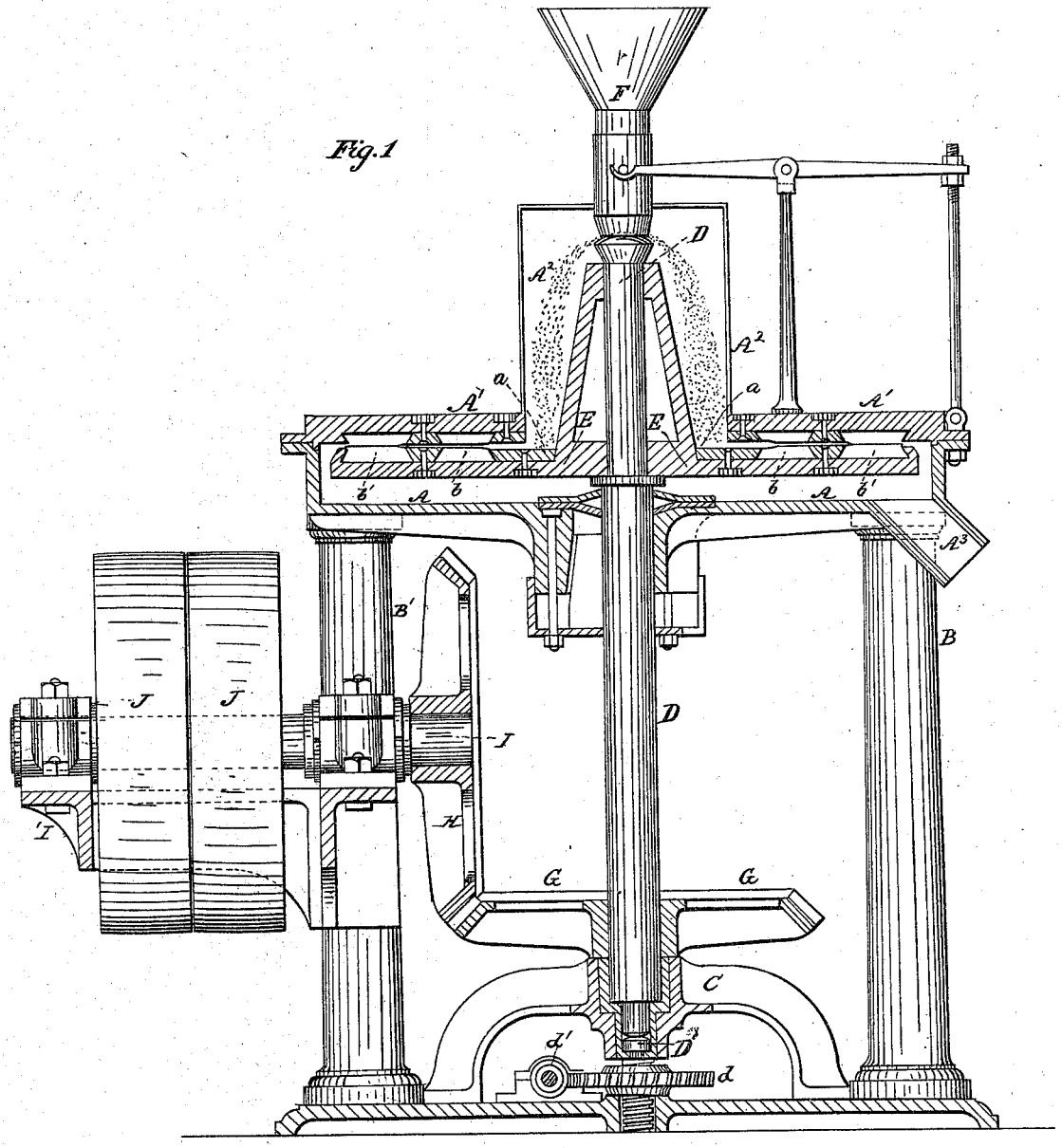
3 Sheets—Sheet 1.

G. A. BUCHHOLZ.

Flour Mill.

No. 108,103. Patented Oct. 11, 1870.

Fig. 1



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3 Sheets—Sheet 2.

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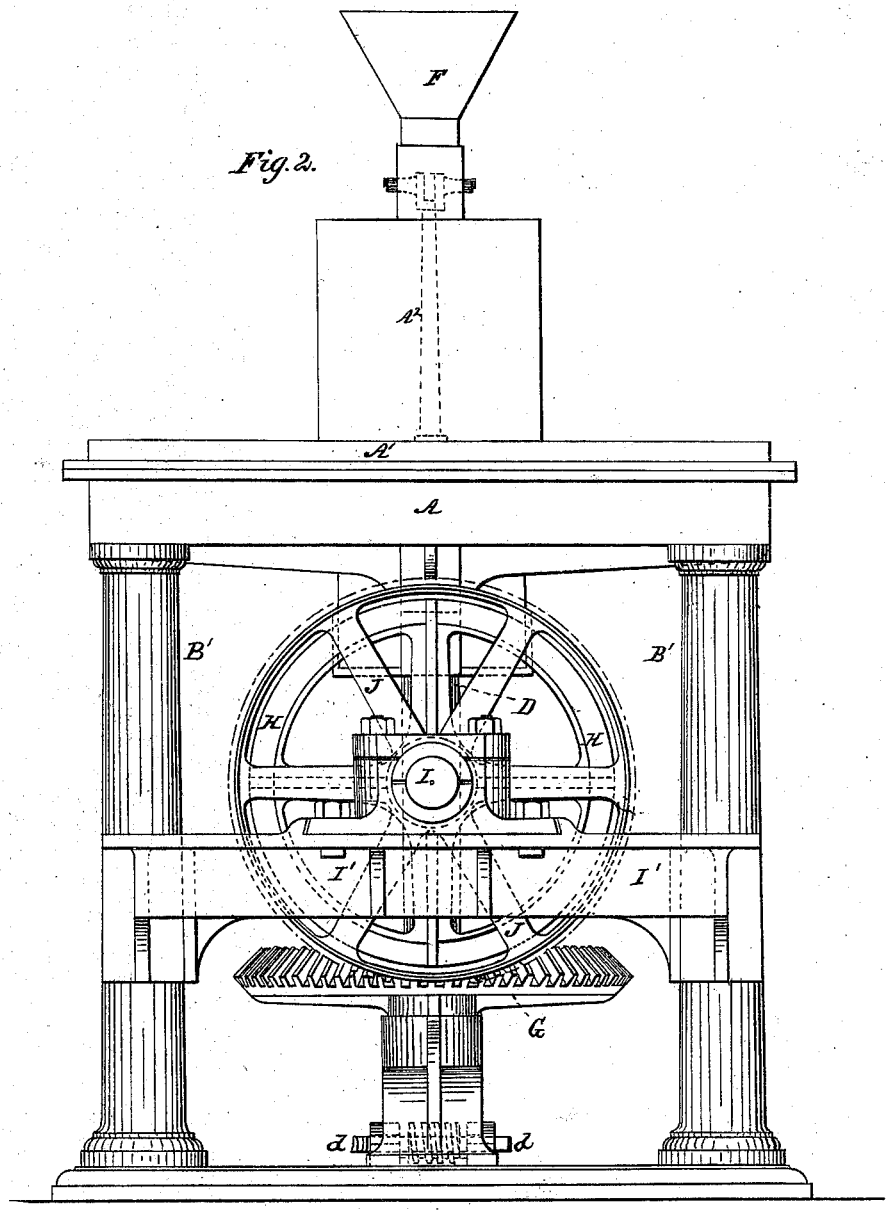
Flour Mill.

No. 108,103. Patented Oct. 11, 1870.

Fig. 2.



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3 Sheets—Sheet 3.

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Flour Mill.

No. 108,103. Patented Oct. 11, 1870.

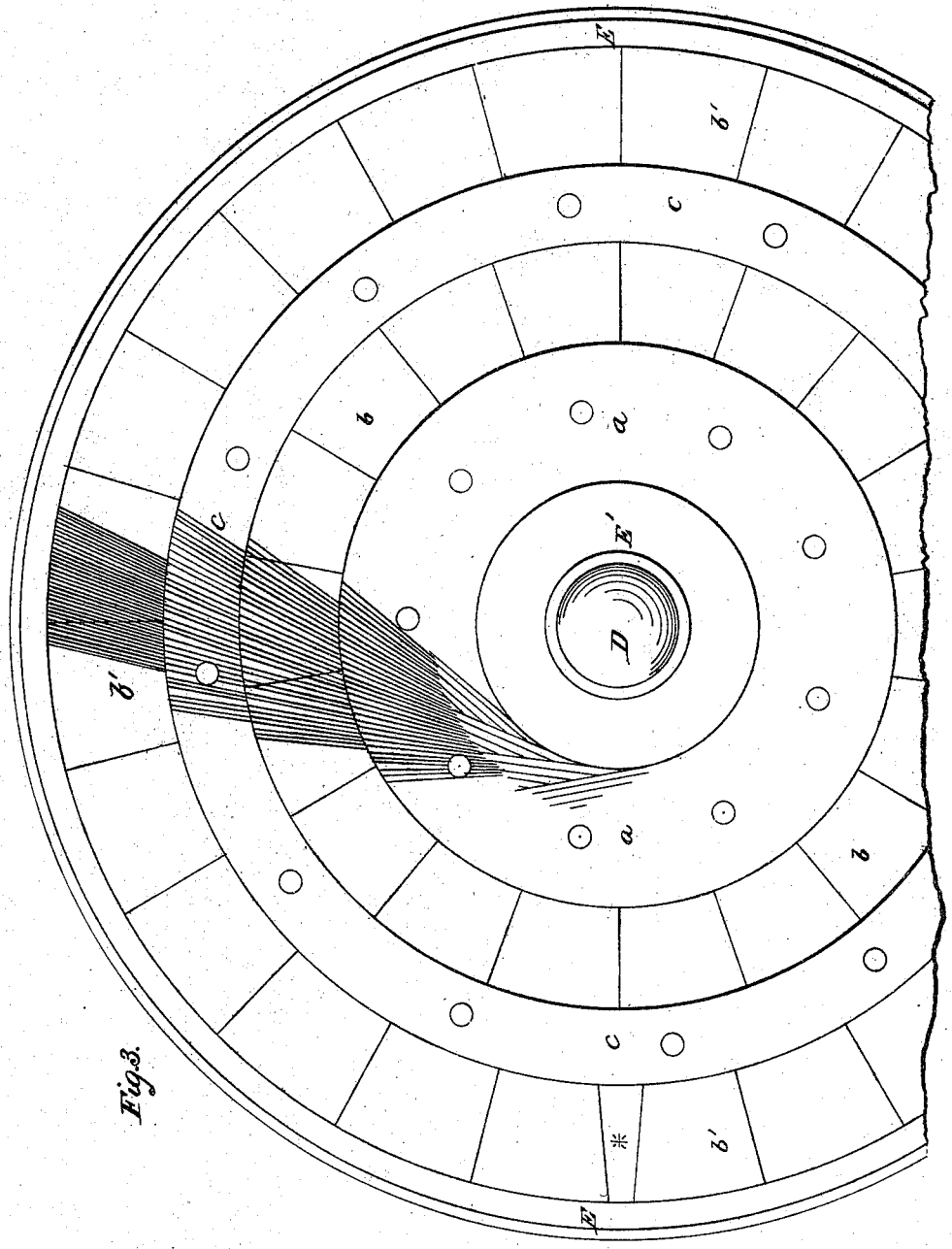

Fig. 3.

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GUSTAV ADOLPH BUCHHOLZ, OF REGENT'S PARK, LONDON, ENGLAND.

Letters Patent No. 108,103, dated October 11, 1870.

IMPROVEMENT IN THE MANUFACTURE OF SEMOLINA AND FLOUR.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, GUSTAV ADOLPH BUCHHOLZ, of Regent's Park, London, in the county of Middlesex, England, have invented new and improved Machinery for Manufacturing Semolina and Flour; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification.

The object of this invention is to convert grain by a kind of shearing action into semolina or into flour. This I effect by the use of an arrangement of machinery, wherein the grain is passed between cutting-surfaces somewhat resembling in arrangement the upper and lower stones of flour-mills, the runner however, taking by preference the place of the bed or lower stone.

In the accompanying drawing—

Figure 1 is a sectional elevation of the improved mill;

Figure 2 is an elevation taken at right angles to fig. 1; and

Figure 3 is a plan or face view of the runner.

The cutting-surfaces are contained in a circular box, A, of cast-iron, supported at a suitable elevation on four pillars B B', secured to a bed-plate.

C is an arched bearing piece for receiving the end of a central shaft, D, which projects up through the circular box A, and carries at its upper end the runner E.

The cover A of the box is fitted on its under side with cutting-surfaces, formed and arranged in manner similar to the acting surface of the runner.

The bottom of the box is cast with a bearing for the shaft D to work in.

The runner E consists of a disk, cast with a recessed face and a hollow boss, E' to receive the central shaft to which it is keyed. The recessed face of this disk (see fig. 3) is fitted with concentric rings of steel or iron, having on their face tangential or diagonal ribs and furrows, forming cutting-edges of any suitable section.

The ribs of the innermost ring *a* will by preference, show in cross-section a figure like ratchet-teeth, deepening gradually from the boss outward.

The chief annular cutting-surfaces *b b'* are formed of steel, and put together in segments, and their edges are beveled to allow of their being held in place by an under-cut lip, or flange on the edge of the disk, and by the rings of iron or cast-steel *a* and *c*, the latter of which is faced with cutting-ribs, and also formed of dovetail section to hold down the segment pieces in their place. These rings are themselves made fast to the disk, which carries them by countersunk screws, or their equivalent. The outermost ring I prefer to form with furrows, that will provide receptacles for the semolina as it is cut by the ribs, and act as channels for the discharging it uncrushed from the mill. The disk, thus formed and fitted, is inclosed in the case A, and runs freely therein.

Over this disk I apply the cover A^1 of the box, which cover forms a second disk, and is similarly provided with a cutting-surface, and serves also to close the case. This disk is, like the runner, slightly concaved or hollowed on its face, the hollow deepening toward the center, and a large central opening or eye is provided, through which the grain is fed to the mill.

The ribs of the operating surface of this disk are also arranged tangentially or diagonally, but in a reverse direction to those of the runner, and thus the meeting of the ribs of the upper and lower disks will cause the shearing action desired.

The eye of the cover is closed by a cap-piece, A^2, which is made fast thereto, and a central opening is made in the top of the cap-piece to admit the bottom of the feed-hopper F. This hopper discharges the hulled grain onto the top of the central-shaft D, which is enlarged and rounded, as shown, to facilitate the distribution of the grain on the runner.

Keyed to the lower end of the shaft D is a spur-wheel, G, which gears into a spur-wheel, H, mounted on the horizontal shaft I.

This shaft I is mounted in bearings carried by the castings I^1 which are made fast to the pillars B'.

The shaft I is fitted with fast and loose belt-pulleys, J, which receive a driving-belt for transmitting rotary motion through the gearing just described to the machine.

To insure a delicate adjustment of the runner E with respect to the fixed disk A^1, an adjustable bearing-pin, D', is provided to receive the downward pressure of the runner-shaft D. This pin has a screw-thread cut on it, and its lower end enters a hole in the bed-plate.

Fitted to the screwed pin is a worm-wheel, *d*, which is free to turn thereon, but supports the screwed pin, itself being supported by the bed-plate.

Into this worm-wheel gears a worm, *d'*, mounted in bearings on the bed-plate. By turning this worm the bearing-pin through its worm-wheel is raised or lowered, and with it the runner-shaft D that bears upon it.

I would here remark that, in order to fit the segment pieces *b b'* in place, it is necessary to provide wedge-shaped pieces, as shown at * * fig. 3, which being inserted last, will force the segment pieces into position, where they will be firmly held by the rings *a c*.

It will now be understood, that, as the grain falls onto the runner, it will, by centrifugal action, be car-

ried between the fixed and running cutting-surfaces, where it will be rapidly reduced to semolina, by a kind of shearing operation, (the ribs of the two acting surfaces crossing each other like the cutting-edges of shears,) and the semolina, traveling along the furrows in the outer segment-pieces *b'*, will be discharged out of the mill through the spout A^3.

In place of ribbed and furrowed rings or segments, I may use steel blades, set edgewise, and spaced out by properly-shaped filling pieces, as described in my patents dated November 23, 1869, and numbered respectively 97,036 and 97,039. In this way I can produce the tangential arrangement of cutting-edges, above explained. These blades may be held in place by being slidden over rebated ribs carried by the disks.

To convert grain into flour by this machine, it will only be necessary to form the cutting-surfaces with finer ribs than is required for the semolina-mill, but in other respects the construction of the flour-mill will be similar to that above described.

Having now described the nature of my invention, I wish it to be understood, that I claim—

The runner E, composed of recessed face-plate, cutting surfaces *b b'*, ratchet-ring *a*, and cutter-ring *c*, combined with the stationary disk A', having reversed cutting-edges, as and for the purpose described.

In witness whereof, I, the said GUSTAV ADOLPH BUCHHOLZ, have hereunto set my hand the 12th day of July, A. D. 1870.

GUSTAV ADOLPH BUCHHOLZ.

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