

on those others, more distance being allowed between the pocket. Some objections are made to this method of distributing the pockets, because the horizontal thrust on the bearings from one of the side pockets, when the other is not grinding, is so great that it quickly wears out the bearing; and they say that the more vertical the resultant pressure is the better for the bearing.

OPERATION OF GRINDERS.

STONE SETTING.—Stones usually run direct on the turbine shaft, so as to eliminate the loss of power caused by belting or gearing and are coupled to it by means of two flanges, which screw in opposite directions on the shaft, as described before, and so arranged that the pressure on the revolving stone will tend to tighten the flanges and not loosen them. Care is taken to centre the stone properly, and when the flanges are screwed up tight, cement is poured in around the shaft and between the stone and the flanges, by grooves and holes in the flanges for that purpose, to fill all the space that may be left, so that the stone may be set tightly everywhere.

Some claim that it is an improvement to bolt the stone and flanges by one-inch bolts running through the stone from side to side, their reason being that this adds to the strength and solidity of the stone and prevents it from bursting. Others who have tried them, discarded them because they claim that they cause the stone to break; one reason for this is that the stone is bound to slip sometime when heavy pressure is sud-

denly applied, but it is in the use of that jig that opinions vary so much. Some manufacturers employ two jigs, a close pointed one, so as to make even cuts, being passed over the surface, which is afterwards somewhat smoothened down with a coarser jig. Others make use of but one jig, usually a close, pointed one, which is passed several times over the surface, until the latter is judged in proper shape. What seems to be a reasonable method is to pass a sharp and rather close-pointed jig (with say 100 projections per square inch), quickly across the surface of the revolving stone, so that it will not pass over the same surface twice, thereby causing an even surface of about 100 projections to the square inch on the stone. Dull jigs should not be used as they make pits instead of sharp projections. If the stone has been sharpened too much, a brick or a plane surface stone is used to smoothen it. Some stones will sharpen by use instead of dulling, in which case they must be smoothed instead of sharpened. The frequency of sharpening depends mainly on the quality of the stone and on the speed and pressure used; for an ordinary English stone with a 50 to 75 lbs. pressure per square inch in the cylinders,

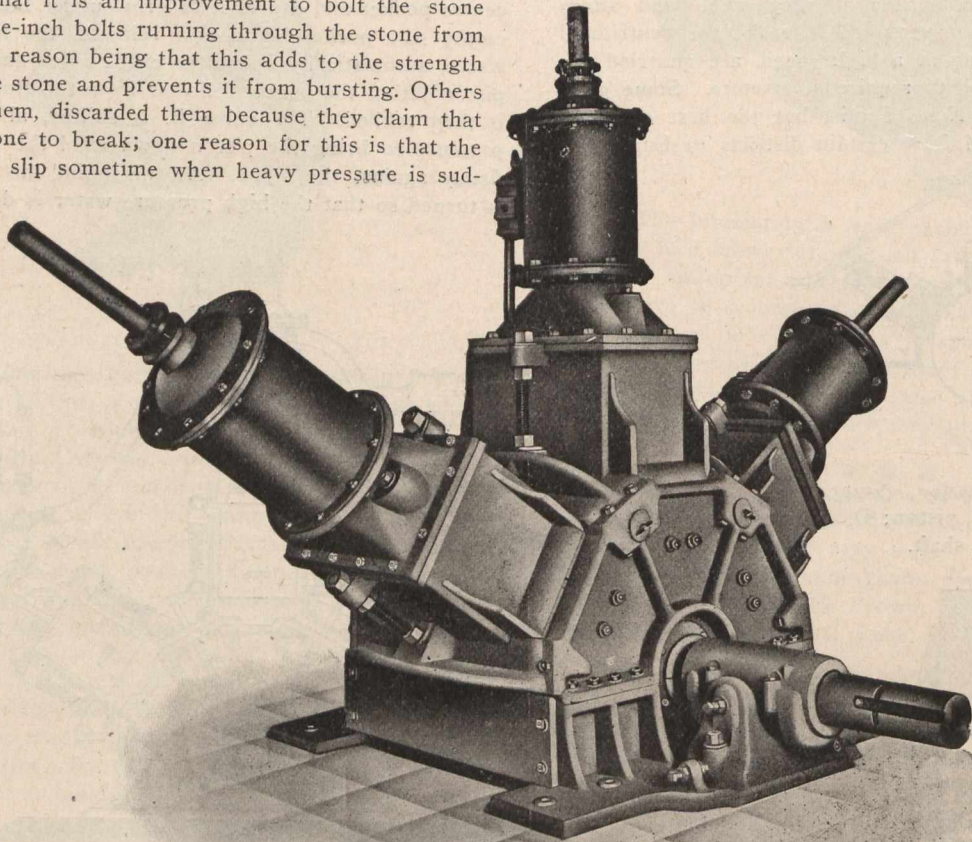


Fig. 19.—New Success Pulp Grinder.

denly applied; this it cannot do if it is bolted tight and the flanges cannot screw any more, and the only alternative left to the stone is to break.

TURNING.—This is done by means of an arrangement represented in Fig. 21. The Fig. B. is pressed against the revolving stone, where it requires turning and is actuated by a screw and hand wheel. The stones are usually thus dressed with a slight crown at the centre, or with the edges slightly rounded off to prevent **sprawling of the stone**. Great care is taken that no cracks are made in the stone which would cause it to fly when revolving under pressure.

SHARPENING.—This is the next operation and a very delicate one it is. In most cases the value of the pulp depends on the skill with which it is performed, as may readily be seen. A perfect sharpening would be one that the surface of the stone would be composed of a large number of very small sharp points or projections which would detach the fibres one by one. In actual practice opinions vary greatly as to how to produce a good sharpening. In nearly every case a steel jig or burr, about 3-in. wide and 3-in. in diameter, with pyramidal projections numbering 16 to 100 per sq. inch,

and a speed of 225 R.P.M. twice a week in summer and once a day in winter is a fair average. After sharpening, the stone is washed to remove all the loose grains of sand and then is ready for operation. The pockets are filled with wood and turbines started.

SPEED.—Some maintain that the maximum production of a grinder occurs when the stone revolves at a speed of 175 to 200 R.P.M. while others claim that a speed between 225 and 250 R.P.M. with an ordinary 44 to 50-inch stone produces the best results. Which is right? The result only tells. Assuming the same sharpness of the stone and the same pressure on the wood, the production increases with the speed up to a certain point and then decreases, and the quality of the pulp also increases up to a certain point and then decreases, but the quality is decreasing when the production still continues increasing. If the speed is too low, the pulp will be coarse, and if too high, it will be mealy and short. To find the correct point, both in speed and pressure, a careful examination must be made and several tests of the products must be applied. An ordinary grinder, with a 50-inch stone, using 24-inch bolts and turning at a speed of 200 to 225