

F. E. HITCHINGS.
Paper-Pulp Grinders.

No. 151,877.

Patented June 9, 1874.

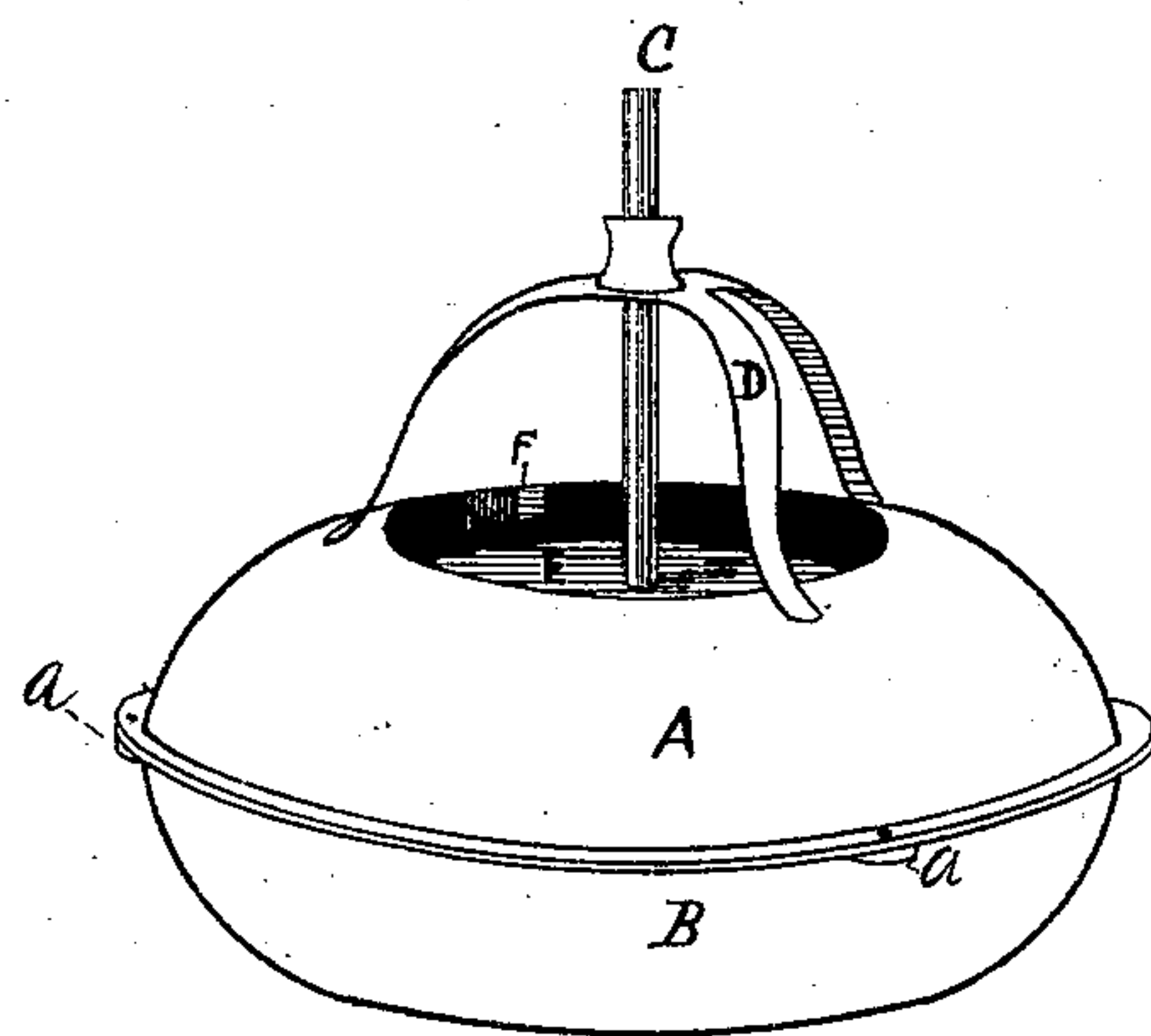


FIG. 1

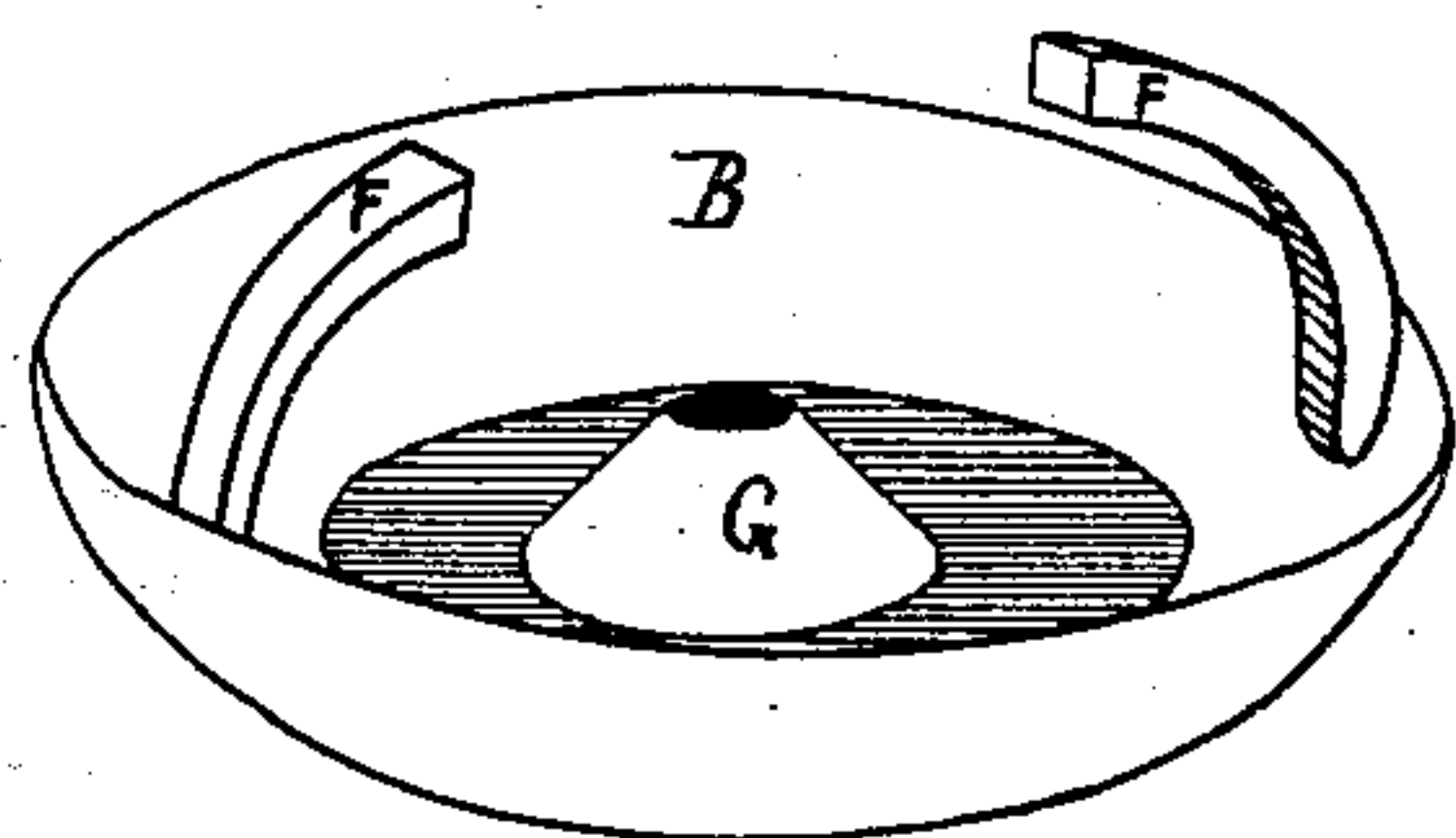


FIG. 2

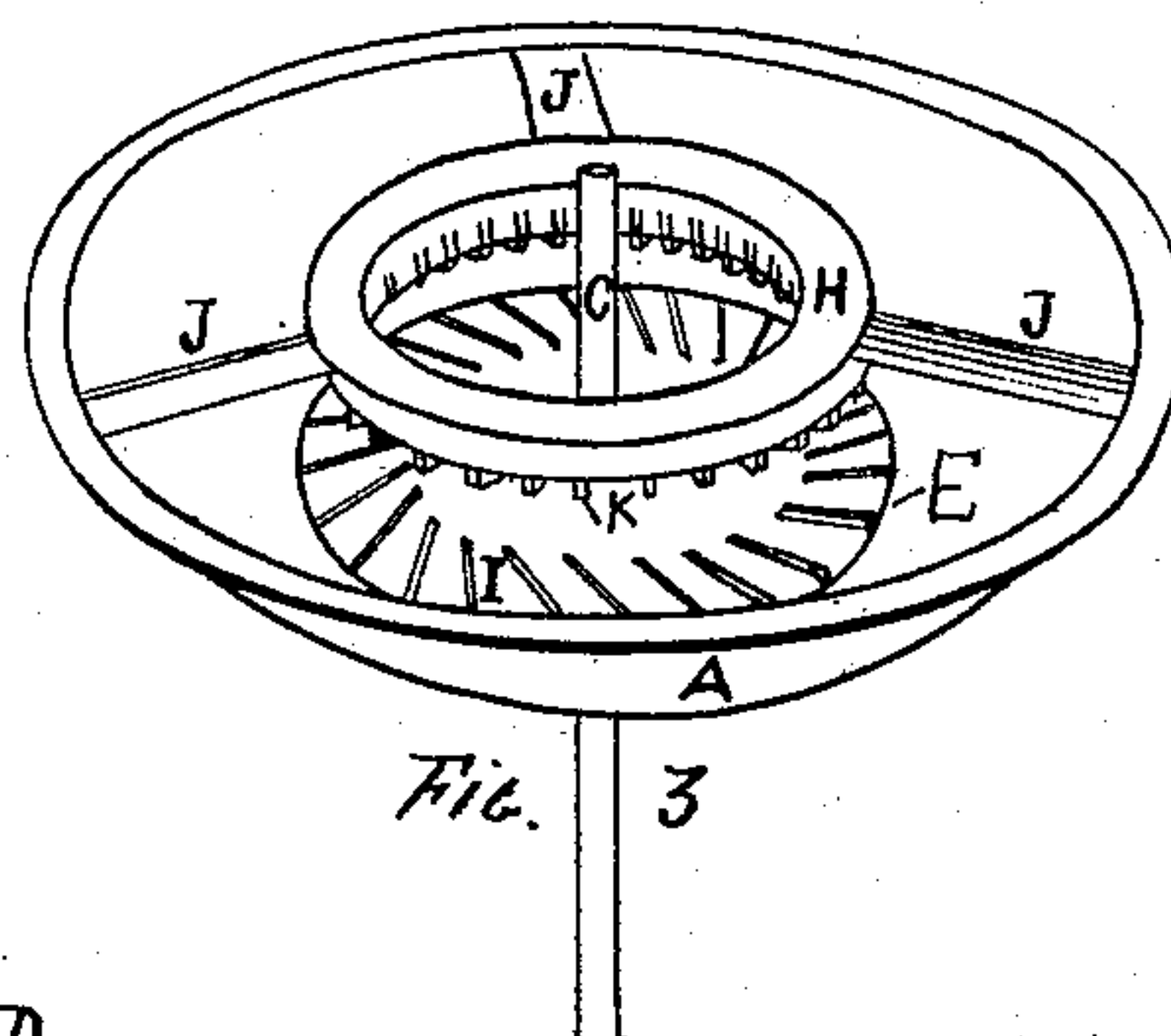


FIG. 3

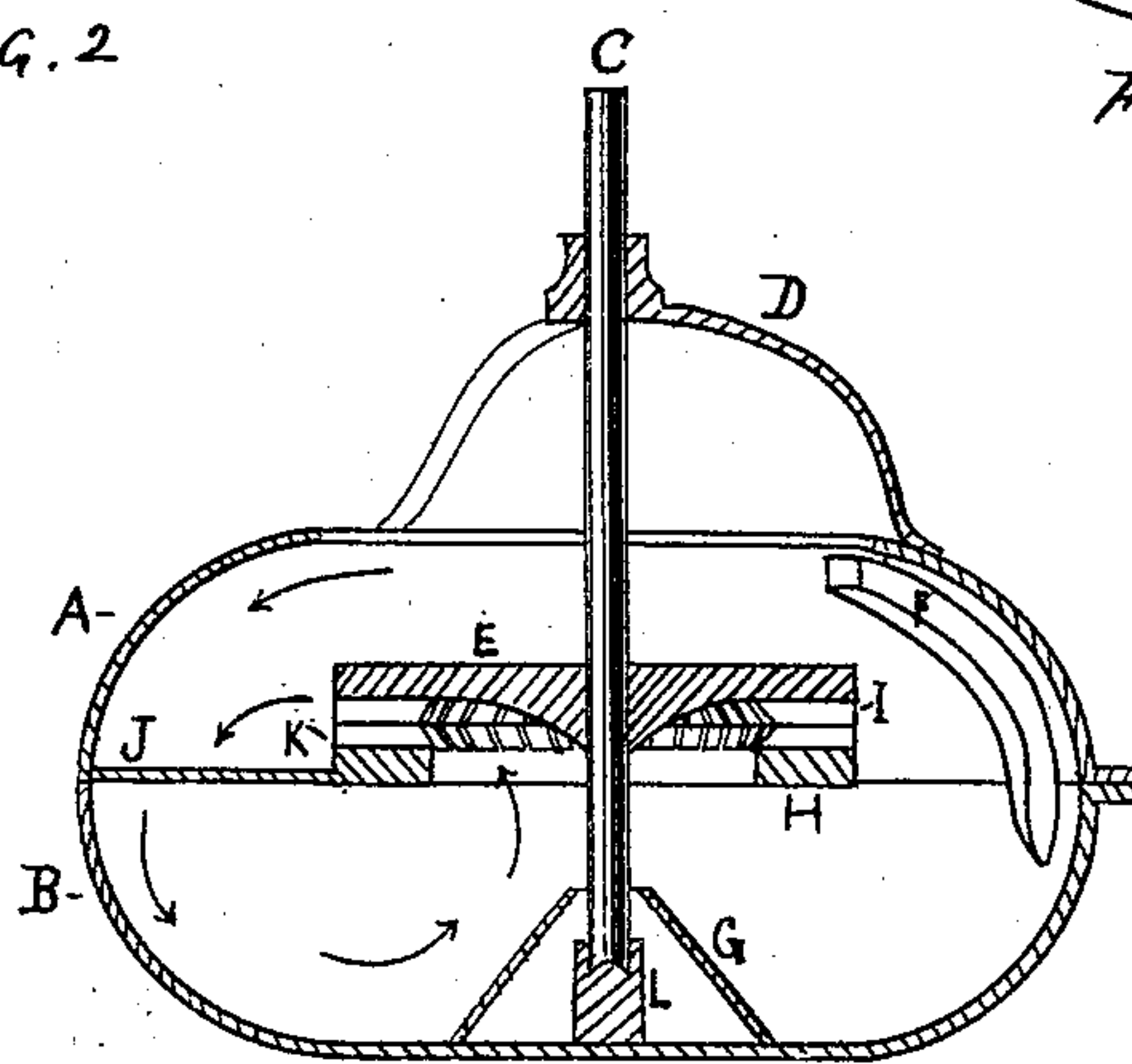


FIG. 4

Witnesses
O. T. Harey
Geo. G. Shaw

Inventor
Frank E. Hitchings,
By C. A. Shaw
Atty.

UNITED STATES PATENT OFFICE.

FRANK E. HITCHINGS, OF GARDINER, MAINE, ASSIGNOR TO SIMEON L. GOULD, OF SAME PLACE.

IMPROVEMENT IN PAPER-PULP GRINDERS.

Specification forming part of Letters Patent No. **151,877**, dated June 9, 1874; application filed April 25, 1874.

To all whom it may concern:

Be it known that I, FRANK E. HITCHINGS, of Gardiner, in the county of Kennebec and State of Maine, have invented a certain new and useful Improvement in Paper-Pulp Grinders; of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which my invention appertains to make and use the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is an isometrical perspective view of my improved engine; Fig. 2, a sectional view, showing the interior of the base; Fig. 3, a sectional view, showing the interior of the cap reversed; and Fig. 4, a vertical section taken through the center of the shaft.

Like letters indicate corresponding parts in the different figures of the drawing.

My invention pertains to machinery for the manufacture of paper, relating especially to that class of pulp-grinders known as beaters; and consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a simpler and more effective machine of this character is produced than is now in common use.

The body of my improved grinder is in form a spherical shell, flattened at the poles, being composed of the cap A and base B, united by bolts *a a* passing through annular flanges, as shown in Fig. 1. The cap A has a large circular opening at its apex, and is provided with the tripartite brace or stand D, in which the vertical shaft C is journaled. Arranged upon this shaft there is a grinding-disk, E, Fig. 4, provided with radial beaters or teeth I upon its under surface, which work in contact with corresponding teeth K on the upper surface of the stationary or annular grinding-disk J, the lower disk being provided with a large central opening, through which the shaft passes, and supported midway in the body of the grinder by means of the horizontal arms J J, as shown. The shaft C rests in the step L, around which is arranged the hollow frustum or conical deflector G, as best seen in Fig. 2. The stops F F are attached to the base B,

and are for the purpose of breaking up and changing the rotary or horizontal currents formed by the action of the disk E, thus causing the stock in the engine to be properly directed to the grinding-disks. The teeth I are set diagonally to a line drawn through the center of the shaft C, on a plane with the face of the disk E, the teeth K being set in the same order with respect to the disk H, but inclining laterally in an opposite direction, or in such a manner that when the disk E is revolved in contact with the disk H the teeth of the respective disks will act conjointly, like the blades of shears, cutting from the periphery of the disks inwardly. This arrangement has been found to be much more effective than when the teeth are so disposed on the disks that the cut commences at the opposite ends of the teeth, or nearest the center of the disk, as in the latter case the pulp or stock is liable to be thrown by centrifugal force from between the disks before being properly acted upon by the teeth.

From the foregoing the nature and operation of my invention will be readily understood by all conversant with such matters.

The engine being properly filled for use, if the shaft C is caused to revolve, a powerful current in the direction of the arrows in Fig. 4 will be created by the centrifugal action of the disk E in a manner which will be readily obvious without a more elaborate description, the contents of the engine passing down between the arms J J, up through the aperture in the disk H, and out between the disks, to be again returned and acted upon in the same way. The object of the deflector or cone G is to deflect or turn the current upwardly, and direct it through the disk H as it descends between the arms J. I sometimes convert my improved engine into a washer by using an ordinary washing-cylinder, arranged in any convenient manner above the disk E, at the same time disconnecting said disk from the shaft, or elevating it from contact with H.

I am aware that in Letters Patent No. 120,265, dated October 24, 1861, reissued July 16, 1872, and numbered 4,976, a paper-pulp grinder is described, in which the lower grind-

ing-disk is arranged upon the bottom of the engine, the upper disk being provided with apertures, through which the contents of the engine pass to the disks, and I therefore make no claim to the same broadly, one objection to such an arrangement being that the grinders are liable to clog from the pulp settling to the bottom of the engine; and another, that rocks and other foreign substances which sometimes accidentally find their way into the engine, will settle to the bottom and be carried through between the grinding-disks, frequently causing great injury to the mechanism. My invention is designed to obviate these and other difficulties in such engines, and to this end I elevate the grinding-disks, as shown in Fig. 4, providing the lower disk with a central aperture, and constructing the upper one whole, as described, so that rocks and similar foreign substances will settle to the bottom without being carried between the disks, and the disks will not become clogged.

I am aware that it is common in wood-grinding machines to use disks provided with teeth so arranged as to give a shearing cut from the periphery toward the center, and therefore do not claim the same broadly when in and of itself considered.

Having thus described my invention, what I claim is—

In a paper-pulp grinder, the disks E K, arranged horizontally in an elevated position in the body of the grinder, the superposed disk E being constructed whole and rotating upon a vertical axis, and the stationary disk K, having a central opening, substantially as and for the purpose specified.

FRANK E. HITCHINGS.

Witnesses:

JOSIAH MAXCY,
J. S. MAXCY.