by means of four heavy steel rods, with screw and nuts at both ends. (See Figure 42.) The pressure used is from 1,500 to 5,000 lbs. per square inch, and is supplied by triplex pressure pumps of usual design. In order to move the platen of the press more rapidly up before it starts to press and down after pressing, the cylinder is usually connected to a low pressure pump, or the discharge from the bottom of the cylinder may be let into the air, allowing the platen

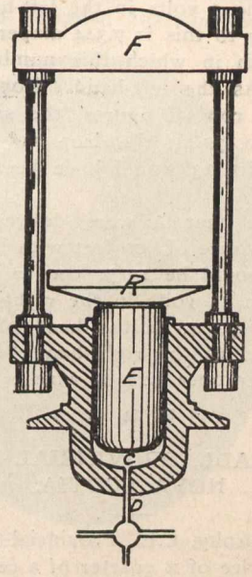

Fig. 36—Hydraulic Press.

to force the water out by its own weight. The percentage of water in the pulp after pressing is usually 50 per cent. This varies sometimes from 45 to 55 per cent., depending on the pressure applied and on the felting between the sheets, but not to any practical extent on whether a suction-box and very high pressure between press rolls have been

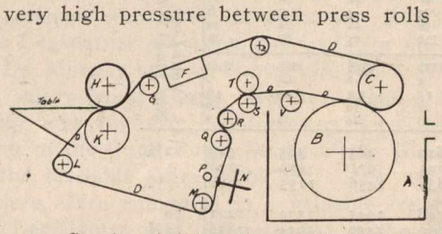

Fig. 37—Sectional Elevation of Wet Machine.

used in the wet machine. The object of the pressure is to get that percentage of water as low as possible, and their practical limit is reached when the pulp contains about 45 per cent. of water. To reduce this percentage other methods with heat as an agency must be employed; these will be considered later.

Baling.

After being pressed the pulp has to be baled into bundles suitable for shipment. From the presses the trucks are rolled to scales, where a sufficient number of sheets are weighed to form a standard uniform weight of dry or wet pulp. This standard weight or amount of pulp is then removed to a press. This consists of cast iron top and bottom, held together by four steel rods. The pressing is accomplished by means of two knees spread out or drawn in by a screw and sprocket wheel driven by a chain, and the driving is so arranged that when a certain pressure is applied the driving pulley falls out of gear and automatically stops pressing. When the pulp is placed in this press, two or three layers are laid under and on top of it, and while subjected to pressure the whole is tied by means of four or five wires inserted in grooves at the top of the bottom casting and at the bottom of the follower. Pressure is then relieved, and the bale is ready for shipment.

Sometimes a wrapper is used, but it is often found more expensive than the loss of pulp occurring without. If there is a chemical pulp mill in connection, a sheet made by this process will be tough, and answer the purpose very well, and at a small cost.

Tests.

There are two kinds of tests, for quality and for percentage of water. For testing the quality of the pulp at the mills the following methods are largely used. A glance at the sheet from the wet machine with a strong magnifying glass will tell the maker whether the pulp is too coarse or too short. Again, as the sheet, ⅛ or 1-10 of an inch thick, issues from the wet machine or from the hydraulic press a piece may be torn off and folded twice; if no cracks or splits appear after this operation the pulp is considered good. Again, a thin sheet when held to the light should not exhibit too large splinters or chips. There are many other such simple tests that may be made, and are employed by different manufacturers. The tests for determining the quantity of water in the pulp are performed by taking samples through different parts of the bales and weighing them

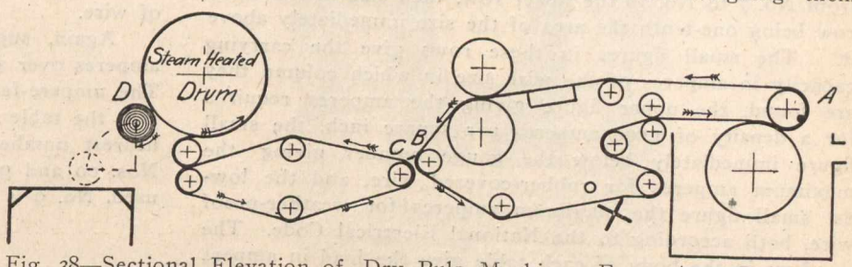

Fig. 38—Sectional Elevation of Dry Pulp Machine. From A to B is same as ordinary Wet Machine. From C to D is the Drying Part

immediately, and then again after they have been dried by heat. The difference in weight gives the percentage of water in the pulp. This is a very delicate operation, one which requires skill and judgment. The percentage of water in a bale differs at various parts throughout the bale, being, immediately after pressing, greater at the edges than in the centre. The percentage also varies constantly from the time the bale is pressed until it is used at the paper mill, due to the drying up of the sides. The weight also changes from loss of pulp in manipulation and handling. These variations, which are the cause of constant disagreements between purchaser and seller, have originated a movement at present towards standardizing methods of testing. The most satisfactory method of determining a weight agreeable to both purchaser and seller is for both parties to determine the percentage of water in the bales when it is most uniform, i.e., just as it issues from hydraulic press.

Yield.

As mentioned before, this mechanical process transforms into pulp practically all the solid substances of the wood except the bark, the only loss occurring in the splinters that pass through unground or which are too large to pass through the screen holes. A cord of green spruce weighing 4,400 lbs. will weigh about 3,700 lbs. after being barked. This will produce on the average 1,900 lbs., or 51 per cent. of the weight of the green wood, the remaining 49 per cent. being water in the wood and the waste occurring through the process. Such a cord of wood treated by the soda or sulphite process would yield from 100 to 1,300 lbs. of dry pulp.

(To be continued.)

At a recent meeting of the directors of the Quebec Central Railway, held in London, England, Frank Grundy, general manager, was elected vice-president of the company. Mr. Grundy has been manager of the road for fifteen years. He was earlier with the Manchester, Sheffield and Lincolnshire Railway.

At the meeting of Toronto No. 1, C.A.S.E., at their hall on Victoria Street, August 3rd, W. J. Webb, who is about to leave Toronto for Winnipeg, and who has been financial secretary of the Association for several years, was presented with a very handsome gold Albert chain, with locket, suitably engraved. The presentation was made by H. E. Terry, president of the Executive, who made a few suitable remarks, and, while Bro. Webb was taken entirely by surprise, he made a neat reply.