

a public highway. In one of these a layer of crushed stone, 12 ins. deep, was spread over the bridge and on top of this cut stone was piled to a depth of 3 ft., making a total unit load of about 300 lbs. per sq. ft., or a total load of 106 tons. Under this the total sag due to the bend in the floor, as well as that in the girders, was $\frac{1}{8}$ in. This load was allowed to remain on the bridge for about three weeks, during which there was no increase in the deflection. The original deflection disappeared when the load was removed.

Another test described in the bulletin was made about a year later, when a railroad track was laid on the bridge and a very heavily loaded freight car was run upon it. As the car was somewhat longer than the bridge it was evident that when one truck was placed the centre of the span would produce the maximum bend or sag in the structure. The weight on one truck was found to be 44 tons, and the rails were so cut that they would give no support to the load beyond the length of track occupied by the truck, which was about 8 ft. Thus the total load of 44 tons was applied over an area approximately 5 ft. by 8 ft. Under this load the total deflection, including the sag in the floor as well as that in the girder, was found by careful measurement to be 0.09 in. This deflection disappeared when the load was removed, and six or eight applications of the same load produced the same effect.

During the summer of 1911 another series of tests, more complete than the preceding ones was undertaken, according to the bulletin. Nine brick piers were built beneath the bridge for the purpose of measuring the deflections and the steel reinforcements in the girders and floor was exposed in 15 places to permit determinations of the deformations by means of gauge marks placed on the steel, and bolts were set in the upper part of the concrete girders to determine the deformation in the concrete. A load consisting of 420 tons of crushed stone was placed in eight large bins, and, in addition, 100 tons of pig iron were placed on the west girder and about 60 tons on the east girder. This load produced a total deflection of 1 in. in the west girder and $\frac{3}{4}$ in. in the east girder without causing failure of the structure. The pig iron was removed within a few days, but the load of 420 tons of stone remained on the bridge for a year, until the present summer. It was then taken off, the deflections being noted as it was removed. When the structure had been completely unloaded it was found to have recovered its original position.

The remainder of the text of the bulletin consists of a general discussion of the economy of well designed bridges of modern types; a detailed presentation of the subject of creosoted timber for bridge floors, and an explanation of the Highway Commission's part in the construction of bridges.

MONTREAL FIRE AND WATER.

The frequent breakdowns in Montreal's water department were discussed by the fire underwriters this week, an increase of rates being considered. Mr. A. W. Hadrill, secretary of the Canadian Fire Underwriters' Association, stated after the meeting that the discussion was the result of the heavy loss at the fire in St. Patrick Street on Sunday night, as no one denied the lack of water had run up the loss. "When we consider that both buildings were fully equipped with fire sprinklers, we feel the fire should have been confined to the rope-walk and that probably would have been the case had there been enough water. The neglect of the water department to have their 15,000,000 gallon pump ready, which was ordered last year, is an instance of the way things are done. We are inclined to believe that the cause for so many accidents is either bad material or bad engineering, or insufficient supervision."

CEMENT DUTY BACK AGAIN.

The five months period in which the duty on cement was reduced by half expired on November 1st. The Government will not extend it. The remission was granted because of the alleged lack of supply in the West and inability, for transportation or other reasons, of the Canadian companies to meet it. The Government's action caused heavy importations from abroad.

During the four months June, July, August and September the importations of cement increased greatly. In these four months of 1911 they were 327,000 barrels, and in those of 1912, they rose to 793,000. The figures by months are:—

Month.	1911. Bbls.	1912. Bbls.
June	55,646	171,395
July	27,314	267,405
August	72,695	188,404
September	171,784	166,452
Totals	327,439	793,656

Significance of these figures will be better understood when the importations into the three prairie provinces are given:—

Month.	1911. Bbls.	1912. Bbls.
June	263	50,434
July	514	140,084
August	187	62,166
September	2,227	49,766
Totals	3,191	302,450

Thus the remission brought the imports up from 3,000 to 300,000 barrels.

RAILROAD EARNINGS.

The following are the railroad earnings for the week ended October 21st:—

	1911.	1912.	Increase or decrease.
C.P.R.	\$2,532,000	\$2,943,000	+ \$411,000
G.T.R.	1,023,892	1,132,152	+ 108,260
C.N.R.	459,000	561,100	+ 102,100
T. & N.O.R.	44,182	27,959	— 16,222

The following are the railroad earnings for the week ended October 31st:—

	1911.	1912.	Increase or decrease.
C.P.R.	\$3,675,000	\$4,295,000	+ \$600,000
G.T.R.	1,463,496	1,648,054	+ 184,558
C.N.R.	794,700	628,500	+ 166,200
T. & N.O.R.	61,285	40,234	— 21,051

The gross earnings of Canadian Pacific Railway last month reached \$12,962,000, the largest in the history of the road. The increase over October of last year was \$1,847,000. The earnings for the first four months of the company's fiscal year were \$48,845,000, which is an increase of \$7,498,000 over the corresponding four months of last year.

The statement of the revenue and expenditure of the Intercolonial Railway for the year ended with March 31st, last, shows:—

Passenger traffic, \$2,842,810; freight traffic, \$6,891,937; mails and express, \$428,985; miscellaneous, \$430,052; total revenue, \$10,593,785. Maintenance of way and structures, \$1,812,419; maintenance of equipment, \$2,681,543; traffic expenses, \$217,943; transportation expenses, \$5,630,139; general expenses, \$248,990; total working expenses, \$10,591,035.