(No Model.)

H. H. COLES.

GRINDING MILL.

No. 303,708. Patented Aug. 19, 1884.

Fig. 1.

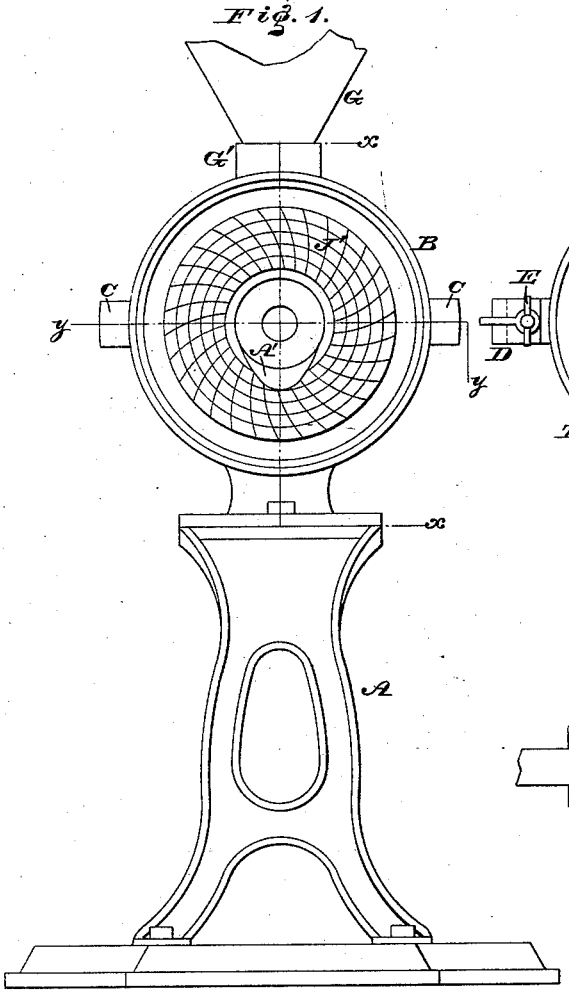


Fig. 2.

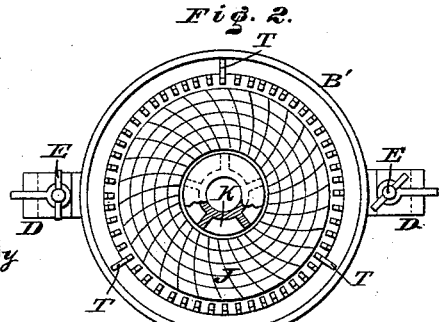


Fig. 4.

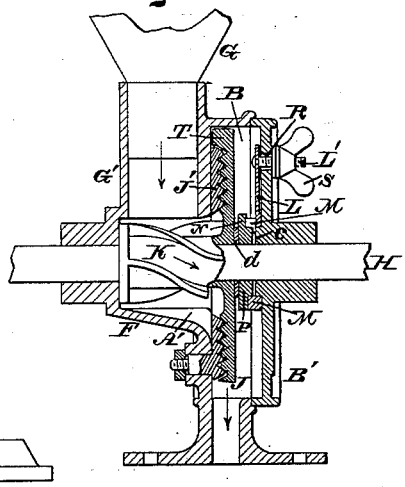


Fig. 3.

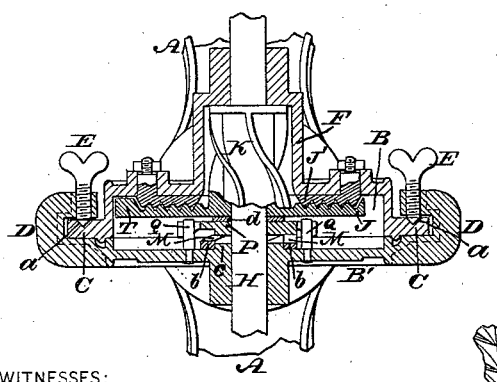


Fig. 5.

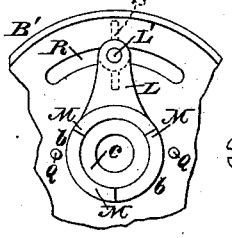


Fig. 6.

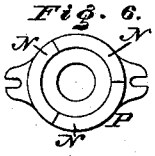
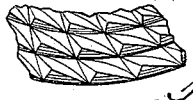


Fig. 7.



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GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 303,708, dated August 19, 1884.

Application filed March 29, 1884. (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 is a side elevation of one of the burrs and the interior of the chamber thereof, and the stand or frame of a grinding-mill embodying my invention. Fig. 2 is a view of the cap removed from Fig. 1; also showing the rotary burr and the end of the spiral conveyer of the mill. Fig. 3 is a horizontal section of the mill in line *y y*, Fig. 1. Fig. 4 is a vertical section of the mill in line *x x*, Fig. 1. Figs. 5 and 6 are views of detached portions. Fig. 7 is a perspective view of some of the teeth of the grinding-burr.

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

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

Referring to the drawings, A represents a stand or frame, on which is supported the stationary burr and stationary part of the grinding-chamber B, the other part of said chamber being a removable head or cap, B′, whereby the chamber may be opened for access to the interior thereof.

Projecting radially from the periphery of the stationary part of the chamber B are lugs C, and projecting radially from the periphery of the cap B′ are hooks D, which are adapted to engage with the lugs C, and provided with screws E, which tighten against said lugs, the latter having countersunk openings *a* to receive the points of the screws, so that the screws center themselves in said openings and cause the cap to be correctly seated on the wall of the stationary part of the chamber. The center of the stationary part of the chamber is formed with a laterally-extending boss, F, with which the hopper G of the mill communicates, said hopper being supported on a tube, G′, rising from the boss F.

H represents the driving-shaft, the same having the rotary burr J keyed or otherwise secured to it, said burr occupying the chamber B, the stationary burr J′ being also located within said chamber, and secured to the wall of the stationary part thereof, an opening, A′, being made centrally in said burr J′ for the passage of the shaft H, the latter having its bearings in the cap B′ and the wall at the outer end of the boss F.

Firmly connected with the shaft H is a spiral conveyer, K, which is provided with parallel spiral flanges extending longitudinally to the burrs, which occupies the boss F, and partly projects into the central opening, A′, of the burr J′, said conveyer being also located below the tube G′, which supports the hopper.

In order to adjust the mill for coarse or fine grinding, I employ a rotary lever, L, having a hub, *b*, which freely encircles a boss, *c*, at the center of the inner face of the cap B′. On the hub *b*, on the face toward the burrs, are spiral flanges or inclines M, which are in contact with spiral flanges or inclines N on a sliding plate, P, the latter being loosely fitted on the shaft H, and guided by pins Q, projecting inwardly from the cap B′, so as to be moved toward and from the rotary burr J, a washer, *d*, being interposed between said plate P and burr J. The end of the lever L is formed with a pin or arm, L′, which projects outwardly through a segmental slot, R, in the cap B′, and has its end threaded for the engagement of a thumb-nut, S, which tightens against the cap for securely holding the lever. It will be seen that when the nut is loosened by moving the lever in one direction the hub *b* on the boss *c*, acting as the axis thereof, the spiral flanges or inclines M bearing against the spiral flanges or inclines N of the plate P, operate said plate, so as to move the burr J more closely toward or against the burr J′, and cause the burrs to grind fine. Again, by rotating or moving the lever in the opposite direction the plate P is accordingly relieved and the burr J is permitted to recede from the burr J′, thus increasing the space between them, and adapting them for coarse grinding, it being evident that the lever may be moved intermediate of the ends of the slot R to adjust the grade of grinding between extreme fineness and coarseness. When the adjustment of the burr is accomplished, the nut S is tightened,

and thus the lever L and connected parts are firmly held.

On the periphery of the burr J are wings or vanes T, which rotate therewith, and serve to prevent packing of the ground material at the base of the chamber B, or collection thereof aronnd the periphery of said chamber.

It will be seen that when the mill is set in motion and the hopper supplied with coffee, spice, or other material to be ground, the latter passes through the tube G', which may be termed the "base" of the hopper, and drops on the spiral conveyer K, so that it is rapidly supplied to the burrs and distributed through the opening or eye A' in several streams thereto, without liability to clog the base of the hopper or the boss F, the grinding thus being expeditiously and easily accomplished. The ground material escaping at the peripheries of the burrs falls to the bottom of the chamber B and passes through the discharge spout or throat thereof, whereby it may be collected and removed.

The teeth of the burrs are arranged in concentric circles, the teeth of one burr alternately fitting those of the other burr. The teeth are of somewhat pyramidal form, with the angle cut away at one side and set obliquely in the circle they occupy, thus presenting large grinding-surfaces, and when the ground material is subjected to the grinding action of one circle of teeth it escapes along the cut-away sides and reaches the channels existing between the teeth of the circle, and so reaches the next circle of teeth, such motion of the material continuing throughout the series of teeth and circles thereof, occasioning a positive and thorough grinding action.

When it is desired to have access to the interior of the burr-chamber, the screws E are loosened and the cap B' rotated, whereby the hooks D leave the lugs C, and said cap may be readily removed and the chamber thereby uncovered. When the cap is reapplied to the wall of the chamber it is rotated, whereby the hooks and the lugs engage, and by tightening the screws E said parts are locked and the cap and chamber again securely connected.

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

1. The guide-pins Q, attached to the burr-case, in combination with the slide-plate P, which they compel to move in a straight line, the burr, which is adjusted by such motion of the plate, and the lever and inclines which operate on said plate, substantially as set forth.

2. A grinding-mill having an adjusting device for the burr, consisting of a rotary lever with spiral inclines and a sliding pressure-plate with spiral inclines, said plate being moved to and from the burr by the operation of the lever, substantially as and for the purpose set forth.

3. The burr-chamber having lugs C, formed with recesses *a*, in combination with the removable cap having hooks D, and the screws E, said screws entering the recesses *a* in lugs C, and being self-centering therein by reason of the shape of said recesses, substantially as and for the purpose set forth.

HENRI H. COLES.

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