

(No Model.)

H. H. COLES.

GRINDING MILL.

No. 375,534.

Patented Dec. 27, 1887.

Fig. 1.

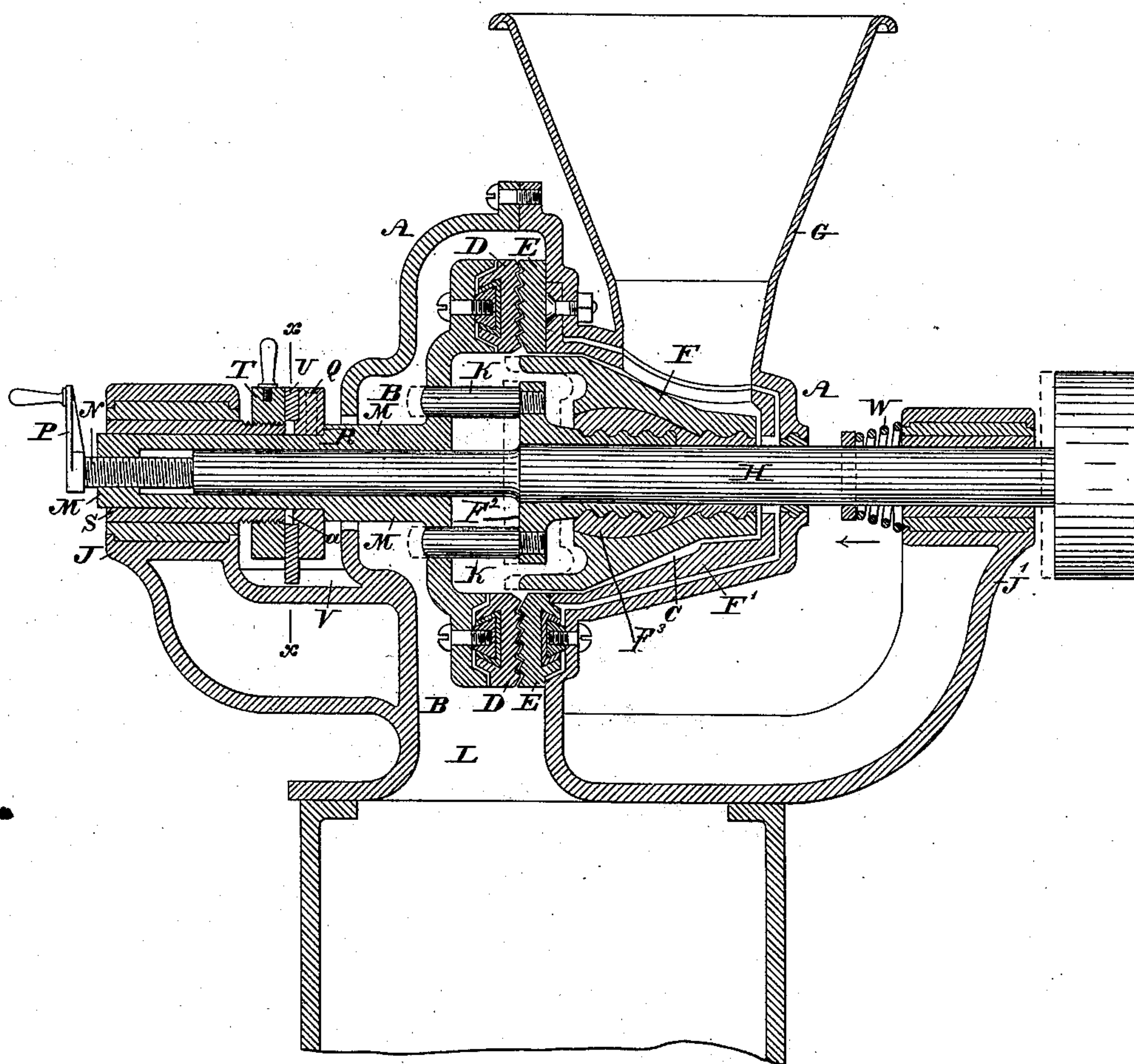
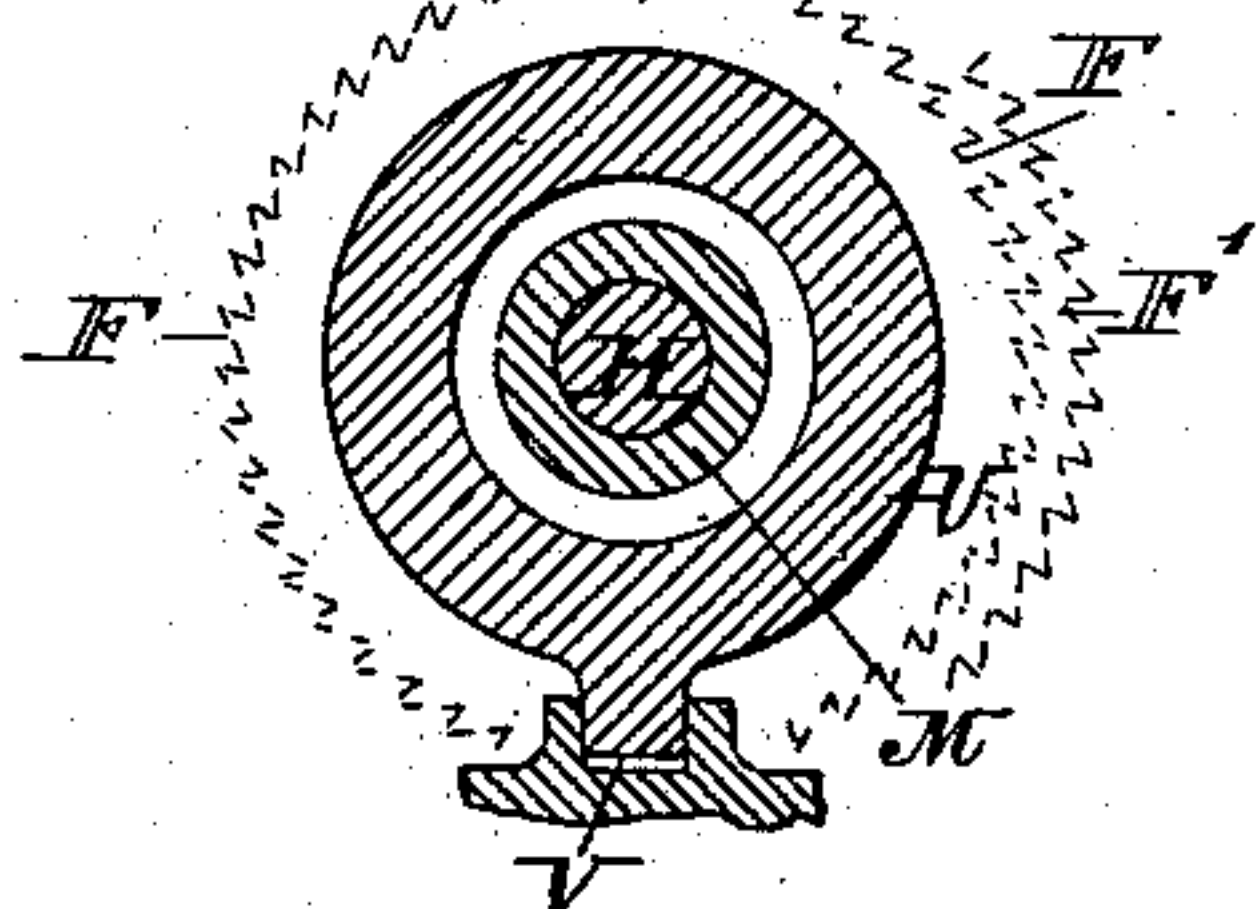


Fig. 2.



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GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 375,534, dated December 27, 1887.

Application filed November 4, 1886, Serial No. 217,953. (No model.)

To all whom it may concern:

Be it known that I, HENRI H. COLES, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Grinding-Mills, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a longitudinal vertical section of a grinding-mill embodying my invention. Fig. 2 represents a transverse vertical section in line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

My invention consists of improvements in grinding-mills, as hereinafter fully set forth, and definitely claimed.

Referring to the drawings, A represents the casing of a grinding-mill formed of suitable metal, the same embodying the chambers B and C, the chamber B containing the runner D and bed E, and the chamber C, which is a lateral extension of the chamber B, containing the breaking or grinding runner F, said chamber C also having a hopper, G, for primarily receiving the article to be ground. The runners D F are mounted on the horizontally-extending driving-shaft H, which has its bearings on the bosses or end portions, J J', of the frame of the machine, and is adapted to have longitudinal play in its bearings. The runner F is rigidly secured to the driving-shaft by means of the sleeve F² and the filling F³, and the runner D is freely fitted on said shaft and receives motion from the runner F by means of pins K, which are secured to the sleeve F² and pass freely through the side of the runner D, parallel with the driving-shaft.

The bed E is bolted or otherwise secured to the side of the chamber B, the bottom of the latter having a throat or passage, L, for the discharge of the ground material.

The portion of the runner D around its central opening is extended laterally, forming a sleeve, M, which freely encircles the shaft H, and has fitted in its outer end a screw, N, which bears against the end of the shaft H, whereby, by rotating the handle P of the screw in one direction, said shaft may be moved in the sleeve M, thus moving the connected runner F and adjusting the same, without, how-

ever, disturbing the runner D, as hereinafter explained.

Secured to the hub or sleeve M, near the wall of the chamber B, is a collar, Q, which abuts against a shoulder, R, on said sleeve. Encircling the outer end of the sleeve M is a collar, S, which is fixed to the boss J of the frame of the machine, and has its inner end threaded for engagement of a rotatable ring, T. Interposed between the ring T and collar Q is an annular washer, U, which freely encircles the sleeve M, and has its lower end loosely fitted in a longitudinally-extending recess, V, in the portion of the frame of the machine below said collar Q, said washer being adapted to move in said recess without being capable of rotation, it being noticed that the inner diameter of the washer is slightly greater than the outer diameter of the collar S, so that said washer may encircle said collar, when moved in the direction of the same by the action of the collar Q, as will be hereinafter set forth; it also being noticed that a space, *a*, exists between the collar S and collar Q, whereby said collar Q may move to and from said collar S.

Connected with shaft H, between the casing A and boss J' of the frame, and bearing against said boss, is a spring, W, which presses against said shaft in the direction of the arrow.

It will be seen that by rotating the screw N the runner F moves to the right or left by the action of said screw and the spring W, respectively, so as to decrease or increase the space between the said runner and its bed for adjustment of said runner relatively to the material to be ground, or the degree it is desired to break or crack the same preparatory to grinding. In the adjustment of said runner F the runner D is not disturbed or moved, as has been stated, as the pins K move freely through said runner D without imparting sliding motion thereto.

When the runner D is to be adjusted, the ring T is employed for such purpose. If the mill is to be adjusted for fine grinding, the ring is rotated, so as to press against the washer U, and consequently the collar Q, whereby the sleeve M is moved, carrying the runner toward its bed. When coarse grinding is desired, the ring is rotated so as to move from the washer U. The spring W is now operative, and as it

presses the shaft in the direction of the arrow, and said shaft bears against the screw N, the sleeve M, which is connected with said screw, is moved in the same direction as the shaft, thus separating the runner from its bed the required extent. The shoulder R of the sleeve M moves the collar Q toward the collar S, the washer U preceding said collar Q until it abuts against the ring T, whose position limits the extent of adjustment of the runner D.

For ordinary grinding the runner F and its bed F' may be employed, as they have grinding-faces, as will be seen by the dotted representation, Fig. 2, they being also adapted to break or crush the material preparatory to fine grinding by the runner D and its bed E.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grinding-mill, the combination of the supporting-frame with a breaking-runner secured to the driving-shaft, a grinding-runner connected to a sleeve loosely mounted on said shaft, a sleeve secured to said shaft and having pins adapted to enter openings in the grinding-runner, a sleeve mounted on said shaft, and having a screw therein on end of said shaft, and a spring on the said shaft bearing in opposite direction from the screw, substantially

as described, whereby the breaking-runner may be adjusted independently of the grinding-runner.

2. In a grinding-mill, the frame A, having bosses J J', in combination with shaft H, suitably journaled therein, the breaking-runner F, rigidly secured to said shaft and having pins K, the sleeve M, having grinding-runner D, secured thereto, the said runner having openings to receive the said pins K, the bed E, the collar S, encircling the sleeve M, rotatable ring T, and collar Q, all substantially as described.

3. The shaft H, having suitable bearings and provided with spring W, in combination with the breaking-runner F, having pins K, secured thereto, the grinding-runner D, with openings for said pins K, and having sleeve M, with shoulder R, the said sleeve being mounted on the said shaft H, the screw N in end of sleeve M, the sleeve S, screw-threaded at its inner end, the boss T, working on said screw-threaded end of sleeve S, the collar Q, and washer U, all substantially as and for the purpose described.

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