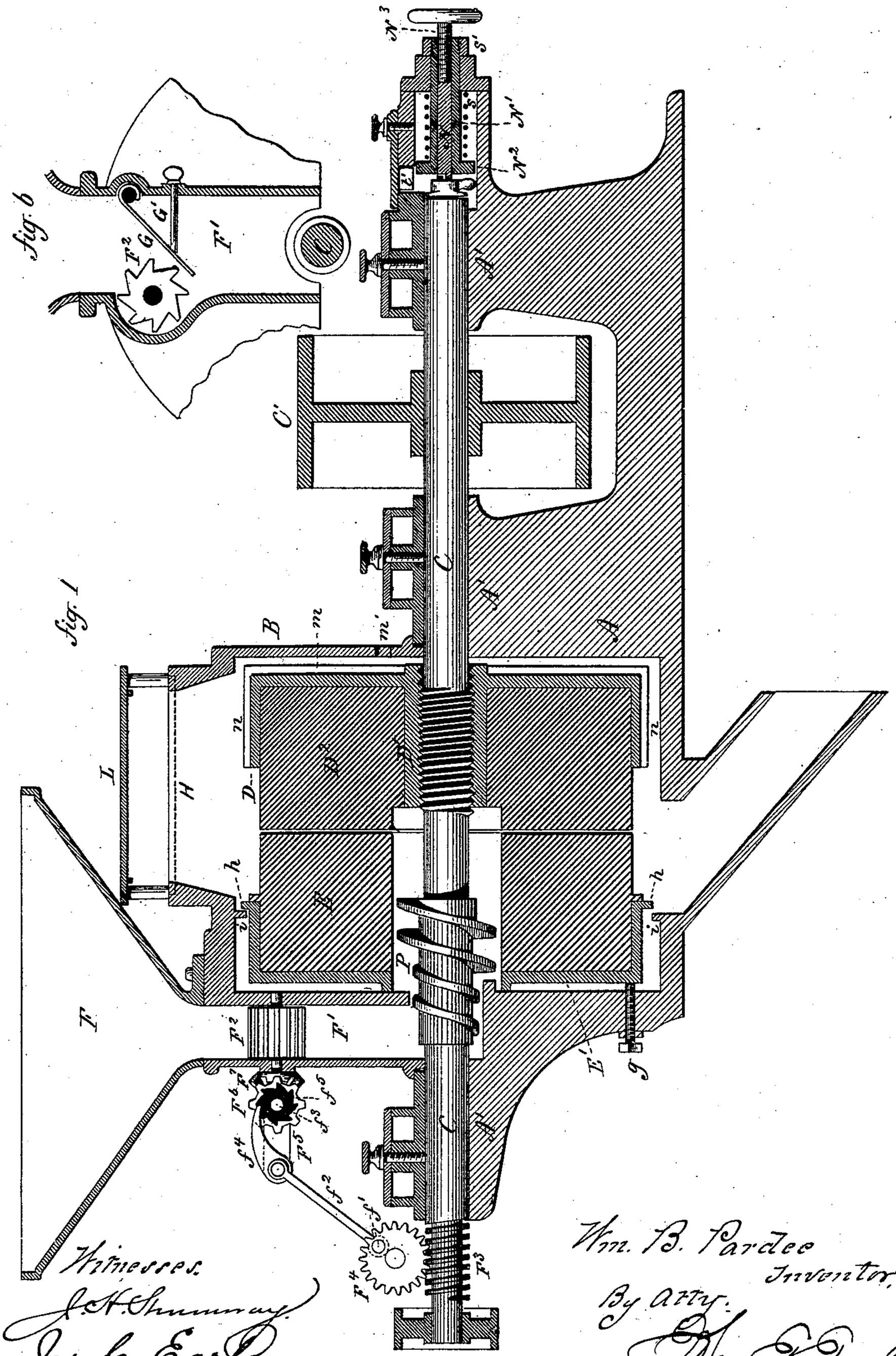
2 Sheets—Sheet 1.

W. B. PARDEE.

Grinding-Mill.

No. 226,777. Patented April 20, 1880.



Witnesses.
J. H. Shumway.
Jos. C. Earle

Wm. B. Pardee
Inventor.
By Atty.
Wm. C. Earle

2 Sheets—Sheet 2.

W. B. PARDEE.

Grinding-Mill.

No. 226,777. Patented April 20, 1880.

fig. 2

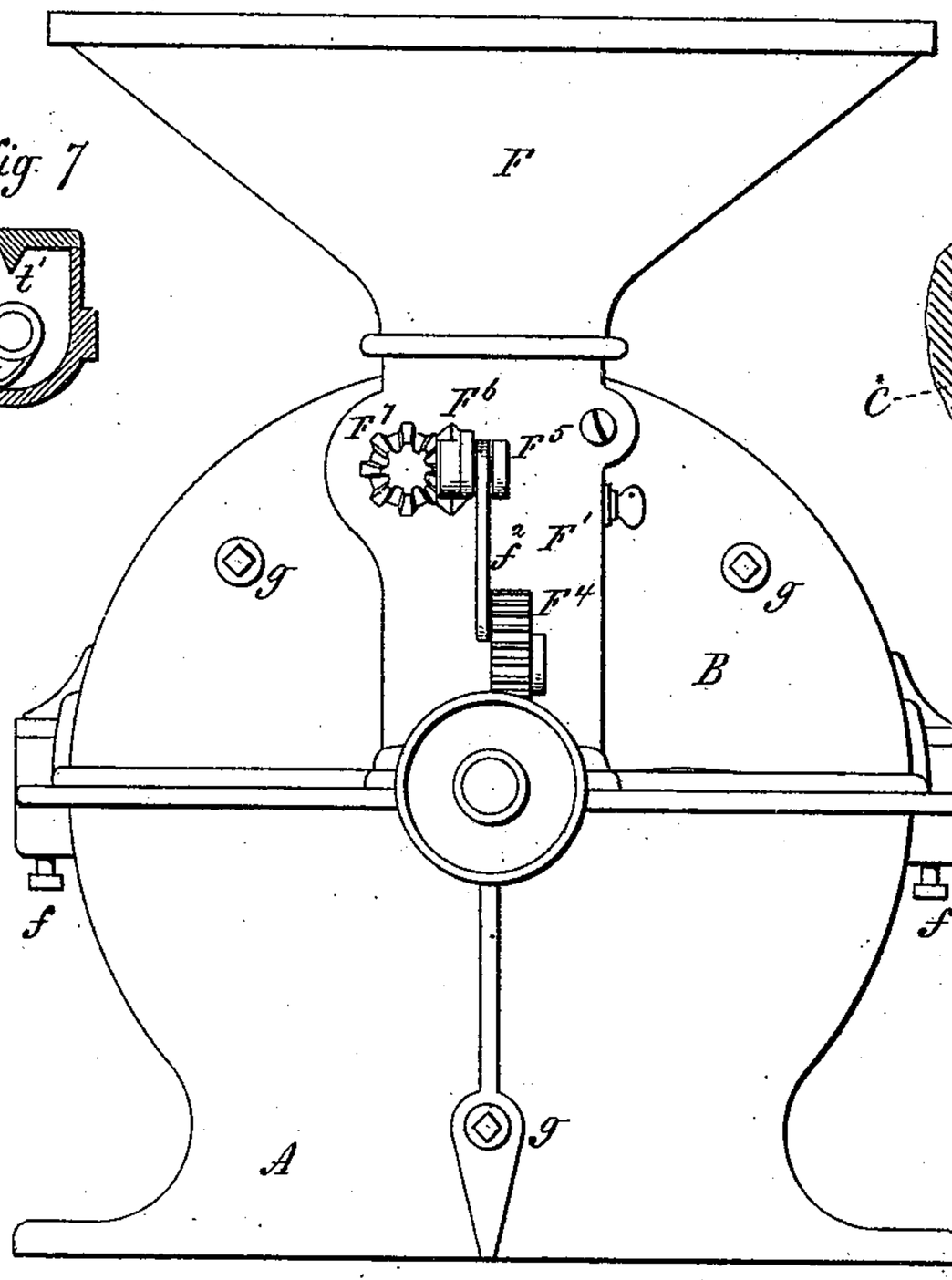


fig. 3

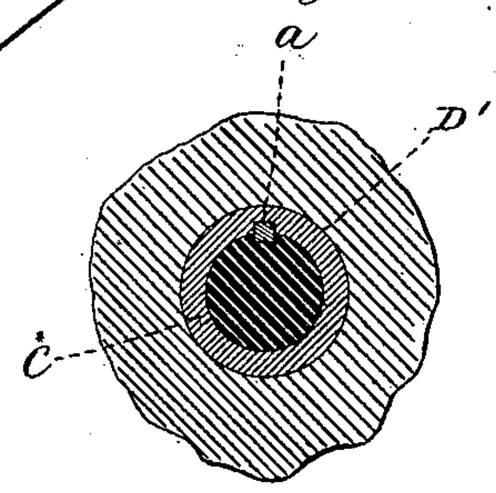


fig. 7

fig. 8

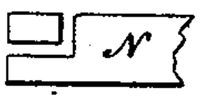


fig. 4

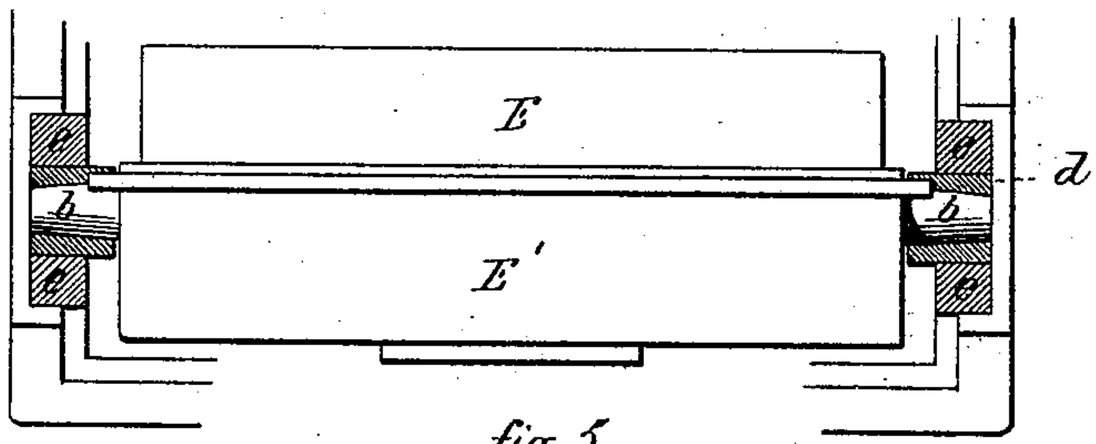
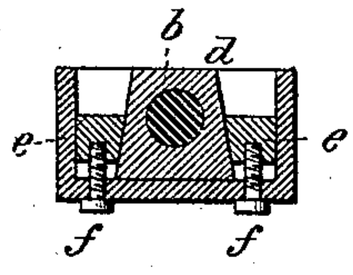


fig. 5



Witnesses.
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John Earle

UNITED STATES PATENT OFFICE.

WILLIAM B. PARDEE, OF NEW HAVEN, CONNECTICUT.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 226,777, dated April 20, 1880.

Application filed March 17, 1879.

To all whom it may concern:

Be it known that I, WM. B. PARDEE, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Grinding-Mills; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a longitudinal central section; Fig. 2, an end view; Figs. 3, 4, 5, 6, 7, and 8, detached views.

This invention relates to an improvement in that class of grinding-mills in which a spindle is arranged horizontally, so that the runner-stone revolves in a vertical plane; and it consists in details of construction, as hereinafter described, and particularly recited in the claims.

A is the bed or base of the machine, forming the lower half of the shell; B, the upper half of the shell, the division between the two parts being in a horizontal central plane, the two parts secured together in the usual manner. On the base are bearings A′ for the support of the spindle C, the spindle being made to revolve by the application of power thereto through the pulley C′ or otherwise. D, the runner-stone case, is constructed at its center with a hub, D′, and this hub screw-threaded upon its interior to fit a corresponding screw-thread on the spindle C. Longitudinally on the threaded portion of the spindle a key-slot is cut, and a corresponding key-slot on the interior threaded surface of the hub to receive a key, *a*, as seen in Fig. 3.

By this construction the runner-stone case may be adjusted longitudinally on the spindle, to set the runner-stone D^2, which it carries, nearer to or farther from the bed-stone E without longitudinal movement of the spindle, a single revolution of the runner-stone case on the spindle giving as close an adjustment as would be ordinarily required; but key-slots may be cut at different points for nicer adjustment, if desirable. This adjustment, it will be understood, is only required where a considerable movement of the runner-stone is desirable—as, for instance, the first adjustment after a change of stones, or after a considerable portion of the grinding-surface has been cut away, or when for any cause the ordinary fine adjustment of the spindle has been exhausted.

The bed-stone E is arranged in its case E′, and this case is provided at each side with a trunnion, *b*, resting in a bearing, *d*, in a seat formed for it in the lower part of the shell, as seen in Figs. 4 and 5. The seat is broader than the bearing, and the sides of the bearing inclined. At each side of the bearing a wedge, *e*, is arranged, each wedge having its own independent adjusting-screw *f*, so that by raising one of the wedges and drawing down the other the bearing *d* will be moved accordingly, and correspondingly move the bed-stone to or from the runner-stone, as the case may be.

The adjustment of the bed-stone through the trunnion *b* moves the stone bodily, or can only change its horizontal plane. It frequently occurs that it is necessary to adjust the plane of the bed-stone with relation to that of the runner. To do this adjusting-screws *g* are introduced through the end of the shell at points above and below the center, to bear against the outer surface of the bed-stone case; hence by withdrawing the adjusting-screws above the center and turning in those below, or vice versa, the vertical plane of the bed-stone will be changed accordingly.

On the outer surface of the bed-stone case there is made an annular rib, *h*, and corresponding to this an annular rib, *i*, within the shell, (see Fig. 1,) and arranged so as to run very nearly together, one overlapping the other. These ribs *h i* prevent any material from the mill passing in between the bed-stone case and the shell, and therefore aid in keeping the mill clean.

F is the hopper, from which a conductor, F′, leads the grain to the opening through the bed-stone. In order to give to the grain a positive feed and avoid the usual shaker, a feed-wheel, F^2, is arranged in the conductor F′, the surface of which is fluted, toothed, or otherwise provided with cavities, and to this wheel an intermittent rotary movement is imparted from a worm, F^3, on the spindle, working into

a pinion, F^4, and from an eccentric pin, f', on this wheel a rod, f^2, connects with a lever, F^5, hung upon a shaft, f^3, carrying a bevel-pinion, F^6, which works into a corresponding bevel-pinion, F^7, on the shaft of the feed-wheel F^2. The lever F^5 carries a pawl, f^4, which works into a ratchet-wheel, f^5, on the shaft of the pinion F^6, so that at each revolution of the wheel F^4 the ratchet f^5 is turned one tooth, imparting to the feed-wheel a corresponding partial and intermittent rotation.

Within the conductor is a hinged or spring gate, G, (see Fig. 6,) the space between which and the feed-wheel F^2 forms the throat for the passage of the grain, the wheel working substantially against the surface of the gate. The position of the gate is made adjustable relative to the wheel by a set-screw, G'. By this device the feed is made positive and regular.

To ventilate the mill—that is, to supply it with a circulation of air necessary to the proper working of flouring-mills—several radially-projecting blades, *n*, are arranged on the outer surface of the runner-case and corresponding blades *m* on the back of the case, and so that the rotation of the runner creates a circulation between the case and shell, drawing air into the case and throwing it out through an opening, H, at the top. This opening is protected by gauze to prevent the possibility of the flour passing out, and it is also provided with a plate or cover, L, which may be dropped down upon and so as to close the opening H, should it at any time be desirable. This arrangement will expel the heat which will be generated in the mill, and by providing the case with openings below air from the outside will be drawn in and passed through the mill. One of such openings is shown at *m'*.

The thrust of the stone is supported against a step, N. This step is arranged in a socket, N', the head N^2 of which rests against a spring, *s*, the strength of this spring being sufficient to hold against the thrust of the runner-stone when at work, but yet yield should any hard foreign substance pass in between the stones.

The step N is adjustable by a set-screw, N^3, introduced into the outer end of the sleeve N, to bear against the outer end of the step and force it inward or permit it to move outward. The spring *s* is adjustable by a nut, *s'*, on the outer end of the sleeve.

To lubricate the step a chamber, T, is formed around the step and around the end of the spindle, as seen in transverse section, Fig. 7. The end of the step which bears against the spindle has an opening leading from its center at the spindle back and upward through the side of the step, as seen in Fig. 1, and also seen in Fig. 8 enlarged.

The chamber T is filled with lubricating material nearly up to the spindle, and on the spindle a dipper, *t*, is arranged so as to revolve with the spindle, and in revolving extends nearly to the bottom of the chamber T, so as to dip into the lubricating material and take a portion at each revolution, and because of its rapid revolution it will throw upward the lubricating material thus taken up, and at the top of the chamber a drip, *t'*, is arranged over the step to receive the lubricating material thrown by the dipper, and from this drip the lubricating material will drop onto the step and work its way between the step and end of the spindle.

The feed-screw P on the spindle, which serves to work the grain from the feed-spout into the mill, is usually made of equal diameter throughout, and only sufficient to clear the lower end of the feed-spout, and considerably less diameter than the opening through the bed-stone. Hence the screw does not serve to completely clear the grain from the opening in the bed-stone. To obviate this difficulty I make the screw P of increasing diameter from the opening in the feed-spout into the opening in the bed-stone, and so that the inner turn or turns of the thread will run as close as practicable to the surface of the opening in the bed-stone, as shown in Fig. 1. Hence the screw not only clears the grain from the feed-spout, but carries it onward through the opening in the bed-stone.

I do not wish to be understood as claiming any of the parts shown and described, except in the combination as hereinafter specified.

I claim—

1. In a grinding-mill, the tapering feed-screw P on the spindle, combined with the feed-spout F' and the opening in the bed-stone, substantially as and for the purpose described.

2. The combination of the headed sleeve N', its nut *s'*, spring *s*, step N, adjusting-screw N^3, and spindle of the mill, substantially as described.

WM. B. PARDEE.

Witnesses:
JOHN E. EARLE,
JOS. C. EARLE.