2 Sheets—Sheet 1.

# J. R. STEWART & W. R. DUNLAP.

## GRINDING MILL.

No. 185,142. Patented Dec. 5, 1876.

Fig. 1

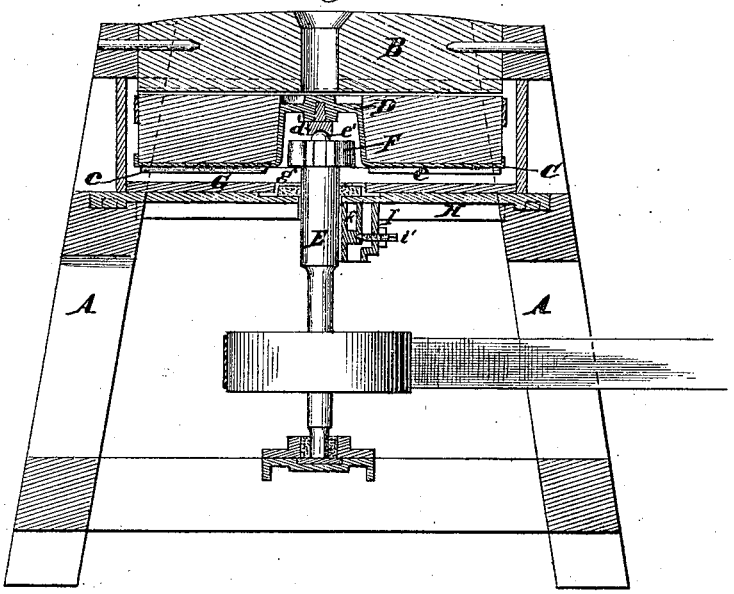



Fig. 2

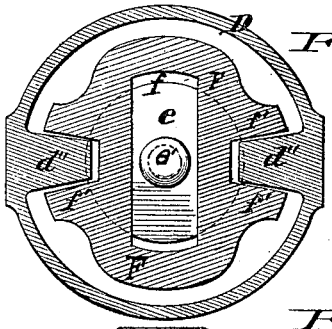
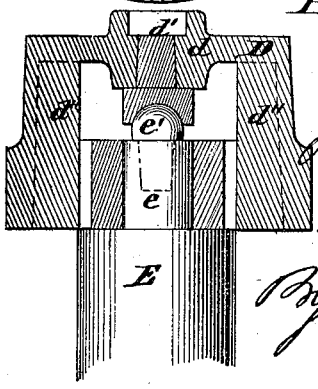



Fig. 3

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2 Sheets—Sheet 2.

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## GRINDING MILL.

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Fig. 4

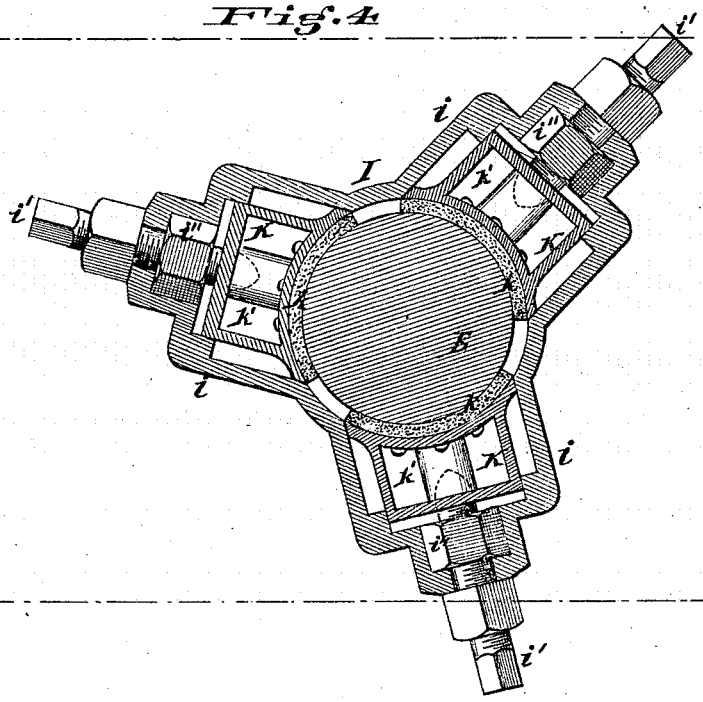
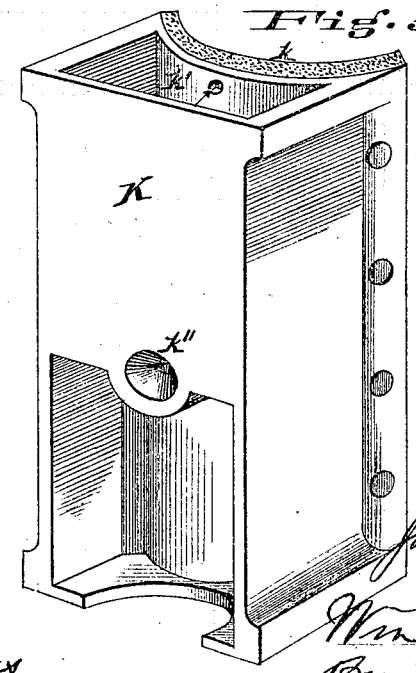



Fig. 5

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# UNITED STATES PATENT OFFICE.

JACOB R. STEWART AND WILLIAM R. DUNLAP, OF CINCINNATI, OHIO.

## IMPROVEMENT IN GRINDING-MILLS.

Specification forming part of Letters Patent No. **185,142**, dated December 5, 1876; application filed May 26, 1876.

*To all whom it may concern:*

Be it known that we, JACOB R. STEWART and WILLIAM R. DUNLAP, of Cincinnati, Hamilton county, State of Ohio, have invented Improvements in Under-Running Mills, of which the following is a specification:

Our invention pertains to that class of grinding-mills in which the under stone runs and the upper stone is stationary, usually called "under-running mills;" and it relates, in the first part, more particularly to the collar-bearing or bush of the spindle, which is placed close beneath the under or running stone. This part of our invention consists of a bush cast, preferably, in one piece with an iron bridge-tree having three adjustable followers, held in place by set-screws and check-nuts, the followers having oil-fountains in their upper ends, and so arranged that they can be moved separately, and the spindle thereby adjusted in three different directions, and so attached that each follower can be drawn down and taken out of the bush for examination or supply of oil by backing out the set-screws, removing and replacing separately, without changing the perpendicular position of the spindle or removing either stone.

The second part of our invention relates to the means for driving the under running stone.

In accordance with our invention the top or neck of the spindle above the collar is made flat or oblong to receive a slotted driver, fitted to play loosely across the flat end of the spindle, the driver having swallow-tailed forks at right angles to the axis of the spindle, which fit and drive lugs cast on the inside of a conical-shaped bush fitted to the lower stone, and resting on the steel pivot of the spindle. By this connection, if one end of the driver comes in contact with the lug of the bush before the other, the driver will slip on the neck of the spindle until both ends drive equally hard.

Figure 1 is a vertical section of an under-running mill embodying our invention. Fig. 2 is a cross-section of the driver and ring. Fig. 3 is a vertical section of our ring and driver and elevation of the spindle. Fig. 4 is a cross-section of the spindle-bearing, and Fig. 5 is a perspective view of one of the oil-fountain followers.

A is the framing of the mill, and B the upper or stationary stone, which is usually set in a frame hinged to the main frame for convenience of dressing, removal of lower stone, &c. Under the running stone a plate, C, is provided, the center of which is formed into a conical bush, D, which is made to snugly fit the hole in the running stone. The plate C is provided with radial scrapers *c*, which direct the flour to the outside of the rim of the stone, and keep the space clear below the stone. The conical bush D terminates in a cap, *d*, which carries the steel countersink *d'*, and its sides are provided with tapering lugs *d''*, by which the stone is driven. The top of the spindle E is provided with a flattened projection, *e*, the sides alone of which are fitted to drive, the ends being kept free of the object to be driven, and the spindle is fitted with the steel pivot *e'*, on which the countersink *d'* of the upper stone rests, the steel pivot and countersink forming a central rest or pivot, on which the running stone may gravitate to preserve its horizontality. Between the part *e* and the bush D a driver, F, is introduced, which has a slot, *f*, fitted to play loosely across the part *e* and swallow-tailed forks *f'*, that embrace, in the manner shown, the tapering lugs *d''*.

This driver being adapted to play laterally, the forks are enabled to effect an equal bearing before the driving force is communicated to the stone, and having swallow-tailed forks, the inclines of the forks assist in centralizing the running stone.

The floor G of the mill is centrally perforated, and retains in place a cap, *g*, for containing a bed of tallow or other lubricant, which, under extreme heating of the journal, will run down and lubricate. This floor is supported on the cast-iron bridge-tree H, on the under side of which the bush I is formed or securely attached. This bush has three sockets, *i*, and three adjusting-screws, *i'*, with lock-nuts *i''*. Each socket is fitted with a follower, K, whose sides are fitted to slide radially in the sides of the socket. Each follower is faced with leather, wood, or an alloy of metal, *k*, for the friction-surface, and a fountain-chamber, *k'*, for containing lubricating material. The side of the fountain at the top

next the face is perforated, so that the lubricant may pass through by feeding slowly through a pendent wick as fast only as needed. Each follower has a countersink, $k''$, for the entrance of the point of the screw $i'$, by which the follower is supported and adjusted.

This construction of bush and followers provides for the free lubrication of the spindle, the convenient adjustability of the spindle, and the easy removal of the followers, as before described.

We claim—

1. In under-running mills, the combination of conical bush D $d$ $d'$, having tapering lugs $d''$, spindle E $e'$, having flattened driving-head $e$, and driver F, having slot $f$ and swallow-tailed forks $f'$, substantially as and for the purpose specified.

2. The combination, substantially as specified, of the runner-stone, the spindle, the floor underneath the runner-stone, the bridge-tree of the floor, and the bush depending from said bridge-tree, provided with fountain-followers, arranged as described, so that they can be easily adjusted, and separately inserted and removed through the lower open end of the bush.

In testimony of which invention we hereunto set our hands.

JACOB R. STEWART.
WILLIAM R. DUNLAP.

Witnesses:
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