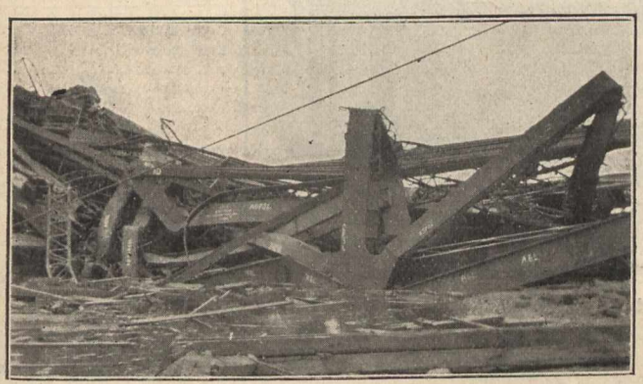
chords and throwing upon them a compression which they are not designed to carry. So that the wreck, as it stands, might have reasonably been caused by a failure of either section.

Conditions at Time of Accident.

At the time of the accident, the work had got to the fourth panel from the south end of the suspended span. A large traveller, weighing 1,000 tons, stood at the end of the cantilever span. It had been dismantled of about one-third of its weight, so that, in this respect, there was less weight upon the bridge than there had been upon previous occasions. This reduction in weight, however, was probably more than made up for by an enormous amount of structural material piled out on the end of the suspended span. Near by was the small crane, weighing about 200 tons. As the accident, from all accounts, occurred at the moment that a locomotive, with two cars moved out to the suspended span, this must be regarded as the proverbial straw which broke the camel's back.

It is interesting to note that the bridge sank with a grinding sound, rather than dropped with a succession of reports. This tends to indicate that failure of compression rather than tension members was the initial cause.



Anchor Arm, Third Panel Point from Main Pier.

The length of time required for the fall is attested to with reasonable accuracy by the experience of the time-keeper. This man was some 250 feet out on the anchor arm when he felt a movement. He immediately started for the bank. He succeeded in reaching the approach span before the anchor arm had parted appreciably from it. The time would therefore be in the vicinity of 12 seconds.

Under the circumstances no member could have been subjected to anything like the pressure which, having due regard to the factor of safety employed, it should be expected to bear without failure. It is a matter of congratulation that the failure occurred now instead of later, when the monetary loss would have been greater and the loss of life might have been too terrible to contemplate.

It is of the utmost importance that no time and expense is spared to arrive at a definite conclusion as to the cause of the accident. Failing this, the question of restoring the bridge will be viewed with apprehension by the public and will present uncertainties to engineers which few will care to accept the responsibility of. The Government is apparently alive to this phase of the question and is still determined to carry out the work of bridging the St. Lawrence.

As to the heap of steel below the bridge, it is no less a problem to know what to do with it. It will entail an enormous amount of work to remove it. The general impression is that it will remain where it is long after the present generation has passed away as a monument to the first Quebec Bridge.

WIRE WOUND WOOD PIPE.

One of the most important British Columbian industries is the manufacture of wooden pipe for waterworks systems. Wooden pipe is by no means a new thing. Years ago logs were bored out and used for the conveyance of water, and for more than twenty years wooden pipe has been manufactured in the United States. However, it is comparatively a new industry in Canada, wooden pipe having been manufactured for the first time in British Columbia about four years ago, the first factory being located at Vancouver. There are now three companies in British Columbia, two in Vancouver, and one in New Westminster, the latter being the Dominion Wood Pipe Company, Limited, which company commenced operations about a year ago. The pipe manufactured by this company is of an entirely new type. The company controls a new patent process of winding the pipe with wire, their method being to use two independent strands of wire instead of one, which it is said gives additional strength to the pipe, since if one wire breaks the other will keep the pipe from bursting. The plant of the Dominion Pipe Company occupies five buildings, the factory, the power house, the dry kiln, the warehouse, and the office. The factory building is 68 ft. x 138 ft., and is equipped with the most modern machinery for the manufacture of the company's product. The power house is 28 x 32 ft., the dry kiln 24 x 70 ft., with a capacity for 10,000 feet of lumber per day. This kiln was installed by the North Coast Dry Kiln Company, of Seattle, Wash., and it is a special feature of the company's equipment. Altogether the company's plant covers about one acre of ground, which lies along a spur line of the railway, giving them the very best shipping facilities. Pipe in all sizes from 2-inch up to 24-inch is manufactured. The plant gives employment to about twenty men, and has a daily capacity of 2,000 feet of 6-inch pipe, and 750 couplings.

Buffalo Steel Co., Tonawanda, New York.—A circular issued by this company deals with high carbon steel bars for reinforcing concrete.

The Ferro-Concrete Construction Co., Cincinnati, Ohio.—Bulletin F., 31, issued by this company, has to do with concrete for footings, piers, piling, foundations, bridge work, retaining walls, smoke stacks, etc. It contains several illustrations of work under construction.

THE "DALLETT" MOTOR-DRIVEN BOILER SHELL DRILL.

The Boiler Shell Drill illustrated is built by the Thomas H. Dallett Co., of Philadelphia, Pa. This machine is motor-driven throughout, and has been designed for the special purpose of taking advantage of high speed steel, and as shown in the accompanying cuts represents the latest development in machines of this character.

There are two end housings, on the front face of which, carried by brackets, are two 5-inch bars on which are mounted two independent motor-driven drill-heads balanced by the two counter weights, having a vertical range of 6 feet, and raised and lowered by means of screws actuated by a motor on the top rail of the machine, this motor being handled by a reversible regulator on the inside of the housing which does not appear in the cut.

An especially noteworthy feature of this machine is the central position of the spindles, not only between the bearings of the drill-head on the bars, but also between the bars, so that the pressure of the drill against the work has no tendency to set up torsional or sidewise strains in the drill-head or bearings, causing excessive friction of the drill in the hole, rapid deterioration of the drill and undue consumption of power, owing to the spindle being thrown out of alignment, as must be the case where a drill spindle is not central of its support.

The machine is entirely self-contained, all adjustments being effected by means of crank handles and hand-wheels, no wrenches whatever being required, and the operator has all the adjustments of the drill-head at his command from either side of said drill-head without moving from his position.

In the lowest position of the carriage, the centre of spindles are 21 ins. from the floor, and in its highest position 7 feet 6 inches. The distance between the housings is 14 feet, and the distance between the spindle centres when the drill-heads are in their outmost position is 12 feet.