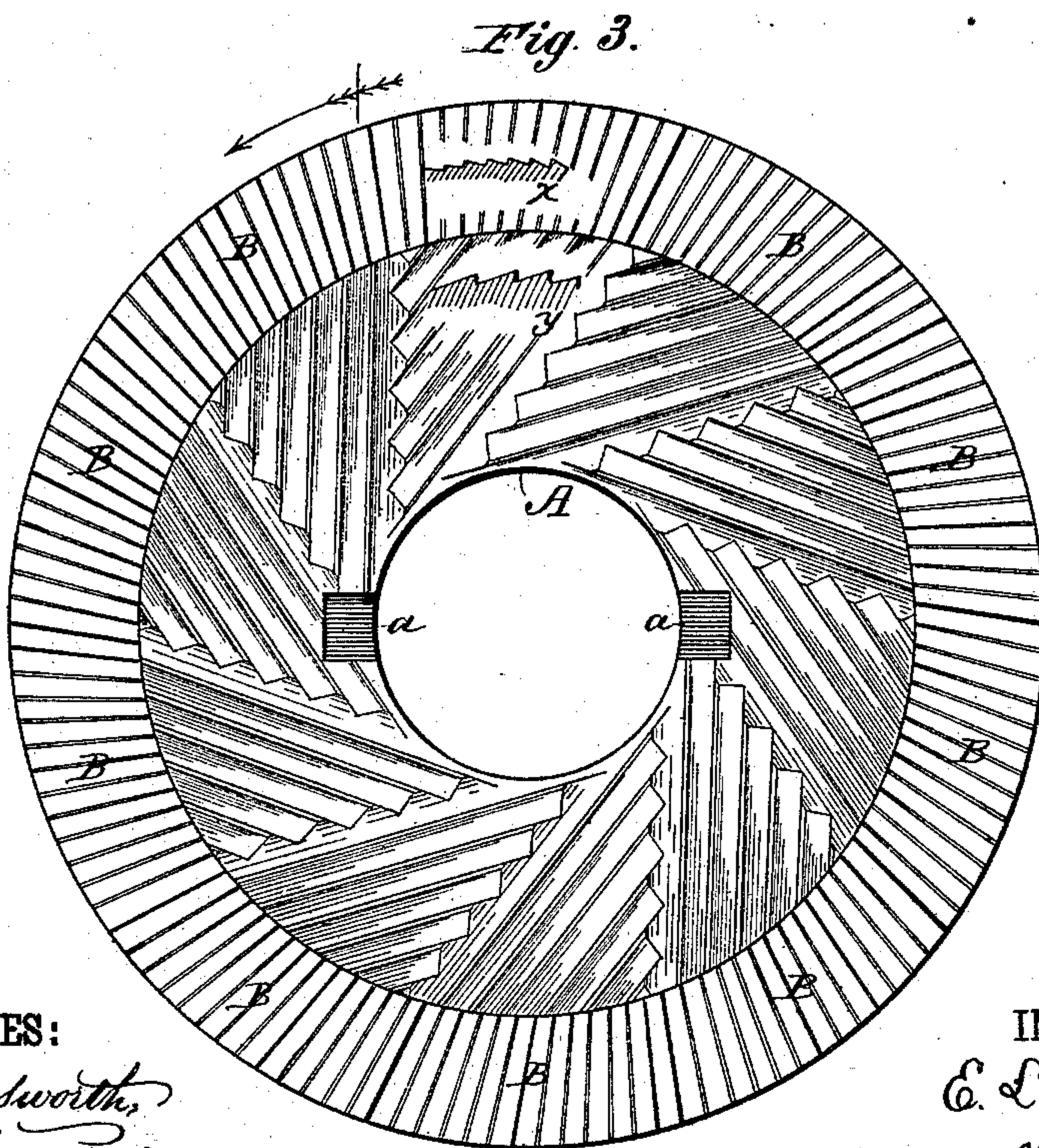
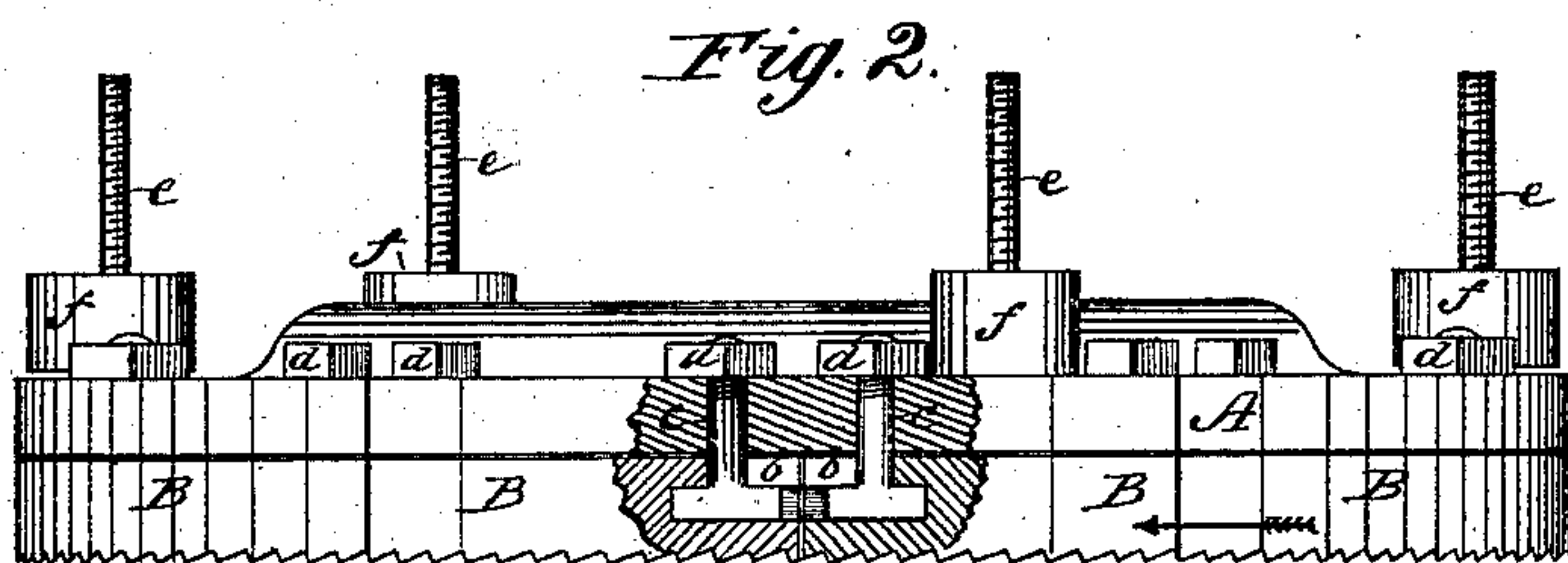
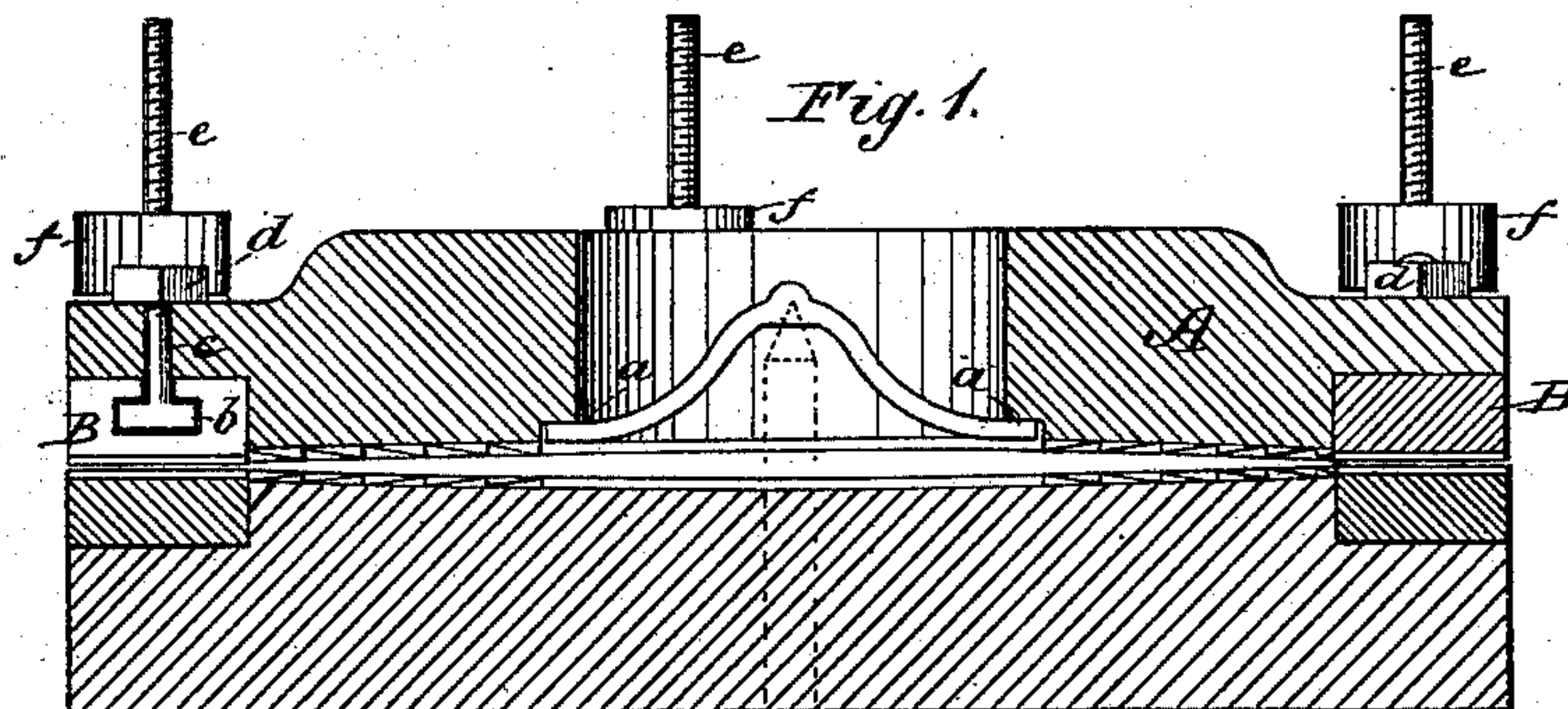


(No Model.)

E. L. BAKER.  
Mill for Reducing Grain.

No. 238,078.

Patented Feb. 22, 1881.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDWARD L. BAKER, OF RED WING, MINNESOTA.

## MILL FOR REDUCING GRAIN.

SPECIFICATION forming part of Letters Patent No. 238,078, dated February 22, 1881.

Application filed May 1, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD L. BAKER, of Red Wing, in the county of Goodhue and State of Minnesota, have invented a new and Improved Disintegrating or Granulating Mill for Breaking Grain; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical central section through the runner and bed-stone. Fig. 2 is an edge view of the runner, with parts broken away to show the manner of holding the segments to the disk. Fig. 3 is a face view of the runner, the other grinder being constructed with a similar face.

My invention is designed to accomplish the disintegrating of grain in milling as is now usually done on grooved iron rolls by a mill or machine applicable to all old-style mills without change in their construction, adapting them with little expense from low-grinding to high-grinding or Hungarian mills, thereby increasing their capacity and usefulness. It is designed, also, to make the best quality of flour while making the greatest possible amount of middlings in disintegrating grain, and to be applied in and take the place of the ordinary French burr-stone now in use. This disintegrating is best accomplished by force applied with moderate motion in contradistinction to the light and rapid impact of the attrition and percussion mills, and by a surface without grit to tear or pulverize the bran.

My invention consists, mainly, in the peculiar dress for the metal disks forming the grinding-surfaces, which dress consists of two series of furrows, an inner series arranged tangential to the eye for draft, and a second series of furrows at the skirt arranged more nearly radial than the inner series, and dressed with the short side of the furrow as the leading-edge. The outer series of furrows are formed in detachable segments by reason of the facility which it affords for renewing or sharpening the furrows, and these segments are secured to the main disk by a peculiar construction and arrangement of parts, which constitute another feature of my invention, as will be hereinafter described.

In constructing my mill in detail I employ two large cast iron or metal disks, the upper or runner having an eye sixteen inches (more or less) in diameter to admit the feed, having the face of these disks planed, with numerous furrows to carry and distribute the grain from the eye quickly to the skirt, where it is caught by furrows smaller and at a different angle or draft, cast in segments of chilled iron set in the body of the disk and raised slightly above the face of the disk, and the face of the furrows of which segments have a reverse inclination to the furrows of the central portion of the disk, and are dressed so that the short side of the furrow is the leading-edge. The inner portion or body of these disks, with the lands and furrows, are designed only for distributing quickly and evenly the grain to be broken, and to facilitate this the center of the disks are dishing one-eighth of an inch in both the bed or under disk and the runner while the segments are on a plane. These large disks of metal are three feet or over in diameter, and weigh from three hundred to twelve hundred pounds for the bed-stone and from one thousand to three thousand or over for the runner, with a recess cut or cast in the body of the runner-disk to receive the bail, to be used for the purpose of disintegrating wheat or other grain, and to be operated like and in the place of the common millstone and applied to the spindle of the ordinary mill, the upper disk or runner to be balanced on a bail, with a driver to be applied to a stationary spindle.

The disintegrating of the grain without producing much flour is accomplished largely by making the face of the furrows or dress in the segments the reverse inclination of the ordinary dress or land in millstones, the lands or bevels on the advance breaking or grinding side being shortest instead of longest, as is the usual form, thus making a cutting action instead of a squeezing action. The depth of the furrows on the segments is less than the diameter of the material to be broken, while that in the body is much greater. The action of these working or breaking segments leaves the bran in much better shape for passing through an aspirator without loss or waste of those heavy particles fit to be reground, as they



are flat, whereas when made upon grooved rollers they are twisted into corkscrew-shapes and carried off by the wind.

In the drawings, A represents the cast-iron runner, whose face, as well as that of the bed-stone, is slightly dishing, and is provided with lands and furrows, like an ordinary millstone, arranged with sufficient draft to distribute the grain. About the periphery of these cast-iron grinders is formed a recess, into which is fitted a removable grinding-surface composed of metallic segments B. These segments are characterized by the following peculiarity with respect to the furrows of the disk: They are of a finer dress, the furrows have less draft, and the inclination of the face of the furrows is the reverse of the furrows of the disk—i. e., the short side of the furrow in the segments is the leading-edge, as shown at *x y*, Fig. 3, so that their action is to break the grain instead of squeezing or mashing it, as the long incline of the furrow does when it is the leading side. The depth of the furrows on the segment is less than the diameter of the grain to be broken, while that of the furrows of the disk is much greater, the latter serving to distribute, and not to break or grind, the grain.

For fastening the segments to the disks the end of each segment is formed with an undercut slot, *b*, so that the head of a bolt, *c*, may be embedded in the segment without showing on the face of the same, allowing the segments to fit flush up against each other. These bolts pass through slots in the disks, and are secured by nuts *d* on the opposite side, so as to hold the segments firmly in place. A feature of merit which this means of securing the segment involves is, first, that it prevents the screw or bolt heads from showing on the grinding-face, and thus does away with lodging-places for mold and prevents the screws or bolts from dropping down between and cutting up the grinding-faces, should the nuts become loose; secondly, as the segments find an abutment against each other throughout the entire periphery, the strain on the bolts is distributed, while the undercut slots in the ends of the segments fit up the one against its neighbor, and thus close up the cavity against the lodgment of dirt and other impurities.

In forming the runner it is constructed with seats *a a* on opposite sides of the eye for the reception of the bail, and its central portions on top are thickened up, so as to give the necessary weight, the center being thickened without thickening the edge, so as to render the balancing of the same more easily effected, for

which purpose vertical screw-stems *e*, with weights *f*, are placed at the thin part of the runner, near the periphery.

In defining my invention more clearly I would state that I am aware that it is not new to construct a cast-iron millstone with detachable segments at the skirt, and I do not claim this, broadly.

I am aware, also, that it is not new to dress a millstone with a series of furrows at the skirt arranged more nearly radial than the furrows within, as shown in patent to Schwab, April 7, 1874. In such case, however, the short side of the furrow was not the leading or cracking edge.

Again, I am aware that it is not new to dress a millstone with a series of furrows at the skirt which have the short edge of the furrows the leading edge, as in patent to Deer, November 20, 1877. In such case, however, the furrows at the skirt are of such great draft (being arranged farther from the radial than the inner furrows) that no cracking action, such as I seek, could take place.

Having thus described my invention, what I claim as new is—

1. A millstone-dress composed of two series of furrows, an inner series of furrows arranged tangential to the eye for draft, and a second series of furrows at the skirt, arranged more nearly radial than the inner series, and dressed with the short side of the furrow for the leading-edge, substantially as described.

2. A disintegrating or granulating mill for breaking grain for after-milling, having grinding-surfaces formed of dressed metal disks provided with detachable metal segments at their skirts, whose faces are arranged in horizontal planes and are provided with a series of furrows dressed with a shorter bevel for the leading-edge, and arranged more nearly radial than the inner series of furrows, substantially as shown and described.

3. The combination of the milling-disk A, recessed at its skirt to receive the segmental sections, the segmental sections B, abutting against each other throughout the entire periphery, provided with undercut slots *b b*, opening at their ends into the adjacent slots, and the headed bolts *c*, having their heads seated in the said undercut slots, and fastened on top of the disk by nuts *d*, substantially as described.

EDWARD L. BAKER.

Witnesses:

EDWD. W. BYRN,  
 SOLON C. KEMON.