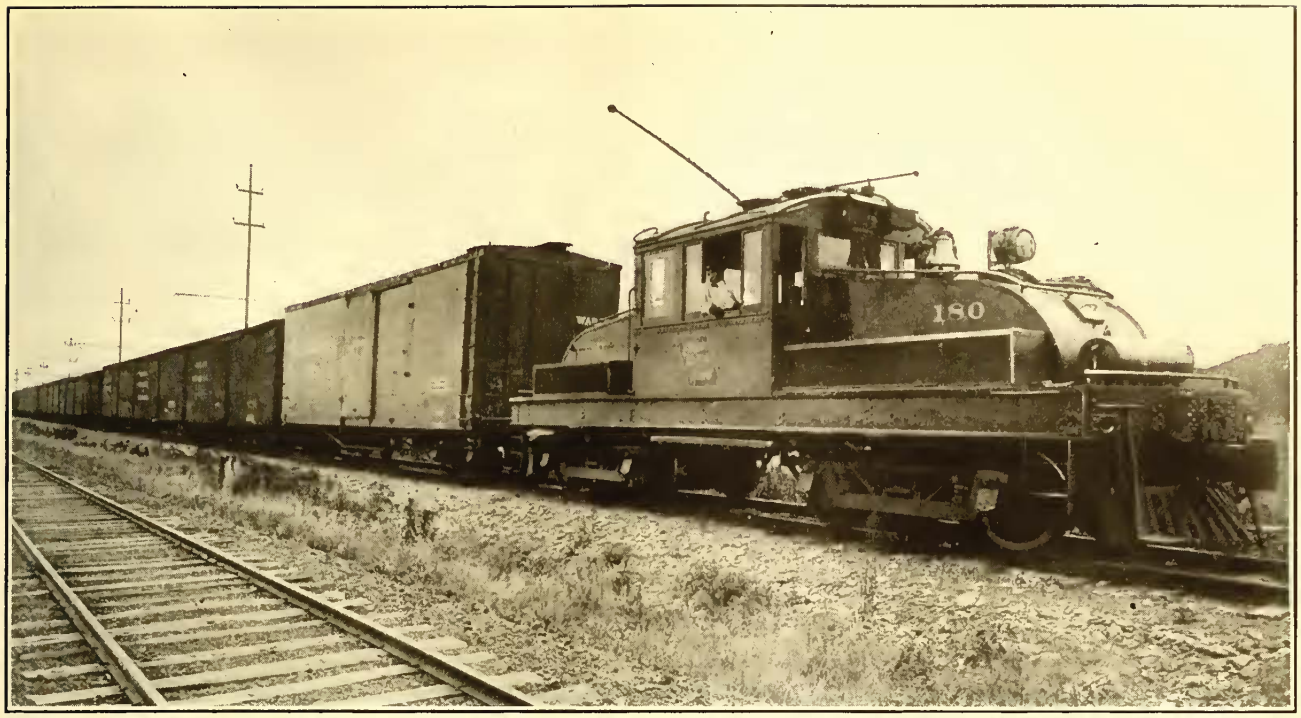


A 60-TON ELECTRIC LOCOMOTIVE AND TRAIN, WATERLOO, CEDAR FALLS & NORTHERN RAILWAY

Electric Railways Are in a Position to Haul More Freight

By A. B. Cole

In Co-ordination with the War Board of the American Electric Railway Association

The author has recently made an extended personal study of the freight carrying facilities of electric railways. From the data thus secured and from those compiled by the War Board, he is able to point out how electric railways, in general and specifically, can relieve a large proportion of the present traffic congestion, particularly when helped by the removal of local franchise restrictions, the extension of steam railroad interchange arrangements, and federal aid in financing the purchase of new rolling stock, the carrying out of track alignment and the improvement of terminal facilities

IN THE MINDS of our public and government, the electric railway is associated only with the transportation of passengers.. This is deplorable, since it means that thousands of miles of track are being used only a very small portion of the time and for only a fraction of their capacity instead of fully sharing the burden of carrying the greatest freight movement in the history of American railroading. It is true that the steam railroads are best fitted for long through hauls, but an investigation of our electric railways will disclose some surprisingly long hauls, as well as indicate what the addition of a few miles of track here or there, the removal of local franchise restrictions, the increase of motive power and car equipment, terminal facilities, etc., could do to relieve the steam railroads of burdensome local passenger and freight service, particularly the latter.

Many of the interurban electric railways, especially those constructed during the early development of this class of transportation, gave little attention to the movement of freight. Those built in more recent years have been devoting more attention to the development of this service. Fortunately enough instances exist to prove not only that electric railways can do great things to relieve freight congestion, but also that they can do it in the fullest co-operation with their older steam brother. Where there is a duplication of facilities, as between a steam railroad and an electric line, the facilities of the electric line should be used to their maximum capacity to relieve the steam line of the short-haul traffic. The general equipment, the motive power and cars of the steam railroad which are used in this short-haul service could then be released for long-haul through freight and passenger service. Thus the present unprecedented congested condition of the steam railroads could be very materially relieved.

The unused and undeveloped facilities of the electric railroads of the country are of such magnitude and can be made available in the present crisis at such a comparatively small cost that it would seem extravagant and wasteful, both in man power and in money, were the government to countenance the much discussed motor-truck transportation plan before the freight carrying power of the electric roads has been fully developed.

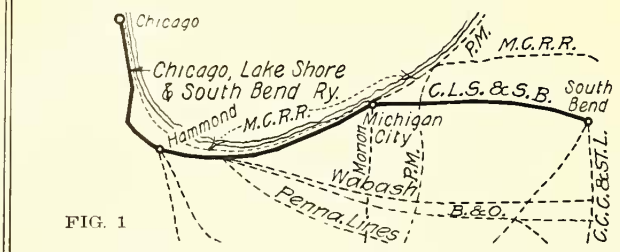


FIG. 1

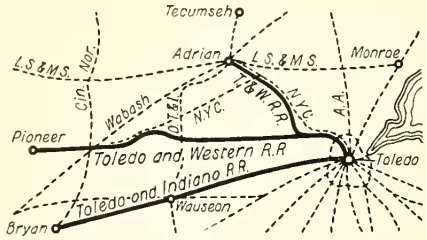
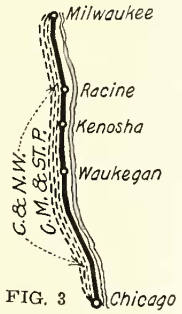


FIG. 2



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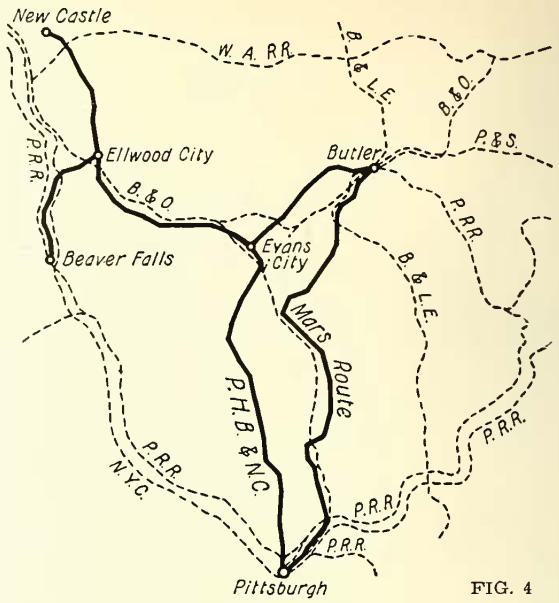
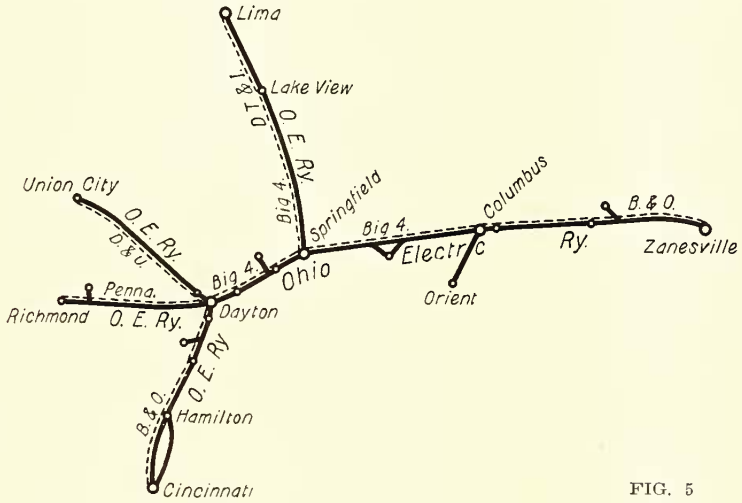


FIG. 4



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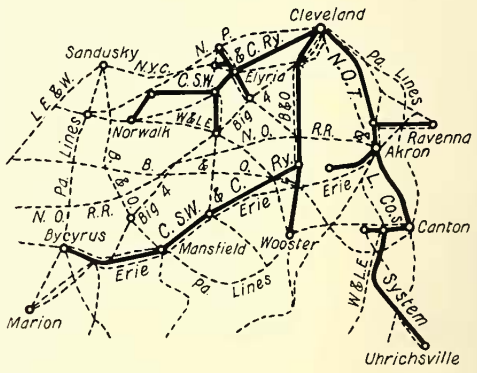


FIG. 6

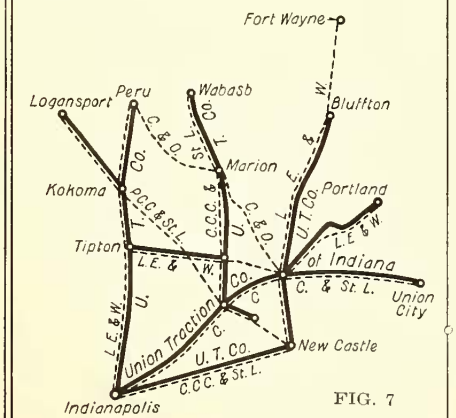


FIG. 7

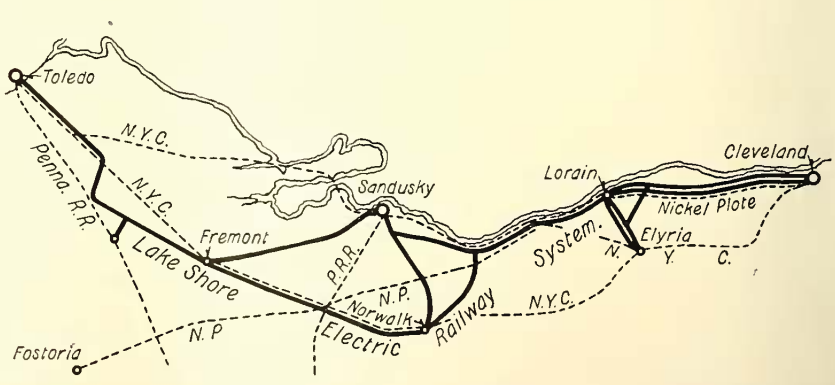


FIG. 8

Fig. 1—Chicago, Lake Shore & South Bend Railway
Fig. 2—Toledo & Western and Toledo & Indiana Railroads
Fig. 3—Chicago, North Shore & Milwaukee Electric Railroad
Fig. 4—Pittsburgh, Harmony, Butler & N. C. and Pittsburgh Mars & Butler Railways
Fig. 5—Ohio Electric Railway
Fig. 6—Cleveland, Southwestern & Columbus Railway, Northern Ohio Traction & Light Company
Fig. 7—Union Traction Company of Indiana
Fig. 8—Lake Shore Electric Railway

DUPLICATION OF SERVICE—SOME SPECIFIC INSTANCES WHERE ELECTRIC RAILWAYS CAN HELP THE STEAM RAILROADS. ELECTRIC LINES SHOWN IN SOLID LINES

The amount of relief which the electric railways can afford the steam lines is not to be measured merely by the tonnage handled, but by the increase in the physical capacity of the steam railroads, through the elimination of long waiting at freight terminals, thus conserving fuel and labor by a reduction of standing time.

The capacity of the steam railroads for through passenger and freight service would be materially increased were the local short-haul traffic handled by the electric lines, and the steam road relieved of odd movements due to local passenger trains, way-freights, and switching, which tend to slow up the through service and impede terminal operation.

An immediate step of most importance in the relief of traffic congestion is the elimination of needless duplication of service by steam and electric lines. A study of seventeen typical cases taken from data secured from the War Board of the American Electric Railway Association and shown in the accompanying maps will indicate the prevalence of this condition.

Immediate Relief by Universal Interchange Far Greater than Through Motor-Truck Haulage

Admittedly there is at present a great shortage of freight cars, and the addition of 100,000 cars recently ordered by the Railroad Administration will only tend to ameliorate, not correct, this trouble. Other steps must be taken, and an important one is to increase the use of the existing cars. This the electric railway would be particularly able to accomplish, if universal interchange between steam and electric lines were established, because of the shorter time spent by freight cars in electric railway terminals.

There are enough electric railways having steam railroad clearances to be of material help; and in the meantime, through federal aid, others could be placed in physical shape for this service at not one-tenth the amount of money which would be required for the construction of highways for the use of motor trucks.

A Few Specific Instances Where Electrics Can Help

Maps illustrating these conditions are shown on the opposite page and elsewhere in this article

An immediate step of most importance in the relief of traffic congestion would be to eliminate the needless duplication of service by steam and electric lines in the same territory. A study of the following typical cases taken from data collected by the War Board of the American Electric Railway Association will indicate the prevalence of this condition:

Northern Ohio Traction & Light Company (1) could readily relieve:

Pennsylvania Railroad at Cleveland, Akron, Ravenna, Barberton, Canton, Massillon, Canal Dover and Uhrichsville.

Baltimore & Ohio Railroad at Cleveland, Kent, Akron, Massillon, Canal Dover, New Philadelphia.

Wheeling & Lake Erie Railroad at Cleveland, Kent, Canton, Massillon.

Erie Railroad at Akron, Kent, Barberton.

This line can handle all steam road traffic between its stations.

Cleveland, Southwestern & Columbus Railway (2) can practically take care of all local freight business between terminals (Cleveland, Wooster and Bucyrus), relieving the New York Central, Baltimore & Ohio, Erie and Pennsylvania Railroads.

Lake Shore Electric Railway (3) is an important link in through interurban service between Cleveland, Sandusky and Toledo, forming an important connection for freight in and out of Detroit. This railway could handle all local business now carried by the New York Central, Nickel Plate and Pennsylvania Railroads between Cleveland and Sandusky and other points.

Chicago, North Shore & Milwaukee Electric Railroad (4) could handle carload and l.c.l. freight as well as Chicago packing house freight to Fort Sheridan and Great Lakes Naval Training Station. Movement of through freight in the Chicago district could be facilitated if carload shipments for points between Highland Park and Milwaukee could be delivered to the electric line, thus eliminating the delay in handling it through Chicago. This in turn would help to reduce congestion at Chicago terminals. The steam railroads favorably affected would be the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul Railways.

Chicago, Lake Shore & South Bend Railway (5) could handle practically all local freight between its terminals, West Pullman, Ill., and South Bend, Ind., relieving the Baltimore & Ohio, Chesapeake & Ohio, Grand Trunk, Michigan Central, New York Central, Pennsylvania and the Wabash.

Michigan Railway (6) can handle both carload and l.c.l. freight. It has considerable equipment, including warehouse and team track delivery facilities at all stations. It could relieve the Pere Marquette, Grand Rapids & Indiana, Michigan Central, Grand Trunk and the New York Central Lines.

Grand Rapids, Grand Haven & Muskegon Railway (7) can care for all l.c.l. shipments originating at its terminals. In this particular case the electric line forms quite an important route between Chicago, Grand Haven, Muskegon and Grand Rapids via the lake boats of the Goodrich Transit Company. This line also forms an important link in through electric railway haulage from Grand Haven and Muskegon to points in Southern Michigan, Ohio and Indiana. Such changes would relieve the Grand Rapids & Indiana, the Pere Marquette, and the Grand Trunk Railways. The last-named serves the same towns as the electric for 28 miles.

Pittsburgh, Harmony, Butler & New Castle Railway (8) can relieve the following steam roads of practically all local freight business, in one of the most important war industry districts in territory served:

Baltimore & Ohio at Pittsburgh, Butler, Evans City, Zelienople, Ellwood City and New Castle—

Pittsburgh & Lake Erie at Ellwood City and New Castle—
Buffalo, Rochester & Pittsburgh at Pittsburgh and Butler—
Bessemer & Lake Erie at Pittsburgh and Butler—
Pennsylvania Railroad at Pittsburgh, Butler and New Castle.

Detroit United Railway (9) can handle both carload and l.c.l. freight over its entire system, thereby relieving the Michigan Central, New York Central, Grand Trunk, Detroit & Toledo, Canadian Pacific, Detroit, Toledo & Ironton, Detroit Terminal, Wabash, Pere Marquette, Ann Arbor, Baltimore & Ohio, Hocking Valley, Pennsylvania, Wheeling & Lake Erie, Toledo & Ohio Central, Toledo Terminal, Detroit, Bay City & Western and Cincinnati Northern.

Toledo & Indiana Railway (10) can handle all local freight traffic between Toledo and Bryan, Ohio, by the steam railroads making more effective use of the Toledo Terminal Railway. This is a belt line connecting with the electric line. If the Detroit, Toledo & Ironton Railway (steam) would interchange with the electric line at Wauseon, Ohio, it would be possible to minimize congestion in this territory without the assistance of parallel steam roads. In general, the steam roads affected would be the Detroit, Toledo & Ironton, Toledo Terminal, New York Central, Cincinnati Northern and Wabash. The last three railroads are parallel to the electric railway.

Rock Island Southern Railway (11) could handle all carload and l.c.l. freight in territory served. It already handles much coal traffic. The steam roads that would be relieved are the Chicago, Rock Island & Pacific, Chicago, Burlington & Quincy, Chicago, Milwaukee & St. Paul, Minneapolis & St. Louis and Santa Fé.

Interurban Railway & Terminal Company, Cincinnati (12) could handle all local passenger and freight business between Cincinnati and Lebanon, Ohio, now carried by the Cincinnati, Lebanon & Northern Railroad. The electric line now has so little business that it is in the hands of a receiver. On the other hand, the grades on the steam line are so severe as to call for an unconomical, prodigal use of locomotives, two being needed for a three-car passenger train out of Cincinnati and two for a seven-car freight train over the same grade.

Aurora, Elgin & Chicago Railroad (13) can handle carload and l.c.l. freight business. The possibilities for extending the l.c.l. business is very great if proper terminal facilities were provided at Chicago. Carload business is now being handled quite extensively and team track freight facilities are provided to all points on the line and to industries adjacent to other lines. The steam roads relieved would be the Chicago & Northwestern, Chicago, Burlington & Quincy, Chicago, Milwaukee & St. Paul, and Chicago Great Western. With the extension of freight interchange privileges, the steam railroads would be still further relieved throughout the Chicago district.

Union Traction Company of Indiana (14) could handle more l.c.l. freight, relieving the steam roads in this district. Here is a noteworthy example in that every one of the 400 miles of this system is paralleled by steam railroads. The roads directly affected are Lake Erie & Western, Big Four, Pennsylvania, Clover Leaf, Wabash, Chesapeake & Ohio, Central Indiana and Monon.

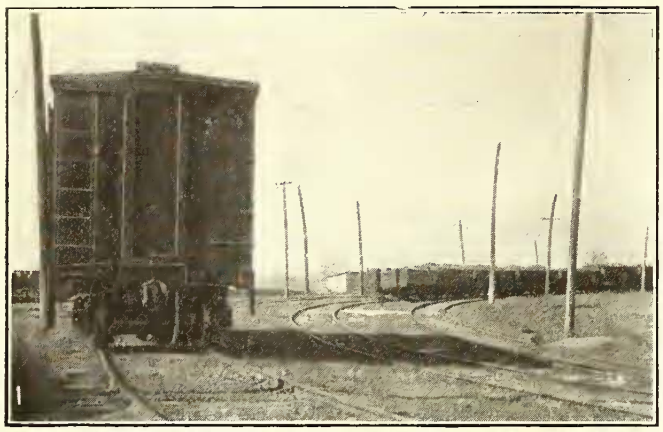
Terre Haute, Indianapolis & Eastern (15) is similar to the case of the Union Traction Company in being paralleled by steam lines. Hence it could afford much relief in l.c.l. business in the territory served by the Peoria & Eastern Railroad, Chicago & Eastern Illinois Railroad, Big Four Railroad, Pennsylvania Company.

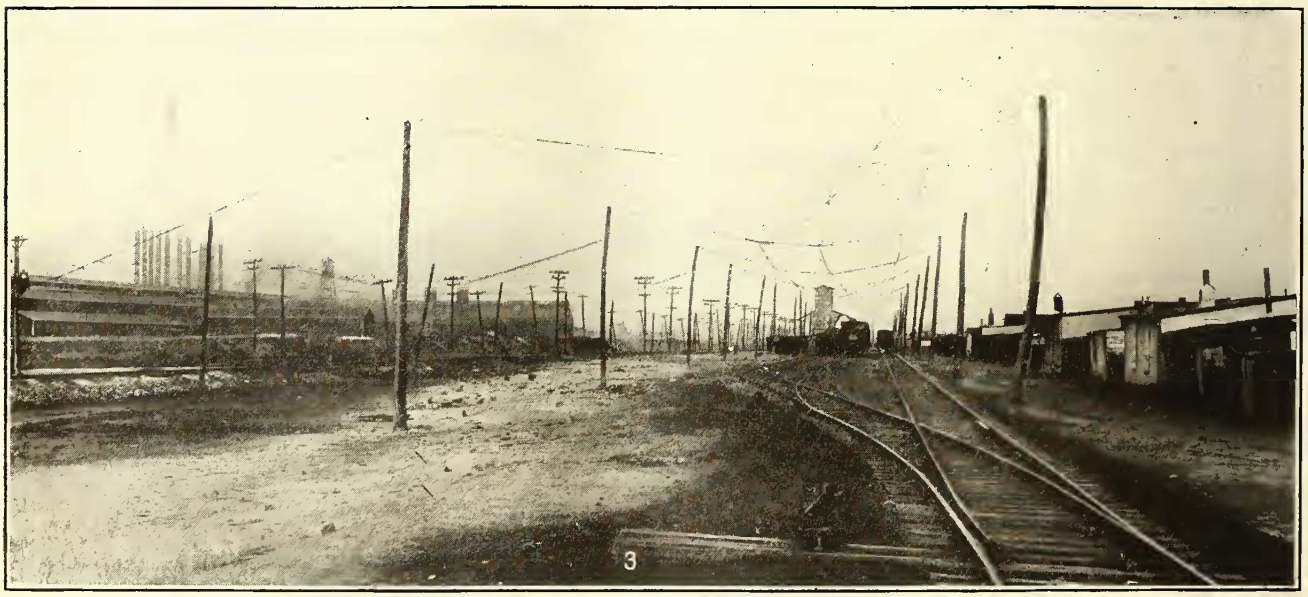
Toledo & Western Railroad (16) can handle both carload and l.c.l. freight and reach any steam railroad entering Toledo through the Toledo Terminal Railway. The steam lines affected would be the New York Central, at Adrian, Palmyra, Blissfield, Riga, Sylvania, Morenci and Fayette; the Detroit, Toledo & Ironton, at Dennison, Ohio and Adrian, Mich.; the Cincinnati Northern, at Alverdton, Ohio, and the Wabash, at Adrian, Mich., and Alverdton, Ohio.

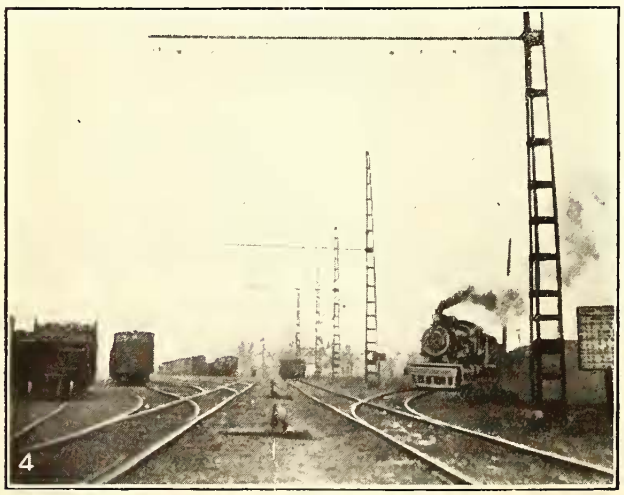
Salt Lake & Utah Railroad (17) can take care of carload and l.c.l. material in territory which it serves, increasing the present amount of freight handled by 300 per cent. This railway has a 50-ton electric locomotive in reserve. It has steam line connections and could greatly relieve the following railroads: Denver & Rio Grande, Los Angeles & Salt Lake, Utah Coal, Union Pacific and Western Pacific.

Among the electric railways handling steam road interchange traffic are the Fort Dodge, Des Moines & Southern Railway, the Niagara Junction Railway, the Toledo & Western Railroad, the Michigan Railway, the Inter Urban Railway of Des Moines, the Detroit United Railway, the Aurora, Elgin & Chicago Railway, the Chicago, Lake Shore & South Bend Railway, and the Waterloo, Cedar Falls & Northern Railway. Such interchange is especially desirable at this time. The results obtained by most of the lines in this group warrant due consideration of this traffic by electric lines wherever practicable.

The Waterloo, Cedar Falls & Northern Railway was the pioneer electric line to arrange with the steam railroads for the interchange of freight. As a result more than 70 per cent of the switching from







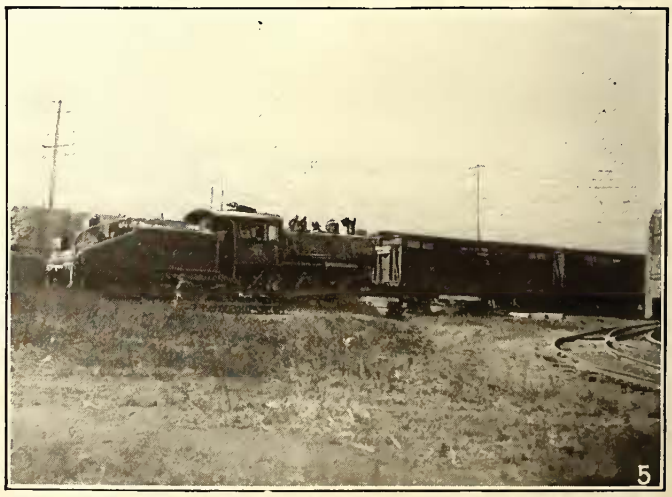


Fig. 1—Toledo & Western R.R. with Toledo Terminal Railway
Fig. 2—Chicago, Lake Shore & South Bend Railway with Lake Erie & Western Railroad
Fig. 3—Illinois Traction System
Fig. 4—Fort Dodge, Des Moines & Southern Railroad with Des Moines Union Railway
Fig. 5—Illinois Traction System—Terminal Railroad Association, St. Louis, Mo.

ELECTRIC RAILWAY STEAM RAILROAD INTERCHANGES

steam roads entering Waterloo with its 175 factories is performed by this line. Similarly the several steam roads entering Cedar Rapids enjoy business from Northern territory due to the construction of the Cedar Valley Road. In other words, a 60-mile branch of the latter between Cedar Rapids and Waterloo forms a connecting link and feeder between the steam roads entering Cedar Rapids. At Waterloo, interchange connections are made with the Illinois Central. The accompanying table gives a better idea of the operations of this heavy freight carrier.

At Waterloo and other points interchange connections are made with the Illinois Central, the Chicago, Rock Island & Pacific and the Chicago Great Western Railroads. Just north of La Porte City, a comprehensive interchange track layout is located between the main lines of the Waterloo, Cedar Falls & Northern Railway and the Chicago, Rock Island & Pacific Railway on the adjoining right-of-way. This was built to relieve the interchange of track facilities between these roads in West Waterloo, and to serve for reception and delivery of freight from the South.

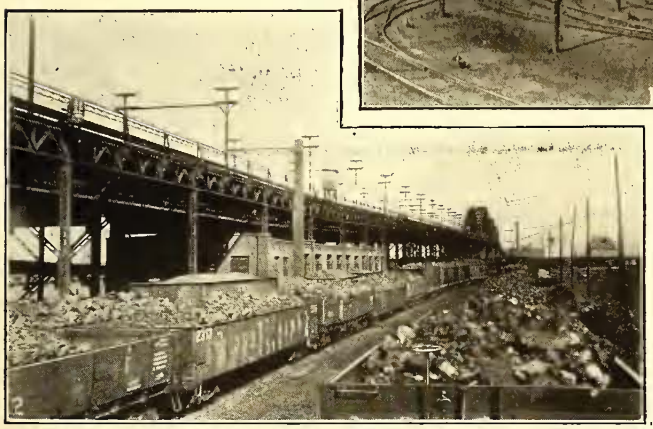
This interchange layout includes two parallel storage tracks each long enough to clear fifteen cars, one of which serves as a delivery track and one as a receiving track. Leads from both steam and electric roads approach these two storage tracks at both ends.

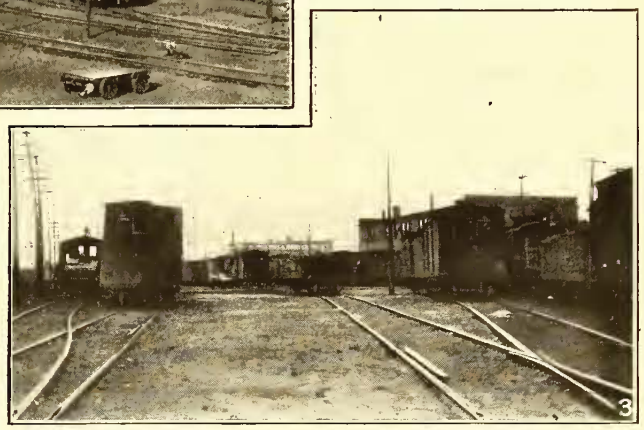
ELECTRIC RAILWAY FREIGHT YARDS

Fig. 1—East St. Louis & Belleville Electric Railway—East St. Louis Yard

Fig. 2—Illinois Traction System—St. Louis Yard at McKinley Bridge

Fig. 3—Fort Dodge, Des Moines & Southern Railroad—Des Moines Yard





FREIGHT CARS AND TONNAGE MOVED ON WATERLOO, CEDAR FALLS & NORTHERN RAILWAY DURING A TYPICAL MONTH

Date	System Total Loads	Empties	Tons	Date	System Total Loads	Empties	Tons
1	53	13	2,915	16	63	14	3,170
2	57	10	3,385	17	59	18	2,857
3	72	27	3,730	18	29	18	1,558
4	56	23	3,675	*19	60	13	2,823
* 5	47	9	2,193	20	60	21	3,194
6	65	20	3,476	21	66	18	3,447
7	49	30	3,009	22	59	28	3,109
8	56	16	3,047	23	62	33	3,184
9	49	19	2,648	24	57	17	3,004
10	60	22	3,052	25	26	21	1,459
11	33	14	1,826	*26	53	27	2,675
*12	54	5	2,345	27	53	5	2,636
13	45	22	2,371	28	53	16	3,057
14	51	6	2,319	29	67	9	3,209
15	46	34	2,635	†30	24	8	1,226
					1,584	536	83,234

Switching service:—Waterloo Belt-Line Yard Engine handled 1717 loads and 1504 empties. *Sundays. †Thanksgiving Day.

cattle and hogs that were smothering to death owing to lack of steam road car for this traffic. As a result, the electric railways transported about 1000 carloads of livestock.

The electric railways also give faster service than steam under normal conditions. If a farmer has cattle for the Indianapolis market, he notifies the interurban a day or two in advance. Within two or three hours after loading the stock is at its destination. The poundage lost by cattle is so much less on the fast electric interurbans than it is on the through steam lines that the farmer actually saves the cost of transportation.

Such examples as this could be multiplied indefinitely as proof that transportation by electric lines can save vast quantities of perishable freight, whether in the form of livestock, vegetables or fruit.

How Quick Electric Freight Aids Food Conservation

The feature which should be borne in mind in any consideration of electric railway freight service is its promptness. The following instance shows how rapid transportation has a direct bearing on the conservation of our food supply.

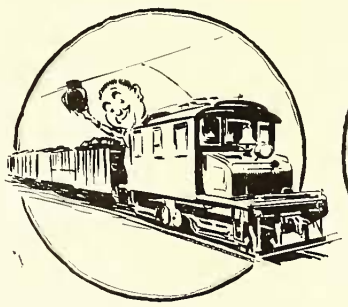
When the steam railroads around Indianapolis were crippled last winter by unusually severe weather, the electric railways not only met the fuel shortage in isolated communities by supplying them with coal, but also answered the appeal of the Food Administrator to save

What Physical Betterments Do Electric Railways Need?

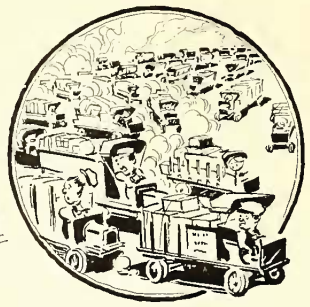
A large number of electric railways are prevented from handling more freight by franchise restrictions which prevent an extensive development along this line. With such restrictions removed, many electric railways

would require only a little financial aid to be in a position materially to relieve the freight situation. These restrictions date back to the time of small horse drawn vehicles and appear grotesque to-day in view of the noise and damage produced by motor trucks in the very communities that will not permit a freight car to travel over its own rails.

Aside from franchise restrictions, however, the electrics need changes in physical alignment (such as easing of curves, construction of long double-ended sidings at way stations, freight cut-offs and belt lines), more terminal and yard facilities and more rolling stock. Of course, as this reconstruction would be for the purpose of fitting the electric railways to operate on M. C. B. standards, they could haul standard steam railroad cars in unlimited numbers.



With a 500-ton electric train a maximum of three or four men is required

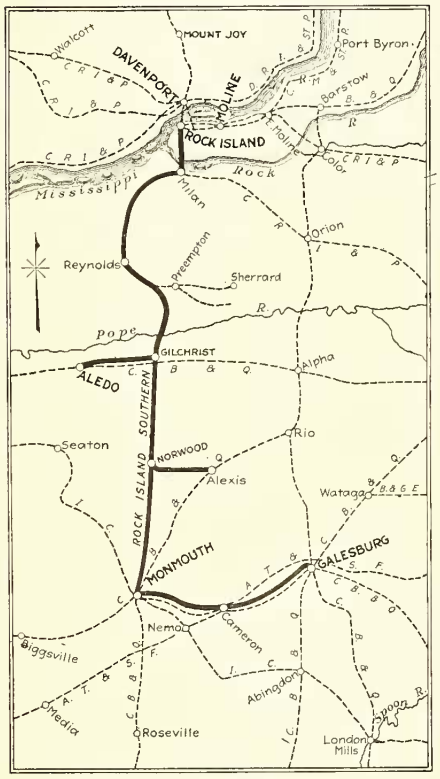


With 500 tons of freight handled by 5-ton motor-truck units, 100 men would be required

A STUDY OF MAN-POWER CONSERVATION

Motor-Truck Development Costlier

Returning to the matter of finances, it is pertinent to mention that for only $50,000 a 75-mile interurban was rebuilt to M.C.B. standards for locomotive freight service thus enabling it to move hundreds of thousands of tons at insignificant cost. How long would an expenditure of $50,000, made and paid for by the public, last in buildings and maintaining motor trucks and highways?



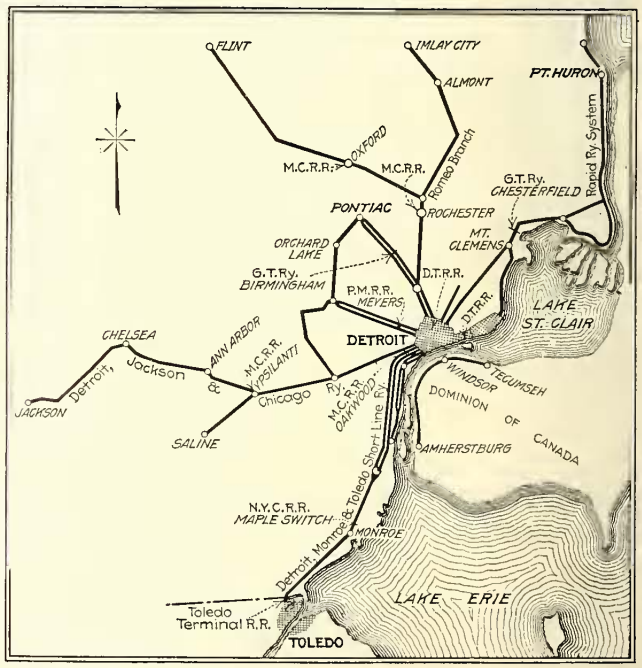
DUPLICATION OF SERVICE—ROCK ISLAND SOUTHERN RAILWAY
(For details see page 895)

It is obvious that $50,000 would not go far in this direction.

The motor truck has well demonstrated its worth in recent years, particularly behind the firing lines in France. There, where the railroad facilities are generally inadequate and where results must be obtained, regardless of cost, the motor truck has been wonderfully effective in affording a quick, though costly, means of transportation over rough roads for comparatively short distances. There have been instances in this country, too, where material had to be moved without delay and *regardless of cost* and the regular means of transportation have failed for one reason or another, where the motor truck has performed so effectively as to lead many to believe that it has miraculous powers and will in time supersede steam and electric railways as freight carriers.

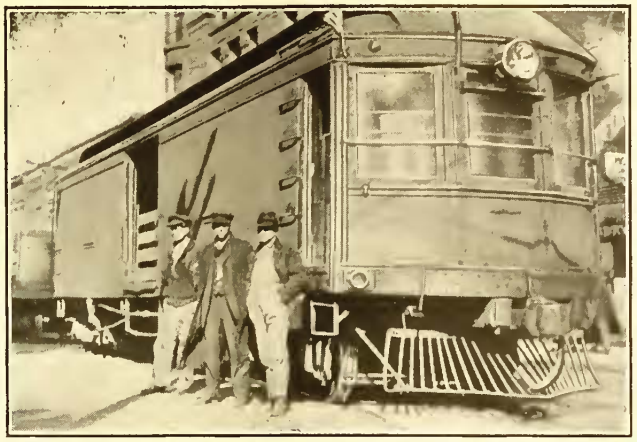
Motor truck haulage is a costly way of handling freight in quantity—costly from the standpoints of highway maintenance, first cost and depreciation of equipment, waste of fuel and lubricants, and, worst of all, waste of manpower. We need take only the figures of motor truck advocates themselves and place the most favorable construction possible on them to appreciatee the fallacy of their contentions.

Enormous sums also are necessary to prepare the roads for motor trucks. For example, a motor-truck advocate writes in the New York *Times* for April 14, 1918, that New York State and its counties alone have spent the staggering sum of $140,000,000 for modern highways. What would a tenth of this sum do for the betterment of electric railway transportation in New York State, merely in affording a new all-rail route across the State from Niagara Falls to Albany? Again, in the *Saturday Evening Post* for April 6, there is an almost casual reference to spending $850,000,000 to make the national highways suitable for motor trucks; and, quite as casually, the suggestion is made that the motor truck because of its usefulness be subsidized by the government!



DUPLICATION OF SERVICE—DETROIT UNITED RAILWAY SYSTEM SHOWING STEAM RAILROAD INTERCHANGES
(For details see page 895)

What the motor truck actually does to a modern brick highway is shown in an accompanying illustration of the Akron-Cleveland highway, over which there pass an average of seventy-five trucks every twenty-four hours. This road was newly paved only three years ago under special specifications prepared by County Engineer Stinchcomb, who said, on its completion, that it represented the highest type of country highway—the perfect road. While it is true that the public pays the bill for improved roads (in most cases) it cannot be expected that the wholesale destruction of recently improved highways will be allowed to continue without objection on the part of the public.



FOOD CONSERVATION—INTERURBAN STOCK TRAIN

There is now pending before Congress a bill to provide that the United States shall aid the States in the maintenance, repair and reconstruction of public roads subjected to extraordinary traffic by reason of the use of such roads by the Government of the United States. This calls for an appropriation of $10,000,000.

The term "road" or "public road" in this bill includes bridges and culverts. If this bill is passed the money will be appropriated from the Treasury of the United States. If the regular avenues of transportation, viz: the railroads, both steam and electric, were used, this unnecessary expense account of repairs to roads due to the movement of these heavy trucks over the same could be saved. In this connection, in an article in the New York *Times* of May 5, 1918, Richard O. Smith, in charge of the Touring Bureau of the Automobile Club of America, states regarding road conditions in one part of the country as follows:

"The travel on the New York to Washington road has been so large both by motor trucks and passenger vehicles that the main highway is badly worn in many places, and it is no easy matter to suggest favorable detours to insure comfortable travel. Several miles of the Lincoln Highway route through New Jersey and Pennsylvania are in very bad condition."

It is obvious that it would be much cheaper and very much better for the communities in cases of this kind to permit the electric railway to handle freight on its own rails and on streets which it maintains instead of spending vast sums for the benefit of an industry which does

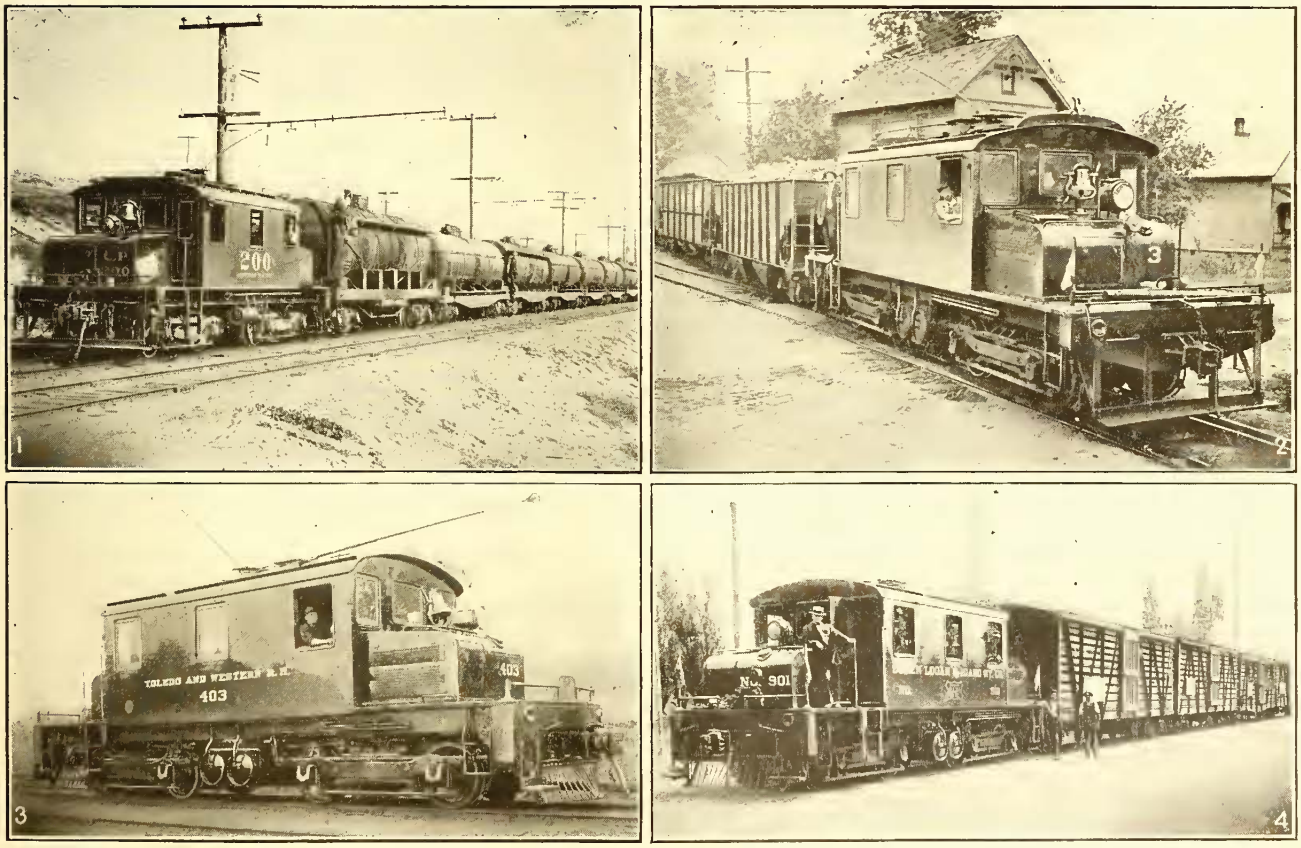
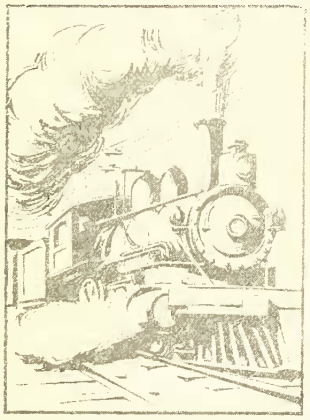
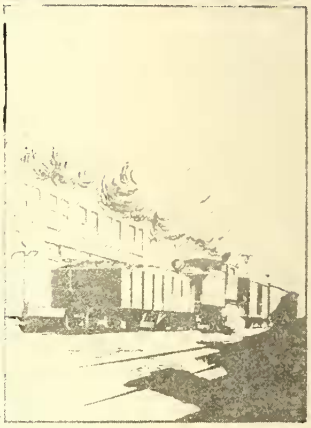


Fig. 1—Pacific Electric Railway
Fig. 2—Youngstown & Ohio River Railroad
Fig. 3—Toledo & Western Railroad
Fig. 4—Utah—Idaho Central Railroad

ELECTRIC LOCOMOTIVES IN STEAM ROAD INTERCHANGE SERVICE



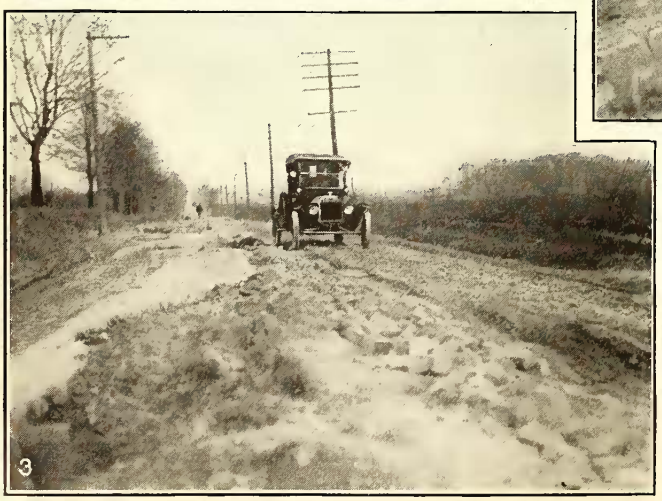


Figs. 1 and 2—Prodigal Use of Locomotives Where Electric Line Could Effect Saving in Fuel, Man-Power and Equipment

Fig. 3—Parallel Electric Line (Interurban Railway & Terminal Company, Cincinnati, Ohio) Could Handle Local Freight and Passengers

Where the Electric Railways Can Help

Fig. 1—Truck-Operating Difficulties, Akron-Cleveland Highway
Fig. 2—Effect of a Few Months Last Winter on the Perfect Road
Fig. 3—Seventy-five Trucks Operate Daily on This Highway
Fig. 4—Electric Railway Menace—Motor Truck and Trailer



not pay its keep in taxes. Nor can there be any argument as to the relative safety of motor truck operation over the public highways and train operation over a right-of-way.

The vaunted speed of the motor truck looks foolish alongside of normal electric railway service. For example, the projectors of a motor-truck service between Detroit and Toledo propose to run 5-ton trucks with two 5-ton trailers each, totaling 15 tons, at a schedule speed of 10 m.p.h., or six hours for the 60-mile run. Electric railway freight trains carrying 50 to 150 tons make the same run in three hours! Longer runs than this would put the motor trucks at a still greater disadvantage since they cannot make reasonable speed at night with

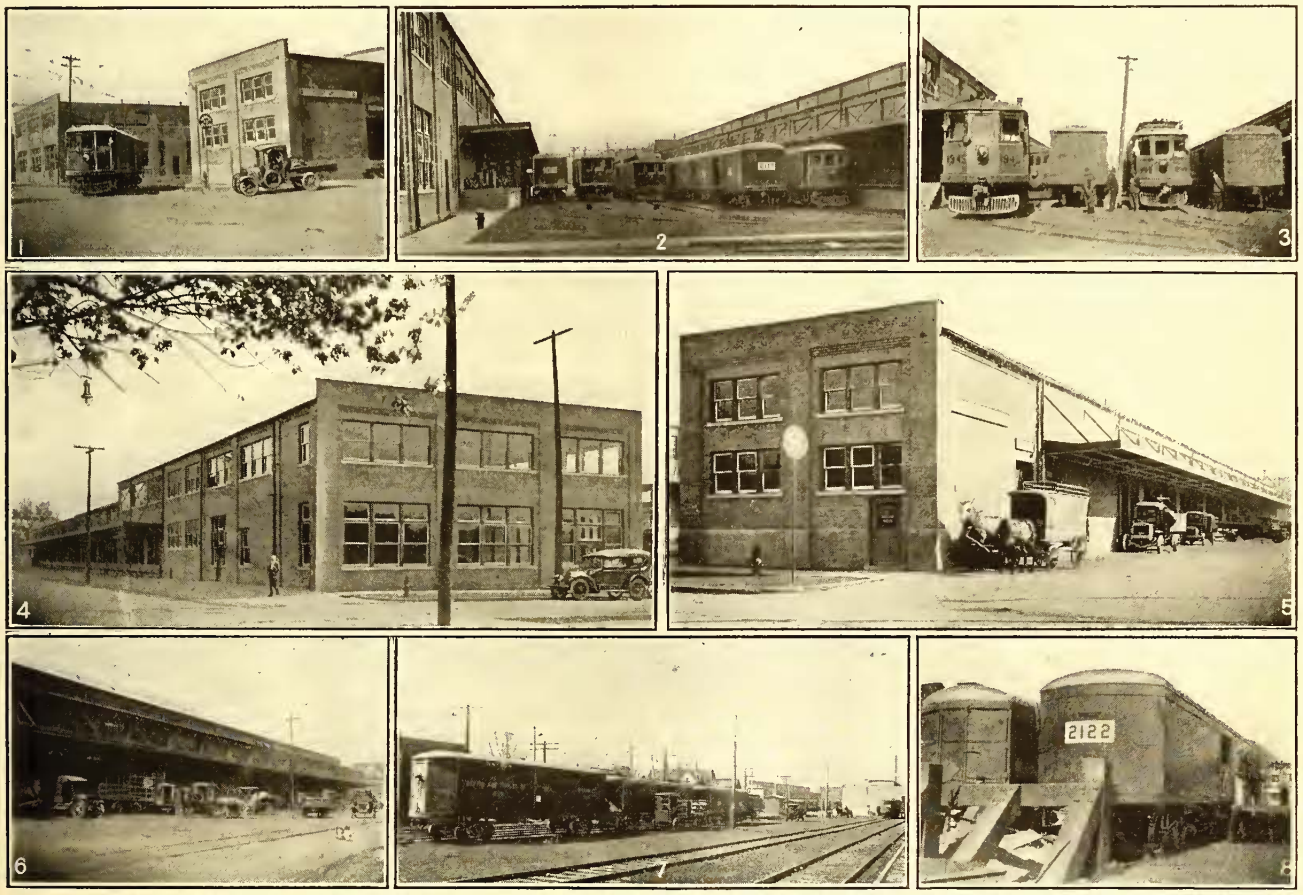


Fig. 1—Front end of out and inbound freight houses
Fig. 2—House tracks—five of these between warehouses
Fig. 3—House tracks—average of 100 cars per day loaded from these
Fig. 4—Inbound freight house
Fig. 5—Outbound freight house
Fig. 6—Team side outbound freight house
Fig. 7—Team and storage yard
Fig. 8—Loading carload freight

DETROIT UNITED RAILWAY—EAST SIDE FREIGHT TERMINAL

any degree of safety to themselves or others. On the other hand, a car on rails runs as fast at night as it does in the day.

Electric Railway Accomplishment On a 12-Mile Haul

The economic fallacy of the motor truck even for so short a haul as 12 miles can be realized from the wonderful achievement of the Inter-Urban Railway, Des Moines, in completely furnishing Camp Dodge by hauling some 10,000 standard steam road cars, totaling 500,000 tons of freight, in 1000 to 1500-ton trains of twenty to thirty cars each, and requiring not more than four men, so that the haul per man was 250 to 375 tons per trip. The average speed ranged from 15 to 18 m.p.h.

Now, had this job been assigned to motor trucks, each driver would not have averaged better than 10 tons per trip, assuming that he could take such an unusually big load. Therefore, to haul 500,000 tons fully 50,000 men-trips would have been necessary compared with 1666 men-trips (assuming 300 tons per man) on the electric railway. In other words, if the motor trucks could have equalled the speed of the electric railway, they would still have required thirty times the man-power!

It follows that there could be no greater waste of man-power than the unrestricted use of the motor truck, not alone in the number of men required for the trucks but in the additional men required for road upkeep, maintenance of a heat engine and increased manufacture of gasoline, which is needed far more abroad than here.

Instances that prove the economic inferiority of the motor truck could be multiplied indefinitely, but it does not follow that the more efficient rail transportation will be utilized as a matter of course. The establishment of regular schedules and routes, and of return load bureaus to enable trucks to return loaded, indicates that the motor truck is backed by men who are making the

most of the extraordinary conditions created by the war congestion of the steam railroads. The danger actually exists that both the railways and the public may be injured immeasurably by an uneconomical form of transportation because that form of transportation is backed by interests worth hundreds of millions of dollars. In short, the public sees the motor truck through the veil of romance.

How the Terminal Facilities Help in Handling Freight

The Detroit United Railways has been able to triple its freight-handling capacity by erecting a new terminal on the east side of Detroit and about 1 mile from the Detroit City Hall. The company has nearly completed an extensive new freight structure on the west side,

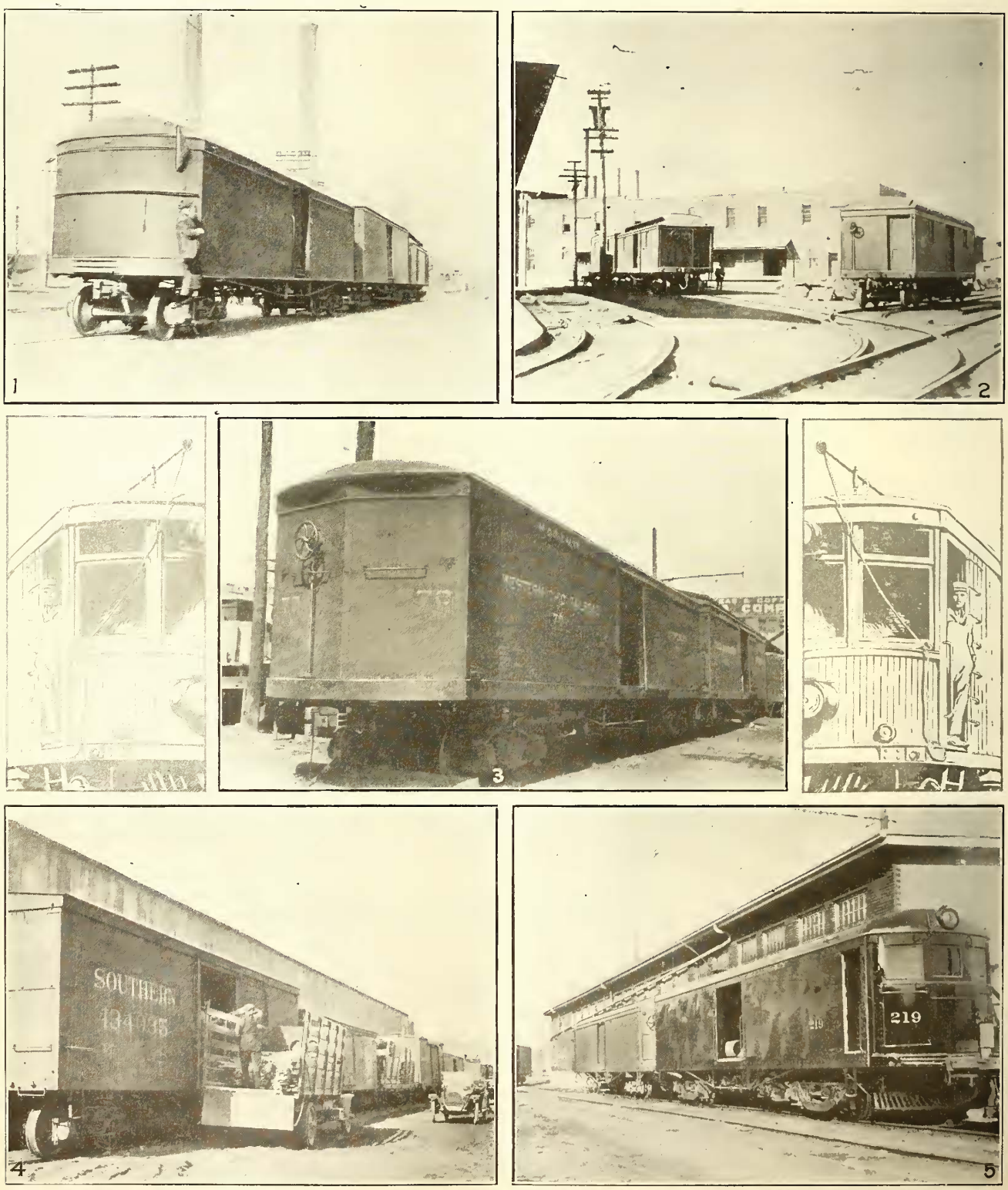
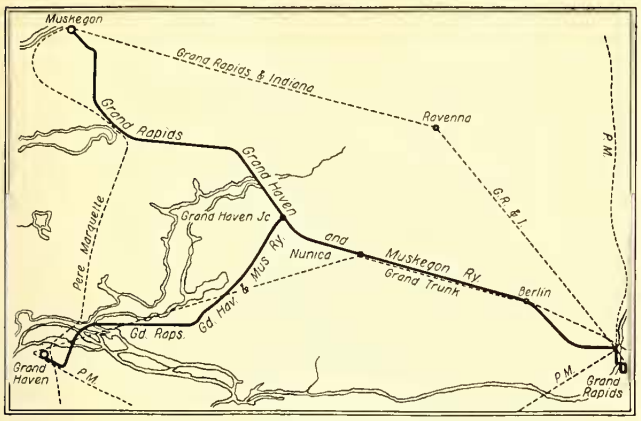


Fig. 1—Typical Interurban Freight Train in the Middle West
Fig. 2—Ohio Electric Railway Freight Terminal—Springfield, Ohio
Fig. 3—Western Ohio Railroad Freight Trailers
Fig. 4—Michigan Railway Freight Yard—Grand Rapids, Mich.
Fig. 5—Michigan Railway—Motor-Freight Car and Trailer

ELECTRIC RAILWAY FREIGHT SCENES



DUPLICATION OF SERVICE—GRAND RAPIDS, GRAND HAVEN & MUSKEGON RAILWAY—(See Page 895)

which represents only one-half of the contemplated development when completed, but has been unable to construct the other half of the terminal because of lack of funds. In the meantime the building has been leased to an automobile concern as a drive-away garage.

The east side terminal occupies an entire city block.

How Detroit United Can Speed Up Air-craft Program

The Detroit United Railway system is so located that the industrial center which it serves could, through close attention to the proper routing of shipments, benefit to even a greater degree than at present from the fast service performed by this line. In the Detroit territory companies manufacturing air-plane motors have often been obliged to make shipments by express because of not being able to get them over the steam roads fast enough. This is very expensive compared with the practically express type of electric freight service of the Detroit United. Although the steam roads have sidings into the air-craft plants, there is no reason why the electric cars of the lines could not be "set out" at these plants for such shipments.

Detroit as a Center of Through Routes

All of the D. U. R. freight routes begin at Detroit. What may be considered the round-trip routes follow:

Detroit to Pontiac—Four runs daily (except Sunday).
Detroit to Flint—Three runs daily (except Sunday).
Detroit to Imlay City—Two runs daily (except Sunday).
Detroit to Jackson—Five runs daily (except Sunday).

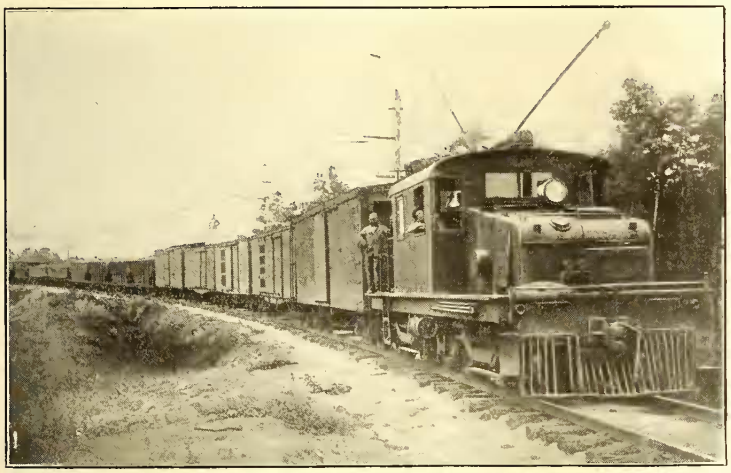


Fig. 1—Piedmont & Northern Lines—Heavy Freight Train. Fig. 2—Chicago, Lake Shore & South Bend Railway, Standard Steam Railroad Equipment

ELECTRIC RAILWAY FREIGHT ROLLING STOCK

The inbound freight house is 60 ft. by 405 ft. and the outbound 45 ft. by 405 ft. Between these two buildings is a yard, consisting of five loading or house tracks. The streets along either side of the freight house serve as a team and truck way to the station. In the block beyond that occupied by the building and house tracks are tracks for loading and unloading carload shipments. These include four team and storage tracks 600 ft. long, connecting between the two buildings and also the main line. All the facilities in this freight house are of the modern type. See ELECTRIC RAILWAY JOURNAL, April 21 and Aug. 11, 1917.

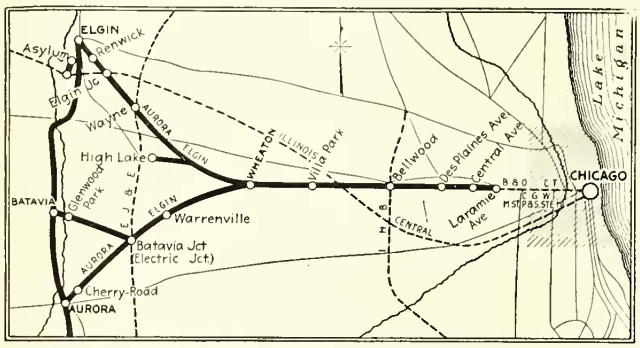
An average of ninety-seven to 100 cars a day are loaded out of the east side terminal of the Detroit United Railway, approximately 2200 to 2400 cars per month, which compares favorably with many a steam road terminal. Practically each one of these cars is equivalent in service to from three to five steam road cars, because many of them are motor cars, and make a large average daily mileage.

Detroit to Ann Arbor—Two runs daily (except Sunday).
Detroit to Northville—One run daily (except Sunday).
Detroit to Port Huron—Two runs daily (except Sunday).
Detroit to Mount Clemons—Three runs daily (except Sunday). Wyandotte and Orchard Lake—Two runs daily (except Sunday).

TYPICAL FREIGHT STATION, CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY

There is a regular daily merchandise car service from Detroit to Saginaw and Bay City, via Flint; from Detroit to Battle Creek, Kalamazoo, Grand Rapids and other points in western Michigan, via Jackson over the Michigan Railways, and from Detroit to Lima, via Toledo, over the Toledo, Bowling Green & Southern, Western Ohio, Dayton & Troy Railway.

During last year a great many shipments were made over electric lines between all the points just mentioned.



DUPLICATION OF SERVICE—AURORA, ELGIN & CHICAGO RAILWAY, WHITE CIRCLES INDICATE TEAM LOADING FACILITIES FOR CARLOAD FREIGHT (See page 895)

At a time when the steam roads were greatly congested all over the country, manufacturers and consumers east of Michigan were greatly assisted by the electric railway lines in getting their materials transported. A movement of about seven cars of automobile parts a day takes place between Dayton, Ohio, and Flint, Mich. The ability of the Detroit United to increase this traffic is limited only by the supply of cars.

Michigan Railway Operates Heavy Trains

The Michigan Railway handles a considerable amount of steam road equipment between Grand Rapids, Kalamazoo and Battle Creek by powerful motor cars, each capable of hauling on a level as high as twenty-six freight cars. The average electric freight train out of Grand Rapids and Kalamazoo is from eight to ten cars in length. An extensive interchange business is carried on between the Michigan Railway and the Detroit United Railway.

The freight handled on this system is practically the same as that on any steam road, as it includes both less than carload and carload. A large amount of the latter goes daily out of Grand Rapids for all points connecting with this road, which includes southern Michigan, northern Ohio and Indiana. Much more relief could be given from Grand Rapids via the Michigan Railway to points in southern Michigan and northern Ohio if a very important gap were closed by the construction of an electric railway between Adrian and Battle Creek, or between Adrian and Jackson.

The freight operations of this road are extensive and they have grown so rapidly that the freight terminal built at Grand Rapids only three years ago is entirely inadequate for the service demanded. It has a yard capacity of twenty-eight cars, while the present traffic would require a forty-car yard. In summer from thirty to forty cars are handled daily, and throughout the year there are handled about twenty cars per day outbound and about fifteen cars inbound.

Steam railroad interchange is carried on by this road at the following points in Michigan:

Allegan—Pére Marquette and Lake Shore Railroads.
Montieth—Grand Rapids and Indiana (Richland Junction).
Chicago, Kalamazoo and Saginaw—Richland Junction.
Battle Creek—Michigan Central.
Holland—Pére Marquette.
Lansing—Pére Marquette.
Bridgeport—Pére Marquette.
Battle Creek—Reaching the Grand Trunk through the Michigan Central.

Michigan Railway Interline Service to Detroit and Points South

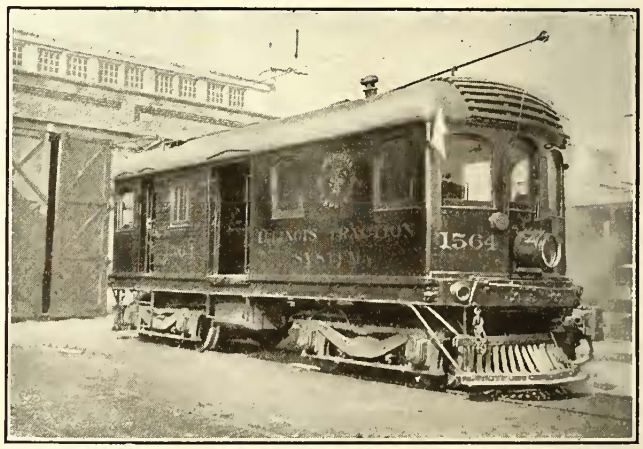
One of the outstanding features of the operation of the Michigan Railway is its flexibility in handling mixed freight equipment, both steam cars and electric trailers.

On the southeastern division, Kalamazoo to Jackson, there are four round trips per day. One of these is an Adams Express run, although this train also handles solid cars to and from terminals. Each train consists of from one to five interurban trailers. Two runs are in the day time and the other two at night.

On the northeastern division, Jackson to Lansing, two round trips are made daily, one during the day and one at night, both doing local work. There is also one round trip each day between Lansing and Owosso, and between Lansing and St. Johns. The freight motive power of this line consists of four steel, 55-ton freight motor cars, each capable of pulling a 500-ton trailing load and easily handling ten loaded freight cars, which is the usual length of train on this system between Grand Rapids, Kalamazoo and Battle Creek.

Electric Freight Terminal Required at Toledo

Toledo, Ohio, is a very important interurban electric freight center. Many cars from Michigan routed to points in Ohio and Indiana, go through this terminal,



ILLINOIS TRACTION SYSTEM—ONE OF EIGHTEEN 63-TON ELECTRIC FREIGHT LOCOMOTIVES

which at present is greatly congested and in no respect commensurate with the importance of the traffic handled.

At the same time there exists in Toledo a large steam freight terminal station belonging to the Toledo Terminal Railroad Company which is unused for the purposes for which it was built. Its location is such that it could adequately serve all electric lines entering the city. A part of the station could be used for passenger service. If this structure were released for the

use of the electric lines, conditions at Toledo would be very much improved. There are possibly similar cases elsewhere of steam railroad property that could be released to the electric lines.

Heavy Carload Carrier—Toledo & Western Railroad

The Toledo & Western Railroad, running due west from Toledo to Pioneer, Ohio, and with a branch running from Allen Junction to Adrian, does one of the most extensive interchange businesses of any electric line in the country. More than 75 per cent of the revenue is obtained from freight operation.

The organization of this line is similar to that of a steam railroad and, in fact, is considered as such by a number of steam roads which have interchange agreements with the electric line. Such an important factor has this railroad been in the development in territory served that the real estate values have increased 100 per cent in the last fifteen years.

Interchanges are located at the following points:

Toledo, Ohio—Toledo Terminal Railroad and connecting lines.

Franklin, Ohio, and Adrian, Mich.—Wabash Railroad.

Denson, Ohio—Detroit, Toledo & Ironton Railroad.

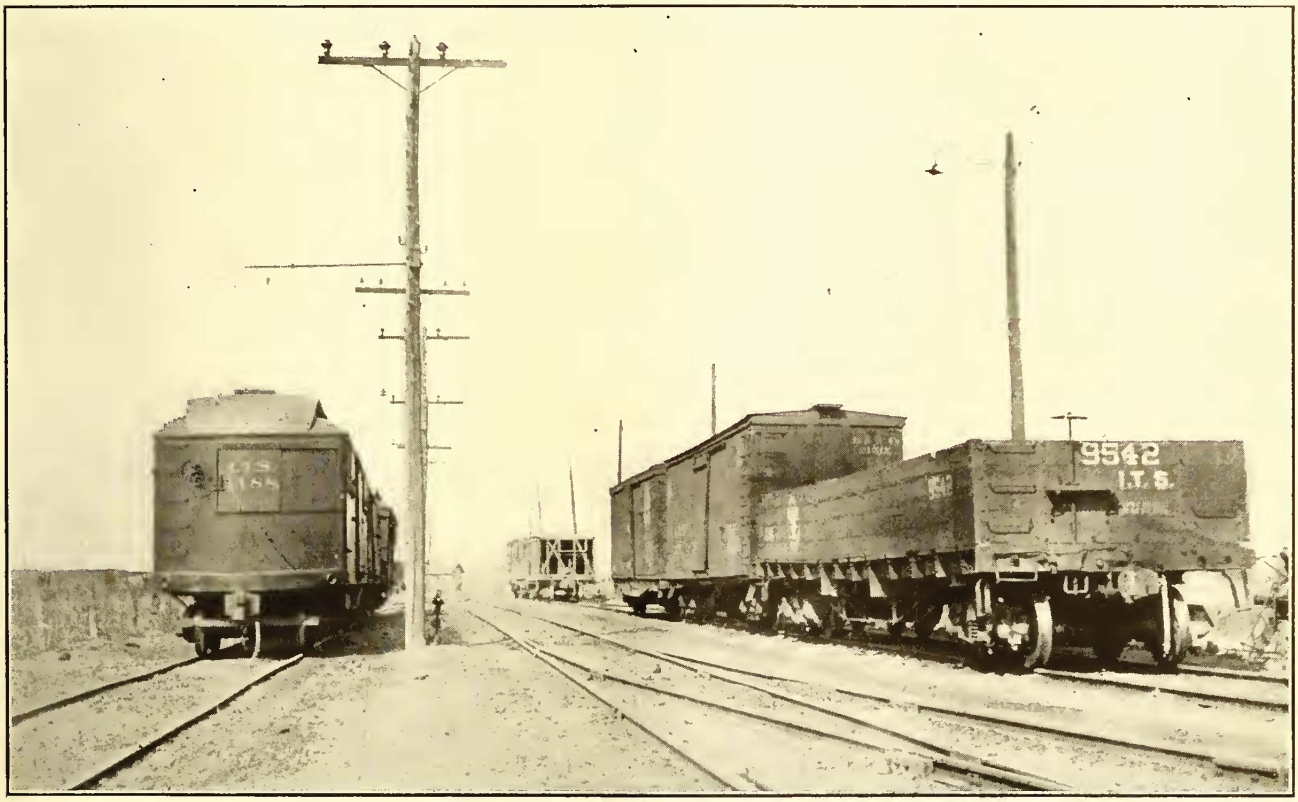
Freight traffic has been increased to the point where an electric locomotive of 60-tons weight is required to handle some trains during the sugar beet season.

Chicago Franchises Restricting Electric Freight Haulage

Chicago city regulations considerably limit the service which the six electric interurban railways, radiating from the city into a very rich agricultural and manufacturing district, could supply. During the off-peak hours enormous quantities of merchandise could be handled over the elevated and surface lines to and from the heart of the city by these interurban systems without any inconvenience or annoyance to the public.

The present elevated lines are used for passenger traffic only, and their economic value could be increased very considerably by their use for express and freight service.

The radiating interurban lines are not being operated at their full capacity and could very advantageously move any freight matter delivered to them from the elevated system. By this means the public would be much better and more profitably served than at present. The interurban lines maintain an express and freight service but are handicapped by reason of the location of their terminals, which are from 6 to 8 miles from the heart of the city. It is unreasonable to expect shippers to haul freight this distance when the facilities provided by the steam railroads for receiving such freight are convenient for downtown distribution.



ILLINOIS TRACTION SYSTEM—FREIGHT ROLLING STOCK ALONG A TYPICAL BELT LINE

There is now pending before the City Council in Chicago an ordinance which, if favorably acted upon, will enable the electric railways entering Chicago to carry freight and express matter over the elevated lines. This will open new important traffic arteries over the Aurora, Elgin & Chicago Railway, the Chicago, Lake Shore & South Bend Railway, and the Chicago, North Shore & Milwaukee Electric Railroad. These lines connect with the elevated structure and have cars that are designed to fulfill the clearance requirements at station platforms and on curves. Unfortunately, the franchise for the elevated lines specifies that no freight other "than mail and such baggage as is carried by hand may be moved

over the elevated lines." This limitation placed on the elevated lines prevents Chicago from enjoying an economic development of inestimable value.

Electric freight haulage in Chicago would greatly relieve steam railroad congestion by taking a considerable amount of short-haul traffic. Aside from providing facilities for carrying freight over the electric lines, including the Chicago Surface Lines, interchange with the steam belt lines operating in this vicinity would make the whole transportation system in Chicago and vicinity far more flexible and useful.

The "North Shore" Line Aids the Great Lakes Naval Station

The Chicago, North Shore & Milwaukee Electric Railroad, skirting the western shores of Lake Michigan between Chicago and Milwaukee, is in excellent position to serve the numerous industries located along its lines. Although it went into extensive freight operation but recently, many of its freight houses are not large enough to care for the traffic, and it has been compelled to enlarge its facilities and erect new stations large enough to give adequate service.

If the plan of moving freight over the elevated lines is carried out, this road will have to make still further additions to its freight facilities. It will then be in a position to be very helpful toward relieving the freight congestion to all points on its line between Chicago and Milwaukee. Instead of being restricted to local freight it would be able to interchange freight with other lines, running south and west of Chicago.

During the last winter, this railway played an important part in handling commodities, judging by these extracts from the Chicago *Evening News* of Jan. 19, 1918:

> Not only did the electric line take care of passengers, but when the steam roads were tied up, it hauled meat, milk and coal to a number of North Shore towns, which otherwise might have experienced a real famine.
>
> The day before the first storm broke in all its fury, the electric line delivered ninety cars of coal to the Great Lakes Naval Station. But for the timely assistance brought to the great training camp with its 20,000 jackies, they would have suffered for lack of fuel. From the Borden's Condensed Milk Company at Evanston, the electric line received two carloads of milk, which were distributed to the towns along the line, thus avoiding a serious milk famine.
>
> Mrs. Scott Dureen, owner of the famous Crabtree Dairy, found the electric railway a savior in the time of distress. The steam railroads could not help her, but the electric line took care of all her shipments in such a satisfactory manner that she will continue to use it hereafter.
>
> When the Naval Section was threatened with a bread famine the electric railway pulled a carload of bread from Libertyville to the Great Lakes.
>
> The same train crew took care of the usual steam road traffic from Rondot.
>
> So successful was the electric road in getting meat cars through and avoiding a meat shortage, that Armour & Company have taken advantage of the facilities and shipped several carloads of meat from the Eaton branch to supply all the North Shore towns along the electric line.

At present the North Shore line has no terminal within the corporate limits of Chicago but stops at its southern terminal, Evanston. However, there is a track connection between this line and the Chicago Elevated lines. Should the Chicago Council finally pass the freight ordinance now pending, it would be possible to work out plans to handle freight at night over both the elevated and surface lines of Chicago. Also intend to greatly develop the territory served by the electric railways.

The "South Shore" Could Run Forty-Car Freight Trains

The Chicago, Lake Shore & South Bend Railway, operating 77 miles between Pullman, Ill., and South Bend, Ind., could also handle all the freight traffic that might be routed over it. Freight is carried as far west as Kensington, Ill., where it is interchanged with the Illinois Central or Pullman Railroads. This road is single track from South Bend to Gary, 59 miles, and double track for the remaining 17 miles. It is protected throughout by automatic block signals.

All freight is hauled by 72-ton electric locomotives rugged enough to draw thirty to forty-car trains instead of the ten-car trains which meet the requirements at present.

Most freight movements are made at night during the off-peak hours. A locomotive makes a round trip of 154 miles from South Bend to Kensington in about fourteen hours. Freight cars loaded up until 6 p.m. in Chicago are "set out" by the Illinois Central at Kensington, from which point they leave at about 1 a.m. and reach South Bend in time for 8 a.m. delivery. This is far better service than that now possible by other existing facilities. This line can materially relieve the steam road situation in its territory, since the railway can carry between its terminals practically all local freight offered for transit.

At South Bend the "South Shore" line taps such industries as the Oliver plow works, the Studebaker plants and the Singer sewing machine works. With the extension of steam road interchange arrangements to this line it could at once become a very great source of relief. Interchange arrangements would also permit it to tap the Haskell & Barker car works at Michigan City and the Rumley implement plants at La Porte, Ind.

Through an interchange agreement already in effect with the Illinois Central Railroad at Gary and with the Elgin, Joliet & Eastern Railway (Chicago Outer Belt Line) at Gary (Golf Junction) this line receives freight for any point in the United States. Interchange is also made with the Chicago & Calumet Railroad.

At present no interchange is made on the east end of this line because the steam lines are said to refuse to deal with an "electric" line. With this barrier removed, the "South Shore" line could interchange with the following steam roads at different points: Lake Erie & Western, Erie, New York Central (Lake Shore), Monon, Michigan Central, Pennsylvania and Baltimore & Ohio.

Wells, Fargo & Company operate their express service on the regular passenger cars, and the last night train each way has an express trailer. Express matter to points east of Hammond, Ind., on the "South Shore" line is brought out from Chicago by the Erie Railroad and turned over to the electric line at Hammond.

In addition to the express business, dispatch or package freight is handled on the regular passenger trains.

Aurora, Elgin & Chicago Railroad Could Handle More Freight

High-speed passenger service is operated by this line as well as a package express and freight service, both carload and less than carload. Like other electric lines entering Chicago, it is seriously handicapped in not

being able to operate its cars carrying express and freight into Chicago over the elevated lines, its express and freight terminal being located at a point 6 miles out from the center of the city. This line has freight motors capable of hauling from ten to thirty standard steam road cars.

While the general character of traffic handled by this line is l.c.l. merchandise and package express, it has steam road interchange regulations with the Illinois Central, Chicago, Burlington & Quincy, Indiana Harbor Belt-Line and Elgin, Joliet & Eastern Railroads. Through the last two named belt lines, this electric line can reach any steam road point in the United States. In an endeavor better to serve its territory, the management has prepared a map, reproduced on page 904 to show the points where team tracks are available for loading and unloading.

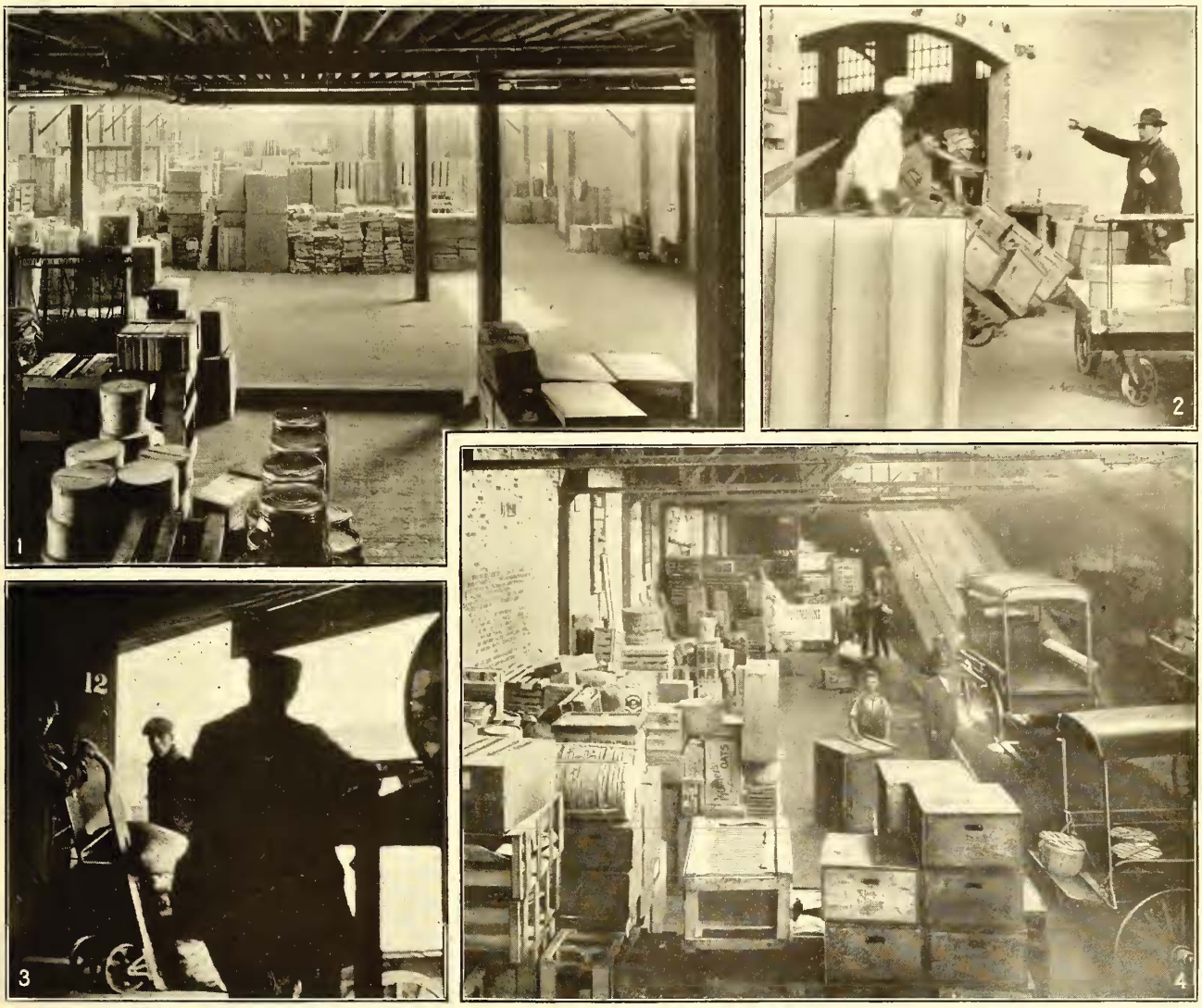


Fig. 1—Detroit United Railways
Fig. 2—Michigan Railway
Fig. 3—Indianapolis Terminal, Checking Freight from Trucks
Fig. 4—Interurban Railway & Terminal Company, Cincinnati, Ohio

FREIGHT HANDLING ON A NUMBER OF INTERURBAN ELECTRIC RAILWAYS

Illinois Traction System

The Illinois Traction System, traverses a territory of diversified agricultural and mining character, providing freight traffic of a steady nature. There are eleven coal mines on the system, and some of these have no other outlet than the electric road, while on adjacent steam roads there are more than 100 such mines, which are also served by the electric system. The three coal mining districts on the system are from Danville to Champaign, from Springfield to Peoria and from Staunton to Springfield. It is the aim of the traffic department of the company so to arrange shipments that each group of mines will supply all the coal needed in its own region, thus keeping the car mileage down to a minimum. This local distribution is undertaken in large part by the railway which delivers coal along the right-of-way to dealers, who unload on their own special sidings directly to their own wagons for house and factory distribution. Although a considerable part of the line is single track and a heavy passenger business is done, the company has been successful in developing also an extensive freight and express traffic, by inaugurating a generous policy of providing long sidings and general improvement of electric railway facilities, including block signals.

The Illinois Traction System serves more than 100 towns and cities located in fourteen counties in the

State of Illinois. Its freight and express traffic is handled by motor express cars drawing trailers, and by large 63-ton electric locomotives, with a drawbar pull of 35,000 lb. Each of these locomotives has an equipment of four 200-hp. motors, which gives it a tractive power equal to the average steam freight locomotives.

Supplementary to the daily operation of freight and express trains over this system, a through service for package or dispatch freight to and from Chicago is maintained by means of a physical connection with the Chicago & Eastern Illinois Railroad. Connection between this steam road and the electric line is at Glover, near Champaign, where a complete installation of connecting interchange tracks has been made to facilitate this class of traffic. By means of fast through express trains, freight received at any terminal point by 5 p.m. reaches its destination on the traction system by early the next morning.

Twenty-four grain elevators have been constructed along the interurban line, and are now in operation and at the service of the shippers of the Illinois Traction territory. Much of the grain going over this system is shipped to Chicago, but since the Illinois Traction System has no physical connection with an electric line into Chicago, it was necessary to build a large transfer grain ele-

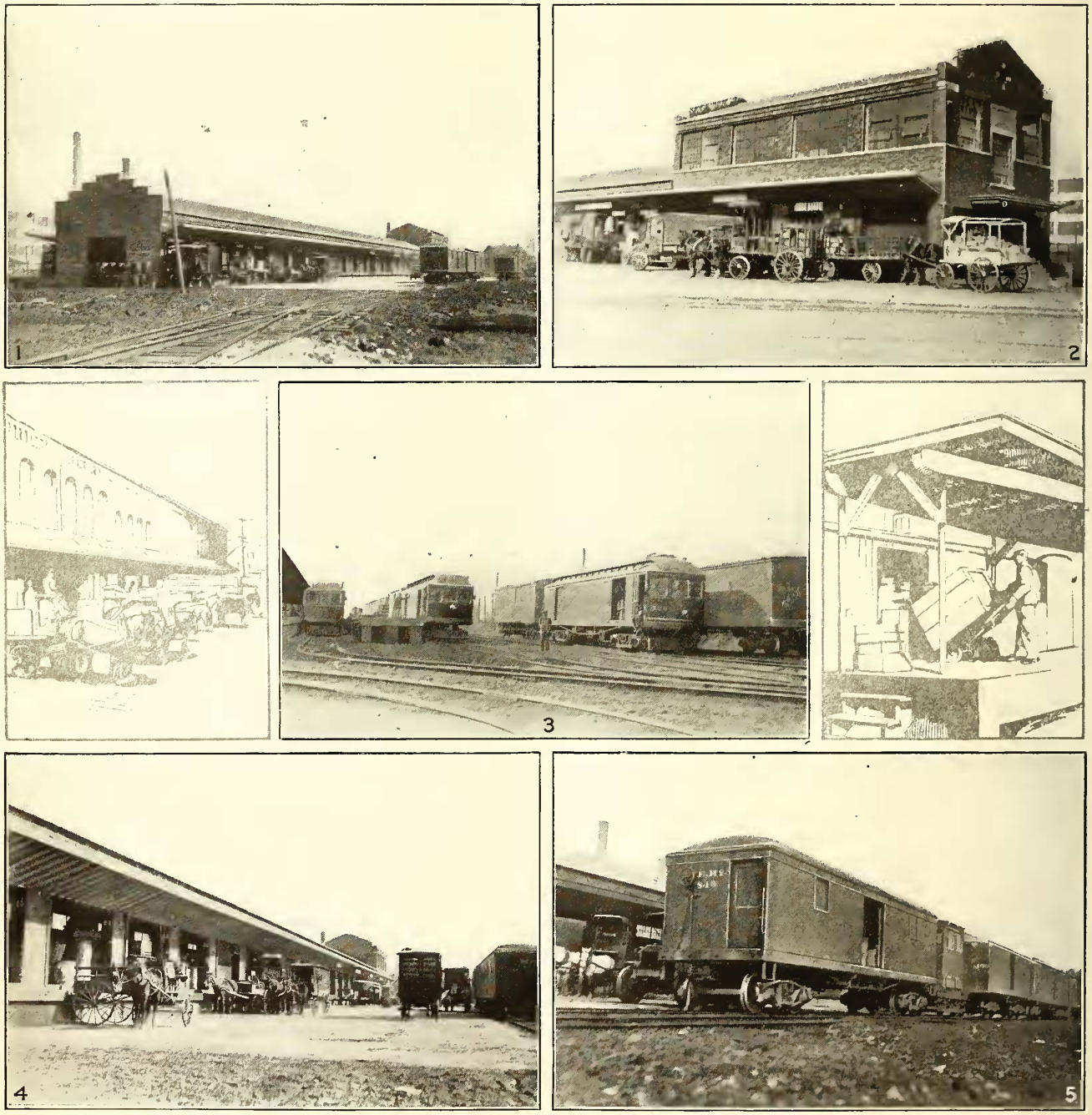


Fig. 1—One of the Terminal Buildings
Fig. 2—Freight Office End of Terminal
Fig. 3—Terminal Yard for Loading and Unloading, Less-than-Carload Merchandising Freight
Fig. 4—Team Driveway
Fig. 5—Interline Interurban Freight Trailers. A Switching Motor Is Used in Moving Trailers About the Terminal Yard, thus Relieving Motor Cars

THE SERVICE AT THE INDIANAPOLIS FREIGHT TERMINAL AVERAGES 2100 FREIGHT CARS PER MONTH

vator at Glover, Ill., where connection is made with the Chicago & Eastern Illinois Railroad. Grain on the traction system is delivered to this elevator and is transferred into steam road cars.

Another noteworthy factor in connection with the Illinois Traction System is that it has its own entrance into St. Louis via the McKinley Bridge. By means of its own terminals at St. Louis, and interchange arrangements with all steam railways entering St. Louis, it assures a great saving of time in handling shipments through that gateway.

Freight Haulage by Iowa's Interurbans

One of the outstanding characteristics of the important electric lines of Iowa is that practically all of them have been built and operated on a steam railroad basis. They are of steam railroad construction but are provided with trolley wires.

On the Fort Dodge, Des Moines & Southern as high as twenty cars to the mile are found, while over the Waterloo, Cedar Falls & Northern anything that a steam railroad handles can be transported. On the Inter-Urban Railway of Des Moines we find a wonderfully extensive movement of materials to construct, equip and supply one of the great military camps of the country.

These points are brought out as a comparison with many of the roads in the Central States which could develop similar freight operation with federal financial assistance.

Inter-Urban Railway Equips Camp Dodge Completely

The Inter-Urban Railway handles heavy steam railroad freight traffic and does a general interchange business through the Iowa Transfer Pool Yard operated by the Des Moines Union Railway, which cares for all steam road interchange in the vicinity of Des Moines. At this yard direct connections are secured by the Inter-Urban Railway with the Chicago, Rock Island & Pacific, the Chicago, Great Western and the Fort Dodge, Des Moines & Southern Railroad.

In addition to this, at Granger transfer is secured with the Chicago, Milwaukee & St. Paul Railway, although most of the interchange with this railway is done at Perry. At Altoona, near the eastern end of the system, interchange is secured with the Chicago, Rock Island & Pacific. At Colfax connection is made with the Colfax Northern, which is a 7-mile line running into an extensive coal field. At Colfax also, interchange is possible with the Chicago, Rock Island & Pacific Railway.

One of the noteworthy facts in connection with the operation of the Inter-Urban Railway of Des Moines is that Camp Dodge, with accommodations for about 25,000 troops is located approximately 12 miles northwest of Des Moines. *This camp, which is virtually a city, was constructed of material hauled in more than 10,000 cars over the electric line. This included the transportation of building materials, supplies, food, munitions, cattle and horses.*

In connection with this camp the electric line not only furnishes an unlimited freight service, which is comparable with that found on steam roads, but also operates a very extensive passenger service.

Des Moines is an important city, and the soldiers travel frequently. To meet this situation on an electric line steam railroad coaches have been secured from roads in the vicinity of Des Moines. Ordinarily the electric locomotives haul freight, but on Saturdays and Sundays, when the passenger traffic is very heavy, they also haul trains of twelve 25-ton trailers. The company has also eight passenger motor cars which have been regeared for train operation and haul from six to seven passenger cars.

Long before the creation of the big camp, several industries on this line were heavy tonnage producers. One of these is a gravel pit, served by the Beaver Valley division on which Camp Dodge is located. From this pit 316,800 tons, or more than 6600 carloads, have been taken in one year. This is more than three times as much output as obtained from any other gravel pit in the State. A number of coal mines of various capacities are also located on this line. Five of these supply more than 4000 tons per day to be handled.

Twelve grain elevators on the Inter-Urban company's lines also bring considerable traffic. Other industries are an ice plant with fifty cars per day in winter, several clay-products plants, one asphalt paving plant and several canning factories. Seven miles of the railway are equipped with block signals, and the Beaver Valley division is rapidly being double-tracked to Fort Dodge.

When Camp Dodge was established it was thought that it would be impossible for the electric line to handle all the traffic. However, the steam lines, the nearest of which was within 1 mile of the camp, while another was 3 miles away, did not extend their lines into the camp. Hence all this traffic had to go by the electric line.

The electric line's service has proved satisfactory beyond all expectations of the government officials. Here is an example of what is done regularly: Often in making troop movements, it is necessary to have very long trains, consisting of baggage and passenger cars. Recently one 60-ton electric locomotive moved a train of sixteen sleepers and two baggage cars to the interchange point, where the steam line actually had to break the train in two because the branch line locomotives could not haul the entire train.

Oct. 2, 1917, is cited as a typical day. On that day, 26,145 tons were moved in 504 cars, nearly 52 tons per car.

Heavy Tonnage Freight Service Waterloo, Cedar Falls & Northern Railway

On the main line of the Cedar Rapids & Waterloo division, freight service is performed by five 60-ton locomotives equipped with four 250-hp. motors, which are capable of making the run of 60 miles between Waterloo and Cedar Rapids in three hours. The capacity of these locomotives is such that an 800-ton train can be handled at 24 m.p.h., and the type of control equipment on these locomotives is specially laid out to meet the demands of heavy traffic on this line. The company also has an extensive freight terminal at Waterloo, in connection with a belt-line along which are located many traffic producing industries. The line switches more than 70 per cent of the steam road tonnage entering Waterloo to these industries.

A Short Big Freight Carrier—Mason City & Clear Lake Railroad

The Mason City & Clear Lake Railroad, one of the earliest interurban systems, has always depended very largely on its freight traffic. The building up of this line is interesting in that it is only 16 miles long and the actual freight route only 10, and on the whole system there is only 5.45 miles of yard track. This line is built on private right-of-way and is not restricted in any way from the standpoint of operating methods.

On the shore of Clear Lake near one end of the line is a large ice house, which during the winter is filled with ice, and a salesman is put on during the summer to take orders for it. The freight revenue from this enterprise, which is very heavy, with the other freight handled on the line, brings the revenue up to more than $30,000 a year, making the average amount per ton of freight 53 cents. During 1917 this line handled 58,172 tons of freight.

New Indianapolis Freight Terminal Relieves Congestion

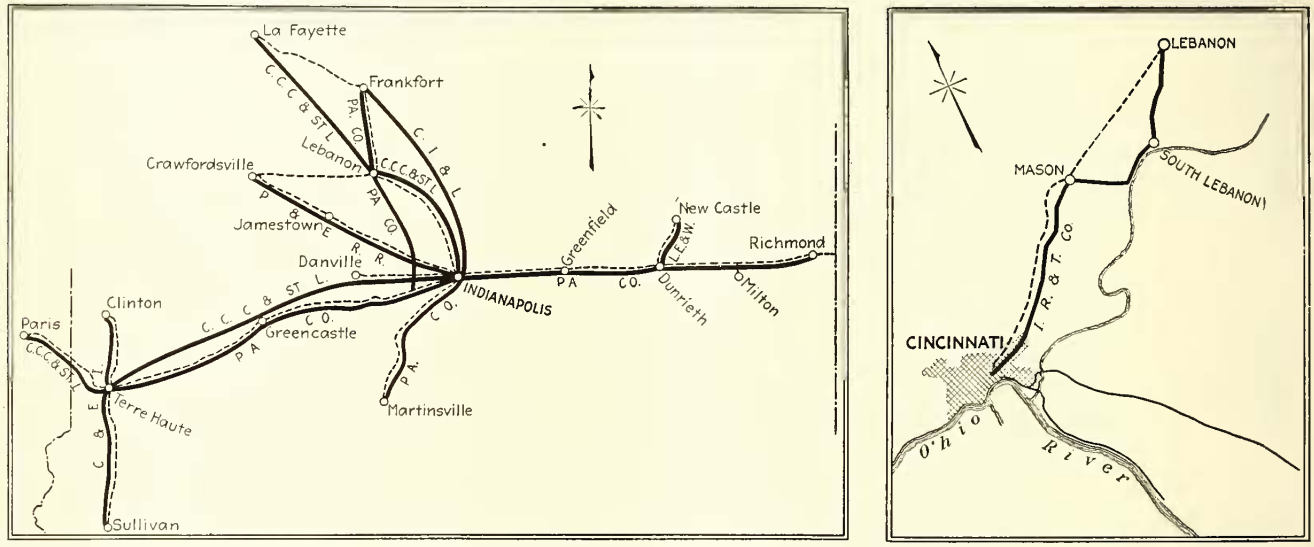
Indianapolis, the long time interurban center of the United States, has helped to foster some of the most important interurban systems of the country. Owing to the rapid development of l.c.l. freight, however, the facilities there became entirely inadequate some time ago. Hence it has been necessary to build a new freight terminal about 1 mile from the present one, which adjoins the passenger terminal.

Although this new terminal is located 1 mile from the center of the city, shippers have not been inconvenienced owing to the general use of motor trucks, which make the run from the heart of the city to the new freight house in a little more than five minutes. A complete description of the new terminal was published in the ELECTRIC RAILWAY JOURNAL of Aug. 11, 1917.

One of the noteworthy features is the terminal layout, which will make possible really rapid handling of l.c.l. and carload freight. Practically all difficulties in the transit of freight from the shippers' trucks through the freight checker and into the freight house have been eliminated.

The first of the new freight terminal buildings has been completed. This development is to include three freight houses, two outbound and one inbound. The former are to be of the following dimensions: 30 ft. x 660 ft. and 30 ft. x 470 ft., with a 50-ft. driveway between them and tracks on the outside of each. The inbound freight house is to be 50 ft. x 450 ft., with a 40-ft. driveway.

When this terminal was laid out, more teamway was allowed in proportion to the house area than is usual in steam terminal design, for it is found in connection with handling electric freight that there is more delay from trucks and wagons, owing to their greater number. Moreover, the use of loops materially helps to clear the yard by reducing the number of switching movements.



DUPLICATION OF SERVICE—AT LEFT, TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY. AT RIGHT, INTERURBAN TERMINAL & RAILWAY COMPANY—(See page 895)

Thirteen tracks will ultimately run straight through the terminal yards, being separated only by buildings and driveways. All the platforms are 10 ft. wide. Sufficient space for two lines of trucks and wagons is provided, and this space extends the full length of the adjoining straight track. Only five tracks, at present, are on the north side and three on the south side of the completed building. Granite block will be used in paving all driveways.

This terminal performs an important function in the effort of interurban electric railways to assist the government in lessening the serious situation on the steam lines. The building of this terminal should be helped in every possible way by the government. It has been somewhat delayed by lack of financial resources.

Indianapolis Could Give More Off-Peak Service

While the interurbans radiating from Indianapolis have been doing an extensive passenger and l.c.l. freight business for years, most of them are important trunk lines. Single-car operation and, in some cases, motor-car and trailer operation have been characteristic of electric freight operation in this territory.

In many cases the roads find it necessary to handle

freight movements practically on passenger schedule. Most freight cars are geared to the same speed as the passenger cars. Furthermore, they are frequently operated during the day, sandwiched between limited and local passenger trains. Yet plenty of freight could be handled during the off-peak hours. In fact, the shortage of warehouse space in Indianapolis has led many of the lines to handle their freight at night, thus improving the load factor. More freight could be handled in this way.

The physical facilities for freight handling, however, are limited, and federal financial aid is needed to place the lines in the proper shape. For instance, sidings are short and often stub-ended, available only for two or three cars and sometimes only one car. In other cases curves, or city fire plugs within clearance lines, prevent handling M. C. B. equipment, or special work will not take M. C. B. wheel flanges.

The Indianapolis Union Railway, or Indianapolis Belt, has been operating for more than twenty years and, naturally, is centrally located, for the city has grown around it. With the extensive development of freight haulage in this city, the electric railways might eventually consider the construction of a belt line, say for two-thirds of the distance around Indianapolis, to give two general entrances for south and west lines and north and east lines.

The Indianapolis electric freight terminal averages 2100 freight cars a month, practically the same as the Detroit United Railway's big terminal. There are eleven through-car routes between Indianapolis and Fort Wayne, four between Indianapolis and Dayton, one to Zanesville, and two to Lima and Cleveland.

Recently the lines radiating from Indianapolis changed their methods of freight operation. Freight cars operate during the night, starting out about 6 p.m. and coming back early in the morning with a return load of milk and other farm products and merchandise. This was found necessary because it was impossible to secure sufficient rolling stock to handle all the traffic. Loading cars at the station during the day and having them on the road at night permitted the use of cars in a more efficient manner, for in the day they virtually were part of the freight house and gave increased warehouse capacity. Therefore the practice in Indianapolis at the present time is to have trail cars and some motor cars "set out" during the day for loading at the freight house. The trailers in taking the l.c.l. freight are loaded as "set out" cars for different points, while the motor cars are generally used as "peddler" cars.

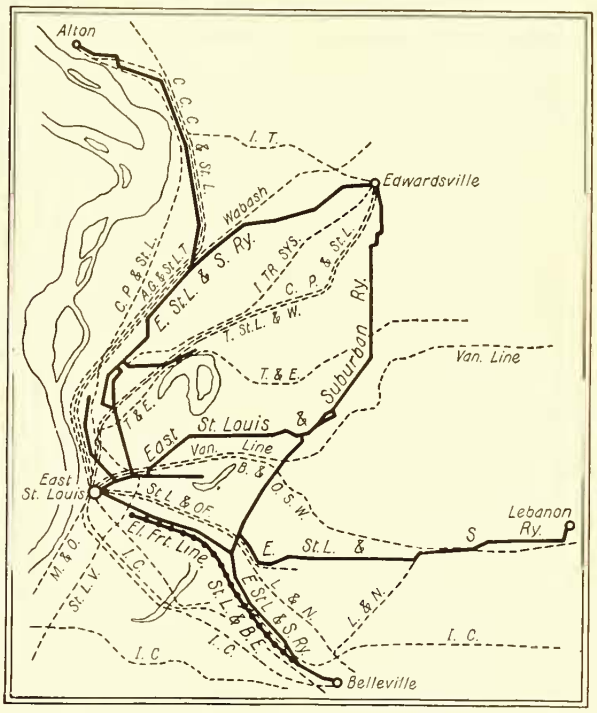
Non-agency stations are cared for by the freight crews. They unlock these stations and place the goods inside ready for delivery to the shipper in the morning. At the larger stations the night employees assist the train crews to handle the freight. Under this arrangement freight can be received as late as 4.30 p.m. at the freight house and will arrive in Terre Haute, Ind., or Paris, Ill., for the next morning delivery.

Interurban lines entering Indianapolis use standard steam railroad classification, including the steam railroad methods of billing and accounting. With the renewal of franchises restrictions in many cities and towns in Indiana a more extensive electric freight development is possible.

Union Traction System Can Handle 25 Per Cent More Freight

The Union Traction Company of Indiana, operating through the central part of the State, is one of the oldest interurban lines in the country. This system includes more than 400 miles of line connected with more than 4000 miles of electric railway. While the company does not conduct what is known as heavy-tonnage freight business, it handles freight by means of motor-freight and express cars and trailers.

Points such as Terre Haute, Louisville, Dayton, Fort



RIPE FOR FREIGHT RELIEF—EAST ST. LOUIS & SURBURBAN AND ST. LOUIS & BELLEVILLE ELECTRIC RAILWAYS

Wayne, Lima, Toledo, Detroit, Sandusky, Cleveland, Columbus, Zanesville, South Bend, Benton Harbor, St. Joseph, Jackson, Saginaw, Bay City, Grand Rapids, and others can be reached by this network.

Undoubtedly there are many points where this electric railway could relieve the steam lines of local traffic, through handling all local freight and also in many cases interchange operation, as at present there is no extensive interchange with steam railroads.

Short, But Important—Winona Interurban Railway

The Winona Interurban Railway, operating between Goshen and Peru, Ind., over a distance of 70 miles, connects at Goshen with the Chicago, South Bend & Northern Indiana Railway, which in turn connects with the Chicago, Lake Shore & South Bend Railway at South Bend.

The South Bend connection forms an important junction point in the through-haul of freight from Indianapolis to Benton Harbor, *via* the Union Traction Company of Indiana, the Winona Interurban Railway and the Southern Michigan Railway—lines popularly known as the route of the "Cannon-Ball Express." The Southern

Michigan Railway connects, at Benton Harbor, Mich., with the Graham & Morton steamship line, which operates a boat service between Chicago and Benton Harbor.

For the last two years the Winona Interurban Railway has been hauling a considerable amount of Chicago freight to and from the territory reached by its line. At Peru, Ind., it connects with the Union Traction Company of Indiana and the Fort Wayne & Northern Indiana Traction Company. The Winona line also interchanges at Peru with the Chesapeake & Ohio and Wabash Railroads. The track and special work is so constructed that standard M. C. B. steam road equipment can be

territory that is served by trunk-lines running generally east and west. Thus the Winona Interurban Railway would be able to save considerable detour of freight. Carload freight could be taken from any of the interchanging steam lines and handled for distribution to any point in the territory.

The "Cannon-Ball Express," previously mentioned, is a through freight service from Indianapolis to Warsaw and, in fact, to Benton Harbor, Mich. This servic eis maintained by a trailer loaded for Indianapolis, leaving Benton Harbor at night and going *via* the Southern Michigan Railway to Goshen. At this point a Winona

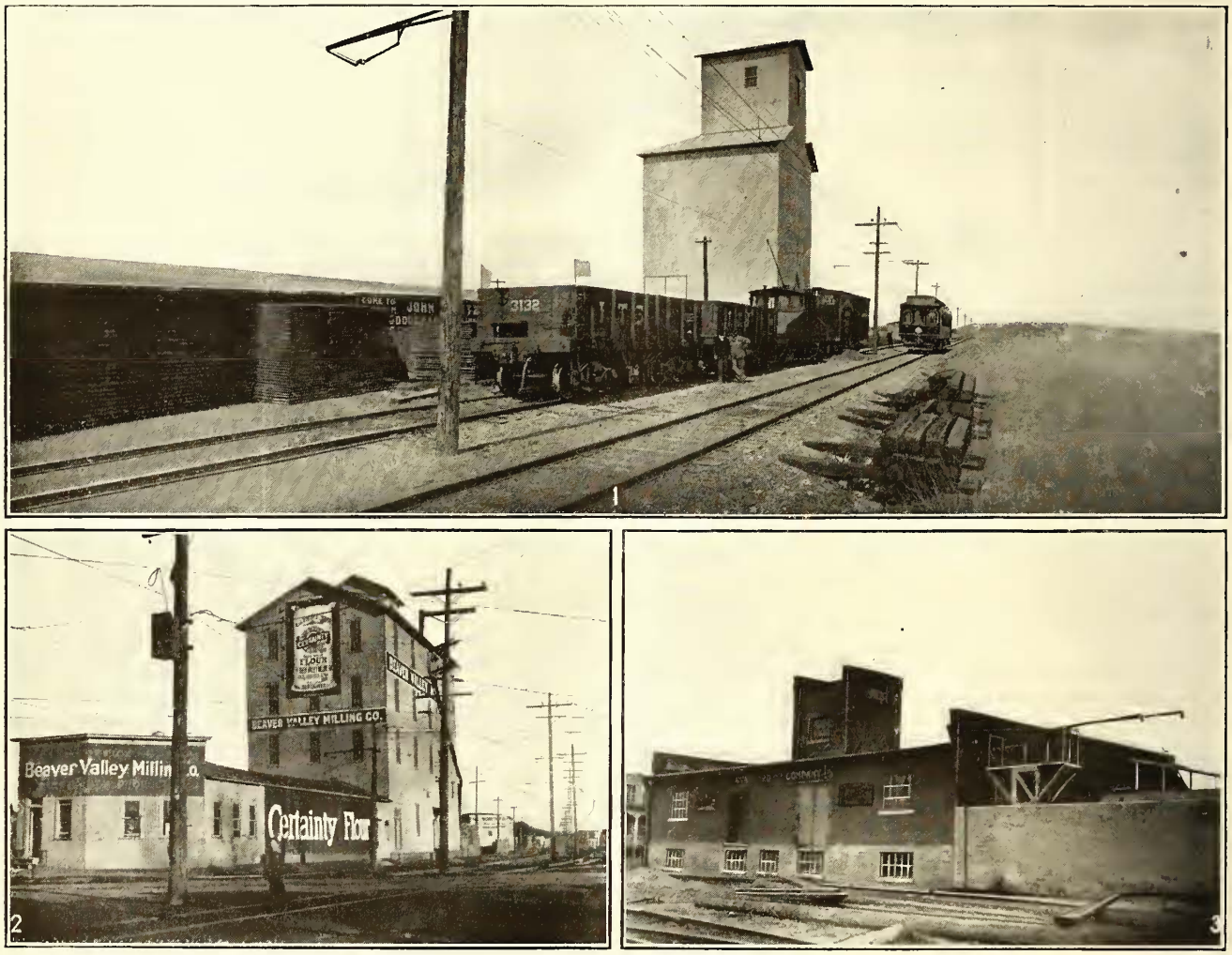


Fig. 1—Grain Elevator, Illinois Traction System
Fig. 2—Grain Elevator, Inter-Urban Railway of Des Moines. Fig. 3—Standard Oil Company—Aurora, Elgin & Chicago Railway
ELECTRIC RAILWAY FREIGHT-PRODUCING INDUSTRIES

operated over the entire system. The Winona Interurban Railway is able to render considerable relief in handling carload interchange traffic with the Wabash Railroad at Peru. At present it is handling on an average sixty carloads a month, not including the l.c.l. shipments. These, collected into carload lots, would equal another sixty cars.

With respect to the general freight service that can be rendered by the Winona Interurban, equipment is now available to handle from ten to fifteen more cars a day. Although it is a short line, it forms an important link in a through route. Moreover, its location is such that it gives a north and south line crossing

interurban motor car picks it up and proceeds to Peru, where it generally picks up a Union Traction Company trailer. By the time the train reaches Indianapolis, therefore, it is a regular three-car freight train. Return service is given from Indianapolis in similar manner, the train leaving at approximately 6 p. m. The service has been noteworthy in many respects, especially in the transportation of perishable commodities.

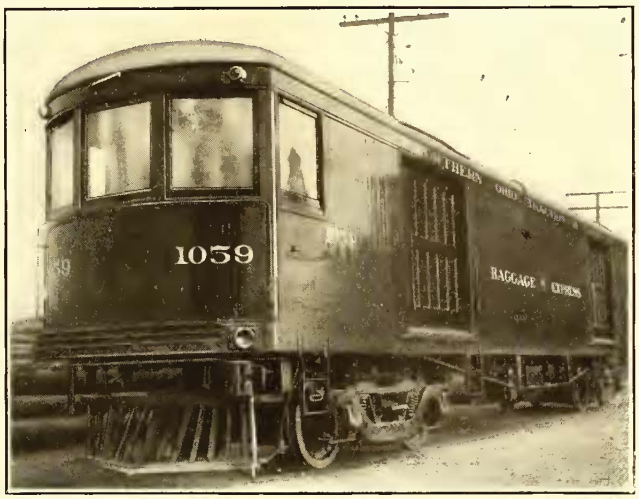
Extensive Plans Held Up in Cincinnati

The electric railway interests of Cincinnati have extensive plans for the development of the express and freight business on the interurban lines entering this

city. This plan contemplates the use of the bed of the old Miami & Erie Canal as an entrance through the city to the downtown district. This would bring the electric lines downtown in a depressed right-of-way to a point where the lines could be advantageously connected with a loop.

The work on this plan has temporarily been held up on account of the inability of civic authorities to settle on a definite scheme for financing the general improvement of transportation in Cincinnati. This condition has restricted the development of interurbans in the surrounding territory, owing to the city system being broad gage and not standard. With the contemplated development carried out, the two electric systems—the Ohio Electric and the Indianapolis & Cincinnati Railway —will be large factors in relieving the congestion in that territory.

The Interurban Railway & Terminal Company, which lays claim to having put up the first interurban electric freight terminal in the United States, has been doing an extensive motor-car freight business for several years, running each day a single freight motor-car over the Rapid, Suburban and Cincinnati & Eastern divisions. The Rapid division runs from Kingston to Lebanon; the Suburban from Cincinnati to Bethel, and the Cincinnati & Eastern from Cincinnati to Richmond.



INTERURBAN FREIGHT MOTOR CAR, NORTHERN OHIO TRACTION & LIGHT COMPANY

The Rapid division is paralleled throughout most of its length by a steam railroad, the Cincinnati, Lebanon & Northern. This was originally built as a high-water line to permit the Pennsylvania System to get into the city with freight during the flood periods of the Ohio River. It is also operated at other times, however, as there is a considerable freight movement over it.

The Interurban Railway & Terminal Company, although primarily a passenger road, could readily take over practically all of the steam passenger traffic and a great deal of the local freight between Cincinnati and all common points. In fact, the two lines are so close to each other after leaving Cincinnati limits that only a fence or pole line separates them for a great part of the distance to Lebanon (see page 900).

Since this steam line was developed for a high-water service, it must enter Cincinnati over an extremely heavy grade, a condition which calls for a prodigal use of locomotives. For example, two steam locomotives are needed to haul seven freight cars over the grade leaving the Cincinnati terminal. The trains move so slowly that not infrequently coal thieves board the cars and within a block or two throw half a ton or more off by the roadside! An actual occurrance of this kind was witnessed by the writer.

The local commuter service of the Cincinnati, Lebanon & Northern is also handled in a costly way. A three-car passenger train will pull out of the terminal with a light American-type engine, and a switcher will couple on as soon as the train gets into the yard. These two locomotives then labor up the grade with three cars!

This instance is cited to disclose the absurdity of overloading a set of steam rails and underloading a parallel set of electric rails. Even if this particular steam road is not overloaded, it is obviously using equipment extravagantly. The passenger business could be handled to better advantage by the interurban railway, because the steam line is primarily designed for freight, and it could be electrified to advantage to improve its operation in that field.

Cleveland Has Possibilities

For some years Cleveland has had what is really an interurban package-express service. Although this meets a certain need, it does not fulfill the demands of the shippers in Cleveland and the surrounding territories. Shippers who have been interested in interurban freight haulage from Cleveland to local points for nearly fifteen years assert that they have been unable to secure what they consider an advantageous arrangement for handling freight out of Cleveland on the interurban railways.

Because of this absence of l.c.l. electric freight, shippers, especially jobbing houses, find themselves restricted in dealing with the small towns near Cleveland. *So interested were these shippers in electric freight haulage that six years they helped to secure permits for the electric railways to haul freight trains of up to three cars through the streets of Cleveland.*

The only line out of Cleveland with extensive freight operation is the Cleveland, Southwestern & Columbus Railway. The Northern Ohio Traction & Light Company, Akron, however, expects shortly to have extensive freight service over its lines into Cleveland.

The present electric railway freight movement in and out of Cleveland *via* the package-express system amounts to about twenty-five cars a day. The Electric Package Agency is carrier for the Cleveland, Southwestern & Columbus Railway, the Northern Ohio Traction & Light Company, the Lake Shore Electric Railway and the Cleveland, Painesville & Eastern Railroad. Only the first-named line, as already noted, handles considerable freight business of its own.

There is a movement on foot in Cleveland that may considerably help both the passenger and the freight situation. To improve realty values in a district known as Shaker Heights, the promoters constructed a 3-mile electric railway at their own expense and turned it over to the Cleveland Railway for operation. This line is now in successful operation and the plans are ultimately to extend it over a private right-of-way

into the heart of Cleveland to a projected passenger and freight terminal near the Square. The steam belt-line operating around Cleveland is to come down the same right-of-way parallel to the electric line.

The same interests are building a large steam railroad freight terminal which is connected through the belt line to the New York Central Railroad and the Pennsylvania Railroad. When this project is fully developed, the electric railways will easily be able to tie into this main trunk line by constructing a few miles of new track. Only one or two lines may not be able to make connections readily.

Northern Ohio Traction & Light Company Twenty-four-Hour Freight Service

Freight service is now operated continuously throughout the twenty-four hours by the Northern Ohio Traction & Light Company to help relieve the congestion on steam lines and assist the government in the movement of food and war supplies. The service is given between Akron, Cleveland and Canton. The property is so situated that it could handle an enormous amount of freight. Indeed, its only limit is its present inability to obtain rolling stock.

The time of transit for freight via the electric line is four hours from Canton to Cleveland, while by steam it would be from four to ten days. This is not necessarily caused by the inefficiency of the steam railroads, but by the difference in the operating conditions. It takes time to move carload shipments on the railroads, while a large amount of freight handled on the electric line consists of l.c.l. merchandise, making it possible for one car to make three or four round trips daily.

One of the important obstacles to the extension of electric railway freight business is the lack of terminal facilities. The Northern Ohio Traction & Light Company, however, feels that it would be able to solve this problem to a certain extent if its freight service were operated at night only.

2800 Miles of Ohio Trolley Used Almost Exclusively for Passengers

The electric railways in Ohio are contemplating a more extensive operation of freight service, as they thoroughly realize the great possibilities of helping along this line in our national emergency. There are 2800 miles of interurban lines in the state used for little else than passenger service. Already electric freight trains run out of Toledo daily. This could be extended to every line in the state.

Through Akron the electric line could handle local freight and leave the main lines of the Baltimore & Ohio, the Erie and the Pennsylvania Railroads free to rush food supplies and coal. The Cleveland & Lake Erie could be used exclusively as a coal carrier. The Toledo & Ohio Central Railroad and the Hocking Valley Railroad could be used for coal only, and *the thousands of miners now idle, through lack of empty cars, would be able to earn a living wage and at the same time would relieve the acute coal shortage.* The Cleveland, Southwestern & Columbus; Columbus, Marion & Bucyrus, and Columbus, Delaware & Marion Railways are so located that they would form an important freight route to Columbus and other points.

East St. Louis Ripe for Freight Relief

Of the relief afforded through an electric line absorbing local traffic, in a radiating metropolitan district, the East St. Louis & Suburban Railway serves to illustrate well the possibilities.

Passenger service is maintained by high-speed two-car limited trains with free parlor car between East St. Louis and Eads' Bridge Stations to Alton, Ill. These trains make the 26-mile run in fifty-five minutes, the run being divided as follows: In East St. Louis, 2.34 miles; interurban, 22.31 miles to Alton and in Alton 1.5 miles. The 22.31 miles of interurban running is made in forty minutes.

Through this service an average of 1000 people a day travel on the limited trains, and the last steam railroad has recently taken off its local passenger service between East St. Louis and Alton, Ill. Now this same property is in a position to give further relief by handling all local freight along the same line. By increasing their freight and passenger handling facilities, many properties around the country could do the same as the East St. Louis & Suburban Railway.

St. Louis & Belleville Electric Railway Is A Freight Line Outright

This road operates a freight line between East St. Louis and West Belleville, doing interchange service with three belt lines: namely, St. Louis & Merchants Bridge Terminal Railway, Venice & Crondulett Railway and Alton & Southern Railway. All three of these connect with twenty-three steam lines entering St. Louis, thus giving interchange connections to these lines and to the St. Louis & Belleville Electric Railway.

About 100 cars a day are interchanged on the St. Louis & Belleville electric line. Twenty cars a day are used for general freight business operating on the line. Two 50-ton locomotives are used to handle this service. The trains operate on a special schedule according to the demands of the coal mines located on the system.

The line is 14 miles long. It has a yard at Twenty-first Street, East St. Louis, consisting of fourteen tracks, with a capacity of 300 cars. Team tracks in East St. Louis at the Twenty-first Street yard have a capacity for unloading thirty cars at a time. Included in the rolling stock of this line are more than 530 40-ton coal cars. While these cars go off the electric line, they are restricted to the East St. Louis and St. Louis district. Practically no l.c.l. business is done by this road.

The industries located on this line are the Excelsior Machine Works, which usually furnish about two carloads a day; the American Carbon Paper Company, which furnishes about three carloads a day, and the following coal mines: Suburban mine, 600 tons, or fifteen-car capacity a day; Superior mines, 800 tons, or twenty-car capacity a day; Avery mines 650 tons or sixteen-car capacity a day and Harmony mine 400 tons, ten-car capacity a day.

During the recent cold weather the steam roads around St. Louis could not deliver the coal, and the electric locomotives handled thirty-seven cars while the steam locomotives could not move. The electric locomotives were used for the purpose of bucking snow and clearing their own tracks.

The East St. Louis & Belleville Electric Railway has always interchanged steam road cars, thirty to forty at a time to a train. The maximum grade is 3½ per cent to 4 per cent, but as the road is built on its own private right-of-way, there are no other physical restrictions. The last coal mine is only 9 miles from East St. Louis, but on the last 4 or 5 miles delivery tracks are located.

More than 3000 cars loaded with building material have been delivered for the improvement of the city streets between the eastern limits to East St. Louis and Belleville, thus making 5½ miles of the finest road of its kind in the country. Other commodities transported by this line have included coal, rock, cement, mine supplies, rails, powder and sand.

Pittsburgh's Hills a Barrier

The narrow valleys and steep hills of the country near Pittsburgh make interurban railway construction extremely difficult. Nevertheless two roads are successfully handling much local freight and passenger traffic, namely, the Pittsburgh, Harmony, Butler & New Castle Railway and the Pittsburgh, Mars & Butler Railway. Both interurbans run to Butler, but the former also serves Evans City and New Castle. The two lines to Butler have carried in one year over 22,000 tons of freight.

The Pittsburgh Railways also operates an interurban line to Washington and Charleroi, over which both freight and passenger traffic is handled. Moreover, the West Penn Traction Company has an extensive network of lines in Westmoreland County, southeast of Pittsburgh.

Since Pittsburgh is a highly developed industrial center, there should be ample opportunity for increased freight service. The topography, however, is largely responsible for slow growth.

Owing to the extensive freight-producing characteristies of the Pittsburgh district, the interurbans entering Pittsburgh will, with proper encouragement, be able to increase their freight-handling facilities considerably. The territory served makes good use of the passenger facilities, and undoubtedly more can be done for the development of freight carrying than is now the case.

Packers Recognize Advantages of Electric Freight

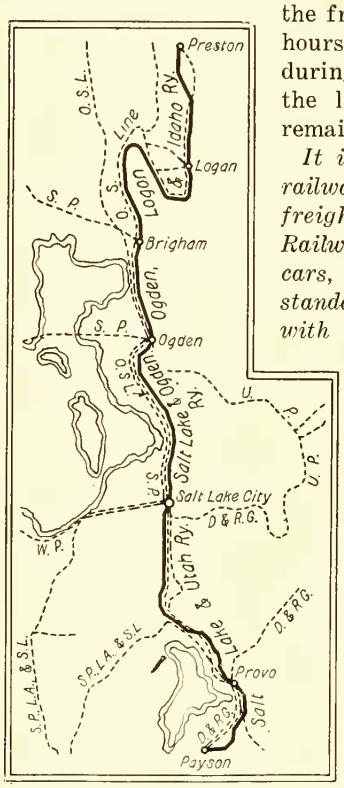
Big possibilities exist in numerous communities for relief to meat packers and Kansas City, generally since the completion of the new Kansas City Freight Terminal. Since the completion of this terminal the trolley freight service has made it possible for packers every day to ship their products.

St. Joseph, Mo., is the location of packing houses belonging to Kansas City packers, and the Kansas City, Clay County & St. Joseph Railway assists considerably in making it possible to equalize the supply of these two markets. *Formerly, four to six days were consumed for a shipment between one of these cities, while on the electric line three hours is the maximum.* There are numbers of other cases in different parts of the country where packers are taking advantage of such service.

All interchange freight is handled in foreign cars, over existing connections with the steam roads.

Big Development in Kansas City From Small Beginning

Kansas City, like several other large cities, has developed a comprehensive electric railway freight terminal. This is operated by the Kansas City Freight Terminal Company. Owing to the fact that at first freight cars could only be moved at night, delays were encountered. Eighty-four cars of freight at one time stood on the tracks of the Kansas City Railway. In order to relieve this situation, the Public Service Commission permitted the railway to operate the freight service between the hours of 6 a. m. and 4 p. m. during the day on part of the line and all day on the remainder.



Salt Lake & Utah Railroad
Bamberger Electric Railroad
(Salt Lake & Ogden Railway)
Utah-Idaho Central Railroad
(O. L. & I. Ry.)

DUPLICATION OF SERVICE—ELECTRIC RAILWAYS OF UTAH (See page 895)

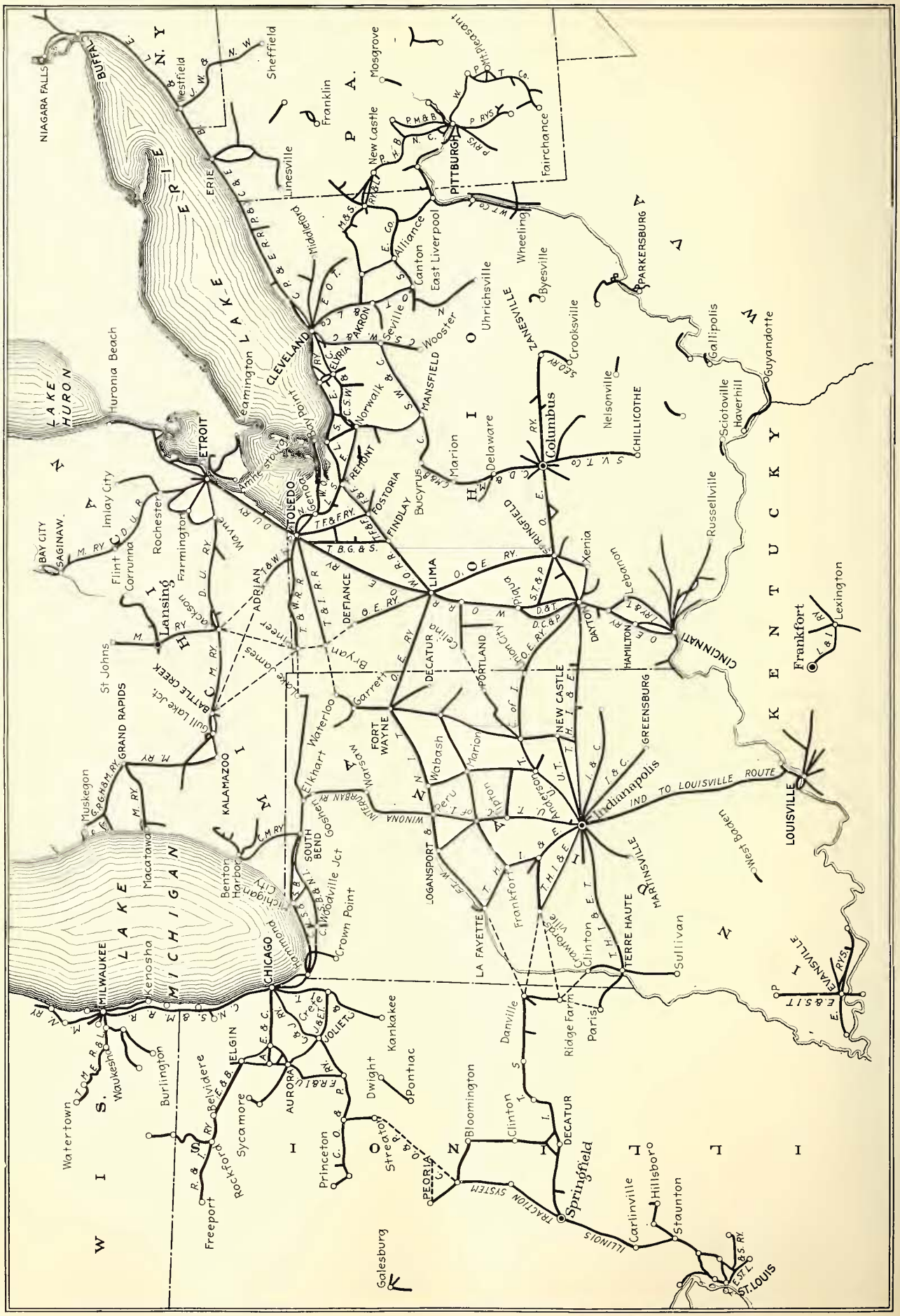
It is unusual to find a city railway handling steam road freight cars. The Kansas City Railways not only owns freight cars, but switches and hauls standard steam railroad cars with an electric locomotive on a 12-mile line between Dodson and Westport Station. This latter point is the southern, residential district of Kansas City. Years ago this route was known as the old Westport & Belt Railway, which was a steam "dummy" line.

In recent years much passenger traffic has been diverted from this by constructing new routes, by operating more cars on one of the newer lines, the Country Club route, and by a commission order permitting switching in the day time.

Lumber yards, coal yards, and other similar industries receive freight cars billed *via* the Kansas City Railways.

A most significant phase of this increase in freight operation is the wonderful service rendered to grocers and merchants along the line. *In Kansas City there are two of the largest retail grocers who secure their supplies from Chicago in carload shipments direct to their branches along the electric line. Many companies and individuals pool their shipments to secure combined full carloads routed direct to them over electric lines.*

The company handles a large number of steam road cars every day between its lines and the Missouri Pacific and 'Frisco Railroads. At Dodson terminal, which is the steam road interchange point, there is a receiving track 900 ft. long.



Solid lines show existing roads. Dotted lines indicate connections that would make through-route operation more flexible

ELECTRIC RAILWAYS OF THE CENTRAL STATES

The new terminal is near the central warehouse and wholesale district, thus requiring only a short haul practically on the level. This terminal has been in operation several months, and its advantages are already producing increased traffic and uniform commendation from shippers and merchants. A great advantage that the shippers find is that goods for the various points on the different lines now may be delivered by one trip, which saves much time.

Electric Line Not Permitted to Build Siding

The Kansas City & Western Railway, which is one of the members of the Kansas City Freight Terminal Company, has been handling general interurban freight for a number of years. It offers direct shipment from Kansas City to Leavenworth, where there are several large institutions, including the State penitentiary and its allied industries.

Although this company is fully capable of handling freight to Fort Leavenworth, the administrative officials would not allow the electric railway to construct a siding because the steam facilities were considered sufficient. As the electric line is not permitted to lay its siding, the possibility of direct shipment into this fort is eliminated, all supplies being delivered by the steam railroads, which have platforms at the fort.

On the other hand, the merchants of Leavenworth have enjoyed so great an increase in retail trade due to the presence of troops that the freight business of the Kansas City & Western Railway increased more than 23 per cent within the last year.

The Kansas City, Kaw Valley & Western Railway, now operating between Kansas City and Lawrence, will be extended to Topeka. Carload freight is handled by two electric locomotives, and interchange transfer service is carried on between the electric line and the Rock Island, Kansas City Southern and Kansas City Terminal Railroads through the terminal connection near Kansas City. More than twenty carloads of freight are interchanged each day. L.c.l. freight is handled by four 50-ft. motor-freight cars and one 40-ft. trailer. Each of these cars has a 60,000-lb. capacity.

Why Not Use Electrics More?

Economically, the electric line has its value in the community served, in many cases being responsible for the development and enhancement of real estate values. For this reason we should consider whether the electric railways of this country, embracing as they do practically one-seventh as much mileage as the steam railroads, and with a capitalization at the last census of approximately $4,700,000,000, and annual operating revenues of approximately $565,000,000, should not do more of the freight transportation of which this country now stands in such great need. Nevertheless the freight earnings of the electric roads in 1912, the year of the last available data, amounted to less than 2 per cent of the total operating revenue.

It is in the interest of the public that the present investment in both steam and electric lines be used to the fullest extent possible before providing at large expenditures other freight haulage facilities that are uneconomical and unable to move great quantities of freight at any one time.

This is an opportune time for the various states to look into the possibilities of "regulating" the motor truck, for there should be no unnecessary expenditure and duplication of investment.

Where Through Routes Are Most Desirable

A very large number of freight car routes are now in daily operation over various electric railway systems of this country. *The fact that these routes exist shows that there are possibilities in long distance freight*

Some Through Freight Rates in the Central States

THROUGH CAR ROUTES FROM INDIANAPOLIS

There are now in operation out of Indianapolis a large number of interurban freight car routes to points throughout the Central States. Several are listed below:

1. From Indianapolis to South Bend, Ind., and Benton Harbor, Mich., via
   Union Traction to Peru,
   Winona Interurban to Goshen,
   Chicago, South Bend & Northern Indiana, to South Bend,
   Southern Michigan Railway to Benton Harbor, Mich.,
   making a three-line operation.
2. From Indianapolis to Garrett, Ind., via
   Union Traction, via New Castle to Bluffton,
   Fort Wayne & Northern Indiana Traction to Fort Wayne,
   Fort Wayne & Northwestern Traction to Garrett, where connection is made for Wells Fargo Express.
3. From Indianapolis to Dayton, Ohio, via
   Union Traction through Anderson, Muncie, and Union City,
   Ohio Electric Railway, to Dayton.
4. From Indianapolis to Louisville, Ky., via four lines:
   Interstate Public Service to Seymour,
   Indianapolis & Louisville to Sellersburg,
   Louisville & Northern Railway & Light to Jeffersonville,
   Indiana Southern to Louisville.
5. From Indianapolis to Dayton, Ohio, via two lines:
   Terre Haute, Indianapolis & Eastern Traction to Richmond,
   Ohio Electric Railway to Dayton.
6. From Indianapolis to Logansport, via
   Union Traction.
7. From Indianapolis to Wabash, Muncie and Kokomo, via
   Union Traction.
8. In addition to this through service, occasionally car loads go from Indianapolis to Toledo, Ohio, via connections at Fort Wayne, Ind., and Lima, Ohio; also carload movements to Kendallville, Ohio, via Fort Wayne, Michigan City, Ind., via South Bend; Columbus and Zanesville, Ohio.
9. The Terre Haute, Indianapolis & Eastern Traction Company loads daily freight cars from Indianapolis to Terre Haute; Danville, Ill.; Crawfordsville, Ind.; New Castle; Lafayette, Ind.; Frankfort, Ind.; Martinsville, Ind., all routed via its own line.

Freight from Indianapolis is transferred at Terre Haute for Sullivan and Clinton, Ind., and Paris, Ill.; at Dayton, Ohio, to all stations on the Ohio Electric Railway; Dayton and Troy Railway; Western Ohio Railroad; Dayton, Covington & Piqua Traction Company; and other stations on the Ohio Electric.

THROUGH ROUTES FROM DETROIT

Regular daily merchandise service is handled by the Detroit United System from Detroit to a number of Michigan points, including Saginaw, Bay City, Flint; Detroit to Battle Creek, Kalamazoo, Grand Rapids, and other points in the western part of the State via Jackson.

Detroit to Lima and Dayton, via
Detroit United to Toledo,
Toledo, Bowling Green & Southern, to Findley,
Western Ohio to Lima and Piqua,
Dayton & Troy to Dayton.

The Ohio Electric Railway System operates extensive through-line freight service over its entire system, and also a considerable interline service.

The network of interurbans throughout the central territory is so constructed that it is possible for practically any point on the inter-connecting lines to be reached. With the proper connecting up with the Indiana and Illinois systems additional freight routes could be established.

With the interurbans operating in Cleveland and Akron territory, a more extensive freight service will be possible to Toledo, Detroit, Columbus, Findley, Lima, Fort Wayne, Dayton and all principal cities located on the interurbans of the Middle West. Also, shipments could be made to Youngstown, Ohio; New Castle, Pa.; Buffalo and Utica, N. Y.; Erie, Pa.; Pittsburgh, Pa.; Alliance, Ohio and other points.

The Lake Shore Electric Railway operates through freight service between Cleveland and Detroit via the Detroit United.

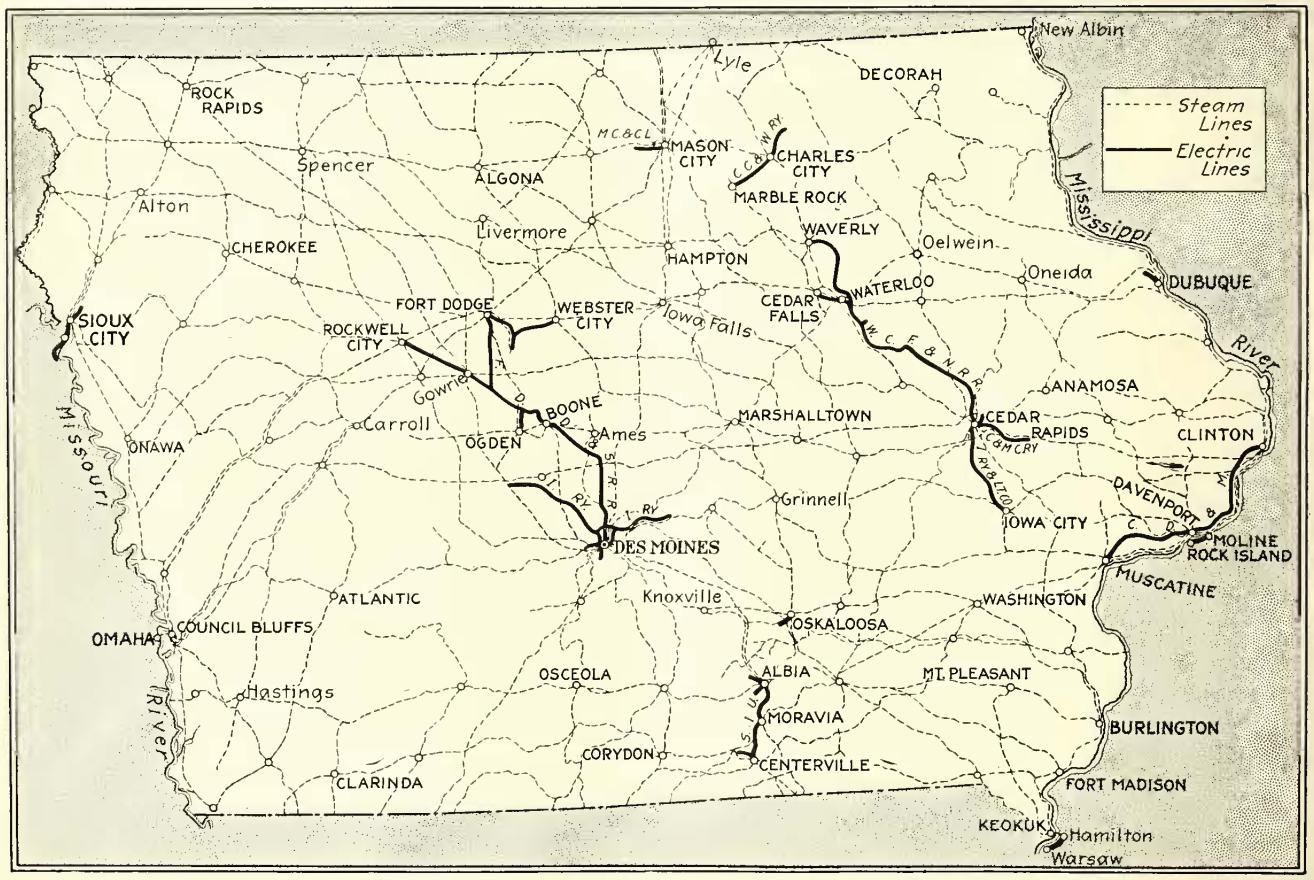
transportation by electric railways that have not been fully developed. While there are many restrictions which prevent a more extensive use of this valuable service in its present form, it is of inestimable value. The dispatch of freight, especially by through-car route, is of such importance that some lines find it necessary to place these through cars on limited passenger trains to expedite long distance shipments, thus giving the shipper the very best service.

In connection with the through routes that now exist, a general survey of the situation and possibilities for more of this long distance freight operation may be of interest.

There are short stretches of country separating some of the interurban properties where, it would seem, consideration should be given by one or the other or both companies for building the connecting link to handle through freight and passenger traffic. Also it would in several instances relieve the steam railroads of short-haul traffic.

Referring to the map on page 916 of the Central States, it will be noted that the electric railway systems of Illinois, principally the Illinois Traction System, are not physically connected with those of the other Central States; namely, Indiana, Michigan, Ohio. To get a through haul from St. Louis to Buffalo and points East the gap between Danville, Ill., and any one of several points in Indiana should be closed. Possibly the most feasible procedure, from the standpoint of interurban traffic, would be to build between Crawfordsville, Ind., and Danville, a distance of only 40 miles, thus giving direct connection into Indianapolis. However, there are one or two other places where union could be made. That which would require the shortest section of track appears to be between Ridge Farm, Ill., on the Illinois Traction System, and Paris, Ill., (20 miles) on the Terre Haute, Indianapolis & Eastern Traction Company. There is also the possibility of closing the gap between Danville, Ill., and Lafayette, Ind. (45 miles.)

Traffic values and construction costs would naturally be the governing factors, but with the assistance of the Federal Government, there is no reason why this construction should not be considered. With a through route provided, it would be possible to make shipments from St. Louis, Mo., to Toledo, Detroit, Indianapolis, Dayton, Columbus, Cleveland, Buffalo and other points, with great relief to the steam roads.



The Fort Dodge, Des Moines & Southern Railroad, the Inter-Urban Railway of Des Moines and the Waterloo, Cedar Falls & Northern Railway are heavy freight carriers running generally north and south

ELECTRIC RAILWAYS OF IOWA, SHOWING NETWORK OF STEAM LINES

A study of the map of the Central States will show other places where the construction of short stretches of track would establish more direct routes between important points. For instance, the gap between Portland, Ind., on the Union Traction Company, and Celina, on the Western Ohio Railroad, would greatly assist in eliminating the extra mileage in through-car movements from Indianapolis to Lima, Toledo, Cleveland, and other points.

Connecting Kalmazoo and Dowagiac, Mich., or electrification of the K., L. S. & C. Ry. between Kalmazoo and Toquin, Mich., via Benton Harbor would shorten freight haul to Indiana and other points.

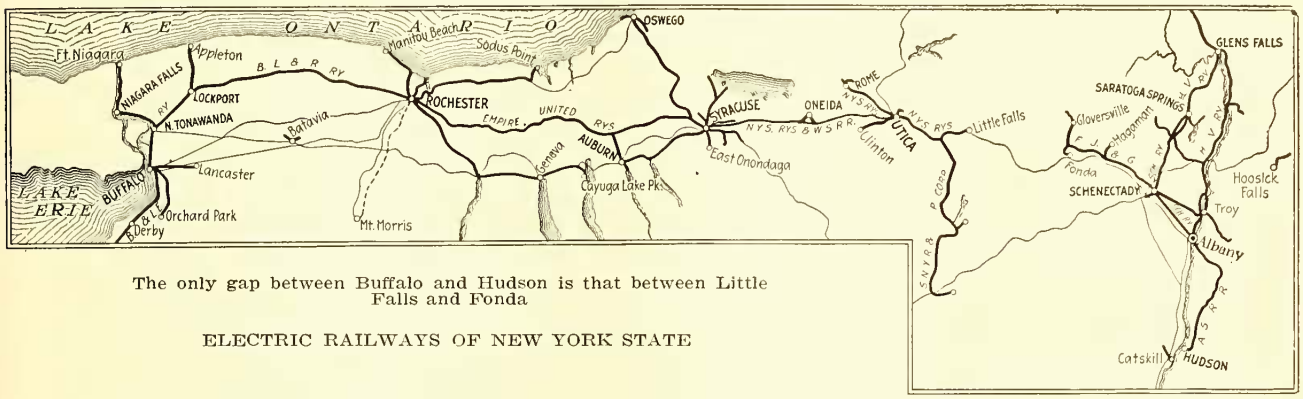
There already is a well-defined route between Terre Haute, Columbus, Dayton, Springfield, Indianapolis and Zanesville; also between Indianapolis and Benton Harbor, via South Bend. There is also no difficulty in reaching Louisville from Indianapolis.

Investigation proves that considerable roundabout mileage is necessary in handling shipments from West Central Michigan points to Toledo and Southward. If the short gap between Jackson and Adrian or Battle Creek and Adrian, were closed, it would be possible to interchange freight from the Michigan Railway System through the Toledo & Western Railroad, and Toledo Terminal Railroad, with any steam or electric line entering Toledo. This would also make it perfectly feasible for a through shipment to go from Muskegon or Grand Rapids, Mich., to Cleveland or Buffalo, via the electric railway, or to any points in northern and central Ohio; from Grand Rapids to Cincinnati or Louisville, or even to St. Louis, by filling the gap between Danville, Ill., and Crawfordsville, Ind.

Another helpful connection could be made between Jackson or Battle Creek, Mich., and Pioneer, Ohio, on the Toledo & Western, and to Bryan, on the Toledo & Indiana, with possibly an extension south to Defiance, Ohio, where it would reach the Ohio Electric System. This extension would permit the handling of freight from western Michigan for Toledo and other Ohio and Indiana points by a direct electric route.

Owing to the extensive trunk-line steam road service between Toledo and Chicago, east and west, it is difficult to say whether an electric extension in that section is necessary now, irrespective of the fact that this territory needs electric railway service. However, a tying together of South Bend, Ind., and Pioneer, Ohio, could relieve the steam roads of much local traffic.

One more link worth consideration is between Waterloo, Ind., on the Fort Wayne & Northwestern Railway, and Bryan, Ohio, on the Toledo & Indiana Railroad. This would greatly shorten the haul from Grand Rapids, Kalamazoo, Battle Creek, Jackson, Toledo and Detroit to Indianapolis, St. Louis and Louisville.



The only gap between Buffalo and Hudson is that between Little Falls and Fonda

ELECTRIC RAILWAYS OF NEW YORK STATE

Conclusions

1. The undisputed economic value of the electric railway is thoroughly evidenced by the foregoing brief covering existing conditions on interurban railway systems. From a purely economic standpoint, existing electric railway facilities should be used to their fullest capacity before the development of any other type of freight transportation is attempted.

2. The investment in electric railway systems of the present day is so great that it would be most uneconomical practically to disregard a highly developed system of transportation service such as electric railways can render under present conditions.

3. Many interurbans are handling traffic which is commensurate with that of steam railroad service, and where facilities exist they are in a position to handle practically all short-haul traffic in their respective territories.

4. Federal assistance to the electric railways by supplying cars, improving physical alignment and freight terminal facilities would place the interurban railways in a position to handle a large percentage of the short-haul freight which is now congesting the steam railways.

5. Furthermore, the expenditure required to place the electric railways in the condition above mentioned, would not amount to one-tenth of that which would be needed for the extension of motor-truck freight haulage in the same territory now being agitated.

Therefore, immediate relief can be secured for the steam railroads through assistance from an existing facility which only needs proper fostering to become immediately an important factor in our national emergency and for the future. In order to affect this, there should be:

Universal interchange of freight rolling stock between steam and electric lines that can handle steam rolling stock, and federal financial aid to those electric lines that would be able to do so with the proper assistance.

Tabulation of Replies Received from War Board Questionnaire Sent to Electric Railways in Relation to Relief They Can Afford Steam Railroads

FREIGHT SERVICE

EASTERN MILITARY DISTRICT

Name of Company	Nature of Relief Afforded	Steam Road Affected
Westchester Kennett & Wilmington Electric Railway (Pennsylvania)	Can handle all local less carload freight in territories served.	Pennsylvania Railroad Baltimore & Ohio Railroad
Ephrata & Lebanon Traction Company (Pennsylvania)	Could arrange to handle a great portion of less carload freight in this territory.	Philadelphia & Reading Railroad Cornwall Railroad
Yonkers Railroad Company (New York)	Can handle less carload freight locally and with connecting lines.	New York Central Lines
Buffalo, Lockport & Rochester Railway, (New York)	Can handle 50 per cent of carload and less carload freight in its territory.	New York Central Lines
The Western New York & Pennsylvania Traction Company (New York and Pennsylvania)	Can handle carload and less carload freight greatly in excess of present demand.	Buffalo, Rochester & Pittsburgh Railroad Erie Railroad Pennsylvania Lines Pittsburgh, Shawmut & Northern Railroad
Chambersburg, Greencastle & Waynesborough Railway (Pennsylvania)	Could handle freight.	Western Maryland Railroad Cumberland Valley Railroad
North Branch Transit Company (Pennsylvania)	Could handle all local freight, express and mail.	Delaware, Lackawanna & Western Railroad Pennsylvania Lines Philadelphia & Reading Railroad
New York State Railways (New York)	Can relieve steam lines of all local less carload freight between common points.	New York Central Lines Pennsylvania Railroad Lehigh Valley Railroad
Southern New York Power & Railway Company (New York)	Can handle less carload freight.	Delaware & Hudson Railroad Ulster & Delaware Railroad Lackawanna-Western Railroad West Shore Railroad New York Central Lines
Orange County Traction Company (New York)	Handles less than carload freight.	Erie Railroad Central New England Railroad
Northwestern Pennsylvania Railway (Pennsylvania)	Handles carload and less than carload freight; can handle all in its territory.	Bessemer & Lake Erie Railroad Pennsylvania Lines
Poughkeepsie & Wappingers Falls Railway (New York)	Can handle less than carload shipments locally and in connection with boat line.	Central New England Railway
Albany Southern Railroad (New York)	Can handle all carload and less than carload business in its territory.	New York Central Lines Boston & Albany Railroad
Elmira, Corning & Waverly Railway (New York and Pennsylvania)	Can handle less than carload, local shipments between Elmira and Waverly. Could handle like shipments between Elmira and Corning if franchise resirictions were removed.	Erie Railroad Delaware, Lackawanna & Western Railroad
Buffalo & Lake Erie Railway (Pennsylvania and New York)	Now handling large amount of less than carload freight. With added equipment and changes in terminals could double present business.	New York Central Lines New York, Chicago & St. Louis Railroad
Conestoga Traction Company (Pennsylvania)	Practically all local freight, less than carload and considerable carload freight under certain conditions.	Pennsylvania Lines Philadelphia & Reading Railroad
North Jersey Rapid Transit Company (New Jersey)	Provided proper grant could be secured in Patterson, N. J., considerable relief could be afforded by making a connection with the Hudson River line and the Public Service lines.	Erie Railroad
Schenectady Railway Company (New York)	Some relief could be afforded in the handling of less than carload freight.	New York Central Lines Delaware & Hudson Railroad
Bridgeton & Milville Traction Company (New Jersey)	Can handle less than carload freight between Bridgeton and Port Norris.	Central Railroad of New Jersey
York Railways Company (Pennsylvania)	Slight relief in handling less than carload freight.	Pennsylvania Lines

NORTHEASTERN MILITARY DISTRICT

Exeter Hampton & Amesbury Street Railway (New Hampshire)	In conjunction with other electric railways in Northeastern Massachusetts and New Hampshire less than carload freight for the towns and cities served could be handled.	Boston & Maine Railroad
Concord, Maynard & Hudson Street Railway (Massachusetts)	Can handle less than carload freight.	Boston & Maine Railroad
Interstate Consolidated Railway (Massachusetts)	Now operating service, which could be increased for less than carload shipments.	New York, New Haven & Hartford Railroad
Worcester Consolidated Street Railway (Massachusetts)	Now handling less than carload freight, could handle more.	Boston & Maine Railroad New York, New Haven & Hartford Railroad Boston & Albany Railroad
St. Albans & Swanton Traction Company (Vermont)	Could take care of less than carload freight between terminals.	Central Vermont Railroad
Shore Line Electric Railway (Connecticut)	Could handle more carload and less than carload freight than now handled.	New York, New Haven & Hartford Railroad Central Vermont Railroad
Atlantic Shore Railway (Maine)	Can relieve steam roads of all less than carload freight and all carload except Biddeford.	Boston & Maine Railroad
Brockton & Plymouth Street Railway (Massachusetts)	Can relieve steam roads of a portion of less than carload freight between Boston and Plymouth.	New York, New Haven & Hartford Railroad
Cumberland County Power & Light Company (Maine)	Now relieving railroads by performing switching service. Also handle carload and less than carload freight.	Maine Central Railroad Boston & Maine Railroad Grand Trunk Railroad
Union Street Railway (Massachusetts)	Could partially relieve steam road of freight service between New Bedford and Fall River.	New York, New Haven & Hartford Railroad
Springfield Street Railway (Massachusetts)	Can absorb some of the freight traffic between Springfield, Worcester, Fitchburg and Providence, which could be augumented by additions to facilities and equipment.	New York, New Haven & Hartford Railroad Boston & Maine Railroad Boston & Albany Railroad Central New England Railroad Central Vermont Railroad

Tabulation of Replies Received from War Board Questionnaire (Continued)

Name of Company	Nature of Relief Afforded	Steam Road Affected
New Bedford & Onset Railway (Massachusetts)	Could partially relieve steam railroad of freight traffic in territory served.	New York, New Haven & Hartford Railroad
Boston & Worcester Street Railway (Massachusetts)	Handling less than carload freight and can handle more with additional equipment which is promised in April.	Boston & Albany Railroad Boston & Maine Railroad New York, New Haven & Hartford Railroad
	SOUTHERN MILITARY DISTRICT	
Charleston Consolidated Railway & Lighting Company (South Carolina)	Can handle local freight, less than carload, to Charleston Navy Yard and other manufacturing plants on Navy Yard and North Charleston division.	Southern Railway Atlantic Coast Line Seaboard Air Line
	SOUTHEASTERN MILITARY DISTRICT	
Union Traction Company (Tennessee)	Handle all less than carload freight business in its territory.	Louisville & Nashville Railroad
	SOUTHWESTERN MILITARY DISTRICT	
Oklahoma Railway (Oklahoma)	Can handle all local traffic and inter-line business provided through rates are installed.	Atchison, Topeka & Santa Fe Railroad Chicago, Rock Island & Pacific Railway
Sand Springs Railway (Oklahoma)	Can handle all freight business between Tulsa and Sand Springs.	Missouri, Kansas & Texas Railway
	WESTERN MILITARY DISTRICT	
Pacific Electric Railway (California)	*Local Carload Freight*: Could relieve steam roads between Los Angeles and points common to both lines where team track service is all that is required, and in case of private industry track where interchange switching arrangements are in effect. This would result in substantial relief. *Less than Carload Freight*: Could relieve steam roads of local merchandise freight from Los Angeles to four stations, amounting to approximately 8,000,000 lb. per month. It is estimated that thirty cars per day would be saved to the steam railroads, in addition to the depot switching at Los Angeles and delivering stations.	Southern Pacific Company Los Angeles & Salt Lake Railroad Atchison, Topeka & Santa Fe Railway
Pacific Northwestern Traction Company (Washington)	Can handle practically all less than carload freight between Seattle, Ballard, Everett. And can handle more of the carload freight between these same points, particularly where team track loading or delivery will suffice.	Great Northern Railway Northern Pacific Railway Chicago, Milwaukee & St. Paul Railway
Puget Sound Electric Railway (Washington)	Can entirely relieve steam roads of less than carload freight in territories served. Can handle all carload freight in territories served where team track loading or delivery is required. With terminal co-operation of steam roads can handle a greater proportion of through Seattle-Tacoma carload freight.	Southern Pacific Company Great Northern Railway Chicago, Milwaukee & St. Paul Railway
Salt Lake & Utah Railroad (Utah)	Can take care of all carload and less than carload business in their territory which will amount to about three times their present handling. One 50-ton locomotive held in reserve and not being used. Has steam-line connections and can be of great relief in this territory.	Denver & Rio Grande Railroad Los Angeles & Salt Lake Railroad Utah Coal Railway Union Pacific System Western Pacific Railroad
Bamberger Electric Railroad (Utah)	Can handle carload and less than carload freight in its territory and jointly with connecting electric lines. All power generated hydroelectric plant, thus considerable coal saving would result.	Oregon Short Line
Willamette Valley Southern Railway (Oregon)	Can handle carload and less than carload freight.	Southern Pacific Company
Peta Luma & Santa Rosa Railway (California)	Can handle all freight shipments between San Francisco, Peta Luma, Santa Rosa and Sebastopol.	Northwestern Pacific Railroad
	CENTRAL MILITARY DISTRICT	
Cleveland, South Western & Columbus Railway (Ohio)	Can practically take care of all local freight business between terminals (Cleveland, Wooster, and Bucyrus).	New York Central Lines Baltimore & Ohio Railroad Erie Railroad Pennsylvania Lines
Milwaukee Electric Railway & Lighting Company (Wisconsin)	Could relieve steam roads of carload and less than carload freight from Milwaukee to Waukesha, Oconomowoc, Watertown, Burlington, Wauwasota, North Milwaukee, South Milwaukee, Cudahy, Mukwonago, Racine and and Kenosha.	Chicago & Northwestern Railroad Chicago, Milwaukee & St. Paul Railway Wisconsin Central Railroad
The Interurban Railway & Terminal Company (Ohio)	Could relieve steam lines operating in the same territory of all less than carload freight between Cincinnati and Lebanon.	Pennsylvania Lines (Cincinnati, Lebanon & Northern Railway)
Western Ohio Railway (Ohio)	With present equipment little relief could be afforded but with additional equipment and improved terminal facilities practically all freight business in territory served could be handled, including a great amount of through business between Dayton, Lima, Toledo and Detroit.	Lake Erie & Western Railroad Baltimore & Ohio Railroad
Fort Wayne & Decatur Traction Company (Indiana)	Can handle all freight business in its territory between Fort Wayne and Decatur. With Erie and Cloverleaf connection, could handle additional carload business to and from Fort Wayne destined to points beyond Decatur.	Erie Railroad Toledo, St. Louis & Western Railroad
Omaha, Lincoln & Beatrice Railway (Nebraska)	Can handle all carload and less than carload shipments to territory served by connection with Missouri Pacific.	Missouri Pacific Railroad Chicago, Rock Island & Pacific Railway
Wisconsin Traction Light, Heat & Power Company (Wisconsin)	Can very materially relieve steam lines on carload and less than carload in city served.	Chicago & Northwestern Railway Chicago, Milwaukee & St. Paul Railway
Minneapolis, Anoka & Cuyuna Range Railway (Minnesota)	Carload and less than carload freight and switching service.	Northern Pacific Railway Great Northern Railway

Tabulation of Replies Received from War Board Questionnaire (Continued)

Name of Company	Nature of Relief Afforded	Steam Road Affected
Toledo & Western Railroad (Ohio)	Can handle both carload and less than carload freight.	New York Central Lines Detroit, Toledo & Ironton Railroad Cincinnati Northern Railroad Wabash Railroad
Dayton, Covington & Piqua Railway (Ohio)	Can handle all carload and less than carload freight except livestock.	Dayton, Toledo & Chicago Railroad Pennsylvania Lines
Milwaukee Northern Railway (Wisconsin)	Can handle all less than carload freight in its territory. If it had track connection with Chicago & Northwestern at Cedar Grove, could remove necessity for carload freight from points north from passing through Milwaukee.	Chicago, Milwaukee & St. Paul Railroad Chicago & Northwestern Railroad
Springfield & Xenia Railway (Ohio)	Can handle all less than carload freight between terminals.	Pennsylvania Lines.
Chicago Elevated Railways (Illinois)	If granted an ordinance by the city of Chicago could handle great amount of less than carload freight.	Chicago freight terminals of many railroads.
Chicago, North Shore & Milwaukee El. Railroad (Illinois and Wisconsin)	Could handle carload and less than carload freight. Could handle Chicago packinghouse freight to Fort Sheridan and Great Lakes Naval Training Station. Could also facilitate the moving of carload freight by having E J. & E. (Chicago Outer Belt Line) deliver carload shipments for points between Highland Park and Milwaukee to this line, thus eliminating the delay in handling through Chicago, which would tend to avoid congestion in Chicago terminals.	Chicago & Northwestern Railway Chicago, Milwaukee & St. Paul Railway
Fort Wayne & Northwestern Railway (Indiana)	Can handle 200 tons per day with additional terminal facilities at Fort Wayne.	Grand Rapids & Indiana Railway New York Central Lines
Union Traction Company of Indiana (Indiana)	Can handle 25 per cent. more less than carload.	Lake Erie & Western Railroad Big Four Railroad Pennsylvania Lines Wabash Railroad Toledo, St. Louis & Western Railroad Chesapeake & Ohio Railroad Central Indiana Railroad Monon Railroad
Ohio Electric Railway (Ohio)	Handles carload and less than carload freight.	A number of railroads in the central, southwestern, western and northwestern portions of Ohio.
Clinton, Davenport & Muscatine Railway (Iowa)	Can handle carload and less than carload freight. Can afford considerable relief by closing four agency steam road stations.	Chicago, Burlington & Quincy Railroad Chicago, Milwaukee & St. Paul Railway Chicago, Rock Island & Pacific Railway
East St. Louis & Suburban Railway (Illinois)	Can afford relief in the transportation of less than carload freight.	Vandalia Railroad Baltimore & Ohio Railroad Big Four Railroad Chicago & Alton Railroad Wabash Railroad Chicago, Peoria & St. Louis Railroad Illinois Central Railroad Louisville & Nashville Railroad Southern Railroad Toledo, St. Louis & Western Railroad
Fort Wayne & Northern Indiana Traction Company (Indiana)	Handles less than carload freight.	Wabash Railroad Pennsylvania Lines Grand Rapids & Indiana Railway Lake Erie & Western Railroad New York Central Lines Nickel Plate Railroad Erie Railroad
Toledo, Bowling Green & Southern Traction Company	Can relieve steam lines of 50 per cent. of less than carload freight and some carload freight.	Baltimore & Ohio Railroad New York Central Lines Toledo & Ohio Central Railroad Wabash Railroad
Rock Island & Southern (Illinois)	Could handle all carload and less than carload freight in its territory.	Rock Island System
Toledo & Indiana Railroad (Ohio)	Can handle all freight traffic between Toledo and Bryan.	New York Central Lines
Mahoning & Shenango Railway (Ohio)	Can relieve steam roads of practically all less than carload freight in its territory provided additional facilities were installed.	Erie Railroad New York Central Lines Pennsylvania Lines Baltimore & Ohio Railroad Pittsburgh & Lake Erie Railroad
Chicago & Interurban Traction Company (Illinois)	Can handle additional less than carload freight.	Chicago & Eastern Illinois Railroad
Eastern Wisconsin Electric Company (Wisconsin)	All less than carload freight.	Chicago & Northwestern Railroad Soo Line
Lake Shore Electric Railway (Ohio)	Handle large amount of less than carload freight.	New York Central Lines Nickel Railroad Pennsylvania Lines
Grand Rapids, Grand Haven & Muskegon (Michigan)	Can care for all less than carload freight shipments orginating at its terminals.	Grand Rapids & Indiana Railway Pere Marquette Railroad Grand Trunk Railway
Detroit United Railway (Michigan and Ohio)	Can handle twenty-five additional flat or gondola cars per day now handled by steam roads. If box cars are provided can handle twenty or thirty additional cars per day.	Michigan Central Railroad New York Central Lines Grand Trunk Railway Detroit & Toledo Railroad Canadian Pacific Railway Detroit, Toledo & Ironton Railroad Detroit Terminal Railroad Wabash Railroad Pere Marquette Railroad Ann Arbor Railroad Baltimore & Ohio Railroad Hocking Valley Railroad Pennsylvania Lines Wheeling & Lake Erie Railroad Toledo & Ohio Central Railroad Toledo Terminal Railroad Detroit, Bay City & Western Railroad Cincinnati Northern Railroad

Tabulation of Replies Received from War Board Questionnaire (Continued)

Name of Company	Nature of Relief Afforded	Steam Road Affected
Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company (Minnesota)	Well located for use as a belt line.	Chicago, St. Paul, Minneapolis & Omaha Railroad Chicago, Milwaukee & St. Paul Railroad Chicago, Great Western Railroad Chicago, Rock Island & Pacific Railroad
Michigan Railway (Michigan)	Can handle both carload and less than carload freight; has considerable equipment, warehouse and team track delivery at all stations.	Pére Marquette Railroad Grand Rapids & Indiana Railway Michigan Central Railroad Grand Trunk Railroad New York Central Lines
Aurora, Elgin & Chicago Railroad (Illinois)	Handles carload and less than carload freight. Possibilities for extending less than carload freight business if able to provide proper terminal facilities at Chicago, are great. Carload business now being handled quite extensively and is prepared to handle team track freight to all points along the line and to industries reached by other lines.	Chicago & Northwestern Railway Chicago, Burlington & Quincy Railway Chicago, Milwaukee & St. Paul Railway Chicago, Great Western Railroad
Ohio Valley Electric Railway (Ohio and West Virginia)	Handles less than carload freight.	Chesapeake & Ohio Railroad Baltimore & Ohio Railroad Norfolk & Western Railway Detroit, Toledo & Ironton Railroad Cincinnati, Hamilton & Dayton Railway Ashland Coal & Iron Railroad
Mason City & Clear Lake Railroad (Iowa)	Can absorb all carload or less than carload into Clear Lake, having joint tariffs with all steam lines. Can perform switching service between steam roads in Mason City.	Chicago, Milwaukee & St. Paul Railway Chicago, Rock Island & Pacific Railway Chicago, Great Western Railroad Chicago & Northwestern Railway and Minneapolis & St Louis Railroad
Northwestern Ohio Railway & Power Company (Ohio)	Can handle all less than carload and most of carload shipments to all points served.	Wheeling & Lake Erie Railroad Lake Shore & Michigan Southern Railroad Lakeside & Marblehead Railway
Eastern Wisconsin Electric Company (Wisconsin)	Can handle all less than carload freight for Sheboygan Falls, Plymouth and Elkhart Lake.	Chicago & Northwestern Railway Chicago, Milwaukee & St. Paul Railway
Evansville Railways (Indiana)	Can absorb all less than carload freight between Evansville, Mount Vernon, Rockport, Indiana, and Henderson, Ky., and carload freight between Evansville and Rockport.	Louisville & Nashville Railroad Southern Railway Louisville, Henderson & St. Louis Railway Illinois Central Railroad.
Chicago, Lake Shore & South Bend Railway (Indiana and Illinois)	Can handle practically all local freight between its terminals.	Baltimore & Ohio Railroad Chesapeake & Ohio Railway Grand Trunk Railway Michigan Central Railroad New York Central Lines Pennsylvania Lines Wabash Railroad

Asphalt Mastic Makes Good Shop Floor

Twin City Rapid Transit Company Has Had Such Floor in Use for Six Years With Excellent Results

IN AN ACCOUNT of the then new forge and structural shop of the Twin City Rapid Transit Company, Minneapolis, Minn., published in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 11, 1913, page 674, mention was made of an asphalt mastic floor which was at the time something of an experiment. The editors of this paper recently addressed an inquiry to W. J. Smith, master mechanic of the company, for the purpose of learning how satisfactory the floor had proved. It will be remembered that the floor is a 1½-in. layer of asphalt mastic laid on a concrete foundation. The composition is 65 per cent gravel, rock and bank sand and 35 per cent mastic and flux.

In reply to the inquiry Mr. Smith states that this floor has given excellent satisfaction. It has had hard service but no repairs have been necessary and it is in first-class condition to-day with the one exception that it is somewhat marked up where the pieces of heavy material have been piled or where jack screws and heavily loaded horses have stood. Sometimes from 20 to 30 tons of steel has been piled in a small space and the weight of this material caused the bars and sections to mark up the floor, especially in warm weather. However this has never caused any great trouble although it somewhat mars the appearance of the floor. Where the floor has not been subject to this heavy piling it is smooth and free from cracks and in fine condition.

Experience has shown that when a floor of this kind is laid it is very important to have firm ground or if it is to be laid on a reinforced concrete slab to have this in good condition. This mastic asphalt floor is made of the same material and is laid in practically the same way as paving asphalt, with the possible exception that a larger proportion of finely crushed rock is mixed with the asphalt. The company uses the same material on the back platforms of all passenger cars. When first used there was some trouble with the floor becoming soft in warm weather, but this difficulty was overcome by using a larger proportion of finely crushed rock. As much of this fine rock was used as could be worked into the mixture without preventing the possibility of troweling it out. It is important to use a flux to coat the concrete. Any contractor familiar with putting down asphalt pavement could do a satisfactory job on floor work. The more service the floor gets the better it appears to be, as it gradually becomes smooth and firm but never hard and slippery.

It would be an excellent plan to use a light steel reinforcing over the concrete slab to prevent any cracking in the asphalt that might occur as the floor gets old. Expanded metal lath would be satisfactory.