(No Model.) 2 Sheets—Sheet 1.

J. F. WINCHELL.

GRINDING MILL.

No. 297,049. Patented Apr. 15, 1884.

Fig. 1.

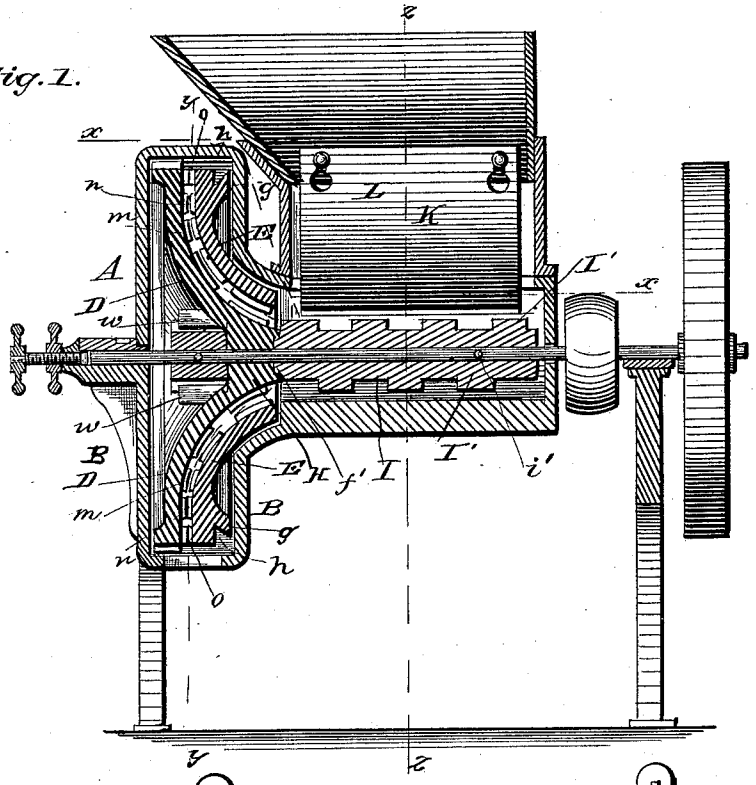
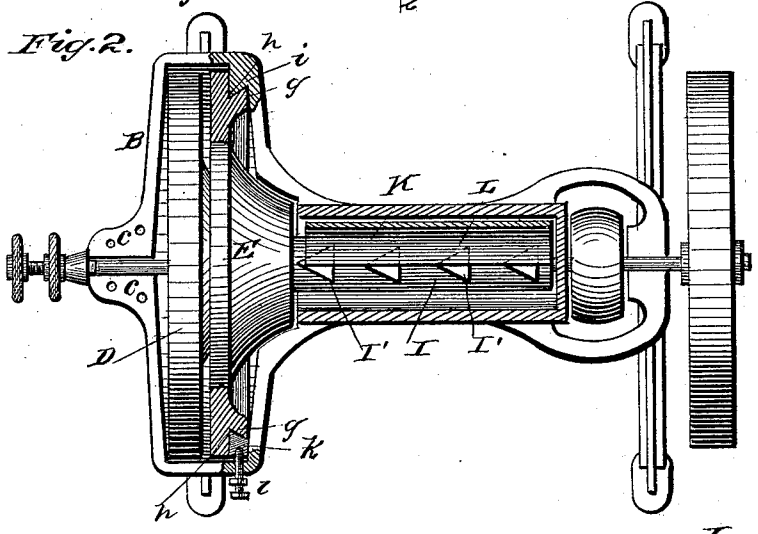


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

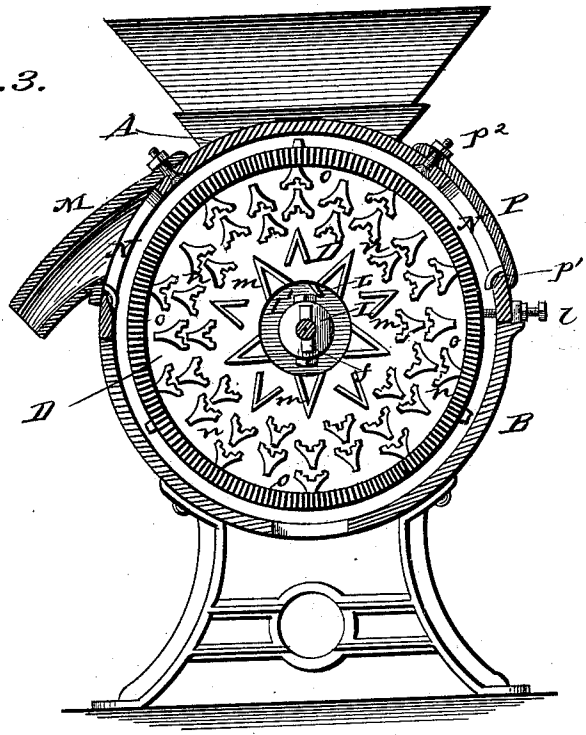
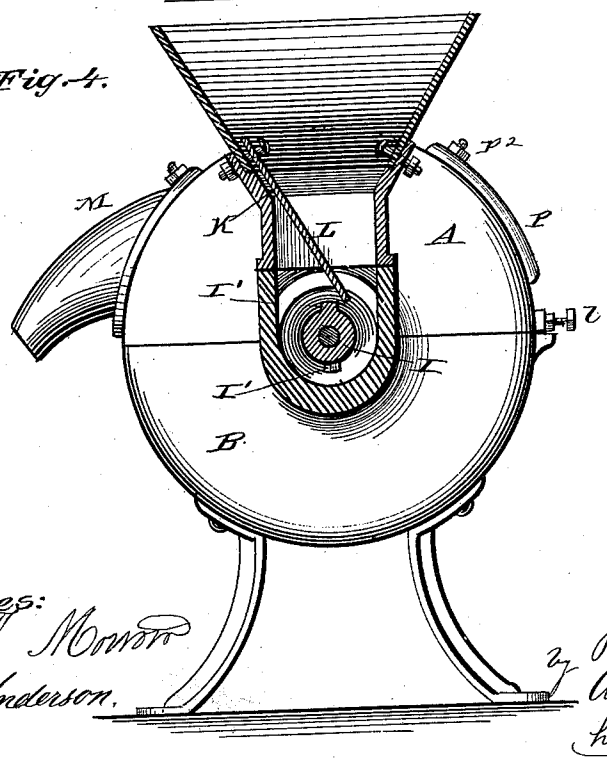


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES F. WINCHELL, OF SPRINGFIELD, OHIO.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 297,049, dated April 15, 1884.

Application filed September 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. WINCHELL, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grinding-Mills; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a vertical longitudinal sectional view of the mill. Fig. 2 is a horizontal section above the crusher. Fig. 3 is a vertical cross-section on the line *y y* in Fig. 1; and Fig. 4 is a cross-section on the line *z z* in the same figure.

This invention has relation to cast-iron grinding-mills; and it consists in the construction and novel arrangement of devices, as will be hereinafter fully described, and particularly pointed out in the claims appended.

The letters A and B respectively designate the upper and lower sections of my case for the grinding devices. Each of these sections is cast in one piece, and the two are united by bolts or screws introduced through the openings *c*.

Two grinding-disks are employed in my mill, and are arranged vertically, as shown. Of these disks, D is rigidly attached to the shaft, while E is arranged, as hereinafter described, in such manner that it will rotate with the shaft only when obstructed by unyielding substances coming between the grinding-surfaces of the disks.

It will be observed that the disk D is keyed to the shaft, as shown at *f* in Fig. 3, and that disk E is arranged against the wall of the casing and partly surrounds the hub of disk D.

The means employed for securing the disk E in position are as follows: I construct a flange on the periphery of said disk or burr, which extends entirely around the same. This flange is marked *g*, and it forms between the main body and its extremity a V-shaped annular recess, (marked *h*, Figs. 1 and 2.) I also form on one wall of the case a wedge-shaped extension, (marked *i*,) which corresponds in shape with recess *h*, and fits therein, as shown in Fig. 2 of the drawings. On the opposite side of the casing I arrange a wedge-shaped block, *k*, which is adjustable, and is adapted to fit in the recess *h*. I furthermore make an opening through the wall of the casing, and pass therethrough a jam-screw, *l*, the point of the screw passing into the rear side of said adjustable block. It is obvious that while the disk or burr E is held in position by screw *l* the firmness and rigidity are regulated at will by manipulating said screw. The disk D has a hub, (marked H,) which passes through the center of disk E and surrounds the working-shaft. This hub H is mortised in its outer end to receive a tenon, *f'*, on the end of the crusher I, the other end of the crusher being keyed to the shaft at *i'*. I' designates the teeth of the crusher, which alternate on opposite sides of the crusher, as shown. The crusher crushes the corn and cobs, and also feeds the crushed material to the grinding-disks.

The manner of connecting the hub and crusher is simple and secure.

The grinding-surfaces of the disks are formed as follows: Near the center of the disk D, I make a series of raised V-shaped figures of the character shown at *m*. These are preferably ten in number, and are arranged as shown. I furthermore form a series of radial raised Y-shaped figures having curved converging walls and stepped bases, as shown on Fig. 3, and marked *n*. These figures *n* occupy the central portion of the face of the disk. Outside the figures *n*, and leading to the periphery of the disk, I make fine serrations, as shown at *o*.

The grinding-face of disk E corresponds in construction with that of disk D, except in the following particulars: I form two raised V-shaped ribs on the face of the disk E, near its center, at acute angles with the feeding-teeth. These ribs are the first portion of the dress to act upon the crushed corn and cobs and crack them. The construction of the disks and the manner of adjusting them are, however, shown in my former patent, No. 273,927, dated March 13, 1883, they being represented here merely for the purpose of illustrating the kind of a mill to which I prefer applying my

improvements. The hopper extends over the entire length of the crusher, has inclined sides and an inclined end for a portion of its height, and vertical walls below. A vibrating agitator, K, is removably secured within the hopper to either of the inclined sides of the hopper, according to the direction in which the mill is run, it being capable of being run in either direction in order to make it self-sharpening. The vibrating agitator consists of a sheet of metal, L, secured to either inclined side of the hopper, and extending down into the vertical portion of the hopper on an incline and partially over the crusher, but not touching it. This agitator is loosely secured at its connecting-points, and is operated automatically by the crushed cobs as they are carried around by the crusher. This agitator also acts as a deflector for the ears of corn, and prevents them from striking on that portion of the crusher which is turning upwardly, thereby preventing the ears from being thrown out of the mill. When the mill is reversed, the vibrating agitator is changed to the other side of the hopper.

The vibrating agitator is preferably secured to the hopper by bolts passed through key-hole slots into the side of the hopper; but any other means may be employed that will permit a loose or vibratory connection.

In making the mill reversible it is necessary to provide a removable spout, M, the lower connecting-point of which hooks over the lower edge of an opening, N, in the case-wall near the top of the same, an opening, N, being made in each side of the case-wall, as shown. One of the openings N is closed by a plate, P, when the spout is attached to the other opening, and a hook and bolt are also provided for the plate P, as shown at p' p^2, Fig. 3. The mouth of the spout is directed downward, as seen in Fig. 3.

The operation is as follows: The ears of corn are fed into the hopper and are deflected by the inclined vibratory agitator to the downwardly-moving portion of the crusher, where they are crushed, and the broken pieces of cobs are thrown upwardly by the upward motion of the crusher, and, striking against the under face of the agitator, vibrate it and prevent choking of the hopper, this being a most essential feature in this class of grinding-mills. The crushed cobs and the corn are then fed to the grinding-disks and ground, and when ground they are carried up and discharged through the spout.

Another essential feature is making the mill reversible by providing the removable spout. When the teeth of the disks have become dulled or worn by running them in one direction, the spout, agitator, and closing-plate may be shifted and the disks run in the opposite direction, which will present sharper teeth for a time, and when they have again become worn they may be again reversed, and thus on until the teeth have become completely worn out.

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 case A B, having opposite openings, N N, in its upper portion, of a removable tangential spout, and a plate for closing the opening opposite the attached spout, substantially as specified.

2. In a grinding-mill, the combination of a hopper having inclined walls, an inclined vibrating agitator-plate, and the crusher beneath the said hopper and agitator-plate, substantially as specified.

3. In a grinding-mill, the combination, with the shaft and the disk D, having the mortise f in its hub H, of the crusher I, having a tenon, f', on one end and keyed near the other end to the shaft, substantially as specified.

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

JAMES F. WINCHELL.

Witnesses:

THEO. MUNGEN,

JOHN D. MORROW.