D. HESS.

Vertical Disk Grinding-Mill.

No. 210,936. Patented Dec. 17, 1878.

Fig. 1.

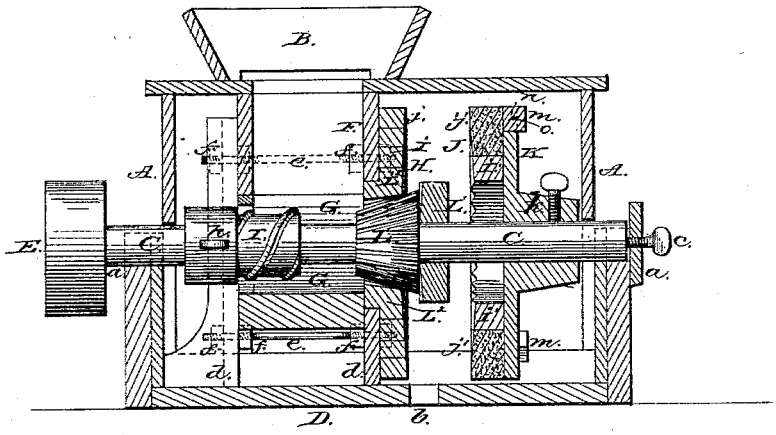


Fig. 2.

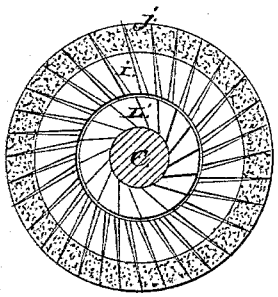
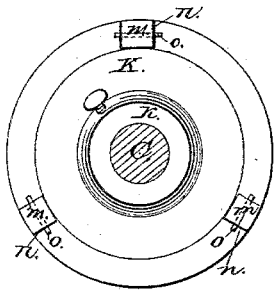


Fig. 3.



WITNESSES

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DANIEL HESS, OF EVANSVILLE, INDIANA.

IMPROVEMENT IN VERTICAL-DISK GRINDING-MILLS.

Specification forming part of Letters Patent No. **210,936**, dated December 17, 1878; application filed August 26, 1878.

To all whom it may concern:

Be it known that I, DANIEL HESS, of Evansville, in the county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a vertical longitudinal sectional view taken through the driving-shaft of a grinding-mill embodying the improvements of my invention. Fig. 2 is a face view of the revolving burr, showing the outer emery or stone ring and the inner steel ring. Fig. 3 is a view of the conical burr that revolves within the stationary burr.

This invention has relation to grinding-mills; and consists in the improvements in the construction of the same hereinafter fully described, and particularly pointed out in the claim.

In the accompanying drawings similar letters of reference indicate corresponding parts in the several figures.

The operating mechanism is incased in a removable shell, A, provided with a hopper, B, in order that it may be exposed at any time for inspection, removal, or repairs. The driving-shaft C is supported in bearings *a a* rising from the horizontal bed-plate D, provided with a discharge orifice or slot, *b*, through which the meal or feed falls to any appropriate receptacle. One end of the driving-shaft C is provided with a band-wheel, E; or a crank may be attached for driving it. At the other end of said driving-shaft C a set-screw, *c*, is employed for adjusting it to cause the burrs to grind coarse or fine. Near one end of the horizontal bed-plate D standards *d d* rise, and between these standards *d d* and the adjustable vertical bed-plate F, and cast with the latter, is the supply-chamber G. The adjustable vertical bed-plate F is connected by adjusting-rods *e e*, having screw-threads at both ends, provided with nuts *f f* on each side of the standards and on each side of the vertical bed-plate, in order that the vertical bed-plate F, which carries the non-revolving burr H, may be adjusted to regulate the burrs to cause them to grind the grain to the required fineness. Upon the driving-shaft C, and projecting within and entirely across the supply-chamber G, is a spirally-flanged feeder, I, which is made adjustable upon the shaft C and within the supply-chamber G by a set-screw, *h*, in order that the feeder may be adjusted when the vertical bed-plate F is adjusted.

The non-revolving burr H and the revolving burr J are each composed of an inner steel ring, *i i'*, and an outer emery or artificial-stone ring, *j j'*. The rings *i' j'*, composing the revolving burr J, are secured to the flange K (which is provided with a hub, *k*, and a set-screw for rendering it adjustable upon the driving-shaft C) by means of studs *m*, secured to the rings *i'* and *j'*, passed through slots *n* in the flange K, and fastened by pins *o*. The rings *i j*, composing the non-revolving burr H, are secured to the adjustable vertical bed-plate in the same manner.

Upon the shaft C, and within circular recesses in the burrs H and J, is a conical steel grinder, L, secured to the shaft C by set-screws. A disk or ring, L^1, which really forms a part of the conical steel grinder, L, has saw-teeth in its face, and is made separately from the part L, in order that it may be removed for the purpose of sharpening it. This portion L^1 fits the circular recess made for it in the revolving burr J, and their faces are always adjusted to the same vertical plane.

Within the circular recess in the non-revolving burr H a steel ring, L^2, having teeth on its inner periphery, is placed, and forms a portion of the conical grinder L L^1.

The conical steel grinder L L^1 forms a separate and independent mill, and may be used to grind feed, &c., when coarse grinding is required, without bringing the large or outer burrs into operation at all, by simply adjusting them sufficiently far apart to prevent them from operating. When it is desired to use the mill for grinding meal, &c., the larger or outer burrs are adjusted to grind the grain to meal or flour after it has been first coarsely ground by the conical steel grinders; and as it passes from the center to the circumference of the grinders and burrs, and the steel rings *i i'* are

finer than the conical grinder L L', and the emery or stone rings *j j'* are still finer than the steel rings *i i'*, by the time the grain has reached the point of discharge it has become flour or meal, as the case may be.

In a working machine the larger burrs, H J, need be only about six inches in diameter, and a mill having burrs of this size will grind from eight to ten bushels of grain per hour. In this there is actually a combination of two mills in one, and they may be used together or separately.

In grinding feed for stock the conical grinders will be used alone. They grind rapidly and easily, from the fact that the grinding is done near the shaft. They may be easily and cheaply sharpened when dulled by use, and replaced at little cost when worn out.

The larger burrs should be used when meal or flour is to be ground, and at this time both mills are operated.

Although I prefer to use alternate steel and emery rings for the burrs, I may use all steel rings, and secure them to the flange K and vertical bed-plate F in the manner described for securing the alternate steel and emery rings.

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

The recessed adjustable revolving burr J, in combination with spindle C, provided with grinding-disk L^1 and cone L, and bed-stone H, provided with grinding-concave L^2, whereby the grinding may be done with or without the operation of the burr-stones, as described, and in the manner set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

DANIEL HESS.

Witnesses:
J. S. GARDNER, Jr.,
P. MAIER.