DEMPSTER NO. 4 VANELESS MILL

MECHANICAL PARTS OF NO. 4 VANELESS MILL

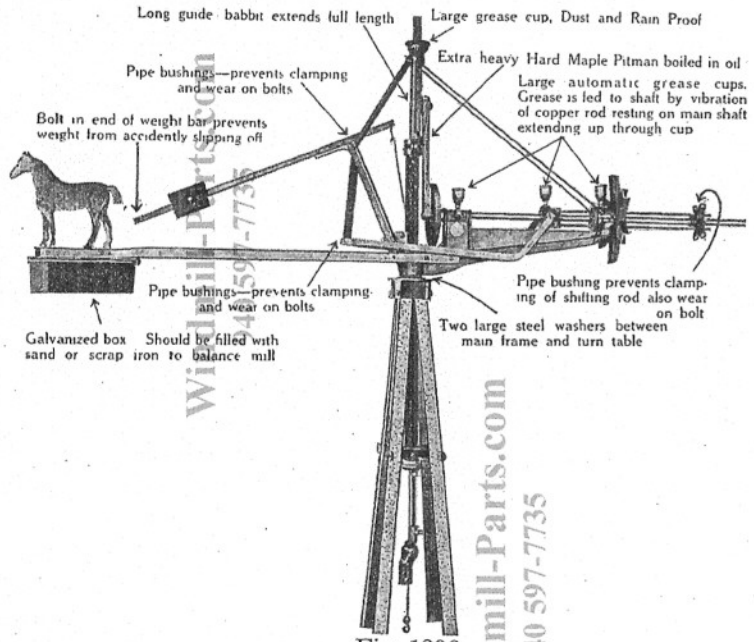

Fig 1206

ing downward in the tower through the storm stay, the other extending upward and carrying a large babbitt lined casting which serves as a bearing and alignment guide for the pitman or square bar. Perfect alignment of this bar is doubly secured by two steel rods running from the end of the main frame.

The upper end of the piston or plunger bar is square and is made of the very best machine steel.

The main shaft is of cold rolled steel, to which is attached the face plate and large spider. The face plate is held in position by a large machine key and is reinforced by a set screw opposite the key. The large spider is securely fastened to the shaft by a long machined steel key.

The small spider, (No. A, Page 21), working on the outer end of the main shaft, and to which is attached the folding and twin rods, has three small projections running full length of the hub, on the inside. By using these ribs or projections we eliminate three-fourths of the friction on the main shaft. They also keep the small spider from sticking to the main shaft on account of grease, ice, sleet and snow.

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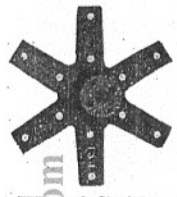
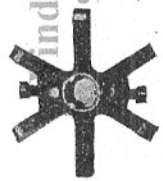
The large wheel spider (No. B), at the outer end of main frame, is provided with a machine turned hub which turns in a thoroughly substantial boxing.

A removable babbitt bearing (No. C), is used in the box on the main frame next to the crank or face plate. This bearing can be easily replaced without removing the mill from the tower.

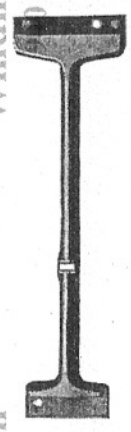


Wheel Spider No. B

Babbitt No. C



Spider No. A



Brace Castings No. D

Pitman No. E

The pitman (No. E), is made of rock maple, boiled in oil, which will stand more neglect and wear longer than any other material. It is reinforced with a rivet through the top and a steel band around the bottom.

Dempster Vaneless No. 4 is Made in the Following Sizes:

Size	Length of Stroke	No. Sections	Weight
10 feet	5, 6½ and 8 inch	6	490 lbs.
12 feet	4, 6, 8 and 10 inch	8	705 lbs.

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Connected at either end to the cross bars of the section is a heavy iron brace (No. D, page 21), one end of which is heavier than the other, and acts as the centrifugal weight. This weight can be plainly seen in the center of wheel section in Fig. 1090. From the center of this combined brace and weight, as you can also see on page 17, the shifting rods run to a spider, which slides back and forth on the main shaft, the spider being connected to the counter weight by a pair of twin rods and flat bars; (shown just back of the horse.)

Fig. 1090, page 18, shows how shifting rod is attached to cast brace on section by means of machine bolt and pipe bushing to prevent drawing bolt too tight. The other end of shifting rod is attached to small spider. Pipe bushing is also used at this point.

HOW DEMPSTER NO. 4 OPERATES.

As the wheel turns the centrifugal weights on the sections have a tendency to fly out from the center. In a light wind the counter weight, acting through the twin rods, sliding spider and shifting rods, holds the wheel in the wind, presenting the greatest possible wheel surface to the wind. But as the wind grows stronger and the revolutions of the wheel increase, the centrifugal force in the section weights overcomes the counter weight and the wheel slowly closes, reducing the wheel surface presented to the wind. The extent to which the wheel closes depends entirely on the velocity of the wind.

As the wind decreases, the centrifugal force exerted by the section weights decreases, and the counter weight gradually opens the wheel, causing it to present a greater surface to the wind.

It is therefore apparent that this automatic governing device operates the **DEMPSTER** No. 4 Mill at a uniform speed under all conditions eliminating the possibility of a sudden strain on the pumping equipment or of tearing the wheel to pieces. In a high wind the **DEMPSTER** mill operates perfectly.

The cut at bottom of page 17 shows the wheel wide open operating in a light wind, the counter weight hanging low. The cut at the top shows the wheel closed, the counter weight pulled high by the centrifugal action of the section weights, one of which can be plainly seen in the top section and one in the bottom section.

OTHER IMPORTANT PARTS.

The main frame (See Fig. 1206, page 20), is of heavy cast iron, reinforced by a large rib extending the full length of the frame on each side, which makes the foundation exceedingly strong.

In this main frame is a heavy wrought steel tube or stem, one end extend-