

L. B. McDONALD.
GRINDING-MILL.

No. 178,653.

Patented June 13, 1876.

Fig. 1

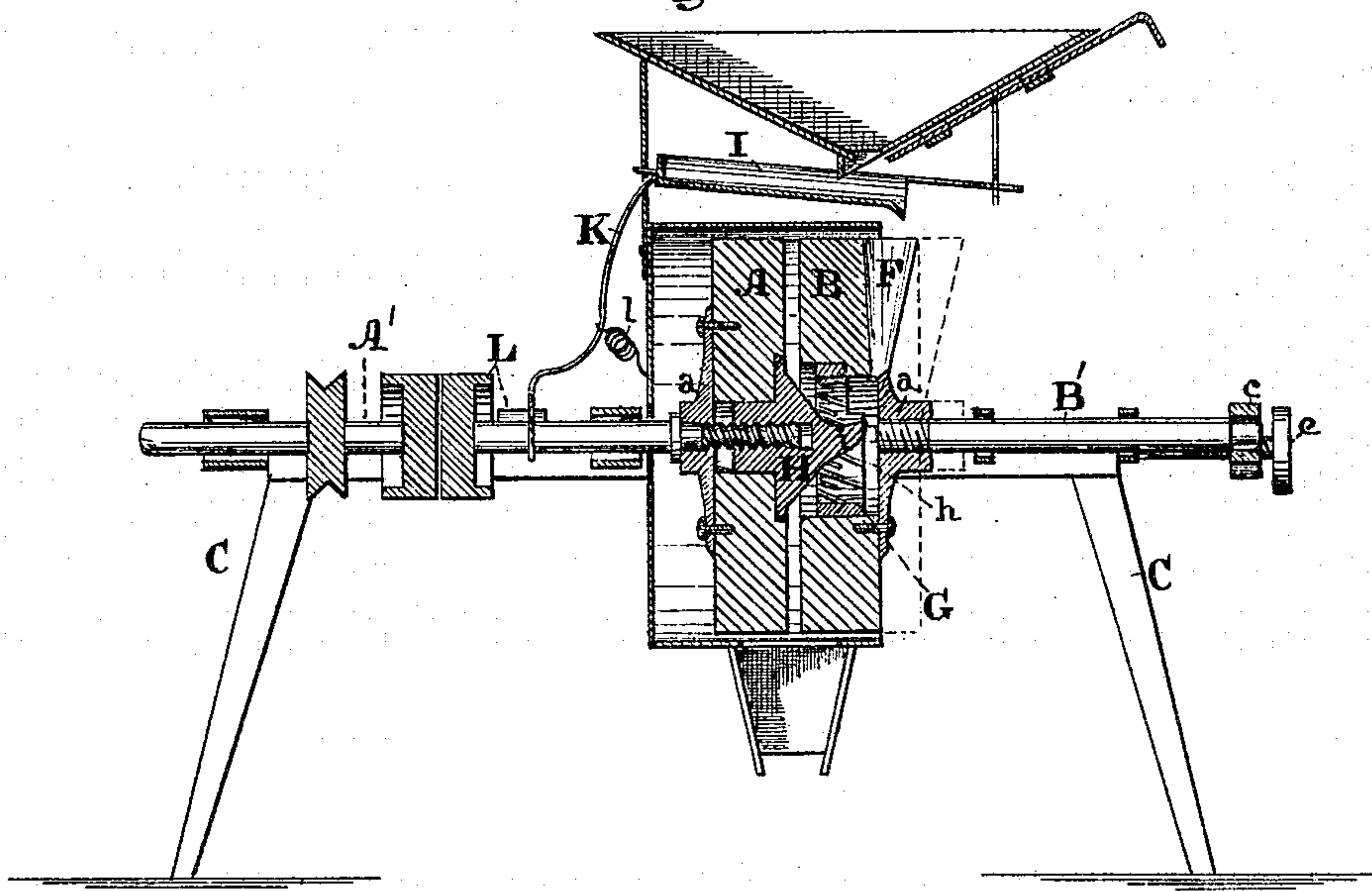


Fig. 2

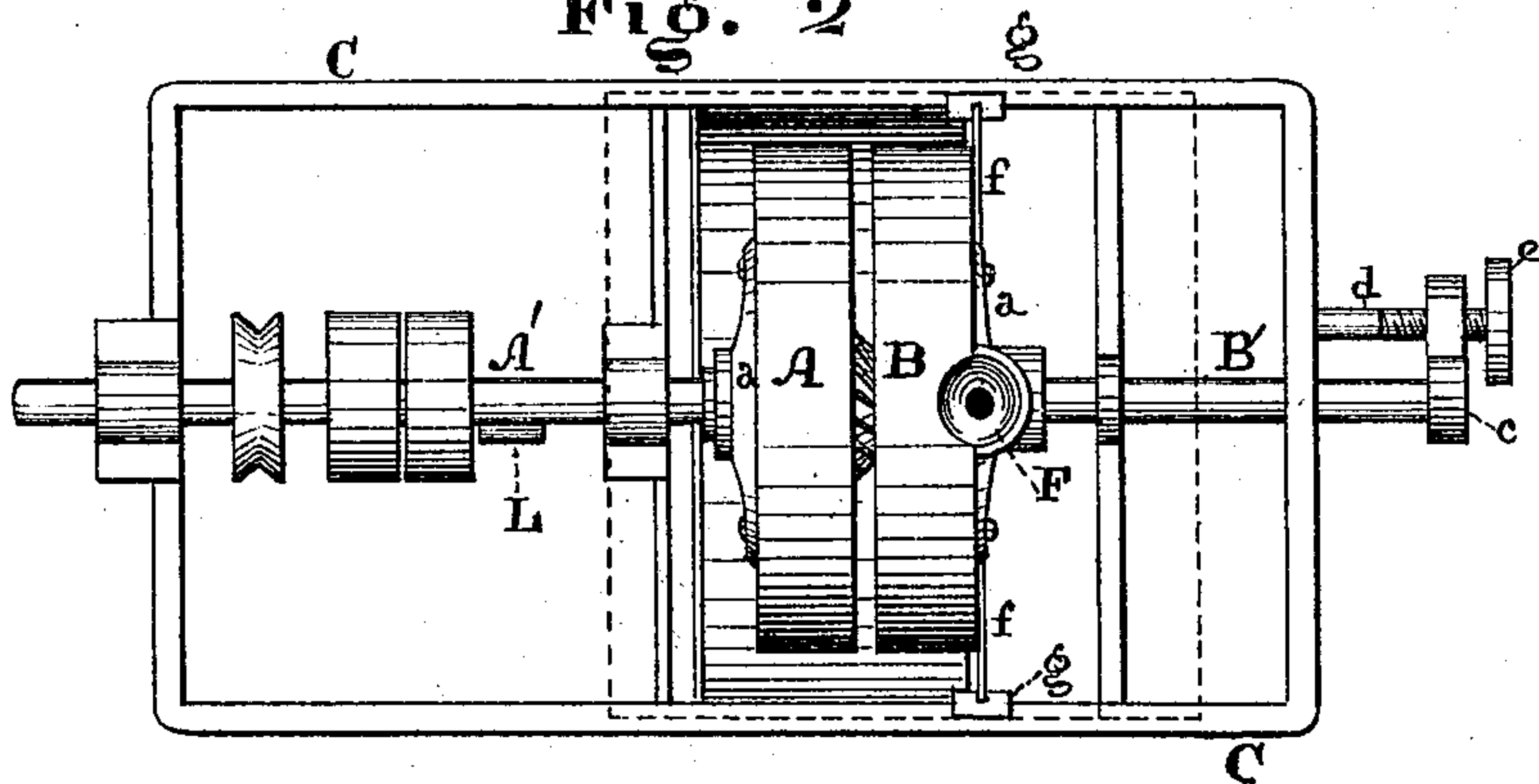
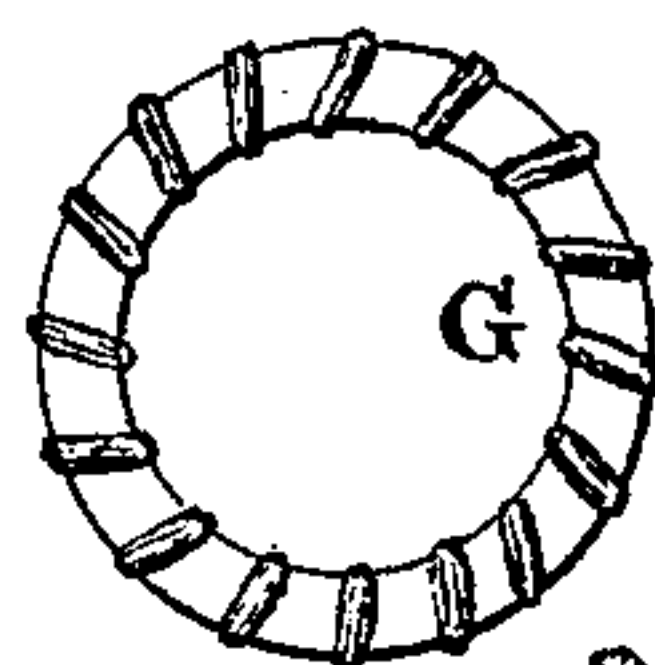
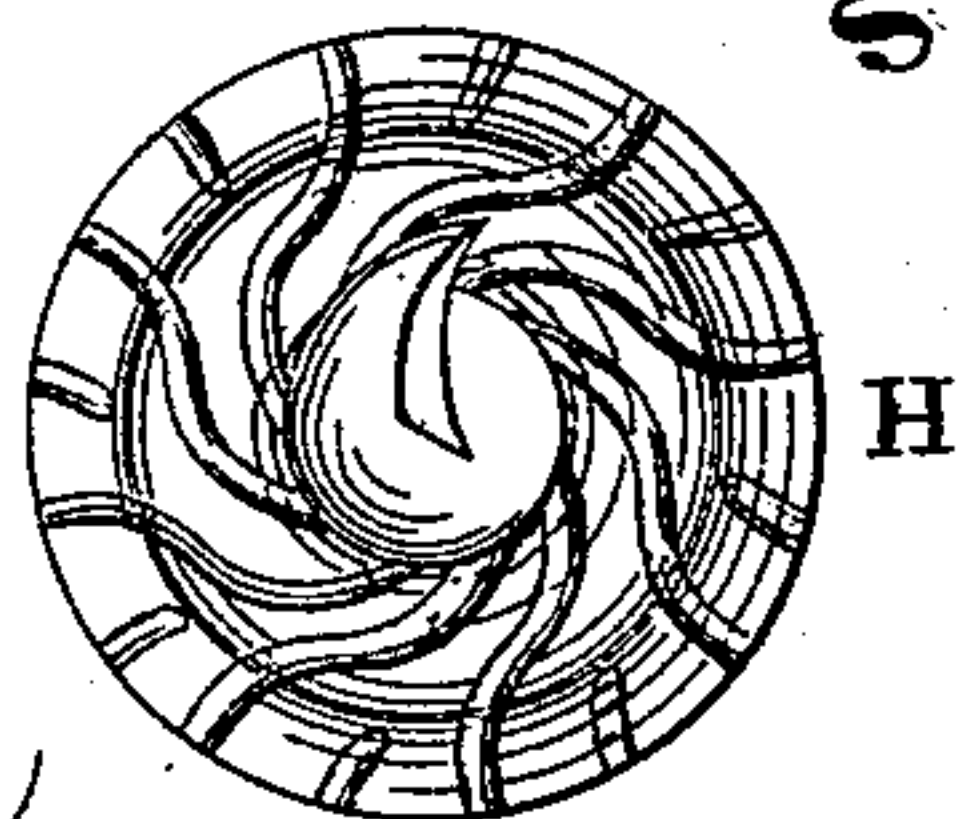


Fig. 3



WITNESSES:
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UNITED STATES PATENT OFFICE.

LEWIS B. McDONALD, OF WYTHEVILLE, ASSIGNOR TO GEORGE W. PALMER, OF SALTVILLE, AND E. H. McDONALD, TRUSTEE FOR MAGDALENA L. McDONALD, OF WYTHEVILLE, VIRGINIA.

IMPROVEMENT IN GRINDING-MILLS.

Specification forming part of Letters Patent No. **178,653**, dated June 13, 1876; application filed April 20, 1876.

To all whom it may concern:

Be it known that I, LEWIS B. McDONALD, of Wytheville, in the county of Wythe and State of Virginia, have invented a new and useful Improvement in Grinding-Mills; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention is an improvement in the class of mills whose burrs or grinding-stones are placed vertically upon horizontal shafts.

The mill is adapted for grinding shelled corn or corn in the ear, for cracking or grinding wheat and other grains, and also for crushing and grinding plaster and bones.

The improvements relate particularly to the construction of the breaking or crushing devices, in connection with vertical burrs; to the manner of securing the conical crusher to the runner; to the means of adjusting the bed-stone, and at the same time preventing its rotation, as hereinafter described.

In the accompanying drawing, forming part of this specification, Figure 1 is a sectional elevation of my improved mill; and Fig. 2, a plan view thereof. Fig. 3 represents face views of the ribbed cone and annulus.

The runner A and fixed bed-stone B are placed vertical upon shafts A' B', which are mounted horizontally in an iron frame, C, and maintained in perfect alignment by being provided with two bearings, so that, however much the stones may wear, they are always maintained in perfect adjustment. The stones are provided with flanges *a*, having internally-threaded hubs, which screw upon the shafts, as shown. The shaft A' is provided with a fast and loose pulley, to adapt it to be driven by belt-connection with any suitable motor. The stone B is fixed, as respects rotation on its axis, but made adjustable toward or from the runner, to provide for grinding fine or coarse. The adjustment is made by means of an arm, *c*, attached to the outer end of shaft B', and a screw-rod, *d*, which passes through the arm *c*, and whose inner end is suitably secured in the end portion of the frame C, so that it can have no longitudinal movement. The rod *d* has a hand-wheel, *e*, by turning which the rod will be rotated, and the shaft

B' thereby caused to slide in its bearings, and adjust the stone B to the runner, as required. The stone B is prevented from rotating without interfering with its axial adjustment by means of ears *f*, having notches to receive flanges or guides *g* attached to the sides of frame C. The shelled corn, corn-cobs, or grain to be ground is fed into the eye *h* of the stone B, through the funnel-shaped tube F attached to the side of the latter. A ribbed annulus or ring-shaped crusher, G, is secured in the front of the eye, flush, or nearly so, with the face of the stone. A spirally-ribbed cone, H, is placed correspondingly in the eye or cavity of the runner, and projects beyond the face thereof, through the ribbed annulus G, and into the eye *h* of the bed-stone. A curved or spiral-shaped horn, *i*, is formed on the cone H, eccentric to its axis or at one side of its apex. The function of the horn is to draw the grain out of the eye *h*, and into the narrow space between the grinding-surfaces—*i. e.*, between the cone H and annulus G, by which it is cracked or broken up into small particles, and thence fed radially outward between the contiguous or contact surfaces of the stones A B, to be reduced to the condition of meal or flour. When corn-cobs are fed into the eye *h* the horn *i* first breaks them into several pieces preparatory to drawing them between the primary grinding-surfaces G and H. The horn *i* will always prevent the mouth of the funnel and eye *h* becoming clogged, whatever be the material fed to the mill. The cone H is provided with a screw-threaded boss, which screws on the end of the runner-shaft A', and thereby clamps the cone firmly in the central cavity of the runner. When the face of the runner has become worn sufficiently to require it, the cone H may be sunk deeper into the cavity by cutting away a portion of the circular shoulder of the cavity, which allows the cone to be screwed up on the shaft A'. I employ the usual form of hopper, supported upon the case of the grinding-stones, and provided with a slide to regulate the discharge into the shoe I. The latter is semi-cylindrical in form, and provided with pivots, which project from its ends, and support the same in pendants at-

ached to the hopper. The shoe is vibrated in its pivots by means of a rigid arm, K, and wiper, L, on the runner-shaft A'. The said arm is held up to the shaft to be acted on by the wiper by means of a spring, l.

What I claim is—

1. The vertical runner having the ribbed cone, provided with a spiral eccentric horn, in combination with the fixed stone having a hollow eye, and the ribbed annulus secured herein, as shown and described, to operate as specified.

2. The conical ribbed crusher H, having a threaded boss, and screwed upon the end of the runner-shaft, whereby it is adapted to be adjusted in the cavity of the runner, as shown and described.

3. The runner A, provided with the ribbed cone H, in combination with a fixed stone, having a ribbed annulus to work in contact with the cone, as shown and described.

4. The stone B, having notched plate or ears, the lateral guides g, the shaft B', arm c, and screw-rod d, passing through said arm, and fixed in the frame of the machine, all combined as shown and described, for the purpose specified.

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Witnesses:

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