118,527,211. The company operates 435.64 miles of main line, of which 33.21 miles are so-called city lines.

$19,628 Earned on $3,576,740 Investment

The annual report of the Bamberger Electric Railroad recently filed with the Public Utilities Commission of Utah shows a net profit of $19,628 from operation on an investment of $3,576,740 in its 35.94 miles of road, running between Salt Lake City and Ogden, Utah.

The report shows that the company had on hand at the beginning of the year accredited to profit and loss the sum of $602,327, and at the end of 1920 the sum of $621,955. The increase in the grand total of its assets over the year 1919 amounted to $261,416, or from $3,858,314 at the close of 1919 to $4,119,729 at the close of 1920. Of this latter figure the company claims to have assets of $3,576,740 in road and equipment, an increase of $182,255 over the preceding year and $46,802 in miscellaneous property, or an increase of $17,500 over 1919.

The investments in affiliated companies shows neither increase nor decrease. This amounts to $147,652. In bonds investment the increase amounts to $600, bringing the total investment in bonds to $36,800. The total investment exceeded the 1919 figure by $200,355.

Current assets shows an increase of $61,685 in spite of several large decreases in certain lines, such as a $40,000 decrease in special deposits. Miscellaneous accounts receivable show an increase of $55,068, and the materials and supplies purchased during 1919 add considerable to this figure in compiling the current assets figure.

The sum of $52,083 was invested in road equipment during the year. In addition $1,766 was expended in substation equipment and $2,874 in miscellaneous expenditures, bringing the total expenditures for betterment up to $182,255.

The company has 73.21 miles of tracks at an average investment of $48,856 per mile.

The company holds $75,000 in first mortgage bonds of the Salt Lake & Ogden Railway drawing interest at 5 per cent, which is the only money or security in the sinking fund.

Financial News Notes

Portland Dividend Declared. — The Portland Railway, Light & Power Company, Portland, Ore., recently declared an initial dividend on the Series "A" first preferred 7½ per cent stock. This payment covers dividends for the period of Jan. 1, 1916, to April 1, 1917.

$3,000,000 Offered in Bonds.—Whitaker & Company, St. Louis, Mo., are offering three-year 8 per cent sinking fund mortgage bonds of the Columbus Railway, Power & Light, Columbus, Ohio. The bonds are dated June 1, 1921, and are due June 1, 1924. The price is 98 and interest to net 8¾ per cent.

Operation of Line Expected.—At a recent conference between Receiver Whysall, his attorney, and W. P. Sturtevant, New York, representative of the bondholders, it was brought out that service may be resumed by the Springfield Terminal Railway & Power Company, Springfield, Ohio. Receiver Whysall, who will plan the reorganization, has given out no statement on this project. The property was sold under foreclosure in June, 1920, for $300,000.

Raleigh Property for Sale.—James H. Pou, Raleigh, and N. A. Sinclair, Fayetteville, N. C., have been appointed commissioners to sell the property of the Cumberland Railway & Power Company, Raleigh, N. C., at receiver's sale on July 2. The company was organized in 1919 and acquired the street railway property in Fayetteville which had long been in disuse. Some months ago a receiver was appointed for the property on the petition of a Lillington bank when interest was defaulted.

Railway Offered to People.—At a recent meeting of the Valdosta (Ga.) Chamber of Commerce the possibility of dismantling the Valdosta Street Railway was discussed. The property just about pays expenses and it was stated that unless the people took over the railway it probably would be junked. Judge Crawford stated that if 100 or more people would take over the railway and work in its interest operating expenses and a small dividend could be paid. The offering price is $15,500.

Eureka Property for $75,000.—The people of Eureka, Cal., will be offered the property of the Humboldt Transit for $75,000, and provision will be made for an additional $30,000 as working capital for the operation of the lines by the city. This proposition will be voted on June 20. The State Railroad Commission recently valued the property at $100,000 but the attorney for the Humboldt National Bank, which represents the bondholders of the railway, announced that the bank had been authorized to submit $75,000 as the valuation of the lines.

Traffic and Transportation

Autos Under Commission

California Railroad Commission Announces Establishment of Automobile Department

So rapid has been the growth of the automobile transportation industry that the Railroad Commission of California has announced the establishment of an automobile department under the supervision of Charles A. Beck. This department will be responsible for all detail work connected with the automobile stage and truck matters, will care for all informal complaints and correspondence, keep time-table and schedule filings, handle applications which can be disposed of by ex parte orders, handle and assign applications requiring public hearing, answer all verbal inquiries, and in general be responsible to the commission for all work in connection with the operation of stages and trucks under its jurisdiction.

Rates, fares and regulations will be handled by the rate department. Issuance of stock, bonds, notes or other securities and the filing of annual or other financial statements will be handled by the department of finance and accounts. The service department as heretofore will look after safety of operation, equipment of cars and the like.

The commission announces that Mr. Handford will be responsible for the formulation of definite lines of policy affecting auto, stage and truck transportation so as to promote uniformity of decisions. Opinions and orders, excepting the minor ex parte orders, will be reviewed and concurred in by Mr. Handford before presentation to the commission for its consideration.

In all matters of accident, investigation and other questions incidental to transportation from the service standpoint, the service department will continue to function through Mr. Handford reporting to the commission as heretofore.

The numerous complaints that come up from competing auto stage lines in regard to irregular operations of some of the auto bus lines have been noticeable at various hearings before the commission during the past year. Recently the Pasadena-Pomona auto stage line filed a complaint with the commission citing the fact that the Motor Transit Company, the largest auto stage operating lines out of Los Angeles, in operating its auto stages between Los Angeles and San Bernardino was violating the terms of its operating franchise rights granted by the Railroad Commission by doing local business on its through schedule. This class of complaint with auto stage lines is frequent with the commission, as many of the stage lines were losing money during the year 1920 and found it difficult to strictly abide by its franchise.

Recently the Burbank Stage Line in applying for an increase in rates informed the commission its losses for the year were $20,000. The Motor Transit Company claimed a loss of $120,000. At a recent hearing of a freight auto transportation line running out of San Diego, where an application had been made to the commission to increase its rates 25 per cent, the commission denied the increase as the manager of the auto freight carrying line could not produce any figures as to his losses, stating that he did not keep any books.

City of Toronto Plans Important Rehabilitation

The Board of Control, Toronto, Ont., has recommended that the City Council pass a by-law providing $7,000,000 for the use of the Toronto Railway Commission in connection with the purchase of the new cars and other equipment by the commission for use next fall when the city takes over the Toronto Railway. H. H. Couzens, Toronto, is general manager of the Toronto Transportation Commission, Ryrie Building, Toronto.

The commission is also planning to construct a new railway through Rosedale and the north limits of the city passing east of Mount Pleasant Cemetery. This line will be constructed if the city opens up certain streets requested by the commission.

The arbitration board has been finally completed which will determine the price to be paid and other details in connection with the acquisition by the city of Toronto (Canada) of the Toronto Railway system upon the expiration of the railway franchise, which takes place next September.

The railway chose Sir Thomas White, former Minister of Finance in the Dominion Government, while the municipality appointed Sir Adam Beck, chairman of the Hydro-Electric Power Commission. These two arbitrators have now agreed upon Hume Cronyn, M. P., as the third member and chairman of the board. Mr. Cronyn is a native of London, Ont. He is prominently identified with a number of financial institutions in his home town.

Transfers Reduced in Size.—The Milwaukee Electric Railway & Light Company placed in use on June 1 on its Milwaukee city lines a reduced-size transfer. The new transfer is 2 in. x 4 in., or 1½ in. shorter than the transfer previously used. The change in size of the transfer was made for the purpose of conserving paper stock.

New Board Attacked

Counsel for Public Service Railway Contends Before Court Evidence Proved Ten-Cent Fare Need

Argument was heard in Part II of the Supreme Court at Trenton, N. J., on June 10 upon the appeal of the Public Service Railway from the decision of the Board of Public Utility Commissioners refusing to grant the corporation permission to charge a 10-cent fare. Frank Bergen and Robert H. McCarter, former attorney-general of the state, appeared for the company. The commission was represented by L. Edward Herrmann, its counsel. The cities, which are opposing the increase, were represented by George L. Record. The court reserved decision.

Mr. Bergen said that the proceedings of the board in recent years had taken a direction and reached a point which not only threatened but seriously affected the fundamental rights of parties interested in utility corporations. He said further that whether or not an existing rate was reasonable was a judicial question. At one phase of the proceedings Justice Trenchard interrupted Mr. Bergen to inquire: "This is really an attack on the utility act by you, isn't it, not on the order of the board in question?"

Mr. Bergen answered that it was an attack on the method employed by the board in the face of overwhelming testimony.

Ten-Cent Fare Essential

Mr. Bergen said further that under the present 7-cent fare the company will lose more than $2,000,000 during the calendar year. The commission had failed for several years past, he said, to provide a fare sufficient to meet operating expenses, fixed charges, taxes and depreciation, let alone a return on the company's capital stock of $48,731,600. It was Mr. Bergen's contention that the 10-cent fare would enable the company to pay its taxes, operating expenses and fixed charges, set aside $1,850,000 for depreciation and earn a net income of $1,266,000, or 2½ per cent on its capital stock, provided the rate were granted for a full year.

Mr. Bergen said:

> Disaster to the company is inevitable unless it is afforded the instant relief to which the Court of Errors and Appeals has held it is entitled. It is intolerable that a plain remedy should be withheld by the board for reasons unsupported by either facts or law. The utility act expressly provides for the fixing of a reasonable rate under the conditions that here exist, and the Court of Errors has clearly defined what elements are to be considered. At the hearings the board solemnly declared its purpose to obey the law as laid down by the court (Case, page 364), but when the time for action arrived it reversed its intention. It is indeed fortunate that we have this court of law to which we may confidently appeal.

In opening his case for the municipalities Mr. Record declared that the commission could have withheld its decision until after July 15, when it was bound by law to announce what it considers a just and reasonable fare. By rendering its decision it gave the company opportunity to appeal in this case, thereby delaying valuation proceedings.

Birmingham Situation Critical

Several Months of Operation Prove Seven-Cent Fare Inadequate—Jitneys a Menace

Hearing of an application of Lee C. Bradley, receiver for the Birmingham Railway, Light & Power Company, Birmingham, Ala., for authority to raise fares in Birmingham has been set for June 28 before the Alabama Public Service Commission at Montgomery. Right to increase fares from 7 to 8 cents in Birmingham and its suburbs and to levy a charge of 2 cents for transfers is asked in the petition, which was filed by Mr. Bradley on June 8 before the Public Service Commission. Judge William I. Grubb, of the United States District Court, issued a formal order on June 4 authorizing the receiver to apply for the increased fare.

STRENUOUS opposition to any increase in the present 7-cent fare has been voiced by members of the City Commission of Birmingham, who declare that the city will fight the proposed advance to the bitter end. It has been indicated by city officials that the public utilities act, under which the Alabama Public Service Commission is granted the exclusive right to regulate rates to be charged by public utility companies operating in the state, may be attacked in the efforts to defeat an increase in fares.

Heavy decreases in the earnings from the operation of the railway are set up by the receiver as the grounds upon which the increase is asked. In his application he shows that receipts have decreased in spite of the recent raise in rates from 6 to 7 cents.

Operation of jitneys in competition with the railway is given by the receiver as one of the contributing causes for the decrease in revenue from the railway department. However, the general business depression and the unemployment situation are cited as the principal cause for the decrease in earnings.

A jitney regulation ordinance was recently adopted by the City Commission, but has not yet been put into effect. Under the terms of this the receiver maintains that the jitneys are recognized by the city as a competing service. The ordinance as originally drafted provided that all jitneys must furnish an adequate indemnity bond or must carry an adequate amount of liability insurance, but these provisions were killed by the majority of the commission before the final adoption of the ordinance. As adopted it provides certain police and traffic regulations and routes for the jitneys. In some instances they are removed from the railway lines, but in several others the jitney routings are allowed to follow the car lines.

In his application to Judge Grubb for authority to apply for the increases Receiver Bradley reviews at length the financial situation of the Birmingham Railway, Light & Power Company and of the causes which make the increased fare necessary. It is shown that when the application for a 7-cent fare was made the cash condition of the estate as of Nov. 1, 1920, showed a deficit of $1,435,101 with other obligations which increased the total obligations of the receiver to $1,873,822.

The increase in fare to 7 cents, it was estimated, according to the application, would produce approximately $25,000 a month in increased net revenue. The petition shows, however, that in January with the 7-cent fare there was an increase of $32,719 in comparison with January, 1920. In February there was a gain of $25,009 over the preceding February. March showed a gain of $15,779 over the same month of 1920. But April showed a loss of $10,871 in comparison with the preceding April. May showed a loss of $24,007. Pointing to the steady decrease the receiver says:

> Instead of receiving approximately $25,000 a month in increased revenue, we find that in the month of May we have a decrease of $24,007, or approximately $50,000 less than was deemed necessary at the time the 7-cent fare was granted.

This condition, Mr. Bradley states, results from business depression and that all lines are showing decreases in comparison with the figures for last year. Lines upon which jitneys are in operation, he states, are showing very heavy decreases. Owing to the uncertainty of jitney operation the receiver points out that it is difficult to estimate the loss caused but that from checks made they were apparently causing a loss of approximately $700 a day during the month of May. The loss from the business depression was estimated at $900 a day for May.

Although operating expenses, it is stated, have been cut from 32.3 cents per car-mile in December, 1920, to 30.5 cents per car-mile in May, 1921, yet the increased revenue from the 7-cent fare has been more than offset by jitney competition and business depression. Other departments are shown to be making a profit or breaking even.

Fare Restraint Suit Brought

A suit to restrain an increase in fare by the Cincinnati (Ohio) Traction Company on July 1 from 8½ cents to 9 cents was filed in the Hamilton County Common Pleas Court by Saul Zielonka, City Solicitor of Cincinnati, during the week ended June 11. Judge Stanley Struble granted a temporary injunction. The suit, similar to a previous one, was made necessary because under the present franchise of the railway, the company contends it must give notice on the fifteenth of the month where deficits have occurred in operation of its lines.

The company and city officials within the last few days have agreed to changes in the franchise, as a result of which, among other things such injunction suits will be unnecessary in the future. As in the former suits in which an increase in the rate of fares was enjoined by the city, the city solicitor again predicates upon the contention that if proper adjustments are made of credits given to subsidiary companies of the Ohio Traction Company the Cincinnati Traction Company would not have a deficit.

Jitney Regulation in Detroit

A new ordinance has recently been passed in Detroit, Mich., regulating jitneys. The new ruling will compel owners and drivers to furnish surety bonds and to indemnify passengers against loss or injury. Owners must supply a $1,000 bond and pay a $3 license fee for every car operated while drivers must put up a $200 bond. Licenses are revocable at the Mayor's will. The penalty for violation of the ordinance is a $500 fine or a prison term of 90 days. The rule became effective on June 15 and will result, it is believed, in a substantial reduction of such vehicles operated.

Litigation Dismissed in Cedar Falls

At a special meeting of the City Council of Cedar Falls, Ia., on May 31, called for the purpose of further consideration of the long drawn-out fare controversy, a resolution was adopted accepting the Waterloo, Cedar Falls & Northern Railway's proposition. Accordingly the 8-cent cash fare continues until the latter part of August and the city of Cedar Falls has dismissed the litigation and authorized the trustee to turn the balance of the money back to the railway.

The 10-cent fare was established in Cedar Falls in September, 1920, by injunction proceedings in the District Court of Black Hawk County, Iowa. Under an order of court the company was required to issue receipts to passengers requesting the same, covering the difference between a 5-cent cash fare and the 10-cent fare, the money represented by such receipts issued being deposited in the hands of a trustee, to be held as a fund in court for future order of the court. The 10-cent rate was collected under this plan until March 1, 1921. The latter part of February, at a meeting between Manager Cass and the City Council of Cedar Falls, Mr. Cass agreed for experimental purposes to install a 7-cent cash fare rate for the month of March, if they would turn over to the company the money that was in the hands of the trustee represented by the receipts outstanding, in amount of 3 cents per receipt. Further that if the 7-cent cash fare rate did not produce an average gross revenue equal to the average gross revenue at the 10-cent rate for the preceding five months that they would permit an 8-cent fare to be installed on April 1.

The agreement was made, the money was drawn down by stipulation in the District Court, and the 7-cent fare installed. It ran through the month of March and the result showed a 12 per cent increase in travel and about a 16 per cent decrease in gross revenue. On April 1, under the agreement, the company therefore installed the 8-cent cash fare. It ran through the month of April and resulted in a decrease in travel over the 10-cent rate and, of course, a decrease in the gross revenue accordingly.

A series of meetings was held during May with the City Council in an attempt to adjust the whole dispute, and finally the City Council was advised that as a last proposition the railway would continue the 8-cent cash fare rate until the latter part of August, 1921, if the city released the balance of the money that was in the trust fund and dismissed the litigation. Another condition of the proposal was that at the end of August the 10-cent cash rate would be reinstalled if the 8-cent rate did not produce a reasonable return on the investment or equal the average return at the 10-cent rate during the five months that the 10-cent fare was in effect.

As previously indicated, the Council on May 31 accepted the proposition but it did not do so until Manager Cass notified the members that if they did not accept it he would install the 10-cent cash fare rate on June 1 and test the matter out in court.

Purchases Equipment—Wins Business.—The Tiffin, Fostoria & Eastern Electric Railway, Tiffin, Ohio, has a contract for hauling about 35,000 tons of stone. The stone quarry is situated adjacent to the company's track. The business was secured by the railway property's purchasing the necessary equipment.

Safety Zone Plan Extended in Los Angeles

Following establishment of a new style safety zone at Seventh Street and Broadway, the busiest point in Los Angeles, Cal., extension of the zone has been ordered by the city.

When the first test was made safety zones were established at the four corners of the intersection 90 ft. long and 4 ft. wide. The zone was marked by white strips painted on the pavement and by chains suspended from stanchions. Entrance to the safety zone was from the front, in line with the property limits.

The zones have been increased in size so that they are now 100 ft. long and 5 ft. wide from the car clearance line. The white-painted strips are to be replaced with white cement strips inset in the pavement. Two chains instead of one, suspended from heavier stanchions, will mark the limits. The zone has room for two cars to load and unload at the front and rear doors and permits the front door of a third car to enter. When traffic is closed, autos must stop in line with the front of the zone.

The plan has proved satisfactory, is speeding up loading of cars and prevents accidents.

SAFETY ZONE AS ESTABLISHED IN LOS ANGELES

Fare Rise in Sault Ste. Marie

The Utilities Commission of Michigan recently issued an order increasing passenger fares on the Sault Ste. Marie Traction Company from 5 to 7 cents, with four tickets for 25 cents. The order went into effect on April 25 and will be in effect until the commission takes a complete inventory and appraisal of the property. The commission in its finding stated that it was convinced that the company was not earning enough money to meet operating expenses.

Transportation News Notes

Increased Fares in Force.—The Ohio Electric Railway, Springfield, Ohio, has placed in effect the new passenger rates authorized by the State Utilities Commission. They are as follows: Columbus to Newark from 90 cents to $1, one way; to Zanesville from $1.65 to $1.80; to Dayton from $1.75 to $2.

Another Five-Cent Line.—New rates of fare and method of operation will be put into effect in East Boston and Chelsea commencing on June 18, providing a 5-cent local fare, without free transfers, in those sections, and a dime fare to and from Boston proper. General Manager Dana of the Boston Elevated Railway has announced this change.

Must File Lower Rate.—The Pottsville Union Traction Company, Pottsville, Pa., has been ordered to file a tariff at the commission office allowing four tickets for 30 cents. The present charge is 10 cents with no ticket fare in effect. Commissioner Rilling decided that the rate was "excessive and unreasonable." The company was also ordered to extend transfer privileges on its Minersville and Yorkville divisions. The Pottsville Union Traction Company is owned and operated by the Eastern Pennsylvania Railways.

Three-Cent Fare on Municipal Line.—According to a statement given out by Councilman Oliver T. Erickson a sufficient number of signatures already returned virtually assure a vote next spring on his initiative ordinance for a 3-cent fare on municipal car lines of Seattle. Petitions have been circulated for some weeks by the Public Ownership League to get voters to sign their approval of the initiative ordinance to be put on the ballot at the municipal election. Councilman Erickson states that while enough signatures have been secured, the petitions will continue to circulate as a matter of education for the people in acquainting them with the plan.

Jersey Railway Carries 9,000,000 Passengers.—The report of Robert G. Fleming, assistant city treasurer of Camden, N. J., and Martin Schreiber, general manager of the southern division of the Public Service Railway, shows that the jitneys in Camden carried 1,429,166 passengers from Jan. 1 to May 1. The Public Service Railway has carried approximately 9,500,000 up to June 1. The jitney owners' receipts for the four months totaled $100,041. Public Service receipts, it is said, equaled $665,000 by June 1. There are 132 jitneys in Camden. The Public Service Railway carries about 50,000,000 passengers each year on the southern division.

Personal Mention

M. R. Bump Heads N. E. L. A.

F. T. Griffith, Portland Railway, Light & Power Company, Elected a Vice-President

Milan R. Bump, chief engineer for Henry L. Doherty & Company, New York, was elected president of the National Electric Light Association at the closing session of the annual convention of that organization in Chicago on June 3. Mr. Bump succeeds Martin J. Insull, vice-president of the Middle West Utilities Company, Chicago.

Other officers elected were: First vice-president, Frank W. Smith, United Electric Light & Power Company, New York; second vice-president, Walter H. Johnson, Philadelphia Electric Company; third vice-president, Franklin T. Griffith, Portland Railway, Light & Power Company, Portland, Ore.; fourth vice-president, J. E. Davidson, Nebraska Power Company, Omaha; treasurer, H. C. Abell, American Light & Traction Company, New York.

M. R. BUMP

The new president is an engineer of broad experience with a sympathetic understanding and appreciation of all phases of the utility business. Milan R. Bump is the fourth member of Henry L. Doherty & Company to become president of the N. E. L. A. Since 1910, except for a few months six years ago when he was vice-president of the Picher Lead Company, Mr. Bump has been chief engineer of the Doherty organization in charge of all engineering and of the construction and operating departments of the public utility division. Later he became a member of the executive committee of the company in charge of the oil transportation, refining and marketing divisions and the natural-gas division.

Mr. Bump was born at Rock Falls, Wis., March 18, 1881. At the age of twenty-one he was graduated in electrical engineering from the University of Wisconsin. In 1904 he became associated with Henry L. Doherty as the first cadet engineer of the Doherty training schools. He served as engineer on several Doherty properties until 1910, when he came to New York to take up his present duties. During his first five years as chief engineer of the Doherty organization Mr. Bump was engaged largely in examining for purchase and revamping many of the utility properties of the Cities Service Company subsidiaries.

In his work of rehabilitating sick utilities Mr. Bump has become a firm believer in the value of good public relations. It is not surprising therefore to find in him one of the most ardent advocates of customer ownership of public utility securities. He is a thorough student of public utility problems even though they be apart from engineering, and through his executive touch with properties in more than half the states he brings to the N. E. L. A. a well-balanced national point of view that should prove of immeasurable value to the electric light and power industry.

Franklin T. Griffith, third vice-president of the association, is a public utility executive who, for a number of years, has fought for water-power legislation that will permit the economical development of Western power resources.

As an attorney he has made great strides in codifying laws governing the development of water powers, and as president of the Portland Railway, Light & Power Company, Portland, Ore., he has been applying his sympathetic understanding of human nature to smooth the way for the utility in best serving the public. When the national water-power laws were being formulated the experience and advice of Mr. Griffith were widely sought, and he gave largely of his energy in constructive thought on this legislation. Then and since, as chairman of the water-power development committee of the National Electric Light Association, he has untiringly worked to bring about far-sighted interpretations of these laws with workable rules and regulations so that the most beneficial results shall be gained.

H. C. Abell, who was re-elected treasurer of the N. E. L. A., is the chief engineer for the American Light & Traction Company, which is the holding company of the Muskegon (Mich.) Traction & Lighting Company, the San Antonio (Tex.) Public Service Company and many light and gas properties.

Attorney Elected President

Jack Beall to Complete Texas Interurbans Left Unfinished by the Late Colonel Strickland

A brief item published last week announced that Jack Beall, former Congressman from Texas, and for the last six years one of the general attorneys for the Texas Electric Railway and other interests of the late Col. J. F. Strickland, has been elected president of the Texas Electric Railway to succeed Colonel Strickland at the meeting of the board of directors in Dallas on Monday, June 6. At the same time the board created a new position, that of chairman of the board, and elected to this post N. A. McMillan, St. Louis, executive manager of the First National Bank of that city and head of the St. Louis Union Trust Company. Mr. McMillan has been closely associated with Colonel Strickland in financing the building of the interurban lines and also in his other enterprises. Two vacancies on the board of directors were filled by the election of C. G. Comegys, of the city of McKinney, and Burr Martin, Dallas.

JACK BEALL

Mr. Beall took over his duties as president of the Texas Electric Railway immediately after his election. He has announced that he would carry out the same general policy that Colonel Strickland had followed, and asked the co-operation of all employees of the company. The first important work left unfinished by Colonel Strickland to be taken up by Mr. Beall is the building of the interurban line to Terrell. Work on grading for this line has already begun, and Mr. Beall says work will be rushed and the line completed as soon as possible.

Mr. Beall is a native Texan, having been born a few miles west of Waxahachie on Oct. 25, 1866. He was educated in the country schools of that district and later taught school for several years before he entered the University of Texas in 1886. He was graduated from the University of Texas in 1890, taking his degree in law. He then entered the practice of law at

Waxahachie and was elected to the Texas Legislature in 1892 and to the State Senate in 1894. Mr. Beall was elected to Congress in 1902 and served continuously as representative of the Dallas district until March 4, 1915, when he resigned to take over his duties in the legal department of the Texas Electric Railway.

Appreciation of Mr. Brooks Shown at Testimonial Dinner

Frank W. Brooks, retired president of the Detroit United Railway, was given a testimonial dinner at the Detroit Athletic Club on the evening of June 8. About 600 officers and employees of the company, among whom were present several who have been with the company over thirty years, expressed their appreciation of Mr. Brooks. As tangible remembrances, the employees presented their resigning leader with a grandfather's clock, a diamond ring and an engraved testimonial, which recites Mr. Brooks' personal merit and his efforts in behalf of the company.

Besides selected guests, Elliott G. Stevenson, counsel for the D. U. R.; Alex Dow and John C. Donnelly, directors; Allen F. Edwards, acting president; J. C. Hutchins, chairman of the board, and E. J. Burdick, assistant general manager, were seated with Mr. Brooks.

F. W. Miller has been appointed superintendent of the Hartford Division of the Connecticut Company, the place made vacant recently by Nathaniel J. Scott when he succeeded the late Warren P. Bristol as manager. Mr. Miller has been with the company thirty years and has worked his way up to his present position. John A. Kiely, who began twenty-five years ago as a motorman and was successively inspector and chief dispatcher, has been appointed assistant superintendent. William W. Melaven has been made general barn foreman. These are the appointments of Manager Scott.

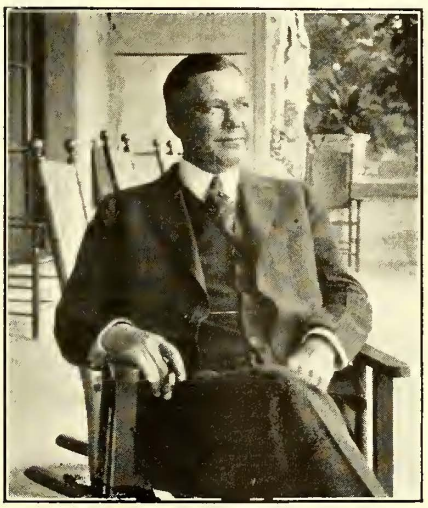
Edward C. Connor, who has been chief engineer to the supervisor of public utilities of the city of Dallas, Tex., tendered his resignation on May 1. The resignation was accepted by John W. Everman, supervisor, but an appointment to the vacancy has not been announced. Mr. Connor is one of the best known civil engineers in Dallas and his work as chief engineer to the supervisor of public utilities has covered valuation of the traction company's lines in connection with the company's application for a fare increase, negotiations looking toward the drafting of a new franchise for the Dallas Railway and the carrying out of the commitment of the traction company in connection with the building of another interurban line into Dallas, which was recently begun and which will extend to Terrell. It is rumored that W. J. Powell, former city engineer, will be tendered the place.

W. O. Wood President

Queens County Railway Official Elected at New York Meeting Last Week—Eighteen Years in New York

At its annual meeting at Lake George on June 11 the New York Electric Railway Association elected as president one of the best-known railway men in the country. This is William O. Wood, whose fund of humor is equally well recognized with his ability as a railway operator. Mr. Wood is president of the New York & Queens County Railway, a position which he has held since 1908. He is also vice-president and general manager of the Long Island Electric Railway and the New York & Long Island Traction Company. All of these properties are affiliated with the Interborough group in New York.

Mr. Wood succeeds T. C. Cherry, vice-president and general manager of the Rochester & Syracuse Railroad, as head of the association. Mr. Wood has long taken an active and forward participation in the work of the state body



W. O. WOOD

and his election to the office of president is a recognition of his services and interest in behalf of the organization. During the past year he served as first vice-president of the New York Association.

Mr. Wood began his electric railway experience in 1900 when he was appointed general superintendent of the Rapid Railway in Detroit. From that city he went in 1903 to Brooklyn, where he became superintendent of the elevated lines of the Brooklyn Rapid Transit Company. The following year he was appointed assistant general superintendent of the company. In 1907 he resigned to become associated with the Interborough Rapid Transit Company and for a year was engaged in special work, reporting to President Shonts.

Mr. Wood was born in Evansville, Ind., and prior to being connected with the electric railway industry was for a time with the Louisville & Nashville Railroad, then with the Flagler lines in Florida and later with the Illinois Central Railroad.

Obituary

Judge Ira B. Mills, chairman of the State Railroad & Warehouse Commission of Minnesota, and a former president of the National Association of Railroad & Public Utility Commissioners, died in St. Paul on May 4 at the age of seventy. Judge Mills was the oldest public utility commissioner in the United States in point of service, having been in office since 1893.

James O. Ellis, manager of the Chelsea Division of the Eastern Massachusetts Street Railway, died on June 9. He was 51 years old. He was born in Brooks, Me., Aug. 19, 1869, and began railroading as a driver of horse cars on the Lowell division of the Lynn & Boston, the former name of the Eastern Massachusetts Street Railway. He became an inspector and finally rose to the position of superintendent of the Reading Division. Nine years ago he was made superintendent of the Chelsea Division, succeeding George H. Gray, who was made general superintendent. The Chelsea Division includes lines in Revere, Chelsea, Malden and Melrose.

William W. Magoon, formerly general manager of the Ohio Valley Electric Railway, Huntington, W. Va., and one of Huntington's most prominent citizens, died recently in Kenova. Mr. Magoon went to Huntington about thirty years ago from Vanceburg, Ky., to build an excelsior plant, but later became identified with the Camden Interstate Railway. He was general manager of the Ohio Valley Electric until about five years ago, when he resigned because of ill health. He was also secretary and treasurer of the Blue Jay Manufacturing Company, which is one of the largest overall manufacturing concerns in the world. He was also secretary of the Huntington Credit Men's Association. He was one of Huntington's most active workers and boosters, and he devoted much of his life along those lines.

Edgar M. Graham, consulting engineer in Muskogee, Okla., was killed May 14 in an automobile accident. For more than ten years Mr. Graham was chief engineer of the Muskogee Electric Traction Company. He built during this time about 10 miles of the Webbers Falls Railway. In 1900 he became assistant to Guthrie & Diehl, consulting engineers, Buffalo, N. Y. The following year he went with the New York Central Railroad and then was with the Lackawanna Steel Company for two years. In 1905 he became chief draftsman for the Buffalo & Susquehanna Railway, and in 1907 was made assistant chief engineer. He entered private practice in Buffalo in 1908. Mr. Graham was forty years old. He had long been active in engineering society affairs.

Manufactures and the Markets

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

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Crossarm Buying Shows Some Increase

Greater Demand May Be Due to Lower Prices—Cut of 10 per Cent This Month

Whether it is due to recent price decreases or not is uncertain but producers report that buying of crossarms shows quite an increase of late. This increase in demand is not noted in the electric railway field, however, as it centers around central station buying. Demand is still far from normal but producers are encouraged that it should show up as well as it does.

There may be some connection between current buying and the price situation for on the first of this month a general cut on longleaf yellow pine crossarms was made amounting to about 10 per cent. Fir crossarms were not affected by the drop. This is not the first price decrease on crossarms this year as a cut amounting to 15 per cent was made on Feb. 1 and another varying from 9 to 15 per cent on March 1. These covered both fir and pine arms.

Stocks are reported to be good with immediate shipments prevailing. Producers are optimistic that the market will open up considerably more during the latter months of the year.

Stocks of Waste Are Not Extra Large

Textile Mill Shutdown Has Curtailed Supply—Prices Are Down, but Buying Shows Little Improvement

With textile mills either shut down or very nearly so for several months past it is doubtful if there is a very great surplus of waste in the country. The raw material of waste is a by-product of these mills and, furthermore, waste manufacturers have held their stocks down in line with current business conditions. At the present time deliveries are immediate but only because demand is low and orders too small to push shipments. There has been a slight improvement reported in the textile situation in New England recently but operation there is still very spasmodic, and it is a question whether or not an increase in demand would not push deliveries on waste.

It seems unlikely that any such increase in buying will materialize for some time, however; not before the last quarter, producers think. The general market situation is quiet with railways buying from hand to mouth and industrial demand, which is usually very considerable, flat. One producer at least reports slight signs of increased activity but others do not confirm this.

Competition is very keen and prices are down accordingly. Within the past month quotations have been lowered one cent per pound at least. Current quotations from several waste manufacturers in lots of 100-lb. bales show on white cotton waste a range of 7 to 12 cents per pound; on colored a range of 5½ to 10½ cents, and on wool waste the price varies from 8 to 17 cents.

Recent Price Cut on Pole Line Hardware Not General

Buying Shows No Reaction, Although Three Reductions Have Been Made This Year—Deliveries Are Immediate

Although one producer of pole-line hardware has just made a 5 per cent price reduction effective June 16, and a large manufacturer's distributer reduced the price 5 per cent about a week ago, there has been no general recent decrease so far as can be learned. Manufacturers in this line have apparently reached the conclusion that price cuts will provide absolutely no stimulus to buying, consequently reductions represent lower costs and nothing more. Three general price cuts have been made since the first of the year and buying has shown little or no reaction. The first cut of 5 to 15 per cent was made in late December and early January, the second of 5 to 7½ per cent on Feb. 15 and the third from 7½ to 10 per cent occurred on April 11.

At the present time there are a few orders and inquiries coming in from central stations but none from electric railways. Stocks have been reduced, one producer who had $500,000 worth of goods on hand earlier this year having cut this down by one-third now, but deliveries are mostly immediate and not longer than one week at the most.

150 More Cars for Detroit

In line with the tremendous construction program under way on the municipal railway system of Detroit, Mich., the city has advertised for bids on 100 safety cars and fifty double-truck Peter Witt cars. Bids are to close on June 28, the company advises. On Nov. 16, 1920, the railway ordered twenty-five safety cars from the Osgood-Bradley Car Company and on April 15, 1921, purchased twenty-five additional safety cars from the same concern. An order for rails and kindred material which the city placed last month, totaling about $800,000, was mentioned in the May 21 issue.

Bituminous Coal Production Holds Up Well

Current Average of 8,000,000 Tons Weekly More Than Present Light Demand Can Absorb

Possibility of a shortage of bituminous coal materializing this fall seems more remote in view of the consistent maintenance of current output. For the past four weeks production has proceeded at the rate of 8,000,000 tons per week according to the Geological Survey, or about 2,000,000 tons above the low point reached early in April. Incidentally this rate of output, *Coal Age* states, is considerably more than can be absorbed under present industrial conditions.

Buying has been restricted to the barest needs, though some forward contracts have been closed. Consumers are still holding off under hopes of lower freight rates and reductions in the price of coal, and this policy is encouraged by the facility with which needs can be filled. It is stated that there will be no general reduction on coal freight rates this year, however. The Secretary of Commerce this week gave it as his opinion that nothing will come of the negotiations between the administration and the railroads looking to a reduction of freight rates on coal. There may be local changes, of course, but they will be made only by rate hearings and after considerable delay.

Export Buying Light, with End of British Strike Near

The export market is dull at the present time as purchasing on British account has slumped in anticipation of an end of the coal strike in Great Britain next week. As a result of the weak condition of the steam coal market prices have further eased off recently. The index of spot coal prices of *Coal Age* declined to 95 on June 14, the lowest figure touched this year. This number represents all prices reduced to one figure and compared with the average government price of 1918 which is taken as 100. The first of the year this index number ranged around 130 but since February it has remained in the neighborhood of 100.

Labor costs at the mines are as yet undiminished. All efforts to open discussion with the United Mine Workers for wage reductions have thus far failed and no prospect of a cut in union wages can be seen this summer. Further than that, of course, the situation is uncertain. Meanwhile, non-union coal produced at lower wages continues to offer keen competition to union coal in the eastern market.

New and Scrap Steel Market on Lower Level

Price Reductions of from $3 to $5 on New Steel Products Fail to Move Much Material

It is felt that the iron and steel trade is operating on a level that is about as low as it can go. A figure of 25 per cent will just about indicate the rate of operation of Corporation and independents together, a figure 5 points lower than it was a week or two ago. With a generally lower volume of business this past week the general tone of the market is softer and some definite price reductions in certain steel lines have been noted.

Iron bars are off 13 cents a hundred pounds to $2.25 and in New York the reduction is 15 to 20 cents to $2.23 to $2.28. Steel bars at Pittsburgh are holding at 2.10. In the sheets black, Pittsburgh, is down $3 a ton to 3.85 and blue annealed is down $4 to 2.90. On plain wire quotations are now 2.75 and on galvanized barbed 3.85 cents, $5 a ton lower than recent prices. Malleable at Chicago is 50 cents lower at $22.20 per gross ton while Pittsburgh bessemer is $1 lower at $24.96. Prices are being shaded on track spikes, quotations on which are $3.40 base, Pittsburgh. Base on track bolts is $4.35, and here too is some shading, probably of $3 per ton.

Since June 7 the scrap iron and steel market has dropped from 50 cents to $1. Old steel axles are $1 lower to $13.50-14.00 and No. 1 cast is $1 lower to $13.00-13.50, all in net tons, Chicago. Old iron axles are steady at $24-25. In gross ton lots, Chicago, 50-cent reductions have been applied to car wheels, bringing them to $13.50-14; R.R. malleable, which is now $13.50-14; frogs, switches and guards, which stand at $11-11.50; old steel rails, short, which are quoted at $12.50-13, and rerolling steel rails, $13-13.50. Buying in this market is extremely quiet.

Insulation Makers Optimistic Despite Light Buying

Good Price Declines of the Past Week Bring Total Decline Since First of Year to Large Figure

Quietness is still the prevailing feature of the electrical insulation market. Repair shops are buying hand to mouth, for most of them are not busy. Industrials are operating at reduced capacity, and furthermore they ordered ahead when deliveries were long so that little buying is being done in that quarter. Electric railways are endeavoring to get along on such insulating material as they have and buy only for immediate needs, and as the appliance industry has been slack for a long time, small motor manufacturers are not active. One of the latter, for instance, recently bought 15 lb. of mica where a normal order formerly totaled 100 lb.

The general outlook is held to be far from discouraging, however. The very fact that motor manufacturers, electric railways, etc., are not stocking insulation means all the more potential business yet to be placed, and as it seems there is not a great volume of repair work being done insulation needs along that line are piling up. Just when this business will break is, of course, a question, but the majority of producers are not expecting anything much to develop in the way of increased business before the first of September.

Buyers apparently do not yet have confidence in present prices despite the radical reductions which the latter have undergone. Prices are still declining, it is true, but it is possible this is largely a result of conditions of keen competition. Since the first of this year, according to one of the large producers, cotton tapes, webbings and sleevings have declined 70 per cent, 25 per cent of this drop occurring just this week; varnished cloths have declined about 28 to 35 per cent, one-fourth of which decrease also was made this week; cotton armature twines, except linen, are down 33⅓ per cent and insulating varnish about 20 per cent. India mica up to the present is undiminished in cost as the price at the mines has not been reduced, but the South American product is now somewhat lower.

Conditions of stock vary considerably, though all producers are pursuing a policy of keeping down inventories and only producing on order. Deliveries of standard material for the most part are immediate, as in general stocks are too large rather than too small under present buying.

Schedule Material Prices Marked Lower Last Week

From about the ninth to the thirteenth of June the various manufacturers of schedule materials increased some of their discounts and lowered certain list prices so that the general result was a decrease in prices averaging around 10 per cent in standard-package quantities. With this general easier price, however, it can hardly be expected that any great amount of business will be stimulated, for the building construction outlet is not yet in a condition to absorb any large amount of schedule material and wiring devices.

Fuse Prices Down 11 to 17 per Cent the Past Month

With the recent price reductions announced on non-renewable fuses by several manufacturers, quotations on both this type and on renewable fuses are now down. Effective the middle of May, leading manufacturers reduced prices on renewable fuses approximately 17 per cent by increasing the discount allowed to distributers 10 points.

Non-renewable fuses were not affected by this drop, however, but the first of this month reductions were made by a couple of manufacturers. Other producers have since then taken similar action, until with further decreases that did not come through until last week non-renewable fuses may be said to have been generally reduced from 11 to 16 per cent this month.

Hydro-Electric Development Proposed for Jamaica

Plans are under consideration at present for the construction of a hydro-electric plant in Jamaica, to cost about £614,740. The present plans provide for a 6,000-kw. development, to include the erection of three power stations equipped with a water turbine directly connected to a three-phase alternating-current generator. Transmission will be both by underground cable in one section and by overhead lines to a main line along the railway. The project also includes the electrification of the railways on the island.

Franchises

Galesburg Railway, Lighting & Power Company, Galesburg, Ill.—The Galesburg Railway, Lighting & Power Company has been granted a franchise to construct, maintain and operate a street railway on South Henderson Street from Knox Street to Monmouth Boulevard. The new franchise will help the company to connect its interurban lines. Work on the new extension has already been started.

Track and Roadway

Tri-City Railway, Rock Island, Ill.—The Moline City Council has instructed City Attorney James M. Johnston to petition the Illinois Public Utilities commission to issue an order compelling the Tri-City Railway to put in new tracks on Fifteenth Street from Eighth to Twenty-fourth Avenues, so that the city may advertise for bids for the paving of the street with brick, with the assurance that the railway will not hold up the work, by refusing to put in new rails.

Southern Indiana Gas & Electric Company, Evansville, Ind.—An agreement has been reached by the Southern Indiana Gas & Electric Company at Evansville, Ind., with the city whereby the company will improve three streets in that city, according to a recent announcement of Mayor Benjamin Bosse, of Evansville.

Interstate Public Service Company, Indianapolis, Ind.—The Indiana Public Service Commission has refused to declare unreasonable an ordinance passed by the city council of Shelbyville ordering the Interstate Public Service Company, Indianapolis, Ind., to make improvements and extensions. The company has appealed to the commission to disapprove the ordinance.

Public Service Railway, Newark, N. J.—The Public Service Railway has been asked by the City of Burlington, N. J., to lower its tracks through the entire city in order that street paving might be started. The work of lowering the tracks will require some time.

Interborough Rapid Transit Company, New York, N. Y.—The new Rapid Transit Commission, New York, N. Y., is preparing plans for the extension of the Queensboro subway from Gilroy Avenue and the Willets Point Boulevard, Corona to Main Street, Flushing. The Board of Estimate has already authorized the extension of the Corona line from the present station at Alburtus Avenue, Corona, to the new storage yards.

Columbus, Delaware & Marion Electric Company, Columbus, Ohio.—The Columbus, Delaware & Marion Electric Company has secured permission from a majority of property owners in Indianola Avenue to lay double tracks for a distance of 800 ft. to Oleantangy Street. The Council is expected to act on a 20-year franchise ordinance permitting the work.

Johnstown & Somerset Railway, Somerset, Pa.—Work will be resumed on the construction of the Johnstown & Somerset Railway which was suspended during the war though six miles had been completed. The line has been operating for a year. In view of the reduced cost of material and labor the board of directors has decided to push the project through. Four miles from Holsopple to Jerome will be finished within 90 days. Engineers are busy now on the line from Jerome to the Lincoln highway via Boswell.

Montreal (Que.) Tramways. — The Kelly Street extension of the Montreal Tramway service will be completed shortly, and the new service from Ahuntsic station to the Canadian Pacific Railroad at Bordeaux will be commenced early in June.

Tacoma Railway & Power Company, Tacoma, Wash.—Frank R. Spinning, ation earning basis, and that the city State Department of Public Works, has announced that he will do all within his power to see that the College of Puget Sound is provided with street car service, urging that the line be obtained by friendly and co-operative means. The Tacoma Railway & Power Company, through Manager Richard T. Sullivan, proposed that the company will build the extension, if the city will remit gross earnings tax to the amount of any deficit that occurs in the operation of the line, figured on an 8 per cent earning basis; and that the city relieve the company of its paving obligations on Portland Avenue when that street is paved. Mayor C. M. Riddell pointed out that the city charter absolutely prohibited the Council from agreeing to any such proposition.

Power Houses, Shops and Buildings

Terre Haute (Ind.) Traction Company.—The Terre Haute Traction Company is preparing to ask the Public Service Commission for permission to finance a $500,000 enlargement and extension of the Water Street power house. The report adds that an imposing $200,000 traction terminal for Terre Haute is also in mind, for which plans have been prepared some time. Under a recent grant of increased rates the company contracted to spend all of the additional income provided in betterments. The new power generating machinery here will be the first step toward complying with this contract, and the terminal station will come along soon after.

New York, Westchester & Boston Railway, New York, N. Y.—Plans are expected to be filed with the Public Service Commission of New York by the New York, Westchester & Boston Railway providing for establishment of a new terminal at 129th Street and Third Avenue, which will cut 15 minutes off the running time between Westchester villages and downtown New York. A through express service to lower Manhattan will be available under the plan by connection with the Third Avenue L at 129th Street.

Trade Notes

The Clark-Hunter Company, Inc., 161 Summer Street, Boston, is now manufacturing the Duwell motor-driven bench grinders at its Worcester factory.

The American Metal Molding Company, Newark, N. J., is now producing a full line of conduit elbows in addition to its flexible armored conductor and metallic flexible conduit. Sufficient factory capacity also is available to turn out special press work for the commercial trade.

The Schiefer Electric Company, 614 City Bank Building, Syracuse, N. Y., has been appointed to represent the Condit Electrical Mfg. Company, Boston, Mass., handling its complete line in the vicinity of Syracuse and the eastern part of New York State exclusive of New York City.

Power Specialty Company, 111 Broadway, New York City, manufacturer of Foster superheaters, economizers, and oil stills announces that it is just completing the expenditure of about one-half million dollars in the enlarging of its works, including new steam power plant and new forge shop.

The Westinghouse Electric & Manufacturing Company has announced the opening of its service department and repair shop at 1535 Sixth Street, Detroit. It is a five-story building and similar to the sixteen buildings erected in the principal industrial centers of the United States for repair purposes. The new repair shop is equipped to handle the designing and manufacture of all types of switchboards in the same way as they would be handled at the main works, and in addition dipping tanks and baking ovens are available. Stocks of repair parts are carried. The company's engineering organization, it is stated, is prepared to install or repair electrical or steam apparatus on the owner's premises.

Ohmer Fare Register Company, Dayton, Ohio, states that there is a continuously increasing demand for Ohmer register service on city lines. Among recent large contracts placed with the company is an order from the Georgia Railway & Power Company, of Atlanta, Ga., for equipping its entire city property with 418 Ohmer No. 3 type, time-feature, totalizing registers and rapid transit operating equipment. This corporation has also given to the Ohmer Company other contracts for equipping its interurban divisions with registers. The Shreveport (La.) Railways Company has likewise placed a long-term contract for the installation of 44 No. 3 type, time-feature, totalizing registers with rapid transit operating equipment for use on all of its city lines.

New Advertising Literature

Steam Separator. — The Griscom-Russell Company, 90 West St., N. Y. City, has issued bulletin No. 1140 describing its "Stratton" steam separator.

Damper Regulator.—The Atlas Valve Company, 282 South Street, Newark, N. J., has issued bulletin No. 5, describing its Victor damper regulator No. 3, high-pressure.

Headlights.—The Electric Service Supplies Co., Philadelphia, Pa., has issued a limited number of copies of its new engineering report, No. 351, on glass reflectors for headlights.

Electric Drill.—The Louisville Electric Manufacturing Company, Louisville, is distributing a circular covering its No. 3, two-speed, and No. 2, single-speed "Universal" electric drills.

Arc Welding.—"Electric Arc Cutting and Welding by Alternating Current" is the title of a new fifty-two-page publication of the Electric Arc Cutting & Welding Company, Newark, N. J.

Belt Conveyor Idler.—C. W. Hunt Engineering Corporation, 143 Liberty St., N. Y. City, has issued a folder describing its new self-aligning, all-steel, troughing, belt conveyor idler.

Bench Grinder.—The Clark-Hunter Company, Inc., 161 Summer Street, Boston, is distributing a four-page leaflet describing the "Duwell" motor-driven bench grinder.

Electric Welders.—Bulletin No. 1 issued by the American Electric Fusion Corporation, 1906 North Halsted Street, Chicago, describes its type "VW" vertical welders.

Multi-Phase Renewable Fuse. — The Federal Electric Company, Chicago, has developed a multi-phase time-limit renewable cartridge fuse designed to prevent polyphase motors running single-phase.

Electric Hoists.—The Electric Hoist Manufacturers' Association, 165 Broadway, N. Y. City, has issued an illustrated bulletin on "Approved Applications of Electric Hoists," with a separate bulletin inclosed entitled: "Monorail Runway Construction."