



many advantages that can be, and always have been, claimed for the distribution of electricity from a central power house, but which have hitherto been more appreciable in communities to the West burning soft coal than in clean New York, with its hard coal and its invariably pellucid atmosphere. It is a truism that with central stations a great number of smaller steam plants scattered all over a wide area are abolished, and with their suppression results a material gain in a diminution of dirt and noise at just so many points. In the same manner, just as the trolley car has banished the dirt-creating horse from the streets, the electric car on the elevated is assisting the cause of cleanliness in the city, whether Boston, New York or Chicago, by relieving the streets of coal dust, steam, oil drippings and dirt in general. This is an important and material item, but it has very often been overlooked in summing up the gains from the adoption of electric power on city elevated roads. Even if the Manhattan system were not already pledged to the change now being carried out, the present disagreeable episode of soft coal consumption would emphasize the public demand for electricity.

### The Present Trend of Steam Practice

The modern electric railway, with its demands for amounts of power hitherto unimagined in central station working, has slowly, but thoroughly, worked a revolution in engine building. It is hardly more than ten years since the installation of a 500-kw railway generator was an innovation looked at askance by the conservative, and the art of the engine builder was directed toward the construction of huge single-cylinder slow-speed engines big enough to drive, at the most, a couple of these monster generators by belts or ropes. A theory was abroad, strongly held by many engineers, that compound engines were unfitted for driving a railway load, and triple expansion engines for such service were regarded as the hallucinations of hair-brained enthusiasts. But the direct-connected unit came and grew until the typical modern station is on a scale only found elsewhere in the engine room of a great steamship.

As a natural corollary of using units of several thousand horsepower, boiler construction has taken on a similar phase of growth, and it has been found by experience that the labor of firing is thus materially reduced, so that one fireman and a coal passer can operate a far larger plant than had previously been supposed possible. All this evidence of huge growth very naturally leads to the question as to what, if any, is the limit of size likely to be imposed on the direct-connected units of the future. Quite apart from matters of construction, there is, of course, a certain ratio between size of unit and size of station that must be taken into consideration.

Even with all the reliability of modern engines and dynamos, it is manifestly not safe to trust the traffic of a system to a single generating set. It is the unexpected that always happens, and even an accident apparently trivial may put a set or a whole station temporarily out of service. A few months ago an eccentric strap in a large electric railway station broke, and the flying rod broke a steam connection, filled the station with live steam and crippled station and service for an hour or more. Even aside from possibilities like this, it is quite easy for a small trouble to shut down an engine so that at least two units must be used, and since with two the station would still be badly crippled by a breakdown of one, it practically becomes necessary to provide such a number of units that the temporary loss of one will not prevent the station as a whole from carrying its maximum load, at least for a few hours. Modern engines and dynamos stand temporary overload remarkably well, but conditions of economy dictate a reasonable amount of subdivision, so that when the operation of an electric railway system depends on a single station it is hardly wise to employ fewer than four units, and five does better.

So one can say for a rough estimate of probabilities that the largest direct-connected unit desirable is unlikely to exceed say 20 per cent. of the capacity of the largest station which it is desirable to install. This magnitude has been the subject of much

and violent debate. Stations between 50,000 and 100,000 hp have already been erected, but their economy has often been seriously called in question. When stations are of so great output the supply of current to an electric railway system at the voltage now in use implies a transmission system with rotary converters, so that the question of economy involved is not merely whether one station of 50,000 hp can supply energy more cheaply than two of 25,000 hp each, but whether it can supply the energy at least 20 per cent. more cheaply, so as to offset the expense and loss involved in the transmission. Exact data on the costs from large stations are difficult to obtain, but, so far as they are attainable, and taking them at their face value, the indications point strongly to the conclusion that if any saving exists it is very much less than the 20 per cent. required to put the two cases on a parity. In fact, it is claimed by many engineers who have made a special study of this subject that a thoroughly well-designed and operated station of even 10,000 hp feeding directly into the network can put power upon it as cheaply as a station of any magnitude yet designed working through the medium of a transmission system.

Be this as it may, it is reasonably certain that there is little object in going above say an output of 5000 kw in a single unit, unless conditions are such as to demand the transmission of power on a very large scale. Undoubtedly if it were economically desirable to run a single railway station of 100,000 hp there might be use for a direct-connected set of 10,000 to 20,000 hp, but the incentive to the production of such machines seems likely to remain small and altogether exceptional. As one gets above 5000 hp engine construction grows somewhat troublesome, and all the problems relating to mechanical design become more difficult. From our present outlook there is far greater chance for gain in the use of higher steam pressure, greater expansion and higher rotating speed than in mere increase in size. Marine practice is in these respects on a higher plane than stationary practice, for the necessities of the case have demanded of the former a marvelous combination of power, compactness and efficiency. It is perfectly true that marine engines are relatively costly, but this is largely because of the demand for lightness and compactness in this service. Modern electric railway stations are not subject to the enormous and violent variations of load that were usual in the early days, and there is no good reason for adhering to the older canons of construction.

And what of the steam turbine? In general mechanical character it has an enormous advantage over reciprocating engines, and has an adaptability for high rotative speeds that is fairly embarrassing. In economy it seems to be at least the equal of compound condensing engines of similar output, and can probably do even better. But it is still to a certain extent experimental, having not yet been thoroughly tried out on a considerable scale, save on a couple of torpedo boat destroyers now out of experimental reach at the bottom of the sea. A few large direct-connected turbines have been built in this country, and everyone is watching for results with the greatest interest. It is assuredly a very interesting line of operations and most promising. If the results are thoroughly successful the steam turbine should lead to considerably decreased cost of direct-connected units, large and small, and also to somewhat higher net efficiency. We do not remember any instance of steam turbines installed for railway use, although several are contemplated and under construction, but they should be admirably suited for such work in large stations, if their mechanical qualities are as good as is hoped by their friends. Their adoption will lead to some very radical changes in the design of dynamos for large outputs, and at first sight the rotative speed seems rather formidable, but the problems involved will stimulate invention, and we are not inclined to worry much about the probable result. A central station equipped with large turbo-generators would certainly be a great gain in the direction of simplicity, and would lead to reduced cost of both operation and construction if the present promise of efficiency is fulfilled. Who will be the first to try it?

### High-Speed Electric Railroading in America

It should be a matter of no little gratification to American electric railway engineers to learn that experiments in very high-speed electric traction will soon be carried on in this country, and that they will probably be even more interesting and valuable than the recent Berlin-Zossen tests which were stopped for lack of suitable track. Our readers are familiar with the magnificent track and roadbed and other excellent engineering features which are being put in for the Aurora, Elgin & Chicago Railway. The regular equipment of this road, which is now nearing completion, is designed for a continuous maximum speed of 70 miles per hour, and the track is of such a substantial character and easy alignment that even higher speeds than this can safely be attained. The regular equipment and operation of the road will in itself be the finest example of high speed suburban and interurban electric service in the world, if all the plans are carried out, and now additional interest is centered on this road because arrangements have been made whereby the General Electric Company may carry on a series of experiments with special apparatus, with which it is hoped to obtain data on electric trains operating at speeds of 100 miles per hour and over. The equipment will necessarily comprise direct current motors supplied from the 100-lb. third rail which the road is laying for current supply, but the data obtained as to train resistance, etc., will be no less valuable than that from the European tests with polyphase motors, because it will give an insight into the exact requirements as to power consumption and the exact values for train resistance at such high speeds. No road in the world offers such facilities for tests of electric trains at high speeds as the new road under discussion. It is laid with 80-lb. track rails, has many long tangents, a solid roadbed, concrete arch bridges, and its few curves are laid with a view to high speed. The Aurora, Elgin & Chicago Railway Company deserves the thanks of the electrical engineering profession, not only for doing such a thorough piece of electric railway construction work, but for allowing tests of great value to be carried out after the work is done. We understand that the apparatus is now being prepared for these high-speed trials, and the entire railway world will certainly look forward to them with interest.

### Trolleys Get the Business

Another interesting illustration of the way in which the trolley lines are superseding the steam railroads in local business was afforded by the experience of the Boston and Albany lines of the New York Central & Hudson River Railroad, as detailed in recent hearings before the Massachusetts Railroad Commission.

In 1887 it appeared that the Railroad Commission recommended that the road put on a local morning and evening train between Springfield and Middletown, a distance of 2.37 miles, to accommodate fifty or more people in the town who wished convenient transportation to and from their work in the city. The train was put on and has been running ever since, but the railroad company now seeks to have the board's authorization for taking this train off its schedule, and it frankly admits as its reason that the public necessity no longer exists. The reason for this change is the fact that three trolley lines, two with half-hourly cars and one with hourly service, satisfy the needs of public transportation between Springfield and Middletown, and have, in fact, taken almost all business away from the steam railroad. A statement from the Boston & Albany's operating department showed that in the month of April, 1902, the average patronage of the railroad train in question was 10½ passengers each way per day, and the earnings of train 83 cents, this giving a net loss on account of this train of \$4.17 per day, or about \$1,310 per year, as the train is not operated on Sundays.

The petition would probably have been granted, as no one was present to show that the train is still needed for public transportation, had not a protest been made by the officials of the United States Railway Mail Service, who declared that mill owners and manufacturers of Middletown had been in the habit of receiving their early mail on the 6:15 a. m. train from Springfield, and did

not wish to have the train discontinued, as the trolley lines do not go near enough to the post office to afford an easy means of replacing train service.

As the protest of the mail service officials was new to the railroad officials, the hearing was continued in order to see if some means could not be found of satisfying the requirements of the mail service, and, at the same time, meeting the wishes of the railroad in regard to the rescinding of the commission's order of 1887.

The Boston & Albany will shortly place a steam driven passenger car in service on the Newton circuit loop, and the company announces that if it prove successful it will probably inaugurate a short interval train service to meet the competition of the trolley lines running between Boston and Brookline, Reservoir, Chestnut Hill, Longwood, Allston, Cottage Farm, Brighton, Faneuil and Newton. It is difficult for any believer in heavy, high speed rapid transit service to see how such a method can be made to pay in the face of the possibilities for electric service which the circuit line offers. No doubt, the time will come when the steam railroads of the country will recognize the advantages in acceleration, cleanliness, freedom from smoke, cinders and heat, lessened train crews, increased flexibility of operation and economy in fuel which electricity gives in practically all service where traffic is large and sustained; but just now they seem to be completely out of touch with the situation. Competition of trolley lines can only be met by electricity itself in the 5-cent suburban zone limits. The steam railway systems would enjoy great advantages in right of way, light grades and curves, superb roadbed maintained at high efficiency, if they would adopt a progressive, enlightened policy toward the development of suburban electric traffic along modern lines, and take advantage of the latest methods of electrical train control and power supply. To the unprejudiced observer of the results obtained in electric suburban and interurban railroads, the attempt to meet present conditions by the use of individual steam-driven cars must appear puerile and impotent.

### Noisy Churches

The ethics and equities of the relations of the trolley car to other elements of social life in the community have been pretty freely discussed and fairly well ascertained, but there will doubtless always remain some debatable ground over which argument may be waged to and fro. We note that the *Chester (Pa.) Times*, in welcoming the rubber tire because it is doing so much to lessen the noises of the street, expresses the regret that trolley cars cannot use it, and the hope that there will develop some way to reduce the annoyances that come from that vehicle. As a case in point it refers to the interruption of church service on Sundays, and thinks, with reason, that Divine worship ought to be protected, even on the ground that eight or nine hundred devout people have real rights not to be disturbed, simply because during hot weather it is necessary to keep windows and doors open. It says:

Whether it will ever come to pass that the trolley car will have the rubber tire attachment is an open question; but there should be some way to reduce the annoyance that comes from this vehicle. All of the congregations that worship in edifices along the lines of the electric railways have the voice of the speaker drowned in the racket and burr of the motors and the wheels of the cars every few minutes; and there should be some provision by which the cars should slacken speed at these points and the gongs be given a rest, except where it be necessary to ring them. Some of the motormen seem to take delight in playing a tune on the big bell when a church is reached, and though the rights and comfort of hundreds of people are violated or disturbed, no action to stop what has become a nuisance has ever been taken. The church officials in all probability could effect the desired reform by simply calling the attention of the railway officials to the matter, and that course should be taken.

There is a good deal of common sense in all this, but it is not to be forgotten that these very trolleys enable a great many people to get to church who otherwise would have to stay at home. Moreover, there are not a few people in town or city who, although religiously disposed, object to the noise from places of worship, and cannot be induced to live near them, and we have even heard of injunction proceedings to stop the inharmonious jangling of church bells.

### The New Beacon Mountain Railway

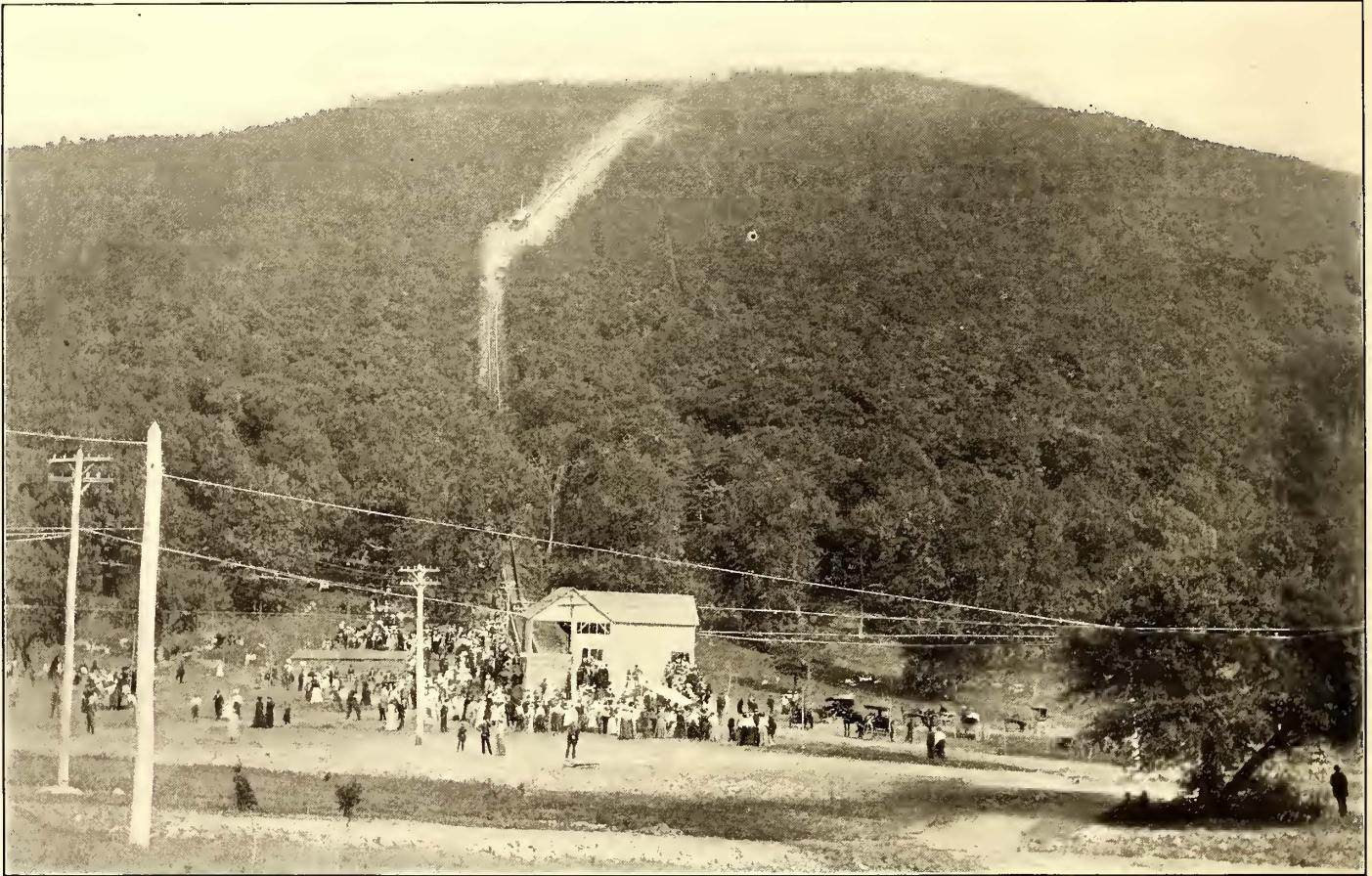
Lovers of picturesque mountain and river scenery may now enjoy the unfolding of a panoramic view of indescribable beauty while ascending the steep face of North Beacon, Fishkill Mountains, by means of the incline railway opened to the public on Memorial Day. Revolutionary memories have made the mountain famous, for on its top and on that of its twin, the South Beacon, burned the signal fires which gave warning of approaching danger. The blazing signals of our forefathers no longer kindle the fires of patriotism, but the smoldering embers of imaginative genius, catching the inspiration of lofty altitudes, burst into flame as one looks out from the summit, lost in the contemplation of scenes wondrously diversified by mountain and valley, placid lakes and undulating plains, with the habitations of man nestling among clumps of trees along winding roads or flowing streams, and here and there a farmhouse amidst cultivated fields.

The mountains are reached by the boats of the Central Hudson Steamboat Company, leaving the foot of Franklin Street, New York, every day of the week, and the ascent of Mount Beacon fit-

cline railway is a single-track road, with a turnout half way up the mountain. There are two cars, each about 34 ft. long, the seats of which are set at such an angle as to make them level on the steep portion of the incline. The cars are attached to a 1 $\frac{3}{4}$ -in. steel cable, one at each end, which passes around the grooved winding drums of the motor-driven hauling machinery at the top of the mountain, where the power house is located.

The character of the car trucks is indicated by one of the illustrations. To permit the wheels to cross the cable at the ends of the turnout, where the ascending and descending cars pass, the wheel on one end of each of the axles is without a flange, perfectly flat of face, although it runs on ordinary T-rail. The wheel at the other end of the axle is double flanged or grooved, to straddle the rail, serving as a traction guide, the cable running on pulley wheels in the centre of the track, as in other cable railways.

The weight of the cable alone is about 3 tons, and in order to obviate as much as possible the varying load which would ordinarily be caused by the shifting weight of the moving cable, the disposition of the grades was made such that the excess of the pull of one car over that of the other car is just sufficient to balance the



GENERAL VIEW OF MT. BEACON INCLINE RAILWAY

tingly concludes a sail of sixty miles up the incomparable Hudson to Fishkill Landing. From this point there is a trolley line to the station of the incline railway at the base of the mountain. This incline railway—an interesting and remarkably substantial piece of engineering work—extends from the base to the top of the mountain, a distance of 2,200 feet, rising at times at the rate of sixty-five feet in a hundred feet of length. The extreme steepness of the grade is delightfully suggestive of the possibilities of aerial navigation.

Apart from its scenic revelations, the operating and constructive features of the road itself are of engineering interest, and warrant a brief description.

In the construction of the track heavy mudsill timbers were placed crosswise 6 ft. apart and carefully ballasted with rock. To these mudsills are bolted heavy 6-in. x 10-in. yellow pine stringers 30 ft. to 40 ft. in length, and the ties are spiked to these stringers, the track rails and guard rails being fastened to the ties in the usual way. The guard rails are made up of two pieces of 4 in. x 6 in. yellow pine timber, breaking joints to make a continuous rail. At two places the grade was so steep as to make 50-ft. trestles necessary in order to insure stability, and these were constructed of heavily-framed 10-in. x 10-inch yellow pine timbers.

As shown by the accompanying view of the mountain, the in-

weight of a piece of cable equal in length to the distance between the two cars. It will be apparent that when one car is at the bottom and the other at the top of the mountain the cable-driving machinery, in raising the lower car, must also raise the additional 3-ton load due to the weight of the cable, but as the cars pass at the turnout, there is an equal length, and therefore an equal weight, of cable between each car and the power house. As the cars continue on beyond the turnout the extra weight of the cable is gradually shifted to the other car; hence, the grade of the incline being steeper at the top than at the bottom, the upper car exerts a greater initial pull on the cable than the lower one. This arrangement insures a more even load on the motors.

As an element of safety, more than double the required power necessary to carry the maximum load has been installed in the power house, where there are two 75-hp motors geared directly to the cable-driving machinery. The cable, which is called upon to carry a maximum load equal only to one-twelfth of its rated capacity, passes around two 8-ft. drums, one of which is an idler and the other the main or driving drum. The latter is provided with an emergency brake wheel, which comes into action if the speed of the motors rises above the normal. A centrifugal governor, driven by a pulley which is keyed to the idler drum shaft, automatically controls the action of the emergency brake, which

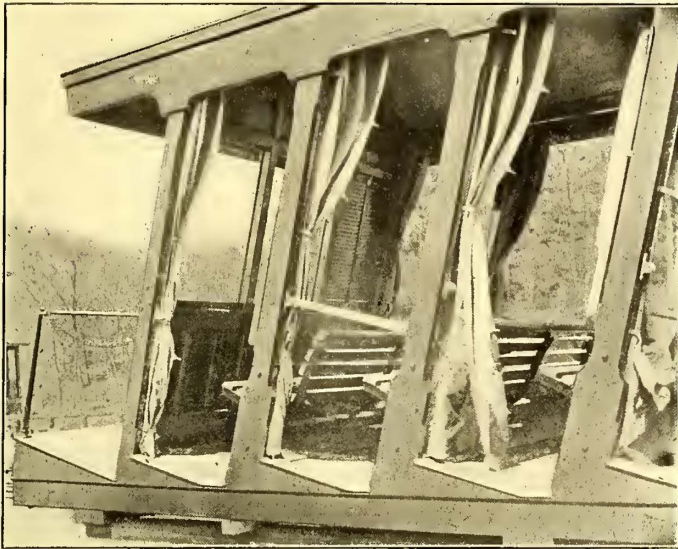
may also be operated independently by the attendant if necessary. The motors are also provided with magnet brakes, a failure of which would be met by the emergency brake.

Extraordinary care has been exercised in providing safety devices. Under ordinary conditions, if a car should break away

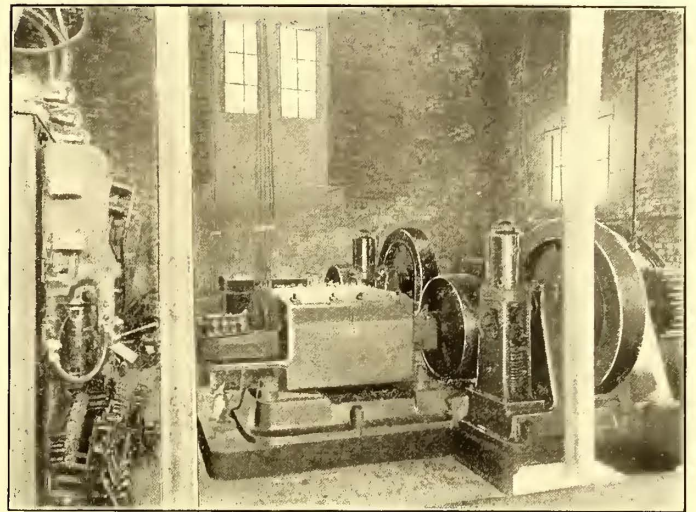
of emergency traction guides of steel, which straddle, but do not touch, the heavy wooden guard rails.

The starting of the cars is under the sole control of an attendant at the power house, who is governed by bell and flag signals, telephonic connection being had between the station at the base of the mountain and the power house at the summit.

The attendant is stationed at a controller considerably larger



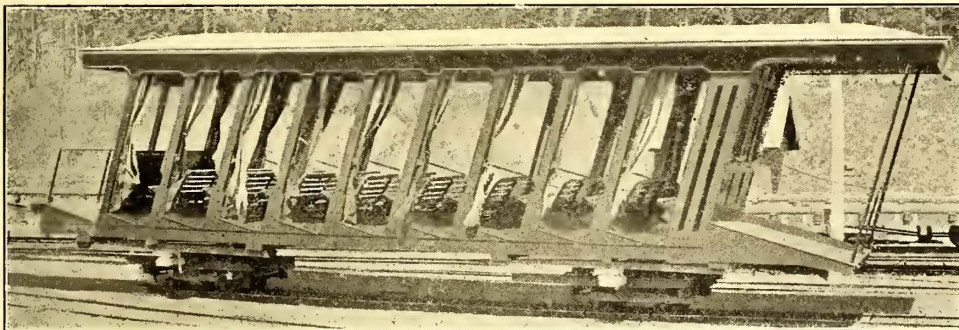
LOWER END OF CAR



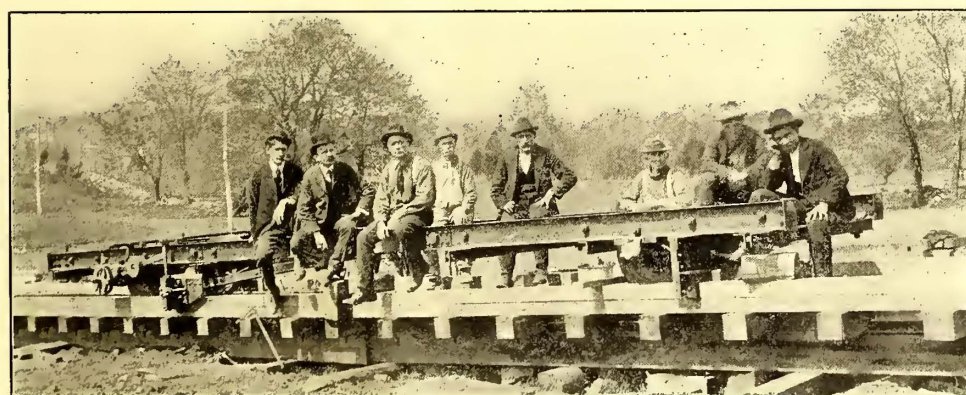
INTERIOR OF POWER HOUSE AT TOP OF INCLINE

from the cable at the point of maximum grade it would go to the bottom, even if the wheels were set rigidly, but such an accident is fully provided for by arranging on the trucks automatic clutching devices, consisting of extra heavy sharp-toothed steel jaws which would be firmly set in the guard rails on each side of the

than the ordinary car controller, but similar to it in action. The controller is so connected with the switchboard and a series of so-called accelerating switches that, no matter if the attendant throws over the controller handle to the limit of its movement, the cars will start gradually, without sudden or variable impetus. The initial movement of the controller handle makes contact for and closes what is termed the main line electromagnetic switch, the normal position of which is open. The closing of this main line switch permits the current to pass to the motors and to the other operating circuits, part of the current passing through the brake magnets, releasing the electric brake. As the car moves its speed is gradually accelerated by the automatic operation of the accelerating switches, which close one by one as the speed increases, returning to their normal open position when the current is cut off by the attendant or by the car approaching its destination. As the car approaches the terminal it automatically opens a series of mechanical limit switches placed on either side of the track. The first and second limit switches open magnetic circuits controlling the speed of the motors, while the third opens a circuit for the main line magnet switch mentioned above, which brings the machinery to a standstill. Should the car pass beyond this third limit switch on the track a fourth switch throws out what is known as the overload and underload circuit breaker, which is provided for the purpose of opening the circuit at any time there might happen to be an overload on the cars, and if the current drops too low to operate the machinery this breaker opens the circuit controlling the magnetic brakes, which then operate to hold the machinery until normal conditions



CAR BODY, SHOWING INCLINATION OF SEATS



VIEW OF TRUCK BEFORE MOUNTING CAR BODY

track in case of a runaway, and the car could not proceed downward without tearing away the guard rails, which are so securely fastened to the track that the whole roadbed would have to be torn up to allow this to happen. The safety appliance mentioned is operated by a centrifugal governor fastened to the axle of the rear wheel, a dangerous increase of speed tripping the governor weights and thereby setting the safety knives into the guard rails. The safety may also be operated by the conductor through a hand trip connection in case of necessity.

Provision against possible derailment is made through the use

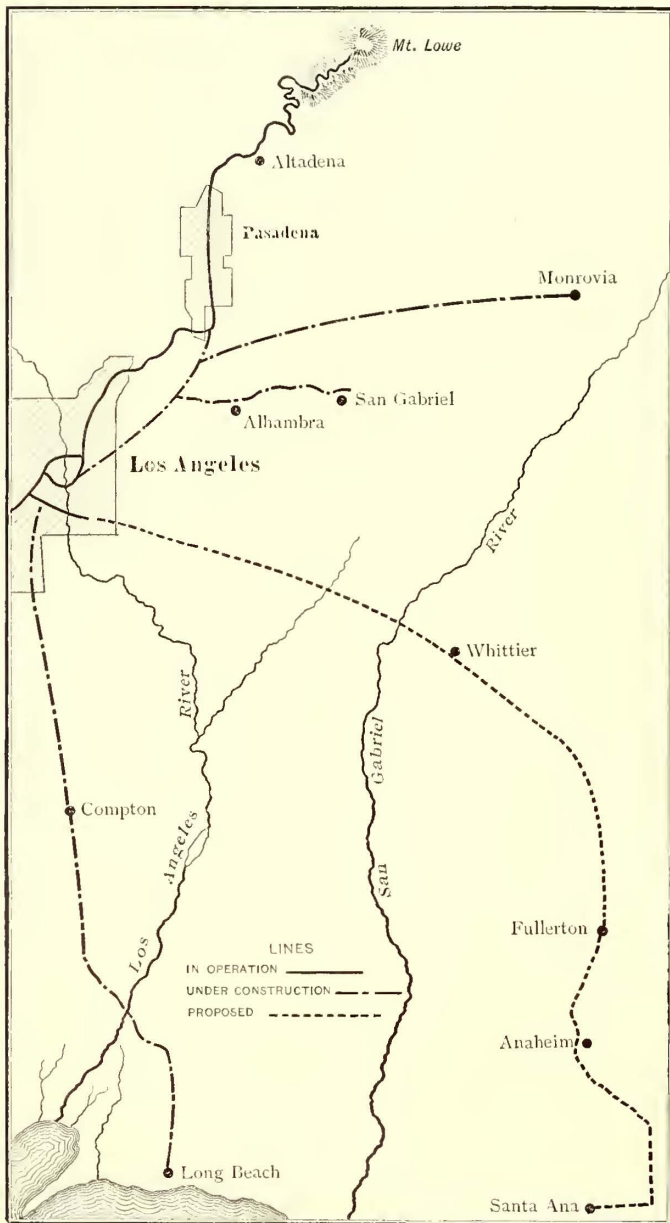
are restored, thus making accidents practically impossible. The position of the switches is always open, unless the attendant turns on the current through the controller, and if from any cause whatever the current is interrupted they drop back to their normal open position, thus stopping the machinery. The machinery will not start a load greater than the predetermined capacity of the apparatus. The elevating apparatus was supplied by the Otis Elevator Company. The magnetic switches may be seen in the lower left hand corner of the power house interior view,

Power to operate this new mountain road is transmitted electrically from the power house of the Citizens' Electric Street Railroad Company, operating a trolley line from Fishkill Landing through Fishkill and Matteawan to the base of the mountain, a 15-minute ride through historically interesting territory. The incline railway was constructed for the Mount Beacon Association, which has purchased several hundred acres of land at the highest points of the North and South Beacons, intending to convert the property into a park and summer resort, and a pavilion is now being built on the summit.

### Los Angeles Interurban Electric Railways

The present activity in interurban railway building in and around Los Angeles, Cal., bids fair to continue for many months, as a glance at the accompanying map, showing the proposed lines in that section, will show.

The Long Beach lines and the road to Pasadena and Alhambra



MAP OF LOS ANGELES RAILWAY EXTENSIONS

of the Pacific Electric Railway Company are nearing completion, yet this is not half of the road building that Henry E. Huntington and his associates propose in the immediate vicinity of Los Angeles. Just as soon as the Beach and Pasadena lines are in operation—which, it is promised, will be in a few weeks—work will be pushed on the branch extension from the Pasadena line to Minrovia, as shown on the map, and on the long line to Santa Clara, it is also announced, graders will be placed at work at once. These are principal lines of the Pacific Electric Company.

On the Long Beach line operations are being conducted mostly from the Long Beach end of the line. The work now in progress on this line lies entirely between Long Beach and Compton. The

double track has been laid to a point within 8.5 miles of Long Beach, making the distance of complete construction from Los Angeles about 11.5 miles. The route will be most direct from Los Angeles, the distance being only 20 miles.

The line has only six slight curves, and the heaviest grade on the road will be less than 1 per cent. The greatest fills and cuts are 17 feet in height, and the longest fill is one-half mile in length. The fills have all been made with electric dump cars, and several trains of them are kept busy. There are fourteen trestles to cross between Compton and Long Beach, the greatest of which is 1000 feet, over Los Angeles River. Upon completion about 250,000 cubic yards will have been removed.

A feature of the Huntington line will be a beautiful boulevard along the track from Long Beach, stretching out toward the city for a distance of two miles. On either side of the track the boulevard will be 124 ft. wide.

Mr. Huntington is also building the belt line and the Temple Street line in Los Angeles. The Temple Street cable will be transformed to an electric road.

Although the Huntington enterprises are larger than any other individual installation, still they comprise only a part of the railroad building that is under way in and near that city. The Traction Company is pushing on to San Pedro, to which point its principal suburban line will soon be completed.

Senator Clark's interests, combined with those of the Hooks, plan to build still another electric line to Pasadena, and it is also proposed to convert the steam road of the Los Angeles Terminal to an electric line.

The Redondo Railroad is now being rebuilt and converted into an electric line, and a new line is being added to the system between Los Angeles and Redondo Beach.

The Los Angeles-Pacific Company is extending its field of operation, and is bettering the lines to Santa Monica to an extent that amounts almost to complete rebuilding.

### Economic Problem Solved by Electric Haulage

Very few people realize the enormous waste of time, energy and money that goes into the teaming of goods in and around a great city. When one stops to consider this subject it is little short of absurd that in a modern American community, where there is a magnificent system of railways for the transportation of passengers between all parts of the city, the same antiquated methods of hauling and delivering goods should be in use that have been common for the last hundred years, and that no advancement should have been made over those used in the most remote rural districts. There have been a few entering wedges, to be sure, in the shape of street railway express service, of which the Metropolitan, of New York, is a notable example, but, as a rule, the possibilities of express and freight hauling on city and suburban street railway systems have not by any means as yet been even recognized. The failure to do this in many cases is not the fault of the street railway companies, as many of them have been chartered for passenger business only, and they fear that an attempt to change may jeopardize charter rights already held. If, however, city and State governments realized fully the wastefulness of the present system of delivering goods in the outskirts of large cities, there would be a radical change in the laws to permit street railway companies to supplant teams and wagons for the greater part of the long hauling business in cities.

A certain case may be taken to illustrate this fact. An electric railway company is now engaged in business of this kind, where it was formerly the custom of the teaming companies to haul express packages and other goods delivered to them by the city department stores a distance of 24 miles, and much of this distance was over roads and city streets that were not in the best condition for this class of traffic. Cases of this kind could probably be found by the dozen, if search should be made for them, while wagon hauls of 5 to 10 miles are exceedingly common around large cities. The longer the haul the more expensive it becomes from the teamster's standpoint, because available streets leading to suburbs are often unpaved and in bad weather make the most impassable roads known. Of course, for short hauls direct loading into delivery wagons and the saving of further handling precludes any economy in loading onto electric express cars. When, however, the distances become longer the expense of the long hauls by wagons is so great that a means of conveyance provided with cheap mechanical traction and a roadway of steel rails should certainly be able to underbid horses and wagons operating over rough streets.

In the suburban delivery system used by most express companies and large department stores it is customary to haul goods to an outlying point of destination by the wagon load, and then

transfer to other wagons for suburban distribution. This is done because it is not practical to have one team and driver make such long trips and for other reasons connected with distribution not necessary to enumerate here. Supposing that an electric railway system had proper loading and unloading depots in the several quarters of the city, and supposing that it had the necessary legal powers, it certainly ought to be able to make rates for a wholesale delivery of goods throughout the city from the downtown district during the night which would be far enough below the cost of operating wagons to secure the greater part of the business. Such a business would not necessarily interfere in the least with that of present city express and teaming companies. It would, rather, be an aid to such companies in relieving them of the long hauls which are unprofitable from a teamster's standpoint, and still leave them the business of delivering to and from the electric railway depots.

Much has been said during the last few years regarding possibilities of automobile trucks and delivery wagons, and the coming importance of this branch of business, but the fact remains that, except for short hauls, where reloading becomes an important factor in the case, nothing can compete in economy with a railway. Not only is the power required for a ton mile lower on a railroad car than on any vehicle propelled over paved streets, but the cost of generating and distributing electric power by modern methods for the propulsion of these cars is undoubtedly lower than the same amount of power can be supplied by a large number of independent automobile motors, whether electric, steam, gasoline or compressed air. It is sometimes argued that investment required for roadway is practically nothing to the individual or company operating an automobile line, whereas a street railway company puts a large part of its investment into roadbed and track. Looked at from the broad economic standpoint, however, it is evident that there is fallacy in this argument, because someone has to pay for the pavements over which these automobiles run, and in the end it will cost the community more to maintain paving for hauling of this kind than to pay interest and depreciation on money invested in street railway tracks. The proper place for the automobile delivery in the future will be for short hauls and in the actual delivery of goods to customers, leaving to the city railway systems the work of performing the distribution of goods over the longer distances found in the larger cities.

What has been said so far in regard to city conditions also holds true with reference to the country, with this exception—that the electric interurban roads and steam railroads have been, so far as possible, relieving the farmers of long hauls to market, and they have been doing this to a much greater extent than the city street railway companies have been relieving the city teaming companies. Some years ago a committee of the Ohio Legislature which considered the matter of good roads reported back to that body to the effect that the building of electric interurban roads was progressing at such a rate that the question of better roads in Ohio would, in all probability, be mainly solved by these electric lines. While it is true, of course, that electric roads do not at present, and never can, for that matter, so completely cover the country as to do away entirely with the necessity of teaming, it is true that the very places where expensive wagon roads can be afforded, because of the volume of team traffic, are the places where electric roads are being built. The electric road relieves the adjacent wagon roads of heavy traffic, so as materially to improve the condition of the road at all times of the year. That has been the universal experience where interurban lines have been built. When once a road is relieved of heavy traffic it becomes much easier to maintain it in good condition. The building of electric interurban roads is, therefore, very nicely taking care of the good roads question in many localities, and this leaves money available for improving the roads where there is not sufficient traffic for electric interurban lines.

It remains to be seen how far electric or other railways for light traffic will penetrate the more remote rural districts, or whether light railways operated by horses will be laid as feeders to rural lines. This will be a most interesting question of development for the next 20 years. The ideal railroad system would enable every farmer to load his marketable commodities on a car in the very field in which they are raised, but it is manifestly impossible to do this by any general scheme of electric railway building common in the United States to-day, because of the investment in branches and side tracks which would necessarily lie idle a greater part of the time. May it not be that some cheap system of branches and farmers' sidings may be evolved which can be worked in conjunction with main trunk lines penetrating rural districts? The whole tendency in electric railway building so far has been toward heavier and better rather than lighter construction suitable to rural lines, where the investment must be comparatively small.

## Settlement of Threatened Street Railway Strike in Chicago

The microbe of discontent seems to have been doing considerable work in Chicago labor circles during the last month, and among other industries the street railways have felt some of its effects. About a month ago an active movement was set on foot by the Amalgamated Association of Street Railway Employees of America to organize unions among the employees of the Chicago Union Traction Company and the Chicago City Railway Company. Captain Robert McCulloch, general manager of the latter company, had already taken the position that he could consistently offer no opposition to men joining a union, provided it did not interfere with their work and restrict him in selecting men and dealing with his own employees. On the Chicago Union Traction Company lines it became generally understood that President Roach opposed the organization of a union by men not in the employ of the company, as he feared that the influence of men not having the welfare of the company or community at heart would be uppermost in such a body. Indeed, no sooner was the work of organization fully begun on the Union Traction lines than President Roach started an organization among the men along similar lines, but of much more financial benefit to the men than the regular union. This organization is the Chicago Street Railway Employees' Benevolent Association. The initiation and membership fees in this are purely nominal, and the benefits are considerable, amounting to \$1 a day to each man and doctor's bills during sickness, or \$400 in case of death. Most of this amount comes from the company. In other words, the company furnishes insurance almost free to its employees who belong to this association. A large number of enthusiastic company men joined the Benevolent Association, but the desire to go into the Amalgamated Association was strong in some quarters, and the work of organizing went on. Charges that the Union Traction Company was discharging men for joining the union began to be made by the organizers, and matters finally reached a stage where it looked as if there might possibly be a strike.

After much discussion and agitation the union men drew up some formal requests, and these were presented to President Roach of the Union Traction Company and the Consolidated Traction Company at a meeting May 30, at which were present several of the directors of the company, a committee of the men, C. O. Pratt, general organizer of the Amalgamated Association, and Franklin MacVeagh, a prominent merchant and public-spirited citizen of Chicago, who is on the industrial committee of the National Civic Federation, and who, as a peacemaker respected by both sides, was largely instrumental in bringing about this meeting of traction company and labor representatives. The requests presented on this occasion were very reasonable as compared with some previous utterances of union men, thanks to an interview of Mr. MacVeagh with President Roach before the resolutions were drafted. President Roach agreed to all the propositions presented, and they were drawn up into the form of an agreement, as follows:

1. That the companies named withdraw all opposition to the organization of their employees into the Amalgamated Association of Street Railway Employees of America.
2. That the companies reinstate to their former positions all employees who have been discharged for taking part in forming this organization.
3. The companies to meet and treat with the committees of this organization on all questions and grievances that may arise in the future.
4. For the purpose of adjusting any disputes that may arise between us in the future it shall be mutually agreed that there shall be selected an arbitration board of three disinterested persons to be selected in the following manner: The company shall choose one, the representatives of the association one, and the two thus selected shall choose a third, the decision of a majority of said board to be binding upon both parties.
5. These requests to be put in the form of an agreement to be binding for one year.

The conference was a very harmonious one throughout, and those present report that nothing but the best feeling was manifested. Thus, the threatened labor troubles in the Chicago street railway systems have been happily averted.

## Chicago Packers Will Use Trolleys

The packing houses of Chicago are preparing to introduce more modern methods into their system of meat delivery for city trade, and will use the trolley hereafter. In the recent strike of the teamsters the scheme, it is said, had a thorough and successful test. Once in effect, the packers will require only one-fourth of the present force of drivers. The packers say that they placed each of their distributing depots in the city near a railroad switch on some line connected with the belt system. But, until forced by the strikers to use the railroads, the packers had not attempted seriously to carry out their plan.

### Some Details of Direct-Connected Generator Sets\*

BY WILLIAM H. BRYAN

1. The results of a recent investigation into some details of the design and construction of steam-driven direct connected generators may be of interest. The inquiry covered:

First. The procedure usually followed between the builder of the generator and the builder of the engine in reaching an understanding regarding the detailed design of shaft and bearings.

Second. The method of construction and final erection preferred.

Third. The advantages and disadvantages of a shaft coupled by flanges, as compared with a continuous shaft.

Correspondence regarding these points was conducted with a number of the leading engine and generator builders, and was supplemented by personal interviews as opportunity offered.

2. There seemed to be a practically unanimous agreement to follow the general design and dimensions recommended by the society's committee on standardization of engines and dynamos, in its final report at the New York meeting, December, 1901. Pending the adoption of these rules, however, or where for any reason the case seems to demand special consideration, the following procedure is usually followed:

On receipt of the order at the works of the generator builder, a certified dimension print is prepared, giving the data which the engine man needs to design his shaft. This drawing shows:

A. The limit lines beyond which the engine parts must not extend.

B. The form which the shaft should have within the armature spider.

C. The weights of revolving parts.

D. The unbalanced magnetic pull for 1.32-in. displacement, which might result from the armature getting a little out of centre, by the wearing of bearings or otherwise.

Usually the diameter of the shaft is left wholly to the engine builder, after putting him in possession of the data necessary to design the same intelligently. The custom is now almost universal of supporting the brush holder rigging on the generator frame, so that the engine builder is relieved of any responsibility on that account. As a rule, also, the engine builder furnishes the extended base, outboard bearing, holding down bolts and shaft keys.

3. The unbalanced magnetic pull (paragraph D) is of decided importance, and its possible effect must not be overlooked. This pull may, of course, be in any direction in the plane of revolution, and it varies as to the square of the displacement. It must be considered in determining shaft dimensions and bearings, as it may occur in a vertical plane, and thus have the same effect as additional weight of armature. It may also occur in a horizontal plane, and must, therefore, be considered in designing the bed plate and foundation bolts.

Usually the generator builder makes his armature hub sufficiently thick to provide for considerable variation in the diameter of the shaft, as may be required by different engine builders. If for any reason the generator builder has already fixed the bore of the armature the engine builder is expected to meet that condition. If he cannot readily do so, the matter is one which must be taken up further for adjustment, or settled by the purchaser or his engineer.

4. On receipt of the foregoing data the engine builder is supposed to proceed at once with the design of a shaft suitable for the intended work. When completed his drawings are forwarded to the generator contractor for checking and approval. On receipt of approved drawings the engine builder proceeds with the construction of the shaft.

As soon as possible after receipt of the shaft dimensions from the engine builder the contractor for the generator prepares a pin gage giving the exact dimensions of the bore of the armature hub. There is a general acquiescence in the recommendation of the society's committee that the engine builder make the necessary allowance for the press fit. A few builders, however, advise that the general contractor provide the allowance when making the gage, so that it will show the actual diameter to which the finished shaft is to be turned. In justification of this position, they claim that the allowance depends far more on the material of the armature and the design of the hub than it does on the shaft. In most cases the allowances recommended by the society's committee for shrink fit are considered ample, although one prominent generator builder thinks the allowance should be doubled.

5. Sometimes there is a departure from this plan of procedure to the extent that the one whose work is furthest advanced makes

the pin gage, and sends it to the other, who governs himself accordingly.

Although all generator builders claim, in advance of award of the contract, that they are prepared to furnish generator data to the engine builder almost immediately on receipt of order, there is almost invariably a serious delay in reaching an agreement between the two contractors. This loss of time is sometimes due to the necessary "red tape" through which an order must pass before it reaches the construction department. Sometimes it is claimed to be due to delays in the mails. Sometimes the data is withheld pending the execution of the formal contract by the proper officials. These delays are often serious when the work is of the "rush" order and it seems that an effort in good faith should be made to avoid them. Is there any good reason why full data on standard machines—even including shaft gages—should not be kept on hand at the district offices for immediate delivery to the engine builder on award of contract? It has even been suggested that bidders on generators be required to file with their proposals the necessary shaft data. This would save much vexatious delay. It is, of course, presumed that the speed of rotation has been decided upon and agreed to by both parties when the contracts are closed.

6. When the engine contractor returns his drawings of shaft to the generator builder the following information is supposed to be given:

E. Direction of rotation—whether clockwise or opposite—when looking at the commutator end of the machine.

F. Location of generator with reference to engine, whether commutator is on the right or left of generator when standing at cylinder and facing shaft.

G. Further details, such as whether there are one or more cranks, whether they are solid forged or forced on, height of centre of shaft above floor, diameter of shaft, location of armature and fly-wheel in relation to bearings, dimensions and weight of fly-wheel, length of hub and cross section of rim.

Some difference of opinion exists as to the best method and place of erecting the armature on the engine shaft. The ordinary practice for small and medium sized units is for the engine contractor to place the shaft in final position where the unit is to be used, after which the generator contractor presses on the armature, and completes the adjustment of the electrical machine ready for service. This necessarily involves some extra expense when the point of erection is at some distance from the builders' shops, or where they have no local erecting gang. Furthermore, the work is always more expensive, and can never be as satisfactorily or as quickly done as in the shops of one or the other of the builders. There is a widespread sentiment, therefore, that either the generator contractor should send his armature to the engine shops, where it can be placed on the shaft by the engine builder, or that the shaft itself—in whole or in part—be shipped to the generator builder for the armature to be pressed on, the latter arrangement seeming the preferable one. This plan possesses many advantages, but is open to the criticism that extra freight charges are incurred and delays invited.

7. The relative location of the two shops with reference to the point of final use would seem to be a factor in determining which shop should press the armature on. For a set destined for erection in St. Louis, for instance, the engines being built at Springfield, Ill., and the generators at Schenectady, N. Y., it would not be justifiable to ship the engine shaft to Schenectady and return. The fact that as soon as the armature is attached to the shaft the whole becomes electrical apparatus, and takes a higher freight classification, has a bearing on the subject; also that there is an increased freight cost in dividing shipments, instead of concentrating them. The contracts should state definitely who is to pay the increased freight charges.

Trouble often results from the erection of the armature on the engine shaft at a distance from the shop, where competent men and suitable facilities are not always to be had. This is particularly the case with centre crank engines, where the crank pin may be sprung, unless a piece is fitted between the jaws of the crank before the pressure is put on.

8. Several prominent builders recommend mounting the armatures on conical collars, instead of the usual press fit. This is claimed to lessen the time of erection, obviate the chances of springing the shaft, and remove all danger of misfit. Furthermore, if the owner ever desires to remove the armature it becomes a simple and inexpensive matter. On the other hand, it is claimed by many large builders that the press fit is more rigid, distributes the strains better, is less expensive, and, everything considered, is superior.

9. For many years I have specified that the engine shaft carrying the armature should be continuous, and not coupled by flanges or otherwise. This arrangement seemed to have the approval of the best engineers and builders on account of its superior rigidity

\* Read at the Boston meeting of the American Society of Mechanical Engineers, May, 1902.



and reliability, as well as the space required on the shaft. It is still preferred by most of the largest generator builders, although many of them do not object particularly to the coupled construction. Sometimes the use of the solid construction involves delay in getting the necessary forgings, as well as extra cost, if it is a rush order. Ordinarily, however, the coupled construction is the more expensive one, but some time may be saved by its use. I was surprised to find a large and growing sentiment among builders of centre crank engines in favor of the coupled form of shaft, the argument being substantially as follows:

10. The armature shaft, being a short and simple structure, could readily be sent to the generator shops for the armature to be pressed on, freight and boxing both being less. Time could always be saved, as it would only be necessary to fit the shaft, adjust it centrally in the outer bearing, then box and ship it, the main shaft being retained to complete the work of balancing, polishing, etc. There will be no danger of springing the shaft, as already explained. Earlier delivery of the completed engine could usually be made, as the engine shafts could be made in quantities, and kept in stock. When time is short the engine builder could complete all his work, except the extended shaft, whereas there is often a delay if a continuous steel forging is necessary. The entire engine can be completed—and even tested—while waiting for the forging for the armature shaft, which on arrival can be finished up in a few days. Some builders are preparing to make up a stock of crank shafts with flanges finished solid on the end of the shaft ready to receive the flanged armature shaft, which will be specially constructed in each case to fit the generator selected. The saving in time and expense is obvious.

I have not been able to satisfy myself, however, that a coupled shaft is as desirable, everything considered, as the solid one, as the chances for inaccuracy and derangement appear greater. The increased space required is also often important, particularly in city plants. There is room for argument on this point, however, and the hope for a full discussion is my principal incentive for presenting this paper.

11. Is the overload limit of 25 per cent. recommended by the committee wise? Most generator builders now guarantee their standard machines to carry 50 per cent overload safely for one hour or longer. Should not the engine have a similar margin? Often the peak of the load lasts but an hour or so, and it is better engineering to run at reduced efficiency for this short period rather than to invest a greater amount in a unit which will be underloaded for the rest of the 24 hours. This can be accomplished by a later cut-off, if the engine is structurally strong enough. Part might also be gained by running up the steam pressure a little, but this is not always permissible.

It is to be hoped that engine and generator builders will promptly carry out their agreements as to early compliance with the details established by the society's committee on standardization, and that there will result great shortening in the time now necessary to agree on shaft data. May the day speedily come, also, when a similar agreement may be reached as to standard sizes of alternating and railway generators.

### American Institute Convention

The nineteenth annual convention of the American Institute of Electrical Engineers will be held at Great Barrington, Mass., on June 18, 19, 20 and 21. Headquarters will be established at the Berkshire Inn. There will be one session each evening, at which papers will be read and discussed. Among the special features will be the discussion of the steam turbine, to which one day will be devoted. Papers will be read on this subject by Francis Hodgkinson and R. R. Bowker. Another session will be given to electric railroading. The list of papers includes the following subjects:

"The Function of Series and Shunt Resistances in Lightning Arresters," by Percy H. Thomas, of Pittsburg, Pa.

"Formula for Calculating the e. m. f. at Any Given Point on an Alternating Current Transmission Line," by Maurice Le Blanc, of Paris, France.

"Notes on Railway Speed-Time Curves," by C. O. Mailloux, of New York.

"Method of Ascertaining from Dynamometer Car Records the Power Required to Operate the Mott Haven Division of the New York Central & Hudson River Railroad, and the Relative Costs of Operation by Steam and Electricity," by B. J. Arnold, of Chicago.

"A Study of the Heating of Railway Motors," by A. H. Armstrong, of Schenectady, N. Y.

"Comparative Acceleration Tests of Steam and Electric Traction," by B. J. Arnold, of Chicago, and W. B. Potter, of Schenectady.

Ample provision has been made for the accommodation of visitors, and the local committee has made arrangements for the

comfort and entertainment of members and their families. An excellent programme has been prepared.

Arrangements have been completed for a special train leaving the Grand Central Station, New York city, at 2 o'clock on the afternoon of Tuesday, June 17, arriving at Great Barrington about 5:30 p. m. Besides this train, there are also through trains at 9 a. m. and 3:30 p. m. on the New York, New Haven & Hartford Railroad (Berkshire division).

### Steel and Concrete Coal Storage Plant

In discussing the requirements of plants of this description before the American Society of Mechanical Engineers at Boston, Franklin M. Bowman called attention to the advisability of storing coal on the ground, and not in an elevated storage, wherever possible. Where this is impractical, however, it is pointed out, it is important that the inside of the storage be entirely lined with concrete, so that no part of the supporting steel work will be exposed to the corroding action of the coal.

Public attention has been called to the possible danger due to corrosions in tall steel frame office buildings, and danger from this source is largely accentuated in a coal storage, with its sulphur and other corrosive substances. For this reason, where a permanent and costly structure is to be built, as is usual in the case of large power houses, Mr. Bowman contends, coal bins lined with steel plates should not be used, as, he says, they are liable in time to become a menace to life and property.

The coal storage pockets of the power houses of both the Manhattan Railway Company and the Metropolitan Street Railway Company, of New York, are steel structures, and the framework is well covered with concrete. The Manhattan Railway Company adopted the Columbian system, which consists of putting in small special beams about two feet apart, thus allowing the main beams to be spaced further apart than otherwise. They are thus able to use concrete of less thickness and effect a saving in weight, cost and space. Another similar and very good construction in use is either expended metal or wire netting covered with concrete. The essential point is to have the steel framework, and especially the joints, entirely surrounded and imbedded in concrete.

On account of the limited space for the coal storage plant, it is often necessary to keep the building narrow, and consequently coal has to be piled to as great a depth as 40 feet. It is, therefore, thought best to design the pocket so that it may be promptly emptied in case of fire from spontaneous combustion, or other causes. Upright wrought iron pipes are installed with a view to determining, approximately, the temperature of the coal by means of a thermometer held at the upper end of the pipe. In this manner any coal in the storage which shows signs of becoming heated can be used at once.

### Pennsylvania Railway Franchise Valuation

The compensation to be paid to the city by the Pennsylvania Railroad Company for the underground railroad it proposes to build across the city has been practically decided upon by the contract committee of the Rapid Transit Commission and President Cassatt and other officials of the railroad company.

For the right to tunnel under the Manhattan side of the North River the company will pay a nominal rental of \$100 a year. The purpose of charging this rental is to enforce a recognition of the right of the commission to exercise jurisdiction over routes under the river which may be planned hereafter.

For the tracks it will lay under the streets of Manhattan the company will pay annually 50 cents a foot for the first 10 years, and \$1 a foot for the succeeding 15 years.

Altogether the company, according to the plans already drawn, will put down under Manhattan 69,000 ft. of tracks. Consequently the compensation the city will receive for the 25 years' franchise to tunnel under Manhattan will be \$1,380,000. The terms to be paid for the right to tunnel beneath the streets of Long Island City will not be decided upon until the question as to whether or not the city is the legal owner of some of the thoroughfares involved has been settled.

The Supreme Court of Ohio has just made several decisions of considerable interest to traction and telephone interests. One is that municipal authorities have no right to grant electric companies the right to erect poles in front of private property irrespective of the rights of the owner. Such an owner—if the pole was placed without his consent—may compel its removal by injunction. The Supreme Court has declared constitutional the law permitting a change of venue in a case where more than fifty stockholders of a corporation reside in the county where the case is to be brought. It is stated that the case will now be carried to the Supreme Court of the United States.

### Topics of the Week

A novel feature has been adopted for Merchants' week, which will be celebrated at New Bedford under the auspices of the Board of Trade and the Merchants' Association next week. These organizations have leased the Onset electric road for two days, and will provide free transportation for all who desire to attend the festivities. On June 17 the entire equipment of the road will be run express from Wareham, Onset and points beyond, for the free use of the people of that section, and on the succeeding day the express service will be run from points between New Bedford and Wareham.

A good deal of comment has been occasioned by the statement in a daily newspaper that John B. McDonald, the contractor for the Rapid Transit Subway, had declared that the electrical equipment for that enterprise would cost \$18,000,000, instead of \$7,000,000, as had been estimated. This information was volunteered in an interview upon the plans of the Rapid Transit Company, and the terms of the contract for the Brooklyn tunnel. It will be remembered the Comptroller Grout, of New York, objected to incorporating the terms of the Manhattan contract in the Brooklyn contract, as he considered them too favorable. Mr. McDonald said that in spite of the favorable terms there would be scarcely any profit left for the contractor, as so many improvements had been introduced in the plans since the original estimates were made. Moreover there had been no precedent to govern the engineers, as the subway work was on an entirely different scale, and of an entirely different character from any other undertaking in the history of American engineering.

The Canadian Electrical Association introduced a novel feature in its programme at the twelfth annual convention, which was held at Quebec during the last week. This innovation had the merit of ensuring the attendance of all the members at the reading of an important paper, and afforded an opportunity to illustrate the principal features of the contribution in a practical manner and much more conveniently than could be done in the regular place of meeting. It was arranged to have special cars leave the convention headquarters at Chateau Frontenac and convey the visitors to the Quebec Railway Light and Power Company, and upon arriving at the car house a paper was presented by one of the members upon "The Electrical Equipment of an Ordinary Street Car." Of course the members had an excellent opportunity to study the points emphasized by the paper, and this added greatly to the value of the contribution.

The smoke nuisance in New York has demonstrated the superiority of the large electric railway and lighting plants over the steam equipments of the manufacturing and office buildings. The latter are compelled to burn soft coal, because of the strike in the anthracite fields, and the result is a black pall over the entire city. In the electric railway and lighting power stations, however, modern equipments have been provided which permit the burning of soft or hard coal under the boilers with equally satisfactory results. No complaint has been made against any of these large plants, but the Health Department has been kept busy notifying owners of office buildings and industrial establishments that they must comply with the law, and several hundred actions have been begun against these who have paid no attention to repeated warnings. It is not expected, however, that the penalty will be enforced in these cases, as it is acknowledged that hard coal is not available in New York. This was demonstrated when the city advertised for bids, and received not a single offer. Dealers who have heretofore supplied the city notified the authorities that their stock was exhausted and that price and time of delivery for future shipments were conditions that could not be arranged until the strike was settled.

It is with pleasure that mention is made of the cordial good will that exists between the street railway management, employees and patrons in Milwaukee. Two years ago a voluntary advance was made by the Milwaukee Electric Railway and Light Company in the rate of compensation paid its motormen and conductors. Prior to June 1, 1900, the following scale was in force: Fifteen cents an hour for the first year, 16 cents for the second, 17 cents for the third, 18 cents for the fourth, 19 cents for the fifth, and 20 cents after five years continuous service. At that time the increase was made to 17 cents an hour for the first year's continuous service after being placed on the extra list, 18 cents for the second, 19 cents for the third and fourth, and 20 cents for the 5th and succeeding years. On June 1, this year, another advance went into effect, making the rate as follows: Eighteen cents an hour for the first year, 19 cents for the second, 20 cents for the third, and 21 cents for the

fourth year and thereafter. In announcing this increase, President Beggs said: "This advance is also voluntary and in pursuance of our policy to do the very best possible for all employees of the company. It is likewise an evidence of our appreciation of your honest, loyal and patient service, and I hope it will be an added incentive for even more careful, faithful and enthusiastic service in the future." The management has made other provisions for the comfort, entertainment and instruction of the men, and there is co-operation in all departments, which, of course, works to the advantage of the patrons.

The city of Providence has witnessed many scenes of disorder during the last ten days. The trouble grew out of the attempt of the legislature to impose conditions upon the local street railway company that the latter's legal advisers claim are unconstitutional. The company resented this invasion of its rights, and certain labor agitators who were interested in precipitating trouble brought about a strike, although a large number of the men positively refused to recognize the authority of the leaders and continued in the service of the company. The management had no difficulty in getting new men to fill the places of the strikers, and cars have been operated every day since the strike was declared. Violence was resorted to and there has been much rioting in the streets. It is apparent that there was no general desire among the men for a strike, and no serious grievance that demanded heroic measures. Had the men awaited the decision of a court of competent jurisdiction their rights would have been protected. Now they have forfeited them by intimidating their former fellow-workmen.

The desire of the East Side Democratic Club, of New York, to create positions for men whom the substitution of electricity for steam on the Manhattan Elevated system has deprived of employment, has led to the adoption of a resolution calling upon the company to employ two qualified motormen for each of the new electric trains on the elevated road. It is not to be expected that the company will pay any attention to this demand, but, as the point raised will probably be revived later on, the merits of the proposition may appropriately be discussed here. The resolution calls attention to the law that requires two pilots for ferry-boats, and declares that the necessity for two motormen is equally great. The cases are entirely different, and the arguments that led to the adoption of the two-pilot law do not apply to the conditions of electric railway service at all. The pilot house on a ferry-boat is inaccessible to passengers and crew, and the occupants are not even under the observation of those on deck. Right here lies the danger of relying on one pilot. The motorman, on the contrary, is always within reach of the passengers, and his compartment opens directly into the coach. There is always a trainman on the same car with the motorman, and any of these employees could safely take the train to the terminal should the motorman become disabled. Then, too, the conditions of operation are necessarily different. The character and length of the runs between stations on electric roads preclude the possibility of serious accidents, while one might readily imagine the disasters that threaten a ferry-boat adrift with a disabled pilot. The experience of street railway companies supports the rule in force on the elevated road of isolating the motorman to a considerable degree, and in New York this is done to the exclusion of passengers from the front platform of surface cars. It is contended that the motorman must be free from crowding and interference of all kinds, and that nothing should be done to withdraw his attention from the operation of his car or train. The presence of an "understudy" or extra motorman would prove detrimental in this respect at least, and it is believed that the danger resulting from the distraction that would surely accompany the introduction of a second motorman in the cab would be much greater than the possibility of a single motorman becoming disabled. Those who advocate the employment of an extra man direct attention to the practice on steam railways, but the cases are not parallel at all. The fireman is not an understudy for the engineer; he has important duties to perform, and both men are kept busy, so that there is little leisure for either, whereas in the electric car there would be absolutely nothing for the second motorman to do.

### Grade Crossings

The steam railroad companies of Pennsylvania have determined to resist all grade crossings of their tracks by electric railway companies. In some instances they have contested and prevented crossings under tracks or on bridges over them, as in the case of the Harrisburg & Mechanicsburg Electric Railway Company, which attempted to cross the tracks of the Northern Central Railway Company at Lemoyne. As soon, however, as the control of the electric railway company passed into the hands of people in-

terested in the Cumberland Valley Railroad Company the attitude of the steam roads changed, and the electric railway was permitted to lay its tracks under the tracks of the Northern Central. The same condition exists at Trindle Spring, near Mechanicsburg, where the Cumberland Valley Electric Passenger Railway Company is held up by injunction from crossing the tracks of the Dillsburg branch of the Cumberland Valley Railroad Company, on which only a few trains are operated; and still another case is reported at the crossing of the Philadelphia & Reading Railway Company's tracks at Mount Holly by the Carlisle & Mount Holly Electric Railway Company. The people depending on the trolley lines are thus put to great inconvenience, and they suffer considerable loss of time because of this dog-in-the-manger policy of the steam railroad companies. Grade crossings should be abolished or obviated wherever it is possible to do so without prohibitive cost to the operating companies. That is admitted by all, but it should also be remembered that the steam railroads were the first to make grade crossings, and they still operate their trains across country roads as well as city and village streets at grade.

The steam railway managers must not complain if their policy reacts and brings home trouble to them, because of the agitation against grade crossings which they started for the purpose of crippling their competitors. It is a dangerous proceeding to excite the fears of the public, and it is always much more difficult to check or suppress a movement of this kind than it is to incite it.

**The London Tubes.**

The battle of the tubes for the solution of the London transportation problem is being fought and decisions have just been rendered by the House of Lords' committee under Lord Windsor and Lord Ribblesdale. We published recently a map showing the proposed tubes and authorized tubes, of what has come to be called the Yerkes System, which includes the Metropolitan District Railway. Hardly had the news of the formation of the Yerkes Syndicate become known, when another equally important announcement was made of another vast consolidation of interests, namely, the London United Electric Railway System (tramways), and the three proposed new tube schemes, the North-East London, the City & North-East Suburban, and the Piccadilly and City. In this latter consolidation appear J. Pierpont Morgan, Arnold Hills and J. Clifton Robinson, who is responsible for the whole success of the London United Tramways, and the new system is now known as the Morgan group. The scheme is a vast and comprehensive one, but does not really conflict with the Yerkes scheme. It did conflict with the Central London scheme, however, for power for a continuation of their present tube southward from Shepherd's Bush to Hammersmith, and then eastward to the city again by way of Piccadilly, the Strand, etc., forming at last a complete circle with the existing portion. This Central London scheme has been finally rejected by the committee, though further consideration will be given to the proposed extension from the Bank to Liverpool Street, and also some minor extensions at the West End for shunting purposes. The Piccadilly and Charing Cross section of the Brompton and Piccadilly scheme is also rejected, which was a short connecting link in the Yerkes scheme. The extension of the London United Railways from Addison Road via Shepherd's Bush to Hammersmith, has also been rejected, but the committee will proceed with the combined scheme presented by the London United Electric Railways, the Piccadilly & City Railway, and North-East London Railway (the Morgan group), which provides for a tube railway from Hammersmith, via Hyde Park Corner, Piccadilly, the Strand, the City, Stoke Newington, and Tottenham to Palmer's Green, also with the cross line between Marble Arch, Sloane Street and Clapham Junction.

In a word, all this really means that the Central London scheme for a southern return loop has been beaten by the opposition of the Yerkes and the Morgan groups, assisted by the Metropolitan Railway. As we have already illustrated the Yerkes system, we now present a plan of the Morgan group of railways, from which it will be seen that it covers even a more comprehensive area than the Yerkes system. The map herewith reproduced from *The London Electrician* shows the district served by the group. As will be seen the Morgan tube line will cover practically the line desired by the Central London Railway, and from Hammersmith will have stations at Sloane Street, Hyde Park Corner, Albermarle Street,

Piccadilly, Charing Cross, the Law Courts, Aldgate, and Cannon Street.

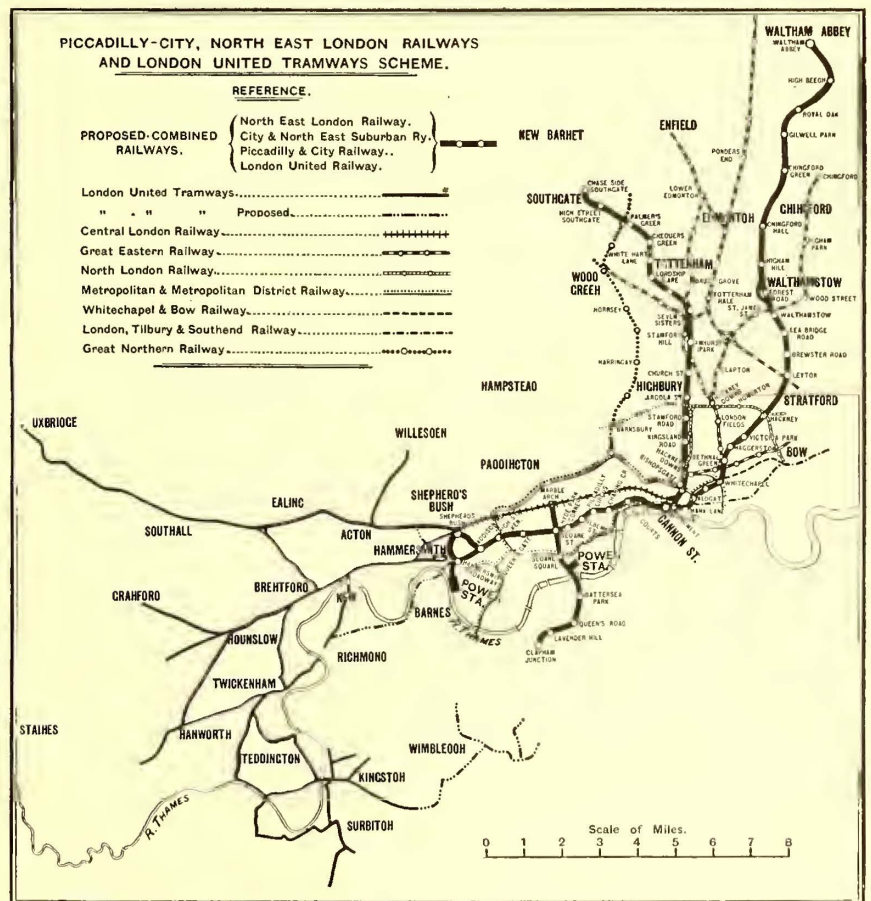
Thence the new tube goes northeast London way, with stations at the Monument, Bishopsgate Street Without, Hackney Road, Kingsland Road, Stamford Road, several in Highbury, Stoke Newington, and Wood Palmer's Green. The rejection of the Piccadilly & Charing Cross section of the Yerkes system is not serious, so that if the new Morgan scheme survives the House of Commons, there will practically be in London the Yerkes system, as outlined last month, and the new scheme, as shown herewith, which it will be seen provides for a tube railway along the Strand, Fleet Street, etc., into and through the city to the northeast. This will, of course, conflict with the District Railway on the embankment, and has been strenuously opposed, but so far as the Lords' committee is concerned, without effect.

It remains to be said that the City & South London Railway, which now has a tube operating from Clapham to the Angel at Islington, have had their scheme for an extension of their system from the Angel to Emston thrown out by Lord Ribblesdale's committee, which appears to be a pity, as it would have been a distinct convenience, obviating any necessity for changing carriages. It should also be said that the extension of the Charing Cross, Euston & Hamstead under Hamstead Heath to Boulders' Green (in the Yerkes group), has been authorized by Lord Ribblesdale's committee.

**London Letter**

*(From Our Regular Correspondent.)*

It is a pleasure to be able to state that the long-standing dispute between the Edinburgh Town Council and the Edinburgh Tramways Company has now been settled. It will be remembered that the company agreed to pay the Town Council 7 per cent per annum for the total expenditure of the tramways system, which is put at about £1,250,000, and which would necessitate an annual payment of about £87,000. The company has been unable to meet this large sum from lack of revenue, owing to the incompleteness of the



MAP OF PROPOSED "MORGAN" GROUP OF LONDON RAILWAYS

system. It has now been decided that £75,000 shall be paid this year, and that this sum shall be increased £2,000 per annum until all the originally intended amount is paid up. This, of course, will become easier for the company as the traffic receipts increase, which they are steadily doing.

The tramways committee of the Sheffield Corporation have de-

voted a sum of £250 from their profits toward the amount required for the provision of music in the public parks and open spaces of the city during the ensuing season. This will doubtless tend to increase their profits by creating traffic. The Sheffield tramcars now run from Tinsley on the Rotherham boundaries to Millhouses, on the Derbyshire side of the city, a continuous run of six miles for 2½d. There are three stages, two of a penny each and one of a halfpenny. Railway traffic is being considerably affected, and fares are being reduced owing to the competition.

The House of Commons committee has unanimously approved the scheme of the London County Council for tramways on the embankment from Waterloo Bridge to Westminster, with provision for the due protection of the District Railway.

The scheme has been most bitterly opposed, not only by District Railway, but by many who thought it a desecration to put tramcars on London's most ambitious boulevard. Still, it has been generally conceded that tramways on the embankment would relieve the Strand and Fleet Street, and most people think now that hitherto not sufficient use has been made of this avenue for traffic.

The line now authorized will join up with the shallow underground tramway which is to pass beneath the new thoroughfare from the Strand to Holborn, and will doubtless by means of future bills be made to connect by means of the bridges with the tramway lines on the south side of the river.

The seventh annual convention of the Incorporated Municipal Electrical Association will be held in London, beginning July 2 and closing July 5. The following is a list of papers to be read and discussed: Wednesday, July 2 (1), Presidential Address, J. H. Rider; (2) Double Current Generators and Their Application, E. T. Ruthven Murray; (3) H. T. Continuous Current Systems, A. S. Barnard. Thursday, July 3 (1), Steam Turbines, S. E. Fedden; (2) The Correct Type of Engine for large Generating Stations, A. A. Day; Friday, July 4 (1), Some Notes *re* Earthing, H. Faraday Proctor; (2) Two vs. Three Wire Distribution, J. F. C. Snell.

The Stockport Road route of the Manchester Electric Tramways is now ready to go into service, and will serve a very populous district. The route commences at St. Mary's Gate, and goes through Ardwick, Longsight, Levenshulme, Heaton Norris and on to the boundary of Stockport. Two of the engines of the new Stuart Street station are now ready for service, so that there will be ample power for the increases which are rapidly coming into service. In the recent arbitration between the Corporation of Manchester and the Manchester Carriage & Tramways Company, which formerly operated the tramways, Sir Frederick Bramwell has given an alternative award, leaving the decision to a court of law. If, he states, it is incumbent upon the corporation to purchase all the horses, rolling stock, etc., the company is entitled to £496,068; on the other hand, if the corporation is bound to purchase only a sufficient number of horses, tramway cars and depots to work the lines, the award would be £229,353.

An agreement has been entered into between the Stockport Corporation, Hyde Corporation and the Bredbury and Romiley Urban District Council, and the Oldham, Ashton & Hyde Electric Tramways, Limited.

The agreement is that Bredbury shall construct tram lines from the present terminus of the Stockport Tramways at Woodley to the Hyde boundary, and lease the same to Stockport Corporation. The Stockport Corporation will provide the electric equipment, the Hyde Corporations to construct a tramway from the terminus of the company's tramway at Gee Cross to the Bredbury boundary to connect with the tramway to be constructed by the Bredbury Council, and the Hyde Corporation to provide the electrical equipment for that portion of the route. The Stockport Corporation and the Tramway Company will grant running powers over each line to each authority. The Stockport Corporation will provide a service of cars between Stockport and the Market place, Hyde, and the company between Hyde and the Bredbury.

The Stockport Corporation and the company are each to charge the full authorized fares upon the tramways, but the following through fares shall be charged: Between Lancashire Bridge, Stockport and Hyde Market place, 4d.; between St. Mark's Church, Bredbury and Hyde Market place, 2½d.; between Lancashire Bridge, Stockport and Woodley Station, 2½d.; between Woodley Station and Hyde Market place, 2d.

The undertaking is a very extensive one, and will open up communication with the towns and villages named above. There will be a through route of about seven miles, and portions of the work are nearing completion. It is claimed that the route will open up districts which are badly in need of improved railway facilities, and will therefore be of considerable importance.

At a recent meeting the Northampton Town Council unanimously voted to adopt the following report, recently prepared by the tramways committee:

(1) That the present method of horse traction should be re-

placed at as early date as could be conveniently managed by electric traction.

(2) That the overhead trolley system should be adopted over the whole existing lines and the proposed extensions under the order of 1901.

(3) That it would be inexpedient to attempt to make use of the heat to be obtained from the consumption of the town refuse for the generation of electric power for this purpose. The estimated cost is about £120,000.

Mr. J. B. Hamilton, the new manager of the Leeds tramways, has returned from a five weeks' visit to the United States, and has formally entered upon his new work.

The corporation of Chester have adopted the report and detailed plans and specifications prepared by their city engineer for the conversion of the present tramways from horse to electric traction, with various extensions. The work will be carried out on the overhead trolley system, and will cost about £8,000.

Lord Stanmore's Committee of the House of Lords has passed the preamble of the Northumberland Electric Tramways bill. It empowers the promoters to construct tramways from Morpeth to Bedlington (eight miles in length), Bebside to Blyth, and Ashlington to Newbiggin (three miles). The company, which was established in 1901, has already obtained some powers in the district. They have a provisional order for Blyth, and are erecting a generating station from which to supply electricity in that town. They have also provisional orders for the supply of electricity in Morpeth, Ashlington and Newbiggin.

Wales has celebrated two important events during the past month, the one the formal opening of the new corporation electric tramways at Cardiff, which have been installed under the careful supervision of Mr. Arthur Ellis, borough electrical engineer and manager, and the other the laying of the foundation stone of the power house for the South Wales Electric Distribution Company at Pontypridd, by Sir Frederick Bramwell.

There are now in Cardiff nearly eight miles of absolutely completed route on which electric cars can run, and at the present moment there are two miles and a quarter under construction. After the completion of Cathays section there will only remain the line from the Hayes Bridge to the Pierhead, and, except for the railway crossings and the contract work under the Bute Street Bridge, this is almost complete, and will be ready for traffic next month.

A few words regarding the system will not be out of place. The power station buildings at Roath comprise large engine and boiler houses, coal bunkers with a railway siding accessible from the Taff ale Railway, and a complete suite of offices for the staff; in the engine room there are installed at present four vertical engines, each 500 hp, with a generator coupled direct on to the shafts of each engine. There is also an 80-km generator, to be used for charging the battery of accumulators, which is installed at the power station, for lighting purposes when the engines are shut down.

In addition to the plant mentioned, there are at present on order two large engines and generators of 1600 hp each, and when these are installed the power station at Roath, besides supplying current for tramway purposes, will be in a position to supply current for electric lighting and power to private consumers, the corporation having already entered into an agreement for the supply of a large amount of power to the Mount Stuart Dry Dock Company and to several other firms in the docks.

The South Wales Electric Power Distributing Company are erecting three large generating stations, viz.: at Pontypridd, Neath and Cwmbran, and a smaller one at Bridgend. The Pontypridd station will consist of a building 258 ft. in length, 146 ft. in width, and 55 ft. in height; but that is only the first instalment of what it will be when completed as designed. It will then measure 760 ft. in length and 277 ft. in width, and will be the second largest electric power station in the world.

At the luncheon, which followed the ceremony, Sir Frederick said: "Here in South Wales they proposed to give electrical energy for all possible purposes—motive power for the factory, for the tramway, and for the railway, lighting for all purposes, electrical chemical, electrical thermal, and in fact, for all things to which electricity could be applied. And all this would be offered in the most economical manner, taken to them without dust or ashes or smoke to spoil their beautiful valleys. Their chairman looked forward to the time when they would be able to 'Marconi' power as now they did the telegraph. They had commenced their proceedings that day with a religious service. He thought that that was appropriate. It was quite true that the affairs of the company would be run for the sake of gaining profit, and they might remember that the laborer was worthy of his hire. But they might also remember that one effect of the undertaking would be to save fuel, and to him fuel was sacred." A. C. S.

**An Analysis of a High-Speed Schedule**

A study of the schedule new being operated on the Albany & Hudson Railway brings forward some interesting deductions in interurban schedule speed. This road was thoroughly described in the STREET RAILWAY JOURNAL of Feb. 2, 1901, and is one of the few Eastern third-rail installations for long-distance service.

At present there are twelve regular passenger trains daily in each direction between Albany and Hudson, and ten on Sundays, each way. The quickest time is made by Train 38, leaving Albany 11.30 p. m. and reaching Hudson at 1.10 a. m., or 100 minutes running time, the schedule speed being 22.3 miles per hour. An analysis of the run of this train, with station distances and speeds, is shown in the following:

ALBANY TO HUDSON, TRAIN NO. 38

STATIONS.	Miles Between	Miles from Albany	Minutes from Albany	Speed M. p. hr. from Albany	Net Time Minutes	Net Av. Speed M. P. H.
Albany to						
Rensselaer	1.1	1.1	12	5.5	12	5.5
Clinton Heights	1.7	2.8	18	9.35	6	17.0
E. Greenbush	2.8	5.6	26	12.9	8	21.0
E. Schodock	3.8	9.4	34	16.6	8	28.5
Sidwig	3.1	12.5	40	18.75	6	31.0
Nassau	.8	13.3	42	19.0	2	24.0
No. Chatham	3.2	16.5	48	20.6	6	32.0
Electric Park	1.5	18.	52	20.8	4	22.5
Riverville	1.7	19.7	56	21.1	4	25.5
Valatie	2.2	21.9	61	21.6	5	26.4
Kinderhook	1.4	23.3	64	21.8	3	28.0
Sunnyside	2.2	25.5	68	22.5	4	33.0
Stuyvesant Falls	1.4	26.9	72	22.4	4	21.0
Rosmore	1.9	28.8	76	22.7	4	28.5
Stockport Centre	1.4	30.2	81	22.4	5	16.8
Stottville	2.1	32.3	85	22.8	4	31.5
Hudson Car House	3.0	35.3	90	23.5	5	36.0
Cold Spring	.4	35.7	91	23.6	1	24.0
Hudson	1.5	37.2	100	22.3	9	10.0

The car equipment for fast service is composed of four G. E. 73 (75 hp) motors, geared to reach a maximum speed of over 51 miles per hour. Thus a high schedule speed is obtained between many of the stations, one of the quickest runs being between Kinderhook and Sunnyside, 2.2 miles in 4 minutes, 33 m. p. h., and the highest schedule speed of all, 36 m. p. h. between Stottville and Hudson Car House, 3 miles in 5 minutes. Out of nineteen runs on the time card, five range above 30 m. p. h. in schedule speed, ten above 25 m. p. h., fifteen above 20 m. p. h., and but two below 15 m. p. h.

On single track all trains are obliged to wait indefinitely at designated meeting points for opposing trains of the same class, except in case of special orders, opposing trains being governed accordingly. In addition to the regular time card stops all trains are obliged to stop on signal at Station "17", Hillview, Onderdonk's, Elliot's Crossing, Schodock Centre, Rowe's, East Schodock (Albany Avenue), Howard's Rock Cut, Best's, Nassau Lake, Sweet's, Maple Avenue, Kinderhook Lake, Kilmer's, White Wings, Loom Works, Hudson, and Hudson waiting-room. While running through city streets motormen are obliged to keep the front vestibule window down and rigidly hold their car speed to the town regulations. Between Albany and Rensselaer the cars operate over the tracks of the United Traction Company. No train can leave the Hudson car house without special orders or a clearance card. The highest schedule speed for the greatest distance from Albany occurs between Albany and Coe's Spring, 24 miles in 91 minutes, average speed, including stops, being 33.6 m. p. h. The effect of the slow speed across the Hudson River from Albany to Rensselaer is put in the schedule as far south as Nassau, 13.3 miles from Albany, and 42 minutes out. There are five regular meeting points between Albany and Hudson, an average of one about every 7½ miles, no train meets more than four others on the run. "Slow" signs exist for all trains at White Wings and Wild's hill curve, north of Valatie. Speed at Albany Avenue, Valatie, is 4 m. p. h., and all southbound trains are obliged to slow at the Stottville Highway. Standard clocks are located at the superintendent's office in Rensselaer and in the Hudson car house. The speed possibilities of this road are most suggestive to managers who are considering the conversion of branch lines from steam to electric power.

**Accident Frauds in Philadelphia**

The persistency with which fraudulent accident operators keep at work in Philadelphia is remarkable. Two or three organized gangs in this most amazing form of swindling were run down by the claim department of the Union Traction Company in July, 1901, and although the punishment meted out in these cases was considered sufficient to dampen the ardor of the hardest of

these miscreants, the company's agents have since that time had to deal with many similar cases. The most recent of the cases against these accident fakirs is that in which four women have been run down, indictments being returned in twenty-three bills of conspiracy to defraud the company. Each of the prisoners was sentenced to serve two years in the county prison. The defendants in the case, under various assumed names, had collected sums of money ranging from \$5 to \$70 by claiming that they had been injured while riding in the cars of the company. The frauds had been going on for some time, and more than twenty claims, amounting to about \$700, had been collected. In one of the cases it was shown that the eleven-year-old daughter of one of the defendants had been instructed by her mother to throw herself on the floor of a car, and in doing so the child broke her arm. Judge Arnold, before whom the cases were tried, said that there were so many false claims presented against the traction company and outrageous damages awarded that the corporation found it cheaper to settle the claims for such amounts as it saw fit. "It appears that the result of this action," the judge said, "has been to create this class of people. One evil begets another. Here are a lot of women who have made it a business of manufacturing false claims, committing perjury, and also bringing their children to do it. If I were to give them the full penalty of the law, I could put some of them in prison for 30 years. I will not do that, but give them the full penalty on one bill."

**Electric Railways and New York Suburban Property**

The influence of the electric railway upon the value of real estate, especially in suburban districts, is clearly indicated by the activity that is already apparent along the proposed Portchester line, as well as the extensions of the present street railway and suburban service to the north of Manhattan. The Union Railway, organized in 1892, which operates a network of trolley lines, undoubtedly assisted in the development of The Bronx, but its importance was chiefly as a feeder to the elevated road and in facilitating local travel. That the elevated railway has been the dominating factor in transportation is shown by the fact that the bulk of the real estate movement has been confined to a strip of land extending outward half a mile—a comfortable walking distance—from Third Avenue. This strip, owing to superior transportation facilities, is virtually a projection of Manhattan, and the new buildings erected there for several years have been mostly five-story flats, elevator apartments and tenements. The completion of the equipment of the Manhattan electrically will doubtless result in greatly benefiting this section. The connection of the trolley lines in Jerome Avenue with the Eighth Avenue trolley at Central Avenue and the Manhattan elevated at 155th Street will open up for development a large section which has remained isolated and unimproved. The section through which Jerome Avenue runs forms a valley separated on the east and the west from the rest of The Bronx by parallel ridges. The natural outlet of the valley is at Central Bridge, but the absence of transportation across the bridge has acted as a barrier to traffic between the valley and Manhattan. The opening of the bridge to the Jerome Avenue trolley will immediately make large tracts of comparatively inexpensive land available for improvements.

It is, however, upon the building of the Rapid Transit subway and the Portchester line that the present boom in real estate north of Harlem is depending. An important result of the construction of the Portchester Railroad will be the opening up of that part of The Bronx which lies east of the Bronx River. This part was annexed in 1897, but owing to its isolation and the absence of an authoritative street plan it has remained practically untouched by building improvements. Both these obstacles are now about to be removed, and the easterly half of the borough will then be in a position similar to that which stimulated building in the westerly half in the '90s. The building of the New York & Portchester four-track electric railway from a point near the Harlem River, at Willis Avenue and 132d Street, northeasterly through Fordham, Williamsbridge, Mount Vernon, New Rochelle and other municipalities in Westchester County, to a point on the boundary line between the States of New York and Connecticut, north of the village of Portchester, a distance of about twenty-one miles, will bring that entire district within easy reach of New York, as it is proposed to run 398 trains daily, and the schedule time for a trip between Portchester and City Hall, Manhattan, is 54 minutes. The opening up of this line will doubtless mark the greatest building boom that has ever been known in the vicinity of New York. A branch about two miles long is proposed to Clason's Point, on Long Island Sound, and other extensions are contemplated. It is also proposed to establish a complete network of feeders throughout this district.

### A Large Shipment of Open Cars

The interesting engraving presented with this article shows a train recently loaded by the John Stephenson Company, Elizabeth, N. J., with open cars for the Brooklyn Heights Railroad Company. The photograph, from which the engraving has been made, was taken just as the Stephenson switching engine was ready to take the train from the yard.

The open cars are a part of an order for one hundred. Most of them have been delivered, there being only twenty-five remaining to be shipped. They are all of the Brooklyn Heights standard thirteen-bench type, measuring 36 ft. 11 ins. over all. They are 6 ft. 7¼ ins. wide at the sills. The floor framing is of unusual strength, being of white oak, with yellow pine side sills, plated with steel. The inside finish is of ash, with a three-ply quartered oak headlining. The glass in the monitor and over the bulkhead windows is double thick imitation bevel. Each bulkhead has the usual drop sash. There are twenty side and 6 end curtains mounted on spring rollers.

The Stephenson patent seat end panel is used, by which the curtain is permitted to come all the way to the floor. These panels are so beveled and rounded that there is no danger of catching the curtain, which is carried well out from the end of the seat. The shape of the panels gives a wide, easy entrance, and the passenger is not liable to strike his person nor catch his clothing. The pockets and attachments are of such a shape that the posts receive a very strong support. Box pattern destination signs are placed at the forward right-hand corner of the bonnet, just under the bow. This is the standard location for signs on the Brooklyn Heights lines, and is, perhaps, the best that has yet been suggested for this form of sign. The cars are of a type which has been found ad-

at all the car houses of the company. It is addressed to John Murphy, general superintendent, and reads: "You are authorized to adjust the wages of conductors and motormen for platform labor on the following scale: Up to one year, 20 cents per hour; one to two years, 21 cents per hour; two to three years, 22 cents per hour; three years and over, 23 cents per hour.

"To inaugurate the accident premium system, the management is willing to pay the following premiums for the prevention of accidents: On December 1 a premium of 1 cent per hour, platform time, will be paid to all trainmen who are then in the service, and who have had no accidents for which the company has been required to pay during the intervening period. In case the total amount paid for any one man's accident is less than the amount of his possible premium, he is to receive the difference.

"It is to be understood that this system is to be an experiment for the term of six months, beginning June 1 and ending Dec. 1, with no contract binding the company to its continuance, if for any reason it should prove ineffectual."

### New Equipment for the Pittsburgh, McKeesport & Connellsville Street Railway

The Pittsburgh, McKeesport & Connellsville Street Railway Company has placed contracts with the Westinghouse Electric & Manufacturing Company and Westinghouse, Church, Kerr & Company for the equipment which will double the capacity of its power plant now being built at New Haven. The contracts for power equipment placed will swell the expenditure for power facilities to \$1,000,000. The orders placed are for three 1500-hp Westinghouse turbines and three 1000-kw Westinghouse generators.



A LARGE SINGLE SHIPMENT OF OPEN CARS

mirably suited to handling the heavy summer traffic of Brooklyn, including the large crowds at the surrounding summer resorts and amusement parks.

### Strike at Providence

The employees of the United Traction & Electric Company, of Providence, R. I., went on strike June 4. The strike resulted from the passage at the last session of the Legislature of a law compelling street railway companies to limit the hours of labor to 10 hours, the work to be done within 12 consecutive hours. The law became operative on June 3, but the company posted notices to the effect that the law was unconstitutional and that it did not intend to change its schedule. Such of its employees as desired to work only 10 hours could do so, but the company promised to protect those who desired to continue as they have been. For the first few days the company was able to run only half of its cars, but is now operating on regular schedule. The lawless element has been at work, and considerable damage has been done to the company's property.

### Increase in Wages at Pittsburgh

The Pittsburgh Railways Company has advanced the wages of 3000 motormen and conductors. The general advance is one cent an hour; in addition the company will pay a premium to the employees who have no accidents through their own fault recorded against them. The official notice of the wage advance was posted

The company had, months ago, contracted for three 1500-hp engines. These are to be supplied by the Allis-Chalmers Company, of Milwaukee, and are to be of the vertical compound condensing type. In the original power plant equipment order there were three 1000-kw Westinghouse generators, and these will be delivered in about six weeks, when the engines are also expected to be delivered. Within 90 days it is said that cars will be speeding over the coke belt system of the company, and in a year they will be coming into Pittsburgh over the lines of the Monongahela Street Railway Company, now controlled by the Pittsburgh Railways Company.

### Keeping Shop Floors Clean

Every master mechanic has experienced difficulties in keeping clean the floors of repair shops and power houses where repairs are being carried on. There is inevitably enough grease and oil on motors and parts that are being taken out for repairs, so that it becomes somewhat tramped over the floors, even when the greatest care is exercised in keeping them in a clean and neat condition. In the South Side Elevated Railroad shops of Chicago it has been found that the use of lime aids in cleaning up the shop floors and in keeping them in good condition. This lime is simply swept over the floor every day, in addition to the regular cleaning. Very little remains on the floor after the sweeping, but it is sufficient to counteract the effect of the oil and grease, and to make it easy at the beginning of each day to clean up what has fallen the previous day, as well as to improve the appearance of the floor.

### Fuel Oil in Railway Power Stations

The announcement that the Interborough Rapid Transit Company, which is to operate the subway system in Manhattan, is considering the advisability of providing for the use of fuel oil in its power plant at Fifty-ninth Street and Eleventh and Twelfth Avenues will not be surprising to those who have given special attention to the advancement that has been made in this line. At the present time two important problems remain unsolved, so far as the use of oil is concerned in large stations at considerable distance from the Texas wells. First of all, satisfactory assurance must be given the managers of these plants that a sufficiently large continuous supply can be had before the adoption of oil for fuel will be considered, and, secondly, it must be demonstrated that the change will not involve an additional expense to the operating company. In the case of the subway system it has been estimated that a material saving can be effected by the use of oil, but the management of the Interborough Company is not yet satisfied that the oil companies can be depended upon for a satisfactory supply.

No doubt, the strike in the anthracite coal region and the consequent scarcity of hard coal have brought the subject of fuel into prominence at this time, and the advisability of making some provision for the use of oil in the case of a continuation or a recurrence of the present labor troubles is generally conceded, but it is pointed out that the operation of a plant like that which will supply current for the subway system would require a very large amount of oil, and it would, of course, be necessary for the management to be convinced that it could procure an almost unlimited supply before it would seriously consider any proposition to use this form of fuel.

Satisfactory reports have been received by the Interurban Company upon the performance of several plants in which crude oil is used, but in none of these are the conditions of operation similar to the demands of the subway system.

During the last few months several interesting contributions have been made to the literature of this subject, and further experimental work is being carried on. It is to be regretted that most of the information available is furnished by comparatively small plants, and these are for the most part located in places near the oil wells, so that comparatively few Northern and Eastern engineers have had an opportunity to study the problem in its commercial aspect. Mr. Reed's paper before the Southwestern Gas, Electric and Street Railway Association at San Antonio, Texas, which was published in the STREET RAILWAY JOURNAL for May 10, described the system installed at Houston, and presented some very interesting data. Mr. Bitgood's contribution at the same meeting was very encouraging to those who favor the use of oil. Now additional data along the same lines is furnished by Messrs. Warren and Edgar in their discussion of this topic before the National Electric Light Association at the Cincinnati convention. Mr. Warren describes the plant of the Los Angeles Electric Company, and Mr. Edgar relates the experience of the El Paso Company with a similar installation.

The method of handling liquid fuel at the generating station of the Los Angeles Electric Company is described by Mr. Warren as follows: The fuel is pumped from the main storage tank to the furnace supply tank of 100-barrel capacity. In this tank the oil is heated to 80 degs. F. It then passes to a pair of small duplex steam pumps which give it 20 pounds gage pressure. The oil then traverses pipes within the breeching of the boilers, which heats it to 190 degs. F., then on to the burners. The burner is of the spray type, using steam as the medium of spraying the oil. These burners consist of two circular disks, one and one-half inches in diameter, slotted and arranged in such manner that the oil, fed by separate pipe to the lip of the upper disk, meets the steam at its orifice just under this lip. This steam forms a fan-tail spray which breaks up the oil into particles sufficiently small to ignite immediately by the heat of the brick lining of the furnace and the layer of bricks upon the grate bars. Each one of these burners has an evaporation efficiency of 3000 barrels of water per hour at 190 degs. F. The sound of combustion produced by these burners is comparatively soft. The flame fills the furnace box, covering the entire furnace-box sheets of the boiler. This gives active heat to all of the evaporative service of the fire sheets without unduly heating any one particular portion, and insures perfect combustion.

A high-temperature thermometer in the smokestack is as necessary as a water-gage glass on a boiler, for by the thermometer only can the fireman graduate the amount of air necessary for perfect combustion. As a test of this, the fireman can raise the temperature of the gases in the stack from 450 degs. to 600 degs. F. by closing the ash-pit doors one inch. By the use of the thermometer the fireman can so regulate the burners under each

boiler that it will do its proportionate amount of work. This is very essential in plants working many boilers set in batteries. It is an important point that the evaporative efficiency of the burners should be kept as high as possible; that is, the burner that consumes 5 per cent. of the steam which it evaporates should not be allowed to consume 20 per cent., which it might do if not judiciously controlled.

In considering the comparative storage area required for coal and for the equivalent amount of oil, taking yard storage as a basis, 40 per cent. less area is required where oil is used, and 50 per cent. less floor area in front of the boilers. In economy of handling, the complement of boiler-room help is reduced fully 50 per cent., and the transportation of ashes is entirely eliminated.

Mr. Warren states as a result of his experience that the use of liquid fuel reduces the deterioration of steam-generating apparatus 25 per cent. This is effected by the even fire of fuel oil, there being no undue strains on the fire sheets, caused by the frequent opening and closing of fire doors, as in the use of coal. The absence of large amounts of sulphur in oil prevents those chemical combinations which so rapidly corrode the tube ends. Ashes, lodging in obscure places and inaccessible corners of the boiler, absorb moisture and form a strong chemical affinity for the parts of sheets with which they come in contact, causing rapid corrosion.

As to the reduction in repair account, the cost of renewing the lining of furnaces, renewing grate bars, bridge walls, back arches, etc., is reduced 80 per cent. by the use of liquid fuel.

In the reduction of the sundries account, the items of coal scoops, slice bars, hoes, firing irons, tube scrapers, wheel-barrows, water hose, steel brooms, wood for starting fires, etc., are entirely wiped out when liquid fuel is used, and there is an additional saving of 75 per cent. in the cost of keeping the station itself clean.

Mr. Edgar in his paper emphasizes the point that in some places, fuel oil is burned, not because it is cheaper, but because of its many advantages over coal. Fuel oil increases the capacity of the boilers slightly and the capacity of the chimney about 30 per cent., and it decreases the cost in the fire room, as has already been pointed out by Mr. Warren.

### Reported Change in Control of the Stanley Company

The report is again circulated that the Whitney-Widener-Elkins syndicate has about completed negotiations for taking over the Stanley Electric Manufacturing Company, of Pittsfield, Mass. The following extracts are made from a long article that appeared in the New York Tribune of June 10: "It was ascertained by the Tribune yesterday (June 9) that the control of the Stanley Company had been taken over by Wm. C. Whitney, Thos. F. Ryan, Thos. Dolan, Wm. L. Elkins and P. A. B. Widener, and that the company's plant at Pittsfield, Mass., was to be increased to about six times its present size within a few months. \* \* \* Mr. Whitney and Mr. Ryan went to Pittsfield on May 1 and inspected the plant there, to see if it could be extended sufficiently to manufacture all the electrical supplies needed by the companies which they and their associates in Philadelphia control. They were accompanied on the tour of inspection by Harry Payne Whitney and by H. H. Vreeland and M. G. Starrett, president and chief engineer, respectively, of the Metropolitan Street Railway Company. They were received by Dr. F. A. C. Perrine, president of the company, and conducted through the plant, and they looked over the site for the proposed extension of the plant. Arrangements for the acquirement of an interest in the Stanley Company, for an extension of the Pittsfield plant and for the manufacture of the electrical supplies needed by the companies controlled by Mr. Whitney and his associates, were made quietly since the inspection of the plant. Work on new buildings for the plant is already in progress. It is expected that before the end of the summer the capacity of the plant will be increased sixfold."

### Telephones on Fast Trains

The new "Twentieth Century Limited," which will be started by the New York Central & Hudson River Railroad on June 15 to make trips between New York and Chicago in 20 hours, is to be equipped with a telephonic service that will give passengers instantaneous communication with each station at which the train will stop. Telephone transmitters and receivers are being erected close to the Central's tracks at Albany, Syracuse, Rochester and other stations, and a special telegraph wire will be set apart for quick telephone service. Whenever the train stops and a passenger or railroad man wishes to establish communication with some person in touch with the telephone system a wire from the train will be connected to the special wire.

### Chicago Subway Scheme

It is said that former Mayor Hempstead Washburne, William A. Alexander and S. Gregory will soon ask the Council of Chicago for permission to build a subway extending to all parts of the city and honeycombing the entire downtown district. An expenditure of between \$40,000,000 and \$50,000,000 is contemplated by the projectors, who plan to turn the huge tunnel over to the city at the end of 15 years for a sum to be agreed upon. Their compensation during that period is also to be agreed upon later. Thirty days after the ordinance has been passed and accepted, Mr. Washburne is reported to have said, work will begin. It is estimated that it will take 3½ years to construct and put into operation the subway in the downtown business districts. Everything in the way of capital up to \$50,000,000, it is stated, has been secured. The project contemplates the use of the subway by the traction companies on all sides of the city, its use for all manner of electric wires, including the wires of the Chicago Telephone Company, and possibly at a later day forcing the abandonment of the elevated loop and the use of the subway by elevated trains, as is the case in Boston. The ordinance will ask for permission to dig from curb to curb and 24 feet deep.

### CORRESPONDENCE

#### Restrictions on the Controller Handle

Chicago, June 2, 1902.

EDITORS STREET RAILWAY JOURNAL:

In my article on the above subject in the STREET RAILWAY JOURNAL of May 24, 1902, a misplacement of punctuation marks which slipped through unnoticed made certain sentences comparatively meaningless and incorrect, and I wish to take this opportunity to correct them. These sentences (which were near the bottom of page 633) were intended to state an objection which has been urged against devices restricting the rate of turning on the current at the controller. The objection, as it has been urged, is that it is necessary to adjust any such device to give only such a rate of acceleration as can be obtained on a slippery track, if it is to prevent the slipping of wheels, which is one of the objects for which it is designed. This being the case, there is no way for the motorman to increase his rate of acceleration when the track is dry and it might be desirable to do so. This is undoubtedly one of the most serious objections that has been urged against this class of devices. It is, however, largely offset by the fact that the timetable on most roads is the same for times when the track is slippery and when it is dry. The only disadvantage, therefore, in limiting the rate of acceleration at all times to that which can be maintained when the track is slippery is that it prevents lost time being made up as easily as might be if the device were not present when the track was dry. Since, however, there is the most chance for delay when the weather conditions are such that the track is slippery, this objection is not as strong as would at first appear.

J. R. CRAVATH.

### Street Railway Patents

[This department is conducted by W. A. Rosenbaum, patent attorney, Room No. 1203-7 Nassau-Beekman Building, New York.]  
UNITED STATES PATENTS ISSUED MAY 27, 1902

700,763. Trolley Catcher; A. W. Ham, Lansingburg, N. Y. App. filed Oct. 23, 1901. A spring winding drum controlled by a pawl and ratchet.

700,810. Car Truck; E. Peckham, New York, N. Y. App. filed July 15, 1897. The object is to improve the spring support for four-wheeled cars and to render more efficient certain appurtenances of the truck structure.

700,851. Automatic Signal; R. L. Storm, Waterloo, Ia. App. filed July 25, 1901. As each car goes into a section, it operates a register which shows at all times how many cars are in a section.

700,894. Pedestal; P. Brown, Wilmington, Del. App. filed Feb. 26, 1901. A wearing plate is interposed between the pedestal and box, and is provided with horizontal flanges to hold them in position and vertical flanges to take the wear off the flanges of the journal box.

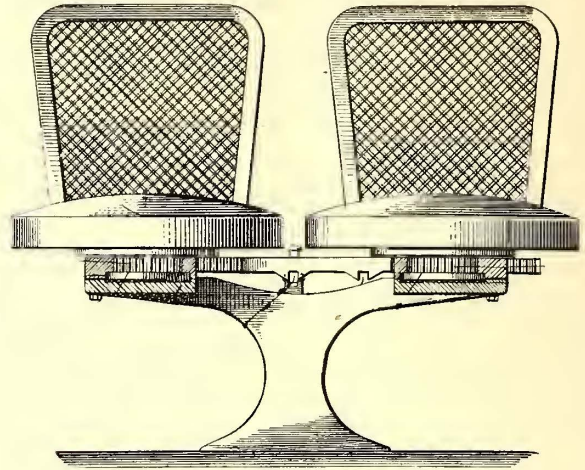
700,992. Boltless Cast Steel Car Truck; W. E. Symons, Savannah, Ga. App. filed July 6, 1901. The side frames are each cast in a single piece and have a central transverse opening, the ends of the transom being fitted in the openings keyed to the side frame.

700,994. Aligning, Securing and Bonding of Rail Ends; F. D. Torre and D. B. Banks, Baltimore, Md. App. filed Feb. 11, 1901.

Consists in applying chocks to the rail ends, which are preliminarily heated to a welding heat, and then applying sufficient pressure to the outer faces of the chocks to weld the same together and simultaneously raise the heads of the rails into surface alignment.

701,047. Car Seat; L. Janson, Brooklyn, N. Y. App. filed Sept. 21, 1901. Two seats mounted to turn on a single support, are connected by a single rack which engage gears centered on the seats; by moving the rack, both seats are turned at the same time.

701,085. Trolley Wheel; J. Preston, Joliet, Ill. App. filed Jan. 29, 1902. The wheel is mounted on cone bearings in the free ends of the two arms of the harp, which are pivoted together.



PATENT NO. 701,047

701,247. Trolley; W. L. Baker, Painesville, Ohio. App. filed Jan. 20, 1902. The ends of the wheel shaft are mounted in elongated holes in the harp so that the wheel may tilt.

UNITED STATES PATENTS ISSUED JUNE 2, 1902

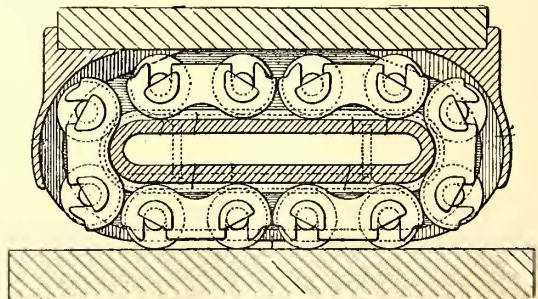
701,292. Wheel; F. M. Canda, New York, N. Y. App. filed Oct. 30, 1901. The rim of the wheel is of harder metal than and separate from the middle or hub portion, the two parts being connected by a binding material fusible at a lower temperature than either the rim or the hub.

701,361. Combined Fender and Brake; M. Kühn, St. Louis, Mo. App. filed Feb. 24, 1902. Details of an apparatus by which the current is cut off, the fender thrown into operative position and the brake applied by throwing the controller handle to one limit of its movement.

701,398. Arrangement for Shifting the Points of Tramway or Railway Lines; G. D. Ross, Glasgow, Scotland. App. filed Feb. 12, 1902. A projection from the car enters an inclined groove in a pivoted plate in the track, the plate being thus swung and the motion being communicated to the switch-point.

701,416. Car Side Bearing; F. G. Susemihl and A. Torrey, Detroit, Mich. App. filed March 3, 1902. An endless train of independent roller trucks run in an endless track between the upper and lower members of the truck.

701,469. Railway or Tramway Vehicle; D. D. Coath, Rangoon, India. App. filed March 6, 1901. According to this invention the wheels of the vehicle are made with flanges on the outside and the tread of the wheel is of greater diameter on its inside edge than on its outer edge.



PATENT NO. 701,416

701,515. Car Bolster; C. S. Shallenberger, Milwaukee, Wis. App. filed Nov. 14, 1901. Details.

701,565. Trolley Rail; W. N. Haring, Nyack, N. Y. App. filed Oct. 19, 1901. The top of a girder rail is made in two parts, and a conduit is formed between them for the reception of an electrical conductor, the parts being secured together by bolts.

701,568. Car Fender; J. D. Hodges, St. Louis, Mo. App. filed



Nov. 19, 1901. A fender arranged to be tripped to fall onto the roadway when an object is struck.

701,682. Fender; E. E. Clark, St. Louis and E. E. Clark, Sedalia, Mo. App. filed April 12, 1901. The tripping of the fender to drop it, which is accomplished automatically, also operates a device for applying the brake.

701,685. Electro-Pneumatic Switch System for Electric Railways; W. H. Cummer, Toledo, Ohio. App. filed Nov. 8, 1901. By the aid of the car controller, the motorman can control certain air motors for throwing the switch in the rails. After the passage of the car, the motors are automatically returned to a neutral condition.

701,781. Track Switch; S. F. Weaver, Philadelphia, Pa. App. filed March 10, 1902. Details.

701,790. Switch Operating Mechanism; F. A. Carroll, Penn Yan, N. Y. App. filed Aug. 23, 1901. A cam carried by the car strikes a lever in the roadbed to move the switch.

701,795. Mechanism for Removing Ice and Snow from Third Rail or Similar Conductors; E. Chamberlin and W. T. Thompson, Brooklyn, N. Y. App. filed April 3, 1901. An ice breaker followed by a brush arranged just ahead of the contact shoe to clean the ice from the track.

### PERSONAL MENTION

MR. WILLIAM R. ROSBOROUGH has resigned as superintendent of the Norfolk Railway and Light Company, of Norfolk, Va.

MR. HENRY E. LONGWELL, mechanical engineer for the Westinghouse Machine Company, of Pittsburg, sailed for England on Wednesday.

SENATOR NELSON H. ALDRICH has resigned the presidency of the United Traction & Electric Traction Company, of Providence, R. I.

MR. J. H. MERRILL, of Cleveland, has been appointed general manager of the Ohio Central Traction Company and the Mansfield, Crestline & Galion Railway, succeeding W. E. Haycox, resigned.

MR. DAVID DANIESSOE, an electrical engineering expert of Langsernd, Wernland, Sweden, is now in the United States for the purpose of studying American electrical traction methods. Mr. Daniessoe was in Pittsburg on June 6.

MR. GEORGE H. BOWERS, secretary of the Peckham Manufacturing Company, was married on June 4 to Miss Ella Constance Godfrey. Mr. Bowers has a great number of friends in the street railway fraternity, and one and all wish him a most successful and happy future.

MR. A. T. PERKINS has been appointed superintendent of the Kansas City, St. Joseph & Council Bluffs Railroad, of St. Joseph, Mo., succeeding Mr. G. M. Holh, who has been appointed superintendent of telegraph of the Missouri Railroad lines, with headquarters at St. Joseph, Mo.

MR. S. M. JAMES has been appointed second assistant to the general superintendent of the Metropolitan Street Railway Company, Kansas City. Mr. James has been in the employ of the company for a great number of years, having started as an inspector, and his promotion is a recognition of the faithful performance of all his duties.

MESSRS. W. H. AND C. F. HOLMES, before retiring from their positions with the Metropolitan Street Railway Company of Kansas City, were each presented a gold watch fob set with a large diamond, and also a framed group of photographs of their old employees. The presentation was made in their offices, and a large delegation of men, representing all departments, took part in the pleasant ceremony.

MR. ALPHEUS S. WILLIAMS, acting United States consular agent at Kimberland, Cape Colony, and assistant general manager of the De Beers Consolidated Mines, has compiled a list of American engineers now in South Africa. The list gives, in the majority of cases, the work being done by the engineer, the college from which he graduated and the professional work both before and during his sojourn in South Africa.

MR. W. A. SATTERLEE, general superintendent of the Metropolitan Street Railway Company, Kansas City, Mo., has been made assistant and close adviser to President Bernard Corrigan, with entire charge of the operation of the road. A number of Mr. Satterlee's previous duties have been placed on the shoulders of his subordinates, and he is now in a position to devote his time to larger matters. Although a strict disciplinarian, his absolute fairness makes him extremely popular with the men, and his pro-

motion has given great pleasure to his associates, who appreciate his ability and are glad to see it recognized.

MR. S. C. COOPER, who has taken the position of secretary of the Cincinnati Traction Company, Cincinnati, Ohio, has been prominent in street railway circles of the East. He is third vice-president of the Street Railway Accountants' Association of America, and, although a comparatively young man, has had wide experience in the financial management of railways. He is a native of Georgia, and has been associated with the Elkins-Widener syndicate for a number of years and connected with many roads in the South. At the time of his election as secretary of the Cincinnati Traction Company he was secretary and treasurer of the Baltimore Security & Trading Company, a New York corporation doing business at Havana, Cuba. He has also filled the position of secretary and treasurer of the City & Suburban Railway, of Washington, D. C.

MR. JOHN B. HARRISON, for fourteen years one of the most prominent and enterprising citizens of Knoxville, Tenn., is dead. The deceased was forty-six years of age. He was born in Anderson, S. C. Nineteen years ago he went to New York city, where he remained for five years, after which he went to Knoxville. He at first entered the shoe business in Knoxville, being located on Market Square, where he continued in this business for two years, when he became a financial broker. He remained in the brokerage business up to the time of his death. In 1896 and 1897 Mr. Harrison was general manager of the Citizens' Street Railway and the Mutual Light & Power Company, both of which were absorbed early in 1898 by the Hambleton Syndicate, of Baltimore, which consolidated the street railway, light and power interests of Knoxville.

MR. GEORGE B. FRANCIS has resigned his position as chief engineer of the street railway system of Providence, R. I., to accept a position as civil engineer with Westinghouse, Church, Kerr & Co., of New York. Mr. Francis was born in West Hartford, Conn., in 1857. He entered the engineering department of the



GEORGE B. FRANCIS

city of Providence in 1874 and spent nearly eight years there on municipal work. He was afterward employed for two years on construction work on the West Shore Railroad in the engineering department, and was also connected with the engineering department of the Oregon Railway & Navigation Company, Northern Pacific Railroad, Northern Pacific Terminal Company, of Portland, Ore.; the New Jersey Junction Railway, the South Pennsylvania Railroad and the New York Central Railroad. In 1887 he returned to Providence and was principal assistant engineer of the New York, Providence & Boston Railroad until 1892, when he became engineer of the Terminal Company at Providence, supervising the general design and arrangement of the terminal in that city. In 1896 he was appointed resident and acting chief engineer of the South Terminal station work in Boston. Upon completion of that work in January, 1900, he became chief engineer of the street railway system at Providence, R. I., which comprises the following companies: Union Railroad Company, Rhode Island Suburban Railway Company, Interstate Consolidated Street Railway Company, and the Pawtucket Street Railway Company. His principal work in this last position has been the general extension of the various lines, suburban and interurban, the construction of new shops, car houses and the design and construction of a new central power station for this system. Westinghouse, Church, Kerr & Company are engaged in a number of large projects in various parts of the United States, and in his connection with this company Mr. Francis will be called upon to decide many problems in all branches of engineering. Mr. Francis is a member of the Boston Society of Civil Engineers, in which he is a director; the American Society of Civil Engineers, and the Institution of Civil Engineers of Great Britain. In addition to the work previously mentioned he has acted as consulting engineer on several important engineering problems, one of which was the foundations for the Kingsbridge power station of the Third Avenue Railroad, in New York city.

## LEGAL DEPARTMENT

CONDUCTED BY WILBUR LARREMORE OF THE NEW YORK BAR

### Some Recent Negligence Cases

The case of *Clark vs. Metropolitan Street Railway Company*, which was before the Appellate Division of the Supreme Court, First Department, in January last (68 App. Div., 49), disclosed a state of facts in a mild degree similar to that occurring at the terminals of the Brooklyn Bridge during the busy hours, and which is apt to happen at any time on all street railways operating open cars. It appeared that the defendant's cars were so arranged that at the end of a line, and before starting back, it was necessary to raise a bar and lower a step on one side of the car. Plaintiff was at end of the line when a car arrived, and attempted to get on before the step was lowered, and as it was lowered it struck his knee. He was accustomed to taking the car at that point, and knew that the step must be lowered, but did not notice that it was not lowered until it struck him. It was held that he took the risk of an injury incident to the condition of the car when he attempted to board it.

This decision, exonerating the railway company from liability, was by a bare majority of the Appellate Court, thus indicating that the question involved was a close one. In our judgment, however, the decision is sound and just. There is a general principle of the law of negligence that "when an appliance, or machine, or structure not obviously dangerous has been in daily use for years, and has uniformly proved adequate, safe and convenient, its use may be continued without the imputation of culpable imprudence or carelessness. *Lafflin vs. R. R. Co.*, 106 N. Y., 136." The converse of this principle is also applied that when by the occurrence of an accident it has been demonstrated that an appliance or structure whose safety has been relied on is actually unsafe, it is incumbent upon persons using the same to discontinue its use or improve upon it so as to avert future casualties. It is, however, a difficult matter to perceive what precautions can be taken for the prevention of accidents such as those disclosed in the *Clark* case, where a street railway terminal is placed in an open street. The very nature of the situation precludes elaborate arrangements for preventing would-be passengers standing in a crowd from making a rush to gain seats on a car that has just arrived and is about to start back. Under such circumstances it is only fair for the courts to lean, as they did in the *Clark* case, against fastening liability upon a company, as the injury obviously would not have occurred but for a passenger's reckless haste.

In *Wolf vs. Third Avenue Railroad Company*, before the New York Supreme Court, Appellate Division, First Department, in January, 1902 (67 App. Div., 605), it was held, where a street railroad company had caused a trench to be excavated in a street, such trench being bridged over at crosswalks, and a car stopped in the night time at such a point that a passenger alighting stepped into the trench, the passenger not having been warned by the conductor, that in an action for the injuries the jury were warranted in finding negligence, either in stopping the car opposite the open trench or in not properly guarding the trench. The court explicitly holds that where a street railroad company contracts with one to make an excavation in a street near its tracks, while the company is not liable for the negligence of the contractor, it owes a duty to the public to guard the excavation.

This decision is in line with that of the New York Court of Appeals in *Deming vs. Terminal Railway Company*, of Buffalo (169 N. T., 1), discussed in an article in this department of the *STREET RAILWAY JOURNAL* for May 31, 1902.

In *Cleveland City Railway vs. Osborn*, decided by the Supreme Court of Ohio in February last (63 N. E., 604), it was held that in an action to recover for personal injury occasioned by negligence of the defendant, the plaintiff cannot recover by merely proving an act of the defendant which was the proximate cause of the injury; but, to authorize a recovery, the plaintiff must also show that such act resulted from culpable negligence by the defendant.

This case was decided on the theory, as the jury found the facts, that the plaintiff was thrown from a street car by its being brought to a sudden stop and a collision with a wagon in front. The

wagon suddenly and without warning turned in front of the car, which was in motion, and the gripman, in order to avoid a collision, put the brakes on hard. He was not able entirely to avert the collision, but the result of his action was to render the shock much less serious than it otherwise would have been. The court held that there was no negligence shown on the part of the gripman or to be imputed to him; that what he had done was the best that could be done in a sudden emergency to minimize a calamity that was bound to happen through another's negligence, and that, therefore, no liability existed on the part of the company. The following language from the opinion of the Ohio court felicitously states the true rule to govern such cases:

"If the gripman had not tried to avoid the collision, and the defendant in error had been injured while sitting in the car, the plaintiff in error would have been liable. Now it is claimed that because he did endeavor to avert the collision he did it too vigorously, and that the plaintiff in error should pay for a result which was unusual, and which could not have been anticipated. It is true that the plaintiff in error was required to exercise toward the defendant in error, as a passenger, the highest practicable degree of care, or, to state it in another way, the highest degree of care possible under the circumstances; but we are sure that the gripman did no more than he ought to have done, and we are not able to conceive what else he could have done under the circumstances. The jury was not authorized to infer negligence from the proven facts. The judgment of the lower court presents the anomaly of requiring one of the strict performance of an act as a legal duty, yet requiring it at his peril. One cannot do right and do wrong at the same time. The injury to the defendant in error, as she puts it before the court, was a pure accident, without the elements of negligence or culpability. It is *dammum absque injuria*."

In connection with this case may be cited the decision of the Supreme Court of New Jersey, in *Schwanewede vs. Railway Company* (February, 1902, 51 Atl., 696), wherein it was held that if it appears "that a trolley car motorman is not going to respect your right to cross the street first, you must wait, or you are guilty of contributory negligence if hurt. A person cannot take chances and hold himself free from contributory negligence. There is a difference between an unforeseen peril and being overtaken by one recklessly incurred."

#### LIABILITY FOR NEGLIGENCE.

MASSACHUSETTS.—Personal Injuries—Nervous Shock—Element of Damages.

Plaintiff, while in one of defendant's cars was thrown against a seat, receiving a slight blow, in consequence of a collision for which defendant was to blame; and afterwards had a good deal of suffering of a hysterical nature. Held, that plaintiff could recover for the shock if resulting from a jar to her nervous system which accompanied the blow to her person, and was not required to show that the shock was the consequence of the blow, it being assumed that the jar was due to the same cause as the blow.—(*Homans vs. Boston Elevated Ry. Co.*, 62 N. E. Rep., 737.)

MASSACHUSETTS.—Street Railways—Starting Car—Negligence—Evidence.

Plaintiff sued for injuries received by being thrown from an electric car as she was stepping off. She alleged that defendant carelessly caused the car to start by its servants, and testified that the conductor rang two bells, on which the car started, but on cross-examination admitted that all she knew about it was that the car started. Her witnesses did not see who rang the bell. The conductor testified that he was collecting the fares, when, just as she was getting off, some one on the rear platform rang the bell. Held, not to justify a finding that the negligence of any employee of defendant caused the car to start.—(*O'Neil vs. Lynn & B. R. Co.*, 62 N. E. Rep., 983.)

MASSACHUSETTS.—Municipal Corporations—Public Ways—Conduits—Transit Commissioners—Powers—Removal and Relocation of Conduit—Liability for Expenses—Liability of Owner—Statutes—Construction—Courts—Jurisdiction—Appeal—Submission on Agreed Facts—Variance—Reservation of Question.

1. Where no question of variance between the declaration and agreed facts is specially reserved in a case submitted on agreed facts, such question will not be considered on appeal, as no question of pleading will be considered in a case submitted on agreed facts unless specially reserved.

NOTE.—Communications relating to this department should be addressed to Mr. Larremore, 32 Nassau Street, New York City.

2. St. 1894, chap. 548, sec. 36, authorizes the Boston Transit Commission to order the removal or relocation of any conduit deemed to interfere with a subway, and requires the owner of such conduit to comply with such order. The commission ordered the removal of a conduit, granting a new location, and notified the owner, who refused to obey unless the commission assumed the expense; and the latter, after notifying the owner that it would do the work at the owner's expense, removed the old conduit, and constructed a new one, which was used by the owner. Held, in an action by the city against the owner for the expense, that the act of the owner by only objecting that the city should bear the expense, and not to the rebuilding of the conduit, and by using the new conduit, precluded himself from raising the defense that he did not wish the conduit rebuilt, and so was not liable.

3. As the statute imposes a duty on the owner of the conduit to obey the order of the commission, the latter, on the failure of the owner to comply therewith, may remove the conduit, and recover the expense from the owner, though it has made no prior request on the owner to perform the work.

4. The latter clause of St. 1894, chap. 548, sec. 36, providing that the commissioners may designate locations in or adjoining the subway for conduits, gas pipes, etc., is an addition to, and not a limitation on, the prior clause of the section authorizing the commissioners to remove or relocate any conduit, etc., deemed to interfere with a subway, and in the exercise of the latter power the commissioners may grant a relocation not in or adjoining the subway.

5. The jurisdiction in equity given by section 20 of the act to the Supreme Judicial Court and the Superior Court to compel a compliance with the act is not exclusive, and the city, on removing and rebuilding the conduit, may bring a law action against the owner thereof for the expense incurred therein.

6. Pub. St. chap. 49, sec. 17, authorizing and providing a method for the removal of buildings or materials within the limits of the layout of a highway, had no application to the removal of the conduit, though the subway was a public way.—(City of Boston vs. Boston Electric Light Co., 62 N. E. Rep., 978.)

MASSACHUSETTS.—Contracts—Evidence—Parol—Additional Consideration—Release.

1. The fact that a release for personal injuries recites a money consideration does not preclude a showing that an oral contract of employment was made as additional consideration therefor.

2. Evidence of an oral contract of employment, made as a part consideration of a release for personal injuries, is not contradictory of the release, and is admissible in an action on such contract, the rights thereunder not arising out of the injury.—(Galvin vs. Boston Elevated Ry. Co., 62 N. E. Rep., 961.)

MASSACHUSETTS.—Evidence—Examination of Experts—Declarations in Interest.

Where, in an action for personal injuries, plaintiff called a physician as a witness, who testified that he had made examination of plaintiff at the request of his counsel, for the purpose of testifying for plaintiff, it was not error to permit the witness to testify to statements made to him by the plaintiff, at the time of such examination, with reference to his bodily condition, such testimony being admissible as the grounds and reasons for an opinion to be given in evidence by the witness.—(Cronin vs. Fitchburg & L. St. Ry. Co., 63 N. E. Rep., 335.)

MASSACHUSETTS.—Street Railways—Collision—Evidence—Judgment of Party Injured—Questions for Jury.

Plaintiff, in a covered wagon, drove out of a cross street on to a street on which there was a double-track railway. As his horse's head was over the first rail, he saw a car approaching about 200 ft. distant. He was driving but little faster than a walk, and continued on without quickening the pace. The motorman turned off the power, and applied the brakes, but the car struck the wagon. Held, that the question of his negligence did not depend on his judgment as to whether there was any chance to cross the track, and evidence thereof was properly excluded.—(Whitman vs. Boston Elevated Ry. Co., 63 N. E. Rep., 334.)

MISSOURI.—Street Railways—Crossing Accident—Death of Fireman—Negligence—Instructions—Looking and Listening.

1. In an action against a street railway for the death of plaintiff's decedent, by collision with a car while he was driving a wagon for the fire department, an instruction that it was his duty to exercise "ordinary care," to make use of his faculties on approaching the crossing, and, whether or not defendant's servants gave signals, it was decedent's duty to look and listen before driving on the track, and if he "failed to exercise ordinary care, and failed to look and listen," and thereby contributed to his injury, plaintiff could not recover, was not erroneous, as declaring failure to look or listen negligence under all circumstances, thereby imposing a higher degree of care on decedent than is required of a fireman.

2. Since the instruction did not declare failure alone to look and listen negligence, it was not erroneous for failing to add that only in case, by looking and listening, decedent would have seen and heard the car in time to avoid the injury, failure to do so would preclude recovery.

3. In an action for the death of the driver of a wagon of the fire department which collided with defendant's street car, an instruction that if the motorman had no warning of the approach of the wagon, nor could have known it by vigilant watch before both car and wagon reached the street crossing, and the wagon and car were then going at such speed that it was impossible for the motorman to avoid a collision, the jury should find for defendant, was not open to the objection that it exonerated the motorman from all negligence prior to the time the car reached the intersection of the streets.—(Guinney vs. Southern Electric R. Co., 67 S. W. Rep., 296.)

NEW HAMPSHIRE.—Street Railways—Personal Injuries—Requested Instructions—Necessity—Misleading Instructions.

1. The rule that a verdict will not be set aside because the instructions given are not sufficiently specific, where no request for more definite instructions has been made, is not applicable where the instruction is given in response to a written question from the jury after their retirement and adjournment for the day, and without the knowledge of counsel.

2. One who negligently goes upon a street railway track may nevertheless recover, if the motorman, after discovering his dangerous situation, could have avoided injuring him by due care, and he himself could not have escaped after discovering the approaching car.

3. In an action against a street railway for personal injuries, where the jury, after retirement, sent to the presiding justice a written question—whether negligence on plaintiff's part would preclude his recovery, without regard to whether the motorman was using due care—the justice's reply that "if the plaintiff was not using due care, and his want of it was the cause of, or directly contributed to, the injury, he cannot recover, even if the motorman was also in fault," was objectionable, because not sufficiently specific; tending to make the jury understand that, whatever the circumstances, plaintiff's negligence would preclude recovery.—(Parkinson vs. Concord St. Ry., 51 Atlantic Rep., 268.)

NEW JERSEY.—Contracts—Sealed Instruments—Action—Pleading—Plea—Want or Failure of Consideration—Sufficiency.

1. Pub. Laws 1900, p. 362, providing that any party to an action on a sealed instrument may plead and set up want or failure of consideration in an action on the contract, does not authorize a plea of want of consideration in an action on a sealed instrument, reciting the mutual covenants of the parties as the respective considerations for the contract, as such plea merely raises the question of the sufficiency of the consideration stated in the sealed contract, but such objection must be raised by demurrer or plea of non est factum.

2. A plea in an action on a contract which merely states that the consideration has failed is a statement of a legal conclusion, and bad, in failing to state the facts showing the manner in which the consideration failed.

3. A plea of partial failure of consideration in an action on a sealed instrument reciting a consideration is bad.—(Raritan R. R. Co. vs. Middlesex & S. Traction Co., 51 Atlantic Rep., 623.)

NEW JERSEY.—Street Railroads—Injury to Passenger.

A lad of nearly twelve years, without invitation, express or implied, got upon the step of the front platform of a moving electric street car, meaning to become a passenger on the car. Access to the platform was barred by a closed door, the place provided for ingress to the car being the rear platform. He rapped on the door, and the motorman looked toward him, but did not open the door, or stop the car, or lessen the speed. The car struck a wagon, and the boy was thrown off and injured. Held, in an action against the company operating the street railway to recover damages for such injury, that the plaintiff was properly nonsuited, because the company owed him no duty except to abstain from willful injury.—(Barlow vs. Jersey City, H. & P. Ry. Co., 51 Atlantic Rep., 463.)

NEW JERSEY.—Motive—Evidence—Injury to Passenger While Alighting—Negligence.

1. The motive of plaintiffs in bringing an action being immaterial, they showing a good cause of action, evidence that they are residents of another State, and have there brought action for the same cause of action, is not admissible to show bad faith.

2. It is negligence for the carrier to couple a switch engine to a train, after it has reached its terminus, while passengers are alighting, jarring it so that a passenger is thrown down and injured, though the coupling is in the usual manner, and with no more force than necessary to effect it.—(Raughley et ux. vs. West Jersey & S. R. Co., 51 Atlantic Rep., 579.)

## NEW JERSEY.—Street Railroads—Injury to Person on Track.

1. If it appears that the trolley car motorman is not going to respect your rights to cross the street first, you must wait, or you are guilty of contributory negligence if hurt.

2. A person cannot take chances and hold himself free from contributory negligence. There is a difference between an unforeseen peril and being overtaken by one recklessly incurred.—(Schwanewede vs. North Hudson Co. Ry. Co., 51 Atlantic Rep., 696.)

## NEW YORK.—Remarks of Judge—Correction in Charge.

Any error in remark of the judge in presence of jury that there is no evidence of negligence of the motorman is cured by his leaving to the jury the question of his negligence, and stating in the charge that when he said he should withdraw from their consideration any question of his negligence he overlooked certain testimony, and that this testimony was for them to be considered on that question.—(Yunkeich vs. Brooklyn Heights R. Co., 75 N. Y. Supp., 86.)

## NEW YORK.—Bill of Particulars—Personal Injury.

Plaintiff in an action for personal injuries, not alleged to be permanent, cannot be compelled to give bill of particulars thereof, with the nature, location, and probable duration of each, and the way they were received; though, in a proper case, he may be required to make his complaint more definite and certain, and may be subjected to physical examination.—(English vs. Westchester Electric R. Co., 75 N. Y. Supp., 45.)

## NEW YORK.—Costs—New Trial for Error of Jury.

An order granting a new trial for a mistake of the jury, without imposing the costs of first trial, will be affirmed only on payment of those costs and the costs of an appeal therefrom.—(Helgers vs. Staten Island Midland R. Co., 75 N. Y. Supp., 34.)

## NEW YORK.—Trolley Cars—Injury to Conductor—Negligence—Contributory Negligence—Assumption of Risk.

1. A trolley car company's negligence is established by proof that, without cause, it constructed its double tracks so that for a few feet they were so close that when cars passed at that point a conductor standing on the running board of one, as it was necessary to collect fares, would be struck by the other, and that the conductor was not warned thereof.

2. A conductor standing on the running board of a trolley car, as was necessary in collecting fares, struck by another car at the only point on the line where the tracks were too near to permit cars to pass with safety to one so standing, engrossed in performance of his duty, and not warned of the danger at that point, or of the approach of the other car, is not, as matter of law, guilty of contributory negligence.

3. A conductor on a trolley line does not assume the risk of being struck by a passing car, while standing on the running board of his car, collecting fares, where the tracks are unnecessarily constructed too near together for only a few feet of the line; he not knowing of the danger, and it not being obvious to him.—(True vs. Niagara Gorge R. Co., 75 N. Y. Supp., 216.)

## NEW YORK.—Street Railroads—Crossing Accident—Negligence of Defendant—Contributory Negligence—Jury Question.

1. Plaintiff, before attempting to cross a double-track street railroad noticed a car approaching on the nearest or uptown track, about two blocks distant from the crossing, and a car approaching on the downtown track, about one block distant, and she crossed the uptown track and stopped between the tracks to allow the car on the downtown track to pass, and the car on the uptown track, running fast, and without sounding a gong, came past, and caught and injured her between the cars. Held, that the circumstances were sufficient to warrant a finding of defendant's negligence.

2. A person about to cross a double-track street railroad, who sees an approaching car on the nearer track about two blocks distant, and one on the further track about one block distant, is not guilty of contributory negligence, as a matter of law, in passing over the first track, and stopping between the tracks to allow the other car to pass, as she is not bound to assume that the car on the first track will traverse twice the distance, and reach the crossing before the other car has passed.—(O'Callaghan vs. Metropolitan St. Ry. Co., 75 N. Y. Supp., 171.)

## NEW YORK.—Question for Jury—Weight of Evidence—Accident at Street Railway Crossing—Negligence—Evidence—Contributory Negligence.

1. There being some evidence in support of plaintiff's claim, the question whether the weight of evidence is with defendant is for the jury.

2. Testimony that plaintiff drove forward to go over a street railway crossing at signal from the company's inspector, and that as the horses got on the track the inspector signaled a car to cross, and plaintiff pulled back as far as he could, but, there being a curve in the track, the rear of the car swung out and struck the team, is sufficient for a finding that the accident resulted from

negligence of the inspector; it not necessarily following that the front of the car would swing out equally far at that point, so that plaintiff must have advanced after the front got by.

3. Whether a person in a team at a street car crossing, who, because of a curve in the track, was struck by the rear end of street car swinging out, was guilty of contributory negligence in turning to one side, after he had backed as far as a car in the rear would allow, is a question for the jury.—(Fay vs. Brooklyn Heights R. Co., 75 N. Y. Supp., 113.)

## NEW YORK.—Street Railroads—Repair of Street—Municipal Resolutions—Admissibility—Street Railroad Company's Negligence.

1. Railroad Law, Sec. 98, requires a street railroad corporation to keep in permanent repair the portion of streets between its tracks and 2 ft. in width outside its tracks, under the supervision of the proper local authorities, and whenever required by them to do so, and in such manner as they may prescribe. Syracuse City Charter, Sec. 30, authorizes the mayor and council to regulate and repair highways and streets; and section 138 empowers the council to repair pavements, and assess abutting property owners therefor. Held, that a resolution of the council, approved by the mayor, empowering a paving company to take up the pavement laid by a street railroad company, and repave the street and keep it in repair in accordance with the city's specifications, is admissible in evidence in an action against the railroad company for injuries sustained by a passenger in stepping into a hole in the pavement on alighting from its cars, as showing that the company was relieved from the obligation of keeping in repair such portion of the street.

2. In such case the resolution was admissible on the question of the street railroad company's negligence, though it were not relieved of its obligation to keep the street in repair by the city's action.—(Welch vs. Syracuse Rapid Transit Ry. Co., 75 N. Y. Supp., 173.)

## NEW YORK.—Incompetent Evidence—Failure to Object—Waiver of Error—Street Railways—Personal Injuries—Proximate Cause—Evidence.

1. Where incompetent evidence is received without objection or exception, the denial of a subsequent motion to strike it out is not prejudicial error.

2. Evidence that the back of plaintiff in a personal injury action against a street railway company was black and blue after the accident, and that liniment was applied thereto by a physician's direction for two months; that plaintiff's head was injured by a scalp wound, requiring four stitches; that she was bruised and shaken up; and that a headache developed soon afterward, when formerly she had headache but seldom—was sufficient to support a finding that the accident was the cause of the headache.—(Lindemann vs. Brooklyn Heights R. Co., 74 N. Y. Supp., 988.)

## NEW YORK.—Employees—Personal Injuries—Evidence—Dismissal of Complaint.

Plaintiff's intestate was a man of allwork in defendant's power house. He was called one day to take the place of another employee in operating a coal conveyor or filler, and, after working there for eight or ten hours, was caught in the endless chain of the conveyor, and drawn under a filler, receiving injuries resulting in his death. There was no evidence as to how the accident happened, nor what caused it. The case was equally devoid of evidence of lack of contributory negligence. Held, not error to dismiss the complaint.—(Palcheski vs. Brooklyn Heights R. Co., 74 N. Y. Supp., 987.)

## NEW YORK.—Street Railways—Negligence of Passenger Boarding Moving Car—Negligence per se.

It is not negligence per se for one to attempt to board a street car moving slower than a man can walk.—(Kimber vs. Metropolitan St. R. Co., 74 N. Y. Supp., 966.)

## NEW YORK.—New Trial—Discretion of Trial Court—Review—Action for Injuries—Excessive Damages.

1. Where the Appellate Court is called upon to exercise its discretion in reviewing the exercise of the trial court's discretion in granting a new trial, the fact that the trial court had the witnesses before it should have considerable weight in support of its decision, but it is not controlling upon the Appellate Court.

2. The uncontradicted evidence of plaintiff showed that when she was injured she was a self-supporting washerwoman, sixty-three years old, a widow, in vigorous health, and earning for the support of herself and an unmarried, sick, and dependent daughter from \$8 to \$11 a week, and that as the result of her injuries she had become bent and decrepit, in constant pain, and an apparent charge for life upon her married daughter. Held, that a verdict for \$1,500 was not sufficiently excessive to show that the jury was swayed by passion, prejudice, or sympathy.—(Sidmonds vs. Brooklyn Heights R. Co., 74 N. Y. Supp., 989.)

## NEW YORK.—Street Railway—Passengers—Personal Injuries—Dismissal of Complaint.

In an action by a passenger against a street railway company for injuries received while alighting from a car, due to its starting forward suddenly, plaintiff testified that he signaled the conductor to stop, and that the car slowed up, and was practically at a stop; that he did not hear the bell ring; that the car was rattling; that he saw the conductor's hand go up as though to ring. Held, error to dismiss the complaint.—(Harris vs. Union Ry. Co., of New York City, 74 N. Y. Supp., 1012.)

NEW YORK.—Street Railway—Personal Injuries—Instructions—Applicability to Error—Harmless Error.

1. In an action for injuries sustained in a collision of two street cars, plaintiff testified that a policeman asked if he did not want to go to a hospital; that he said, "No," he preferred to go to G.'s house; that "they took a cab for us, and put us in the cab, and I went up to my friend Mr. G.'s house." On cross-examination he stated that when he first came to, after the accident, he "was in a cab. That was the first time I knew anything about it, when my friend G. and the other fellow started to push me around in the cab." Held, to sustain a charge that plaintiff testified that a policeman took him to G.'s house, and that the jury could consider why the policeman was not called as a witness.

2. Even though there was no policeman in the cab with plaintiff, there clearly was some other person there, who was not called to testify, so that there was no prejudice, since the jury must have understood that that was the person referred to by the judge.—(Goodstein vs. Brooklyn Heights R. Co., 74 N. Y. Supp., 1017.)

NEW YORK.—Appeal—Non-suit—Review—Exclusion of Competent Evidence—Street Railroads—Injury to Pedestrian—Negligence—Evidence—Sufficiency—Authorizing a Finding of Negligence—Direction of Verdict—Contributory Negligence—Evidence Authorizing a Finding—Direction of Verdict.

1. The court, on appeal, in reviewing the ruling of the trial court in dismissing the complaint at the close of plaintiff's evidence, will consider as admitted competent evidence excluded by the trial court.

2. A pedestrian left the sidewalk to cross a street in which there were two street car tracks. On the track farthest from him was a south-bound car, moving at a speed of over twenty miles an hour. When he reached the south-bound track, the car was from 15 ft. to 20 ft. away. He almost cleared the track when the car struck him. The street was well lighted, and there were no vehicles or other cars about. The motorman gave no warning, and made no effort to slacken the car's speed until after the accident. Held, that though the evidence warranted a finding that the motorman was negligent in failing to slacken the speed of the car or give any signal, yet it also warranted a finding that he was chargeable merely with an error of judgment, in believing that the pedestrian could cross the track in safety, and hence the court could not direct a verdict for defendant on the issue of its servant's negligence.

3. The evidence also authorized a finding that the pedestrian was not guilty of contributory negligence, as he might rely on the motorman's exercising due care, though it also warranted a finding to the contrary, and hence the court could not direct a verdict for defendant on the issue of contributory negligence.—(Handy vs. Metropolitan St. Ry. Co., 74 N. Y. Supp., 1079.)

NEW YORK.—Action for Injuries—Pleading—Bill of Particulars—Character of Injuries.

Where a complaint in an action for injuries fully and completely described the injuries, except that it concluded with a statement that "some of the injuries" were permanent, leaving defendant without notice as to what injuries were claimed to be permanent, it was entitled to a bill of particulars specifying permanent injuries.—(Cavanaugh vs. Metropolitan St. Ry. Co., 74 N. Y. Supp., 1108.)

NEW YORK.—Street Railroads—Injury to Passenger—Question for Jury—Permanent Injury—Instructions—Error Without Prejudice.

1. Where there is evidence that a passenger on a street car indicated to the conductor a desire to get off, and that he rang the bell, and the car slowed up, and the passenger then went to the step to get off on the car's stopping, when the car suddenly started forward with a jerk, throwing such passenger off, and the testimony as to the signal to stop being given is not disputed, though there is a dispute as to the sudden starting of the car, the evidence is sufficient to go to the jury on the question of negligence.

2. Where, in an action to recover for personal injuries, it was not alleged that they would be permanent, a verdict will not be set aside for error in admitting the testimony of a physician that he thought the injury would be permanent, when the jury were instructed as to the damages to be allowed—the court refusing to charge that damages could be awarded for future suffering—and defendant took no exceptions to the charge, and made no requests which were not granted.—(Crow vs. Metropolitan St. Ry. Co., 75 N. Y. Supp., 377.)

NEW YORK.—Trial—Non-suit—Dismissal—Special Verdict—Street Railways—Personal Injury—Subsequent Decease—Proximate Cause—Trial Judgment.

1. Under Code Civ. Proc. Sec. 1187, providing that, when a motion to non-suit the plaintiff or for the direction of a verdict is made, the court may, pending the decision of such motion, submit any question of fact to the jury, and when a special verdict is rendered on such submission the court may determine such motion, it is error for the court to direct a judgment dismissing the complaint on the merits after such motion, submission and special verdict.

2. Where plaintiff's intestate was injured while a passenger on a street car by a collision of cars, and soon thereafter was stricken with acute pulmonary tuberculosis, from which disease the jury found he died, and there was no evidence that the disease was caused by or resulted from the accident, judgment, in an action against the railway company to recover damages for such death, should be directed for defendant.—(Hoey vs. Metropolitan St. Ry. Co. et al., 74 N. Y. Supp., 1113.)

NEW YORK.—Elevated Railroads—Action for Injury—Telegraph Linemen—Right to go Upon Elevated Structure—Obligation of Railroad Company to Those Rightfully Upon Its Structure—Electric Feed Wires—Insulation and Repair—Presumption from Insulation—Evidence—Ordinary Care—Jury Question—Contract Against Negligence—Pass.

1. Plaintiff, an experienced lineman of the New York police department, was injured while in discharge of his duty in repairing a police telegraph wire which was carried upon the structure of defendant elevated railroad company, which charged the city rent for the privilege of stringing such wires upon its structure. Plaintiff alleged that the injury was caused by a shock from a current of electricity escaping from defendant's trolley feed wire by reason of defendant's negligence in allowing such wire to become uninsulated and defective. Held, that in the absence of any provision of restraint in the contract giving the city a right to string its police wires on defendant's structure, such privilege would contemplate the right of reasonable access by the city to its wires for repairing and maintaining them, and hence plaintiff was not a trespasser or a bare licensee, but one lawfully upon the structure, engaged in the business of his employer.

2. The obligation of defendant was that of ordinary care, which required the exercise of such care both in stringing and in maintaining its electric wires, mindful of any inherent danger in them when highly charged, and mindful that from time to time the workmen of the city, in discharge of their duties, might be brought in proximity to or contact with them.

3. The care which defendant was bound to exercise included ordinary and reasonable insulation of its wires, and also such ordinary and reasonable inspection as would preserve such insulation from such impairment as would render the wires dangerous to those whose business might bring them in contact with them.

4. The fact that the wire, the defect in which was alleged to have caused the injury, was insulated, was a recognition of its inherent danger.

5. There being evidence which warranted a finding that the shock was due to the contact of defendant's insulated feed wire with an iron brace of the structure at a point where the insulation of the wire had been completely worn away, so that when plaintiff's hand came in contact with the iron brace the current from the wire was conducted through the brace into his body, and also evidence warranting a finding that the defective insulation was due to the attrition of the feed wire with the iron brace, and that a year or more of such attrition might elapse before the insulation would be worn entirely away, and that defendant might have discovered the defect by reasonable, practical and available tests, by use of instruments commonly employed for the purpose, the question whether defendant had used ordinary care in the premises was properly submitted to the jury.

6. The fact that plaintiff held a pass issued to him by defendant, entitling him to free passage through its stations and upon its structure, but not to free transit upon its trains, upon condition that he would assume all risk and liability of accident while using it, did not debar plaintiff from recovery, since, there being no relation of passenger and carrier between the parties, the rule as to contracting against negligence when such relation did exist was not applicable, especially in view of the fact that he gained access to the structure by climbing, and not by availing himself of the permission conferred by his pass.—(Wagner vs. Brooklyn Heights R. R. Co., 74 N. Y. Supp., 809.)

NEW YORK.—Wrongful Death—Damages.

In an action by a mother for the death of a child, a verdict for \$300, where the evidence of the funeral expenses and other special damages showed them to amount to \$180, will be set aside as grossly inadequate.—(Willsen vs. Metropolitan St. Ry., 74 N. Y. Supp., 774.)

## FINANCIAL INTELLIGENCE

### THE MARKETS

#### The Money Market

WALL STREET, JUNE 11, 1902.

The position of the local money market has undergone no really important change during the last two weeks. With the easing of the rates for money, foreign lending, which cut such a prominent figure last month, has ceased and forwardings of currency from the home interior have fallen off. Still the addition to cash holdings from the regular currency inflow of the season suffices to keep the large Treasury withdrawals in check, while the dullness in speculative circles favors a declining, or at least a stationary loan account. Under these conditions the prospect for a rising surplus reserve is not very certain, but the present low interest rates are pretty sure to continue. Sterling exchange holds strong, but the rate at Paris is too high to suggest even a possibility of gold exports. No decided change is likely to occur until the mid-summer crop-moving period. By that time the size of the harvest will be known, and the volume of our export trade in the staple products can be more easily calculated than it can be at present. Should events move as is now promised, we shall have an abundance of grain and cotton available for shipments against the maturing of foreign credits already extended to this market. While this will insure on the one hand against further exportations of gold, it will facilitate, on the other hand, the drawing of fresh assistance from abroad in case of our running into a tight money market. So far as the purely domestic side of the situation is concerned a great deal depends upon how much relief the reduced tax schedules, which go into operation next month, will give from the Treasury drain, and whether or not the syndicates and other heavy borrowers of the last eighteen months, will see fit to be abstemious. Bank reserves are abnormally low, and they will not have the help they had last year from the government's bond redemptions. But they may be benefited again by large deposits of new gold from the Alaskan mines, and they will have the assurance that last year's recall of European capital at an exceedingly awkward time will not be repeated.

#### The Stock Market

Intense dullness, unaccompanied by any material change in prices, has characterized the recent dealings on the Stock Exchange. The daily average business has not only been the smallest of the year, but the smallest since the autumn of 1900. What trading there is is confined wholly to the professional operators who make their living by fractional fluctuations. The public and the larger interests who originate important movements, are alike inactive, and this situation will, to all appearances, continue until some definite intimation is given of when a settlement of the anthracite coal strike may be expected. The outlook in this quarter hardly seems any different from what it was two weeks ago. According to the common idea the crisis will not be reached until the miners resort to violence in an attempt to gain what they cannot accomplish by peaceful methods. If this stage of the contest can be postponed by the union leaders, then the struggle is likely to go on indefinitely and become a mere test of endurance. But if, as is generally anticipated, the leaders are unable to hold the more turbulent element in check, then matters are apt to be brought to an issue more quickly. There still is no reason to believe that any plans of intervention looking to arbitration or compromise will succeed, because of the determination of the operators to carry the fight to a finish. The stock market, meanwhile, is buoyed up by the feeling that the strike is the only drawback to a situation which points very strongly to higher prices. Efforts to start a "bear" campaign invariably meet with failure, owing to the fact that they do not dislodge stocks from the hands of investors and syndicates where the supply is chiefly held. For a month and a half the crops have enjoyed almost perfect weather, and their condition, with the single exception of winter wheat, is above the average for the season. This circumstance, along with the enormous acreage planted, indicates an unusually heavy total yield, with any kind of favorable weather between now and harvest. The excellent crop outlook and the already remarkable showing of railway traffic, are the foundations upon which the current market rests.

Scarcely anything of a special nature can be said of the market for the local traction shares. Dealings in this group, as a rule, have been light, even as compared with the scant total of business elsewhere. The favorable statement of Metropolitan for the March quarter has attracted rather better support to the shares, and at tempts have been made from time to time to bid up both Metropolitan and the new Securities Company stock. The pool in Brooklyn

Rapid Transit is not disposed to hurry matters, but it apparently feels confident in its position. Some speculative liquidation in Manhattan Elevated last week carried the price down momentarily to 130, but the stock as regularly happens on all occasions of weakness, was well taken on the decline.

#### Philadelphia

The indications are that holdings of Union Traction stock are more concentrated now than at any other time in its recent history. It may be that, so far as any immediate show of earnings and dividend prospects are concerned, the motives of the buying are not clear to the majority of outside observers. There are the benefits of the lease to the Philadelphia Rapid Transit, apart from staving off the possibility of future competition, exactly discernible. But from the speculative point of view the stock is certainly well held, and the people who have bought lately seem to have plenty of confidence. The quotations ruled around 42 until the end of last week, when a fresh advance started, carrying the price up to 43½. The Union Traction warrants, or rights to subscribe to stock in the new holding company, have sold at 4, against 3 two weeks ago, and they are now selling at 3¾. All other business in the traction shares in Philadelphia has been confined to small lots during the fortnightly period since our last review. These scant dealings are, of course, in harmony with the conditions existing everywhere in the speculative field. Consolidated Traction of New Jersey has sold at 69, Philadelphia Traction at 97½ and 97½, United Traction of Pittsburgh preferred at 51, American Railways at 45½, "ex." the quarterly dividend of 1¼ per cent, Camden and Trenton at 5, Railways General at 5½, Reading Traction at 32, and Detroit United at 75½ up to 79. Bond transactions comprise Consolidated of New Jersey 5s at 112½, Electric-People's Traction 4s at 98¾ to 99, Indianapolis Railway 4s at 88½ down to 88, United Railways 4s at 89, Union Traction of Indiana 5s at 102 down to 101, People's Passenger 4s at 107, Citizens' Passenger of Indianapolis 5s at 110¼.

#### Chicago

Light trading has been the rule on the Chicago Exchange during the fortnight. City Railway shares sold in a few odd lots at 210. There was a report, not confirmed, that the company is about to take up negotiations with the local government for extension of its franchises. Union Traction sold down on small liquidating sales from 19½ to 18½. The elevated stocks are not materially changed. Fairly large amounts of Northwestern common changed hands at 38 and later at 37½, South Side sold at 114, Metropolitan common at 38 and the preferred from 90 up to 90½. Rumors are again in circulation that the South Side will make some extensions and that the Northwestern has plans of a similar nature, but officials emphatically say that these are projects which will only mature in the distant future. Sufficient supplies of structural material, for one thing, could not be secured inside a year at the earliest. Meanwhile it is significant that the Metropolitan is the only line at present operating an extension that is showing very gratifying results.

#### Other Traction Securities

Massachusetts Electric common, after selling up to 45¼ ten days ago, fell back to 44. It was regarded as significant, however, that the volume of transactions on the advance was much larger than on the decline. The preferred was unusually strong at an advance to 99. Scattering sales were reported in West End common around 96, and in the preferred at 116, up to 116¾. Considerably more interest has been manifested in the securities involved in the Norfolk, Newport News and Portsmouth consolidation, which are dealt in on the Baltimore Exchange. Norfolk Railway stock sold up to 13¾ on the announcement that it would be taken into the deal on a basis of \$13.50 a share. The payment of the 2 per cent coupon upon the income bonds of the United Railways of Baltimore had a favorable effect upon all the company's securities. The income bonds selling ex-interest advanced to 69½, and the general 4s to 96. Other Baltimore sales include Charleston Consolidated Electric bonds at 89, Norfolk Railway 5s at 114½, Lexington 5s at 101 and 101¾, Charleston Railway 5s at 106¾, City & Suburban (Washington) 5s at 95, City Railway of Newport News 5s at 116¾, and North Baltimore Traction bonds at 119. In the local New Jersey markets, North Jersey Traction shares sold up a point to 29½, and the bonds a half point to 84 on further talk of the plans of the trolley syndicate which is working in the New Jersey field. The local markets at Columbus, St. Louis, New Orleans and Louisville have been quiet. Small sales of St. Louis Transit were recorded around 31¼, and in the preferred at 84. New Orleans City Rail-

road is a trifle higher for the common at 33¼ on the excellent earnings reports. A few small lots of Louisville common were offered at 125, which is some concession from recent figures. The preferred is strong at 119 bid. On the New York curb, one of the recent features was the sale of 400 Brooklyn City Railroad at 249, an advance of a point over the last previous sale. It is said this buying was by parties who are taking all the stock offered in the market. San Francisco securities have reacted rather sharply after the recent attempts to manipulate their quotations upward. The preferred is off from 64½ to 63¾, the common from 24¾ to 23¾ and the subscription privileges from 104 to 102.0.

Last week was the busiest ever experienced on the Cleveland Stock Exchange, the total sales exceeding the entire month of June last year. The strong market was due almost wholly to the activity in Detroit United, of which 11,919 shares were sold, the bulk of which brought prices close to 80. It is thought that the greater part of the stock went to New York, Cincinnati and Montreal capitalists, whose intention appears to be to establish the market price at a new high level of 80. During the week the stock advanced from 74¾ to 80, closing at 78¾. Who has been selling the stock is not known. The Everett-Moore Syndicate claims to have sold about 26,000 shares recently, but the majority of this went in large blocks, whereas the recent sales on the local exchange were from 50 to 200 shares. It is thought that much of it was sold by small investors who have had the stock up as collateral, and who have been waiting for an advance. Certain it is that Cleveland banks have been carrying a large amount of the stock, and have been urging the borrowers to lift their loans. Several thousand shares of Detroit sold on the Cincinnati Exchange as well.

Pomeroy-Mandelbaum securities also showed considerable activity last week. Elgin, Aurora & South advanced to 41, about 300 shares selling. There were several sales on Southern Ohio Traction, which has advanced to 66. It is thought this stock will make further advances before the listing of the Cincinnati, Dayton & Toledo stock, which will succeed it about July 1. Monday Elgin, Aurora & Southern advanced to 44 on a small block. Two hundred Southern Ohio sold at 66, and 100 at 66½.

**Security Quotations**

The following table shows the present bid quotations for the leading traction stocks, and the active bonds, as compared with a week ago:

	Closing Bid	
	May 27	June 10
American Railways Company.....	45½	*45¼
Boston Elevated .....	164	165
Brooklyn R. T. ....	667½	67¼
Chicago City .....	207	208
Chicago Union Tr. (common).....	18¾	18¼
Chicago Union Tr. (preferred).....	53½	52½
Cleveland & Eastern.....	a33	a33
Cleveland Electric .....	a83	81
Columbus (common) .....	52¾	51
Columbus (preferred) .....	107½	107
Consolidated Traction of N. J.....	69	69
Consolidated Traction of N. J. 5s.....	1117½	112½
Detroit United .....	72½	78¼
Electric-People's Traction (Philadelphia) 4s.....	98½	99¼
Elgin, Aurora & Southern .....	40	42½
Indianapolis Street Railway 4s.....	85½	88
Lake Street Elevated .....	12¾	12½
Manhattan Ry. ....	132¾	131¾
Massachusetts Elec. Cos. (common).....	44¼	43¾
Massachusetts Elec. Cos. (preferred).....	96¼	97
Metropolitan Elevated, Chicago (common).....	38	38
Metropolitan Elevated, Chicago .....	89	90¼
Metropolitan Street .....	147¾	149
New Orleans (common) .....	33¼	33¼
New Orleans (preferred) .....	110¾	111
North American .....	121¾	121
Northern Ohio Traction (common).....	30	33¼
Northern Ohio Traction (preferred).....	a85	a84
North Jersey .....	29½	29½
Northwestern Elevated, Chicago (common).....	37½	37½
Northwestern Elevated, Chicago (preferred).....	..	..
Philadelphia Traction .....	97½	97
St. Louis Transit Co. (common).....	31	31¼
South Side Elevated (Chicago).....	112	110
Southern Ohio Traction .....	a67	66½
Syracuse (common) .....	22	22
Syracuse (preferred) .....	64	64
Third Ave. ....	130	130
Toledo Railway & Light.....	20	20
Twin City, Minneapolis (common).....	122¼	119¼
United Railways, St. Louis (preferred).....	83½	83
United Railways, St. Louis, 4s.....	87½	87½
Union Traction (Philadelphia).....	40¾	43¾
Western Ohio Ry. ....	18	17¾

\* Ex-dividend. † Last sale. (a) Asked. (b) Ex-rights.

**Iron and Steel**

The most important development of the last two weeks in the iron market is the action of the steel rail pool in fixing the price for 1902 at \$28 per ton. This is the same figure that has been kept steadily throughout the past year, and the fact that no advance is made when the output is sold seven months ahead is the most effective demonstration that has yet been given of the desire of the leading trade interests to keep down prices. Orders aggregating from 350,000 to 400,000 tons of steel rail have already been booked for 1903 delivery. In other branches of the industry there is nothing new that is worthy of comment. The coal strike has caused a number of blast furnaces to close operations, and more will probably be closed down in case the strike continues, but as yet the proportion of those which have suspended from this cause is not large enough to be a very serious matter. Quotations are unchanged, as follows: \$21.50 for Bessemer pig iron, \$32 for steel billets and \$28 for steel rails.

**Metal**

Quotations for the leading metals are as follows: Copper 12¼ cents, lead 4½ cents, tin 297½ cents, spelter 47½ cents.

SAN FRANCISCO, CAL.—A new issue of bonds will be made shortly by the North Shore Railroad to the amount of \$3,500,000. This includes expenditures for betterments aggregating \$1,375,000, and \$1,500,000, which is to refund the North Pacific Coast issue maturing in 1912. The issue bears interest at the rate of 5 per cent. The contemplated improvements include a new ferryboat, 25 miles of new track, a large electric generating station and the construction of a 2½-mile cut-off. The Mercantile Trust Company will open subscriptions on June 14.

EAST ST. LOUIS, ILL.—The details of the plan for the consolidation of the electric railway companies of this city have been made public. The East St. Louis & Suburban Company will be organized in New Jersey, with \$5,000,000 stock. This company will issue \$8,000,000 of thirty-year 5 per cent collateral trust bonds, of which \$5,285,000 will be issued in exchange for all the stock and bonds, excepting \$215,000 of the East St. Louis Railway, the St. Louis & East St. Louis Electric Railway, the St. Louis & Belleville Electric Railway and the East St. Louis & Suburban Railway, the latter recently organized to consolidate a number of small companies. There will be reserved to take up the \$215,000 underlying bonds an equal amount of the new collateral bonds, while the remaining \$2,500,000 of the issue will be held under restrictions of the trust agreement to provide for the future requirements of the company. The securities deposited as collateral for the \$8,000,000 bonds are \$5,535,000 bonds and \$5,000,000 stock at par value of the merged companies. All the officers of the new company are Philadelphians. They are: C. M. Clark, president; E. W. Clark, Jr., vice-president; G. L. Estabrook, secretary, and C. A. Pearson, Jr., treasurer.

MINNEAPOLIS, MINN.—The Twin City Rapid Transit Company has declared the regular quarterly dividend of 1¼ per cent on the preferred stock, payable July 1.

HELENA, MONT.—The entire property of the Helena Power & Light Company has been sold by Master Commissioner Henry N. Blake to Thomas A. Marlow for \$200,000, the minimum price fixed by the United States Court. Mr. Marlow represents Eastern capitalists, who will incorporate a new company to operate the property, and will make many improvements. Mr. Marlow said after the purchase: "We contemplate many improvements in the property, based on the report of an engineer who came here a year ago last March to examine and report on it. These improvements will be made as soon as practicable and will extend to all departments—street railway, electric and gas. The intention is to make it a first-class, up-to-date plant, such as the business will justify."

HAMBURG, N. Y.—The Railroad Commissioners have granted permission to the Hamburg Railroad Company to issue a mortgage of \$300,000, the proceeds to be expended in improving its road.

LONG ISLAND CITY, N. Y.—A certificate of consolidation of the New York & Queens County Railway Company and the Queens Railway Company under the former title and with a capital of \$5,000,000, has been filed with the Secretary of State. The directors of the company are: William H. Shelmerdine, Francis Rawle and James M. Gregg, of Philadelphia; Clarence D. Simpson, of Scranton, Pa.; Jacob R. Beetem, Frank P. Maize, Dennis W. Murphy and Charles G. Fitch, of Long Island City, and William E. Stewart, of New York City. The Queens Railway Company was incorporated only a few days ago as the successor of the New York & North Shore Railway Company, operating between Jamaica and Flushing. The New York & Queens County Railway Company, operating between Long Island City and Flushing, operated the New York & North Shore Railway under lease. Both companies are controlled by the same interests.

GREENSBORO, N. C.—An important deal involving the consolidation of all gas, electric light, street railway and power interests in this city has been consummated, by which control has passed from Baltimore interests into the hands of New York parties. More than \$500,000 are involved and cash was paid for the newly acquired property. At the reorganization meeting held recently the following officers and directors were elected: Dr. F. A. C. Perrin, Pittsfield, Mass., president; F. R. Williamson, of Flemington, N. J., vice-president; V. J. Jerome Otis, of New York, secretary and treasurer; E. P. Wharton, Dr. W. M. Gamewell, of Pittsfield, Mass, and Sterling Birmingham, of New York, directors. A seventh director will be chosen later.

TACOMA, WASH.—A meeting of the stockholders of the Tacoma Railway & Power Company will be held on June 23 to vote upon the question of the sale of the property and franchises and the liquidation of the company.

TABLE OF OPERATING STATISTICS

Notice.—These statistics will be carefully revised from month to month, upon information received from the companies direct, or from official sources. The table should be used in connection with our Financial Supplement "American Street Railway Investments," which contains the annual operating reports to the ends of the various financial years. Similar statistics in regard to roads not reporting are solicited by the editors. \* Including taxes. † Deficit.

COMPANY	Period	Total Gross Earnings	Operating Expenses	Net Earnings	Deductions From Income	Net Income, Amount Available for Dividends	COMPANY	Period	Total Gross Earnings	Operating Expenses	Net Earnings	Deductions From Income	Net Income, Amount Available for Dividends
<b>AKRON, O.</b> Northern Ohio Tr. Co.	1 m., Apl. '02	49,425	28,527	20,898	12,829	8,069	<b>DULUTH, MINN.</b> Duluth-Superior Tr.	1 m., Apl. '02	41,174	22,105	19,069	9,604	9,465
	1 " " '01	39,618	25,477	14,142	-----	-----		1 " " '01	37,106	20,276	16,830	9,133	7,697
	4 " " '02	130,559	114,862	75,697	50,579	25,118		4 " " '02	152,435	89,991	62,444	38,443	24,001
	4 " " '01	162,271	104,034	58,237	41,988	16,249		4 " " '01	131,870	79,899	51,971	36,419	15,551
	12 " Dec. '01	617,011	* 350,845	266,169	136,162	130,004	<b>ELGIN, ILL.</b> Elgin, Aurora & Southern Tr.	1 m., Apl. '02	29,642	19,595	10,047	8,333	1,713
	12 " " '00	513,725	* 317,475	196,249	141,133	55,117		1 " " '01	26,613	18,285	8,328	8,333	-----
<b>ALBANY, N. Y.</b> United Traction Co.	1 m., Apl. '02	117,072	81,527	35,545	23,603	11,941		11 " " '02	344,136	195,674	148,462	91,667	56,795
	1 " " '01	109,898	75,982	33,859	19,901	13,955		11 " " '01	300,962	192,726	108,236	91,667	10,569
	10 " " '02	1,215,771	837,766	378,005	215,823	162,181	<b>HAMILTON, O.</b> Southern Ohio Tr. Co.	1 m., Apl. '02	27,774	15,245	12,529	7,500	5,029
	10 " " '01	1,141,036	775,467	365,559	199,433	166,126		1 " " '01	23,530	14,405	9,125	7,500	1,625
<b>BINGHAMTON, N. Y.</b> Binghamton St. Ry. Co.	1 m., Apl. '02	14,843	9,841	5,002	-----	-----		12 " " '02	353,141	186,365	166,779	90,000	76,779
	1 " " '01	13,994	9,220	4,774	-----	-----		12 " " '01	303,704	166,757	136,946	90,000	46,946
	9 " " '02	155,621	85,026	70,595	48,498	22,097	<b>LONDON, ONT.</b> London St. Ry. Co.	1 m., Apl. '02	9,942	6,395	3,547	2,335	1,211
	9 " " '01	140,084	75,794	64,290	44,384	19,906		1 " " '01	9,496	5,999	3,497	1,998	1,499
<b>BOSTON, MASS.</b> Boston Elev. Ry. Co.	12 m., Sept. '01	10,869,496	7,336,597	3,532,899	2,896,359	636,539		4 " " '02	26,723	12,465	8,896	3,569	3,569
	12 " " '00	10,236,994	6,828,110	3,408,884	2,932,839	476,044		4 " " '01	36,192	25,136	11,056	7,807	3,249
<b>Massachusetts Elec. Cos</b>	12 m., Sept. '01	5,778,133	3,915,486	1,862,648	937,206	925,442	<b>MILWAUKEE, WIS.</b> Milwaukee El. Ry. & Lt. Co.	1 m., Apl. '02	206,049	99,154	106,893	64,108	42,785
	12 " " '00	5,518,837	3,659,337	1,859,500	994,294	865,206		1 " " '01	184,210	96,099	88,111	60,483	27,629
<b>BROOKLYN, N. Y.</b> Brooklyn R. T. Co.	1 m., Apl. '02	1,041,706	* 705,011	336,696	-----	-----		4 " " '02	401,276	432,271	257,901	174,370	89,989
	1 " " '01	989,994	* 658,282	331,711	-----	-----		4 " " '01	728,683	397,530	331,152	241,163	89,989
	10 " " '02	10,468,072	* 7,489,910	2,978,162	-----	-----	<b>MINNEAPOLIS, MINN.</b> Twin City R. T. Co.	1 m., Apl. '02	263,243	131,388	131,854	58,516	73,338
	10 " " '01	9,844,598	* 6,522,733	3,321,865	-----	-----		1 " " '01	232,243	111,741	120,502	56,667	63,834
	12 " June '01	12,135,559	* 7,216,008	4,919,551	4,341,748	577,803		4 " " '02	1,059,565	512,040	547,525	234,066	133,468
	12 " " '00	11,768,550	* 7,106,373	4,662,177	4,135,405	526,772		4 " " '01	926,311	449,323	476,988	216,460	260,527
<b>BUFFALO, N. Y.</b> International Tr. Co.	1 m., Feb. '02	230,744	132,920	97,824	94,276	3,548	<b>MONTREAL, CAN.</b> Montreal St. Ry. Co.	1 m., Mar. '02	154,390	83,850	70,540	15,848	54,692
	1 " " '01	235,021	118,273	116,748	84,411	32,338		1 " " '01	144,794	93,272	51,521	9,288	42,234
	8 " " '02	3,519,491	1,664,285	1,855,206	789,124	1,066,081		7 " " '02	1,079,110	679,459	399,652	106,234	293,418
	8 " " '01	1,998,050	972,319	1,025,731	641,057	384,674		7 " " '01	1,012,816	652,921	359,895	64,363	295,532
<b>CHICAGO, ILL.</b> Chicago & Milwaukee Elec. Ry. Co.	1 m., Apl. '02	13,057	5,899	7,159	-----	-----	<b>NEW YORK CITY.</b> Manhattan Ry. Co.	3 m., Dec. '01	3,038,435	1,404,971	1,633,465	753,135	880,329
	1 " " '01	10,443	5,584	4,859	-----	-----		3 " " '00	2,728,598	1,340,696	1,387,902	749,857	638,045
	4 " " '02	44,749	23,603	21,146	-----	-----		12 " Sept. '01	10,455,872	5,328,649	5,127,223	2,688,132	2,444,091
	4 " " '01	31,041	22,614	11,428	-----	-----		12 " " '00	9,950,735	5,195,312	4,755,423	2,688,644	2,066,779
<b>Lake Street Elevated</b>	12 m., Dec. '01	786,462	388,799	397,663	-----	-----	<b>Metropolitan St. Ry.</b>	3 m., Dec. '01	3,887,936	1,723,972	2,163,964	1,151,140	992,824
	12 " " '00	757,954	378,661	379,293	-----	-----		3 " " '00	3,786,030	1,699,649	2,086,381	1,138,467	947,914
<b>CLEVELAND, O.</b> Cleveland & Chagrin Falls	1 m., Feb. '02	3,454	2,255	1,199	-----	-----		12 " June '00	14,720,767	6,755,131	7,965,636	4,534,068	3,431,567
	1 " " '01	2,435	3,016	+ 581	-----	-----		12 " " '00	14,437,134	6,631,254	7,805,880	4,445,720	3,360,160
	12 " Dec. '01	47,976	* 32,002	15,974	13,023	2,951	<b>OLEAN, N. Y.</b> Olean St. Ry. Co.	1 m., Mar. '02	3,994	2,411	1,584	1,146	438
	12 " " '00	49,646	* 33,272	16,374	13,294	3,080		1 " " '01	3,835	2,043	1,794	1,187	604
<b>Cleveland &amp; Eastern.</b>	1 m., Feb. '02	4,916	3,616	1,300	-----	-----		9 " " '02	41,735	21,611	20,124	12,343	7,781
	1 " " '01	3,525	4,037	+ 512	-----	-----		9 " " '01	39,270	19,276	19,994	11,068	8,925
	12 " Dec. '01	90,390	52,022	38,368	43,678	+ 4,310	<b>PITTSBURG, PA.</b> Consolidated Traction	1 m., Dec. '01	304,669	140,941	163,728	91,548	72,180
	12 " " '00	62,893	36,672	26,221	36,148	+ 9,927		1 " " '00	277,439	109,069	168,370	89,807	78,563
<b>Cleveland El. Ry. Co.</b>	1 m., Feb. '02	168,462	97,446	71,016	22,170	48,846		9 " " '01	2,649,656	1,145,651	1,503,905	807,667	694,238
	1 " " '01	151,805	90,251	61,554	18,875	42,679		9 " " '00	2,471,696	1,013,240	1,458,456	799,704	658,752
	2 " " '02	356,544	203,452	153,092	49,495	109,146	<b>PHILADELPHIA, PA.</b> American Railways	1 m., Apl. '02	79,619	-----	-----	-----	-----
	2 " " '01	318,537	189,514	129,023	37,851	91,172		1 " " '01	64,339	-----	-----	-----	-----
	12 " Dec. '01	2,236,898	1,265,953	1,030,945	244,231	786,714		10 " " '02	810,663	-----	-----	-----	-----
	12 " " '00	2,061,505	1,121,037	940,467	258,483	681,984		10 " " '01	691,393	-----	-----	-----	-----
<b>Cleveland, Elyria &amp; Western.</b>	1 m., May '02	25,045	13,311	11,735	-----	-----	<b>RICHMOND, VA.</b> Richmond Trac. Co.	1 m., Sept. '01	20,991	15,669	5,322	3,196	2,126
	1 " " '01	20,707	11,141	9,566	-----	-----		1 " " '00	20,727	10,770	9,957	3,843	6,115
	5 " " '02	103,194	64,702	38,492	-----	-----		12 " " '01	218,569	139,542	79,027	38,618	40,410
	5 " " '01	84,721	54,523	30,267	-----	-----		12 " " '00	203,057	108,198	94,859	37,608	57,250
	12 " Dec. '01	249,260	136,865	112,394	57,023	55,371	<b>ROCHESTER, N. Y.</b> Rochester Ry.	1 m., Apl. '02	86,183	45,491	39,192	24,730	14,462
	12 " " '00	179,698	102,393	77,304	34,562	42,742		1 " " '01	82,778	51,910	30,867	23,574	7,293
<b>Cleveland, Painesville &amp; Eastern.</b>	1 m., Apl. '02	12,696	6,934	5,762	-----	-----		4 " " '02	350,343	193,423	156,919	99,104	57,815
	1 " " '01	10,184	5,935	4,249	-----	-----		4 " " '01	328,832	213,788	115,045	96,268	18,777
	4 " " '02	44,682	26,111	18,541	-----	-----	<b>SCRANTON, PA.</b> Scranton Ry. Co.	1 m., Oct. '01	2,638	29,300	adf26661	-----	-----
	4 " " '01	36,203	21,610	14,592	-----	-----		1 " " '00	48,781	34,787	13,993	-----	-----
	12 " Dec. '01	164,971	* 87,102	77,869	72,500	5,369		10 " " '01	507,989	295,079	212,910	-----	-----
	12 " " '00	141,112	* 89,592	71,520	72,500	+ 980		10 " " '00	504,852	298,122	206,730	-----	-----
<b>DENVER, COL.</b> Denver City Tramway Co.	1 m., Apl. '02	124,516	66,533	57,983	32,865	26,119	<b>SCHENECTADY, N. Y.</b> Schenectady Ry. Co.	3 m., Dec. '01	84,061	46,949	37,112	13,454	23,658
	1 " " '01	116,357	62,866	53,490	31,304	22,186		3 " " '00	30,876	14,517	16,359	6,087	10,272
	4 " " '02	481,348	261,118	220,230	131,259	88,972	<b>SYRACUSE, N. Y.</b> Syracuse R. T. Co.	1 m., Apl. '02	56,008	31,349	24,659	19,025	5,634
	4 " " '01	435,297	236,915	198,382	125,622	72,759		1 " " '01	52,416	28,470	23,946	18,683	5,263
	12 " Dec. '01	1,507,293	818,321	688,965	383,180	305,785		10 " " '02	574,652	316,908	257,744	190,196	67,548
	12 " " '00	1,302,290	722,458	579,839	374,291	205,548		10 " " '01	512,389	280,907	231,482	186,286	45,194
<b>DETROIT, MICH.</b> Detroit United Ry.	1 m., Apl. '02	259,776	150,719	109,057	66,402	42,655	<b>TOLEDO, O.</b> Toledo Ry. & Lt. Co.	1 m., Mar. '02	111,174	53,151	58,024	37,833	20,189
	1 " " '01	228,597	131,888	96,709	57,360	39,349		1 " " '01	98,749	46,047	52,701	24,271	28,431
	4 " " '02	1,015,407	586,374	429,033	260,155	168,878		3 " " '02	325,238	163,442	161,796	113,494	48,302
	4 " " '01	878,86											