Ont., for delivering cold blast to the heating furnaces. In the foreground is one of a set of heavy horizontal hot pressed nut-forming machines; to the right is the enclosed tool-room, equipped with lathes, drills, shapers, etc.; while beyond, in perspective, are a series of modern, vertical nut-forming machines, capable of cold pressing all standard sized nuts from ¼ in. to 1½ in. It will be perceived that all the machines and appliances are belt driven from overhead shafting, running down to the middle of the building, with hangers suspended from roof trusses.

At the western end is the Storage Room, partitioned off as shown in the view (Fig. 7, taken from within the enclosure, and looking down the shops towards the power house. On the left (unseen) is the office, and between this and the tool-room are two fine modern tools, one a horizontal reamer, with six spindles; the other, a back-geared nut-tapper, having six spindles also, capable of tapping ⅜-in. to 2-in nuts. Beyond the tool-room eastward is a 10-ton shearing machine, also two nut-cleaners and two rumblers for taking the burr off nuts, etc.; while about the middle of shop floor is a modern champering press, and nearby, Dawson heating furnaces, combining to make a specialized plant, which, though small compared with some in the United States and Great Britain, is an interesting example of the almost perfect adaptation of means to ends. Returning to the commodious storage room, we found about 400 tons of high-grade wrought iron. together with other supplies, and bins for storing the finished product. At the north end of this department is a large doorway through which material can be carted to and from the town; while at the opposite end is a doorway of like size, through which the products of the factory can be lifted into trucks on the switch siding and carried by rail to all parts of the country.

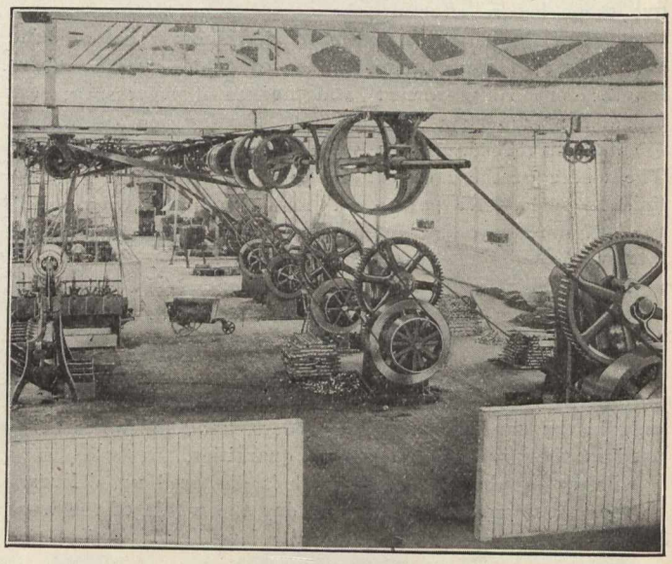

Fig. 7.

Such is a very casual description of a nut factory, which. for equipment and systematic arrangement, is unsurpassed, if not superior, to anything of the kind in the Dominion.

A "DRY TEST" ON A RIVER DAM

The Otis Fibre Board Company is constructing a concrete-steel dam from 15 to 20 feet high across the Westfield River at Russell, Mass. The work has been carried on through the winter, but is not quite completed. During the "break-up" of the river in the first week in March the dam was subjected to an ice stress so peculiar as to warrant description.

The slope of the deck is 1 on 1, the thickness at the top being 9 in. and at the bottom 12 in. The thickness of the crest is 18 in. The material in the deck is 1-2-4 gravel concrete. The buttresses are spaced on 10-foot centres. The dam stands on a solid ledge, but it is not anchored in any way, depending for its stability as against sliding solely on the roughness of the rock, combined with the high angle of the resultant pressures due to the weight of the dam and the water pressure on it. The resultant angle when the dam is just full is about 30 degrees with the vertical.

The general cross section of the dam is fairly illustrated in Fig. 1. Temporary waste-gates were left in four of the bays to carry the water during construction. A mile and a half above this dam is another dam, followed by a series of dams for many miles up the river, each creating a pond of moderate extent. The Westfield River is notoriously "quick," and a warm rain the first week in March broke up the river throughout its length. The ice in the numerous ponds passed over the several dams comfortably, but when the basin formed by the Otis dam was reached there was not water sufficient to float the ice, and the entire basin for a mile and a half became packed with the accumulated ice from the whole river above, which lodged against it. The river slowly rose, as the waste-gates were insufficient to carry the flow, until the true water level was about half way up the deck of the dam. Under these conditions the pond would extend back but a few hundred feet. At that point the pressure of the ice, urged by the quick water above the pond, became so great as to force the accumulation of ice over the dam as shown in the illustration. Hundreds of thousands of tons of ice, from 12 to 15 inches thick, was *pushed over* the crest of the dam while the water flowed through the gates beneath. The concrete was so hard and the slope so easy that after the ice subsided not even the mark of a scratch was to be discovered on the deck or crest. The probability is that an ordinary solid dam having a vertical up-stream face would have given way under the enormous strain of a "dry test" such as this, as there was no water to float the ice over the crest. Un-

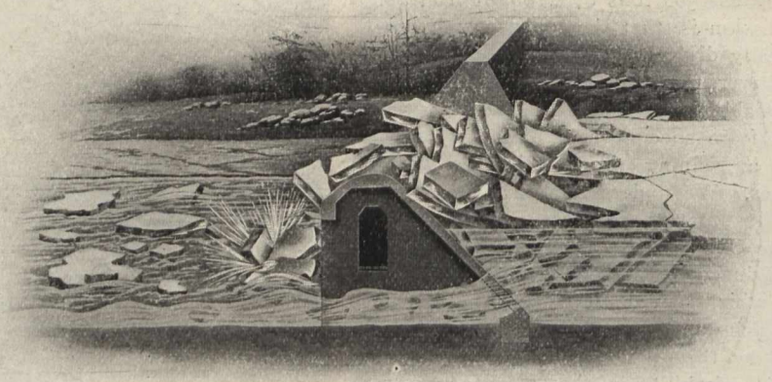

Fig. 1.