(No Model.) 3 Sheets—Sheet 1.

P. T. COFFIELD.

GRINDING MILL.

No. 391,689. Patented Oct. 23, 1888.

Fig. 1.

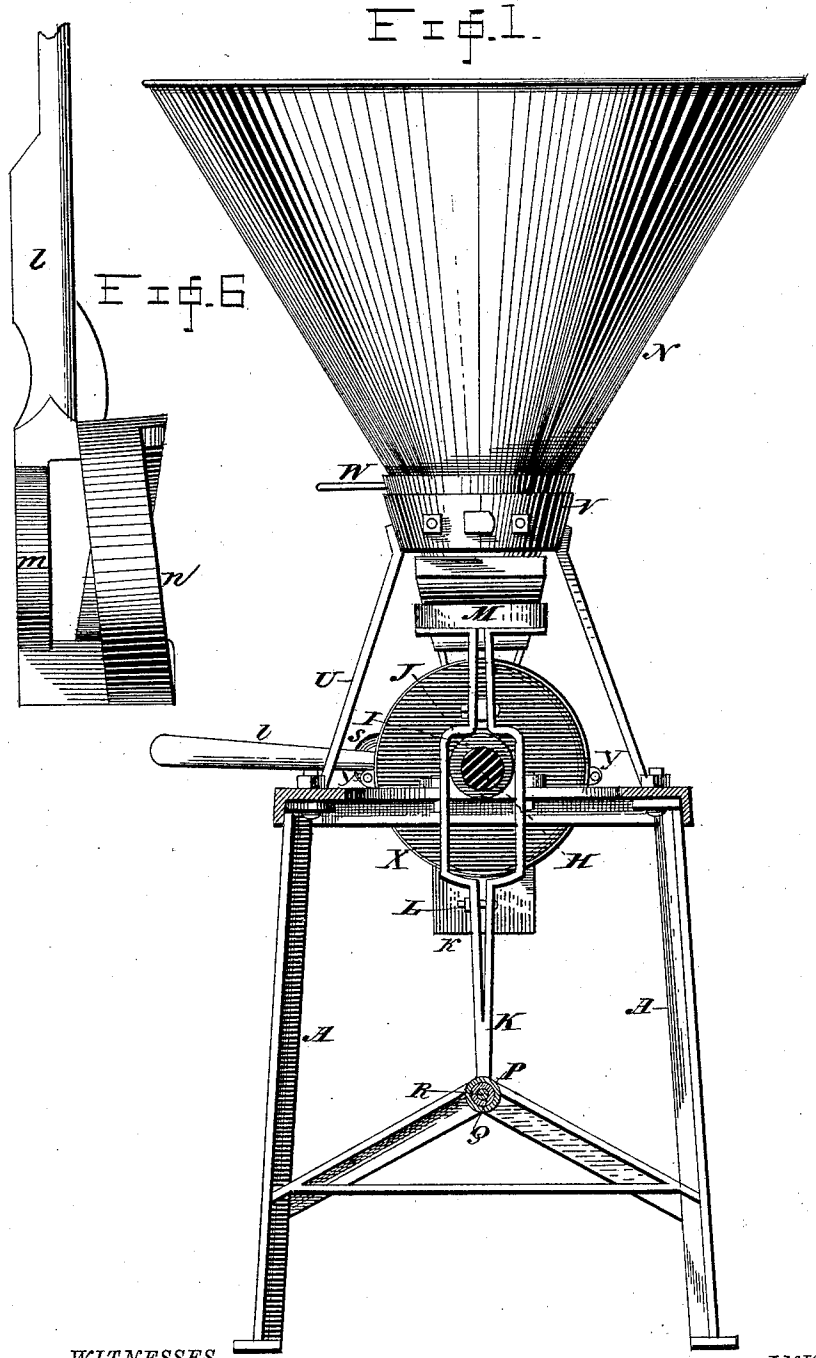


Fig. 6.

WITNESSES.

A. A. Graham.

Edwin L. Bradford.

INVENTOR.

Peter T. Coffield.

By Coulmin & Gennes,

his Attorneys.

N. PETERS, Photo-Lithographer, Washington, D. C.

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Fig. 3.

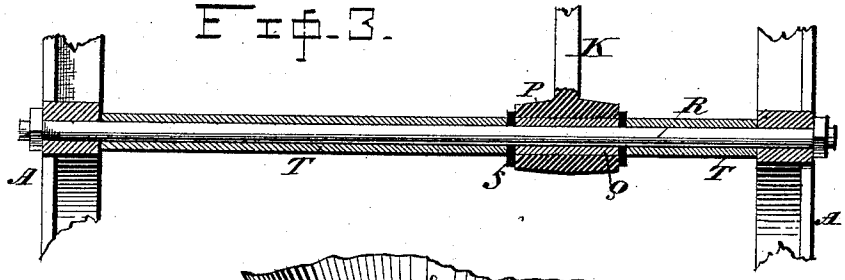
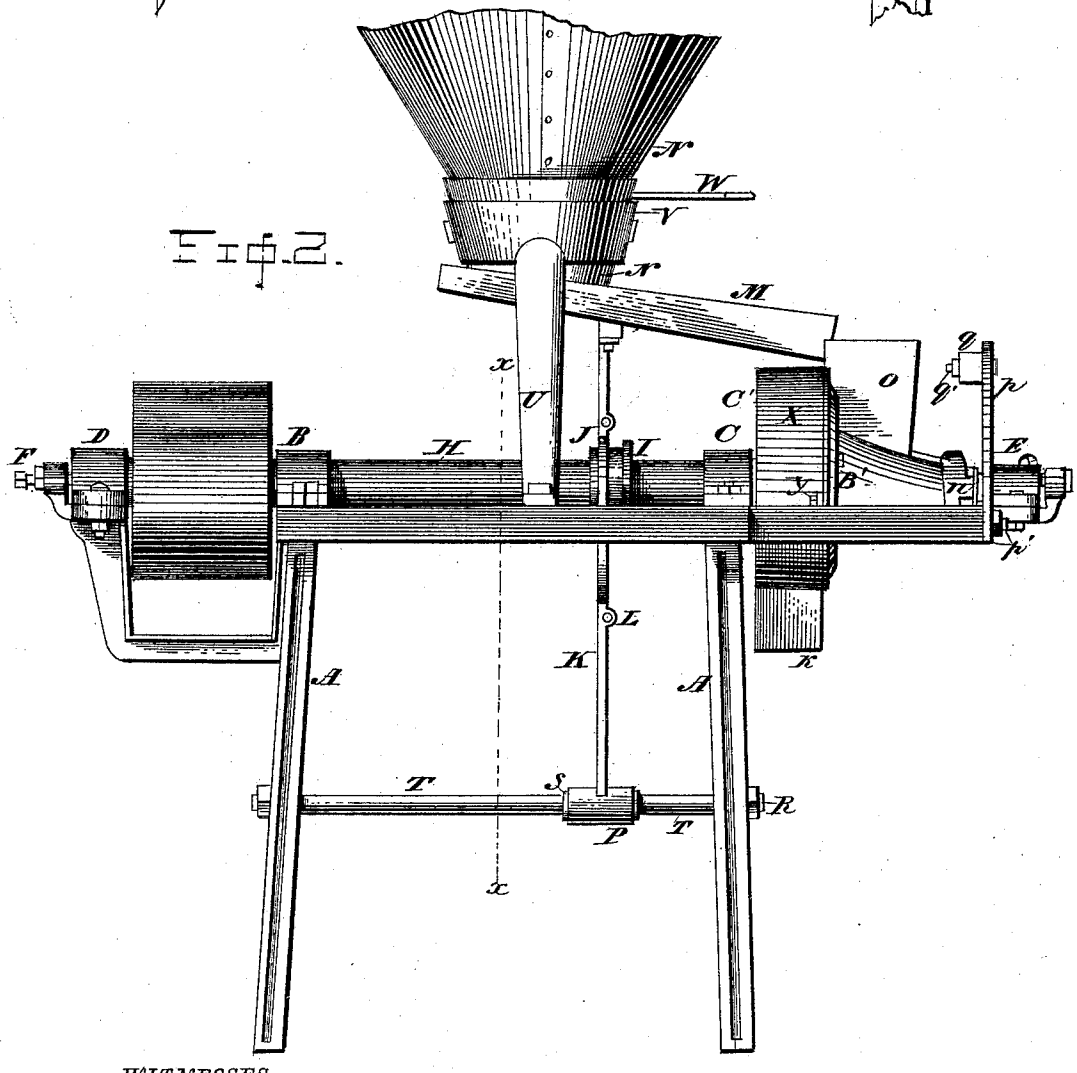


Fig. 2.



WITNESSES.

A. P. Seutman.

Edwin L. Bradford.

INVENTOR.

Peter T. Coffield.

By Goldsmith & Emmes,

his Attorneys.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 3.

P. T. COFFIELD.

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Fig. 4.

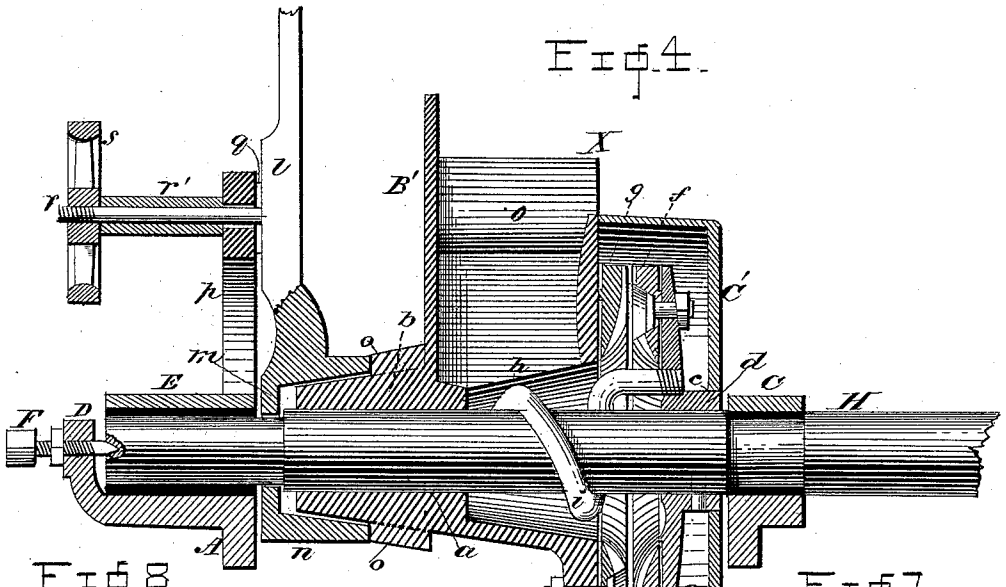


Fig. 8.

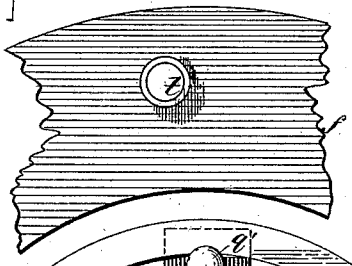


Fig. 7.

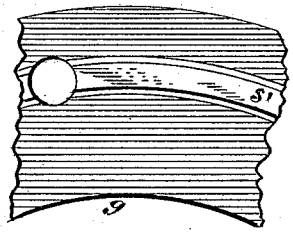
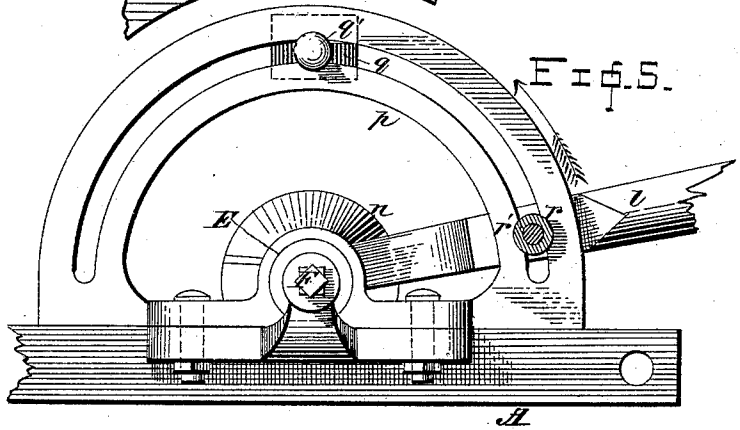
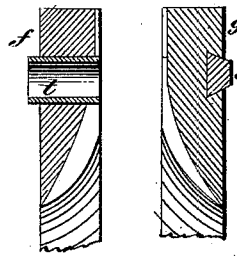


Fig. 5.



Figs. 9 & 10



WITNESSES,
A. A. Seaman,
Edwin L. Bradford.

INVENTOR.
Peter T. Coffield.
By Coulmin & Semmes,
his Attorneys.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

PETER T. COFFIELD, OF NEW CARLISLE, ASSIGNOR OF ONE-HALF TO RICHARD H. RODGERS, OF SPRINGFIELD, OHIO.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 391,689, dated October 23, 1888.

Application filed January 28, 1887. Renewed September 24, 1888. Serial No. 286,237. (No model.)

To all whom it may concern:

Be it known that I, PETER T. COFFIELD, a citizen of the United States, residing at New Carlisle, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in grinding-mills, having special reference to the class known as "vertical-disk mills;" and it consists, essentially, of a casing fitted upon the main shaft so as to move back and forth, of a lever having a cam-faced portion which engages with said casing to actuate it, and of a non-rotating grinding-disk secured to the shaft. It also consists of the peculiarities hereinafter pointed out.

In the accompanying drawings, forming a part of this specification, and on which like reference-letters indicate corresponding features, Figure 1 represents a partial end elevation and a partial sectional view on the line *x x* of Fig. 2 of my improved mill; Fig. 2, a side elevation of the mill with a portion of the hopper removed; Fig. 3, a sectional view of a portion of the frame, showing the manner of mounting the pan-standard; Fig. 4, a vertical sectional view of the grinding-disks, the casing, and the parts in immediate juxtaposition thereto; Fig. 5, an end view of the lever guiding and locking devices; Fig. 6, a side view of the lever detached; Figs. 7 and 8, rear views of portions of the grinding-disks, showing the beads and projections of softer metal; Figs. 9 and 10, sectional views thereof.

The letter A designates the frame of my improved mill constructed, preferably, of the form shown and of cast-iron, and having at B and C suitable bearings for the intermediate portions of the main shaft, and at D and E like bearings for the ends thereof, and also bearing-screws F of the usual character, having pointed ends which enter countersinks in the ends of the shaft and act to prevent it from longitudinal movement. This shaft H carries an eccentric, I, which stands within the members J of the pan-standard K and actuates it rapidly from side to side, yet smoothly and without rattling. The bolt and nut L enable the members J, which are somewhat yielding, to be brought closer together to take up wear. Secured in any desired manner to the upper end of the standard is the feed-pan M, of sheet metal, and extending in an inclined position from the base of the hopper N to the mouth O of the casing, whereby the material is constantly and uniformly fed to the said box from the receiving-hopper. The lower end of the standard has a hub, P, which fits snugly over a collar, Q, on the brace-rod R of the frame A, and at either end of the collar is placed a washer, S, which keeps the hub in place, while sleeves T hold the washers and act as shoulders, against which the frame-legs are forced by the nuts on the brace-rod R to give rigidity to the frame generally. Mounted upon the frame are supports U, connected by a collar, V, into which the lower end of the hopper N extends and is secured. The hopper is provided with the usual feed-slide, W, which serves to regulate the size of the throat of hopper and the consequent quantity of material which passes from it.

The letter X refers to the casing composed of two parts, B′ and C′, and secured together at Y, the former having a mouth, O, formed integrally therewith, and both mounted upon the main shaft, one directly, as seen at *a*, an elongated sleeve or hub, *b*, serving to support it thereon, and the other part indirectly, as seen at *c*, by fitting over the boss *d* of the rotating disk *e*, this disk being mounted rigidly upon the main shaft H and carrying the rotating grinding-disk proper, *f*. The other and the non-rotating grinding-disk, *g*, is secured to the part B′ of the casing, and is moved toward the rotating grinding-disk *f* by the lever, to be presently described. The material, as already suggested, falls from the feed-pan into the mouth O of the casing, and thence it goes through the passage *h* and is caught by the worm *i* and carried to and between the grinding-disks *f* and *g*. This worm in the present instance is simply a bar coiled round the shaft and secured to the disk *e*. The material after being ground passes out through the discharge-passage *k*, in the lower part of the part C′ of the casing and is received by any receptacle the user may employ.

The letter *l* designates the setting-lever, one end whereof has an eye, *m*, which turns upon the

shaft H as a center, and also has a cam-faced ring, *n*, which fits freely over the sleeve *b* and acts against the lugs or ribs *o* on the said sleeve, whereby, when the lever is thrown in the direction of the arrow in Fig. 5, the casing, with its non-rotating grinding-disk *g*, secured to the part B′, is moved toward the other grinding-disk, *f*, and the space between the grinding-surfaces regulated. Upon reversing the lever the said part B′ and its grinding-disk are free to move back from the other grinding-disk, and the presence of the intervening grain causes them to recede.

The letter *p* refers to a slotted segment secured firmly to the frame at *p′*, as by bolts, and provided with an adjustable stop consisting in the present instance of a block, *q*, held to the segment by a bolt and nut, *q′*. Thus the stop may be placed at any desired point along the segment, and thereby limit the movement of the lever and determine the distance between the grinding-disks and the consequent degree of reduction of the grain or other material being ground. Another use of the stop is that of preventing the disks from being accidentally brought into contact, which would likely occur, especially when the mills were run by inexperienced persons, if the binding device on the lever were alone depended upon. Again, the degree of reduction of the grain can be previously determined by setting the stop on the segment at points which have been ascertained to allow the disks to come certain distances apart. The setting-lever is held in position by a binding device composed of a bolt, *r*, secured to the lever and extending through the slot in the segment, and of a sleeve, *r′*, and a hand-wheel, *s*.

Referring now to the grinding-disks, it will be seen in Figs. 7, 8, 9, and 10 that they are provided with rings or beads *s′*, or with projecting bushings *t*. These are cast in the disks and are of iron, while the disks are of cast-steel, and their purpose is to afford a surface which may be readily faced off in a lathe, so as to make that part of the grinding-disks which stands against their mountings parallel with the faces of the disks, whereby they will run true and stand the same distance apart throughout their entire grinding-surfaces. It will be understood that either or both of these forms of softer surfaces may be used. The reason for adopting them is that the cast-steel disks are too hard to turn off or face with lathe-tools, and have to be dressed on an emery-wheel, which does not allow of truing them so accurately as desired.

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

1. In a grinding-mill, the combination, with the main shaft and a lever pivotally mounted thereon and having a cam-faced ring, of a rotating grinding-disk secured on said shaft, and a non-rotating disk slidingly mounted on the shaft, and a casing also slidingly mounted upon the shaft inclosing said disks, and to which the non-rotating disk and the cam-faced ring are connected, the latter slidingly and the former positively, whereby upon moving the lever around the shaft as a center the sliding disk will approach or recede from the other disk according to the direction in which the lever is moved.

2. In a grinding-mill, the combination, with the mill-shaft and a lever pivoted thereon and having a cam-faced ring, of a casing slidingly mounted on the shaft with which said face of the lever engages, and a grinding-disk secured to the casing and free to move with it, and an adjustable stop secured in the path of the lever to limit the movement thereof, for the purpose set forth.

3. In a grinding-mill, the combination, with a main shaft and a lever having an eye fitted to the shaft and constructed with a cam-faced ring, of a casing having a hub provided with ribs, the hub extending into the ring of the lever and the ribs engaging the cam-faced surface of the lever, a non-rotating disk secured to the casing and both the casing and disk slidingly mounted on the shaft, a segment near the lever, and an adjustable stop carried by the segment, and locking devices to secure the lever.

4. In a grinding-mill, the combination, with the main frame and brace-rod, the sleeve, the washers, and a collar thereon, of a feed-pan standard having a hub fitted to the collar between the washers and composed of two yielding members, the feed-pan carried by the standard, and the main shaft having an eccentric mounted thereon between the members of the standard.

5. In a grinding-mill, a grinding-disk of cast-steel having holes therein, and metallic tubes of softer metal fitted within said holes and projecting beyond the plate at the rear side thereof, whereby holes are provided in the disk for securing it, and soft projections provided which may be dressed off to bring the disk true when mounted.

In testimony whereof I affix my signature in presence of two witnesses.

PETER T. COFFIELD.

Witnesses:
A. A. YEATMAN,
CHASE STEWART.