

line, it runs northwest on a nine mile tangent to a point $3\frac{1}{2}$ miles west of the latter, where 13 deg. of 30-min. curve occurs. There is then a 13 mile tangent followed by 6 deg. of 30-min. curve; a 10 mile tangent and 7 deg. of 30-min. curve; a $4\frac{1}{2}$ mile tangent and 4 deg. of 30-min. curve; a 7 mile tangent and 12 deg. of 30-min. curve; then five miles of tangent to connection with the Milwaukee division near St. Francis, three miles from the Milwaukee station. From this point the new line continues as third and fourth tracks of the Milwaukee division on the old right-of-way as far as the Bay View interlocker just south of Kinnikinnick river, where there is a double-track bridge. The work in Illinois is being done under the name of the Chicago & State Line Railway, while that in Wisconsin is under the name of the Milwaukee & State Line Rail-

The Chicago & North-Western has three lines out of Chicago. One runs due west to Omaha, another northwest to St. Paul and Minneapolis, and the third north along the lake shore through Milwaukee. All three leave the city as double-track lines. From Wells street station to Clybourn Junction, three miles out, the latter two are combined as a four track line. The road has its heaviest suburban traffic on the lake shore line, which traverses an almost continuous series of populous suburban towns all the way to Milwaukee. The freight and through passenger traffic on this line is also extremely heavy, and long ago the combined traffic had attained a volume that taxed its two tracks beyond their capacity, particularly at the south end, where the suburban traffic is densest.

The first measure of relief to be adopted was the building of the Mayfair cut-off some 15 years ago. As will be seen from the accompanying map, it leaves the main line at North Evanston, running southwest to Mayfair Junction and south to large freight yards at 40th street, Chicago, enabling all through freight traffic to be diverted from the very busiest portion of the main line, to the 40th street yards, and through them south to Wood street yard when necessary.

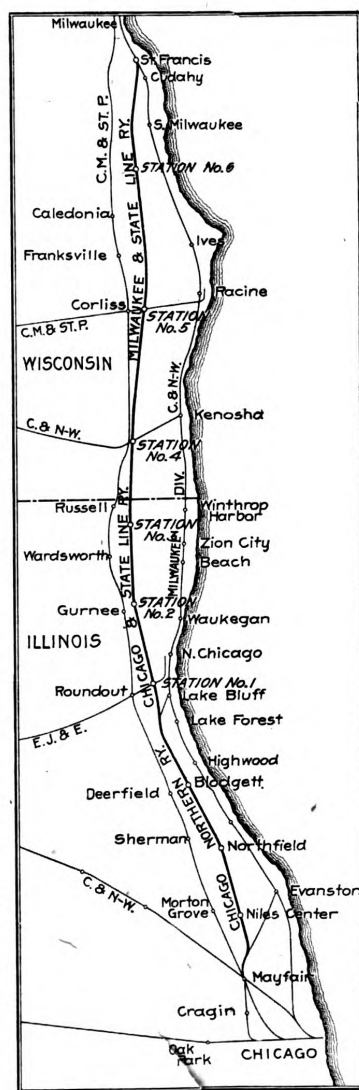
When necessary.

As the growing volume of suburban traffic extended northward, further relief became necessary, and it was first proposed to build a third track as far as Lake Forest. However, this plan was abandoned in favor of the construction of a third and fourth track from Lake Bluff southward a short distance west of the existing line to juncture with the Mayfair cut-off, which enabled through passenger and freight traffic to be diverted from the shore line between Lake Bluff and Chicago. This new line, built two years ago as the Chicago Northern, is 22.2 miles long.

But the line north of Lake Bluff soon evidenced the need of enlarged capacity. The Rockford line, or Kenosha division as it is known, joins the Milwaukee division at Kenosha, Wis., 52 miles north of Chicago. This branch line contributes a considerable traffic, the ice business in the summer time being particularly heavy as the line traverses a lake region where a large amount of ice is harvested. In order to avoid interference with the passenger traffic as much as possible, which, of course, is heaviest in the day time on account of the suburban trains, as many as possible of the freight trains were run at night. But the situation was far from satisfactory and it was therefore decided to extend the third and fourth tracks through to Milwaukee.

The idea at first was to have these tracks adjacent to the existing line, but this was abandoned for several reasons. One was the presence of several small cities on the line, such as Kenosha, Racine, etc., where additional right-of-way across the town would have to be bought at large expense. Also the multiplication of grade crossings at these places was a serious objection. Furthermore, an investigation showed that by building this third and fourth track as a separate line a short distance west of the shore line, not only could much lighter maximum grades be obtained, enabling larger tonnage trains to be hauled, but also all towns, with their accompanying grade crossings, would be avoided and with them the need of frequently reducing speed or stopping whether traffic and operating conditions required it or not.

The new line, work on which began May 1st, is about 53 miles long, and it probably comes as near to being an air line as any equal length of road in this part of the country. Starting from Chicago and State Line Junction on the Chicago Northern, a mile and a half southwest of Lake Bluff and about a mile west of the shore



**Chicago & North-Western's New Line
to Milwaukee.**

Racine and consists of five 70-ft. deck girders which ultimately will be placed on masonry piers. Temporary pile piers will serve until the line is completed so that the masonry material can be hauled in cheaply. All subway abutments will likewise be of piling temporarily. The culverts are cast-iron, three sizes of pipe being used, viz., 24 in., 36 in. and 48 in. There are some 1,500 ft. of the last and a considerably greater amount of the 36 in. The highway crossings are mostly at grade, the country being too flat in most cases to permit grade separation at reasonable cost. Out of 50 such crossings, seven are overhead and three underneath. There are four railroad crossings which include the Elgin, Joliet & Eastern, the Chicago & Milwaukee interurban electric lines branch from Lake Bluff to Rockefeller, the Kenosha division of the North-Western, and the Racine branch of the Chicago, Milwaukee & St. Paul. All of these will be interlocked. The three steam road crossings are to be all-electric

way. The former has 16½ miles and the latter practically 36 miles, including the two miles from St. Francis to Bay View, making something less than 53 miles total.

As would naturally be inferred, the work on most of the line is moderate. The maximum gradient is $\frac{3}{10}$ of one per cent., or 15 ft. to the mile, against $\frac{2}{10}$ of one per cent. on the old line. The curves, as already stated, are all 30 min. There are several fairly heavy cuts and fills. On the first three miles from the south end there is heavy borrow work. For the next five miles the work is light, but at mile eight there is a 56,000 yd. cut. In miles nine and ten there are two cuts aggregating about 100,000 yds. Mile 12 has a 83,000 yd. cut, miles 16 and 17 have each a 56,000 yd. cut, and 19 and 20 each 55,000 yd. cuts. The next 18 miles is all moderate work, but miles 48 and 49 have a 190,000 yd. fill, and 49 and 50 a 340,000 yd. cut starting at the north end of 49 and extending through 50. This cut is through St. Francis hill, and it will have a maximum depth of 35 ft. It was stated that the maximum grade will be $\frac{3}{10}$ of one per cent. This should except the grade coming out from Milwaukee through this cut, which will be $\frac{1}{10}$ of one per cent. This was to avoid carrying the bottom of the cut below the surrounding drainage level.

Root river crossing is the only bridge of any size on the line. It occurs about five miles north of a point opposite orders which ultimately will pile piers will serve until material can be hauled in pipe be of piling temporarily. size being used, viz., 24 in., ft. of the last and a con-

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and that of the electric road probably mechanical. The line will be laid with 90-lb., 33-ft. rails. The 30-ft. rail has been standard on the North-Western heretofore. White oak ties and gravel ballast will be used throughout, the minimum depth of ballast under the ties being 12 in.

Although there are no towns on the line, six stations have been provided for. No names have been assigned to them and at the present time they are distinguished by numbers. No depots will be built as it is not expected that any local business will develop because of the proximity of the old line and of the Chicago, Milwaukee & St. Paul. These stations will have necessary passing tracks, a telegraph office, etc. Station 4, the crossing of the Kenosha division, will be the most important, because of the interchange of traffic between the two lines. It will have coaling and watering facilities, ash pits, etc., storage tracks, Y connections between the two lines, and a large building for employees. The other stations have two passing tracks, each 4,000 ft. long in the clear, giving capacity for 100 cars.

This new line, with its light grades and curves, will enable fully 30 per cent. greater loads to be hauled than the present line. It will be worked at first by the telegraph block system. Later on, if conditions require, automatic block signals will be installed. The completion of the line will relieve the present line of all through freight and passenger traffic. It will also permit a material reduction to be made in the running time of through trains between Chicago and Milwaukee, should such a condition become desirable or necessary. An interesting and important feature of the scheme is the flexibility of operation which will be afforded by the several connections between the two lines. These cross-connections will enable trains to be diverted from one line to the other as operating and traffic conditions require.

As already stated, construction work was actively begun May 1st. It is expected that the line as far as Kenosha division crossing will be completed and in operation not later than Dec. 1st of this year. This will relieve greatly the present line by cutting off from it the freight traffic to and from the west over the Rockford line. Most of the remainder will probably be completed this year, but the contractors have until July, 1906, to finish on account of the St. Francis hill cut, which is so situated that only one steam shovel can work on it.

The work is being done under the supervision of Mr. E. C. Carter, Chief Engineer of the Chicago & North-Western, Mr. C. T. Dike being Resident Engineer in charge of construction. The contract for clearing, grading, track-laying, surfacing and ballasting was let to Winston Brothers Company, Minneapolis, Minn.

Switch Engines for Bridge Service at Cincinnati.

The Chesapeake & Ohio recently placed in service eight locomotives of the type shown in the accompanying illustration, for use over the Cincinnati bridge. They pull heavy trains from Covington, Ky., on the C. & O., to Ivorydale, Ohio, on the C. H. & D. They weigh 142,500 lbs. in working order, have 20-in. x 28-in. cylinders with piston valves, and a tractive power of 30,600 lbs. Superin-

have been paid by Texas railroads on account of personal injuries, from 1891 to 1904 inclusive, the following amounts:

| | | |
|--------------------|--------------------|----------------------|
| 1891.....\$223,749 | 1896.....\$487,402 | 1901.....\$1,457,973 |
| 1892.....284,726 | 1897.....472,799 | 1902.....1,765,653 |
| 1893.....295,042 | 1898.....598,645 | 1903.....1,940,551 |
| 1894.....333,338 | 1899.....655,739 | 1904.....1,873,777 |
| 1895.....464,768 | 1900.....1,018,637 | |

The same authority gives for the fiscal year ended June 30, 1903:

| | |
|--|----------------|
| Ratio of income to commission valuation of properties..... | 6.41 per cent. |
| Same year, ratio of payments for injuries to gross earnings..... | 3.09 per cent. |

Startling as are these figures when considered only as an item of operating expense, they become a source of anxiety and even of alarm to the managements of this important commercial interest when compared with similar data from adjacent states and territories in which transportation conditions are substantially the same.

From data for the year 1899 supplied by a large number of railroad systems operated in the west and southwest, many of which are allied with railroad interests in this state, it appears that there were:

| | |
|---|-------------------------------------|
| Outside of Texas..... | 1 injury for each 49 miles of road. |
| In Texas..... | 1 injury for each 14 miles of road. |
| | Per mile of road.— |
| | Claimed.....\$180.00 |
| | Paid.....\$9.48 |
| Outside of Texas amounts in suits were..... | 1,208.00 |
| In Texas amounts in suits were..... | 82.04 |

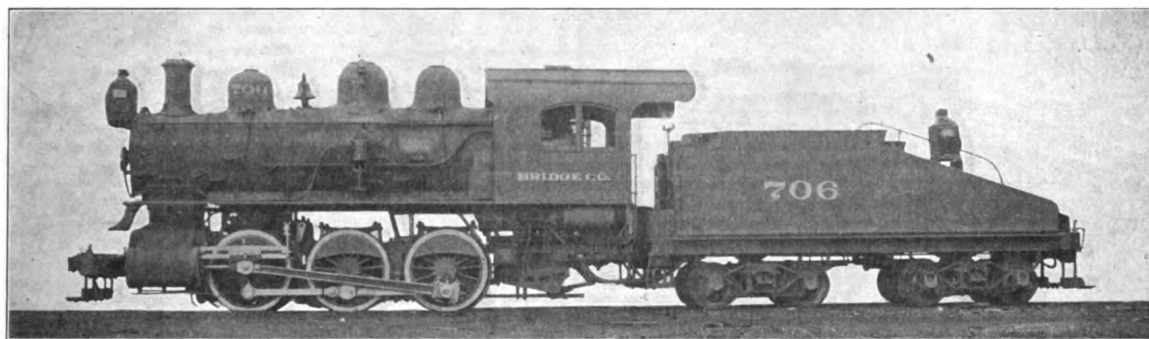
By some of the lines operating systems both in and out of Texas in 1899, the following sums were paid for damages for personal injuries:

| | |
|--|-------------------|
| | Per mile of road. |
| Atchison, Topeka & Santa Fe, outside Texas..... | \$4.19 |
| Gulf, Colorado & Santa Fe, inside Texas..... | \$6.83 |
| Missouri, Kansas & Texas, outside Texas..... | 19.73 |
| Missouri, Kansas & Texas, inside Texas..... | 217.66 |
| St. Louis Southwestern, outside Texas..... | 2.30 |
| St. Louis Southwestern, inside Texas..... | 7.48 |
| Southern Pacific (in 1902), outside Texas..... | 20.00 |
| Galveston, Harrisburg & San Antonio (in 1902), inside Texas..... | 500.00 |

Not long since I had occasion to examine the record of an accident which occurred in the northern part of the state. The facts of the accident and the responsibility of the company were clear enough; a collision in the yard between a switch engine and a passenger train. One of the passengers hastened to his home and employed a lawyer, and within three days from date of accident filed suit for heavy damages. Representatives of the company endeavored to adjust plaintiff's claim for injuries, and asked permission for a medical examination by its chief surgeon, or by any reliable disinterested physician, with the view of ascertaining what would be a fair compensation. This was refused by both the attorney and his client; later on, however, the attorney submitted for consideration of the company an opinion of the patient's family physician, offering it as the only basis upon which an adjustment could be made. The opinion read as follows:

"Traumatic injury of spine; partial paralysis of lower extremities; nervous system a perfect wreck; never will be able to perform any labor requiring use of lower extremities; bladder and sexual trouble as consequence of injury to the spinal nerves; Mr. — is a physical and nervous wreck."

As the company was clearly liable, and had no other or better



Six-Wheel (0-6-0) Switching Engine for the Cincinnati Bridge.

tendent of Motive Power Walsh, of the C. & O., reports that in the three months that they have been in service they have given excellent results. They were built at the Richmond works of the American Locomotive Company.

Doctors and Damage Suits.

The following extracts are taken from a paper entitled "The Doctor and the Damage Suit," recently read at Galveston by Mr. T. Fay, General Manager of the Southern Pacific Texas lines, and printed in the *Houston Chronicle*:

According to the reports of the Railroad Commission, there

medical evidence, it paid \$9,500 in settlement, and the patient, cured, as by a miracle, returned to his work, and has ever since been earning the same wages in the same line of employment as before the accident.

Another case is that of a fireman who was injured in West Texas, and brought suit for damages, claiming total paralysis of lower extremities. He was brought into court in a wheel chair, and by agreement of physicians, three of whom were appointed by his lawyers and four appointed by the company. The plaintiff's physicians testified positively that he was paralyzed, and would never walk again. Those appointed by the company testified that he was not paralyzed. A sympathetic jury believed plaintiff's phy-