

pumps, all four being worked by levers of the piston rod of the intermediate pressure cylinder.

The boilers for supplying steam—which are two in number, of the Lancashire type, with a 120 pipe economizer—were supplied by the makers of the engine. The following are the principal particulars of the plant:

Engines.	
High-pressure cylinder.....	13 in.
Intermediate-pressure cylinder.....	20 in.
Low-pressure cylinders (two).....	21 in.
Stroke.....	36 in.
Steam pressure.....	160 lb.
Indicated horse power.....	325
Air pump, single acting.....	12 in.
Circulating pump, single acting.....	10 in.
Cooling surface in condenser.....	640 sq. ft.
Boilers (two).	
Length of shell.....	28 ft.
Diameter of shell.....	7 ft. 6 in.
Diameter of flues.....	3 ft.
Test pressure.....	250 lb.

Messrs. Hick, Hargreaves & Co. are well known makers of large high class engines, such as are required for cotton mills for which large power, steady driving and economy are demanded, and have in one year, we are informed, turned out about 25,000 i. h. p. of such engines, with the corresponding boilers and mill gearing.

A GRAIN SCOURER, POLISHER, AND SEPARATOR.

The illustration represents a machine having an upper fixed and a lower revolvable screen between which the grain is fed centrally and passed out peripherally, a suction fan forcing a current of air through the screens, whereby the grain is thoroughly scoured and polished, the screenings and other impurities being at the same time separated from the grain. By means of an inlet chute the grain is passed through a central feed opening in the middle of the upper screen, there being a feed screw arranged upon the vertical shaft in the feed opening to press the grain coming down the chute into and between the two screens. The lower end of the vertical shaft on which the lower screen is mounted is set in a step supported at its ends on springs, whereby the scouring disks will be self-adjustable when the stream of wheat is not regular, hand wheels being provided to enable the miller to adjust the machine while in motion to scour hard or light. The grain is discharged from the peripheries of the screens into an annular receptacle into which extend wings on the under side of the rim of the lower screen, whereby the grain is forced upward on the outer wall of the receptacle, finally passing over the edge upon an inclined flange extending into an annular casing supported on the main frame. The grain is thence discharged upon another inclined flange, and falls through into a discharge channel in which operate wings secured on a spider rotated by the central shaft, the channel having an outlet chute through which the scoured and cleaned grain is discharged. A suitable suction fan with fan wheel is secured on the vertical shaft centrally in the top of the casing, and the air current through the separating chamber, as shown by the arrows, is regulated by a ring with slotted holes working over similar holes in

