(No Model.) 2 Sheets—Sheet 1.

J. R. KINLEY.

GRINDING MILL.

No. 352,135. Patented Nov. 9, 1886.

Fig. 1

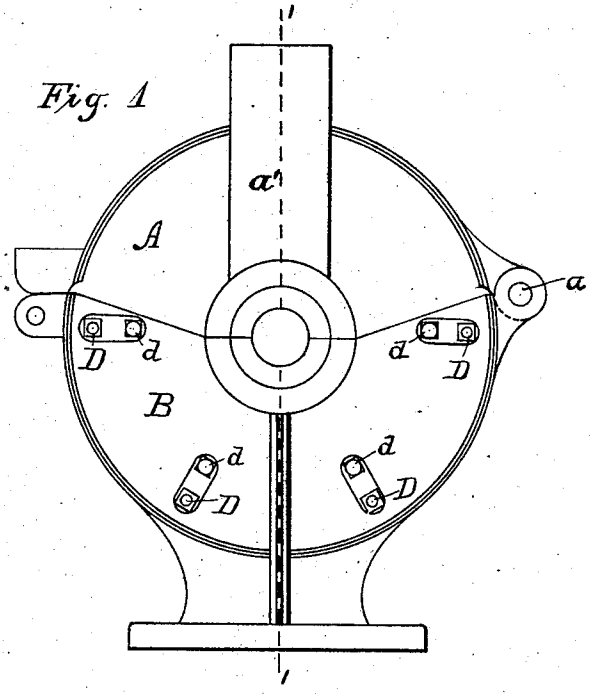
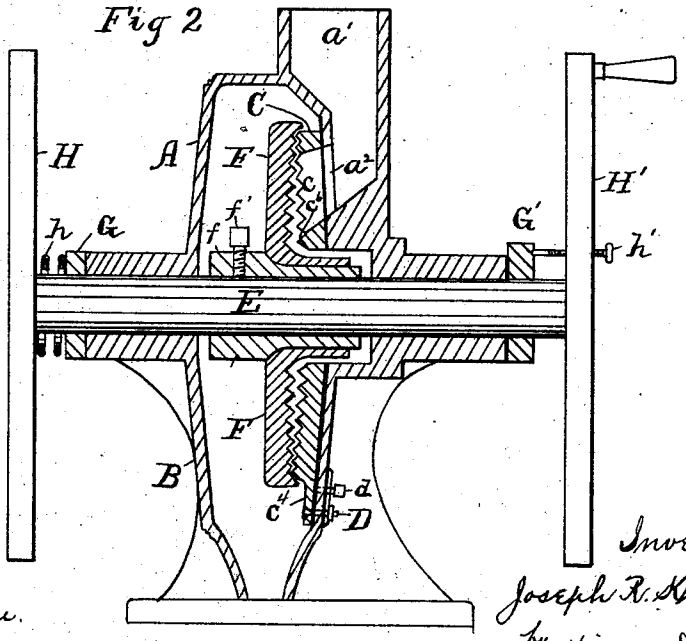


Fig 2



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

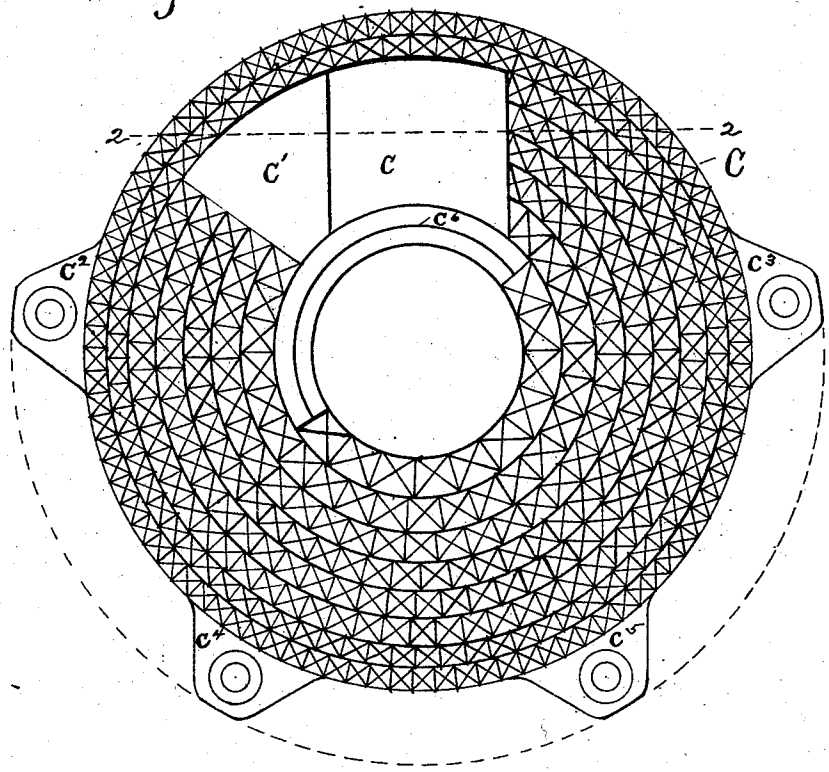
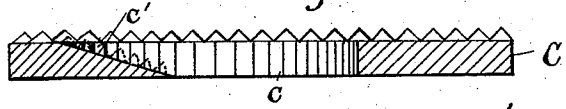


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOSEPH R. KINLEY, OF CHICAGO, ILLINOIS.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 352,135, dated November 9, 1886.

Application filed March 4, 1886. Serial No. 194,067. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH R. KINLEY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a description, reference being had to the accompanying drawings, which is made a part of the description.

My invention relates to vertical disk grinding-mills; and its objects are to increase the speed of grinding and to provide means for adjusting the grinding-disks true to each other, either when setting up the mill or when at any time the adjustment may be disturbed.

To this end my invention consists in the peculiar construction and combination of parts hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my improved mill with the fly-wheels removed. Fig. 2 is a vertical section on line 1 1 in Fig. 1. Fig. 3 is a front view of the stationary grinding-disk. Fig. 4 is a sectional view of the upper part of said disk on line 2 2 in Fig. 3.

Like letters represent similar parts in the several figures.

A represents the upper and B the lower part of the mill-casing, which parts are hinged together by the pivot *a*.

a' represents the chute, integral with the upper part, A, of the casing, which chute conveys the grain from the hopper to within the casing through the orifice a^2 in the side of said casing.

The line of division between the parts A and B of the casing is not horizontal, but extends from near the center at an angle upward to the periphery on each side of the center, for the purpose hereinafter specified.

C represents the stationary grinding-disk, which is fastened to the lower part, B, of the casing. Above the central opening through which the shaft passes an orifice, *c*, is provided, which, when the casing is closed, is adjacent to the opening a^2 in the casing, as shown, so that any grain which passes through said orifice a^2 will also pass through the opening *c* to between the grinding-surfaces. The front of a portion, *c'*, of the disk C on that side of the orifice *c* toward which the revolving disk moves is cut away or beveled from the back to the level of the grinding-surface, as shown in Figs. 3 and 4. Without this beveled portion *c'*, the grain as it passed through the opening *c* would, to a great extent, be pushed back again into the chute, instead of being carried along between the grinding-surfaces by the revolving disk; but by the addition of this bevel the grain passes readily through the orifice *c*, and rests within the space formed thereby between the two disks. The revolving disk cannot then push the grain back into the chute, but carries it along with it as it revolves to between the grinding-surfaces, where it is ground. It is of course evident that it is not necessary that the cut-away or beveled portion *c'* should be plain. It may be provided with a grinding-surface, as shown by the dotted lines in Fig. 4. The essential feature is the space formed between the two disks adjacent to the opening *c*, which gradually decreases in the direction of the motion of the revolving disk. Below the opening *c* is, preferably, a rib, c^6, which extends partially around the inner edge of the disk and prevents the grain from falling into the center.

Upon the outer edge of the stationary disk C the lugs c^2, c^3, c^4, and c^5 are formed, which, however, may be parts of an annular flange, as shown by the dotted lines in Fig. 3, and two of these lugs should be above the center of said disk. The bolts D D D D pass through said lugs and through the casing B, two of said bolts passing through that part of the casing above the center.

As before stated, the upper and lower parts of the casing are of such shape that the line of division between them extends from a point adjacent to the center of the disks outward and slightly upward to the periphery, as shown in the drawings. This enables me to provide bearings in which the shaft E revolves, partly in the upper and partly in the lower part of said casing, so that said shaft may be easily mounted and dismounted when required. I am also able to connect the stationary disk to the lower part of the casing by bolts, a part of which engage with said disk above and a part below its center. This makes the fastening of the disk firmer, and provides for overcoming any tendency of the upper part of the

disk to yield to the pressure of the materials being ground, and thereby to spring or tilt out of the perpendicular.

d d d d represent set-screws which screw into said casing and have their inner ends resting against the back of the disk C.

E represents a shaft, which is mounted in bearings in the casing.

F represents the revolving disk, which is preferably cast about a soft-iron hub, *f*, before said hub is bored. The disk can then be accurately centered. The hub is provided with a bore through which the shaft E passes, and is secured to said shaft by the set-screw *f'*.

The preferable means for adjusting the mill to coarse or fine grinding is that shown in Fig. 2. Collars G' G' loosely surround the shaft, outside of the casing at each side, and rest against said casing. Fly-wheels H H' are rigidly attached to the shaft E at each end thereof. Upon one side, between the collar G and wheel H, a coiled spring, *h*, loosely surrounds the shaft and thrusts against the collar on one end and the wheel on the other, thereby exerting a continuous force to draw the disk F away from the disk C. Upon the other side of the casing a set-screw, *h'*, screws into the wheel H' and thrusts against the collar G', thereby acting, when being screwed in, to draw the disk F nearer to the disk C.

The disks are adjusted true to each other, as follows: The revolving disk is secured to the shaft, as specified. The stationary disk is secured to the casing loosely by the bolts D, &c. The disks are then brought into contact by screwing in the set-screw *h'*. The set-screws *d d*, &c., are then screwed against the back of the disk C until the two disks touch evenly at corresponding points on all sides of the center, when the bolts D D, &c., are tightened, thereby holding the disk in the desired position. This affords a ready and simple means for adjusting the disks true, as well in setting the mill up in the first instance as at any time when the adjustment has, by any means, been disturbed.

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

1. In a vertical-disk grinding-mill, a stationary grinding-disk having a feed-orifice above the center thereof, and a portion of said surface adjacent to said orifice and in that direction toward which the revolving disk moves cut away, and a raised rib extending partially around the inner periphery of the disk and below said orifice and beveled portion, substantially as and for the purpose specified.

2. In a grinding-mill, the combination of the stationary grinding-disk, and an inclosing-casing consisting of two parts hinged together, the line of division between said parts extending from near the center of the disk outward and upward to the periphery, with bolts for securing said disk to the lower part of the casing, one or more of said bolts passing through said casing and engaging with said disk at points above the center of said disk, the remaining bolts passing through the casing and engaging with said disk at points below its center, substantially as and for the purpose specified.

3. In a grinding-mill, the combination of the stationary grinding-disk, and an inclosing-casing in two parts, the lower part of which extends above the center of the disk near the circumference thereof, with bolts and set-screws which pass through said lower part of the casing and engage with said disk, substantially as and for the purpose set forth.

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