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REFORM IN CAR WASHING

The results of the analytical investigation of the subject of car washing by the Detroit United Railway, published elsewhere in this issue, carry a lesson in economy that is of great value to the companies. Before the conclusions were announced the subject was considered from every possible standpoint, and the improved methods developed as a result of the tests received a thorough trial. If car-washing is in the hands of careless workmen without proper supervision, the loss to the company may be very heavy. In order to accomplish the mere end for which they are working, the washing of the car, the men may use water heated to too high a temperature or solutions that are not made properly. Both of these risks can be overcome by the methods recommended by the Detroit United Railway, and no company can afford not to overcome them. In the chemical analyses and in all of the conclusions drawn therefrom extreme care and conservatism were used, particularly after the extent of the economy arising from even a slight lengthening in the life of paint and varnish became apparent. The gratifying prospects of economy shown in the article by Mr. Smith, therefore, represent moderate estimates of the advantages anticipated.

GIVING WIDE PUBLICITY TO ROUTE CHANGES

It is clear that a good many managers fail to realize the opportunity for well-directed publicity which occurs whenever important route changes are put into effect. In view of the interest of the public in all features of the service with which its comfort and convenience are associated, something more than a bald announcement of an impending change in car routing is highly desirable. Here is excellent publicity material. Such changes are properly the result of careful studies of traffic distribution, development of neighborhoods, shifts in population, temporary municipal construction arrangements, important repairs to track, or other special events or conditions which are all in the day's work to the railway man but which are matters of genuine news interest to the people at large. If a company can bring out these news features in announcing alterations of a more or less permanent character in its schedules and routes, much good can be accomplished. The local press is pretty likely to accord liberal space in its reading columns to such matter, and it is certain to be perused by the great mass of readers because the majority are directly and personally affected by the change in routing. Moreover, the carefully prepared, brief explanation of the reasons for such changes disarms an extraordinary amount of potential criticism. Many people are constitutionally opposed to changes of any sort and do not realize, for example, that by the shortening of a route between two terminals of dissimilar population it may be possible for a company to give even better service between an intermediate point and the larger center. A simple explanation in connection with the announced change may obviate a great deal of illogical grumbling by people who are really benefited by the change and contribute to the stock of popular good will which is always so great an asset for an operating company.

CONFLICT OF PUBLIC SERVICE COMMISSIONS

A suit recently brought by the Southern Pacific against the California and Arizona Railroad Commissions has finally crystallized the question of the conflict of the two state commissions over matters pertaining to a line common to both states. Attorneys for railroads and interurban electric lines have long been perplexed as to the relative or final jurisdiction of state public service commissions in cases where a road is attempting to improve its system as a unit and finds itself confronted by several and often conflicting orders in the states containing the unit. The immediate cause of the present suit was the refusal of the Arizona Railroad Commission to authorize a two-year note issue of $30,000,000 already consented to by the California Railroad Commission. When two public commissions thus have a head-on collision in a matter of mutual interest, the result simply puts one more crack in the theory of public service regulation of security issues under our present system of state government. The Supreme Court has cleared up the question of the relative jurisdiction of state commissions and the Interstate Commerce Commission over the valuation of carriers as a basis for interstate and intrastate rates, but now it will probably be called on to decide a conflict of state commission jurisdiction in a purely financial matter over which the Interstate Commerce Commission has no control. If the present commission control is to continue, some way must be devised whereby proper weight may be given to the decision of an equally empowered but foreign commission having jurisdic-

tion over the same case. Otherwise we shall have a louder demand for an increase in power of the Interstate Commerce Commission to cover such financial questions. A clear-cut decision, free from all technical and legal subtleties, defining the extent of the powers of state commissions to prescribe the terms upon which a corporation engaged in interstate business may secure money required for its corporate purposes would aid materially in settling this conflict of jurisdiction, and such a decision is needed.

PENNSYLVANIA PUBLIC UTILITY LAW

The "public service company law" recently passed by the State of Pennsylvania, which was abstracted in detail in the news notes last week, is on the whole better than most of those which have been passed in other states during the past two years. As originally introduced the bill was exceedingly crude, but by the process of amendment it was considerably improved before its final passage. Whether in practice it will be as effective and satisfactory to all parties as its sponsors predict is a matter, of course, for the future to decide. We say "of course" because this country is really on the threshold only of good public utility legislation and regulation. Our lawmakers as yet are only groping their way in the dark so far as this matter is concerned, and this is probably the reason for the exceedingly imperfect and ill-considered acts of this kind which have been put upon the statute books of some of our states recently. It should not be forgotten also that the success of public service regulation in any state depends quite as much upon the character of the men chosen to administer its provisions as upon the act itself. Indeed, so important is the personality of a public service commission that a good body can do well under a bad law, whereas a bad commission is able to accomplish a great deal of harm even under a good law. Not only, then, is the general plan of public service regulation still in an experimental state in this country, but we are still uncertain whether under our form of government and the method generally followed for the appointment of such commissioners it is possible to secure and retain such a high standard of men as the importance of their duties requires. It may be that their term of office will have to be extended to equal that of our judges in the highest courts—say for fifteen years or for life. The ten-year term under the Pennsylvania law seems to indicate a tendency in this direction.

To discuss concretely now some other provisions of the Pennsylvania law—one of the sections of greatest moment in any law of this kind is that which deals with the issuance of securities. In the Pennsylvania act two methods are outlined. Under the one the public service corporation may apply to the commission for permission to issue its securities, stating the various terms, conditions and purposes of the issue, and if the commission finds the facts set forth in the application to be correct, it grants its "certificate of valuation." In case, however, the issuance of the securities is immediately necessary, the public utility is permitted to proceed without the official sanction of the commission, provided it subsequently files with the commission a "certificate of notification," giving the purposes and a detailed description of the issue, and accounts for the application of the money arising from the sale. Thus, under either plan the public is protected from fraudulent stocks and bonds, and at the same time the system is so elastic that no corporation should be seriously hampered in the making of necessary improvements.

Of scarcely less importance is the final solution reached by the Legislature in the always perplexing matter of the abolition of grade crossings. The Pennsylvania Legislature recognized the futility of attempting to establish in advance a hard and fast method of a division of the expense of improvements of this kind. Local conditions vary so greatly that any set rule is apt to be inequitable in nine cases out of ten to one or two of the interested parties—the railway, the State and the municipality. Hence, the commission has received power under the act to apportion the cost in each particular case as the benefits to be derived from the improvements by each may appear upon an examination of the circumstances. This, it is true, places a great deal of power in the hands of the commission, but if its decisions are made judicially and impartially no more satisfactory plan could be devised, and the whole principle of public service regulation depends upon the selection of men for commission work who will decide questions of this kind fairly and equitably.

The section of the law concerning the keeping of accounts is important in view of the present agitation for municipal ownership. The idea has been prevalent in some circles that fabulous profits exist in public utility ownership and operation, and this belief has undoubtedly inspired to a great extent the movement in this country for municipal ownership, especially of electric light plants. Authoritative data, however, as to the realization of such profits and the comparative economies of privately and municipally owned plants are lacking. The Pennsylvania law states, however, that both privately and municipally owned utilities must keep uniform accounts and render reports to the commission, a provision which should materially aid in making more nearly possible a conclusive comparison of the two methods. The law also places a desirable restriction on any municipality wishing to furnish its citizens with service already offered by a private utility, in that before so doing it must obtain from the commission a "certificate of public convenience." Thus the commissioners, not the local authorities, are the final judges of the needs of the public, and they have power to protect a private company doing good business from unregulated competition by municipally operated plants. This provision, while benefiting more directly light and power properties, nevertheless protects all investments in public utilities better than before.

As a counter-provision to the above concession to privately owned utilities, however, a section once eliminated was reinserted, providing that no contract between a public utility and a municipality is valid unless approved by the commission. This obviates the difficulty under former conditions whereby corporations could make contracts with municipalities that would debar the commission from control of the corporations owing to the inviolability of the contract relation.

The final, and perhaps most important, part of the act which we shall discuss here is that which is the most important part of any act of this kind, namely, that relating to

rates and the methods to be employed by the commission in enforcing its rulings. Under the Pennsylvania law the commission has power over rates, and severe penalties are provided for refusal to follow its orders. But the rigor of these penalties is somewhat lessened by the procedure outlined for appeals. Upon an appeal from any order of the commission the Dauphin County Court is authorized after a special hearing to grant an interlocutory order of supersedeas upon such terms and conditions as it, in its discretion, may prescribe. A more specific provision is made in the case of an appeal from an order establishing or changing rates, prices, etc., for such an appeal itself acts as a supersedeas, in case a bond is filed with the Commonwealth to provide for damaged parties in the event of a decision adverse to the utility. On the refusal to obey any order of the commission, therefore, the penalties will not apply if any appeal is brought immediately and sufficient reasons are given for the issuance of an interlocutory order, and in the case of a refusal to establish new rates the appeal automatically suspends the penalties. These arrangements make posssible a punishment for a deliberate and groundless refusal of obedience yet do not bar the utilities from recourse to the courts for the redress of actual injustice.

The Pennsylvania Legislature seems to have been little influenced by the prevailing haste to make public utility legislation, and the result is a fairly comprehensive and detailed law. Undoubtedly there are errors in it of omission and commission which time will bring to light. But in view of the tendencies of the day and after the act is balanced pro and con, it seems a better example than usual of public utility legislation because while making provision for the settlement of grievances against public utilities it still affords to them some protection against persecution on the part of the authorities.

AVOIDING OR MAKING TROUBLE?

"Street Railway Avoids Trouble with the City by Making Concessions." This is the column heading used by several daily newspapers reporting the settlement of a dispute entered into last week by a railway company and the authorities of the city in which its lines are located. Without reference to this particular agreement, which for the sake of argument may be assumed to be entirely wise and proper, there is ample reason to question whether public service corporations avoid trouble by "concessions." When the corporations are in the wrong, when the demands of a municipality or a public service commission are just, of course the corporation must make concessions. But to avoid immediate trouble too many surrenders are made which should not be made. A long succession of such surrenders leads to a situation—a state of mind—in which it appears to be the rule that railways have no rights which administrative bodies or the public need respect. The treatment of the steam railways in connection with compensation for carrying the mails is an example of what happens as a result of constant concessions, or, in other words, constant surrender to impositions. Notwithstanding the fact that the railroads were performing a constantly increasing service, their pay was reduced from 34 per cent of the postal revenues in 1901 to 21 per cent of the revenues of 1912. Then the parcels post law was passed, with only casual consideration of the additional work it would impose on the carriers, and a 5 per cent increase in pay was grudgingly voted for a 30 per cent increase in postal business. Very soon the 11-lb. limit is to be increased to 20 lb. without any provision for increased compensation to the railroads which have had weighings under the 11-lb. rule.

We cite this case because it happens to be a current illustration of the results of making "concessions"—that is to say, of submitting to exactions without a fight—but other examples in which electric railway companies have been the sufferers could easily be mentioned. What happens to individuals who do not stand up for their rights? They may be kicked and cuffed with impunity—and that is what generally happens to them. A similar fate may be expected by corporations that do not insist—even at the expense of some trouble and unpopularity—that their rights shall be respected.

PHILADELPHIA TRANSIT PLANS

Philadelphia is the latest recruit to the list of large American cities whose inhabitants are extremely anxious to be whisked between home and work at express train speed. In accordance with this demand, the Philadelphia city administration, through its transit commissioner, A. Merritt Taylor, has worked out a plan for a combined subway and rapid transit system which is to be constructed at a cost of nearly $60,000,000. An abstract of Mr. Taylor's report appears elsewhere in this issue. A notable feature of his report is the moderation shown with regard to subways, not more than 8.6 miles of underground route being proposed at present. Indeed, stress is placed upon the fact that modern elevated structures can be made unobjectionable.

The wisdom of this moderation will be apparent when a comparison is made of the density of population of Philadelphia and other cities, as quoted in the abstract. A city of 2,000,000 inhabitants scattered at the rate of 5.2 per dwelling cannot hope for the costly subway construction which is permissible in old New York with its 26.5 persons per house. In fact, the example of London is sufficient to prove the financial risk of heavy subway building in a city which is free to grow in every direction. The great advantage preserved by Philadelphia, from the standpoint of health, of being a city of one-family houses is a disadvantage when the development of a costly means of transit is concerned. Hence if Philadelphia should want an extensive underground rapid transit system it must be prepared to subsidize it by a guarantee to private capital of an adequate return upon the investment. It would be little balm to the partner company to know that while it was losing money, the city was more than recouping its own operating losses in higher realty values. It is not impossible, however, that the building of a rapid transit system will actually result in creating wide strips of apartment houses along the new routes. Mr. Taylor observes that the two-family house rather than the one-family dwelling followed rapid transit to West Philadelphia, and the same phenomenon to a more exaggerated degree is promised by real estate operators in Brooklyn.

The Kansas City, Clay County & St. Joseph Railway

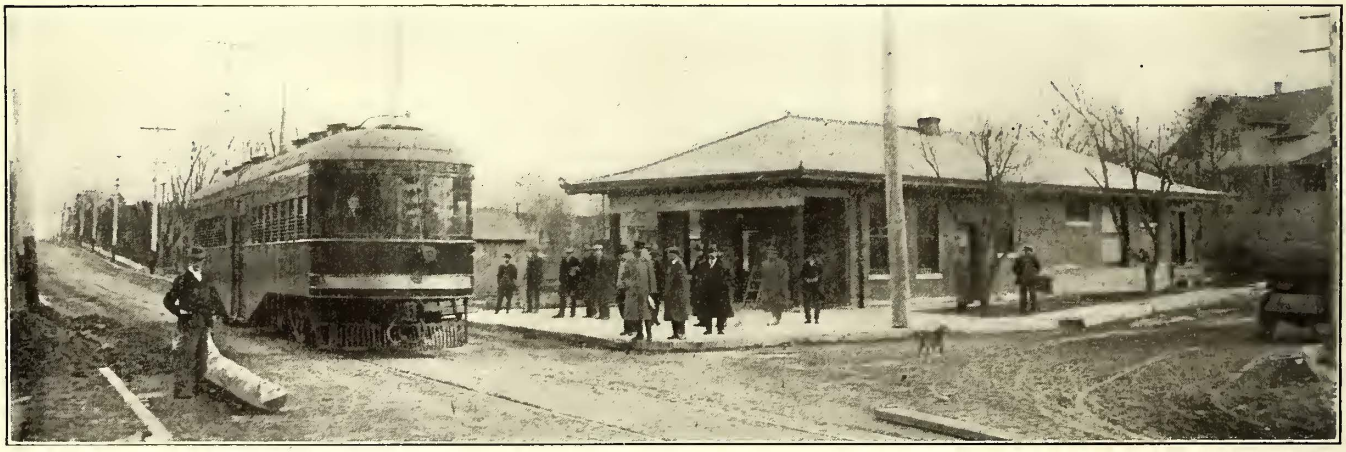
An Important and Extensive Interurban Railway Recently Completed in Missouri—1200 Volts Is Used, with 1200-Volt Rotaries in the Substations—The Construction Standards of the Company Are Described in Detail

The Kansas City, Clay County & St. Joseph Railway, recently placed in operation between Kansas City, St. Joseph and Excelsior Springs, Mo., marks the completion of a work that for years has been the dream of interurban promoters, namely, a high-speed, short-route electric line connecting the cities of Kansas City, Mo., and St. Joseph, Mo. This location has long been recognized as one of the most desirable in the Central West for an electric line, and during the past ten years no less than ten such interurban lines have been projected—all of which were doomed to failure, principally on account of the construction difficulties and the high cost necessary in building between these two points an electric line that could compete successfully with the steam roads.

There are at present six steam roads competing for the freight and passenger business between these points. The shortest of these has a length of 62 miles, and the quickest running time is two hours and ten minutes. To this time must be added that to allow passengers to reach the depots from the center of the business district, making the time actually consumed from terminal to terminal about two hours and thirty minutes. Inasmuch as there are no municipalities of large size between Kansas City and St. Joseph, an interurban, to secure revenue enough to justify the investment, had to construct practically a straight line between these two cities, to shorten the running time, and at the same time lower the fare as compared with the steam roads. To secure this practically straight line, it was necessary to build through some very hilly territory, making the construction costs so heavy that financing the project was difficult.

Another difficulty which beset the early promoters was the fact that the Missouri River had to be crossed at some point, and as there was no bridge available over which an electric road could secure trackage rights, it was necessary for the railway company to build its own bridge. The cost of such a project was in itself enough to discourage any real attempt at building the road, and it was this matter of a bridge that was the real cause of the failure of the majority of the roads that had been projected.

Prior to the beginning of construction on the Kansas City, Clay County & St. Joseph Railway, the Armour-Swift-Burlington syndicate purchased, directly across the Missouri River, in North Kansas City, 3200 acres of land and platted this ground for a town site. To develop this territory it was necessary that this addition should have quick and easy connection with Kansas City proper, and accordingly the syndicate built a $2,000,000 bridge across the river at this point. This bridge is the largest of its kind in existence and may be classed among the really great bridges of the country. It has a length of 5000 ft., is built of two decks, and 18,076 tons of stetl was used in its construction. The lower deck is for steam road service, while the upper deck is arranged for street and interurban cars, vehicles and pedestrians. That part of the bridge over the river channel is so designed that the lower deck may be raised for the passage of boats without interfering with traffic on the upper deck.



K. C., C. C. & St. J.—Waiting Station at Liberty on Springs Division

In addition to the bridge, the syndicate also built a double-track, 600-volt electric line connecting with the Metropolitan Street Railway at Third and Locust Streets in Kansas City, extending across the bridge and through the syndicate holdings north of the river. At about the middle of the track the road is divided into two branches, one extending to the north and the other to the east.

The promoters of the Kansas City, Clay County & St. Joseph Railway were not slow in seeing the advantage thus created for building the much-promoted electric line between Kansas City and St. Joseph and between Kansas City and Excelsior Springs, and accordingly they secured from the syndicate a contract giving to the proposed road trackage rights on the bridge and over the syndicate's electric line through the holdings north of the city. Construction of the road was started in September, 1911, and the first car was placed in operation on Jan. 21, 1913, on the Excelsior Springs division and on May 5 on the St. Joseph division.

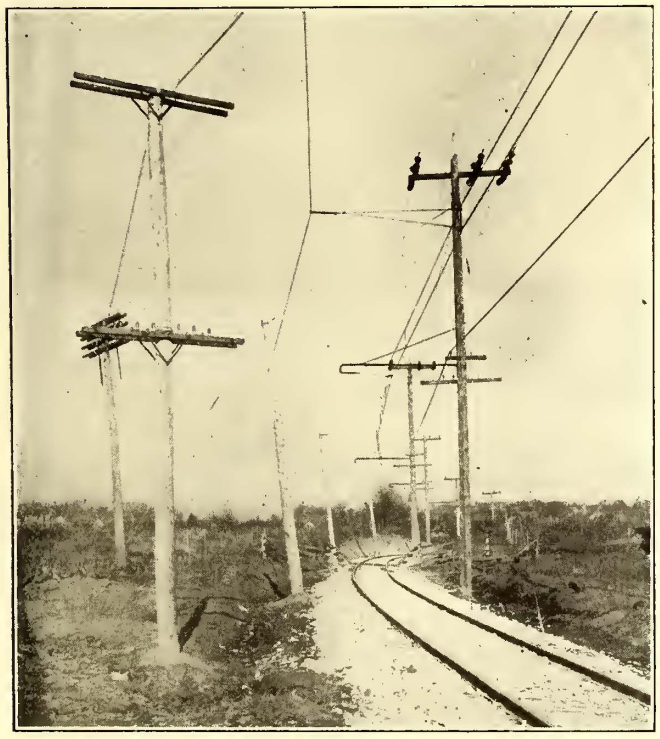
The Excelsior Springs division, after leaving the tracks of the Union Depot Bridge & Terminal Company, ascends abruptly from the river bottoms to the higher lands and strikes practically a straight line to the Excelsior Springs terminal, passing through the city of Liberty, famous in civil war times as the home of Mosby and Quantrell, the raiders. This city has a population of about 5000 and is the county seat of Clay County and the home of William

Jewel College. The city is 15 miles from Kansas City, the running time for this distance being forty-five minutes, eighteen of which are consumed by a car in reaching the junction at North Kansas City from the Kansas City terminal.

Excelsior Springs, the only other city of the Excelsior Springs division and the terminal of the line, has a population of about 7000, in addition to the large hosts of health seekers attracted to the city by the curative values of its mineral springs.

The St. Joseph division of the road is approximately two times the length of the Excelsior Springs division, the type of construction being the same. In addition to the terminal cities of Kansas City and St. Joseph, two small cities, namely, Dearborn and Camden Point, are located on this division. The former of these cities has a population of about 900 and the latter a population of about 300, in addition to the students of the Missouri Christian College, which is located at this place. In addition to the population of the cities above mentioned, the two Kansas Cities have a combined population of about 330,000, and St. Joseph a population of about 78,000, making the number of people served by the line, including the rural population, about 500,000.

It is the intention of the road to do a general railroad business, both freight and passenger. That the estimates of the promoters in regard to the passenger revenue were conservative has been fully demonstrated up to the present time, the number of passengers carried having exceeded all expectations. To date, no freight has been handled, but this service will be inaugurated soon. Inasmuch as the



K. C., C. C. & St. J.—Track and Overhead Line on Curve at Entrance to Middletown

interurban taps considerable territory that is served by no other railroad, the prospects are bright for a large revenue from this service.

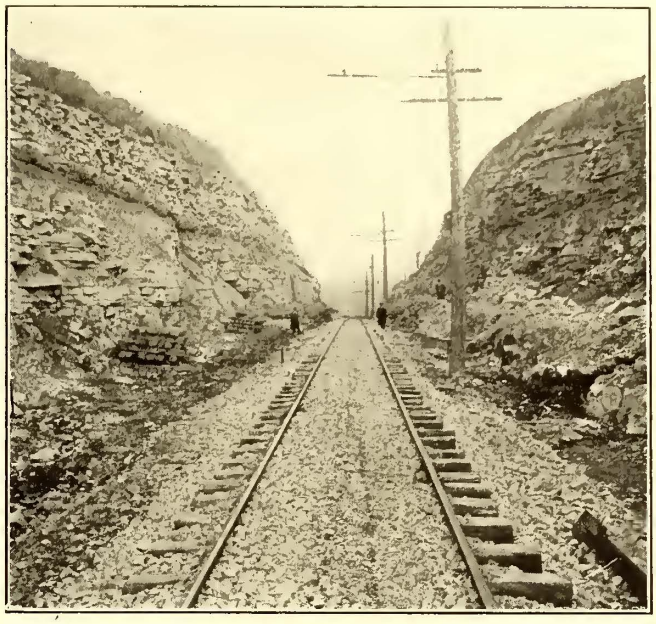
FRANCHISE

The road is built in two divisions, one from Kansas City to Excelsior Springs and the other from Kansas City to St. Joseph, these divisions having a length of 28.35 miles and 52.42 respectively. For the Excelsior Springs division this distance is divided up as follows:

	Miles
Metropolitan Street Railway tracks in Kansas City	1.09
Union Depot Bridge & Terminal Railway tracks	4.23
Kansas City, Clay County & St. Joseph Railway tracks	23.03

The mileage of the St. Joseph division of the road is as follows:

	Miles
Metropolitan Street Railway tracks in Kansas City	1.09
Union Depot Bridge & Terminal Railway tracks	2.94
Kansas City, Clay County & St. Joseph Railway tracks	46.22
St. Joseph city tracks	2.17



K. C., C. C. & St. J.—Rock Cut on Springs Division

The Kansas City terminal of the railway company is located at Thirteenth and Walnut Streets, in the heart of the retail, theater and hotel district of the city. It is a two-story brick building consisting of waiting room and baggage room, with the general offices on the second floor. The city tracks on one side of this terminal are not used by the city cars, a plan which allows for lay-overs by the interurban cars without interfering with city traffic. Inasmuch as this terminal is located only a little more than a mile from the private right-of-way of the Union Depot Bridge & Terminal Railway, only about twelve minutes are consumed from the time the cars leave the Thirteenth and Walnut Street terminal until they are outside of the city limits. This, together with the short mileage as compared with competing steam roads, gives the interurban a decided advantage in the matter of running time to the cities on its route.

In St. Joseph the cars also operate to the middle of the business district on the city tracks of the St. Joseph Railway, Light, Heat & Power Company, the interurban terminal being located at Eighth and Edmond Streets, directly across from the Federal Building.

The road traverses Clay, Platte and Buchanan Counties and, in addition to the cities mentioned above, Dearborn, St. Joseph and Liberty. All county franchises are for the period of the life of the charter of the railroad, which is 200 years. The franchises in the city of Dearborn are for the same period, while that in St. Joseph over the one-half mile of track owned by the railway company is for twenty-five years and in Liberty for fifty years. The company has no franchise in Excelsior Springs as it enters that city over a private right-of-way on which no streets or alleys are crossed.

TRACK AND ROADWAY

From a point where the road connects with the tracks of the Union Depot Bridge & Terminal Railway, it is built on a private right-of-way for the entire distance except in the cities. This right-of-way varies in width from 60 to 200

ft., the standard width being 66 ft. The country traversed is hilly, making necessary some heavy grading. The heaviest grade is 3 per cent, and the sharpest curve outside of the cities is 5 deg. The largest cut is 62 ft. deep and 1450 ft. long. The material taken from this cut consisted mostly of stone, which was crushed and used to ballast the Excelsior Springs division. The greatest fill is 58 ft. deep and adjoins the cut just mentioned at the entrance to Excelsior Springs. Five-hundred and eighty-three thousand seven hundred and eight cubic yards of earth and 178,949 cu. yd. of rock were removed on the Excelsior Springs division and 1,028,257 cu. yd. of earth and 140,250 cu. yd. of rock on the St. Joseph division.

The roadbed on embankments is 16 ft. in width and in excavations 22 ft. with side slopes one and one-half to one in rock. Typical sections of the roadbed are shown in the cuts on page 220.

The rails are of 70-lb. A. S. C. E. section, laid on white oak ties placed on 24-in. centers and ballasted in crushed rock. Approximately 2000 yd. of ballast was used to the mile. These rails are joined with Duquesne rail joints on the St. Joseph division and continuous rail joints on the Excelsior Springs division. All the joints are of the four-hole type and are bonded with American Steel & Wire No. 0000 compressed terminal bonds. The rails are laid with broken joints. Turn-outs are spaced every 3 miles and are 300 ft. long. High rigid switch stands, No. 7 frogs and 15-ft. switch points are used at switches. One-half of these sidings on each division face one direction and the other half face the opposite direction. Under this arrangement all trains receive rights to the switch point only and must head in and then back out at the sidings at the meeting point unless otherwise directed by the dispatcher. This is done to avoid the possibility of a trainman leaving the switch open.

The right-of-way for the entire distance is fenced with the American & Steel Wire ten-bar railway fence. Approach fences adjoining the highway are constructed like the line fence, and the ayes and cattle guards are built of 1-in. x 6-in. x 3-in. fencing constructed in truncated shape and secured to three stub posts.

BRIDGES

The bridges consist of six steel structures and 108 reinforced concrete arches, all designed to carry safely a concentrated load of 100 tons on two trucks spaced 22 ft. apart, in trains and at high speed on each track.

K. C., C. C. & St. J.—Armour-Swift-Burlington Bridge Over Missouri River

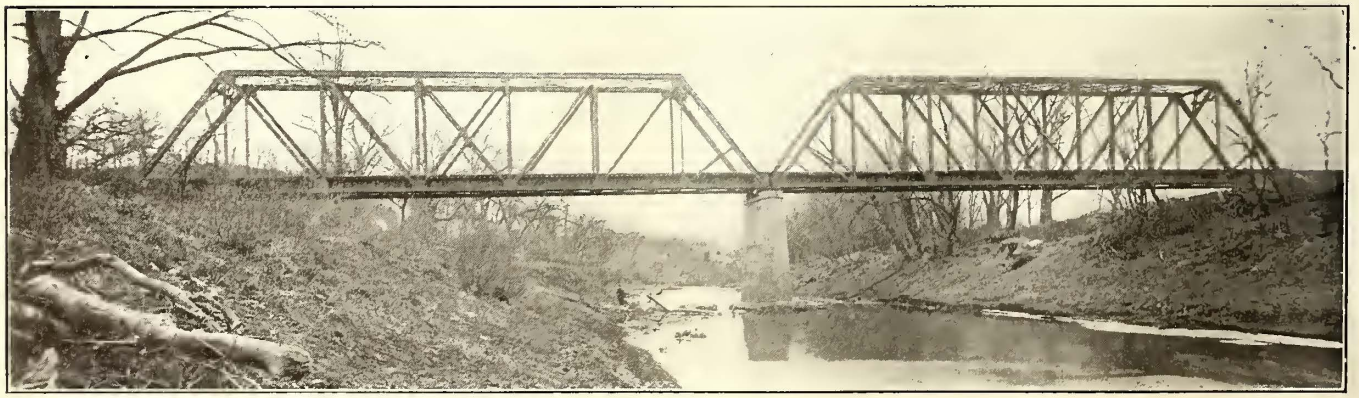
The largest of the steel structures is through the town of Dearborn on the St. Joseph division. This was necessary because at this point the road descends abruptly from a high bluff. This structure is of girder construction and is composed of twenty-five spans, each 60 ft. in length. The maximum height is 37 ft. and the gradient 2.97 per cent. With the exception of the Platte River bridge, which consists of two spans, each a 164-ft. Pratt truss, all of the bridges were built to carry the electric line over steam roads. There are seven of these steam-road crossings, varying in length from 692 ft. to 139 ft. The largest and most interesting of them is that over the Quincy, Omaha & Kansas City Railroad at Avondale on the Excelsior Springs division. This structure has a length of 692 ft. and a clear height of 34 ft., and is of girder construction, built on a 3-deg. curve and 1.1-per cent grade. Other railway crossings are over the Chicago, Burlington & Quincy at Liberty, where the steam road is crossed on a girder structure 338 ft. long and 23 ft. high, the Chicago, Milwaukee & St. Paul crossing at Liberty, a plate girder viaduct 139 ft. long and 25 ft. high, and the Chicago Great Western bridge at Willow Brook, 230 ft. long and 27 ft. high.

The size of the concrete arches used for carrying the load over water courses varies in length from a few feet, one span, to the largest, consisting of three spans, each 60 ft. in length. All of these arches are of the Luten design.

The following cost formula was used in computing the cost of all arches:

$$I(S+2)(3F+W+10) = \text{price, where}$$

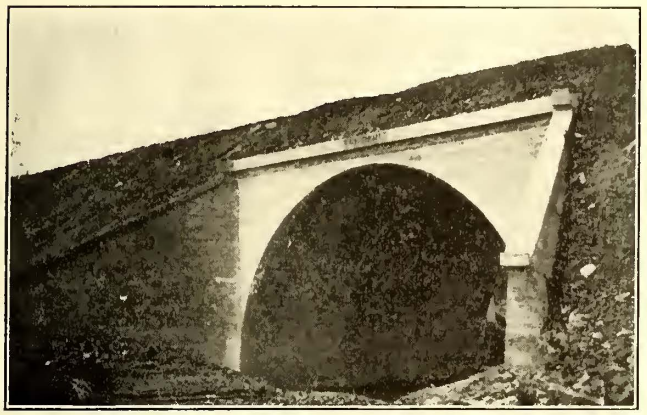
S = Span in feet,
F = Profile fill,
W = Subgrade width in feet, and



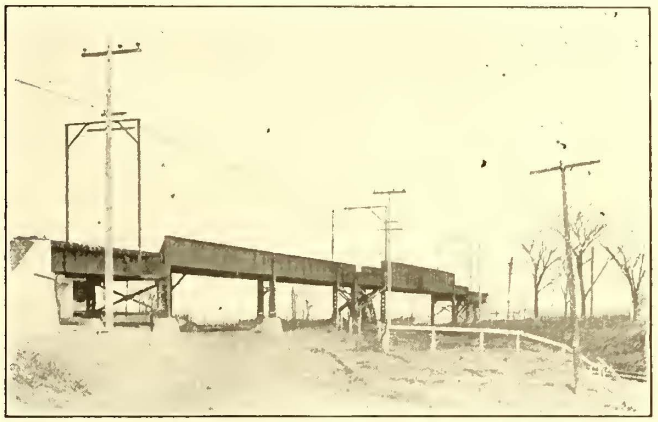
K. C., C. C. & St. J.—Platte River Bridge

I = Unity for the following prices:

Cement, per barrel	$1.25
Sand, per yard	1.00
Stone, per yard	1.00
Lumber, per 100 feet	2.00
Steel, per hundredweight	1.75
Labor, per day	2.00
Excavation, per yard	.50
Superintendence, per hour	.50
	$10.00



K. C., C. C. & St. J.—Typical Concrete Arch Over Watercourse



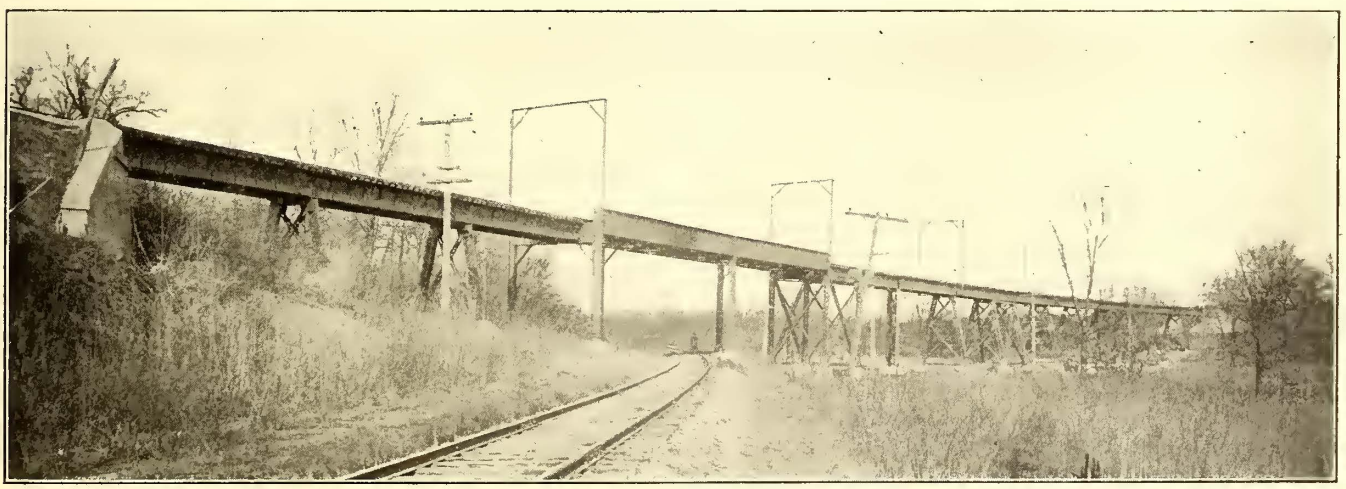
K. C., C. C. & St. J.—Crossing Over Chicago, Burlington & Quincy Railway at Liberty

The values of I on the Kansas City, Clay County & St. Joseph Railway were as follows:

St. Joseph Division		Springs Division	
Sta. 171 to 299	= 1.30	Sta. 325 to 533	= 1.35
Sta. 299 to 587	= 1.40	Sta. 533 to 618	= 1.40
Sta. 587 to 674	= 1.35	Sta. 618 to 840 + 50	= 1.35
Sta. 674 to 903	= 1.45	Sta. 840 + 40 to end	= 1.40
Sta. 903 to 1135	= 1.50		
Sta. 1135 to 1179	= 1.45		
1179	= 1.50		
Sta. 1207 to 1520	= 1.45		
Sta. 1520 to 2394	= 1.40		
Sta. 2394 to 2638	= 1.45		
Sta. 2638 to end	= 1.40		

As an example: At Station 261 + 60 on the St. Joseph division is an arch with a span of 12 ft. The profile fill is 9 ft., the subgrade width is 16 ft., and the value of I for this station is 1.30. Substituting these values in the formula gives the price as $964.60.

With one exception, inside the city of St. Joseph, no steam roads and but a few highways are crossed at grade.



K. C., C. C. & St. J.—Interurban Crossing Over Quincy, Omaha & Kansas City Railroad

For the most part, concrete arches are used when passing over highways, and steel structures are employed to carry highways over the interurban road.

PASSENGER STATIONS

In addition to the waiting stations in Kansas City and St. Joseph, which were remodeled from business buildings by the company to fit conditions, there were also built combination passenger and freight stations at Liberty and Excelsior Springs.

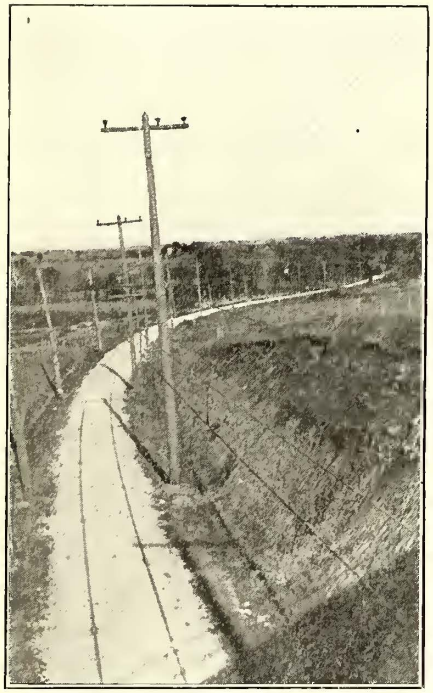
The former of these two stations has a length of 60 ft. and an over-all width of 24 ft. 8 in., and is partitioned off into waiting room, office, baggage room, freight room and toilet room. The building is one story in height with walls of hard-burned shale brick on concrete foundation, all walls being laid with cement mortar, colored black. The floors, with the exception of a ½-in. top dressing, are of concrete 4 in. in thickness, laid on a foundation of cinders 6 in. thick. Window frames and doors are wood. The roof is of asbestos shingles. A platform is provided for the loading and unloading of freight.

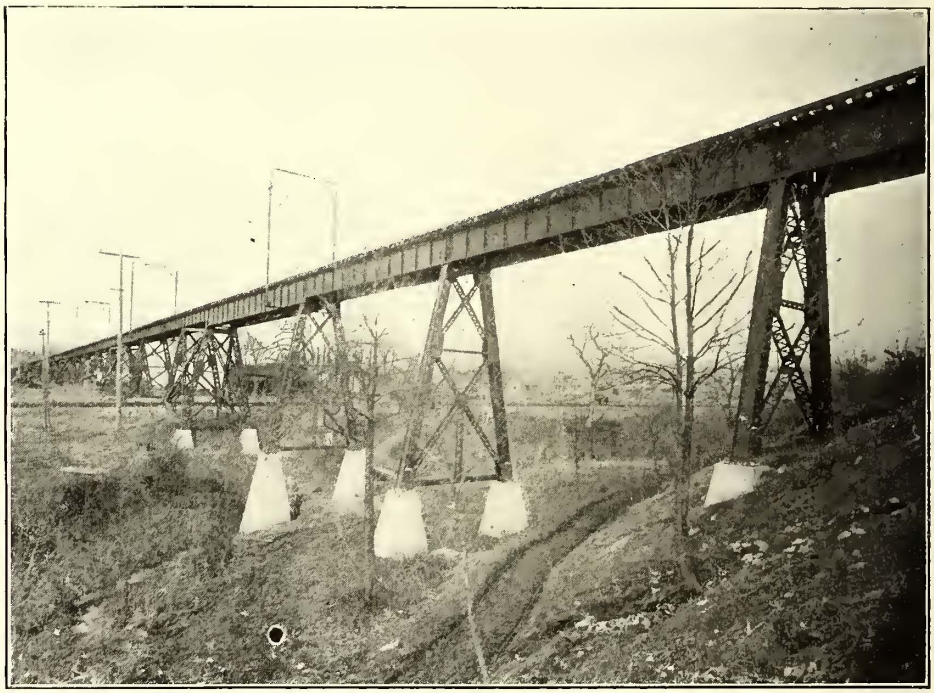
The Excelsior Springs station has a ground area of 24 ft. by 60 ft., and is divided into three compartments, namely, a waiting room, ticket office and freight room. Specifications for this station are the same as for the Liberty station with the exception that in this case the walls are carried above the roof and capped with tile coping, and the roof is composed of wood sheathing water-proofed, with a five-ply tar and gravel roofing.

SHELTER STATIONS

At every point where a stop has been established by the railway company a shelter station has been erected. As standard, the company has adopted three classes of shelter stations, known as Classes 1, 2 and 3 respectively. The type of station built at any point is determined by the amount of business done at the place in question. Class 1 station is 8 ft. square in plan, with a height of 8 ft. from the floor to the peak of the roof, and is built with side walls of sidings with one door and two windows. The platform in the

front of the station is 12 ft. long and 6 ft. wide. Four stations of this class were built on the Excelsior Springs division and eight on the St. Joseph division. Class 2 and Class 3 stations are open shelters. Class 2 has a length of 30 ft. and is provided with two seats separated from each other by a wooden partition, the whole being protected by a roof projecting far enough to insure protection in case of bad weather. To date only one of these stations has been built. Class 3 station is the one most frequently used and meets admirably the needs of a country shelter shed where but few people assemble at one time. As shown by the view on page 218, this station consists primarly of two partitions, set at right angles to each other, equipped with seats and protected with a roof, the whole being supported on the 10-ft. x 10-ft. platform. Although the shelter is open at all sides, the passenger can always secure protection by it, regardless of the direction in which the wind or rain is coming. Eleven of these shelter sheds have been built on the Excelsior Springs division and sixteen on the St. Joseph division. The standard painting for all stations is maroon with green roof and trimmings.





K. C., C. C. & St. J.—Right-of-Way Over and Overhead Highway Crossing and Dearborn Viaduct on St. Joseph Division

FREIGHT STATIONS

In addition to the combination freight and passenger stations at Liberty and Excelsior Springs, individual freight stations have also been erected at St. Joseph and Kansas City. The Kansas City freight station is at Third and Cherry Streets at the south end of the Armour-Swift-Burlington Bridge and has a length of 100 ft. and a width of 18 ft. This station is outside of the territory covered by the franchise of the Metropolitan Street Railway so that freight cars will not be operated over the city tracks. To facilitate the rapid handling of freight at this station, the freight house proper has been made long and narrow with roller steel doors in the two side walls, directly opposite each other. With this arrangement freight can be unloaded from the cars and moved crosswise of the building to the team loading and unloading platform, on the other side of the building. Conversely, outgoing freight can be loaded into cars in the same manner.

The freight station at St. Joseph has been remodeled from a brick dwelling and is at Eighth and Angelique Streets, but a short distance outside of the retail business district. This building is divided into three divisions by brick walls and consists of an office, a perishable freight room and a general freight room. The walls are of brick, extending above the roof and capped with tile coping. The roof is of concrete, reinforced with self-centering expanded metal, No. 24 gage. It is waterproofed with a five-ply tar and gravel roofing. The floors are of concrete 1½ in. in thickness. The same general plan for loading and unloading freight has been followed in the freight room as in the Kansas City freight house, large doors being placed in each side of the wall. For the present the freight equipment consists of five 52-ft. steel express motor cars, equipped with four 100-hp General Electric No. 225, 1200-volt motors, and five wood trailer cars, 40 ft. in length.

It is the intention for the present to do a package express business, no arrangements having been made for the interchange of freight with steam roads, and no contracts have been made with old-line express companies for handling express. It is expected that the freight service will be inaugurated about the middle of July.

POWER

Power for the operation of the two divisions of the road is purchased from the Metropolitan Street Railway Company, of Kansas City, and is generated at the Third and Cherry Streets power plant at 25 cycles, three phases and 6600 volts. To take care of this additional load the Metropolitan Street Railway Company installed at this plant, in addition to the former equipment, one 2500-kw G.E. turbo-generating set. Under its power contract, the Kansas City, Clay County & St. Joseph Railway agrees to purchase power from the Metropolitan Street Railway Company for a period of twenty-five years.

The power is transmitted over the pole line of the Union Depot Bridge & Terminal Railway Company from the power house to the railway company's transformer station located in North Kansas City at the junction of the two divisions of the road. At this point the 660-volt current is stepped up to 33,000 volts and delivered to the railway company's transmission lines.

TRANSFORMER STATIONS

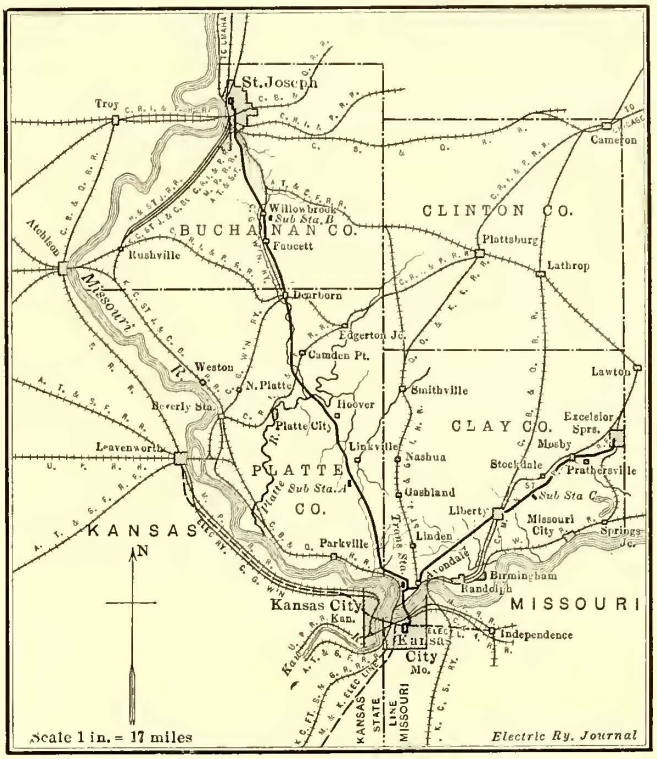
In the design of the Kansas City transformer station, as well as in all other power and passenger buildings built by

the company, special attention has been given to securing a thoroughly fireproof construction so as to get as low an insurance rate as possible. That the aim of the designers was realized is evidenced by the fact that the company has been able to secure a rate of 25 cents for all insurance.

The transformer station is 36 ft. sq. over all and is two stories in height. The first story is divided into a dispatchers' office, trainmen's room, toilet and bathroom for the trainmen and transformer compartments, while the second story is given up to the switch room. The walls of the building are of No. 1 kiln-run hard common brick, supported on concrete foundation, the bricks being laid with American bond with six stretchers between the header courses. The walls are capped with tile coping. All window openings are framed with steel sashes, the lower sash being pivoted at the top and opening in. Glass in all windows is "A" grade, double strength plain glass. Steel doors are used for all door openings. The floor on the first story of the transformer station is of concrete, 4 in. in thickness, laid on a foundation of 6 in. of broken stone well rammed into place, with the exception of the floor in the transformer compartments, which is 6 in. in thickness, carried on a foundation of 9 in. of broken stone. This heavier floor at this point is necessary to support the transformers. The thicknesses of concrete above mentioned include a surface coat composed of one part Portland cement and two parts of sand, applied before the foundation layer of concrete had time to take its initial set.

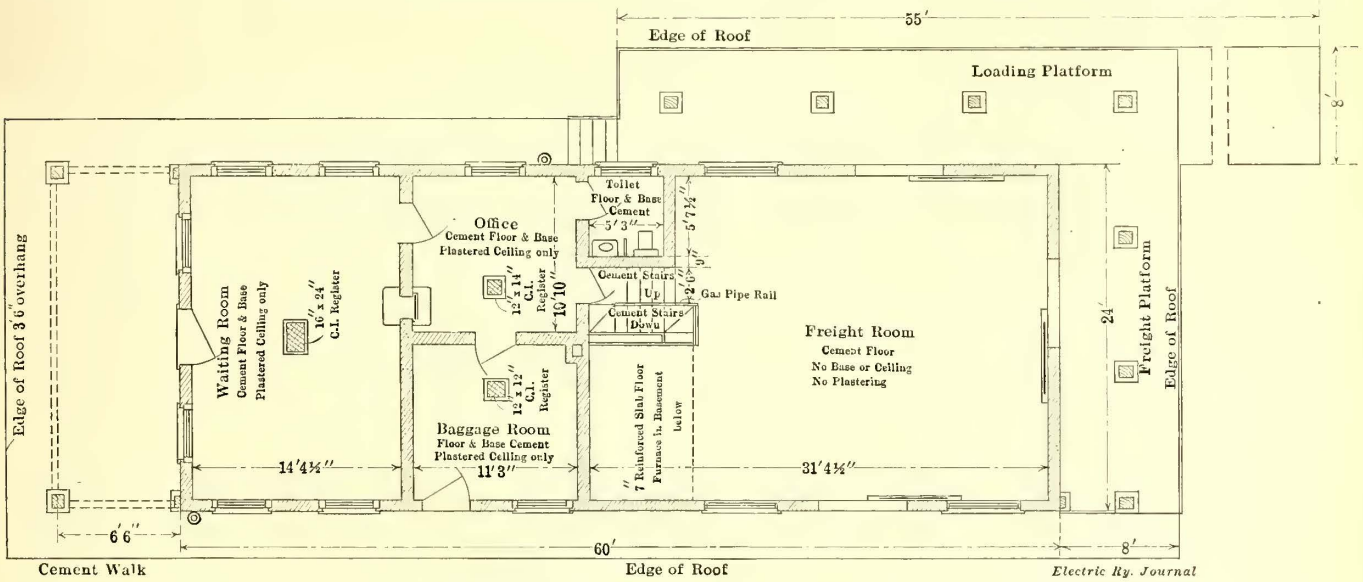
The second-story floors are of the ferrolithic type of flat construction, the reinforcement being unpainted No. 24 gage, with ½ in. depth of corrugation. The roof is also of the ferrolithic type, the reinforcement being No. 24 gage with corrugations ½ in. deep. The upper surface of the corrugation is covered with ⅞-in. coat of one part Portland cement to three parts of sand, floated to a true surface. The under side of the roof reinforcement is plastered with a ⅜-in. coat of cement plaster composed of one part Portland cement to two parts of sand, to which mixture was added two-fifths of a part of hydrated lime and hair. This mixture of hydrated lime and hair is composed of 4 lb. of hair to five sacks of lime and was allowed to stand forty-eight hours before being placed. The roof is waterproofed with a five-ply tar and gravel roofing.

One interesting feature in the design of this transformer station is the transformer compartments. Each of these measures 9 ft. x 10 ft. with a height equal to the height of the first floor, and they are divided from each other and the rest of the building by fireproof walls without openings. Entrance to each compartment is through an 8-ft. x 11-ft. steel door opening from the outside of the building. Ventilation for each compartment is secured by a hinged ventilator and by metal framed windows with gratings at the top of each compartment.



K. C., C. C. & St. J.—Map of Route of New Railway by Solid Black Line

The main equipment of this transformer station consists of three 750-kva, oil-insulated, self-cooled, single-phase, twenty-five-cycle, 6600 to 33,000-volt Westinghouse transformers, together with switchboards and switching apparatus. In addition to the main transformers one 5-kva "SK," single-phase, twenty-five-cycle, 6600-220-110-volt Westinghouse transformer is installed. From this latter transformer is secured the 110-volt power for lighting the transformer station and the shops and the 220-volt current for the operation of the shop machinery.

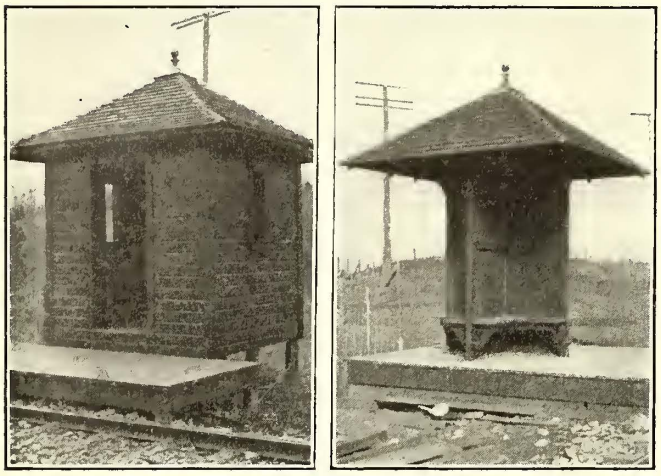


K. C., C. C. & St. J.—Passenger and Freight Depot at Liberty, Mo.

The switchboard is composed of one panel in two sections. This is mounted on an angle-iron frame and located on the ground floor in the dispatcher's office.

SUBSTATIONS

The high-tension, 33,000-volt, twenty-five-cycle current is converted to 1200-volt direct current at three substations, one on the Excelsior Springs division and two on the St. Joseph division. The general specifications of substation



K. C., C. C. & St. J.—Typical Small Waiting Stations

buildings conform very closely to the specifications of the transformer station, and in design they are identical with one another. These buildings have a ground plan 43 ft. 6 in. x 41 ft. and are divided into two divisions by a brick fire wall, whose openings are protected by steel doors. In the larger of these compartments are installed the transformers, electrolytic lightning arresters and auxiliary apparatus, while the rotaries and switchboards are installed in the smaller compartment. The buildings are one story in height with brick walls of the same specifications as the transformer station and supported on concrete foundation. The floors are of concrete, and the roof is of the same type as the transformer station. The window frames are of steel as are also the doors opening into the building. As will be noted from the accompanying halftone of the transformer and substation, no effort has been made toward architectural adornment, the object sought in the design being rather utility, combined with lasting and fireproof qualities.

In each of these stations is installed, as the main equipment, two 500-kw, 1200-volt commutating-pole Westinghouse rotary converters having a speed of 750 r.p.m. These rotaries are insulated for and can be operated at 1500 volts. This speed of the rotary was chosen in place of 500 r.p.m. because somewhat better efficiencies are obtained at all loads and a more stable commutation at heavy overloads. With a six-pole rotary converter operating at 500 r.p.m. it is not possible to place the brushes as advantageously as with the four-pole rotary at higher speed. The space between poles on the 750-r.p.m., four-pole rotaries is greater and allows for a more advantageous armature winding for this high voltage than can be obtained on a 500-r.p.m. rotary. This is due to the fact that a greater number of commutator bars can be employed, with a correspondingly average reduced potential difference between bars, permitting a more advantageous use of the interpoles. The four-pole construction also enables the rotary to carry larger overloads than would be possible with the 500-r.p.m. construction, owing to the more advantageous proportioning of the machine, so that it was possible to obtain from the manufacturers a guarantee on overloads up to 200 per cent of the rated capacity of the machine, or three times full load current of 416 amp, for swinging periods of twenty seconds without undue heating or injurious sparking. These rotaries are self-starting from the alternating-current end.

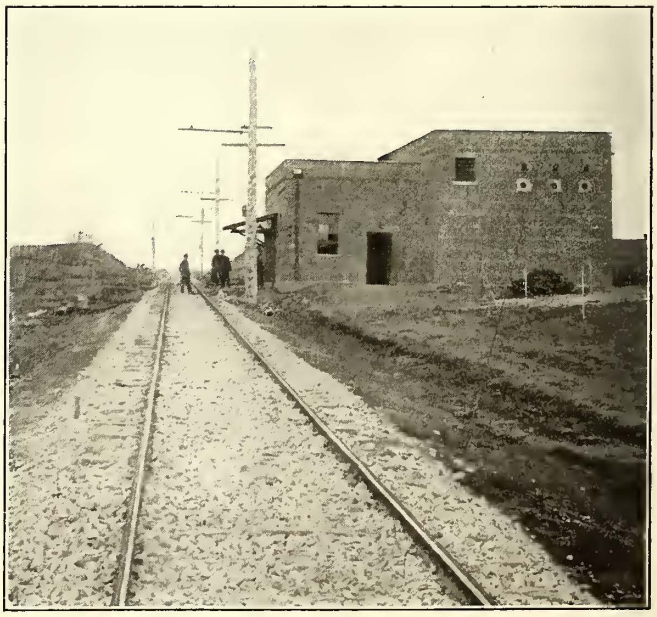
The switchboard in each station is composed of black marble mounted on angle-iron frames and consists of six panels, two converter panels, two feeder panels and two negative bus panels.

One interesting feature in the design of the high-tension buses is the fact that they are run in iron pipe mounted on insulated pipe-frame brackets. The transformers used in the substations have a capacity of 185 kva. These are oil-insulated and self-cooling, single phase, twenty-five cycles, 33,000-730 volts. Two banks of these transformers are placed in each station. The additional equipment of the transformer compartment includes type "A" electrolytic lightning arresters, complete with horn-gap disconnecting and charging device for use on the 33,000-volt circuit with ungrounded neutral; type D choke coils, 35,000 volts; type M disconnecting switches, 33,000 volts; type GA oil circuit-breakers, three-pole, single-throw, hand-operated with distant mechanical control and 44,000-volt overload automatic inverse time limit relays. All of the transformer and substation equipment was furnished by the Westinghouse Electric & Manufacturing Company.

OVERHEAD CONSTRUCTION

One pole line is used to carry the trolley wire and three-phase transmission line, one telephone circuit and the feeder cable, space being allowed on the crossarms for signal wires. The design is such that the road may ultimately be operated at 1500 volts d.c. with 1200 volts d.c. for initial operation. The design is initially for single track, permanently located on the right-of-way as one of the tracks of a double-track road.

In general five-point catenary bracket construction is used, span construction being employed only on long overhead viaducts and bridges and for short distances in the cities. Bracket construction is also used on the fifteen sidings on the St. Joseph division and the eight sidings on the Excelsior Springs division, a line of poles being set on the outside of the siding and opposite the main line of



K. C., C. C. & St. J.—Substation "C," Springs Division

poles. With this design, in case the line is double-tracked, the siding poles may be used as main line poles without change.

The pole spacing is 150 ft. on tangent line and less on curves, the distance depending upon the degree of curvature. The accompanying table gives approximately the spacing used on curves, also span and pull-off hanger spacing.

All sags are calculated to a temperature of 60 deg. Fahr.

The sags above given are from the center of the messenger to the center of the trolley, equal to 22 in. at the bracket arm.

All poles are Michigan white cedar, those carrying transmission lines being 40 ft. in length and without transmission lines 35 ft. in length. All poles have a diameter of

TABLE SHOWING POLE SPACING, ETC., ON DIFFERENT DEGREES OF CURVES

Brackets	Degree of Curve	Pole Spacing	Hanger Straight Line	Hanger Pull-off	Sag
9 ft.	tangent to 1 deg.	150 ft.	5	..	16 in.
12 ft.	1 deg. to 2¾ deg.	150 ft.	4	1	16 in.
12 ft.	2¾ deg. to 3¼ deg.	135 ft.	4	1	13 in.
12 ft.	3¼ deg. to 4 deg.	120 ft.	4	1	10 in.
12 ft.	4 deg. to 5½ deg.	105 ft.	4	1	8 in.
12 ft.	5½ deg. to 7½ deg.	90 ft.	2	1	6 in.
12 ft.	7½ deg. to 10 deg.	75 ft.	2	1	4 in.
12 ft.	10 deg. to 17 deg.	60 ft.	..	2	2½ in.
12 ft.	17 deg. to 80-ft. radius	45 ft.	..	3	..

8 in. at the top to comply with the Northwestern Cedar Men's Association standard specifications for electric poles. As a rule the poles were framed before being set, and the pins and insulators placed on the crossarms. In special instances, when the wires pass over foreign transmission and telephone lines, poles having a length as great as 60 ft. are used. The following table gives the pole settings for different lengths of poles:

35-ft. poles in the ground 6 ft. deep.
40-ft. poles in the ground 6 ft. deep.
45-ft. poles in the ground 6 ft. 6 in. deep.
50-ft. poles in the ground 7 ft. deep.
55-ft. poles in the ground 7 ft. 6 in. deep.
60-ft. poles in the ground 8 ft. deep.

On curves all poles are keyed with stone or timber and in soft ground are set in concrete at points of special strain. Poles on bracket construction are set with the face of the pole a distance of 7 ft. 6 in. from the center line of the track, and on straight line they are set with a rake of 8 ft. from the track. On span construction through towns and at other places where such procedure was necessary the main line of poles is set with a rake of 2 ft. and the 35-ft. poles opposite with a rake of 4 ft. Where guying was necessary ⅜-in., seven-strand, galvanized steel wire having a tensile strength of 5000 lb. was used, the pole being protected by galvanized iron bands where the guy wire passes around the pole. Wood strain insulators are cut in all guy wires at a distance of 8 ft. from the pole, and the guys are anchored to a ⅝-in. x 6-ft. anchor rod, passed through a 6-in. x 8-in. x 8-ft. tie, buried 5 ft. deep. All guying was done before any strain was brought on the poles by the erection of any high-tension, trolley or feeder wires.

The crossarms are of Washington fir with dimensions as follows:

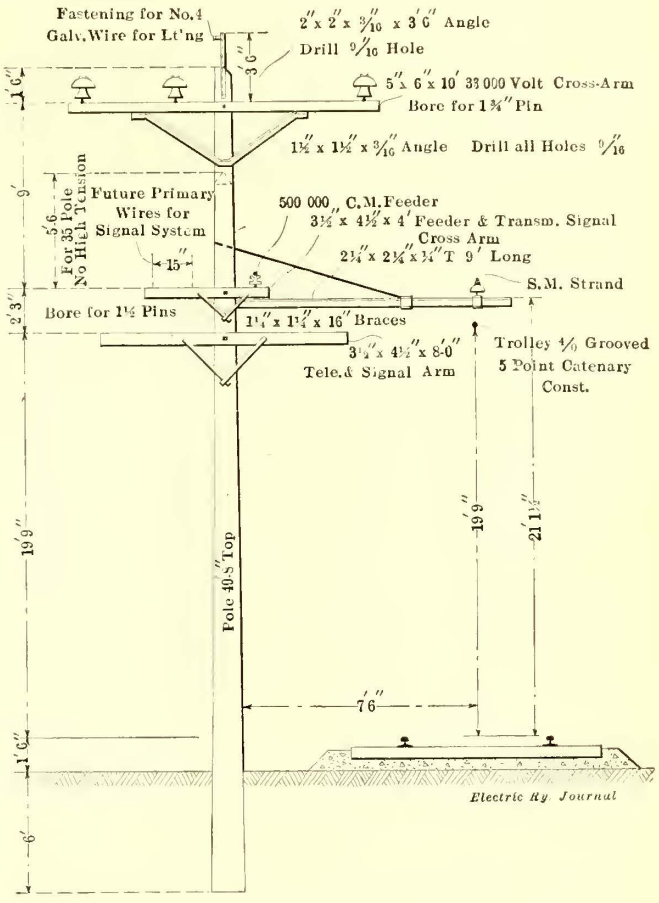
For the 33,000-volt high-tension line, 5 in. x 6 in. x 10 ft., four pin; feeder arm, 3½ in. x 4½ in. x 4 ft., three pin; telephone crossarm, 3½ in. x 4½ in. x 8 ft., eight pin. A space has been allowed on this and the feeder crossarms for the installation of signal wires.

The high-tension crossarm is placed at the top of the poles and is braced with 1½-in. x 1½-in. x 3/16-in. angle brace, having a spread of 5 ft. The feeder arm is placed second from the top immediately above the bracket arm and the telephone arm just below the bracket arm. On curves of 2 deg. and greater, iron pins having a ¾-in. x 7-in. shank and a 4¾-in. curved base to fit 5-in. x 6-in. arms and extending 7½ in. above the high-tension crossarms are used. For high-tension lines along tangent track, locust pins having a 1¾-in. x 6-in. shank and 13 in. over all to fit Ohio Brass Company's 33,000-volt insulators are installed. For the d.c. 1200-volt feeders the company uses 1½-in. x 4½-in. shank, locust pins, 9 in. over all, to fit Ohio Brass Company's insulators No. 10,041, and for the telephone line 1½-in. x 4½-in. shank locust pins, 9 in. over all, to fit Ohio Brass Company's insulators No. 10,565. For telephone transposition 1½-in. x 4½-in. shank, locust pins, 10 in. over all, to fit Ohio Brass Company's insulators No. 10,747 are used.

All insulators on the St. Joseph division are brown porcelain, having a wet flash-over test of 68,000 volts and a dry flash-over test of 90,000 volts. The high-tension line on the Excelsior Springs division is carried on porcelain insulators having a wet flash-over test of 70,000 volts and a dry flash-over test of 133,000 volts. All 1200-volt feeder insulators are designed for a working voltage of 6600.

The 9-ft. bracket arms are 2½-in. x 2¼-in. x ¼-in. T-sections, with ⅝-in. tension rods. All brackets are black japanned. For tangent steadies on inside curves the bracket arms are 12 ft. long, 2¼-in. x 2¼-in. x 5/16-in. T-sections with ⅝-in. tension rods. These also are black japanned. The messenger insulators are designed for test voltage of 20,000.

On span wire construction ⅜-in., seven-strand Siemens-Martin galvanized steel cable, having a tensile strength of



K. C., C. C. & St. J.—Pole Line Construction

5000 lb., is used. This is attached to the poles with ⅝-in. x 14-in. galvanized eye-bolts. These eye-bolts are placed at such a height as to allow for a dip in the span wire of 1 ft. in 10 ft., with the eye-bolt run out the full length. Wood strains are cut into the span wire 8 ft. from the trolley on either side and into the pull-offs and bridle guides. The catenary cable is supported at the center of the span by Westinghouse cross-stand messenger hangers.

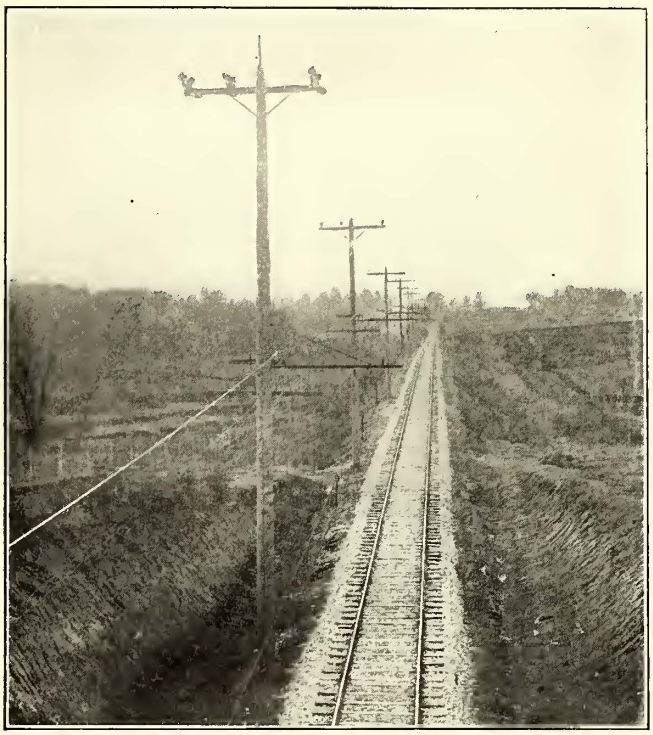
The catenary construction is of the single messenger type, the sag at the center being approximately 16 in. The messenger is 7/16-in. Siemens-Martin steel strand, having a tensile strength of 9000 lb. and an elastic limit of 5300 lb. Five-point suspension, with Westinghouse flexible catenary hangers and curve pull-offs, is used.

The trolley is No. 0000 B. & S. gage, hard-drawn standard grooved copper wire having a textile strength of 46,500 lb. per square inch. The height of the trolley wire is 19 ft. above the head of the rails.

The feeder wire is 500,000-circ. mil, bare stranded copper cable, composed of thirty-seven strands, each having a

diameter of 116.2 B. & S. gage, concentric type. This cable is strung the entire length of both the Excelsior Springs and St. Joseph divisions. It is tied to the insulators with No. 6 B. & S. soft-drawn copper wire and is rope-spliced and soldered. This feeder was erected before the bracket arms were placed and, as shown in the accompanying cut, this feeder is placed on the track side of the pole.

The trolley and messenger is sectioned at four pointts,



K. C., C. C. & St. J.—View of a Tangent Over an Overhead Highway Crossing

one being on each division to insulate the 1200-volt railway current from the 600-volt current of the Union Depot Bridge & Terminal Railway, one at the substation on the Excelsior Springs division and one at substation "B" on the St. Joseph division. Westinghouse 1200-volt section insulators are used. The feeder is tapped into the trolley approximately three times per mile. These taps are No. 0 B. & S. copper wire, soldered to the feeder and run through two feed tap porcelain insulators and fastened to the feed tap trolley feeder. Rymco trolley switches are used at all turnouts.

Garton-Daniels 1200-volt arresters are used for the protection from lightning of the feeder and trolley wires. These arresters are located about five to the mile and are so spaced as to bring an arrester on each pole where a feed tap is located. These arresters are placed about 17 ft. above the top of the rail and are connected to the feeder wire by means of a No. 6 B. & S. copper wire which is soldered to the No. 0 B & S. copper wire and is stapled to the pole with galvanized fence staples. The ends are soldered to the brass caps of a ¾-in. x 7-ft. galvanized iron pipe having a driving point placed at one end and the brass cap at the other end. This pipe is driven directly underneath the lightning arresters to a depth of 6 ft., leaving 1 ft. above the ground.

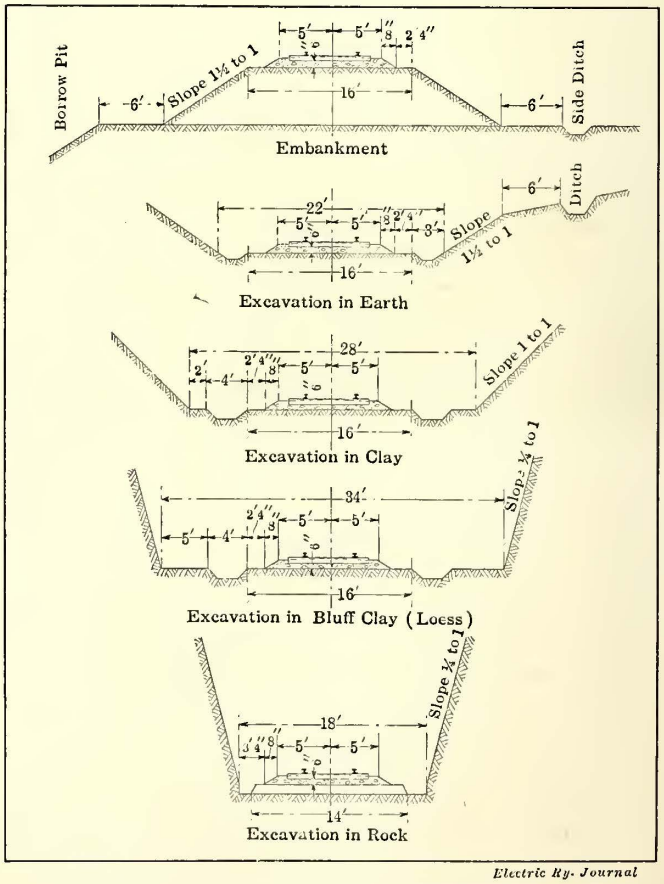
The high-tension, 33,000-volt, three-phase, twenty-five-cycle transmission line is carried from the Metropolitan power house to the junction transformer station by three 300,000-circ. mil bare stranded feeder cable. From the transformer to substation "A" on the St. Joseph division, a distance of about 12 miles, three No. 2 B. & S. medium hard-drawn bare copper wires are used. These are supported on insulators and pins as stated above and tied in with No. 6 soft-drawn B. & S. copper tie wire. From substation "A" to substation "B," a distance of about 26 miles, and also from the transformer station to substation "C" on the Excelsior Springs division, three No. 4 B. & S. medium hard-drawn bare copper wires are strung.

For the protection of the high-tension lines a No. 6 B. W. G. galvanized steel wire is strung over the top of all high-tension poles. It is placed at a height of 22 in. above the top of the pole and 3 ft. 6 in. above the top of the high-tension crossarms. This wire is fastened to a porcelain knob, which in turn is bolted to a 2-in. x 2-in. x 3/16-in. x 3-ft. 6-in. angle-iron. This ground wire is grounded approximately five times to the mile by means of No. 8 B. W. G. galvanized steel wire, which extends down the track side of the pole and is fastened at intervals of 5 ft. with galvanized iron fence staples. This wire is attached to the ground wire by wrapping and soldering and is grounded at the base of the pole to a ¾-in. x 7-ft. galvanized pipe, having a driving point and brass cap and driven into the ground at the base of the hole.

The telephone circuit consists of two No. 10 B. & S. copper wires. This line is transposed every 1000 ft., the transposition being made on one transposition insulator. Telephone jack boxes are placed every mile and at all sidings for the entire length of each division.

METHOD OF ERECTION OF CATENARY LINE

The following is the method used in the erection of the catenary line: After the poles were placed and guyed, the brackets were placed at a height of 21 ft. 1½ in. from the



K. C., C. C. & St. J.—Typical Track Sections

top of the rail to the top of the bracket, and the insulators were placed on the pins. The trolley and messenger wires were both pulled in at once and hung over the brackets, except at curves where the trolley was supported below the bracket arms by means of a loop of No. 8 galvanized iron wire hung over the bracket arm at intervals of from 30 ft. to 40 ft. The trolley wire was then pulled tight and temporarily anchored while it was resting on the bracket arm.

In order to get the desired tension of about 1000 lb. for the No. 0000 trolley, the pull was made with a pair of three-shear blocks and a purchase with a pair of two-sheave blocks. By using this method it was found that three men would get the desired tension. The messenger was next adjusted to give the proper sag, after which it was lifted on the insulators and tied to prevent moving in the direction of the track. The trolley wire was then dropped and temporarily supported by loops of No. 8 iron wire from the T-iron bracket and from the center of the messenger spans. The hangers were then installed, and the trolley and messenger wires were anchored every half mile on tangent track and at the end of tangent track at the end of each curve. Sufficient slack was left in the curves to allow the trolley messenger wire to be pulled over to the proper alignment of the track. To prevent the creeping of the messenger and unequal strains at the brackets, the tension of the messenger was made the same in short spans as in the 150-ft. spans, and this required different length of hangers according to the span. The messenger is not secured rigidly to the insulators but is allowed to move, thus keeping the tension uniform.

SHOPS

The shops and carhouse are in one building situated at North Kansas City, the junction point of the two divisions of the road. In ground plan, this building is 192 ft. 8 in. long by 115 ft. 2 in. wide, and it is divided into two bays by a 12-in. brick fire-wall. There are three openings in this wall protected by tin-clad automatic fire-doors. The larger of these bays, measuring 54 ft. 1 in. wide, is devoted to car storage. Four tracks run the entire length of the building, and the storage capacity is twelve passenger cars. The south half of this storage bay has a concrete floor, the remainder being of Joplin grit. All track openings are protected by rolling steel fire-doors.

One interesting feature in the design of this storage bay is that the tracks are raised above the floor about 18 in., being supported on small concrete pedestals. This arrangement greatly facilitates the work of inspectors when examining trucks and other apparatus located under the car. The same arrangement of tracks is also carried out outside of the building for a considerable distance.

The smaller bay, measuring 48 ft. 6 in., is given over to the shops proper, the paint shop and the storeroom. The west end of the shop for a distance of 69 ft. 10 in. is depressed about 5 ft. below the main floor and permits work to be performed under two cars at one time. In this depressed portion of the shop there are a blacksmith's outfit and a shop-heating boiler and sand drier. A concrete walk extends around the two sides of the depressed portion.

The paint shop is 72 ft. long and 16 ft. 6 in. wide, divided from the machine shops by a plastered ferrolithic partition, a rolling steel fire-door protecting the opening into this paint shop. The storeroom is at the rear of the building and measures 32 ft. x 23 ft. 4 in. There are two tracks into the shop bay, and one of them extends into the machine shop. The capacity of these tracks is five cars. Midway on these shop tracks are placed two 10-ft. turntables connected by a cross track. These turntables are to facilitate the handling of trucks.

To the east of the car shop is an addition 95 ft. long and 10 ft. wide. This is divided into a hard-coal bin, sand bin, soft-coal bin, washroom for the shop employees, and the master mechanic's office. To the east of the building and about 15 ft. from it is a detached oil house of the same type of construction as the shop proper, measuring 15 ft. square.

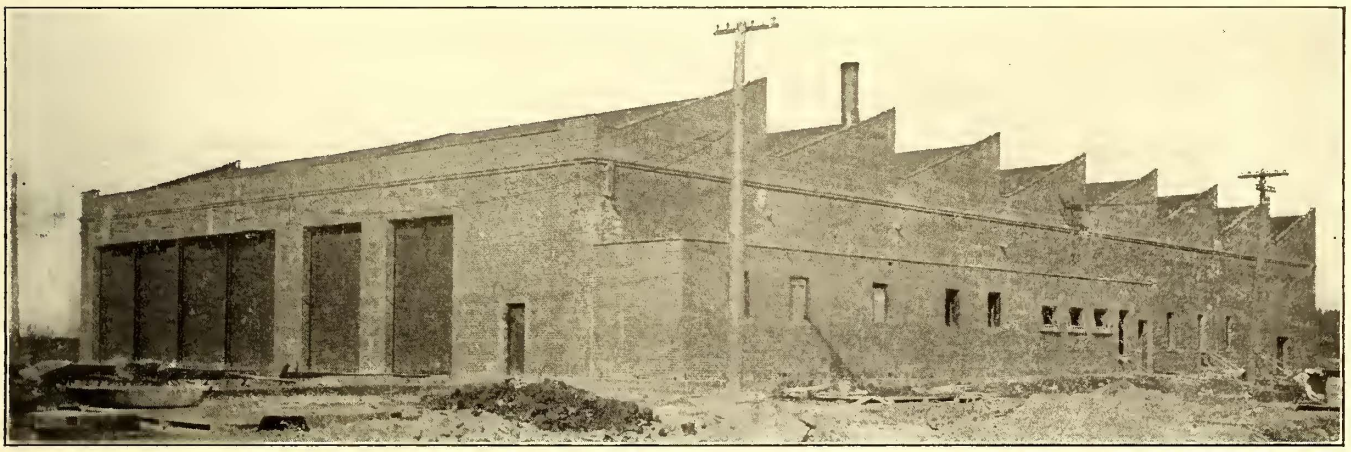
The shops are heated throughout by steam heat on the vacuum system. The lighting is by incandescent lamps attached to the 110-volt, twenty-five-cycle lighting mains.

The building walls are of brick, supported on concrete foundation, and are capped with salt-glazed tile coping. The floors are of concrete. The roof is of reinforced concrete of the saw-tooth type, with the skylights facing the north. This is of the ferrolithic type of construction and supported on structural steel roof trusses. All doors and window openings are furnished with metal doors and metal window sashes.

OPERATION

The road is operated under strictly standard rules, standard form 31 train order being used. The Excelsior Springs division was placed in operation on Jan. 21, 1913, and the St. Joseph division on May 5. Up to the present time the number of passengers carried has exceeded all expectations and the indications are that this business will increase as the road becomes better known. The success so far enjoyed by the road may be attributed to several causes, among which are the shorter time as compared with steam roads, lower fare, the convenience to passengers afforded by the cars entering into the business district in the cities and the determination of the operating department, headed by J. R. Harrigan, general manager, to give service unequaled by any steam road in the county. At present a forty-five minute headway is in force on the Excelsior Springs division and a seventy-minute headway on the St. Joseph division. Trains are composed of one car, except on Saturdays, Sundays and holidays, when two-car trains are operated in multiple. The type of passenger cars used was described in the Electric Railway Journal for Jan. 18, 1913.

The road was built by the Wyandotte Construction Company, Robert P. Woods, chief engineer, all designs, plans and specifications being worked out and all work done under his supervision. For the most part the work was sub-contracted except in a few instances when the work was done by the construction company itself.

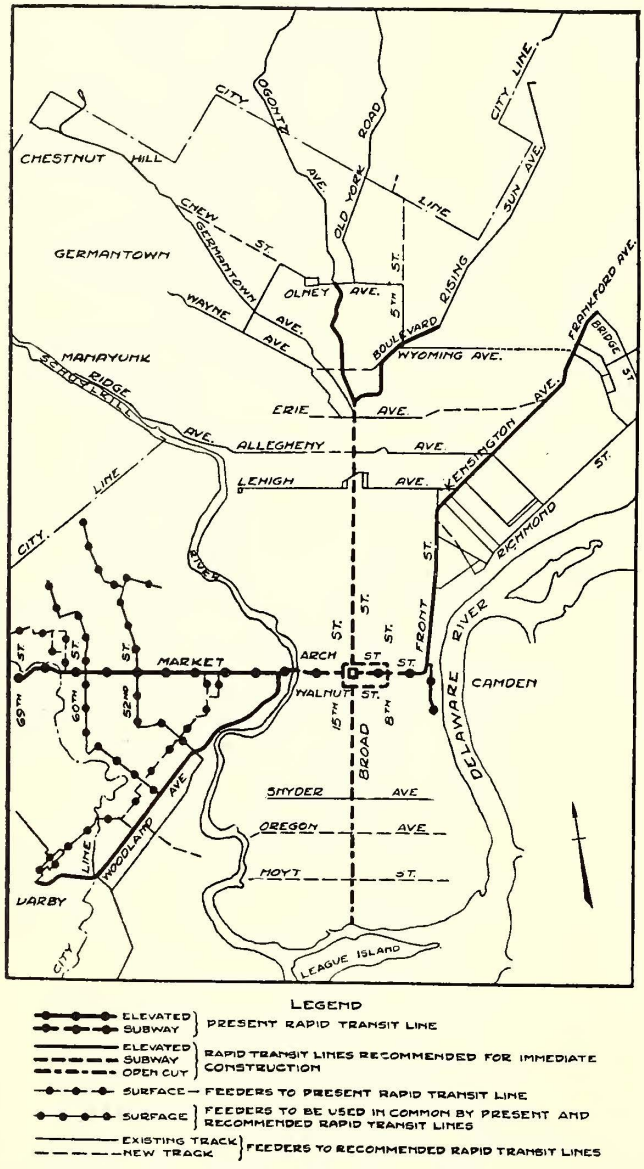


K. C., C. C. & St. J.—View of Repair Shops Taken Before Completion

Rapid Transit Report on Philadelphia

A. Merritt Taylor, Director of Department of City Transit, Recommends Construction of Subway and Elevated Lines at a Total Cost of Nearly $60,000,000—The First Development Would Comprise 25.4 Miles of Subway and 33.9 Miles of Elevated Single Track

The Philadelphia Department of Public Works has issued, under date of July 31, Vol. I of the report of A. Merritt Taylor, director of department of city transit, on an enlarged subway and elevated system for Philadelphia. Vol. II will contain maps and plans, mostly in colors. The technical portions of the report were conducted under the direct supervision of Ford, Bacon & Davis, consulting engineers, New York.



Philadelphia Report—Map Showing Existing and Proposed Rapid Transit Routes

Director Taylor recommends that the city start at once on the construction of a four-track subway in Broad Street from City Hall northward to Pike Street and a two-track subway southward from City Hall to League Island, with a central delivery subway loop in Fifteenth, Walnut, Eighth, Arch and Filbert Streets. The city also shall proceed at once with the construction of an elevated branch railway from the Broad Street subway at Pike Street to Olney Avenue and one to Rising Sun Avenue.

Coincident with these undertakings Director Taylor recommends that the Philadelphia Rapid Transit Company shall begin construction of an elevated railway from Front and Arch Streets to Frankford and an elevated railway from Thirtieth and Market Streets to Darby. The various routes suggested are shown in the accompanying map. In general, free use has been made of elevated structures outside of the central business district.

Mr. Taylor estimates the total cost of these improved rapid transit facilities at $57,587,000, of which $34,682,000 is to be paid by the city and $22,896,000 by the Rapid Transit Company in equipment as lessee of the Broad Street subway and for construction and equipment of the Frankford and Darby elevated railways.

In submitting his report with these recommendations to Mayor Blankenburg, the director says:

"The report contains definite recommendations and plans whereby such recommendations can be carried out by the city without burden to the taxpayers and with ultimate profit to the city treasury.

"All legislation necessary to enable the city to carry out the recommendations has been outlined, drafted and passed by the Legislature and signed by the Governor since my appointment as transit commissioner.

"The recommendations in the report cover the construction, equipment and operation of specific routes by the Philadelphia Rapid Transit Company, the construction of the Broad Street subway and branches by the city and the operation and equipment thereof by the Philadelphia Rapid Transit Company; also a logical and sound financial plan whereby the undertaking can be financed by the city and the Philadelphia Rapid Transit Company jointly in a manner which will gain these facilities for the city without causing an increase in the tax rate and in such a manner as to vest ownership of all the valuable facilities recommended for immediate construction and the equipment thereof in the city ultimately as a great income-producing asset, the cost thereof to be paid by the earnings from operation."

RECOMMENDED RAPID TRANSIT SYSTEM

Section I of the first volume deals with the recommended rapid transit system and explains how the routes were laid out on the basis of traffic studies. In the case of Broad Street it was felt that two express tracks should be provided at the outset, as it was calculated that the capacity of two local tracks would be exceeded within from five to ten years after the completion of the line. The mileage of the first development of the recommended rapid transit system, if operated by the Philadelphia Rapid Transit, would be as follows:

Table I—Mileage of First Development of Recommended Rapid Transit System

Line	Miles of Line			Miles of Track		
	Subway	Elevated	Total	Subway	Elevated	Total
North Broad Street line (north of Race Street)	4.2	4.0	8.2	16.3	8.1	24.4
Delivery loop (Race to Spruce Street)	2.1	...	2.1	4.5	...	4.5
South Broad Street line (south of Spruce Street) (a)	2.3	1.1	3.4	4.6	2.2	6.8
Frankford line	...	6.4	6.4	...	12.7	12.7
Darby line	...	5.4	5.4	...	10.9	10.9
Total (a)	8.6	16.9	25.5	25.4	39.9	59.3

(a) Includes as elevated 1.1 miles of two-track line in open cut south of Bigler Street.

If satisfactory arrangements cannot be made with the Philadelphia Rapid Transit Company, an independent system, with surface feeders, is recommended. This system would include 22.4 miles of subway and 34.5 miles of elevated single track.

TABLE II—REVENUE PASSENGERS PER CAR MILE, YEAR TO JUNE 30, 1913

	Surface	Rapid Transit	Ratio Rapid Transit to Surface
New York (Manhattan and Bronx)	6.5	4.9	75%
Brooklyn (including Queens)	5.6	5.2	93
Total, Greater New York (excluding Richmond)	6.1	4.9	80
Chicago (a)	5.2	3.7	71
Philadelphia	5.3	5.7	108
Boston (b)	5.7	5.8	102
Average	5.6	4.8	86%

(a) Chicago surface for year to Jan. 31, 1910; Rapid Transit for year, June 30, 1910.
(b) Boston Elevated Railway Company's system only; includes Cambridge, Somerville, Chelsea, Everett, Medford, Malden, Watertown, Brookline, Arlington and Belmont.

GENERAL DESIGN AND ESTIMATES

Section II covers general design. The cars should be about 50 ft. long, weigh about 40 tons and have at least three doors in each side, to be operated by compressed air. The trains should consist exclusively of motor cars equipped with, say, two 125-hp motors per car and operated for a normal station stop of twenty seconds and a maximum stop of forty seconds.

Although all electric lines, both surface and non-surface, of the Philadelphia Rapid Transit Company have a wide gage, it is recommended that the proposed system be of standard gage. In the cost estimate for subway construction it has been assumed that the open-cut method will be used almost exclusively and that elevated structures will be of solid-floor design. In all cases the stations have been estimated as 500 ft. in length to accommodate ten-car trains. Section III is devoted to cost estimates according to different headrooms, number of tracks, etc.

TABLE III—REVENUE RIDES PER YEAR PER CAPITA, YEAR TO JUNE 30, 1912

	Surface	Rapid Transit	Total
New York, including Bronx	159	229	388
Brooklyn (including Queens)	186	79	265
Total Greater New York (except Richmond)	171	167	338
Chicago (a)	204	74	278
Philadelphia	252	22	274
Boston (b)	234	50	284
Average	199	109	308

(a) Chicago surface for year to Jan. 31, 1910; Rapid Transit for year, June 30, 1910.
(b) Boston Elevated Railway Company's system only; includes Cambridge, Somerville, Chelsea, Everett, Medford, Malden, Watertown, Brookline, Arlington and Belmont.

TIME SAVING

Section IV is devoted to a statement of the travel time saved by the proposed routes, the city being divided into time zones. It is estimated that the present subway-elevated line to West Philadelphia saves time for about 165,000 people, but the new lines would raise this to 983,000 persons, or 60 per cent of the (1912) population within the city limits. A large part of the remaining 40 per cent is within the central part of the city and would be served better by surface lines.

SURVEY OF PRESENT TRAFFIC, ESTIMATED TRAFFIC, INCOME ACCOUNT, ETC.

Section V is a survey of present traffic. In making this survey two observers were placed on approximately every fifth car of each line during practically the entire day, and a record of the trip of each passenger boarding the car was obtained, under the following headings:

Record (a) time of day; (b) route of car; (c) direction; (d) street at which passenger boards car; (e) street corner to which passenger is destined; (f) route on which destination is located if reached by transfer or exchange ticket; (g) fare presented—whether cash, exchange ticket, transfer or free; (h) transfer or exchange ticket issued, if any. The data were transferred to cards by means of an electric tabulating machine, and the cards were then segregated in 113 traffic sections. Each section was noted for (a) population in 1912, (b) land areas in acres available for residences, (c) density of population per acre, (d) rides originating on day of survey, (e) equivalent revenue, year to June 30, 1913, (f) rides per annum and (g) revenue per capita, year to June 30, 1913.

Section VI relates to the estimated traffic of the proposed rapid transit system. Section VII is an estimate of income account, with allowance for taxes and 3 per cent of operating expenses for reserve fund. It is accompanied by curves showing the rides per capita in New York, Brooklyn, Chicago and Boston.

FUTURE RAPID TRANSIT SYSTEM

Section VIII deals with the future rapid transit system and the possibility of inter-operation with electrified steam suburban lines. In addition to the lines recommended for immediate construction, it is tentatively suggested to follow them with 132.4 miles of elevated and 24.2 miles of subway single track.

TABLE IV—INCREASE IN RIDING HABIT

	1890	1895	1900	1905	1910	1912
New York, including Bronx	...	...	276	312	376	388
Brooklyn, including Queens	...	...	208	230	251	265
Greater New York (excluding Richmond)	...	...	249	279	325	338
Chicago (a)	159	180	200	235	278	...
Philadelphia	158	192	220	258	258c	274
Boston (b)	172	200	229	255	274	284

(a) Chicago surface for year to Jan. 31, 1910; Rapid Transit for year, June 30, 1910.
(b) Boston Elevated Railway Company's system only; includes Cambridge, Somerville, Chelsea, Everett, Medford, Malden, Watertown, Brookline, Arlington and Belmont.
(c) Adjusted for strike

EFFECT ON ASSESSED VALUES, POPULATION, ETC.

Section IX discusses the effect of subway and elevated construction on real estate values in the business and residential districts based on experience with both the West Philadelphia line and the New York subway system.

Section X covers population and housing statistics, showing past increases of population in New York, Chicago, Philadelphia and Boston and estimated increases for Philadelphia. In 1910 the population density per acre of land area was as follows: New York (Manhattan and Bronx), 69; Brooklyn, 32.9; Chicago, 19; Philadelphia, 14.3, and Boston, 19. Another table shows that in 1910 Philadelphia had 295,220 dwellings, or one house per 1.1 families within the corporate city limits, as compared with 104,143 for New York (Manhattan and Bronx), or one house for 4.3 families. The population per dwelling compares with other cities as follows: New York, 26.5; Brooklyn, 11.1; Chicago, 8.9; Philadelphia, 5.2; Boston, 7.9. The report concludes that if Philadelphia is to maintain its pre-eminent advantage of having a dwelling for each family it is necessary to develop the outlying areas.

TABLE V—POPULATION PER MILE OF TRACK

		Surface		Rapid Transit		Total	
	Population	Miles of Track	Population per Mile of Track	Miles of Track	Population per Mile of Track	Miles of Track	Population per Mile of Track
New York (Manhattan and Bronx)	2,904,906	190.6	15,241	457.2	6,353	653.0	4,449
Brooklyn (including Queens)	2,038,154	121.9	16,720	698.8	2,917	815.5	2,499
Total Greater New York (a) (excluding Richmond)	4,943,060	312.5	15,818	1,156.0	4,276	1,468.5	3,365
Chicago (b)	2,185,283	143.7	15,207	666.2	3,280	809.9	2,698
Philadelphia (a)	1,623,200	14.7	110,422	564.7	2,874	579.4	2,802
Boston (a)	1,094,831	26.5	41,314	420.0	2,607	446.5	2,452
Total	9,846,374	497.4	19,796	2,806.9	3,508	3,304.3	2,980

(a) For year 1912 (estimated). (b) 1910 U. S. Census.

REPID TRANSIT IN AMERICAN CITIES

Section XI opens with a history of rapid transit in New

York, Brooklyn, Chicago, Boston and Philadelphia. Comparison of track mileage shows that Philadelphia with 14.7 miles of rapid transit lines has about one-half the rapid transit mileage of Boston, one-tenth that of Chicago and one-twentieth that of Greater New York. The ratio of rapid transit track to total track of the local surface, elevated and subway systems is 2.5 per cent in Philadelphia compared with 20 per cent for New York's present mileage and 35 per cent for New York's authorized mileage. In Philadelphia about 8 per cent of the passengers travel on the rapid transit lines, in Chicago 25 per cent, in Brooklyn 33 per cent, and in New York more than 50 per cent. The revenue passengers per car mile and the rides per capita for the year ended June 30, 1912, were as given in Tables II and III, while Table IV shows the increase in riding habit since 1890 for the same cities. The population per mile of track is shown in Table V and the approximate investment per mile in Table VI.

RATES OF FARE

Section XII relates to rate of fare. In Greater New York the 5-cent fare extends to the northern limit of Manhattan Borough and eastwardly through the built-up districts of Brooklyn and Queens. Beyond this the 10-cent and 15-cent limit from the City Hall extends beyond the lines to the city limits on the north and an extra 5-cent fare beyond the city limits. To the west an interurban electric line connects with the elevated line, charging three additional 5-cent fares to the limit of the 16-mile circle.

In Philadelphia and Boston the subway and elevated lines charge a 5-cent fare in conjunction with free transfers to outlying surface lines.

CONCLUSIONS DRAWN IN REPORT

The proposed rapid transit lines for Philadelphia are all within the 7-mile radius from the City Hall and well within the 5-cent fare limits of the surface lines. Only one, the Darby line, extends beyond the present city limits. The 5-cent rate of fare, therefore, must necessarily be adopted on these lines.

From the standpoint of the public, in order to promote free intercourse between all parts of the city, it would appear to be desirable that transfers should be given at many points of intersection of surface lines with rapid transit lines and at points of intersection of the rapid transit lines themselves. There are limitations, however, which should be observed.

Care must be taken to avoid congestion of the expensive high-speed lines by short riders to and from the business district, which is already well served by surface

Table VI—Approximate Investment in Present Rapid Transit System per Mile, Dec. 31, 1912

	Elevated		Subway		Total	
	Of Line	Of Track	Of Line	Of Track	Of Line	Of Track
New York (Manhattan and Bronx)	$2,739,700	$1,003,300	$5,510,900	$2,126,800	$3,806,200	$1,421,800
Brooklyn (including Queens)	1,034,500	437,000	5,294,100	1,730,800	1,176,500	492,200
Total Greater New York	1,836,700	723,600	5,498,300	2,099,700	2,708,700	1,059,200
Chicago	1,788,300	682,000	.....	.....	1,788,300	682,000
Philadelphia	.....	.....	.....	.....	2,328,800	1,156,500
Boston	.....	.....	.....	.....	3,283,500	1,660,400
Average investment per mile					$2,751,500	$985,100

Note.—The above costs per mile include equipment and all appurtenances and are not comparable with cost of structure alone, referred to elsewhere. The low costs in Brooklyn and Chicago are due to the preponderance of elevated track.

16-mile circle of the metropolitan area, while in New Jersey, owing to the disconnected location of the various communities, 20 and 25 cents is charged to that distance. The maximum ride to the edge of this metropolitan district varies from 0.6 cent per mile to 1¼ cents per mile. In Chicago the 5-cent fare limit from the City Hall extends to approximately 10 miles from the business center. The 15-cent limit approximately coincides with the 16-mile circle, giving a maximum ride for about 1 cent per mile.

In Philadelphia practically all of the street railways are operated within the city limits at the 5-cent rate. The second 5-cent zone, making a 10-cent fare limit from the City Hall, extends from 8 to 11 miles from the center to the west and from 12 to 14 miles on the north; the 15-cent fare limit on the north coincides with the 16-mile circle, while in New Jersey the 20-cent fare limit extends to the 16-mile circle.

In Boston the 5-cent fare limit extends about 5 to 9 miles from the center of the city, while the 15-cent limit largely coincides with the 16-mile circle.

In all four cities the central business and residential districts are within the zone of 5-cent fares. Transfers are practically universal, although in Philadelphia 3 cents is charged at some points for transfers which are locally termed "exchange" tickets.

In New York the subway and elevated lines charge an almost universal rate of 5 cents for any distance, a second 5-cent rate being charged only to some points in Brooklyn. On the Hudson tunnel system, operated to Newark in conjunction with the Pennsylvania Railroad, the fare is 17 cents for about 9 miles, or approximately 2 cents per mile, although the sixty-trip monthly commutation rate averages 1.06 cents per mile. The Hudson Tunnel system has recently increased its local fare to points north of Christopher Street from 5 cents to 7 cents.

In Chicago the 5-cent rate is charged on the elevated lines, and to this end transfers with surface lines should not be given generally closer than about 3 miles from the central business district, or at points showing a time saving of less than five to ten minutes, and only at intersections where stations exist. Within this central zone the present surface lines provide facilities for taking care of this traffic almost as expeditiously as the rapid transit lines and short-ride travel should not be encouraged on the latter.

EXTENSION OF BERLIN RAPID TRANSIT LINE

An article on the latest extension of the Berlin Elevated & Subway Company, which was written by G. Kemman, retired government councilor, Berlin, for the June and July proceedings of Der Verein Deutscher Eisenbahnverwaltungen (German Railroad Managements' Association), has just been reprinted in pamphlet form. The article describes the Spittelmarkt-Alexanderplatz extension and gives a comprehensive idea of the latest construction and line equipment standards of the Berlin company, especially in signal work. The details concerning the construction and reconstruction of the Spree River tunnel are also of unusual interest.

CHANGES ON DESSAU-BITTERFELD LINE

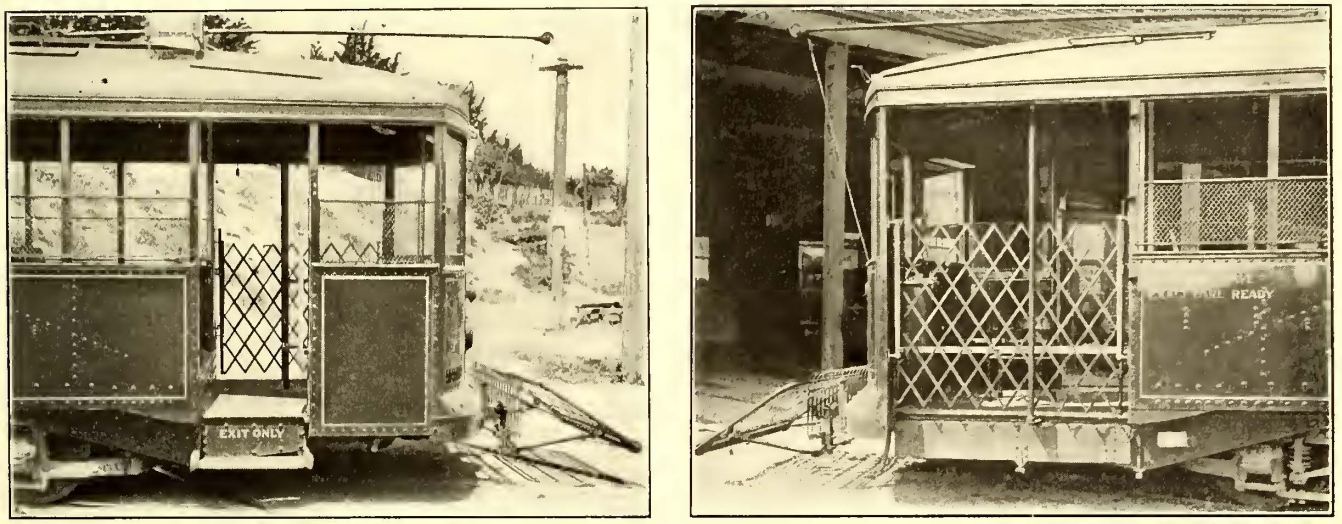
The Dessau-Bitterfeld trial section of the single-phase electrification of the Prussian State Railroads has been equipped with an improved form of line construction to permit the use of 15,000 volts instead of 10,000 volts and also to permit the span lengths to be increased from 246 ft. to 328 ft. The lengthening of the spans not only gives a decrease in the number of porcelain insulators required but also reduces the obstruction of line signal indications. It is planned at present to electrify a total of 93 miles for trains operated at a maximum speed of 68.2 m.p.h.

California Type Cars for San Francisco

The Sixty-five New Cars of the United Railroads of San Francisco Are Notable for the Adoption of Side-Girder Semi-Steel Construction, Arch Roof, Combination of Open and Closed Sections, Large Platforms, Prepayment Features, Etc.

The United Railroads of San Francisco have placed in service sixty-five new cars, the design of which involves several novel features worthy of mention.

The general outlines and dimensions are the same as with most of the rolling stock used by this company for the past five years, except that the company has adopted what



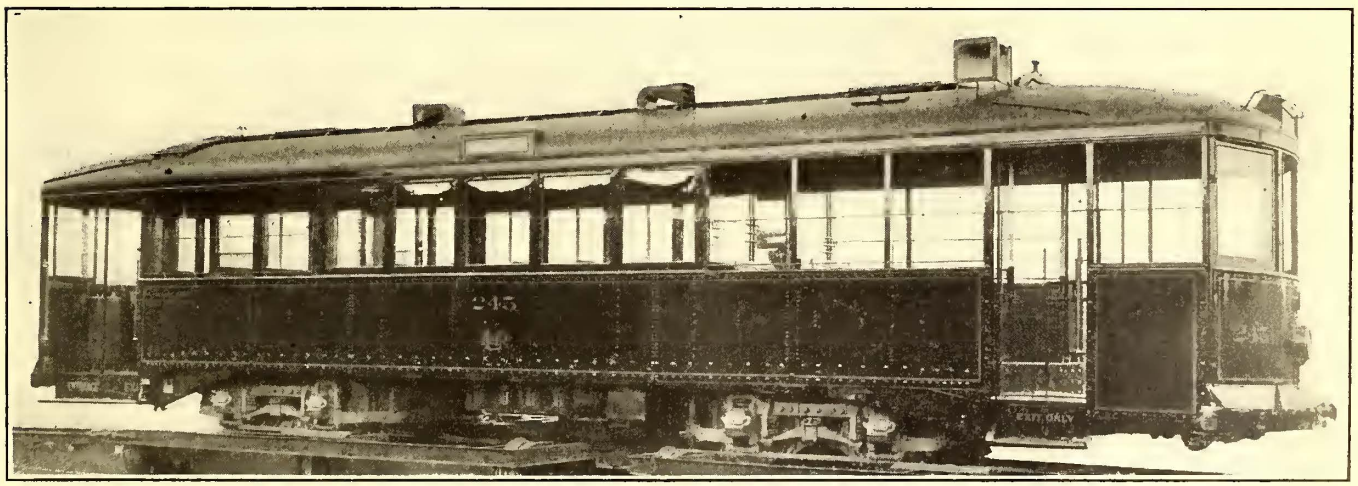
San Francisco Car—Front and Rear Platforms, Showing Entrance and Exits

is known as the "California" type, which in general involves open sections at each end with a closed section in the center. The principal dimensions are as follows: Length over bumpers, 47 ft.; length over corner posts, 32 ft. 4 in.; outside length of closed section, 15 ft. 4¾ in.; width over drip rails, 9 ft. 2 in.; height of roof above rail, 11 ft. 3 5/16 in.; truck centers, 20 ft. 10¼ in.; truck wheelbase, 4 ft. 6 in.

The material used in construction comprises side sills of long-leaf yellow pine, end sills of white oak and steel plates, crossings and diagonal bracing of white oak, side and corner posts of white ash, platform knees of steel plates and angles, arch roof of ⅜-in. poplar, sash of white ash, body bolsters of pressed steel and ball-bearing center plates. The interior of the cars is finished in white ash, the headlining of agasote and the metal finish of polished brass. The cars are also furnished with Hedley anti-climbers.

SIDE-PLATE CONSTRUCTION

The entire side plate is designed to act as a plate girder, using the side sills as the bottom chord and the 3/32-in. side plate as the web plate, with intermediate stiffener angles at each side post. The upper chord is composed of angle iron, cut out at each side post, in addition to which there is an over truss rod of flat bar steel to take a portion of platform load. This method of side-plate construction does not in any way depend on the side post for strength, thereby allowing the use of a very light side post, which gives the car a light appearance above the window sills.



San Francisco Car—Latest Design for the United Railroads of San Francisco, Showing Division into Central Closed Section, Semi-Open Sections, Arch Roof, etc.

PLATFORM AND STEPS

The floor area of each platform, 46.25 sq. ft., is larger than that of any other car in use at the present time in San Francisco and is of great advantage in loading and

unloading. On observation the company has found that twenty-five people can stand on the rear platform, which is a great help during rush-hour loading at congested points.

Stop-watch tests have also shown the average loading time per passenger to be 1.1 seconds and for unloading by front exit only, 0.95 second per passenger.

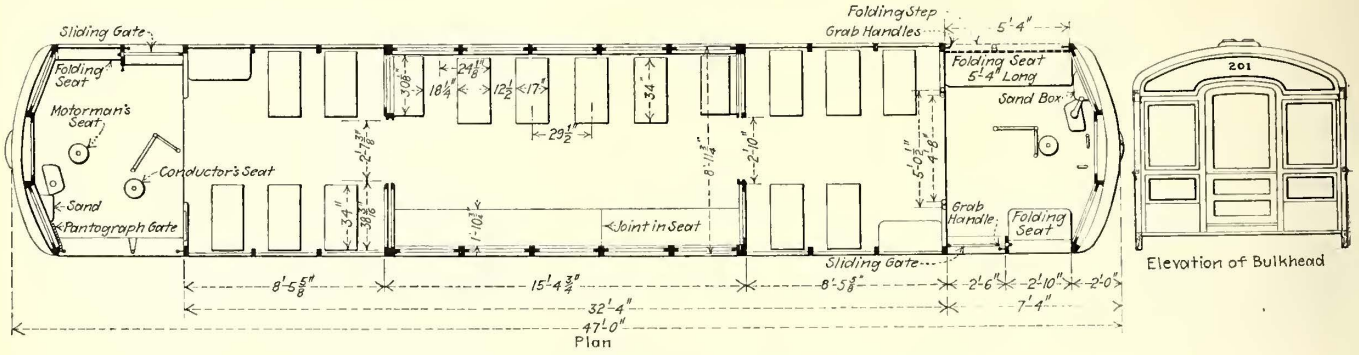
Great consideration was given to step and platform design, which is the heart of the prepayment type of car.

VENTILATION

Ventilation for the closed section is obtained through four roof funnels, two acting as intakes and two as outlets. In addition a perforated panel ventilator is carried at each end of the closed section over the window opposite the door.

SEATING ARRANGEMENT

Two different seating arrangements are used, varying only in the closed section, where cross seats are used on



San Francisco Car—Plan and End Elevation at Bulkhead

The distance to the first step from the street is 15⅛ in., from the first step to the platform 12⅛ in. and from the platform to the car proper, with the use of a 2-in. platform ramp, 10 in. This arrangement places the floor of the car only 39¼ in. above the head of the rail, with a light car and new wheels, despite the vertical curves over which these cars operate and the use of 33-in. wheels.

The conductor's railing, which can be locked up to the ceiling, is designed to give the maximum-width entrance. It also acts as a motorman's guard rail and serves to operate the folding step on the blind side of the car, thus making it impossible for the car crew to neglect to raise or lower the step at the proper time.

FOLDING PLATFORM SEATS

The car has four folding platform seats which are used only on the front end of the car. These seats afford an extra seating capacity for six people but interfere in no way with passengers who leave the car by way of the front exit. Wired, polished plate glass, ⅜ in. thick, is set in each side sash of the platform windows to protect users of these very popular seats in case of a slight collision.

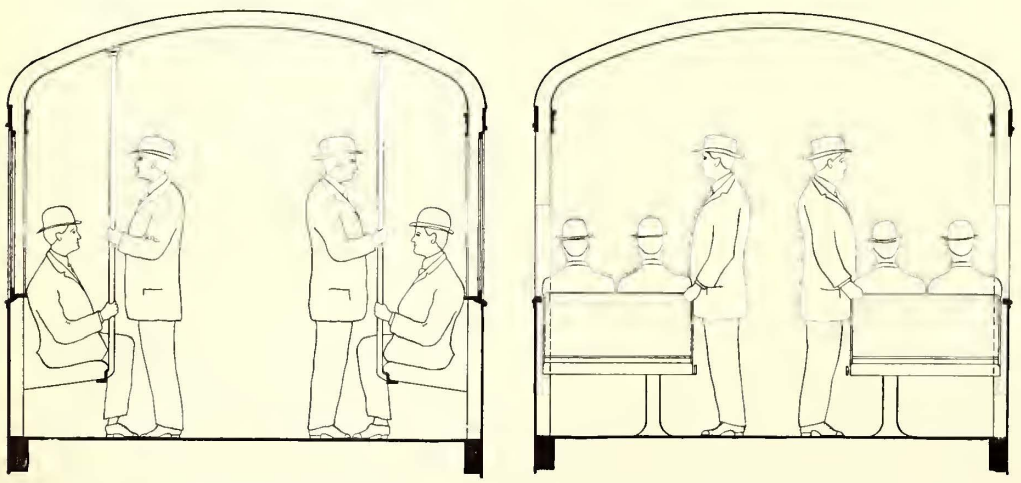
EXIT GATES

All operating mechanism of the sliding exit gates is concealed behind the panel back for folding the platform seats, which is removable. The mechanism has been so arranged that the momentum of the car does most of the work in opening and closing.

one side in place of longitudinal seats on both sides. In the cars that have longitudinal seats on both sides of the closed section, there is an unobstructed space under the entire length of seats, thus permitting the free use of a vacuum cleaner.

The seats in the open sections are of special design, as they are pivoted only and not throw-over. They are of slat construction, with natural finish to match the interior finish of the car. These special seats permit a clear aisle space of 31⅛ in. between the cross seats. The accompanying line drawings of sections of a closed and open section with standing load were taken from actual photographs of a 140-lb. man.

After careful study and actual tests the company decided to use vertical hand rods in the closed section in place of hand straps. Passengers of various heights, of course, can use these rods with equal comfort. The stanchions and screens at the end sills serve two purposes: first to define clearly the dividing line between the platform and the car proper so that conductor can ask passengers to step into the car; second, the screens act as a guard to prevent passengers who are occupying seats of the open section from putting their feet against passengers who are occupying the folding platform seats. As all stanchions are enameled white, they are easily kept clean.



San Francisco Car—Aisle Clearances with 140-lb. Men Between Longitudinal and Cross Seats

The seating capacity of the cars with longitudinal seats on both sides of the closed section is fifty, including folding platform seats, and fifty-two for those cars having cross seats on one side of the closed section.

EQUIPMENT, WEIGHTS, LIGHTING, ETC.

The operating equipment per car consists of two Brill 27 GE-1 trucks, four GE-216 form E motors and two K-28-J controllers. The scale weight of a car ready for service is 48,440 lb., or 931 lb. per seated passenger. The cars receive ample illumination by means of twenty-four 16-cp carbon lamps.

CONCLUSION

The management prepared the plans for these cars with the most painstaking care, utilizing every inch of space so well for the comfort of passengers that the new type is now the most popular car operating in San Francisco. The complete car was designed by W. B. Farlow, chief draftsman of the engineering department, under the supervision of Charles N. Black, vice-president and general manager United Railroads of San Francisco. The cars were built at the American Car Company works of The J. G. Brill Company.

San Francisco Car—Looking from Closed Section Toward Semi-Open Compartment and Platform

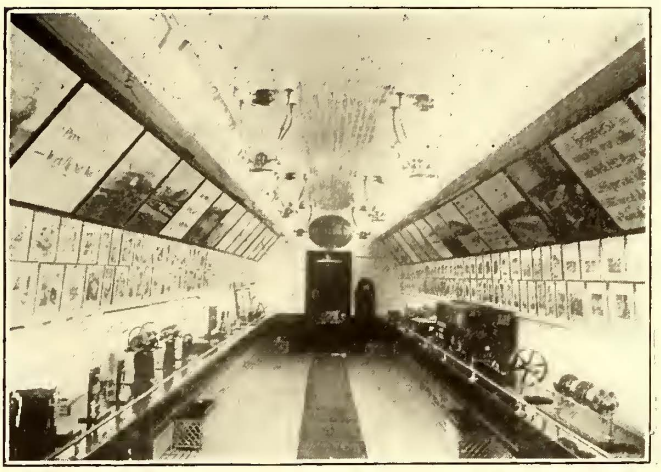
SAFETY EXHIBIT CAR ON NEW YORK CENTRAL

The New York Central Railroad Company has just completed a "safety exhibit" car, which will be put into service in connection with the work of the safety department of the company. The car is intended primarily for use as an instruction car to inculcate the doctrine of "safety first" in the minds of the 25,000 or more employees of the railroad. It was equipped under the supervision of M. A. Dow, general safety agent for the entire system, who will have charge of the various trips the car will make over all the company's lines.

A car of this kind, of course, is of greater importance to steam railroads than to electric railways, owing to the greater extent of the former, but as the electric lines are taking a great interest in safety appliances and education, a brief description of the car may be of value here. With its concrete models for teaching workmen and its easy accessibility to the public, the car affords a means for the reduction of accidents that some of the larger interurban electric lines might find it advantageous to adopt.

The interior of the car is finished in white enamel. Along each side is a shelf about 3 ft. from the floor, finished in mahogany and containing models of the principal machine tools used in the many shops of the system. The New York Central requires all such machinery to be properly guarded so as to prevent workmen becoming caught in the various parts and injured, and these models show the proper manner of applying the guards. Along the side walls of the car above the models are several rows of pictures, some showing the principal shops of the company and others demonstrating machine guards and various safety appliances. On one side of the car the picture space is devoted entirely to unsafe practices, and there are fully 100 photographs which explain graphically the common practices of railroad employees that cause accidents resulting in injuries, both to themselves and to others. Alongside of each picture showing the improper or unsafe way of doing various kinds of shop and road work is another picture showing the safe or proper way. Employees will be conducted through this car by an attendant and instructed in the matter of safeguarding not only themselves but also the public from injury.

One section of the picture gallery is devoted to the trespass question, and pictures show how people needlessly risk their lives trespassing on railroad property. Above these trespass pictures is a statement of the number of persons killed and injured on railroads in the United States during the past year. Attached to the exhibit car there will be a coach which will be used as a lecture car. This car is equipped with a stereopticon, and illustrated lectures on safety will be given to employees at various points. The safety car will be exhibited at first in the large terminals and centers of operation in the East, then in the shops, and lastly in the smaller localities.



Interior of Safety Exhibit Car of New York Central, Showing Exhibits

The New York Central lines have a department devoted entirely to safety work, and a systematic effort to bring about a reduction of all classes of accidents has been made for some time past. That the work has proved successful is indicated by statistical statements appearing in the car.

ELECTRIC RAILWAY PROPOSED FOR BAGDAD

Two English engineers have just arrived at Bagdad to survey three different lines for an electric railway from Moazzem, 5 miles north of Bagdad, to Garara, 5 or 6 miles south of Bagdad. It was reported in May, 1912, that a concession to build this line had been granted to Mahmoud Shabander, Bagdad, and that Mr. Shabander had left for Europe to contract for engineers and materials. It is now reported here that Mr. Shabander has sold his concession in whole or in part to an English firm and that actual construction will begin in the near future. The engineers are surveying two lines through the city of Bagdad and a third line just along the east border of the city. A fourth line will be surveyed along the west bank of the Tigris through west Bagdad. After the surveys have been completed the plans must be submitted to the imperial government at Constantinople for approval of the one or the other line or lines.

A number of the cars in Pittsburgh display the letters "M. U. F." on one of the advertising cards at the front end of the car. The unsophisticated stranger is apt to ask the meaning of these letters, and he is told that they stand for "Move Up Front." Because they excite curiosity, they probably make more impression than if the words were spelled out.

Car Washing Versus Paint Preservation

An Account of a Chemical Investigation of the Subject of Car-Washing, Revealing the Detrimental Effects of Poor Soap on Paint and Varnish—Improvement in Methods Possible as a Result of the Investigation—Will Lengthen the Life of Paint and Varnish

BY MORGAN B. SMITH, CHIEF CHEMIST AND COMBUSTION ENGINEER DETROIT UNITED RAILWAY

In the latter part of November, 1912, E. J. Burdick, superintendent of power of the Detroit United Lines, made a trip to one of the suburban car-washing stations of his company for the purpose of noting the methods used in washing the large interurban cars running on that division. He was particularly interested in finding out the reasons for the failure of the paint and varnish on one of the cars after only three months' service after it was refinished.

The results of this observation of methods at one car-washing station led to a very complete investigation of the methods employed at the other stations, about twenty in number. This general investigation proved beyond any doubt that the washing of cars plays a large part in the life of the paint and varnish with which the cars are finished.

In order to indicate in a general way the importance of long life of car finish some computations were made on the basis of 1600 cars in service (a low figure) at a cost of $80 each for refinishing (also a low figure). These calculations are shown in Table I.

Not only is there the direct cost of preparing the car for refinishing and the subsequent refinishing; there is also the much greater factor, namely, the loss of earning time while the cars are out of service in the paint shop.

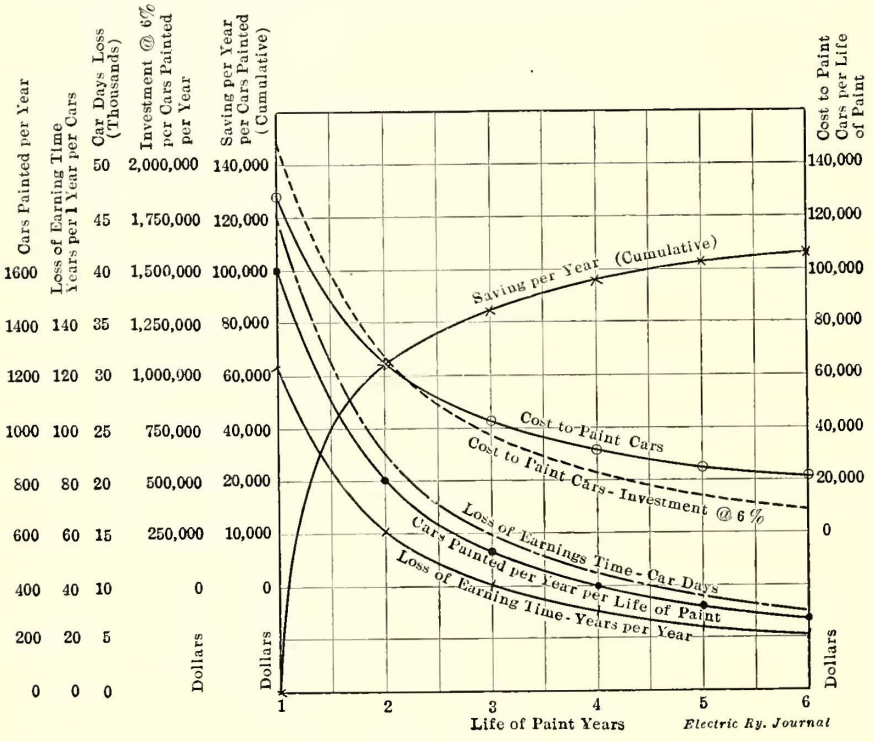


Diagram Showing Statistics of Painting Cars in Detroit

Assuming that it requires four weeks properly to refinish each car, we arrive at the figures given in Table II, which show the actual loss of earning time in car days per year and in years per year.

As the result of this investigation the company determined to turn the matter over to the laboratory for thorough research there under the direction of the writer of this article.

The results of the laboratory research may be summarized thus:

CRITICISM OF OLD METHODS

1. Water at too high a temperature is used.
2. Too much soap is used.
3. The period of contact of soap with the highly finished surfaces is too long, i.e., rinsing does not follow soon enough after the application of the soap.
4. The use of soda ash cannot be too highly condemned.
5. There is insufficient wetting of the car surfaces to soften hard mud and dust and to loosen sand, etc.
6. Soap is used which undoubtedly attacks the varnish and paint.

INVESTIGATION OF METHODS CRITICISED

1. Reference to builders of motor cars and other highly finished vehicles, followed by exhaustive laboratory tests, showed that the maximum safe temperature for wash water is 80 deg. Fahr.
2. The use of too much soap may be avoided (and now is) by supplying the car-washing stations with a stock soap solution of a strength equivalent to 1.5 oz. per gallon of water. With stronger soaps this weight of soap may be reduced, but it should never be used on car surfaces at a greater strength than given above.
3. Rinsing must follow the soaping immediately to avoid attack by the soap on the car surfaces.
4. Soda ash or other equivalent alkali must be kept out of reach of the car washers. It is an excellent paint remover.
5. Cars must be wet down over the entire surfaces at least twice and, better, three times, to assure the softening of the accumulated mud and sandy particles.
6. Referring to paragraph one, above, we recommend that at each car-washing station there be installed a suitable recording thermometer in each of the supply tanks so that a record of the temperature of the wash water may be had for every hour of the day. We further recommend that the charts used be marked with red ink at the desired

TABLE I—POSSIBILITIES OF ECONOMIES

Life of Paint, Years	No. Cars Painted per Year	Cost to Paint Cars	Saving in Cost of Painting (Cumulative)	Cost to Paint Cars Represents an Investment of (at 6 per Cent)
1	1600	$128,000	.....	$2,133,333
2	800	64,000	$64,000	1,066,666
3	534	42,720	85,280	712,000
4	400	32,000	96,000	533,333
5	320	25,600	102,400	426,666
6	267	21,360	106,640	356,000

TABLE II—ACTUAL LOSS OF EARNING TIME

Life of Paint, Years	Cars Painted per Year	Loss of Earning Time per Year	
		Years per Year	Car Days per Year
1	1600	123.1	44,800
2	800	61.5	22,400
3	534	41.0	14,952
4	400	30.0	11,200
5	320	24.6	8,960
6	267	20.5	7,476

temperature (80 deg. Fahr.) so that the men in charge may see at a glance whether the temperature is correct or not.

6. The character of the soap used has a great deal to do with the life of the varnish and paint upon which it is used.

ANALYSES OF SOAPS

In order to get some knowledge of the general run of the so-called potash oil soaps on the market, eleven soaps were purchased in the open market in the city of Detroit and analyzed. The results are shown in Table III.

These soaps were also used in so-called panel tests, which will be described below.

No soap was found which did not in time attack the varnish and paint on the test panels. As the result largely of the panel tests, recommendations were made as follows in the matter of first, second, third, fourth and fifth choice among the soaps tested for the given utility, namely, car washing. First choice, soap No. 3; second choice, soap No. 9; third choice, soap No. 4; fourth choice, soap No. 2; fifth choice, soap No. 10. It is to be noted that those soaps which had the least detrimental effect upon paint and varnish in the panel tests are those which contain medium amounts of actual soap, running from 28.18 per cent to 31.00 per cent fats (anhydrides).

Soap No. 5, above, contains a large percentage of free alkali and showed by far the worst attack on paint and varnish.

Table III—Analyses of Soaps, Percentages

Soap No.	1	2	3	4	5	6	7	8	9	10	11
Water	58.45	59.85	64.05	58.86	49.41	52.62	54.62	47.36	54.90	64.5	53.75
Free acid	0.17	0.51	0.40	0.43	0.17	0.23	0.51	0.28	0.56	0.43	1.07
Total alkali	5.88	5.54	4.45	5.31	5.53	6.65	6.31	6.69	5.44	5.23	6.28
Free alkali	0.06	0.08	0.07	0.05	1.84	0.08	0.06	0.11	0.94	0.10	0.085
Insoluble in water	...	0.03	0.03	0.05	0.02	0.01	0.02	0.01	0.01	0.01	trace
Fats (soap)	29.2	29.00	29.50	31.00	39.00	33.00	32.60	39.50	30.04	28.18	37.88
Undetermined (fillers), glycerine, etc...	6.24	4.99	1.51	4.31	4.04	7.81	5.89	6.05	8.13	1.53	0.935

Notice the free alkali in Nos. 5 and 9 and the free acid in No. 11.

PANEL TESTS

In the so-called panel tests sections of panels from trolley cars were subjected to the action of solutions of the soaps being tested. The panels were one-half immersed. The temperature was that of the laboratory, ranging from 20 deg. to 24 deg. C. The strength of the soap solutions in each case was equivalent to 10 grams per liter (1.33 oz. per gallon).

The panels were immersed in the soap solutions, left for a stated time, removed, rinsed with running water and brushed off with a soft long-haired brush. The condition of the paint and varnish was then noted.

The panel tests resulted as shown in Table IV, beginning with that soap which showed the least effect upon the paint and varnish:

Table IV—Results of Panel Tests

Time:	24 Hours	48 Hours	96 Hours	120 Hours	13 Days	14 Days
Soap No:	2	2	4	3	3	3
	3	3	3	4	9	9
	7-11	7-11	10	9	4	4
	4-10	4	6	10	1	2
	9	10	2	6	2	10
	5	9	9	1	10	1
	1	6	1	2	6	7
	6	5	7-11	7-11	8	6
	8	8	5	8	7-11	8

The panel tests are undoubtedly of great value in the final acceptance or rejection of soaps for car-washing purposes.

There was a very great divergence in the character of the soaps tested in the panel tests, there being a decided line of demarkation between the first five soaps and the remaining soaps.

All analyses were carried out in the manner recommended by the United States Department of Agriculture, Bureau of Chemistry, Bulletin No. 109, revised.

NEW BASIS FOR CAR WASHING

Upon completion of this very important research the matter of car washing was at once placed upon a new basis. A competent man, trained in practical handling of paints and varnishes, was placed in charge of this operation and is now held responsible for the work on the cars.

The new system has now been in operation about three and one-half months and already the bettered conditions are evident. Not only is there less attack on the paint and varnish, the cars look better and brighter. They lack a certain dulled appearance which they formerly quickly assumed in the course of washing. The varnish retains its luster very markedly compared with its appearance under the old methods of car washing.

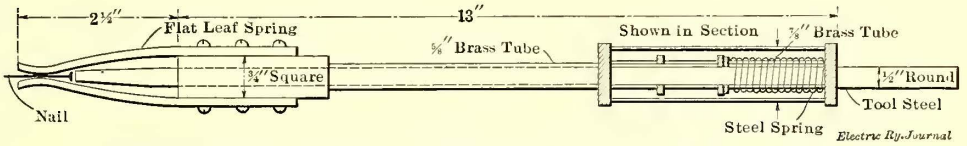
The company hopes to lengthen the life of the paint and varnish at least one year; it may be that an increase of two or three years is entirely within reach. Reference to the calculations given above shows what an important factor this is in the economies of car maintenance.

As in all work of this nature, experience will show what is most desirable and where improvements may be made in the recommendations advanced for the new car-washing methods.

The company believes it has located one of the "leaks" which have gone unnoticed heretofore in car handling, and it is giving this information to the railroad world in the hope that it may be of interest and value to those engaged in the operation and maintenance of cars in general.

TOOL FOR DRIVING NAILS IN INACCESSIBLE POSITIONS

Considerable trouble has been experienced in recabling the cars of the Topeka (Kan.) Railway Company when the point of application is at a point inaccessible for nailing. In order to eliminate this difficulty S. S. French, master mechanic, has designed and manufactured a special tool for this purpose. In principle this device consists of a pair of leaf springs to hold the nail at the end of a tool-steel plunger. A hammer blow at the opposite end of this plunger drives the nail and is returned to the normal position by a steel spring. The device is simple, inexpensive and will pay for itself on a single car in time saved. The design details of this tool are shown in the sketch presented herewith.



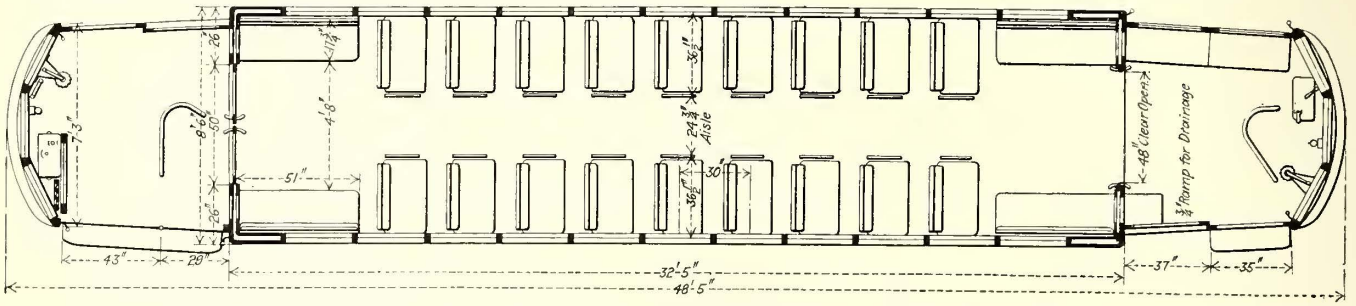
Hammer and Nail Holder for Fastening Cleats on the Bottom of Cars

John M. Roach, president of the Chicago (Ill.) Railways, is having a private railroad built to connect his Florida grapefruit plantation with the Allen River. The railroad will be 10 miles long and will open up a rich portion of Florida on the northern edge of the Everglades that has been to a great extent undeveloped owing to lack of adequate transportation.

New Cars of the Chicago Railways

Like the Company's Preceding Type, These Cars Are of Arch Roof Design, but They Are Notable for the Use of Maximum Traction Trucks with Field Control Motors, Structural Changes to Secure Lower Weight and Greater Seating Capacity

Mention has been made in the Electric Railway Journal of the 200 cars which are to be added to the equipment of the Chicago Railways Company. One hundred of these cars will be built in the shops of the company, fifty have been ordered from the American Car Company and fifty have been ordered from the Southern Car Company. The cars will be of the same type and will involve a number of changes from the present standard car of the company, particularly in the use of maximum traction trucks, motors with field control, deep side girders, use of some wood in the floor framing, cast-steel bolsters, greater seating capacity and lower weight per seated passenger. Earlier designs of the company are described in the Electric Railway Journal for Nov. 7, 1908, Aug. 28, 1909, and Oct. 7, 1911. The new cars will follow the double-end design now in use on the lines of the company.



Chicago Railways Car—Combination of Transverse and Longitudinal Seating

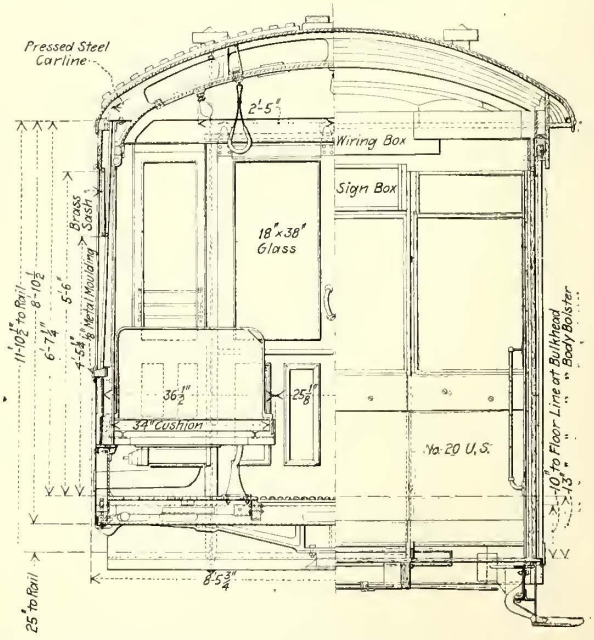
No other design was considered seriously at the present time in view of the desire of the company to have the cars for winter operation and of the disinclination to make a radical change in type without a careful study to determine the applicability of other types to the particular traffic conditions existing in Chicago. The company, however, will undoubtedly make engineering studies in the future, when it has more time to do so, in order to determine whether another type would be better suited to existing conditions than the one which has been standard in the past. The present double-end standard type of car has been found to be well adapated to the high schedule speed requirement of the Chicago properties.

The trucks of the new cars will be manufactured by The J. G. Brill Company and will be of the 39-E type.

Before a decision as to the electrical equipment was made a number of tests were completed for the purpose of determining what type of equipment would best meet the traffic needs existing in Chicago. It was decided finally to equip the cars with two motors, and the motors to be used will be the Westinghouse Electric & Manufacturing Company's type No. 534 Y-1. The new motor will have interpoles and field control and will be fully ventilated; the gearing will be three-pitch, with a gear ratio of 15:69.

During the preliminary tests to determine the acceptable type of electrical equipment it was found that the schedule in the congested district was about 5.75 m.p.h., while in the non-congested district it was about 11.1 m.p.h. In the congested district the rate of braking and of acceleration was 1.5 m.p.h. per second. In the non-congested district the rate of acceleration was found to be 2 m.p.h. per second; in braking the rate was 2.1 m.p.h. per second. The line on which these tests were made was the West Madison Street line. The congested district was determined as the district between Halsted Street and the central business district loop, comprising a total of 2.165 miles of track. The number of miles of track in the non-congested district, comprising that part of the line extending between Halsted Street and the western outlying terminal, was 8.005 miles. The total number of miles of track in the line, therefore, was 10.17 miles. The entire trip was within the limits of the city of Chicago.

It was found that the stops per mile in the congested district, including slow-downs, averaged about 15.75. In the non-congested district, including slow-downs, they averaged about 8.25. Two slow-downs were estimated to be equivalent to one stop. The average duration of the stops in the congested district was 10.5 seconds. In the non-congested district the average was 5.7 seconds. While the line on which these tests were made is not the heaviest traffic line of the company, it is one of the heaviest and in ordinary operation involves many and frequent passenger stops as well as serious vehicular interference.



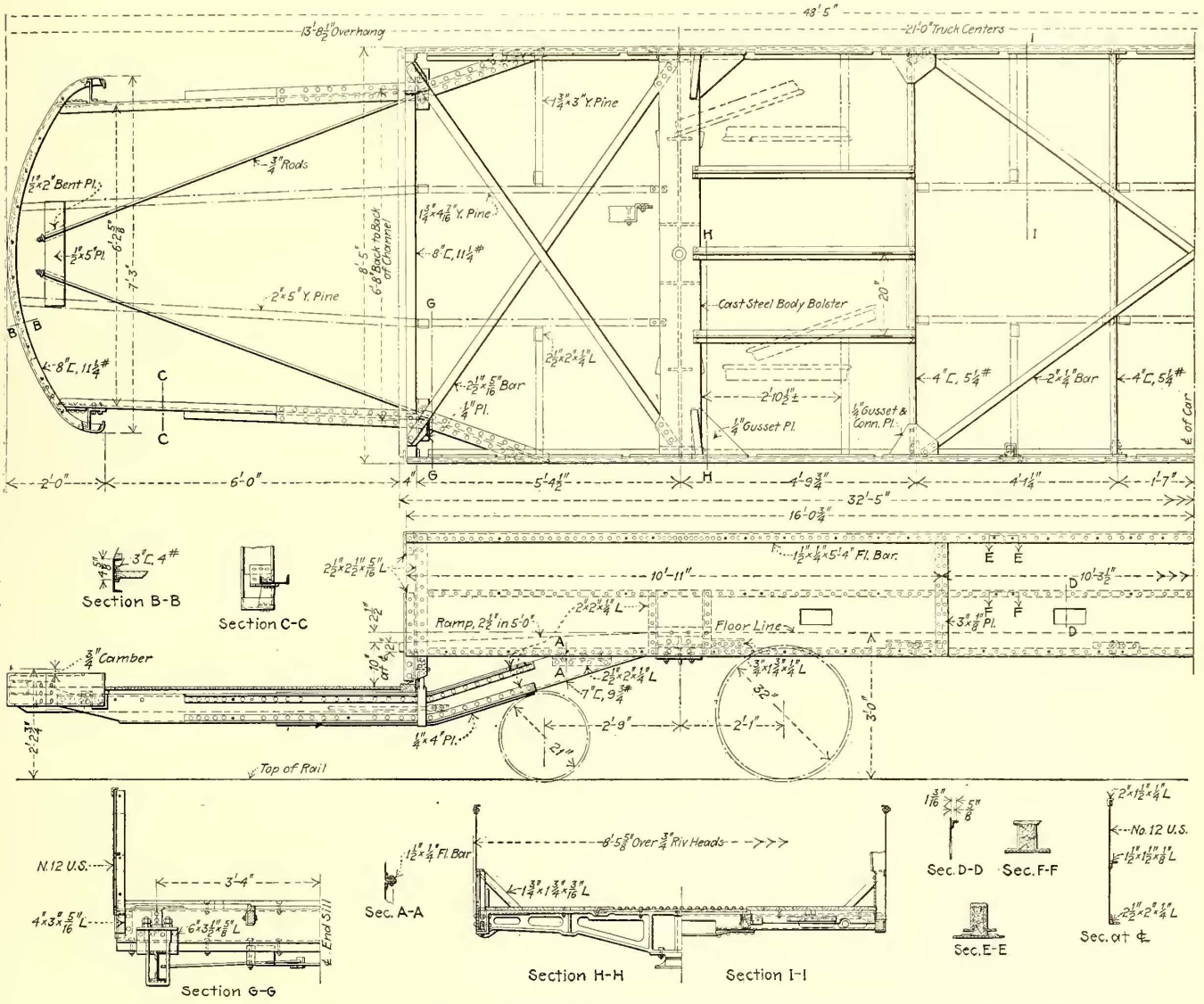
Chciago Railways Car—Half End Section and Elevation

During the tests particular attention was paid to the requirements of the company in connection with tunnel operation. It was found that the car with the new type of motor equipment could be operated out of the tunnel successfully on an 11.5 per cent grade with one motor, provided a running start could be made.

The air brakes for the new cars will be furnished by the National Brake & Electric Company. An emergency feature will be included in the provision for a conductor's valve on the platform. This is designed particularly for use in case of necessity during operation through a tunnel. The grades in the tunnels under the Chicago River through which the company operates vary from approximately 8 to 11.5 per cent.

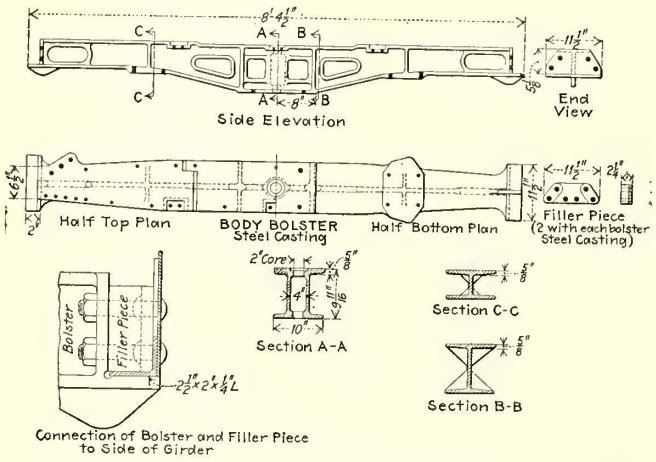
In the design of the car body every effort was made to keep the equipment as light as possible consistently with strength. The estimated weight of the car is not to exceed 37,000 lb., and it is hoped that it will be considerably lighter than this. A great deal of attention was paid to the design of the details of all members of the car. There will be a steel underframe, the principal feature of which will consist of a deep side girder of No. 12 gage sheet steel 30 in. wide. This also forms the outside sheathing of the car. The underframe is designed with standard structural sections throughout and will be furnished by the Chicago plant of the American Bridge Company and shipped to the car builders and to the shops of the Chicago Railways Company. The weight of the underframe is approximately 4000 lb., not including cast-steel bolsters. In the design of the floor members of the underframe wood has been substituted for some of the longitudinal and transverse members in place of the usual steel, as wood was found to be lighter for these parts. The steel body bolsters are being obtained from the Gould Coupler Company and are guaranteed to meet a service center-pin load of 22,000 lb. The underframe is so designed that the maximum fiber stress which comes at the point directly over the bolsters does not exceed 12,500 lb. per square inch. This underframe is of such a design that it can be manufactured readily by structural-steel manufacturers as well as by car builders. The car body has a length of 32 ft. 5 in. over corner posts and 48 ft. 5 in. over bumpers. The truck centers are 21 ft. The width of the car at the widest part is 8 ft. 6 in.

The cars are arranged with doors in the end bulkheads, giving a wide opening in the center and permitting two passages for the entrance and exit of passengers. This arrangement differs somewhat from the one existing in the present Chicago Railways cars. It permits a larger seating capacity in the interior of the car, due to the fact that the longitudinal seats are run to the end bulkheads. This permits the use of four additional transverse seats. The number of seats in the present type of car is forty; the number in the interior of the new car will be forty-eight, or an increase of 20 per cent. In addition seats accommodating five passengers will be arranged on the forward platform, giving a total seating capacity of fifty-three passengers per car. The car will be of the arched-roof type and will be provided with the Cooke vacuum ventilating system. The intakes for the air are placed in the side of the girders instead of in the floor, thus avoiding the dust which has been experienced with floor intakes. The side girders will be provided with louvers through which air will be taken to the heaters by means of ducts.



Chicago Railways Car—Half-Plan, Half-Side Elevation and Miscellaneous Structural Details

The steps are particularly low. The first is 12½ in. above the rail; the second step leading to the platform is 11½ in., and from the platform to the interior of the car the step is 10 in. Beginning at the threshold plate there will be a ramp of 2½ in. in 5 ft. This gives a total height from the rail to the top of the floor in the center of the car of



Chicago Railways Car—Details of Steel Body Bolster

36 in. This is accomplished by the use of 32-in. diameter driving wheels.

The new car has been designed by the equipment department of the Chicago Railways Company under the jurisdiction of H. H. Adams.

MR. WESTINGHOUSE DISCUSSES BRAKES AND COLLISIONS

During the current week George Westinghouse contributed to the *New York Times* an interesting letter on "Brakes and Collisions." Using the recent New Haven accident and the subsequent exoneration of Engineer Dougherty as a text, Mr. Westinghouse preaches to the public a well-needed homily on the relation between high speeds and collisions. Not only does the public demand the highest possible speeds, but it severely criticises the company which fails to keep all of its trains to schedule. The pressure thus exerted upon the railway officials, and in turn upon the man at the throttle, leads to conditions where the speed made over certain sections far exceeds the safe limit when it is felt that lost time must be regained at any cost. It follows that some accidents are due not to defects in equipment but to the natural failure of that equipment to meet conditions for which it was not originally designed.

As an illustration Mr. Westinghouse states that a train which is equipped with a certain air brake will make an emergency stop within 1100 ft. when the initial speed is 60 m.p.h., but when the initial speed of the same train is 80 m.p.h. it will still be traveling at the rate of 60 m.p.h. at the end of 1100 ft. With regard to the public demand for steel cars on the score of safety he says: "If a train could be so solidly constructed that there would be no telescoping, then the impact of collision at high speed would be of such force that the occupants of the colliding trains would be injured . . . whereas if a portion of the train yields or is crushed, the effect is to lessen the blow upon the remaining cars of the two trains involved."

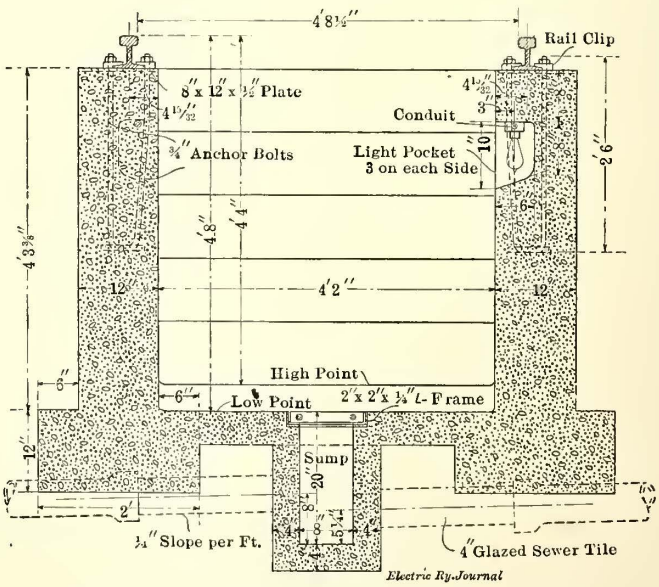
Mr. Westinghouse concludes that the first and greatest step to be made toward the attainment of safety is to limit the maxium allowable speed of trains. To this end locomotives should be fitted with a speed indicator and graphic recorder for observation by the engineer and for checking by his superiors. Such a device could be combined with an automatic apparatus which would apply the brakes when the permissible maximum speed was exceeded. Finally, Mr. Westinghouse urges an investigation of the entire safety problem by the Interstate Commerce Commission, but justly insists that the public ought to be willing to reimburse the railroads for the introduction of improved devices and methods.

A LIGHT AND DRY PIT

A growing appreciation of the fact that the best work is done in comfortable and cheerful surroundings is shown by the attention now being given to the layout of shops and carhouses. Formerly the repair pit was a gloomy and unwholesome place in which to work and there was little incentive to do good work in it. In the carhouses recently built the repair pit is designed for comfort and convenience. This is illustrated in the pits recently completed for the Portland Avenue carhouse of the New York State Railways in Rochester. A cross-section of one of these pits is shown in the accompanying figure.

In the design of these pits special attention was given to lighting and drainage. Each pit is 103 ft. long, 4 ft. 2 in. wide and 4 ft. 8 in. deep from the top of the rail to the lowest part of the floor. A pitch of 4 in. in the length of the pit is allowed to drain water to a sump located 12 ft. from one end. The walls are of concrete 12 in. thick and rest on a footing 12 in. x 24 in. The floor is 5 in. thick. At one end is a flight of 9-in. x 9-in. concrete steps. The sumps of adjacent pits are connected with 4-in. glazed sewer tile laid with ¼-in. slope to the foot.

To support and hold the rails, 8-in. x 12-in. steel plates ½ in. thick are embedded in the concrete and the rails are clamped on these by means of ¾-in. anchor bolts 2½ ft. long and standard rail clips, two bolts to a plate. The sump is covered with a grating resting in a rectangular frame made of 2-in. x 2-in. x ¼-in. angle iron, 12 in. x 12 in. outside. The grating consists of nine bars, 11¼ in. x 1½ in. x ¼ in., set on edge, mounted on 2½-in. x 11-in. machine bolts and spaced uniformly apart with 1-in.



Cross-Section of Pit in Portland Avenue Carhouse, Rochester, N. Y.

separators of ½-in. pipe. There are three incandescent lamps on each side of the pit mounted in pockets 6 in. x 10 in. x 6 in. in size and placed 8 in. below the top of the wall. The sockets for the lamps are located in steel outlet boxes and the wiring is carried in iron conduit molded into the walls.

News of Electric Railways

Developments in the Detroit Situation

On Aug. 5 the Detroit United Railway proposed a settlement of the differences between itself and the city of Detroit by offering to operate at a fare of seven tickets for 25 cents, with universal transfers. This offer was in answer to Mayor Marx's recommendation to the Council that the fare be reduced to 3 cents on all lines on which franchises have expired and that some of the company's property be seized in security for taxes claimed to be due for several years back. The company has agreed, as a part of its proposition, to pay these taxes. The terms to which the company offered to agree follow:

"First—On or before Aug. 15 we will put in effect rates of fare as follows:

"(1) Seven tickets for 25 cents, good on all lines in the city of Detroit and within the one-fare zone, so-called, during twenty-four hours of the day.

"(2) Upon the payment of a seven-for-a-quarter ticket or a 5-cent fare, a transfer shall be issued to any connecting or intersecting line according to the existing custom.

"(3) The existing provisions for workmen's tickets, eight tickets for 25 cents, to remain unchanged.

"(4) The rates of fare now in effect on the Detroit Railway lines to remain unchanged, except that payment of a seven-for-a-quarter ticket shall be received for a fare, including a transfer on any other line.

"(5) A single cash fare shall be 5 cents.

"Second—Detroit United Railway shall do all paving on all lines except where existing franchises otherwise provide.

"Third—Detroit United Railway will construct the proposed crosstown line on or near Junction Avenue, in connection with existing tracks; also connect the Mack Avenue and Myrtle Street line as heretofore proposed, and will extend the Kercheval Avenue line easterly to St. Jean Avenue, thence southerly to Jefferson avenue, and also make the necessary extensions to the new Michigan Central terminal station—all to be done on streets and locations to be approved by the Common Council. This work shall be started in 1913 and completed as soon as practicable, and all such lines and extensions shall be constructed and operated under the same terms, in substance, as those on which the Hamilton Boulevard extension, so-called, was constructed and is being operated.

"Fourth—The Detroit United Railway will pay to the treasurer of the city of Detroit, on or before Aug. 15, 1913, $75,000 for the privileges exercised by it on the Fort Street lines since July 24, 1910.

"Fifth—While we have understood that payment of the $300 per day under the resolution of the Common Council exempted the railway from the payment of the city taxes involved herein, nevertheless, for the purpose of reaching an adjustment of differences, the Detroit United Railway will pay to the treasurer of the city of Detroit the back city taxes assessed against it in the years 1910, 1911, 1912, as per the city treasurer's books, including interest and penalties as fixed by law, up to Aug. 15, 1913—such payment to be made in ninety days, or sooner, from Aug. 15, 1913, with interest at 6 per cent per annum from Aug. 15, 1913, to the date of payment. This does not in any wise affect the liability of the Detroit United Railway for the taxes assessed against it for the year 1913.

"Sixth—In consideration of the foregoing, the Detroit United Railway expects and understands that it shall be relieved of the payment of $300 per day fixed by the resolution of the Common Council adopted on Oct. 26, 1909, approved Nov. 2, 1909.

"Seventh—It is further understood that no existing rights of either the city of Detroit or the Detroit United Railway shall be impaired or affected in any wise by this temporary arrangement, except as herein explicitly stated, and that it is a day-to-day arrangement only."

This communication was read before the Common Council at its meeting on the evening of Aug. 5 and was referred to the committee on franchises. A meeting of the Council was called for Aug. 7 to consider the proposition. Street Railway Commissioner James Couzens opened the negotiations with the company which resulted in this offer. Mayor Marx said in part in his message to the Council regarding the offer:

"I am pleased to be able to announce to your honorable body the receipt late this afternoon of a communication from J. C. Hutchins, president of the Detroit United Railway, in which the company agrees to make valuable concessions to the city without the granting of a term franchise of any kind whatsoever. These concessions, I estimate, will be worth more than $1,000,000 a year to car riders of Detroit.

"In addition, Mr. Couzens informed me, and also President Hutchins of the railway company, that he and Messrs. Dodge and Ford, of the Ford Motor Car Company, stood ready to place at the disposal of the car riders of Detroit 1000 Ford cars should the company discontinue all or any part of its service Thursday morning. It was this splendid act on the part of Mr. Couzens and his colleagues in the Ford company that did more than anything else to force the company to our terms.

"I believe that, pending municipal ownership, these terms will be welcomed by the people of Detroit and I recommend that the 3-cent resolution which I advised your honorable body to pass be deferred. Also that the $300 a day rental resolution, passed in 1909, be rescinded."

Mayor Oscar B. Marx sent to the franchise committee of the City Council of Detroit on Aug. 1 a letter repudiating all proposals of the Detroit United Railway and advocating the passage of a resolution establishing 3-cent fares and universal transfers on all the lines on which franchises have expired. Three of the seven members of the committee were absent at the time and action on the resolution was therefore postponed.

In his letter Mayor Marx said:

"The Detroit United Railway has put into writing its final proposition, involving the only concession which it is willing to make as now stated, in lieu of the concessions previously offered, which reads as follows:

"In addition to the propositions contained in the recent communication to the Common Council of the city of Detroit, the company makes these additional propositions:

"'As soon as it is legally authorized to do so by the city of Detroit, it will operate all the street railways within the city (whether constructed under the ordinance of Dec. 4, 1894, commonly called the Detroit Railway ordinance, or under other ordinances, and whether the franchise thereof has or has not expired) under the terms, provisions and obligations of said ordinances of Dec. 4, 1894, and it will agree at any time during the life of said ordinance, which expires Dec. 4, 1924, to sell and transfer to the city of Detroit all its railway property in said city, on fair and reasonable terms to be agreed upon, or failing agreement, to be determined in any fair and reasonable way, and will further agree that in the event of said sale, the valuation for all franchise rights shall be taken as if this agreement had not been made.'"

This offer the Mayor characterized as ridiculous and impossible. He said further in his letter:

"I therefore have the honor to place before your honorable committee and to recommend for passage the resolution declaring 3 cents to be the legal fare upon all lines where the franchises have expired. I would be very glad to be able to recommend that this include all the lines in this city, but we have power to legislate only on the lines where franchises have expired. As far as the purchase of lines is concerned, that properly comes within the jurisdiction of the board of street railway commissioners."

The resolution presented to the committee by Mayor Marx declares that the fares upon all of the streets where franchises have expired are excessive and unreasonable.

On Aug. 4 Mayor Marx announced that he would urge Council to take action toward seizing cars for alleged back taxes amounting to $439,734 and unpaid rental on the Fort Street line. The committee on franchises had already acted favorably upon the Mayor's resolution declaring a 3-cent fare and the Police Commissioner had prepared to enforce the order. At a meeting of the committee Attorney Joslyn

read a statement from the company in which it was asserted that the property could not be operated on the plan outlined. Apparently the company had decided to cease operations on the lines and parts of lines where franchises are held to have expired. The company's statement follows in part:

"The company cannot and will not attempt to operate upon the terms of said resolution, but it desires to continue the operation of its cars as heretofore, or under the terms and conditions hereinafter indicated. But as protection in such operation cannot be expected from the police department or other city authorities, it will not attempt to continue operations against physical violence or interruption; and as there is no other alternative, it will, if said resolution becomes effective, discontinue operations upon the streets and parts of streets named in said resolutions whenever such violence or interruption occurs. In other words, we will only stop service when compelled to do so by violence.

"While this company believes that the proposed proceedings on the part of the city government are illegal and in violation of the contractual rights of this company, it none the less realizes that it is its duty to do what it can to prevent injury and loss to itself and to the industries of the people of the city.

"Mayor Marx, in commenting on our proposition, communicated by him to your honorable body on Friday, said that it included 'no extensions.' The company desires to correct this misconception. The Mayor should have understood that the company's former offer to build extensions continues in full force, and that if all its railways are put under the Detroit railway franchise, as stated in Friday's proposition, all extensions will be built and operated under that ordinance."

To make this so clear that it could not again be misunderstood the company restated its proposition.

On July 31 James Couzens, J. F. Dodge and W. D. Mahon took the oath of office as members of the street railway commission and organized with J. F. Dodge as president. Edward T. Fitzgerald was selected as temporary secretary. It was decided to ask the City Council to appropriate $2,500 to pay the salary of a permanent secretary. The acting secretary was instructed to communicate with the officers of the Detroit United Railway and ascertain whether they are willing to negotiate with the city for the sale of all the lines pending the decision of the Supreme Court on the validity of the Verdier home rule law.

Award of Buffalo Arbitrators

Edward D. Jackson, who represented the employees of the International Railway, Buffalo, N. Y., on the board of arbitration chosen to settle the question of wages, hours and length of the agreement to be entered into between the employees and the company, withdrew from the board on the afternoon of Aug. 1 and Mayor Louis P. Fuhrmann, the third member of the board, said that arbitration had failed. Bert L. Jones, vice-president and general manager of the Great Gorge Route, who represented the company on the board, was opposed to granting the men any increase. Mayor Fuhrmann's proposition was 23 cents an hour minimum to 29 cents an hour maximum with a five-year sliding scale.

Through the efforts of Mayor Fuhrmann another conference of the board was held on the night of Aug. 1 and at midnight an agreement was reached. Under the terms of the agreement the motormen and conductors on the city lines and the Lockport branch will receive 1 cent an hour increase with a five-year sliding scale with 23 cents as the minimum and 29 cents as the maximum. This agreement relative to wages will run for three years, when the men will receive another increase to run for the remaining two years of the agreement. During the last two years the men will receive an increase of 2 cents an hour over the present scale, which is 22 cents minimum and 28 cents maximum. The agreement was not signed by Mr. Jackson, representing the men. He presented a minority report. The text of the award made to the men by Mayor Fuhrmann and Mr. Jones is as follows:

"The wages for all motormen and conductors in passenger service, both city and interurban lines, shall be as follows: From May 1, 1913, to May 1, 1916: First year, 23 cents per hour; second year, 24 cents per hour; third year, 25 cents per hour; fourth year, 26 cents per hour; fifth year, 27 cents per hour; over five years, 28 cents per hour; over nine consecutive years' service shall be 29 cents an hour.

"From May 1, 1916, to May 1, 1918, the wages shall be as follows: First year, 23 cents per hour; second year, 24 cents per hour; third year, 25 cents per hour; fourth year, 27 cents per hour; fifth year, 28 cents per hour; over five years, 29 cents per hour; over nine years' consecutive service, 30 cents an hour.

"Regular men shall perform extra work when necessary to take care of traffic exigencies and to provide adequate service to the public when extra men for any reason are not available.

"All regular men assigned for extra work over and above their regular day's work shall be paid at the regular rates for all overtime worked beyond their regular day's work.

"No increase of wages shall be granted train dispatchers, telegraph operators, agents, baggagemen and ticket clerks. They are receiving fair compensation for the services rendered, and we believe are as well paid as men occupying similar positions on lines similarly operated.

"Men having no Sunday runs and who are required to show up for work shall be paid from the time they are ordered to report until they are relieved, at their regular rates, with a minimum allowance of five hours' time.

"All men taken from their own runs to do other work, where the hours for service are less than their regular work, shall receive pay for the number of hours their regular work calls for, and they shall be paid at the regular rates per hour for all overtime.

"No increase in wages shall be granted to men having charge of boilers or fire engines at carhouses and shops or to men working in the building department. We therefore determine that the matter of increase of wages for men having charge of boilers or fire engines at carhouses and shops or to men working in the building department shall be a matter of adjustment by the company in individual cases.

"Shopmen shall be allowed time and one-half for over time and for work on Sundays and holidays.

"Men who are promoted to positions in shops and barns shall receive such compensation as their qualifications, efficiency and length of service may warrant, all of which shall be determined by the company.

"The demand for a horizontal advance in wages of 25 per cent is denied, because it is unreasonable and the method illogical and unjust, as there are doubtless many men employed in the shops who are receiving as much as they should be paid for their services rendered, while there may be some who are not receiving as much as they should receive. We, therefore, determine that the matter of increase of wages of shopmen shall be a matter of adjustment by the company in individual cases.

"No increase of wages shall be granted to switch tenders, curve greasers and electric-shovel men. We therefore determine that the matter of an increase of wages of the above men be a matter of adjustment by the company in individual cases.

"Extra men shall receive a minimum wage of $1.25 for each day on which they respond to all such calls as may be designated by station foremen.

"This agreement and the provisions hereunto shall continue in force and be binding on both parties mentioned in this agreement until May 1, 1918, and shall continue thereafter from year to year. Either party desiring a change in any section or sections shall notify the other in writing thirty days before the expiration of this agreement, and thereafter if any change in any section or sections shall be desired by either party, notice shall be given thirty days prior to the first day of May of the following year."

The questions at issue between the company and its employees, other than those of wages and the length of the term of the contract, were all settled in conference. On Aug. 5 the members of the executive committee representing the men were granted a hearing by Edward G. Connette, president of the company. Following this meeting Mr. Connette issued a statement in which he said that both parties had agreed to abide by the decision.

United Railways, St. Louis, Operating with Keokuk Power

On July 29 the United Railways Company, St. Louis, Mo., transferred about one-half of its entire load from its own steam stations to the hydroelectric plant of the Mississippi River Power Company at Keokuk, Ia. The Union Electric Company, also of St. Louis, has a contract with the United Railways whereby it supplies a maximum of 25,000 kw, which is being supplied to it in turn by the Mississippi River Power Company. The final transfer of the railway load from the two steam generating stations, namely, the Central and North Broadway, totals at this time between 20,000 kw and 21,000 kw during the morning and evening peaks.

For the present, at least, both the Central and North Broadway power stations will be held in reserve with seventeen boilers banked in the former and fifteen in the latter and the Central power station will supply 5000 kw during the evening peak and the Broadway station will supply 4000 kw. As soon as the reliability of the hydroelectric service is established, the company will bank only a sufficient number of boilers in the two steam stations to supply 8000 kw during the morning and evening peaks, 5000 kw at one station and 3000 kw at the other. The contract for power with the Union Electric Company, St. Louis, is about to expire, and this 25,000-kw additional load will be transferred to the Mississippi River Power Company in the near future, which will make the total maximum contracted load carried to the United Railways 47,400 kw.

Two new GE 2000-kw. 300-r.p.m. interpole rotary converters with brush-raising devices for starting have been installed temporarily in the Central power house. It is anticipated that this substation equipment will ultimately be transferred to an existing station when increased capacity is desired. At this substation new transformer equipment was purchased, but at the other stations it was necessary to tear down the old transformers and rewind them from a step-down from 6600 volts to 430 volts to a transformation from 13,200 to 430 volts a.c.

It is anticipated that the transfer in the power load from the United Railway's generating stations to the Mississippi River Power Company will result in a saving of approximately three-fourths of the coal bill and 33 per cent of the labor.

Appointments to Pennsylvania's Public Service Commission

The members of Pennsylvania's Public Service Commission, which is to supersede the State Railroad Commission, have been appointed by Governor Tener. The commission is made up of the following: Nathaniel Ewing, Fayette County, chairman, ten-year term; S. L. Tone, Allegheny County, nine-year term; Samuel W. Pennypacker, former Governor, eight-year term; Emory R. Johnson, Philadelphia, professor of transportation and commerce expert, University of Pennsylvania, seven-year term; Milton J. Brecht, Lancaster County, six-year term; Charles Frederick Wright, Susquehanna, five-year term; Frank M. Wallace, Erie, four-year term. There are three members of the new commission that served upon the State Railroad Commission, Messrs. Ewing, Pennypacker and Brecht.

Prof. Emory Richard Johnson has been professor of transportation and commerce in the University of Pennsylvania since 1896. He is an authority on valuation of railroad property and was a member of the Isthmian Canal Commission. He was born in Waupun, Wis., on March 22, 1864. In 1888 Professor Johnson received the degree of bachelor of laws in the University of Wisconsin, and in 1893 the University of Pennsylvania conferred upon him the degree of Ph.D. He was instructor of economics in Haverford College from 1893 to 1896. In the latter year he was chosen professor of transportation and commerce in the University of Pennsylvania. He was a member of the United States Industrial Commission in 1899, and from that year to 1904 he served as a member of the Isthmian Canal Commission. In the year following Professor Johnson was the expert on valuation of railroad property for the United States Census Bureau. In 1909 he was engaged as a traffic expert for the National Waterways Commission. He was appointed by President Taft in 1911 to report on Panama Canal traffic, tolls and measurement of vessels. Since 1901 Professor Johnson has been the editor of Annals of the American Academy of Political and Social Science. He is a member of the board of collaborators preparing an economic history of the United States for the Carnegie Institute. He is the president of the Geographic Society of Philadelphia and a member of the American Economic Association, the National Geographic Society, the Association of American Geographers and the Historical Society.

S. L. Tone is second vice-president of the Pittsburgh Railways. He is a graduate of Rensselaer Polytechnic Institute of Troy, N. Y., and has served twenty years with the Pittsburgh Railways.

Charles Frederick Wright is a native of Susquehanna County and was educated in the Montrose Academy. He served as cashier in the First National Bank of Susquehanna, and is now vice-president of that institution. He is also interested in manufacturing and water power enterprises. He was elected to Congress in 1898, 1900 and 1902. He was appointed Treasurer of Pennsylvania by Governor Stuart April 11, 1910.

Mr. Wallace is president of the Second National Bank of Erie, has charge of the Strong estate and other large interests and is treasurer of the Pittsburgh Coal Company.

At the organization of the commission John P. Dohonoy was promoted from marshal of the old commission to investigator of accidents, a new position paying $5,000 a year. George A. Wood, Philadelphia, has been transferred from the State Department to marshal of the commission at $2,000 a year. William M. Trinkle, of the Attorney General's Department, was made chief counsel at $6,500 a year, resigning his position as assistant deputy attorney general. Archibald B. Miller, secretary of the old commission, was elected temporary secretary of the new commission. The commission has laid preliminary plans for active work and Investigator Dohonoy will look into the recent Pennsylvania Railroad wreck at Tyrone.

The provisions of the Pennsylvania Public Service Company law were summarized in the ELECTRIC RAILWAY JOURNAL of Aug. 2, 1913, page 194.

San Francisco Chamber of Commerce Protests Against Municipal Railway Extension

The proposal of the city of San Francisco, Cal., to issue $3,500,000 in bonds for the extension of the municipal railway in that city has met with unqualified disapproval by the Chamber of Commerce. On July 21 that body issued a statement giving its reasons, which may briefly be summarized as follows: The exposition can be adequately served in other ways not involving a large drain on municipal resources. The extension of the existing system of street car lines into the outlying districts would be indefinitely blocked by the proposed municipal ownership plan. The city cannot afford to borrow the money, for "cities as well as individuals must pay the penalty of extravagance."

The body says that it has considered the subject from three points of view as follows: (1) as it will affect a solution of the street railroad facilities for the visitors to the exposition in 1915; (2) as it will affect a solution of the street railroad transportation problems of the whole city as they relate to the city's proper growth and development, and (3) as it affects the borrowing capacity of the city in relation to its imperative necessities.

So far as the transportation to the exposition is concerned the Chamber of Commerce says in its report that this transportation "can readily be obtained without cost to the city by securing extensions to existing lines at four or five points, comprising approximately only fifteen blocks of new track and by an automobile bus service operated along Van Ness Avenue from important sections of the city." The report says, however, that the question of transportation to the exposition, although important, is merely a temporary condition, that the general transportation problem is of much more importance and that this problem can be solved only by encouraging the extension of the existing railways. Reasonable conditions should be written in any new franchise for privately owned roads as the result of the charter amendment, and private capital should be induced to construct and operate extensions into the new sections. Finally the report says that the bonded indebtedness of the

city is such that it would be most unwise to attempt to place all of the available funds of the city in municipal railways when money is required for a new water supply and other necessary city improvements.

Vote on Electrification Proposal.—The vote on the proposal to electrify the London & Port Stanley Railway, London, Ont., will be taken on Aug. 11.

Underground Railway Proposed in Montreal.—A project for the construction of an underground railway in Montreal, Que., has been submitted to the City Council by F. S. Williamson, who is a member of the Canadian Society of Civil Engineers. The plans show that the construction of 12.5 miles of double-track lines is proposed at an estimated cost of $20,000,000.

The Proposed Maine Referendum.—Governor W. T. Haines of Maine has issued a proclamation stating that the general election to decide on the recall of the public utilities act of Maine will not be held until September, 1914, which means that the present railway commission of Maine will continue until that time. In the proclamation Governor Haines emphasized what he considers the good points of the law and urged the people of the State to consider the question carefully before voting on the act.

Transportation Committee for New England.—The following gentlemen have been asked by M. C. Brush, second vice-president of the Boston Elevated Railway, to serve on the committee on transportation of the American Electric Railway Association for New England: Massachusetts, E. S. Wilde, New Bedford; Robert E. Hamilton, Boston. Maine, Harry B. Ivers, Portland. New Hampshire, J. Brodie Smith, Manchester. Rhode Island, A. E. Potter, Providence. Connecticut, W. S. Murray, New Haven. Vermont, F. C. Wilkinson, St. Albans.

Subway Construction Contract Let.—The Public Service Commission for the First District of New York has executed a contract with the E. E. Smith Contracting Company, the lowest bidder, for the construction of that section of the Broadway-Manhattan subway lying between Union Square and Twenty-sixth Street. The total amount of the Smith company's bid was $2,056,702. The plans call for a four-track underground railroad with one-half of the express station at Union Square and a local station at Twenty-third Street and Madison Square.

Canadian Pacific Electrification Story Denied.—G. M. Bosworth, vice-president of the Canadian Pacific Railway, has issued a statement denying that the company contemplates running an electric railway from Hamilton to Niagara Falls, Ont. It had been previously stated that the company would shortly commence the construction of such an electric railway. The Canadian Pacific Railway now operates between Hamilton and Buffalo over the Toronto, Hamilton & Buffalo Railway and the Michigan Central Railway and between Toronto and Hamilton over the Grand Trunk Railway.

Elevated and Subway Bill in St. Louis.—A bill has been introduced in the House of Delegates to grant the St. Louis Rapid Transit Company a franchise for the construction of a combined subway and elevated rapid transit system, stretching westward through the heart of St. Louis from Second and Mullanphy Streets to Clayton Avenue and the city liimts. The plan is being promoted by James D. Houseman, who has estimated the total cost at $17,000,000. Mr. Houseman is reported to be connected with the St. Louis & Western Traction Company and the St. Louis County Belt Road, both projected, with offices in the Roe Building, St. Louis.

Negotiations in Regard to Phones in New Subways in New York.—Negotiations are under way looking toward the operation of public telephones in all of the subway stations in the new dual rapid transit system in New York, but inasmuch as the rapid transit act prohibits the use of such places for other purposes than those immediately connected with transportation it is necessary that the Legislature so amend the provisions of the rapid transit act as to permit telephone operation. Commissioners McCall and Maltbie, of the Public Service Commission for the First District, conferred recently with Governor Sulzer in regard to the proposal.

Double-Unit Turbo-Alternators for New York Subway.—The Interborough Rapid Transit Company, New York, N. Y., has awarded to the Westinghouse Machine Company the contract for three 30,000-kw steam turbo-generator units for installation in the Seventy-fourth Street Station to assist in supplying energy for operating the enlarged New York subway. Each unit will consist of a high-pressure and a low-pressure element, each element comprising an independent steam turbine driving a synchronous alternator. The high-pressure and low-pressure turbine of each unit will be governed simultaneously in order that the load on the unit may be divided properly between the two elements.

Letter from A. E. R. A. Manufacturers' Association.—On July 31, 1913, H. G. McConnaughy, secretary-treasurer of the American Electric Railway Manufacturers' Association, wrote a letter to the members of the association in regard to the spirit of co-operation that should characterize the work of the association. He asks why the membership of the association cannot be increased to 1000. In conclusion Mr. McConnaughy says: "Here is an opportunity for you—sales managers and publicity managers—to show your ability. Will you start a little mail order campaign for the good of all? You have about twelve weeks to get one or more members, which means a thousand by Saturday Oct. 11. Can you see the Pier with a layout of that size? We want Saturday and Sunday to prink up and receive the early arrivals. No opening of boxes or hammering on Monday."

Appeal in Newark Gas Case.—The Public Service Gas Company, Newark, N. J., carried to the Court of Errors and Appeals at Trenton on July 31 an appeal from the decision of the Supreme Court of New Jersey sustaining the order of the Public Utility Commission requiring the company to furnish 90-cent gas in fifteen municipalities constituting the Passaic zone. The company contends that the order is unjust and unreasonable and unconstitutional, because its effect is to take property without just compensation. Other grounds advanced for reversal are that the valuation of $4,750,000 placed upon the property by the board was below the fair value of the property; that in estimating the reproduction cost the board disregarded reliable and uncontradicted proof of value and accepted unreliable and inaccurate evidence; that the board excluded important elements of value, including special franchises, and that the findings were inadequate because the board included only fifteen of the 150 municipalities in which the company operates in the State.

First Train Under New Subway Contracts in New York.—The first operation of trains under the dual system subway contracts signed by the Public Service Commission for the First District on March 19 last took place on Aug. 4, 1913, when the New York Municipal Railway Corporation (Brooklyn Rapid Transit) began running trains through the Centre Street Loop subway from the Williamsburg Bridge to City Hall, Manhattan. The Centre Street Loop is about 1½ miles long and runs from the basement of the new Municipal Building northward under Centre Street to the Delancey Street extension and under the Delancey Street extension to the Williamsburg Bridge, with a spur from Canal Street leading over the Manhattan Bridge. For the present, no use will be made of the Manhattan Bridge connection, which will go into operation when the Fourth Avenue subway in Brooklyn is ready for use. At present, also, there is no connection with the Brooklyn Bridge, but that connection is being built and when it is completed loop operation over the Williamsburg and Brooklyn Bridges will be possible. The temporary operation by the Brooklyn company will utilize only the two western tracks under Centre Street and the two northerly tracks under Delancey Street extension. Over these tracks the elevated trains going over the Williamsburg Bridge bring passengers as far south as Chambers Street station under the new Municipal Building without change of cars and without the payment of any additional fare. As soon as certain reconstruction work on the Broadway and Myrtle Avenue elevated lines is completed, additional elevated trains will be transferred from the Brooklyn Bridge to the Williamsburg Bridge and through the loop subway. This will allow the company to send more trains over the Brooklyn Bridge, which at present is badly crowded.

Financial and Corporate

Stock and Money Markets

Aug. 6, 1913.

Quotations at the close of trading to-day on the New York Stock Exchange showed little change from those of the preceding day. The local traction shares were active and strong for a short period, Brooklyn Rapid Transit advancing ½ to 89¼. A slight gain was also made in Interborough-Metropolitan common. Rates in the money market to-day were: Call, 2¼ @ 2½ per cent; sixty days, 3¼ @ 3¾ per cent; ninety days, 4½ @ 5 per cent; four months, 5¼ @ 5½ per cent; five months, 5½ @ 6 per cent; six months, 5½ @ 5¾ per cent.

In the Philadelphia market the net changes, on light trading, were small. The bulk of the trading was in United States Steel.

Securities were stronger in Chicago to-day. Chicago Railways, Series 2s, were a feature. The demand for bonds was good.

Trading on the Boston market continued dormant. The bond market was extremely weak.

In the Baltimore market to-day the trading in stocks was fairly active. United Railways issues were the features.

Quotations of traction and manufacturing securities as compared with last week follow:

	July 30	Aug. 6
American Brake Shoe & Foundry (common)	89	90¼
American Brake Shoe & Foundry (preferred)	129	129
American Cities Company (common)	34	37½
American Cities Company (preferred)	65	65½
American Light & Traction Company (common)	345	345
American Light & Traction Company (preferred)	104	104
American Railways Company	38	38
Aurora, Elgin & Chicago Railroad (common)	*39½	39½
Aurora, Elgin & Chicago Railroad (preferred)	*82½	82
Boston Elevated Railway	94½	91
Boston Suburban Electric Companies (common)	7½	7½
Boston Suburban Electric Companies (preferred)	55	55
Boston & Worcester Electric Companies (common)	*8	*8
Boston & Worcester Electric Companies (preferred)	42	*42
Brooklyn Rapid Transit Company	87¾	88½
Capital Traction Company, Washington	115	115
Chicago City Railway	*165	*165
Chicago Elevated Railways (common)	*25½	*25½
Chicago Elevated Railways (preferred)	*75	*75
Chicago Railways, ptcptg., ctf. 1	92	*92
Chicago Railways, ptcptg., ctf. 2	27⅛	27⅛
Chicago Railways, ptcptg., ctf. 3	*7½	*7½
Chicago Railways, ptcptg., ctf. 4	*2½	*2½
Cincinnati Street Railway	a110	a110
Cleveland Railway	*102¾	a102¾
Cleveland, Southwestern & Columbus Ry. (common)	*6	*6
Cleveland, Southwestern & Columbus Ry. (preferred)	*29	*29
Columbus Railway & Light Company	18	18
Columbus Railway (common)	a69½	a69
Columbus Railway (preferred)	88	a90
Denver & Northwestern Railway	*107	*107
Detroit United Railway	a70	a70
General Electric Company	140	140
Georgia Railway & Electric Company (common)	*114¾	a114¾
Georgia Railway & Electric Company (preferred)	*82½	*82½
Interborough Metropolitan Company (common)	15⅝	15¾
Interborough Metropolitan Company (preferred)	58⅜	58¼
International Traction Company (common)	*30	*30
International Traction Company (preferred)	*95	*95
Kansas City Railway & Light Company (common)	15	*15
Kansas City Railway & Light Company (preferred)	*36	*36
Lake Shore Electric Railway (common)	*9	*9
Lake Shore Electric Railway (1st preferred)	*90	*90
Lake Shore Electric Railway (2d preferred)	*25	*25
Manhattan Railway	126	126
Massachusetts Electric Companies (common)	*14½	*14½
Massachusetts Electric Companies (preferred)	72	74½
Milwaukee Electric Railway & Light Co. (preferred)	*90	*90
Norfolk Railway & Light Company	25	25
North American Company	69	70½
Northern Ohio Light & Traction Company (common)	a70	a70
Northern Ohio Light & Traction Company (preferred)	a100	a100
Philadelphia Company, Pittsburgh (common)	43¼	42
Philadelphia Company, Pittsburgh (preferred)	43	40
Philadelphia Rapid Transit Company	22½	23⅜
Portland Railway, Light & Power Company	*58	*58
Public Service Corporation	108	108
Third Avenue Railway, New York	34¾	35¾
Toledo Railways & Light Company	a12	*12
Twin City Rapid Transit Co., Minneapolis (common)	*104	104¼
Union Traction Company of Indiana (common)	*4½	*4½
Union Traction Company of Indiana (1st preferred)	*80	*80
Union Traction Company of Indiana (2d preferred)	*30	*30
United Rys. & Electric Company (Baltimore)	26⅝	26⅞
United Rys. Inv. Company (common)	22½	*23
United Rys. Inv. Company (preferred)	42	*42
Virginia Railway & Power Company (common)	51	53
Virginia Railway & Power Company (preferred)	89	*89
Washington Ry. & Electric Company (common)	91	91
Washington Ry. & Electric Company (preferred)	87¾	88¼
West End Street Railway, Boston (common)	71½	72
West End Street Railway, Boston (preferred)	86	88
Westinghouse Elec. & Mfg. Company	63	63½
Westinghouse Elec. & Mfg. Company (1st preferred)	109	111

*Last sale. a Asked.

ANNUAL REPORT

Brooklyn Rapid Transit Company

Gross earnings of the Brooklyn Rapid Transit Company in the year ended June 30, 1913, increased 3.99 per cent over the preceding twelve months. Operating expenses, however, increased only 1.76 per cent, so that the surplus from operation showed a gain of 21.17 per cent. The annual report to stockholders presents the following results:

Revenue from operation, year ended June 30:	1913	1912
Transportation	$23,865,260	$22,949,021
Miscellaneous	287,028	277,529
Total	$24,152,288	$23,226,550
Operating expenses:		
Maintenance of way and structure	$1,678,124	$1,636,712
Maintenance of equipment	2,202,208	2,155,134
Operation of power plant	1,421,123	1,404,160
Operation of cars—trainmen's wages	4,062,796	3,863,700
Operation of cars—other expenses	1,572,661	1,586,974
Damages	605,092	681,441
Legal expenses in connection with damages	217,211	231,975
General law expenses	61,934	65,196
Other general expenses	746,871	733,294
Freight and mail expenses	264,324	252,762
American Railway Traffic Co.—expenses	1,112	711
Total	$12,833,456	$12,612,059
Net revenue from operation	$11,318,832	$10,614,491
Income from other sources	339,947	317,991
Total income	$11,658,779	$10,932,482
Deductions:		
Taxes	$1,750,083	$1,775,041
Interest and rentals (net)	5,411,768	5,446,219
Total	$7,161,851	$7,221,260
Surplus	$4,496,928	$3,711,222
Profit from real estate disposed of and other miscellaneous items	†7,483	20,037
Total surplus for year	$4,504,411	$3,731,259
Surplus at beginning of year	5,863,813	5,427,394
Total	$10,368,224	$9,158,653
Of this amount there has been appropriated:		
Accounts written off	$28,514	$2,973
Adjustment of taxes prior years	*116,256	28,544
Adjustment of expenses prior years	67	14,460
Supersession and depreciation	60,523	9,013
Special reserve	50,000	1,000,000
Dividend on B. R. T. Co. stock outstanding	2,440,770	2,239,851
Total appropriations	$2,463,618	$3,294,841
Balance sheet surplus	$7,904,606	$5,863,812

*Credit. †In 1913 miscellaneous items only.

The report of T. S. Williams, the president, explains at length the contract with the city for rapid transit development and says on this subject:

"It will be seen that all the surplus earnings of the new rapid transit system, except that portion which is paid over to the city, will accrue to the New York Consolidated Railroad Company, of whose stock the Brooklyn Rapid Transit Company and one of its constituent companies own over 96 per cent.

"Stockholders are to be congratulated that so large a part of the funds called for by the city contracts, and all that will probably be required during the first three years, are in hand and were secured upon more favorable terms than would be possible under existing financial conditions. The construction work is now under way and will be prosecuted as rapidly as conditions permit.

"In the meanwhile a portion of the Broadway-Fourth Avenue line, namely, two tracks in the Centre Street loop, was placed in operation on Aug. 4, 1913, and, under the provisions of the city contract as to temporary operation, the pooling of earnings then became effective.

"The status of the surface railroad lines in the company's system remains unaffected by the new contracts with the city."

On other topics the report says:

"Dividends declared during the year aggregated $2,440,770. The rate was 1¼ per cent quarterly, except for the last quarter, when it was increased to 1½ per cent.

"Certain adjustments of the profit and loss account, including the setting aside of a special reserve of $50,000 and the charging off of $60,523 to supersession and depreciation, left the surplus of the combined system as of June 30, 1913, $7,904,606, as against $5,863,812 at the close of the fiscal year 1912.

"The construction charges aggregated $5,400,819, of which

the larger amount was in connection with the rapid transit contracts with the city of New York.

"Two short extensions of surface lines were constructed during the year. Additional trackage thus constructed was 1.19 miles measured as single track; 13.43 miles (including 0.14 miles on the Brooklyn Bridge) of single track were relaid with a standard type of heavy grooved rail; 122,565 sq. yd. of improved pavement (14.57 miles of street) were laid between tracks and rails, and in addition the city was reimbursed for approximately 32,150 sq. yd. of pavement laid adjacent to the outer rails of tracks. A much larger volume of work has been arranged for the ensuing fiscal year. Six electrically operated switches, three side tracks, and five crossovers were constructed during the year, and seventy-five pieces of special work were renewed.

"On the elevated lines 47,045 ft. of rail (representing approximately 4.45 miles of single track) and 3540 ft. of steel guard rail were renewed; 19,300 cross ties, 28,582 ft. of timber guard rail, 69,424 ft. of footwalk and 2473 track bonds were renewed. Three and one-half miles of elevated structure were repainted.

"The 20,000-kw turbo-generator unit contracted for last year has been delivered and is now being erected, the installation of the auxiliary apparatus being practically completed. A temporary substation, made necessary by the operation of the Centre Street loop, has been erected at Centre and Walker Streets, Manhattan, and equipped with two 1000-kw rotary converters and auxiliary apparatus.

"In the transmission system, 66.77 miles of trolley wire were renewed and 2.06 miles erected in connection with extensions, side tracks, etc.; 1523 trolley poles were painted, 191 poles reinforced, 690 poles reset, 250 poles replaced and 112 new poles erected; 1.56 miles of feeder were installed in underground conduits and 3.75 miles of overhead feeders removed.

"One hundred surface cars of the center entrance type were ordered and eleven had been put in use at the close of the fiscal year; 105 cars of miscellaneous type—freight, mail, work cars, etc.—were equipped with wheel guards; two snow plows were added; fifty-seven pairs of modern design maximum traction trucks replaced an equal number of equipments of less efficient type; 1507 surface passenger cars and eighty-two freight cars were overhauled, repaired and varnished; 900 elevated passenger cars were overhauled, repainted and varnished, and five additional lights installed in each of thirty-two motor cars. The brake equipment of 317 elevated motor cars was improved by the installation of interlocking devices. Additional machinery was installed in the various shops.

"The East New York employees' club house was altered to provide increased facilities and equipped with refrigerating plant and cold-storage room, and additional restaurant and kitchen utensils and restaurant and club room facilities have been installed and improved at other locations.

"The sprinkler equipment in the Fifty-eighth Street depot, contracted for last year, was completed.

"Numerous minor improvements have been made, particularly in repair shops and depots, for the better protection of the companies' properties against damage by fire.

"Three hundred new fireproof metal lockers have been installed at various depots and shops.

"New equipment for the construction and repair of tracks has been purchased, consisting of three rail grinders, two electric cranes, one electric rail-welding machine, one electric bonding apparatus, two electric track drills, two gasoline concrete mixers and one rail-cutting machine.

"The effectiveness of the work of the medical inspection bureau, established in December, 1912, was reflected in a very material decrease in the number of working days lost by employees on account of sickness compared with the corresponding period of the year previous. The bureau is supported by the company and the service is rendered without charge to employees, and through an arrangement with various druggists the employees are enabled to procure medicines at small cost.

"Just prior to the close of the fiscal year and effective July 4, 1913, a general increase was announced in wages of employees, benefiting about 6000 men in the transportation department. The increases varied according to the length of service and record of efficiency, and ranged from 4 to 15 per cent.

"An opportunity was presented during the fiscal year to acquire upward of two-thirds of the capital stock of the Coney Island & Brooklyn Railroad, and application to take this stock was made to the Public Service Commission, First District, by the Coney Island & Gravesend Railway, one of the constituent companies. No action has been taken by the commission upon the application.

"On March 1, 1913, the Brooklyn Rapid Transit Company, in co-operation with the American Museum of Safety, undertook a children's safety campaign of six months in the public schools of Brooklyn. This work, authorized by the Board of Education of the city, has been continued with great success through the last four months of the regular sessions of the schools ending in June, and is now going on in the summer schools and playgrounds throughout the territory in which the company operates.

"In many of the schools the teachers have given most encouraging co-operation by such undertakings as the organization of safety patrols to guard the children in crossing streets going to and from school, and in the arrangement of safety days, on which, in several instances, an entire day has been given up to safety demonstrations, with lectures, recitations by the children and safety plays, in which some children would impersonate passengers, some conductors and motormen and others pedestrians and the drivers of vehicles in the streets. In one school, where a publication is issued monthly, one number of this publication was devoted especially to the safety work, and cuts were printed of the Brooklyn Rapid Transit safety wagon, the model cars and the other paraphernalia of the safety crusade.

"The safety work has adapted itself very successfully to the instruction in the summer schools and summer playgrounds maintained in various parts of the borough of Brooklyn, particularly in the congested districts. The summer school and playground instruction being necessarily of a more informal character than that of the regular school session, the lecturers in the safety campaign have been able to come very intimately into contact with the children and in many instances with their parents.

"Specially for this summer school work, a set of drawings was prepared graphically illustrating accident conditions due to carelessness of passengers or pedestrians, which drawings have been employed with evident appreciation by the children and the teachers. All told, in the campaign of the last six months, approximately 300,000 safety buttons have been distributed and 600,000 leaflets. The lecturers have visited practically all of the public schools in Brooklyn, 170 in number, and many parochial schools. The summer instruction is covering thirteen summer schools and over thirty playgrounds.

"It is anticipated that the school crusade this year will be a beginning for even more extended safety instruction in the schools with possible outside co-operation from organizations or committees. Evidences of appreciation by the children and their parents have come in from many sources, and the work has the cordial indorsement of the school authorities of the city."

Statistical results are given in the report as follows:

	1913	1912
Passenger earnings—increase over preceding year, per cent	3.94	5.66
Passengers carried	626,304,156	598,555,794
Revenue mileage	82,217,451	81,604,127
Increase over preceding year, per cent	0.75	2.49
Earnings per revenue mile, cents	28.5	27.6
Cents per Passenger		
Passenger earnings	3.74	3.77
Miscellaneous earnings	0.17	0.16
Total earnings	3.91	3.93
Operating charges	2.05	2.11
Taxes	0.28	0.29
Interest and rentals	0.86	0.91
Total	3.19	3.31
Surplus	0.72	0.62
Charges per Cent of Operating Earnings		
Repairs and renewals	16.13	16.39
General operating	33.53	33.89
Damages	2.51	2.95
Legal expense	1.16	1.28
Total operating	53.33	54.51
Taxes	7.27	7.67
Interest and rentals (net)	20.71	21.78
Surplus	18.69	16.04
	100.00	100.00

Report of Subsidiary Companies of Republic Railway & Light Company

The Republic Railway & Light Company, which controls about 156 miles of interurban and street railways in Ohio and Pennsylvania, reports for the first half of 1913 an increase in gross of 13.77 per cent on the earnings of subsidiary companies, an increase in net of 12.14 per cent and in balance surplus (after interest) of 23.78 per cent.

The consolidated statement of earnings of the subsidiaries for the twelve months ended June 30, 1913, as compared with those of the preceding year, items between subsidiary companies and between subsidiary companies and the Republic Railway & Light Company being eliminated, follows:

	1913	1912
Gross earnings	$2,842,175	$2,518,450
Operating expenses and taxes	1,723,933	1,511,712
Net earnings	$1,118,242	$1,006,738
Interest	535,029	531,378
Surplus	$583,213	$475,360

The earnings of subsidiary companies, exclusive of the Pennsylvania Power Company, increased approximately 50.7 per cent in gross and 76.3 per cent in net in the four years ended Dec. 31, 1912.

The percentage of increase for the first six months, 1913, over the corresponding period, 1912, were as follows:

	1912	Jan.-June, 1913
Gross earnings	10.90	13.77
Net earnings	11.17	12.14
Surplus	25.38	23.78

Questions and Answers Under Uniform System of Accounts

Another series of tentative answers to questions raised in connection with the uniform system of accounts established by the Interstate Commerce Commission is published below. Agreement on these answers, as on those published in the issues of May 17, 1913, June 7, 1913, and July 5, 1913, has been reached by members of the committee on a standard classification of accounts of the American Electric Railway Accountants' Association and representatives of the commission. As these answers have not yet 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.

Q. What account should be charged with amounts paid for the services of trustees under mortgages?

A. Account No. 79, "Miscellaneous General Expenses," in the classification of Operating Expenses of Electric Railways.

Q. What accounts should be charged with the rent of a floor in a building which provides space for the receivers of conductors' collections, instruction and club rooms, etc.? What account should be charged with the cost of maintaining the furniture and equipment of the club room?

A. The rent of the portion of the building used for receiving and instruction rooms should be charged to Operating Expense Account No. 48, "Superintendence of Transportation." The rent of the portion used for recreation purposes and the cost of maintaining its furniture and equipment should be charged to Account No. 72, "Other Transportation Expenses." If the rent is an insignificant amount it may all be included in Account No. 48, "Superintendence of Transportation."

Q. What account should be charged with the cost of chisels, bits, drills, etc., used on power-driven machines, such as lathes, drills and shapers in the shops?

A. Operating Expense Account No. 38, "Shop Machinery and Tools."

Q. What account should be charged with the first cost of welding rail joints?

A. If the work is done on existing tracks, the cost should be charged to Operating Expense Account No. 5, "Rail Fastenings and Joints," unless the welded joint is more expensive and is a distinct improvement over the joint replaced, in which case the excess cost of the new joint over the original cost of the old one should be charged to Account No. 7, "Rails, Rail Fastenings and Joints," in the classification of Expenditures for Road and Equipment of Electric Railways, the remainder of the cost being charged to operating expenses as indicated above. If the welding of joints is done as part of the original construction of the road, the entire cost should be charged to Account No. 7, "Rails, Rail Fastenings and Joints," in the classification of Expenditures for Road and Equipment of Electric Railways.

Q. What accounts should be charged with the cost of packing used in power plants, carbon rings for turbines and power station tools?

A. The cost of packing and of carbon rings for turbines should be charged to Operating Expense Account No. 30, "Power Plant Equipment." The cost of repair parts of machine tools in power plants should also be charged to Account No. 30, and the cost of hand tools to Account No. 54, "Miscellaneous Power Plant Supplies and Expenses."

Q. An electric railway company which owns a private right-of-way in a city is required to pave intersecting streets to the full width of the right-of-way. To what account should the first cost of such paving be charged?

A. To Road and Equipment Account No. 10, "Paving." (See Case 191 in Accounting Bulletin No. 7.)

Q. Should the rent of rooms in general offices assigned to the use of officers and clerks whose salaries are charged to Account No. 48, "Superintendence of Transportation," be charged to that account or to Account No. 75, "General Office Supplies and Expenses"?

A. Account No. 75, "General Office Supplies and Expenses."

Q. What accounts should be charged with the rent of rooms and the cost of telephone service for the claims department, which is accommodated in a portion of the space rented for general offices?

A. The rent should be charged to Operating Expense Account No. 75, "General Office Supplies and Expenses," and the cost of telephone service to Account No. 79, "Miscellaneous General Expenses." (See Case 96 in Accounting Bulletin No. 7.)

Q. In making an extension of a power house it was necessary to tear down the end wall. The salvage, with other material, was used in building a new wall. What disposition should be made of charges and credits in such a case?

A. The cost of the wall removed should be credited to the road and equipment account to which it is charged. The same cost, less the value of salvage, together with the cost of removal, should be charged to Operating Expenses. The cost of the new wall should be charged to Road and Equipment Account No. 30, "Power Plant Buildings."

Q. What accounts should be charged with the cost of construction and maintenance of cars equipped as track-riveting machines and portable substations?

A. The first cost of electric motive equipment should be charged to Road and Equipment Account No. 37, "Electric Equipment of Cars"; the first cost of car bodies and trucks to Account No. 38, "Other Rail Equipment"; the first cost of riveting machinery, including its electric motors, to Account No. 38, "Other Rail Equipment," and the first cost of substation equipment used to Account No. 31, "Substation Equipment." The cost of maintenance of such cars should be correspondingly divided among Operating Expense Accounts Nos. 31, "Electric Equipment of Cars"; 35, "Service Cars," and 31, "Substation Equipment."

Change in Control of the New England Investment & Security Company

Sanderson & Porter, of New York, who have acquired a controlling interest in the common stock of the New England Investment & Security Company, are making an engineering study of the subsidiary electric railways. Until this is completed and the data obtained in this way are considered no announcement will be made by Sanderson & Porter in regard to their plans concerning the properties.

In referring in its issue of Aug. 4, 1913, to the status of voting power as between the preferred stock and the common stock of the New England Investment & Security Company the Boston *News Bureau* said:

"Some confusion has arisen as to the voting power of the

preferred and common shares of the New England Investment & Security Company, control of whose common stock has been transferred from New Haven interests to Sanderson & Porter, New York.

"The trust was created in 1906 with seven trustees, three of whom, Charles S. Mellen, Nathaniel Thayer and William Skinner, were deemed to be appointed by the preferred shareholders, and four, Robert W. Taft, Edwin Milner, D. Newton Barney and Charles F. Brooker, were deemed to be appointed by the common shareholders. [The original trustees were succeeded by others. The last reported trustees were Henry L. Higginson, A. Willard Damon, J. T. Harmer, Aug. G. Bulock, Bentley W. Warren and Charles E. Ware. Eds.]

"It is provided in the declaration of trust that a majority of the preferred stock may at any duly authorized meeting remove any trustee 'deemed to be appointed' as representing the preferred shareholders and appoint a new trustee in his place. Similarly a majority of the common shareholders may act in regard to the four trustees 'deemed to be appointed' in their interest.

"It is furthermore provided that if default on the preferred 4 per cent dividend should continue thirty days the management of the trust shall be vested in the three trustees appointed by the preferred stock and the power of the four members representing the common shall be suspended, as well as the voting power on the common stock at any meetings so long as the default shall continue.

"To the common stock, however, alone belongs the right to terminate the trust. The association was formed to run for twenty years and eleven months, with the proviso that a vote of two-thirds of the common stock outstanding may at any time terminate it. There is at the present time only $100,000 of common stock outstanding.

"In event of liquidation the preferred stock is entitled to $105 per share, the annual dividend rate while outstanding being 4 per cent, both of which were guaranteed by the Consolidated Railway Company, which a year later was merged with the New York, New Haven & Hartford Railroad, the latter assuming the guarantee.

"The guarantor company has the option of calling the preferred stock at any dividend date (January and July) at 105. Terms of the call provide that once a week for eight weeks notice of the call must be published in some Boston, Springfield and Worcester newspapers, the last publication to be at least seven days prior to the dividend date."

The Boston *News Bureau* said in its issue of Aug. 2, 1913:

"H. L. Higginson, a trustee of the New England Investment & Security Company, says in connection with the sale of that property to Sanderson & Porter, New York:

"'The press seems to regard this as a belated New Haven sale, when, as a matter of fact, the New Haven railroad sold its Massachusetts trolleys to this voluntary association some years ago.

"'At the time the New England Investment & Security Company was formed I was invited to subscribe for 100 common shares at $100 cash, and did so. No string was attached to the subscription and I had the right to sell or keep the stock at my pleasure, and have done so. I recently sold my stock for $200 a share because it seemed to me best.

"'The point to be made is that the New Haven railroad parted with the Massachusetts trolleys years ago to the New England Investment & Security Company. The recent sale of the common shares to New York interests was a voluntary step taken by the owners of these common shares because they preferred the money to their shares. I do not see where the New Haven figures in this transaction.'"

Interborough Rapid Transit Company Lists Additional Bonds

Announcement has been made by the New York Stock Exchange that $12,541,000 of first and refunding 5 per cent bonds of the Interborough Rapid Transit Company, New York, have been admitted to the list, and $148,416,000 additional of said bonds may be added prior to July 1, 1914, on official notice that they have been sold and passed beyond control of the company. Following is the proposed distribution of the $160,957,000 bonds:

For payment of notes paid May 1, 1913	$16,043,000
For refunding of outstanding mortgage bonds at 105 and interest (to be called probably Nov. 1, 1913)	33,861,800
For company's share of new subway construction	54,043,000
For equipment of new subways	21,000,000
For elevated third-tracking	10,800,000
For elevated extensions	13,154,000
For improvements on power plant of existing elevated lines	4,000,000
For expense of sale of bonds and to make up discount or deficiency, the amount realized on sale to net not less than 93½	8,055,200
Total	$160,957,000

The remaining bonds, to the amount of $139,043,000, of the authorized issue of $300,000,000 may be issued with the approval of the Public Service Commission for any additional needs for further construction of the subway or elevated lines that may arise, as well as to provide funds for additions to the proposed system when traffic demands warrant.

Barcelona Traction, Light & Power Company, Ltd., New York, N. Y.—The stockholders of the Barcelona Traction, Light & Power Company, Ltd., have authorized the creation of $12,500,000 of 7 per cent non-cumulative preferred stock. Of this amount $10,000,000 has already been sold to a French syndicate at par. The proceeds will be used for further developing the plans of the company in and around Barcelona, Spain. The remaining $2,500,000 of the new preferred stock will be held in the company's treasury against further needs. Dr. F. S. Pearson is president of the company, which was organized two years ago to construct and operate a tramway property in and around Barcelona and also to develop and distribute electric light and power. The company also has $30,000,000 of common stock, all of which has been issued. The company controls all of the tramway lines and electric light and power properties in Barcelona, Spain.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—At the request of minority bondholders of the Buffalo & Lake Erie Traction Company, Chairman Decker, of the Public Service Commission, on Aug. 1 granted an adjournment until Aug. 22 on the application of the bondholders' committee for the reorganization of the company, the acquisition of the capital stock of the Buffalo, Lockport & Rochester Railway and a new electric power corporation. Minority bondholders will organize formally so as to present their side of the case before the commission.

Cleveland & Eastern Traction Company, Cleveland, Ohio.—A rehearing before the Public Service Commission has been asked by the Cleveland & Eastern Traction Company on an adverse ruling made some time ago relative to the issue of $54,000 of first mortgage bonds. No further hearing has been asked on the ruling in regard to issues of $32,000 of preferred stock and $27,000 of common stock.

Commonwealth Power, Railway & Light Company, Saginaw, Mich.—The Commonwealth Power, Railway & Light Company has declared a second dividend of 1 per cent on its $15,500,000 of common stock, along with the regular quarterly payment of 1½ per cent on the $16,000,000 of 6 per cent cumulative preferred stock, both payable on Aug. 1 to holders of record July 19.

Connecticut Valley Street Railway, Greenfield, Mass.—A quarterly dividend of three-quarters of 1 per cent has been declared on the $500,000 of common stock of the Connecticut Valley Street Railway, payable on Aug. 1 to holders of record of July 19, which compares with 1 per cent on May 1, one-half of 1 per cent on Feb. 1, 1913, and Aug. 1, 1912, and 1 per cent on Feb. 1, 1912, the first payment.

County Traction Company, Chicago, Ill.—The portion of the County Traction Company which operated in Evanston prior to the recent strike, the settlement of which was described in the Electric Railway Journal of July 26, 1913, page 150, has been sold to a group of capitalists represented by Clement C. Smith, Robert E. Bernat and Frank McCollough. The new company has not yet filed incorporation papers, but the nominal capital is said to be $500,000. The purchasers will immediately take steps to obtain a franchise from Evanston and in the meantime a temporary permit under which they can operate the property. Rehabilitation will begin as soon as funds can be obtained.

Dixon, Rock Falls & Southwestern Electric Railway, Tampico, Ill.—A bill was filed by the Illinois State Trust

Company, East St. Louis, as mortgage trustee, at the June term of the Circuit Court of Henry County to foreclose the mortgage of the Dixon, Rock Falls & Southwestern Electric Railway, under which, it is stated, $165,000 of bonds were issued. It is proposed to reorganize the company by permitting the holders of the bonds of the present company to exchange their bonds for a like number of shares of stock in the new company, but bondholders have the option of filing their bonds and receiving in cash their share of the proceeds of sale. It is stated that about $15,000 in cash was subscribed to buy the Tampico terminal, lay tracks, etc. Additional subscriptions will have to be made to purchase right-of-way and equipment.

Fort Smith Light & Traction Company, Fort Smith, Ark.—The directors of the Fort Smith Light & Traction Company have failed to declare the July dividend on the $1,410,000 of 7 per cent cumulative preferred stock.

Gary & Interurban Railway, Gary, Ind.—Frank N. Gavit, president of the Gary & Interurban Railway, is quoted in part as follows in regard to the suit for receivership brought by F. C. Raff: "The action is an effort to test the validity of the consolidation of the various roads which now constitute the corporation known as the Gary & Interurban Railway. This consolidation was made on Jan. 28, 1913, under the authority of the Indiana statutes. Mr. Raff holds a minority of stock in the Gary & Interurban Railway, which, like the other original companies, went out of existence at the time of the consolidation. He contends that the consolidation is not valid, and he seeks to have it so adjudged. We have confidence of the termination of the suit in favor of the consolidation. If, however, Mr. Raff should succeed, the only effect would be to dissolve the consolidation and put the companies in the position they occupied theretofore." The application for the appointment of a receiver was referred to in the ELECTRIC RAILWAY JOURNAL of Aug. 2, 1913, page 200.

Georgia Railway & Electric Company, Atlanta, Ga.—The Georgia Railway & Electric Company has applied to the State Railroad Commission to be allowed to issue $430,000 of first mortgage refunding and improvement bonds. A hearing is set for Aug. 12. The petition states that these bonds are for refunding purposes and to provide funds for extensions and improvements.

Lincoln Railway & Light Company, Lincoln, Ill.—It is stated that the Lincoln Railway & Light Company at Lincoln, Ill., will discontinue the operation of its railway lines on Sept. 21, in consequence of financial embarrassment brought on by street paving expense and the substitution of new rails for the present rails in the district to be paved.

Louisville (Ky.) Railway.—According to the statement of the Louisville Railway for June, which was recently made public, the gross operating revenues of the company were $5,676 greater than those of June, 1912. There was an increase of $10,031 in operating expenses, however, bringing the net operating revenue to $4,355 less than that for June, 1912. For the six months ending June 30, 1913, gross operating revenue increased $58,217, and net revenue $33,463. Net income of all properties operated by the company, after the payment of all expenses and charges, was $58,622 for June, a decrease of $15,261 as compared with June of last year, and $354,331 for the six months, a decrease of $16,970. Officers of the company estimate that nearly $7,000 of the June increase in operating expense is due to the recent advance in wages. Another factor in the increased expense was the Oak Street cross-town line, started a few months ago, which is not yet paying its way. The interruption of traffic over several suburban lines by the spring floods is also responsible for a part of the decrease shown for the six-months period ending June 30. The company is setting aside for taxes on the interurban lines $1,000 a month more than a year ago, and the same additional amount on the city lines. Interest charges are $4,160 a month greater than a year ago, by reason of the February issue of $1,000,000 of 5 per cent bonds.

Morris Railroad, Morristown, N. J.—The mortgage of the Morris Railroad to the Safe Deposit & Trust Company of Pittsburgh, as trustee, is made to secure an issue of $137,500 thirty-five-year 5 per cent $1,000 bonds dated July 25, 1913, but redeemable at par after one year, interest semi-annually. The mortgage provides for a sinking fund to retire the bonds at maturity.

Newell (W. Va.) Street Railway.—The Newell Street Railway and the Newell Bridge Company have been consolidated as the Newell Bridge & Street Railway Company.

Northern Ohio Traction & Light Company, Akron, Ohio.—On July 28 the Ohio Public Service Commission heard the petition of the Northern Ohio Traction & Light Company for permission to issue $3,000,000 in securities to be used as collateral to secure a loan.

Ohio Electric Railway, Cincinnati, Ohio.—As a result of recent changes in the financial organization of the Ohio Electric Railway the company now has the following stock and bond issues: Common stock authorized, $8,000,000 in $100 shares, $8,000,000 issued; preferred stock, 5 per cent non-cumulative, with equal voting rights, par $100, callable on any dividend date at 105 on thirty days' notice, $6,000,000 authorized, outstanding $3,000,000; second and general mortgage 5 per cent gold bonds, dated June 2, 1913, par $10, $500 and $1,000, authorized amount $5,000,000, outstanding July 24, 1913, $601,700. The bonds are to be delivered for improvements when and as approved by the Public Service Commission of Ohio or other governmental authority. The entire bond issue is subject to call on any interest date for payment in cash or for substitution of first and refunding mortgage bonds dated Jan. 1, 1910, exchanged at par after eight weeks' notice.

Pacific Gas & Electric Company, San Francisco, Cal.—The Pacific Gas & Electric Company reports the recent sale of $4,500,000 of one-year 6 per cent notes.

Porto Rico Railways, Ltd., San Juan, P. R.—Shareholders of the Porto Rico Railways are offered the right to subscribe at par at the Royalty Securities Corporation on or before Aug. 23 for $500,000 of 7 per cent cumulative preference shares, one new share for each seven shares (common and preferred combined) now held. The proceeds will be used to meet capital expenditures in 1913, chiefly for the completion of lighting lines. Subscriptions are payable 25 per cent now and 25 per cent Sept. 1, Oct. 1 and Nov. 1.

San Francisco, Napa & Calistoga Railway, Napa, Cal.—Practically all of the claims against the San Francisco, Napa & Calistoga Railway on account of the recent accident are said to have been settled out of court. The directors have levied an assessment of $5 a share on stockholders.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—E. W. Clark & Company, Philadelphia, Pa., have sent the following notice to holders of the Fidelity Trust Company certificates of deposit of common stock of the St. Joseph Railway, Light, Heat & Power Company: "The contract with Henry L. Doherty & Company for the purchase of the common stock of the St. Joseph Railway, Light, Heat & Power Company was made for the benefit of the Cities Service Company and has been transferred to that company. We have agreed with the Cities Service Company to extend the payment due Aug. 1, 1913, to March 1, 1914, and the payment due Feb. 1, 1914, to Aug. 1, 1914, so that the balance of purchase under such contract is due $15 a share March 1, 1914, and $35 a share Aug. 1, 1914. Interest on all instalments at the rate of 5 per cent has been paid to date, and the new agreement provides for interest after Aug. 1, 1913, at the rate of 6 per cent per annum, payable March 1, 1914, and Aug. 1, 1914. Pursuant to this agreement, $500,000 of Cities Service Company 7 per cent convertible notes have been deposited with the Fidelity Trust Company as additional collateral for the instalment due March 1, 1914, the notes to be returned to the Cities Service Company upon payment of this instalment. We regard this agreement as being to the advantage of depositing stockholders, and more than 65 per cent of the deposited stock has approved the agreement. Interest due on Aug. 1, 1913, will be paid on presentation of certificates of deposit at our office for indorsement of such payment and assent to the modified agreement."

Toronto (Ont.) Railway.—Twenty-seven 4½ per cent currency bonds of $1,000 each and 270 sterling bonds of £100 of the Toronto Railway issued under the first mortgage dated Sept. 1, 1892, have been drawn for redemption on Sept. 1.

Dividends Declared

Connecticut Railway & Lighting Company, Bridgeport, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

Detroit (Mich.) United Railways, quarterly, 1½ per cent.

Harrisburg (Pa.) Traction Company, 3 per cent.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, quarterly, 1¼ per cent, preferred.

Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo.	June	'13	$111,601	$63,763	$47,838	$31,744	$16,094
1 "	"	'12	105,172	59,536	45,636	30,995	14,641
6 "	"	'13	575,158	357,345	217,823	187,547	30,276
6 "	"	'12	540,874	330,558	210,316	182,598	27,718

COLUMBUS (GA.) ELECTRIC COMPANY

1 mo.	May	'13	$55,982	*$25,809	$30,173	$20,350	$9,823
1 "	"	'12	49,319	*23,154	26,165	19,028	7,137
12 "	"	'13	644,135	*290,522	354,613	233,734	120,879
12 "	"	'12	583,583	*260,851	322,733	216,236	106,497

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

1 mo.	June	'13	$2,649,559	$1,087,803	$1,561,756	$1,101,301	$460,455
1 "	"	'12	3,454,394	1,067,239	2,387,155	1,094,501	1,292,654
12 "	"	'13	32,985,361	13,260,743	19,724,618	13,187,549	6,537,069
12 "	"	'12	32,551,592	13,047,802	19,503,790	12,980,024	6,523,766

JOPLIN & PITTSBURG RAILWAY, PITTSBURG, KANS.

1 mo.	June	'13	$47,897	*$29,069	$18,826	$12,542	$6,284
1 "	"	'12	45,077	*26,513	18,564	12,933	5,641
12 "	"	'13	560,285	*328,650	231,635	150,500	81,135
12 "	"	'12	503,587	*297,134	206,453	154,993	51,450

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

1 mo.	June	'13	$148,222	$65,215	$83,007	$46,518	$36,489
1 "	"	'12	129,983	56,448	73,535	42,209	31,326
12 "	"	'13	1,661,961	709,860	952,101	534,590	417,511
12 "	"	'12	1,438,231	629,957	808,274	483,128	325,146

MONONGAHELA VALLEY TRACTION COMPANY, FAIRMONT, W. VA.

1 mo.	June	'13	$78,738	$27,415	$51,323	$24,127	$27,196
1 "	"	'12	72,400	30,038	42,362	21,854	20,508
6 "	"	'13	442,067	151,655	290,412	144,660	145.752
6 "	"	'12	387,024	159,142	227,882	113,107	114,775

NEW ORLEANS RAILWAY & LIGHT COMPANY, NEW ORLEANS, LA.

1 mo.	June	'13	$562,320	*$363,917	$198,403	$145,225	$53,178
1 "	"	'12	522,855	*326,789	196,066	136,472	59,594
6 "	"	'13	3,467,585	*2,139,812	1,327,773	856,958	470,815
6 "	"	'12	3,342,493	*1,988,356	1,354,137	821,151	532,986

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1 mo.	May	'13	$183,317	*$98,074	$85,244	$24,166	$61,078
1 "	"	'12	148,060	*77,318	70,742	20,846	49,897
12 "	"	'13	1,975,120	*1,048,806	926,313	284,405	61,078
12 "	"	'12	1,634,302	*890,489	743,814	251,677	492,137

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

1 mo.	May	'13	$35,645	*$17,907	$7,739	$7,425	$314
1 "	"	'12	21,418	*15,955	5,462	7,132	†1,669
12 "	"	'13	285,260	*188,836	96,423	87,569	8,854
12 "	"	'12	275,783	*180,601	95,182	83,937	11,245

PENSACOLA (FLA.) ELECTRIC COMPANY

1 mo.	May	'13	$22,770	*$15,635	$7,135	$6,477	$658
1 "	"	'12	34,141	*14,828	9,313	6,377	2,936
12 "	"	'13	285,728	*179,251	106,477	76,526	29,951
12 "	"	'12	286,825	*181,303	105,522	68,235	37,288

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1 mo.	May	'13	$715,073	*$411,192	$303,881	$171,713	$132,168
1 "	"	'12	681,003	*390,603	290,399	164,663	125,736
12 "	"	'13	8,354,255	*4,885,798	3,468,458	2,018,238	1,450,220
12 "	"	'12	.....	.....	.....	.....	.....

SAVANNAH (GA.) ELECTRIC COMPANY

1 mo.	May	'13	$70,026	*$45,209	$24,817	$22,726	$2,090
1 "	"	'12	63,524	*47,481	16,044	16,009	35
12 "	"	'13	782,654	*562,086	222,569	218 007	2,562
12 "	"	'12	724,337	*535,995	188,342	187,299	1,043

TAMPA (FLA.) ELECTRIC COMPANY

1 mo.	May	'13	$69,556	*$38,158	$31,398	$4,528	$26,870
1 "	"	'12	63,365	*33,277	30,088	4,363	25,725
12 "	"	'13	771,535	*404.078	367.457	54,977	312,481
12 "	"	'12	721,577	*389,244	332,333	56,637	275,696

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1 mo.	June	'13	$754,495	$363,242	$391,253	$145,443	$245,810
1 "	"	'12	692,417	335,853	356,564	143,079	213,485
12 "	"	'13	4,230,531	2,166,225	2,064,306	878,629	1,185,677
12 "	"	'12	3,926,120	2,048,606	1,877,514	855,475	1,022,039

*Includes taxes. †Deficit.

Traffic and Transportation

Increase in Wages on Pacific Electric Railway

A general increase of 8 to 10 per cent in the wages of trainmen employed by the Pacific Electric Railway was announced on July 26, 1913, by Paul Shoup, president of the company, the increase being effective on July 1. President Shoup, in his letter to J. McMillan, general manager of the company, said:

"In reference to previous discussion as to increase in wages of trainmen, particularly to the recommendation of the superintendents submitted on May 10, 1913, with your approval, to analyses made subsequently thereto as to the increase in operating expenses if such recommendation were adopted, and to my final approval given on July 3 to the changes in schedule, date of effectiveness being left open pending certain questions as to the reassignment of runs that would follow through the application of our seniority rule, the effective date governing increase in pay will be July 1. Changes in runs under seniority rule referred to can be made before such date as you determine as giving proper opportunity to all interests, taking into consideration the necessities for re-examinations.

"The officials of the company have inaugurated a sweeping change which involved the reclassification of the trainmen. There will be two classes—those employed in the interurban service and those in the city service. According to the orders trainmen, whether now employed in city service or interurban service, may exercise their seniority rights to change runs from one service to another and reassignment of runs will be made accordingly. Hereafter as vacancies occur or new runs are established trainmen will have the rights thereto according to seniority, whether in city or interurban service. New employees will, as far as possible, be assigned to city service and not to the interurban lines at the beginning of their service. The following schedule of wages will govern for the train service employees, for passenger conductors and motormen, interurban service only: First year, 27 cents an hour; second year, 28 cents an hour; third year, 29 cents an hour; fourth year, 30 cents an hour; fifth year, 31 cents an hour; sixth year and thereafter, 32 cents an hour.

"The schedule for the freight and work trainmen and yardmen is as follows: Motormen, 33 cents an hour; conductors, 33 cents an hour; brakemen and switchmen, 29 cents an hour; trolleymen, 25 cents an hour; yard foremen, 33 cents an hour; yardmasters, $125 a month.

"Employees of all other departments, such as employees in power houses, substations, electric line work, car inspection and repairing and maintaining, towermen, terminal stationmen, gatemen, as well as men employed in and around offices, including the general offices, who wish to take advantage of the increase in wages and enter the train and yard service, will be given preference over applicants not now in the company's service, conditional upon their qualifying for such service."

Increase in Wages in Milwaukee.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., on Aug. 1, 1913, increased the wages of the motormen and conductors in its employ 1 cent an hour. A similar increase went into effect in July, 1912.

Increase in Wages in Kansas City.—Federal Judge Hook at Kansas City has ordered the receivers of the Metropolitan Street Railway, Kansas City, Mo., to increase the wages of the motormen and conductors in the employ of the company 5 per cent. The increase is to date from Aug. 1.

Violation of Two-Cent Fare Law Alleged.—R. T. Breckenridge, of the Duquesne Manufacturing Company, Columbiana, Ohio, has filed complaint to the effect that the Youngstown & Southern Railway is violating the 2-cent fare law and is discriminating in the rate of fare charged between various points.

Strike Unlikely at Holyoke, Mass.—Further conferences scheduled for the present week between L. D. Pellissier, general manager, and S. D. Nevin, treasurer, of the Holyoke Street Railway and a committee of employees regarding

the practical application of the recently effective "nine-hours-in-eleven" law indicated that a satisfactory solution of the matters at issue will be secured.

Hearing in Jersey City in Regard to Lower Steps.—Officials of the Public Service Railway, Newark, N. J., testified before the members of the Public Utility Commission in Jersey City on July 25 in regard to the expense that would be entailed to carry out the demand of the women's clubs of Hudson County that the steps and platforms of the cars operating in Jersey City be lowered to an average height of 15 in.

Through Routing Ordinance for Chicago Elevated Roads Signed.—Mayor Harrison of Chicago, Ill., has signed the ordinance providing for the through routing of elevated railroad trains. It is expected the companies will file their acceptance within the next few days. Nothing will be done by the local transportation committee relative to unified operation of the surface line companies and the Mayor's subway ordinance until September.

Center Side-Entrance Trail Car Proposed for Cincinnati.—W. Kesley Schoepf, president of the Cincinnati (Ohio) Traction Company, has notified the city that he hopes to work out plans for a center side-entrance trail car that will meet the needs of the city. The car, he says, will seat about seventy people. The company hopes to have a number of the cars in operation by the latter part of November or early in December.

Question of Limiting Car Capacity in Washington.—The question of whether or not the carrying capacity of cars operated by the electric railways in the District of Columbia shall be limited is to be discussed at a hearing to be held by the Public Utilities Commission at 10 a. m. on Aug. 11. The commission also will consider the question of permitting passengers to occupy the platforms of closed cars and the front seats and running boards of open summer cars.

Illinois Traction System Made a Member of the Illinois Freight Committee.—Effective on Sept. 1, the Illinois Traction System will become a member of the Illinois Freight Committee Association, a steam road organization which issues all interline rates within the State. The membership to this association brings with it all the privileges enjoyed by the steam road representatives and it makes the Illinois Traction System a party to all tariffs issued by this association and establishes joint rates with all the steam railroads.

City Demands That Tracks Be Sprinkled.—A unique case occurred in Sacramento, Cal., on July 19, when F. G. Wrightson, city street superintendent, swore out a warrant charging N. J. Hullin, superintendent of the local electric railway lines of the Pacific Gas & Electric Company, with maintaining a nuisance. The nuisance results from the alleged failure of the corporation to sprinkle the streets adjacent to its tracks throughout the city, as required by a municipal ordinance. The complaint recites that the dust resulting constitutes a menace to the public health.

Prepayment Cars in Interurban Service.—The Ohio Valley Electric Railway, Huntington, W. Va., has put ten pay-as-you-enter cars on its interurban line between Huntington, W. Va., and Ashland, Ky. It has also put eight new cars in city service in Huntington. The pay-as-you-enter cars are 50 ft. 7 in. long and 8 ft. 6 in. wide. The plan has been adopted of passengers paying 5 cents each on entering and the conductor collecting additional fares as needed in passing from district to district. The fare between Ashland and Huntington is 15 cents, so that two additional collections are necessary.

Headlight Ordinance Passed in Chicago.—The Council of Chicago passed on July 14 a revised ordinance which prohibits the use of headlights with parabolic or condensing lenses or reflectors unless the headlight is properly shaded so as not to blind or dazzle users of the highway. A fine of not less than $5 and not more than $50 is provided for violations. The ordinance was designed primarily to eliminate the use of high-power headlights on automobiles, and while it is broad enough to include electric railway cars, it does not affect the latter as they do not use headlights of the types considered objectionable.

New Chartered Car Tariff in Brooklyn.—The Brooklyn (N. Y.) Heights Railroad has filed with the Public Service Commission for the First District of New York a new tariff for chartered cars on the surface lines in Brooklyn, making a 25 per cent reduction for the months of July and August for such cars for orphan asylums of all denominations. The present rates for such cars, either open or closed, are $9 for one-way trip and $12 for round trip on 5-cent routes; $12 per one-way trip and $17 for round trip on 10-cent routes, and $18 per one-way trip and $23 for round trip on 15-cent routes. The orphan asylums will be allowed 25 per cent reductions from these rates.

Through Rates Between Indianapolis and Louisville by Oct. 1.—Following its recent decision in the case of the Louisville Board of Trade against the electric railways which operate between Louisville and Indianapolis, in which these lines were ordered to make through rates between those cities and points beyond Indianapolis, the Interstate Commerce Commission has ordered that the rates be agreed on by Sept. 1. This means that tariffs must be filed with the commission some time this month. With the required notice of thirty days to shippers the effective date of the new tariffs will be Oct. 1. The decision of the commission in this case was referred to at length in the ELECTRIC RAILWAY JOURNAL of July 19, 1913, page 118.

Increase in Wages in Birmingham.—The wages of motormen and conductors in the employ of the Birmingham Railway, Light & Power Company, Birmingham, Ala., were raised 1 cent an hour, beginning Aug. 1. The new rate of pay affects all motormen and conductors who have been in the service of the company more than a year. It was cited in the notice that the men who have been with the company less than a year have received great benefits under the minimum wage scale and therefore would not be raised at this time. The new scale of wages for motormen and conductors, according to this raise, is as follows: Eighteen cents an hour for the first year; 20 cents, second year; 21 cents, third year; 22 cents, fourth year; 23 cents, fifth year; 24 cents, sixth year; 25 cents, seventh year, and 26 cents, eighth year.

"Electric Railway Service" to Be Issued Semi-Weekly.—In its issue of July 29, 1913, *Electric Railway Service*, which has been published once a week in the interest of the Detroit (Mich.) United Railway, said: "With this issue *Electric Railway Service* becomes a semi-weekly publication. It will be placed in the little boxes of the cars and in the waiting rooms Tuesdays and Fridays of each week. Whether you believe in municipal ownership of street railways or whether you are opposed to this theory of civic government you are sure to find something of interest to you. Above all, you will find facts that it is important you should know whether you are or are not a property owner. There isn't a problem appertaining to street railway transportation that *Electric Railway Service* will refuse to discuss. The truths we tell are disturbing the plans of self-glory and the plans of self-gain of some people, but remember that not one statement or figure published by *Electric Railway Service* has been attacked by these people. Read *Electric Railway Service*. All good live news. No advertising."

Suit to Set Aside Fare Order.—The receivers for the Metropolitan Street Railway, Kansas City, Mo., have filed suit in the federal court at Topeka to set aside the order of the Kansas Utilities Commission for joint rates over the Kansas City Western Railway and the Metropolitan Street Railway from Chelsea Junction in Kansas City, Kan., to any point in either of the two cities. Some time ago at the instruction of the City Commissioners of Kansas City the city attorney in an effort to secure an adjustment of rates over the two lines went before the utilities commission, which ordered a single 5-cent fare. The fare over the Leavenworth lines formerly was 10 cents from Chelsea Junction to other points in either of the two cities. A 5-cent fare was demanded at Eighteenth Street, where the Kansas City Western Railway connects with the lines of the Metropolitan Street Railway. The Metropolitan Street Railway carried passengers by different routes from Chelsea Junction for 5 cents. The receivers assert that the order is confiscatory. The receivers also charge that changing the fare would call for a readjustment of the traffic and that the matter is within the jurisdiction of the Interstate Commerce Commission.

Personal Mention

Mr. Jacob Kahler has been appointed roadmaster of the Northampton Traction Company, Easton, Pa., to succeed Mr. James O'Connell.

Mr. James H. McKnight has been appointed general freight agent of the Norwich & Westerly Traction Company, Norwich, Conn.

Mr. George P. McNear has been elected treasurer of the Petaluma & Santa Rosa Railway, Petaluma, Cal., to succeed Mr. Thomas Archer.

Mr. W. Lennox has been elected vice-president of the Colorado Springs & Interurban Railway, Colorado Springs, Col., to succeed Mr. A. G. Sharp.

Mr. William P. Zehner has been elected secretary of the Bloomsburg, Millville & Northern Railway, Bloomsburg, Pa., to succeed Mr. C. W. Miller.

Mr. V. F. Fabian has been appointed superintendent of the Westfield division of the Springfield Street Railway to succeed Mr. Everett I. Putnam.

Mr. J. A. Durham has been appointed general manager of the St. Francois County Railroad, Farmington, Mo., to succeed Mr. A. D. Brinkerhoff.

Mr. William E. Jones has been appointed master mechanic of the Chicago, Aurora & De Kalb Railroad, Aurora, Ill., to succeed Mr. William H. Harms.

Mr. H. J. Wightman has been appointed auditor, assistant secretary and assistant treasurer of the Trinidad Electric Transmission, Railway & Gas Company, Trinidad, Col., to succeed Mr. G. W. Parks.

Mr. J. A. Wilcox has been appointed superintendent of the Corning & Painted Post Street Railway, Corning, N. Y., to succeed Mr. H. H. Ryal. Mr. Wilcox was formerly master mechanic of the company.

Mr. Harry S. New has been elected vice-president of the Indianapolis & Northwestern Traction Company, Indianapolis, Ind., to succeed Mr. Robert I. Todd, who has been elected president of the company.

Mr. A. L. Kasemeier, formerly auditor of the Cincinnati (Ohio) Traction Company, the Ohio Traction Company and the Cincinnati Car Company, has been transferred to the Cincinnati Car Company as auditor exclusively.

Mr. Arthur Bremmen has been appointed chief engineer of the power station of the Hartford & Springfield Street Railway, Warehouse Point, Conn., to succeed Mr. Fred M. Du Bois, who continues with the company as master mechanic.

Mr. W. H. MacAlister, who was vice-president of the Cincinnati Car Company, has been made treasurer of the Cincinnati Traction Company, the Ohio Traction Company and the Cincinnati Car Company, to succeed Mr. H. L. Sanders.

Mr. E. T. Schuler, who has been secretary and treasurer of the Alabama City, Gadsden & Atalla Railway, Gadsden, Ala., has also been elected president of the company to succeed Mr. G. H. Schuler, who has been elected vice-president.

Mr. J. C. Daigen has resigned as master mechanic of the Cleveland & Eastern Traction Company, Cleveland, Ohio, after seven years of service to become lubricating expert with the Universal Lubricating Company, with headquarters in Cleveland, Ohio.

Mr. E. H. Henning, superintendent of the Niagara Falls division of the International Railway, Buffalo, N. Y., has been promoted to the position of superintendent of interurban lines of the system. Mr. Henning entered the employ of the International Railway as a motorman eighteen years ago.

Col. George W. Goethals, chairman of the Isthmian Canal Commission and chief engineer of the Panama Canal, has consented to accept the honorary presidency of the International Engineering Congress and will preside in person over the general sessions to be held in San Francisco, Sept. 20-25, 1915.

Mr. Harold F. Cook has been appointed assistant to the president of the Ottawa, Rideau Lakes & Kingston Railway, Ottawa, Ont., which is under construction. Mr. Cook was born at Croydon, Eng., on June 13, 1888. He was graduated in civil and mechanical engineering at the Central Technical College, London, Eng., in 1909.

Mr. R. R. Ritchie has resigned as supervisor of safety of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind. Mr. Ritchie has been with the company for two years, and through his efforts the safety first movement was established on the system. Mr. Ritchie will become connected with the Mobile Railway & Light Company, Mobile, Ala., which operates 58 miles of electric railway in that city.

Mr. O. J. Cherry, who has been superintendent of the Lockport division of the International Railway, Buffalo, N. Y., for several years, has resigned, and Mr. J. W. Andrews has been appointed as assistant to Mr. E. H. Henning, the superintendent of the interurban lines of the company, vice Mr. Cherry. Mr. Andrews was formerly with the Public Service Commission of the Second District of New York.

Mr. R. S. Mahan has been appointed claim agent for the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo. Previous to assuming his present duties Mr. Mahan was in the employ of the Wyandotte Construction Company, which secured the right-of-way for the Kansas City, Clay County & St. Joseph Railway, built the road and later had charge of the Platte River quarries, where all of the crushed rock ballast for the St. Joseph division was secured.

Mr. H. L. Sanders has been made auditor of the Cincinnati (Ohio) Traction Company and the Ohio Traction Company, to succeed Mr. A. L. Kasemeier. Mr. Sanders has been with the Cincinnati Traction Company for about six years, having entered the service of the company from the accounting department of the Atlantic Coast Line. Mr. Sanders came to the Cincinnati Traction Company as assistant purchasing agent and was made treasurer about two years ago. He was made auditor of both the Cincinnati Traction Company and the Ohio Traction Company last month.

Mr. C. E. Palmer, who has been connected with the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., for the last two years as superintendent of transportation, has resigned, effective on Aug. 1. Previous to being connected with the Fort Wayne & Northern Indiana Traction Company Mr. Palmer was at Pottsville, Pa.; with the Ohio Electric Railway at Cincinnati, and the Chicago, Lake Shore & South Bend Railway. Mr. Palmer intends to spend the next month at his home in Middletown, Ohio, expecting to take a position in the Southwest about Sept. 1.

Mr. A. D. Brinkerhoff is now acting in the capacity of secretary and treasurer of the National Light & Power Company, St. Louis, Mo. This company was until recently acting in the engineering and managing capacity for the St. Francois County Railroad. These latter duties have recently been taken over by the management of the M. R. & B. T. Railway. The National Light & Power Company is now operating a number of electric light, water and ice plants in Kentucky and Missouri, and is doing a general electric and mechanical engineering consulting business in the Middle West.

Mr. A. de Sola Mendes, vice-president and general manager of the Georgia Coast & Piedmont Railway, has succeeded Mr. H. F. Dunwody as general manager of the Mutual Light & Water Company and City & Suburban Railway, Brunswick, Ga. Mr. Mendes was born in New York and started his career in the banking business with J. F. Lisman & Company, of that city. He entered the railroad business fifteen years ago under Mr. Samuel Hunt. After handling the accounting and traffic departments of several short lines Mr. Mendes took charge of the Georgia Coast & Piedmont Railway in 1908. Mr. Dunwody, it is stated, will devote himself in the future largely to his law practice.

OBITUARY

D. F. Webster, formerly electrical engineer and master mechanic of the Sedalia Light & Traction Company, Sedalia, Mo., is dead.

Construction News

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

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

RECENT INCORPORATIONS

*Alton & Southern Railroad, East St. Louis, Ill.—Incorporated with a capital stock of $10,000 to build a railway from a point opposite the city of St. Louis through East St. Louis to a point at or near the east banks of the Mississippi River in Madison County. The incorporators are C. B. Fox, Gilbert McCullough, C. E. Rodgson, C. W. Souder, R. S. Sherwin, W. Abt and W. H. Hebenstreit.

*Evanston (Ill.) Traction Company.—Incorporated with a capital stock of $10,000 to own and operate street railways. The incorporators are Frank M. McCulloch, Bertram W. Rosenstonc and Claude O. Netherton.

*Olympian Springs Railway, Power & Light Company, Olympian Springs, Ky.—Incorporated to build and operate an electric railway between Olympian Springs and Olympia, a station on the Chesapeake & Ohio Railway 4 miles from the springs. J. D. Wilson, Greensburg, Ky., is president, and A. J. Heliker, Louisville, and J. Frank Taylor, Glasgow, Ky., are stockholders. S. F. Crecilius, Louisville, is engineer for the company, which has begun a survey for the line.

*Quebec (Que.) Rapid Transit Company.—Incorporated to build a system of radial lines from Quebec serving Limoilou, Beaufort, Charlesbourg, Rivière Jaune, Lake St. Charles, Indian, Lorette, St. Foy, Cap Rouge, Montcalmville, St. Grégoire, St. Anne de Beaupré and the Isle of Orleans. Nothing has been done in the way of arranging for construction. A. Taschereau, Quebec, is interested.

*Farmers' Traction Company, Sioux Falls, S. D.—Incorporated in South Dakota with a capital stock of $350,000. The route of the proposed line has not been announced. Incorporators: Frank L. Richardson, E. Stout and H. F. Fellows.

FRANCHISES

Gadsden, Ala.—The Gadsden, Bellevue & Lookout Mountain Railway has received a street railway franchise in Gadsden.

Glendale, Cal.—The Pacific Electric Railway has received a fifty-year franchise to construct a street railway over certain streets in Glendale.

Pittsburg, Cal.—The Oakland, Antioch & Eastern Railway, Oakland, has received a franchise from the trustees to operate through Pittsburg.

San Diego, Cal.—The Los Angeles & San Diego Beach Railway, which proposes to electrify its line, has filed applications for franchises on the La Jolla division and the San Diego city division, which would extend the present franchises to Dec. 31, 1952.

San Diego, Cal.—The San Diego Electric Railway has filed an application with the City Council for a franchise to construct a double-track line from F and Twelfth Streets to El Cajon Avenue.

San Francisco, Cal.—The Ocean Shore Railroad has applied to the Board of Supervisors for a fifty-year franchise to extend its line from Twelfth Street south of Mission to the block bounded by Twelfth, Mission, Eleventh and Market Streets, on which it proposes to erect a terminal depot.

Bunker Hill, Ill.—The St. Louis, Belt, Bunker Hill & Eastern Railroad has received a franchise to construct an interurban line through the city.

Brainard, Minn.—George Reid, president of the Minnesota Central Railway, has applied to the Council for a street railway franchise in Brainard. [E. R. J., July 12, '13.]

Linden, N. J.—Application will soon be made by the promoters of the proposed Linden-Warner Station line for an electric railway franchise in Linden. [E. R. J., May 17, '13.]

New York, N. Y.—The Board of Estimate has adopted a resolution granting a franchise to the Brooklyn & North River Railroad for the construction and operation of a double-track street railway from Flatbush Avenue extension along Fulton Street to Nassau Street, in Brooklyn, and over the Manhattan Bridge to Canal Street, in Manhattan.

Everett, Wash.—The Northern Pacific Traction Company has received a franchise to construct an electric railway in Everett.

Huntington, W. Va.—The Huntington & Charleston Railroad will apply for a franchise for an extension in Huntington.

Huntington, W. Va.—The Ohio Valley Electric Railway will apply for a franchise to double-track several of its lines and build a new single-track line in Huntington.

TRACK AND ROADWAY

Northwest Arkansas Railway, Bentonville, Ark.—It is reported that the promoters of this company have arranged for a lease of the St. Louis-San Francisco Railroad tracks between Rogers and Bentonville, and will use them for the line which they expect to have in operation in the near future. The line will be extended at Bentonville out to the Park Springs Hotel, a distance of about 1 mile. The company secured franchises from Bentonville, Rogers and Cave Springs last fall, but nothing has been done up to the present time. Storage battery cars will be operated. H. L. Cross, Bentonville, is said to be interested in the project. [E. R. J., Dec. 21, '12.]

Fresno (Cal.) Traction Company.—This company has applied to the Railroad Commission for permission to build the Biola line. The grading has already begun and is well under way. The extension will be about 8½ miles in length, extending from Muscatel to the new townsite of Biola.

Clear Lake Railroad, Lakeport, Cal.—This company has applied to the Railroad Commission for authority to issue a sufficient amount of its stock and bonds to build an electric railway from Hopland, in Mendocino County, to Lakeport. There already has been expended on the project about $37,000, and it is estimated that there will be required to complete it the additional sum of $396,300. The surveys have been completed, and almost all of the rights-of-way secured. The company has an authorized capital stock of $500,000 and an authorized bond issue of $400,000.

San Rafael & San Anselmo Valley Railway, San Rafael, Cal.—S. J. Norton, who has completed the preliminary work for the building of the 6-mile line between San Rafael and San Anselmo, announces that a charter will be applied for at once. It is planned to operate storage battery cars for the present. The necessary franchises through the county and towns have been secured and the bonds filed. The company will be capitalized at $100,000. The following directors have been elected: E. S. Rake, S. J. Norton, A. E. Scott, Louis Peter, Prentiss Grey, Frederick Croker and Frank Riede. S. H. Cheda, president of the Marin County National Bank, was temporory treasurer. [E. R. J., Aug. 2, '13.]

Augusta & Edgefield Electric Railway, Edgefield, Ga.—This company plans to build from Augusta, Ga., north, via North Augusta, S. C., Ropers, Edgefield, Pleasant Lane and Kirksey, to Greenwood, 55 miles, with permission to use either steam or electricity for the motive power. C. W. Requarth, Charlotte, N. C., will have charge of the survey and obtaining right-of-way. There will be two bridges, one over the Savannah River at Augusta, Ga., and one over Turkey Creek. William P. Calhoun, Edgefield, is chairman of the survey committee.

Quincy & Western Illinois Railway, Quincy, Ill.—This company is said to have begun work on 3 miles of track for a belt line. Henry Dayton, Quincy, president. [E. R. J., July 6, '12.]

Hutchinson & Western Interurban Railway, Hutchinson, Kan.—This company has received permission from the Public Utilities Commission to issue stock to the amount of $375,000 and $1,500,000 in bonds. The proceeds will be used for the construction of its proposed interurban line between Hutchinson and Hudson. [E. R. J., Dec. 28, '12.]

Kansas Central Traction Company, Topeka, Kan.—This company has made arrangements for financing construction and will begin work on the proposed line Sept. 1. It will extend from Coffeyville to Parsons, through Edna and

Altamont, with a branch from Altamont to Oswego. The main power plant will be located at Altamont. Philip Strack, Indianapolis, Ind., president; O. C. Randal, Altamont, treasurer. [E. R. J., June 15, '12.]

*Bowling Green, Ky.—W. H. Brashear, Bowling Green, has projected the construction of a 3-mile electric railway from Bowling Green to Beech Bend Park, Ky. Either a power plant will be built or arrangements for current made with the Bowling Green Railway. It is also possible that the Bowling Green Railway will purchase and operate the line when it is completed.

Portland (Maine) Railroad.—The erection of a $1,000,000 bridge between Portland and South Portland is practically assured owing to the decision of the Portland Terminal Company, a corporation representing the Boston & Maine Railroad and the Maine Central Railroad to pay $400,000 toward the work. The county of Cumberland will pay $500,000 as its share of the bridge, and the Portland Railroad, which is to operate cars over the bridge, will give $100,000. The matter of constructing the bridge, or rather agreeing to the proportionate payment of all interested parties, has been a subject of legislative discussion for several years, and it was finally settled by the last Legislature.

Brandon (Man.) Municipal Railway.—The City Council has decided to extend the present lines, which have only recently been completed, on several streets.

Winnipeg (Man.) Electric Railway.—This company has under construction 8 miles of single track on various lines in Winnipeg and St. Boniface, and 6 miles of suburban track in St. Vital and Fort Garry.

Minneapolis, St. Paul, Rochester & Dubuque Traction Company, Minneapolis, Minn.—This company has awarded a contract for grading on 8 miles of its extension to Frederick & Barnard, Minneapolis, and sub-contracts to Dale & Baumgardner, St. Paul, and to McCollough & Cheney, Minneapolis. The company now operates a line from Minneapolis south, and plans to build an extension southwest, via Rochester and Cresco, toward Dubuque.

*Red Lodge, Mont.—It is stated that the residents of Red Lodge have interested H. A. Glasmacher and C. L. Mayo, Seattle, Wash., in a plan to promote an electric railway from Red Lodge to the Bearcreek coal fields. The line would be about 6 miles long.

Manhattan & Queens Traction Company, New York, N. Y.—This company has received permission from the Board of Estimate to extend its line from the present terminus, at Fulton Street and Hoffman Boulevard, to the Long Island Railroad station at Guilford Street. The board acted favorably upon the engineer's report on the route of the Manhattan-Jamaica line.

New York & North Shore Traction Company, Roslyn, N. Y.—In an item published in the Electric Railway Journal of July 26, page 164, it was stated that the New York & North Shore Traction Company was considering plans to build a line between the railroad station and Great Neck Village. The company states that it is not contemplating the building of any such line.

Cleveland (Ohio) Railway.—The directors of the Cleveland Railway have accepted the franchise granted for the East Seventy-ninth Street cross-town line between Hough Avenue and Kinsman Road.

Columbus, Kenton & Toledo Traction Company, Kenton, Ohio.—Surveys have been completed by this company on its line between Columbus, Findlay, Richwood, Kenton, Toledo and Magnetic Springs. It will connect at Findlay with the Toledo, Bowling Green & Southern Railway, [E. R. J., Aug. 10, '12.]

Toronto & Eastern Railway, Toronto, Ont.—This company announces that the line from Bowmanville into Toronto will be ready for operation early next spring. The grade between Bowmanville and Pickering will soon be completed, and nearly four hundred men will be set at work on the grade from Pickering west of Toronto. The rails are already laid from Bowmanville, ½ mile west, and a large force of men are now to be placed at work laying the rails between Bowmanville and Pickering.

Medford, Ore.—Construction of an electric railway from Medford to Siskiyou Heights has been begun by S. S. Bullis & Sons, holders of an electric railway franchise in Medford. The line will be completed as far as the Heights by November. The company also has a franchise to construct a line in certain portions of Jackson County.

Portland Railway, Light & Power Company, Portland, Ore.—This company will begin the construction of a line through the residence district lying east of East Thirty-seventh Street to the city limits, and between Tillamook Street on the north and Hassalo Street on the south.

*Prineville, Ore.—A contract has been closed by the citizens' committee, representing the business interests of Prineville and vicinity, and H. P. Shell, Tacoma, Wash., for the construction of a 30-mile electric railway from Metolius to Prineville.

Johnstown (Pa.) Traction Company.—This company is said to be preparing plans for double-tracking part of the Winder branch at King's Station, Johnstown.

Somerset (Pa.) Street Railway.—It is stated that G. C. Winslow has completed surveys and other preliminary work for the projected 45-mile line between Somerset, Rockwood and Johnstown. [E. R. J., Aug. 10, '12.]

Montreal & Southern Counties Railway, Montreal, Que.—The Board of Railway Commissioners has authorized the company to operate its cars, carrying passengers, baggage, express and other traffic over the Central Vermont Railway between the east end of its Southwark yards, St. Lambert and Richelieu, Que., 12 miles, and to use the Central Vermont Railway passenger and freight stations, yards and other facilities.

Three Rivers (Que.) Tramways.—Construction is about to be begun by this company, it being the intention to build about 7 miles of line on several streets in Three Rivers, Que., and also outside of the city to the Cap de la Madelaine. The authorized capital stock is $500,000, of which $400,000 has been subscribed. The officers are L. P. Normand, president; R. Bournival, secretary and treasurer, Three Rivers.

Regina (Sask.) Municipal Railway.—The Council has under consideration plans for the extension of the line into the Canadian Pacific Railway annex, crossing the Grand Trunk Pacific Railway at Thirteenth Street. The line is also being extended on Young Street to the new power house at Winnipeg and Twentieth Streets.

Dallas Southwestern Traction Company, Dallas, Tex.—The organization of this company, which proposes to build a 90-mile line from Dallas to Glen Rose, has been perfected by the election of the following officers: E. P. Turner, Dallas, president; William Poindexter, D. M. Sansom and C. A. Dunn, Dallas, vice-presidents; B. B. Cain, Dallas, treasurer; George Williams, secretary; E. M. Gleason, general manager. [E. R. J., July 26, '13.]

SHOPS AND BUILDINGS

Los Angeles & San Diego Beach Railway, San Diego, Cal.—This company, which proposes to electrify its line, has secured a site near Pacific Beach for its machine shops and carhouse.

San Diego (Cal.) Electric Railway.—A new carhouse, 200 ft. x 300 ft., will be erected at once by this company on University Heights. The buildings will be divided into three sections with fireproof walls. Each section will contain five tracks. The entire building will be equipped with automatic sprinklers. Accommodations for motormen and conductors also will be provided. The carhouse will have a storage capacity of 100 cars. The contract for the excavating has been awarded to M. D. Goodbody.

Manhattan City & Interurban Railway, Manhattan, Kan.—During the next few weeks this company plans to build a new carhouse in Manhattan.

Saginaw-Bay City Railway, Saginaw, Mich.—Plans are being made by this company to remodel its carhouse on North Washington Avenue, Saginaw. The work will include a new front and a second story, 80 ft. x 60 ft., to be used as offices. A reading room, 24 ft. x 30 ft., will also be installed, and there will be lockers and bathrooms. In the carhouse proper seventeen tracks will be installed with accommodations for 100 cars.

Oregon Electric Railway, Portland, Ore.—This company has placed a contract with Moore Brothers, Portland, for the construction of a brick passenger depot in Eugene. The structure will cost about $25,000.

Philadelphia (Pa.) Rapid Transit Company.—The Unit Construction Company has received a permit to build a one-story and two-story motormen's and conductors' building for the Philadelphia Rapid Transit Company at Fifty-ninth Street and Callowhill Street. It will be 148 ft. x 140 ft. and it is estimated will cost $55,000.

Williamsport (Pa.) Passenger Railway.—Plans have been completed and bids will be asked shortly by this company for the construction of a carhouse in Williamsport. The structure will be one story high, 225 ft. x 50 ft., and will contain four tracks.

Eastern Texas Traction Company, Greenville, Tex.—This company has purchased a site in Greenville for an interurban station. The structure will be 54 ft. x 208 ft. and will contain a passenger station, ticket offices and general offices of the company.

Gray's Harbor Railway & Light Company, Aberdeen, Wash.—Work has been begun by this company on its new carhouse at Electric Park in Hoquiam. The structure will have concrete floors, steel frames and concrete roofs and will be 105 ft. x 110 ft. The carhouse of the company is at present located in Aberdeen, but is being moved to Electric Park on account of the greater convenience of handling the traffic.

POWER HOUSES AND SUBSTATIONS

Birmingham, Ensley & Bessemer Railroad, Tuscaloosa, Ala.—This company will add to its equipment considerable power plant and substation apparatus consisting of two 1500-kw Curtis turbo-generators with a 35-kw turbo-exciter and 50-kw motor-generator exciter set, two "spiro-flow" condenser equipments, one 500-kw rotary converter, transformers, switchboard panels and accessories. All the apparatus is being built and will be installed by the General Electric Company.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—A power plant will be erected by this company near Pacific Beach.

United Railroads, San Francisco, Cal.—This company has ordered from the General Electric Company substation equipment consisting of a 1500-kw rotary converter, three 525-kva air-blast transformers and new switchboard apparatus.

Louisville (Ky.) Railway.—This company is interested in a plan of the city for straightening and deepening the channel of Beargrass Creek as a means of preventing floods. The power plant of the company, on Jacob Street, was seriously threatened by the high water which invaded that section last winter, though it was not actually put out of commission. By the new plan the danger from this source would be eliminated. The Louisville Railway will probably donate certain land to be used in the improvement work.

International Railway, Buffalo, N. Y.—This company has purchased from the General Electric Company a 1000-kw rotary converter, 1050-kw air-blast transformer and switchboard panels.

Interborough Rapid Transit Company, New York, N. Y.—The Westinghouse Machine Company has received a contract to supply the Interborough Rapid Transit Company with three turbo-generator sets of 30,000.kw each, the turbines to be manufactured by the Westinghouse Machine Company and the generators by the Westinghouse Electric & Manufacturing Company.

Philadelphia (Pa.) Rapid Transit Company.—This company has filed plans with the building department for a substation to be erected at Thirty-second Street and Dauphin Street.

Utah Light & Railway Company, Salt Lake City, Utah.—This company will add to its substation equipment a 560-kva, 720-r.p.m. three-bearing motor-generator set and four 300-kw transformers, switchboard panels, etc., the order for all of which has been placed with the General Electric Company.

Manufactures and Supplies

ROLLING STOCK

Halifax (N. S.) Electric Tramway has ordered six 21-ft. car bodies from the Nova Scotia Car Works.

Citizens' Traction Company, Oil City, Pa., is reported as expecting to purchase new equipment.

Washington (D. C.) Utilities Company is in the market for five 50-ft. center-entrance double-truck interurban cars.

Peoria (Ill.) Railway has placed an order with the St. Louis Car Company for four passenger cars mounted on No. 99-B single-motor trucks.

Bartlesville (Okla.) Interurban Railway has placed an order with the St. Louis Car Company for one 21-ft. car body, mounted on its No. 72 trucks.

Meridian Light & Railway Company, Meridian, Miss., has placed an order with the Southern Car Company for four semi-steel, single-truck car bodies.

Clinton (Ia.) Street Railway has placed an order with the St. Louis Car Company for seven 40-ft. passenger cars mounted on St. Louis-Warner trucks.

Indianapolis Traction & Terminal Company, Indianapolis, Ind., has ordered twenty-five 33-ft. 2½-in. double-truck, closed cars from the Cincinnati Car Company.

Chicago, Ottawa & Peoria Railway, Peoria, Ill., noted in the ELECTRIC RAILWAY JOURNAL of Aug. 2, 1913, as expecting to purchase three interurban cars, has ordered these cars from the St. Louis Car Company.

Interurban Railway & Terminal Company, Cincinnati, Ohio, has placed an order with the Cincinnati Car Company for five 50-ft. combination passenger, smoking and baggage cars and two 50-ft. express cars.

Decatur Railway & Light Company, Decatur, Ill., noted in the ELECTRIC RAILWAY JOURNAL of July 19, 1913, as being in the market for four double-truck cars, has ordered these cars from the St. Louis Car Company.

Peninsular Railway, San José, Cal., noted in the ELECTRIC RAILWAY JOURNAL of June 2, 1913, as expecting to purchase eight interurban cars, has ordered these cars from the Jewett Car Company. These cars, which will have a seating capacity of sixty-four, will have a length over all of 55 ft. 6¼ in., a width over all of 9 ft. 8 in., and will be equipped with four 150-hp, 308-D-3 Westinghouse motors.

Chicago (Ill.) Railways, noted in the ELECTRIC RAILWAY JOURNAL of July 26, 1913, as having ordered fifty cars from the Southern Car Company, has specified that these cars are to have a seating capacity for fifty-eight persons, to weigh about 37,000 lb. complete, wheelbase 21 ft., length of body 32 ft. 5 in., length over all 48 ft. 5 in., width over all 8 ft. 6 in., height sill to trolley base 8 ft. 10½ in. The body will be of wood and metal and the underframe entirely of metal.

TRADE NOTES

W. R. Kerschner, New York, N. Y., has been appointed Eastern sales manager for the Keyes Products Company, manufacturer of the Neva-Split panel for car-head linings.

Edison Storage Battery Company, Orange, N. J., has appointed H. S. Thompson vice-president. Mr. Thompson was formerly manager of the railway department of the company.

Galena Signal Oil Company, Franklin, Pa., has appointed J. C. Tipton as Canadian representative of the company with offices in the Shaughnessy Building, Montreal, Que., succeeding A. Lichtenheim, deceased.

Tungstolier Works of the General Electric Company, Cleveland, Ohio, have moved their general offices from Conneaut, Ohio, to the above address, where a salesroom for wholesale business will be maintained in the Euclid Building.

Hall Switch & Signal Company, New York, N. Y., has opened a branch office in the new Birks Building, Montreal, Que., in charge of B. H. Richards. Previous to this time all Canadian business of the company has been handled through its main office.

Atlas Preservative Company of America, New York, N. Y., has received recent large orders for its Atlas-A weed killer and track preservative from the Connecticut Company and the Northwestern Pennsylvania Railways, which is being applied under the supervision of the company.

William Wharton, Jr., & Company, Inc., Philadelphia, Pa., have announced the opening of a branch office in the Chandler Building, Atlanta, Ga., in charge of H. F. McDermott as engineer and district sales manager to handle their business in that territory.

St. Louis Surfacer & Paint Company, St. Louis, Mo., was noted in the Electric Railway Journal of Aug. 2, 1913, through error, as having lost its entire plant by fire. While the company did suffer considerable loss by this cause it is still doing business and filling orders with its usual promptness.

Railway Products Corporation, Buffalo, N. Y., has filed papers of incorporation. Its capital is $300,000. It will manufacture and sell railway products, railway cars, passenger, freight and street cars and equipment, appliances and accessories. The directors of the company are: Thomas B. Wheeler, Christopher M. Baldy, George V. Harmon and Guy Williams, all of Buffalo.

Dossert & Company, New York, N. Y., report a large increase in the exports of their solderless connectors. They have recently completed orders for the Manila Electric Railway & Light Company in the Philippines; the Sao Paulo Tramway, Light & Power Company, Brazil; the Trans-Isthmian System, Panama, and for installations in Cuba, Chile and Japan. The order for Sao Paulo is the largest export shipment ever made by Dossert & Company, totalling 8000 connectors for conductors ranging in size from No. 8 to 500,000 circ. mil.

George H. Anger, managing director of the Anger Manufacturing Company, Preston, Lancashire, England, will sail for New York on Oct. 5, 1913, in the interests of his company. Mr. Anger will attend the convention this fall of the American Electric Railway Association, where the Anger improved automatic brake adjuster will be exhibited by the Ackley Brake & Supply Company, which is sole manufacturer and agent for this device in the United States. Later Mr. Anger expects to take an extended trip visiting many of the electric railways in Canada.

General Electric Company, Schenectady, N. Y., has recently received orders for four-motor car equipments and straight air brakes from the following companies: Capital Traction Company, Washington, D. C.; Cedar Rapids & Marion City Railway, Cedar Rapids, Ia.; Tri-City Railway, Davenport, Ia.; Alton, Granite & St. Louis Traction Company, East St. Louis, Ill.; Virginia Railway & Power Company, Richmond, Va.; Springfield (Ohio) Railway; Bay State Railway, Boston, Mass.; Detroit (Mich.) United Railway; Atlantic City & Shore Railroad, Atlantic City, N. J.; Belt Line Railway Corporation, New York, N. Y.

Electric Service Supplies Company, Philadelphia, Pa., has placed on the market a car-lighting switch of improved design to provide for the increased capacity required by modern car-lighting installation. The adoption of a switch mechanism rated at 5 amp gives sufficient capacity to control several series of lamps. This mechanism is of the barrier type which will successfully handle 600 volts at considerably above the rated ampere capacity. This is accomplished by operating the switch blades in a narrow slot between two porcelain barriers, allowing a very small air space which is virtually a vacuum and which the arc cannot follow. Spring clips provide for a 5-amp inclosed fuse which may be quickly replaced. These switches have bases 3⅛ in. by 4 in. and are 1⅞ in. deep, with a cover in place, excluding the handles. The bases, covers and handles are made of chocolate-colored porcelain presenting an attractive appearance.

ADVERTISING LITERATURE

Esterline Company, Indianapolis, Ind., has recently issued Folder No. 272, illustrating and briefly describing its graphic meters. Many applications for these instruments are shown.

Railway Utility Company, Chicago, Ill., has issued illustrated Catalog No. 400, which describes the economy secured by its utility electric thermometer, which controls electric car heaters.

Ohio Brass Company, Mansfield, Ohio, has issued its *O-B Bulletin* for June-July, 1913, which contains leading illustrated articles on "A Trip Over the Liberty Bell Route" and "A Notable Transmission Project."

Union Electric Company, Pittsburgh, Pa., has issued a price list and discount sheet covering its lines of electrical supplies and apparatus. The booklet is well printed and the arrangement of headings excellent.

Wendell & MacDuffie Company, New York, N. Y., has issued a very attractive pamphlet entitled "A Job for the Russell," describing the Russell snow plow and containing a series of interesting photographs which are self-explanatory in illustrating the efficiency of this snow plow.

Union Switch & Signal Company, Pittsburgh, Pa., is issuing Bulletin No. 68, which explains that the company has established a copy service department to aid such of its customers as wish to avail themselves of its service in the preparation of copy for advertisements, write-ups for news stories, booklets or other descriptive matter by which the attention of the public may be drawn to signals. The service will be entirely free to those who use the apparatus of this company.

The J. G. Brill Company, Philadelphia, Pa., prints in the July, 1913, issue of the *Brill Magazine* an illustrated biography of Constantin de Burlet, president of the International Union of Tramways & Local Railroads. Among the feature articles are the following: "Conditions Which Govern the Type of Car for City Service in Jersey City, N. J.," "Santa Barbara, California, Adopts the Center-Entrance Car," "Further Use of Prepayment Principles by Detroit United Railway," "Fast Autobus Service in the Lehigh River Valley," "Single-Truck Prepayment Cars with Straight Sides in Muscatine, Iowa," and "New Design of Prepayment Car for Springfield, Ill."

General Electric Company, Schenectady, N. Y., has issued Bulletin No. A4093, which describes its generators for electrolytic work and supersedes its previous bulletin on that subject. Bulletin No. A4124 contains a detailed description of its automatic starter for alternating-current motors and automatic control panels for squirrel-cage induction motors and slip-ring induction motors, float switches for remote control of automatic starting panels or rheostats and pressure governor panels, also for remote control. Bulletin No. A4130 describes and illustrates its adjustable speed direct-current motors, designed to meet the requirements of individual drive of machine tools. Bulletin No. A4135 describes its lightning arresters for electric railways. Bulletin No. A4139 gives a detailed description of its central station oil switches of high rupturing capacity. The switches are both automatic and non-automatic and for voltages from 15,000 to 70,000. The bulletin also contains a large list of central stations in which these switches are in use.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has just issued Leaflets Nos. 3572 and 3660, covering the electrification of the New York extension of the Pennsylvania Railroad and the New York, New Haven & Hartford Railroad, respectively. These leaflets cover the salient points of both roads together with a description of the more important parts of the equipment. They are well illustrated and contain maps showing the territory covered by both of the electrified systems. Descriptive Leaflet No. 3571 describes in some detail the commutating-pole rotary converter, explaining its advantages with particular reference to the commutating pole and the method of starting. "Electric Arc Welding Processes" (catalog section 3049), issued by the industrial and power department of the Westinghouse Electric & Manufacturing Company, is a reprint of an article which appeared recently in the technical press by C. B. Auel, director of processes, standards and materials of the company. This paper, which is well illustrated, explains in an interesting manner the different processes employed in are welding, their advantages and limitations, and gives some interesting figures of comparison of arc and blacksmith welding.