New York Terminal Works and Business of the Delaware, Lackawanna & Western Railroad.

Although the principal business of this company is the transportation of anthracite coal from the Lackawanna district of the Pennsylvania coal fields, it has necessarily enlarged the character of its business by the building of an independent double-track road to Buffalo, where it makes a Western connection to Chicago, principally over the New York, Chicago & St. Louis Railway.

It operates also a line to Oswego, on Lake Ontario, and over that and several other branches has direct connections to some of the rich and fertile districts of the central part of the state of New York.

It remains, however, in its operation, simply a transportation company, and its business terminates in Hoboken, at the station on the west bank of the Hudson River (shown in Fig. 1), lying opposite Christopher street, New York, which is about 2¼ miles north of the Battery.

The handling of miscellaneous freight at this station, the lighterage to and from New York, and the handling in the

HOBOKEN YARD.
D.L.&W.R.R.

HOBOKEN.

AVENUE.

FERRY

STREET.

WILLOW

MEADOW

GARDEN

BLOOMFIELD

WASHINGTON

HUDSON

NEWARK

City Line.

20TH

19TH

18TH

17TH

16TH

15TH

14TH

13TH

12TH

1800 Ft. to Tunnel Portal.

Eng. Coal Pockets

ROUND HOUSE

MAIN WEST BOUND PASS. TRACK.

PASSENGER YARD

MAIN EAST BOUND PASS. TRACKS

LOCAL and FREIGHT YARD.

VEGETABLES.

IRON SHIP CANAL.

TRACKS ON HIGH TRESTLE WORK

COAL YARD

Receiving Tracks.

Grade descends 26 ft. per mile →

JERSEY CITY.

HENDERSON

PROVOST

Tobacco Transit Shed

Steepest Grade Approximate.

Foot of

THROUGH FREIGHT YARD

Center Line of 12th Street if extended.

N.Y.L.E. & W.R.R.

FREIGHT

EXPRESS

FERRIES TO NEW YORK.

No. 1 EMIGRANT

WEST BOUND No. 2 2 Story Shed

TRANSFER BRIDGES

EAST & WEST BOUND No. 3

No. 4 DERRICK & CRANE EAST BOUND

No. 5

PLANE SCALES No. 6

PLANE SCALES No. 7

PLANE No. 8

PLANE No. 9

Shaft. HUDSON RIVER TUNNEL. (Proposed)

PLANE No. 10

EMPTY TRACK

EMPTY TRACK (TRESTLE)

EMPTY TRACK

EMPTY TRACK

EMPTY TRACK

EMPTY TRACK

EMPTY TRACK (TRESTLE)

GRAIN

EAST BOUND 1 Story Shed No. 11.

EAST BOUND 1 Story Shed No. 12.

ERIE R.R.

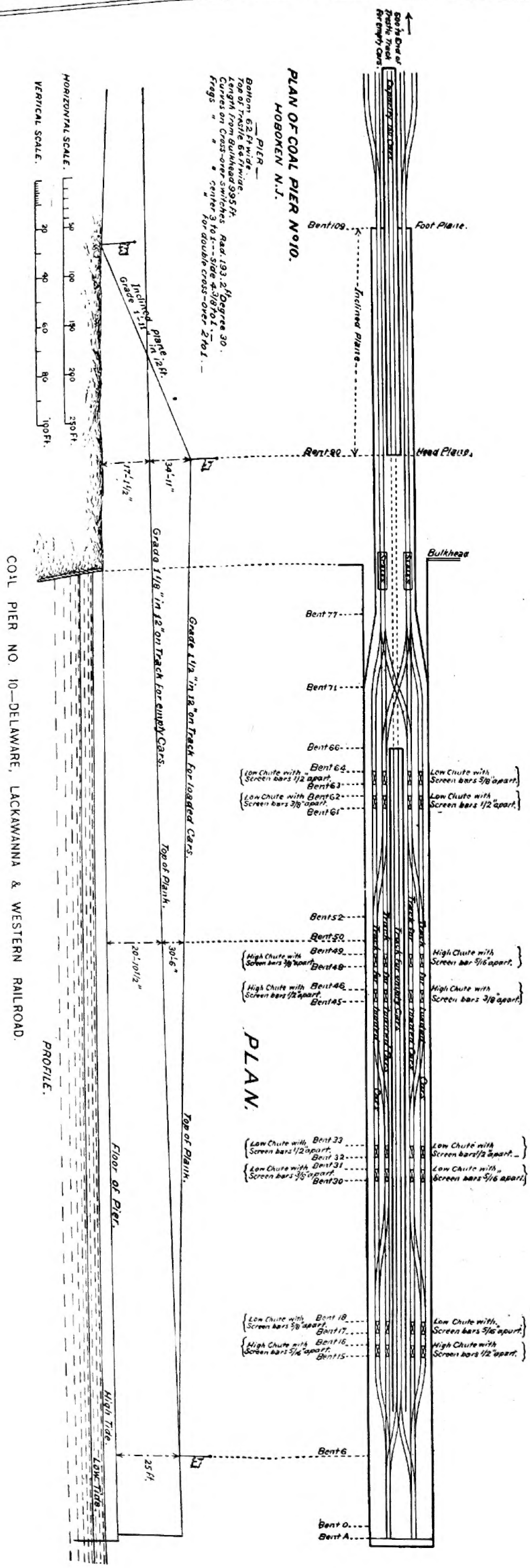
HUDSON RIVER

2100 Ft.

SCALE.
200 400 600 Ft.
50 100 150

N

HOBOKEN YARD—DELAWARE, LACKAWANNA & WESTERN RAILROAD.



city are all done under a contract with a private firm; hence, in addition to the necessary work of moving cars in the yard, the principal work done directly by this company is the handling of the coal.

Like the Pennsylvania and Erie railroads, it has a yard on the Hackensack meadows (called the Secaucus yard), but i is not an important one; being simply a few tracks paralle to the main tracks, making in all about six miles of sidings.

Running eastward from this yard the grade ascends to the tunnel through Bergen Hill, which is entered at about the same point as the Erie Railroad, but ona considerably higher level and in a more northerly direction. The eastern portal is only 1,600 ft. from the beginning of the terminal yard, and as the grade is high, all the city streets are crossed overhead on substantial iron bridges.

The northern part of the yard, above the ship canal, is devoted to the passenger, local freight and iron business, and is now being rebuilt according to the plan shown. There are about 36 acres in this part of the yard, and 20 miles of track, of which 9 miles are devoted to the passenger, and 11 miles to the freight business. Five engines with crews are employed in the latter business during the day and two at night, moving from 125 to 200 cars a day each way.

The southern part of the yard, below the ship canal, is newly built, regularly graded, and all the tracks are in excellent line and surface and of new material. There are about 58 acres in this part of the yard back of the bulkhead line and 33 miles of track, of which 6 miles are used for the through freight business and 27 miles for the coal business.

The coal is hauled generally in small dump cars, each of which occupies about 13 ft. in length in a train, weighs about 7,500 lbs. and carries about 12,000 lbs. of coal. Gondola cars with hoppers are also used. Each occupies 28 ft. in length in a train, weighs 20,000 lbs. and carries 40,000 lbs. of coal. The east-bound road engine hauls 100 of the smaller cars in a train to Secaucus yard, and the train is there divided, 60 being hauled through the tunnel by the road engine and 40 by a "tunnel" engine. On entering the yard the engine cuts loose and the cars are run by gravity down the grade on the receiving tracks, while the engines are turned on the turntable *A* and haul empty cars back. The in-bound loaded cars are immediately inspected, the boxes filled and the date of arrival marked with white chalk on each car. The yard engine then hauls them up the grade, and with the grade descending in the direction of the work, sorts the cars.

On Pier 5, which runs by the side of the long ship canal, is a high-level trestle-work, on which the tracks run on about a level grade from the Henderson street bridge. The coal is run from the cars directly to the vessels, or dumped on the pier for "stock," as required. It is devoted to the coal business of the New York, Susquehanna & Western Railroad.

Piers 6, 7, 8, 9 and 10 are built on a plan similar to that indicated in Figs. 2 and 3. The cars are hoisted by machinery up a steep inclined plane from the tracks in the yard to the top of the elevated trestle-work on the piers, the coal dumped into the bins and thence into the vessels, and the empty cars run back down a longer inclined trestle-work track into the yard. These "empty" tracks are sometimes in the centre and sometimes on the side of the pier. Pier No. 10 is the newest and best arranged.

Piers Nos. 6, 7, 8 and 9 are devoted to the business of the agents of different mines, generally two or three consignees on each pier. Each one of these consignees keeps his stock separate, and sells independently the coal from the different mines, making in all some 30 consignments. Consequently, the coal from each must be separated in the yard, and each mine ships several different sizes of coal, which also must be put together so as to operate the piers regularly and systematically. Hence the yard for each pier is admirably designed for this work, being divided into a series of small yards as shown.

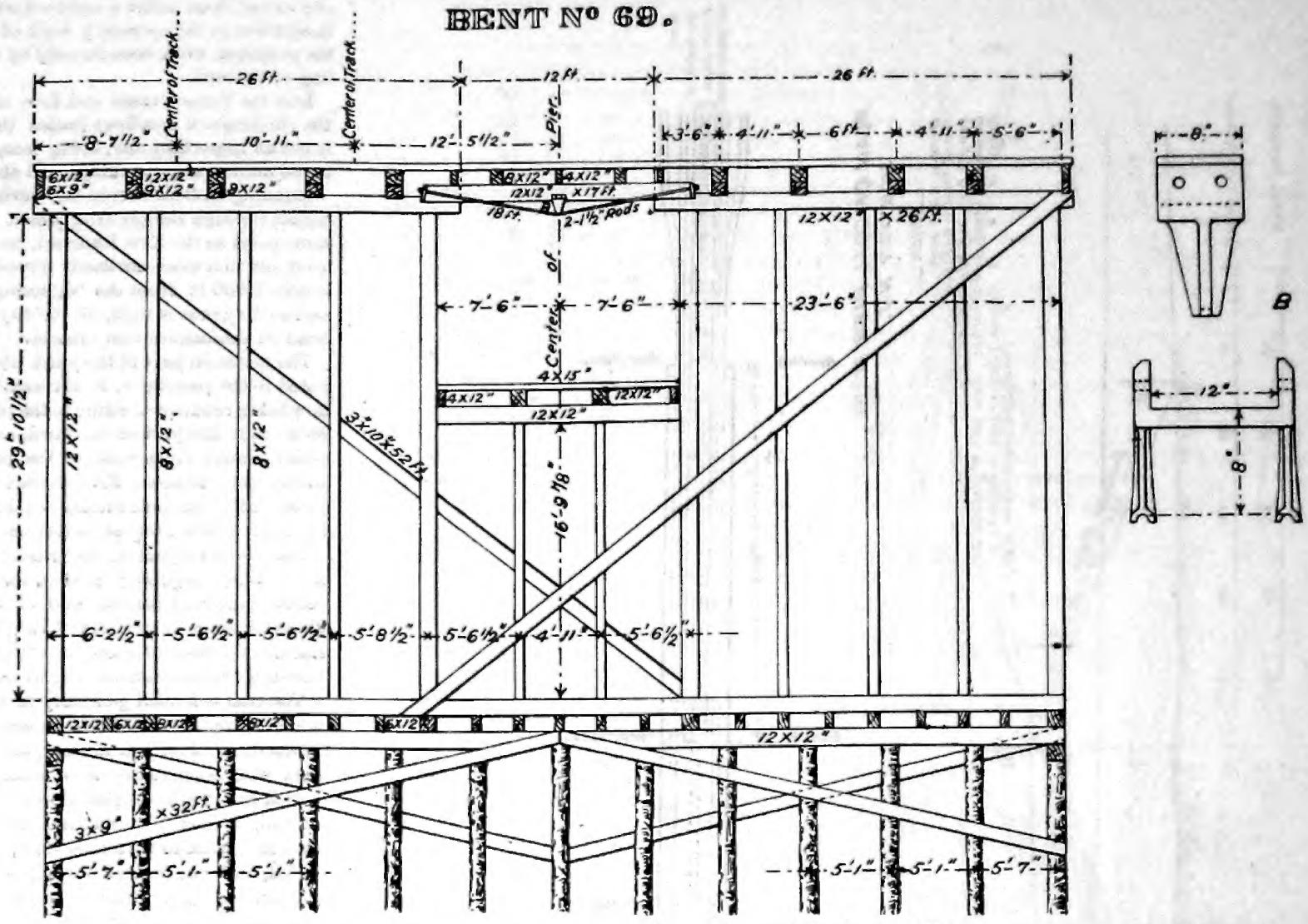
The plan of the yard of Pier No. 10 indicates a different arrangement of business. The coal handled in this pier is mined entirely by the Scranton Coal Co., which classes the product of all its mines alike and does not sell each separately. Therefore, the sorting of this coal is simply the necessary separation of the different sizes, which is done at Port Morris yard, which is some 30 miles west. Hence, the trains arrive in the Hoboken yard assorted in sizes, and the only yard work needed is to place the cars so that they can he hauled up on the plane. In winter two of the small cars (in summer generally three) are hooked by a chain to a link in a wire cable of 1¼ in. diameter, which runs over sheave-wheels at the bottom and top of the plane and thence to the drum. Both drums—one under each track—are on the same shaft and run in the same direction, but, the cables being wound in opposite directions, the cars are raised on one plane at a time.

All the planes are furnished with one pair of "dogs" for each bent. There are two sticks of timber hung on a heavy round-iron bar running across the plane and inserted in the stringers. The long end of the dog below this bar rests in the cap below, while the short upper end extends just far enough to catch the car axles. As the car passes up the plane, the axle runs along the upper edge of the dog which revolves on its own axis and allows the car to pass over it, but as soon as each car-axle leaves, it assumes its regular position, and if an accident occurs catches the axle of the car and prevents it from running down the plane.

The drum-shaft is geared directly to the driving-shaft of a pair of 16 × 30 in. cylinder horizontal engines, which (with the boilers) are operated by one man and use about 1¼ tons of coal in a day of 10 hours.

The loaded cars on arriving at the head of the plane immediately pass over the scales and are weighed; and the tracks are so well arranged that they can be placed without trouble at any bin on the pier.

The bins are located as shown on the plan. They are lined



COAL TRESTLE BENT—DELAWARE, LACKAWANNA & WESTERN RAILROAD HOBOKEN YARD.

with sheet iron, and receive the coal as it is dumped from the cars. From the bins the coal runs over the bar screen (the sizes of which are given), and thence over the iron apron into the vessel. The aprons are hinged at the end next the trestle-work, and are raised and lowered by means of chains running to an ordinary hand-drum gearing at the top. The dust and screenings are wheeled back on the pier and shipped separately. The bins are of different sizes, and the aprons at different heights, in order to accommodate the different kinds of vessels. The sailing vessels which run to Boston and other points on the coast, carry from 700 to 800 tons, and the coal is run into them and larger vessels, when they are empty, from the high bins.

The coal for the city is carried in canal boats of 230 to 250 tons capacity, and to load them the larger and lower bins are used. These latter bins will hold 50 tons, and hence the movement of the cars need not wait on the "trimming" and movement of the boats. None of the bins, however, are intended for permanent storage.

The work of dumping and moving the cars on the piers is done by men employed by the railroad company; 3,000 tons can be regularly handled on Pier 10 each day of 10 hours, with 35 laborers, there being little shoveling required, either with the gondola hopper cars or the the small dump cars.

At the end of Pier No. 10 is a coaling station for tug-boats. The coal is dumped on the pier and delivered to the boats by a contrivance worthy of notice. It is a small car carrying a sheet-iron hopper holding about a ton of coal, which is weighed on scales rigged on the car itself. By this means the coal, wherever it may be, is weighed on the car, which is run on a track to the boat. Its possible application to the following work is the cause of its being noted here.

Commercially speaking, the coal trade is most active in the spring and fall of the year; in summer the coal is not so readily sold, but it is the best season of the year for its mining. Therefore much more arrives at the docks then than is shipped from them, and consequently the surplus must be stocked. This is done in great piles running back 400 ft. from the bulkhead and 25 ft. high. When this coal is shipped in the fall the boats lie at the bulkhead and the coal is screened by hand and wheeled to the boats by wheelbarrows. Each wheelbarrow delivers 224 lbs. of coal, and the load of each barrow is weighed and corrected on a small platform scale placed wherever it may be convenient.

It is evident that the principal advantage in cost of operating that a coal-carrying road has over a road doing a general business, is in the handling of its freight; for while in practice, the apparent proportion of paying to dead load per car is much greater with a coal car than with a merchandise car—perhaps twice as greater—still the coal car is always hauled back empty, and although its work is more regular and prompt, as it returns against the grade the practical proportion of paying to dead load is probably diminished to nearly the same ratio as with cars for merchandise and general freight. GRATZ MORDECAI.

Contributions.

The Manufacture of Sparks.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The following instance of a large output of sparks came under my notice lately, and may be interesting to some of your readers, and serve the purpose of a shocking example, showing that the extension front is not invariably an efficient spark-arrester.

On a Western road recently an extension was arranged with fine nettings and low baffle-plate to catch all of the sparks. This necessitated cleaning the front end every 20 miles or less. In a trip of 180 miles 126 bushels of sparks were run out of the extension, weighing 45 lbs. per bushel or 5,670 lbs. The engine averaged 60 lbs. of coal per mile, or 10,800 lbs. for the trip, and although she was a 17 × 24, with 3¼ nozzles, over half of the fuel was drawn through the flues in the shape of sparks, which, while they may not have had the value of the coal as fuel, were valuable, inasmuch as they burned readily in a blacksmith's fire. With the ordinary extension it is not uncommon to run an engine 200 and 300 miles with but one cleaning of the extension—which is the result of using coarse netting, ½ in. mesh. At the end of the trip the extension is cleaned of its contents—about eight or ten bushels. As the engine, as has been shown, drew 126 bushels through the flues, it follows that the ordinary extension saves about ten bushels and throws out 116 bushels in 180 miles.

VERAX.

The Origin of Coupon Tickets.

WAVERLY, Va., Oct. 8, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I would inquire through your valuable paper who first introduced the coupon tickets so universally used at the present day. They are as familiar as if they had always existed, but there must be a beginning to all things, and it might be interesting to know the beginning of coupon tickets.

In 1853 the writer was in charge of the freight and passenger department of the Rutland & Washington Railroad (now run and controlled by the Delaware & Hudson Canal Co.), a new road opened in 1852, and in 1853 operated in connection with the Albany Northern Railroad. The connection was made at Eagle Bridge, N. Y., and it formed a line from Rutland, Vt., to Albany, N. Y. This was previous to any all-rail connection made through to Chicago, but in the latter part of that year a through rail connection was made.

At Rutland, Vt., we had a connection with the Rutland & Burlington Railroad, which gave us a through line from Boston. Although we were a north and south line between New York and Montreal, I thought I could make an east and west line from New England to the West which would secure some of the emigration which was then flowing west. The Boston & Albany Railroad was the only outlet at that time and secured all the traffic. Our line would be some 30 miles longer, but having good connections, we decided to try and build up a business.

A coupon ticket suggested itself to me as a good means to advertise the route, and one offering a convenient and safe way for the passenger to buy a through ticket and save any further trouble, knowing just the cost of his journey and securing him against any imposition.

I drew up a plan for a ticket, and had samples printed by Mr. Tuttle, of Rutland (now Tuttle & Co.). I had never seen anything of the kind or known of any being in use, and have never since learned there was.

With my samples I went to Buffalo and saw Mr. C. C. Dennis, Superintendent and Engineer of the Lake Shore road at that time and for a long time thereafter, and well known in railroad circles. Mr. Dennis was well pleased with the plan, and offered to make the tickets good west of him as fast as new lines opened. The line through to Chicago was not complete between Cleveland and Toledo, but would be complete in a few weeks. Mr. Dennis' kind offer relieved me of going further to arrange for the reception of my tickets.

I returned home and got out my stock of tickets to all principal points from Rutland west to Chicago, and had them ready in time to begin sales when the line was complete. I placed our tickets at principal stations in New England, especially in Boston, they selling a card ticket to Rutland and then using ours west. After the first month's sales, we paid the next month to roads west about $2,000, and the traffic gradually increased.

At first our friends of the Boston & Albany road gave little attention to it, only ridiculed the idea of making our line a western route, but before a year had passed they began to feel a little alarm and finally influenced the management of the New York Central to discontinue receiving our coupons. To obviate that I had a friend in Mr. Chauncey Vibbard, the Superintendent, who provided us with their card ticket, and we put them in the hands of our conductors, who took up the New York Central coupons and gave the passenger the New York Central card ticket instead. Then we were all right again.

We found that persons were going west to visit friends and returning, and that there was a traffic east as well as west. I then sent an agent west who succeeded in getting the Western roads to issue tickets over our line, and Eastern roads about that time began to issue their own tickets, until the system became general, and before I left the Rutland & Washington we were ticketing to St. Paul and all points West as far as roads were built.

The ticket I first issued was a longer ticket than the present style, as the coupon was printed lengthwise. My first plan was to cut between each coupon, so that the edges would hold them together, and so that each conductor could easily detach his coupon; but standing by when samples were printing, I noticed the dotted lines indicating the division, and suggested that the rule be raised to prick it through, which was done, and made a complete perforation.

In a few years the Great Western Railway was completed, forming a line from Buffalo *via* the Michigan Central. A strong competition sprang up between the Lake Shore and the Great Western routes, and they came into the Eastern states with their own tickets and established agents and paid large commissions, sometimes as high as $3 or $4 on a ticket. Julius Morris represented the North Shore and Wm. Barr the South Shore; both energetic men; and the war was strong. In due time other roads west of them sent on agents, and Rutland became the centre for tickets agents. Then, as now, the competing lines would get together and fix rates, and solemnly bind themselves to strictly live up to rates and commissions fixed, only to break their agreement the next day.

The plan proved to be to our advantage, as it brought us business. We were not in the fight, which was all from Buffalo west, but the struggle for business centred at our terminus in Rutland.

I would like to know if you or any of your readers know of the coupon ticket being used earlier than 1853 in any part of the United States. I know there were none selling West when we issued them, but there might have been in the South. If not, I shall claim their introduction. Before 1853 I had been connected with the Central Vermont Railroad, and sold tickets from Burlington, Vt., to Boston, Lowell, and other principal points, but that was a card ticket, and a settlement was made from reports. J. WILDER.