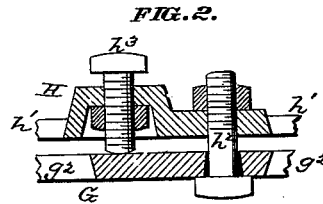
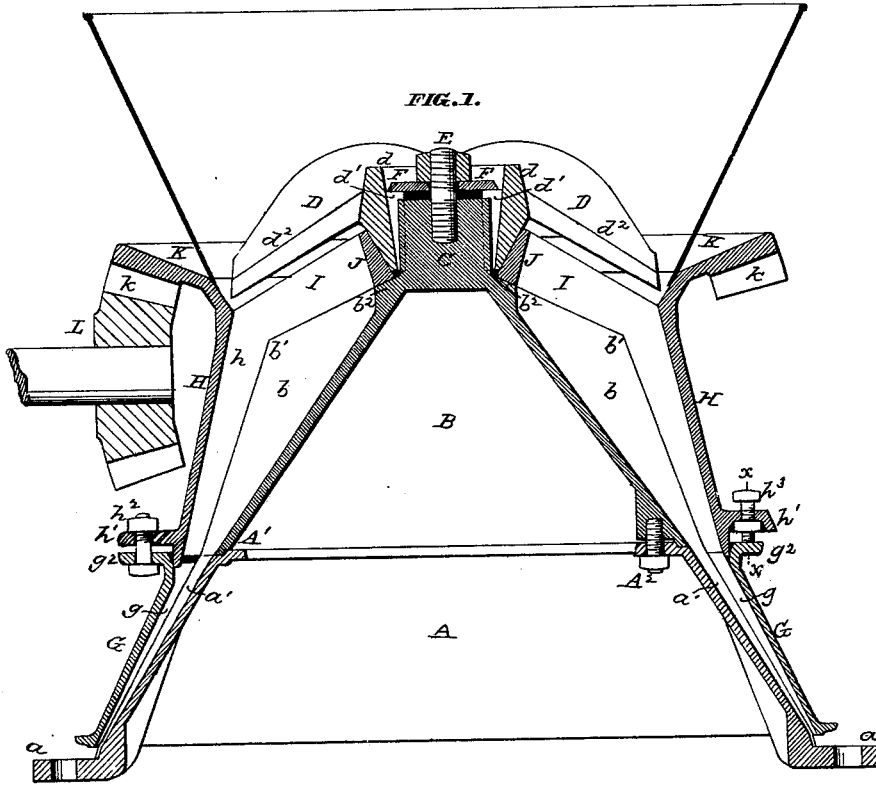


T. D. POWERS.
GRINDING-MILL.

No. 188,184.

Patented March 6, 1877.



ATTEST:

Robert Gurns
Le Blond Burdett

INVENTOR:

Theodore D. Powers
by Knights
atys

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FIG. 3.

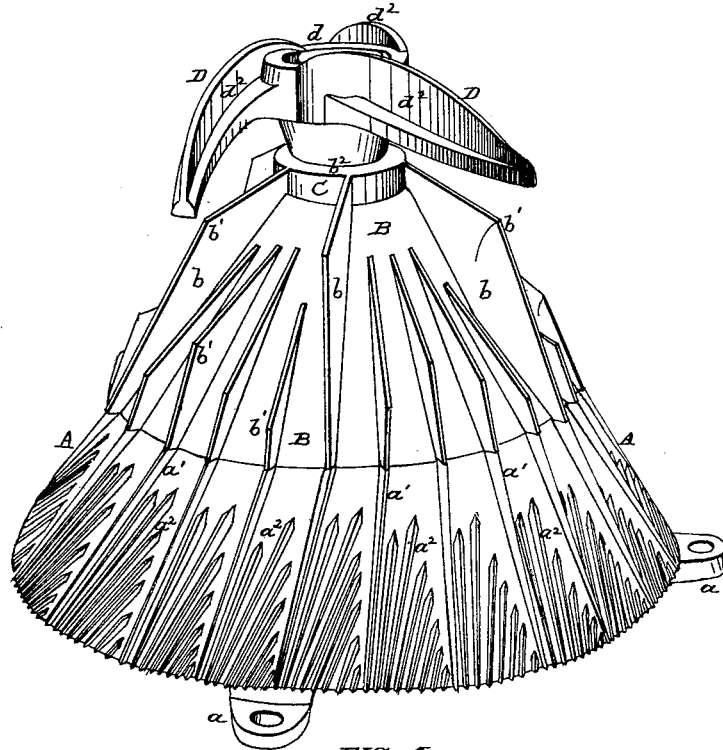
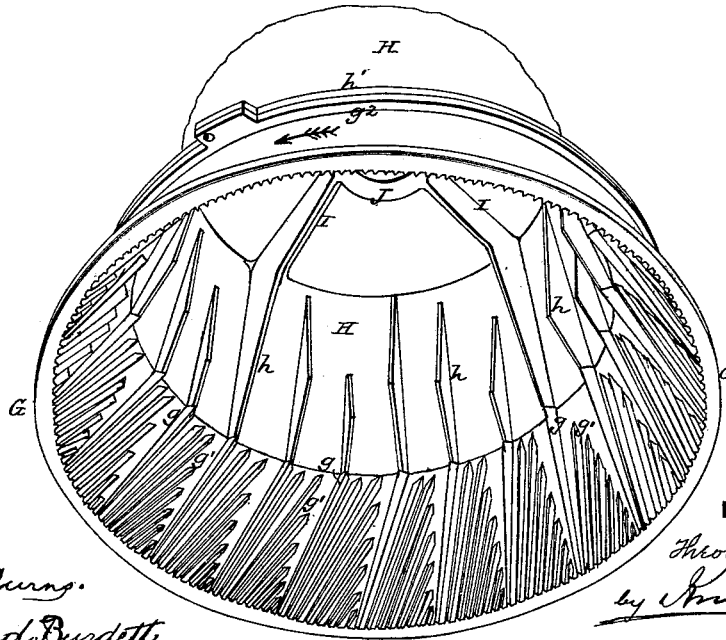


FIG. 4.



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UNITED STATES PATENT OFFICE.

THEODORE D. POWERS, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ALL HIS
RIGHT TO JAMES A. FIELD, OF SAME PLACE.

IMPROVEMENT IN GRINDING-MILLS.

Specification forming part of Letters Patent No. 188,184, dated March 6, 1877; application filed
September 8, 1876.

To all whom it may concern:

Be it known that I, THEODORE D. POWERS, of the city and county of St. Louis, and State of Missouri, have invented certain Improvements in Grinding-Mills, of which the following is a specification, reference being had to the accompanying drawings.

This invention belongs to the class of cast-iron mills, and is suitable for grinding corn, either shelled or with the cob, or cob and husk.

In my improvement the inner grinder or cone is fixed, and the outer grinder or concave rotates.

My invention consists, in part, in constructing the outer shell of the grinder in two parts, adjustable relatively by stay-screws and distance-screws, as hereinafter described.

The invention further consists in combining, with the outer revolving shell, an inner cone having teeth with points or angles of varying height.

The invention further consists in constructing a stirring arm or frame with a ribbed or flanged hub for fixing it relatively to the center block or post of the cone, as hereinafter described.

In the drawings, Figure 1 is an axial section of the mill. Fig. 2 is an enlarged detail section at *x x*. Fig. 3 is a perspective view of the inner grinder. Fig. 4 is a perspective view of the outer grinder, showing the interior of same.

A is the lower portion or base of the inside grinder or cone. This is fixed to the bed-frame by bolts passing through the lugs *a*. The grinding-surface of A is divided into sections by teeth *a*¹, extending from top to bottom of A, and somewhat inclined from the vertical, so as to tend to feed the grain through the mill. These teeth project farther from the surface at the top than at the bottom of A, so that the meal becomes finer as it passes down between the grinding-surfaces. Between the teeth *a*¹ are teeth *a*², which are placed parallel with the tooth *a*¹ upon one side, and, like those *a*¹, the teeth *a*² project farther as they extend upward.

The upper portion B of the inside grinder has a surface nearly in line with A, and pro-

jecting blades or ribs *b*, matching at the lower ends with the teeth *a*¹. These blades are made angular in outline, as shown, and their edges are somewhat inclined from the vertical in the same direction as the teeth *a*¹ *a*², so as to tend to carry the stuff being ground down through the mill. The blades *b* are formed with the angle *b*¹ of varying height, so as to leave spaces between the larger blades, into which whole ears of corn may fall. The portions A B are fitted together with a rabbet-joint, A¹, and held by bolts A².

The apex of the inside grinder A B is formed into a cylindrical block or post, C, on which fits the hub of the breaker D. The hub *d* of the breaker has ribs *d*¹ cast upon its inner side, which rest in suitable recesses or slots in the part C, and the hub is held down on C by a screw, E, and washer F. Projecting from the hub *d* are arms *d*², which I prefer to make curved, as shown, so as to cause no sudden jar when an ear of corn is pinched between the breaker-arms and the radial arms of the outer grinder. *b*² is a shoulder all around the base of C, which forms the bearing of outer grinder G H. The outer grinder—which is the runner—has a lower portion, G, of the same height as A, and having teeth *g* *g*¹, similar to those *a*¹ *a*², but inclined in the opposite direction, so as to tend by their inclination to force the meal downward. The rotation of the outer grinder, as shown, is in the direction of the arrow; but it is obvious that the teeth may have an opposite inclination, and the runner or outer grinder have rotation in an opposite direction. The upper portion H of the outer grinder or runner has blades *h*, whose edges fit the edges of the blades *b* upon the inner or fixed grinder, and the edges of the blades *b* and *h* have such relative inclination to each other that they act together as shears to cut up the corn, cobs, and husks passing down between portions B and H. Arms I extend inwardly from H to a bearing-collar, J, having bearing on the surface *b*².

The arms I turn between the breaker-arms *d*² and the blades *b*, the lower side of the arms I passing in close contact with the upper edges of the largest of the blades *b*, so as to break and slice the ears of corn passing down.

The upper and lower portions of the outer grinder G H are formed with flanges $g^2 h^1$, having bolt-holes for the passage of the stay and distance screws $h^2 h^3$, which secure the parts adjustably together. The upper edge of the portion H turns outward in a flange, K, on the under side of which is a cog-gear, k , extending all around and engaged by a bevel cog-wheel, L, by which the outer grinder is turned. L is a hopper attached to the rim K.

I claim—

1. The outer grinder made in two parts, G H, in combination with the adjusting-screws $h^2 h^3$, substantially as and for the purpose set forth.

2. The part B, having teeth b , the angle b^1 of which is of varying height, in combination with grinder G H, as and for the purpose set forth.

3. The hub d of the stirring-arm D, having rib d^1 and cylindrical block or post C, having recesses for the reception of the ribs d^1 , in combination with the screw E, substantially as set forth.

THEODORE D. POWERS.

Witnesses:

ROBERT BUENS,
N. W. MERRILL.