RAIL FAILURE STATISTICS FOR 1915.*

By M. H. Wickhorst,
Engineer of Tests, Rail Committee.

THIS report deals with the statistics of rail failures collected for the year ending October 31, 1915, furnished by the railroads of the United States and Canada in response to a circular sent out by the American Railway Association. The information furnished by each railroad showed the number of tons laid of each year's rollings from each mill, the equivalent number of track miles, and the total number of failures that occurred in each year's rolling from the date laid until October 31, 1915. It may be remarked that as a whole the returns this year were more complete and satisfactory than heretofore.

The failures were divided into four classes, namely, head, web, base and "broken." They were reported by the railroads on American Railway Engineering Association form M. W. 408 as revised in 1915. (See Manual for 1915, p. 104.) A copy of this form reduced in size is given with this report as an insert. The reports cover rollings for 1910 and succeeding years, and the ages of the rollings would average in the track about the years shown below:

1910—5 years.	1913—2 years.
1911—4 years.	1914—1 year.
1912—3 years.	1915—several months.

The tonnages represented by the statistics in this report are shown below:

Year rolled.	Bessemer.	Open-hearth.	Total.
1910	647,616	969,075	1,669,691
1911	317,818	805,489	1,123,307
1912	230,318	1,235,974	1,466,292
1913	122,974	1,403,848	1,526,642
1914	52,837	976,852	1,029,689
1915	13,295	621,603	634,898

The equivalent track miles are as follows:

Year rolled.	Bessemer.	Open-hearth.	Total.
1910	4,678.46	6,908.97	11,587.43
1911	2,263.75	5,717.42	7,981.17
1912	1,657.33	8,716.85	10,374.18
1913	998.05	9,670.54	10,668.59
1914	380.02	6,681.22	7,061.24
1915	99.12	4,187.14	4,286.26

It will be noted that the Bessemer rails have continually become a smaller proportion of the total amount reported on.

The failures were tabulated with reference particularly to the performance of the rails made by the different mills and were classified successively in the following order: Kind of steel (Bessemer or open-hearth), mill, year rolled, weight per yard, section and railroad. The totals were figured for the groups by the year rolled.

Lots of less than 1,000 tons (that is, less than 1,000 tons in any one year's rolling) were excluded from the tabulation, as they would unnecessarily extend the tables and not materially change the group totals and averages. The method of compiling the statistics was to make prints (generally blue-line whiteprints) of the reports submitted by the different railroads, after seeing that all the lines were fully filled out, and then cutting them up along the horizontal lines with a large card cutter or trimming board. These strips constituted the units in the tables, and after sorting in suitable order and collecting into the desired groups, the information was transcribed into tables on a typewriter, from which zinc plates were made for printing in the report.

Failures Classified by Mills.—The detail tabulations by mills and years rolled are given in Table 7, sheets 1 to 20, inclusive. A condensed table showing the failures of each year's rolling of each mill is given as Table I. First, it is interesting to note from this table the comparative performance of Bessemer and open-hearth rails for the several years' rollings. Figuring the failures per 100 track miles of open-hearth rails as 100 for each of the years 1910, 1911, 1912 and 1913, the relative failures of the Bessemer rails, together with the failures per 100 track miles, is shown below:

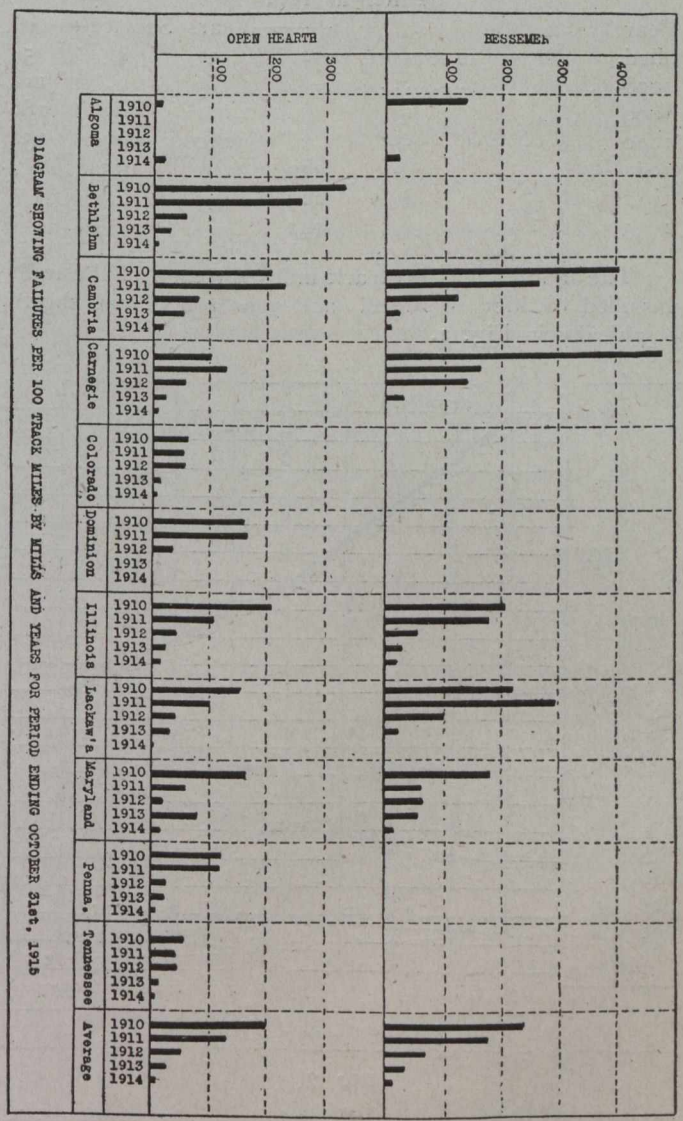

Fig. 1.

Failures of Open-hearth and Bessemer Compared.

Year Rolled	Years Service	Failures per 100 Track Miles Open-Hearth	Failures per 100 Track Miles Bessemer	Comparative Failures Open-Hearth	Comparative Failures Bessemer
1910	5	153.1	236.9	100	154
1911	4	115.5	178.8	100	155
1912	3	46.0	66.9	100	143
1913	2	24.8	35.2	100	142

It will be noted that the Bessemer failures per 100 track miles were about 50 per cent. greater than those of the open-hearth rails. It is probably also true that the

*Bulletin of the American Railway Engineering Assoc.