drewith by a pitman rod. A step is also provided upon ich to place the wood to be split. It is made of cast n, and is bolted to the frame. The wedge or axe is tened to the sliding block, and rises and falls with it. e two cranks are placed 180 apart on the shaft, to vent two blocks being split at the same time, which uld cause a sudden strain on the driving gear. Splitrs do not demand much power for their operation, and nsequently can be run with light machinery. The wood ed in most mills is small enough to enter the grinder

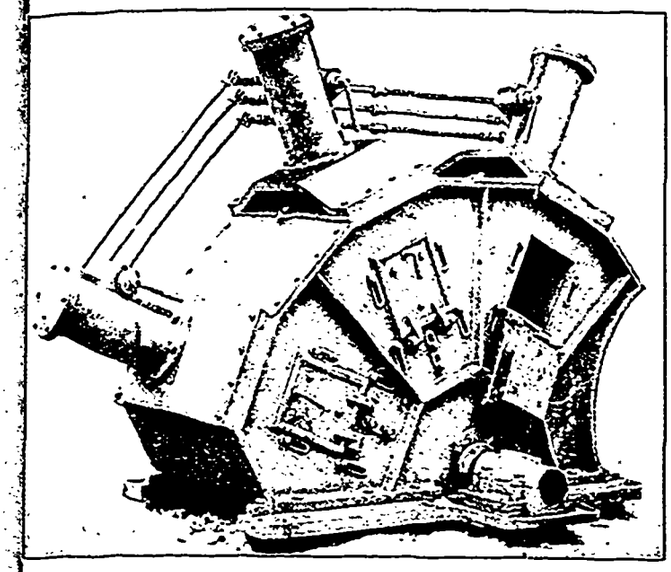

FIG. 5 WOOD PULP GRINDER (made by Robb Engineering Company.)

ket without previous splitting, and when an occasional ck occurs that is too large, it is split with an axe.

GRINDING.

DESCRIPTION OF GRINDING.—The wood is conveyed from the wood room to the grinder room. Here it is ground on revolving stones by hydraulic pressure, being thereby reduced to pulp. Fig. 5 is a cut of a grinder manufactured by the Robb Engineering Company, of

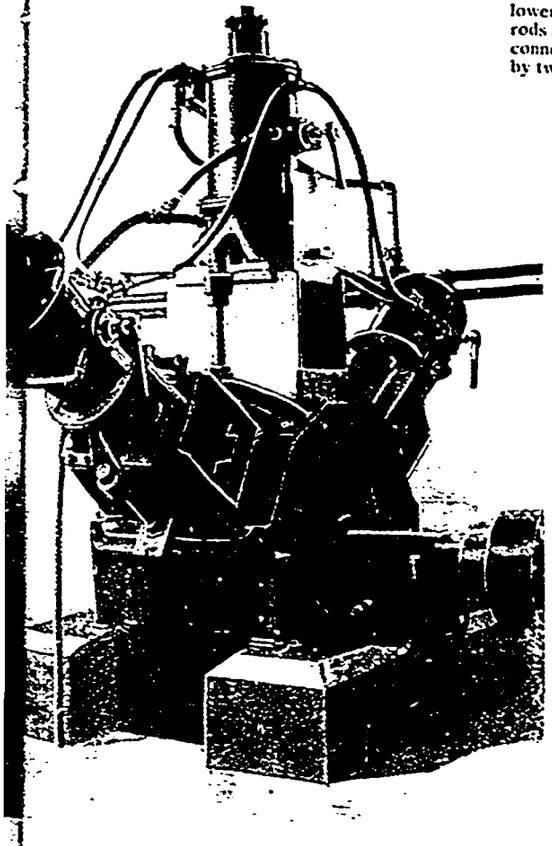

FIG. 6—PORT HENRY WOOD PULP GRINDER.

furnishes the pressure required to force the wood against the stone. Doors are fitted in one of these side plates, through which the wood is passed in filling the pocket. The sides of the pocket are cast iron plates, which can be raised or lowered to suit the wear of the stone, and are adjusted with screws and clamp bolts passing through the main frame. These pockets are made to take 24 inch wood and are 13 inches wide. The cylinders are made either 8 or 10 inches in diameter, and each is independent of the others, being controlled by its own lever and valve. These cylinders are lined with drawn brass tubing, which is an advantage. All valves and valve seats are made of phosphor bronze. The pistons are packed with double cupped leather packing, which works equally well in both directions. The shaft is of steel, 7 inches in diameter in the bearings, and 7½ inches in the stone. The bearings are 7" x 20", lined with babbitt, being oiled and cored out for water circulation. Heavy flanges of cast iron are provided on each side of the stone, faced and turned true, and threaded right and left hand on the shaft. The shaft is provided with packing boxes where it passes through the frame, which prevents leakage of pulp and water. The stones used with this machine are from 48" to 50" diameter by 26" face.

The capacity of a grinder depends on the power supplied. With 10 cylinder and using 400 h. p., this one is capable of making about six tons of dry pulp per 24 hours, or with 8 inch cylinders and 280 h.p., the capacity would be between 3½ to 4 tons dry in the same time. The speed should not exceed 200 revolutions per minute, and may run as low as 175 without disadvantage, depending on the material to be ground, pressure, and other considerations.

Fig. 6 is the standard open frame type of grinder manufactured by the Jenckes Machine Company, of Sherbrooke, Que. This machine is constructed in a substantial manner and has given good satisfaction. The cylinders are cast iron, lined with brass, and fitted with cast iron heads. The lower heads are bolted direct to the top of the pocket, and are hollow castings fitted with doors on each side, which can be removed should the lower glands require packing or adjusting. The piston rods are made of steel, 3½ inches in diameter, and are connected to the followers by shrinking, and also secured by two brass nuts, one being a lock nut. The piston head is packed with four square rings ⅝ inch wide. Glands for piston rod are made of brass, secured by 3 stud bolts and brass hexagonal nuts. The pocket followers are made with strips cast on the face, which prevents the rolling of the wood in the pockets. This is quite an advantage, as rolling may cause a serious break. The pockets are constructed in one piece, two inches in thickness, and can be adjusted sufficiently close to the stone so as to prevent the formation of splinters to any great extent. The middle pocket is made larger than the other two, it being 16 inches wide, while the others are 14 inches. The pockets are raised and lowered by two 2-inch screws each. The doors are made of steel plate, and slide in a groove cast in the frame. The main boxes for the shaft are self-adjusting, and conform to any variation in the shaft. They are 18 inches long and wood lined, the bearings running in water. The flanges for the stone are made of steel 38 inches in diameter, faced up true and threaded right and left hand on the shaft. The shaft is made of hammered steel, keyed for coupling, or can be made for a shrink couping if required. The grinder case can be tipped up, allowing access to the stone when necessary. The stone is 54 inches in diameter by 26 inch face, in the larger size, and 18 inch face in the smaller.

Operation of the piping system of the Port Henry grinder.—In Fig. 7 is shown a side view of the Port Henry grinder, described above. This gives a good illustration of their manner of piping, which is claimed by the makers to possess many advantages. In the operation of any pulp grinder, one pocket at least must be idle all the time. This is necessary, for when a pocket has finished grinding, another must be thrown on to take up the load while the first is being refilled. Suppose, in this case, the two side pockets are grinding, and one of them requires refilling, the centre pocket being idle. By changing the three-way valve A, the high pressure is thrown on the centre pocket, and causes it to grind under high pressure. The empty side pocket being now relieved, the low pressure water automatically opens its check valve, and acts upon the piston from the under side, lifting it and its follower from the stone. The pocket is then refilled. Valve B is shifted, allowing the low pressure to bring the piston down until the wood is pressed firmly against the stone. At this point the three-way valve is turned, so that the high pressure water is diverted from the centre pocket, and enters on the top of the piston of the side pocket, at the same time automatically closing the low pressure check valve. The centre pocket is now idle, and should the other side pocket require refilling, the process of doing so is similar to that described. If the centre pocket requires refilling, the follower is lifted from the stone by means of valve B, which is always connected to the low pressure. The pocket is then refilled, and the low pressure let into the cylinder above the piston. In this manner, as above stated, the cylinders are always filled with water at either high or low pressure, consequently when the three-way valves are shifted there is no loss of time before the pockets begin to grind. By this method of piping the grinder is always taking the same amount of power with comparatively small variations, and this enables the speed to be kept fairly constant. This is important, as when the speed is allowed to vary considerably, the pulp is not of uniform quality, and if the stuff pump is driven

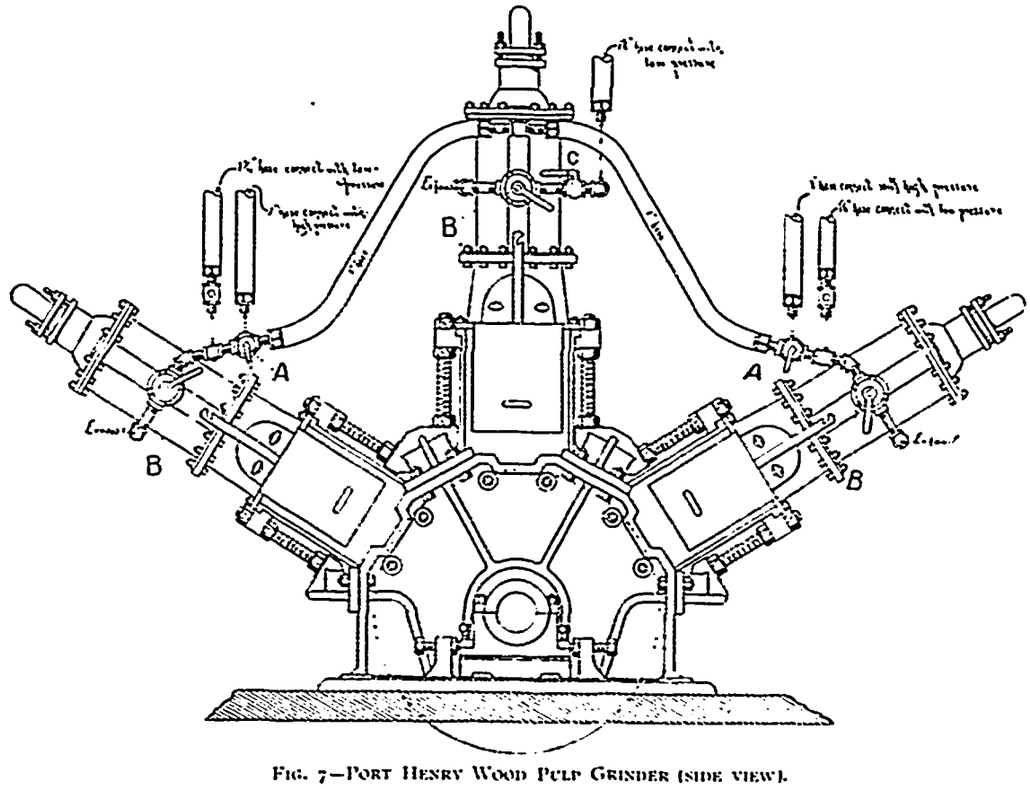

FIG. 7—PORT HENRY WOOD PULP GRINDER (SIDE VIEW).

off the grinder shaft, the regulation of the stock is not an easy matter.

Shelburne, N.S. This grinder is very strongly built, and is a good example of the closed frame type. As will be seen from the illustration, the grinder consists of a heavy cast iron bed plate which carries the bearings of the shaft, and two cast iron side plates, between which the stone revolves, and where the pockets are situated. Above each pocket is fixed an hydraulic cylinder, which

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Mr. William Craddock, of Huntsville, Ont., has recently been given a contract for twelve car loads of broom handles to be shipped to Liverpool, Eng.