

D. J. & E. J. AMES.
Feed-Grinding Mill.

No. 226,152.

Patented April 6, 1880.

FIG. I

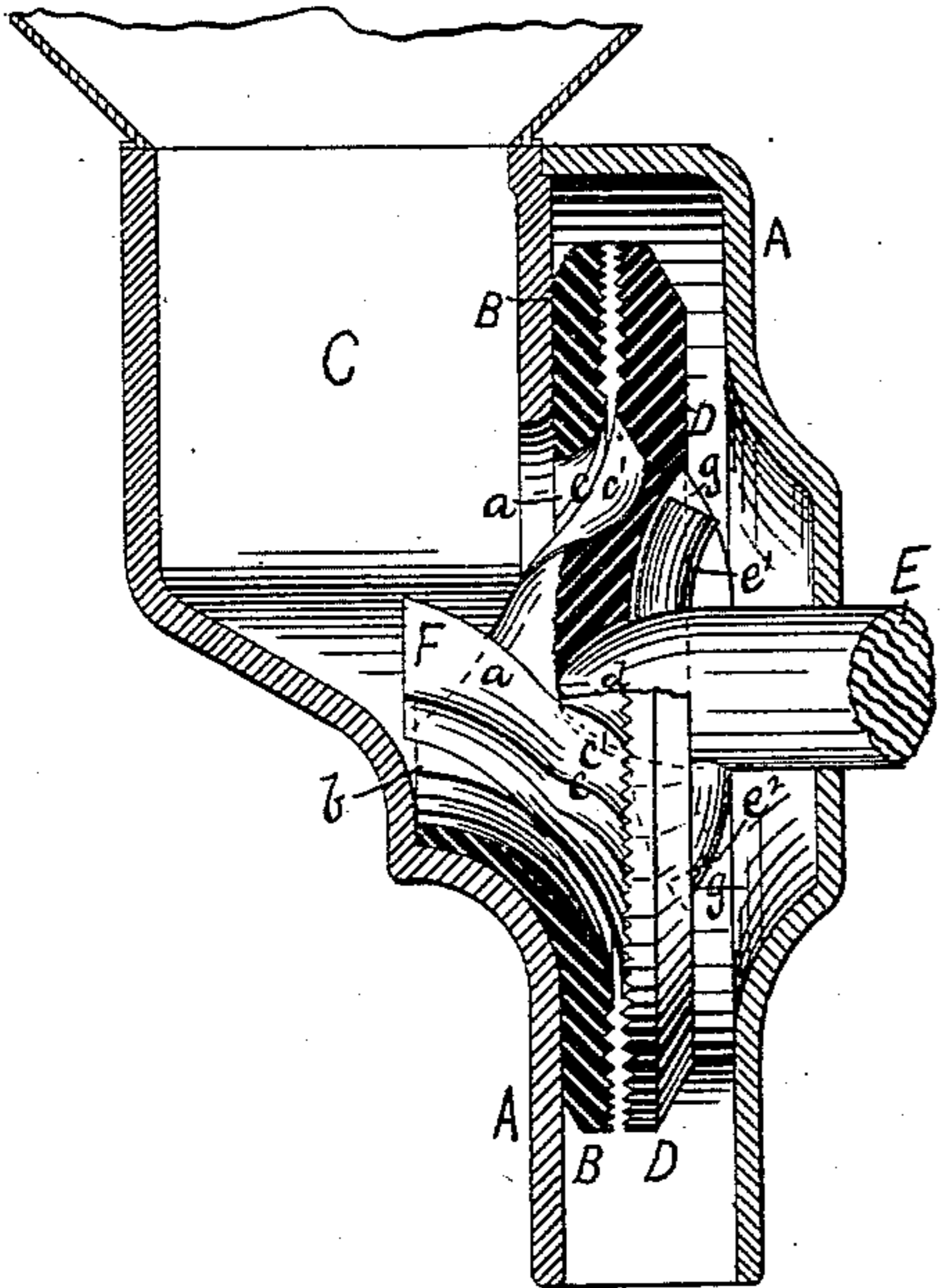


FIG. II

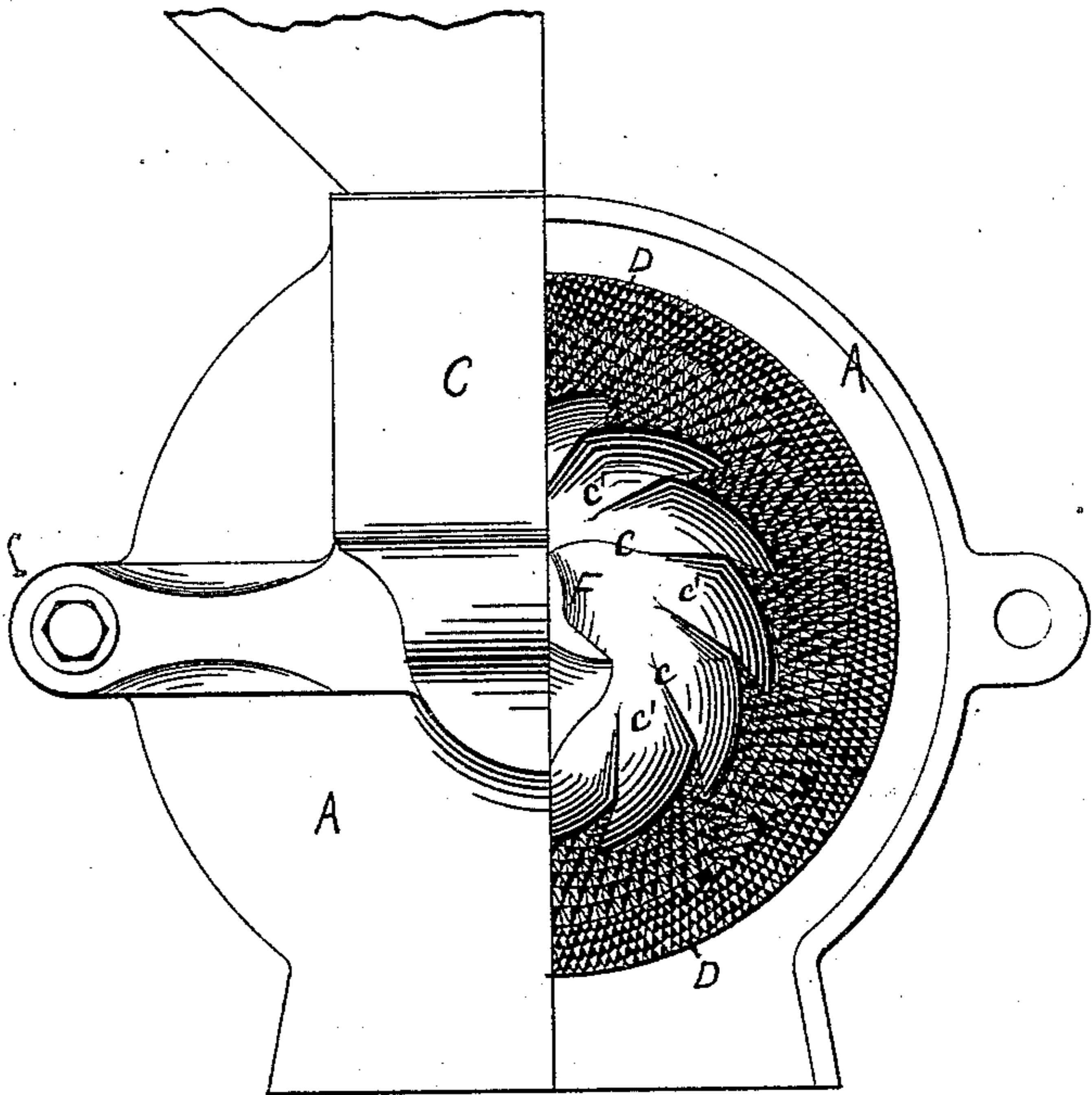


FIG. III

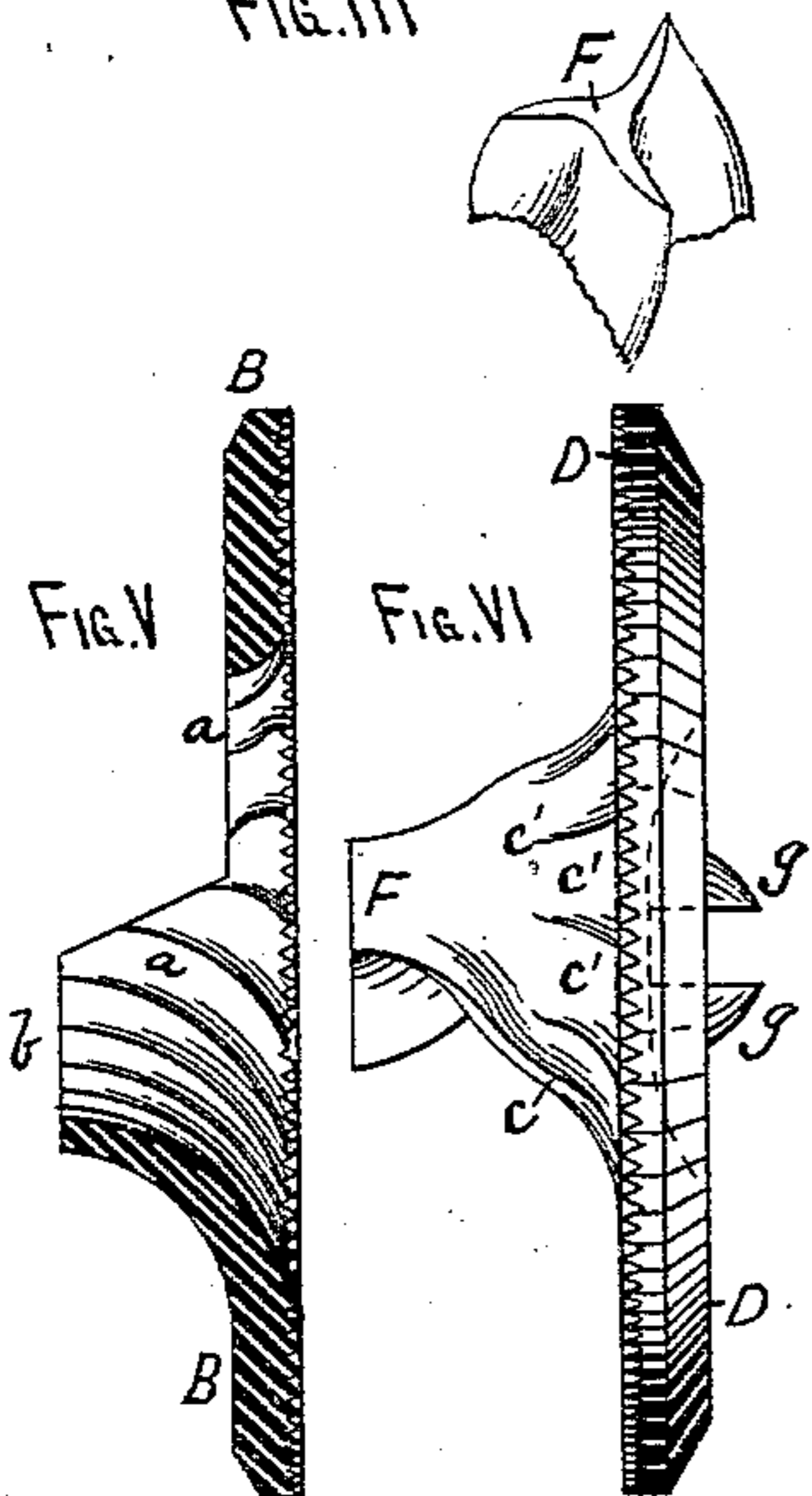


FIG. V

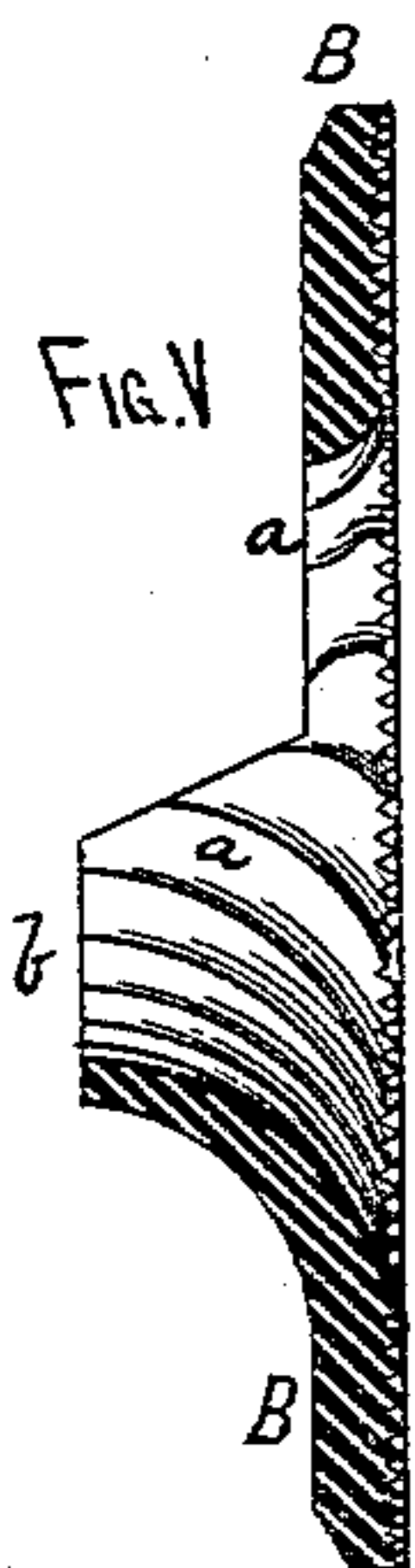


FIG. VI

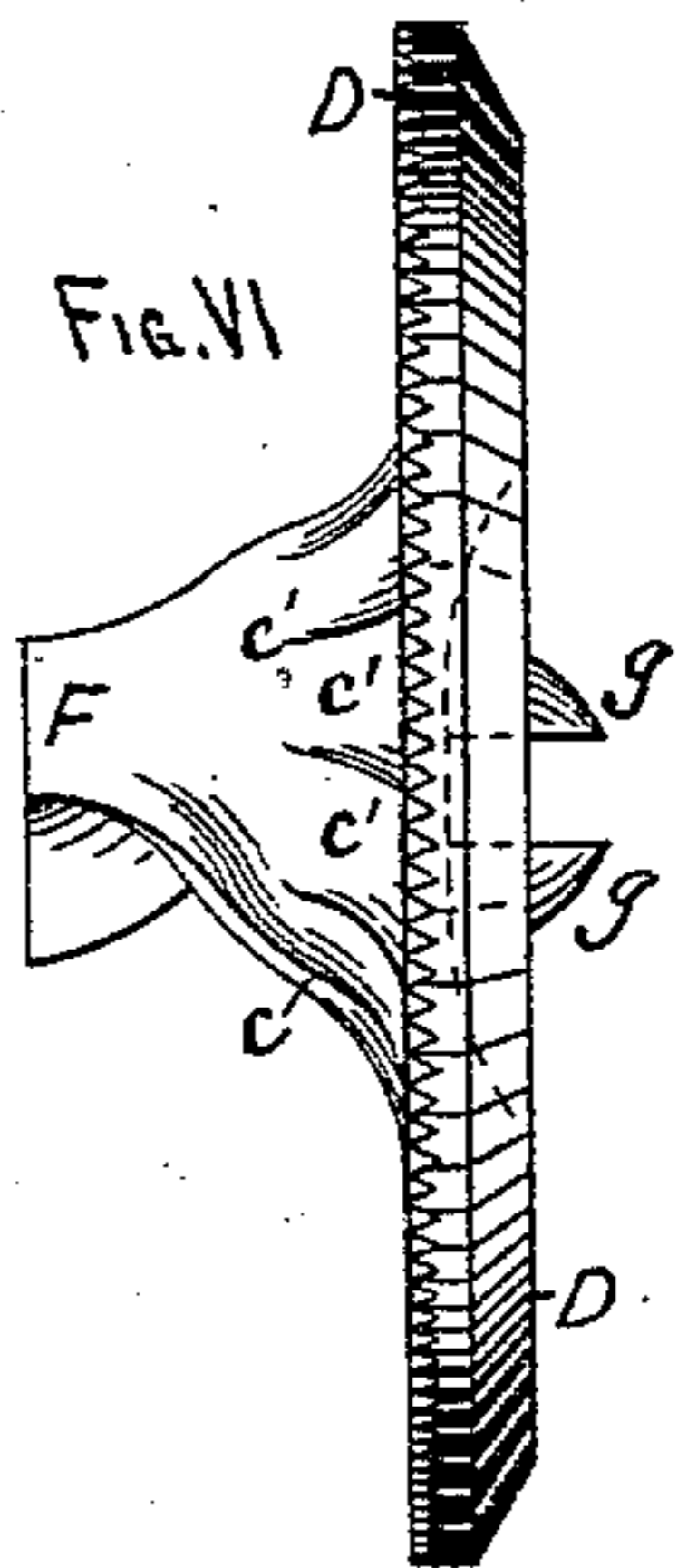
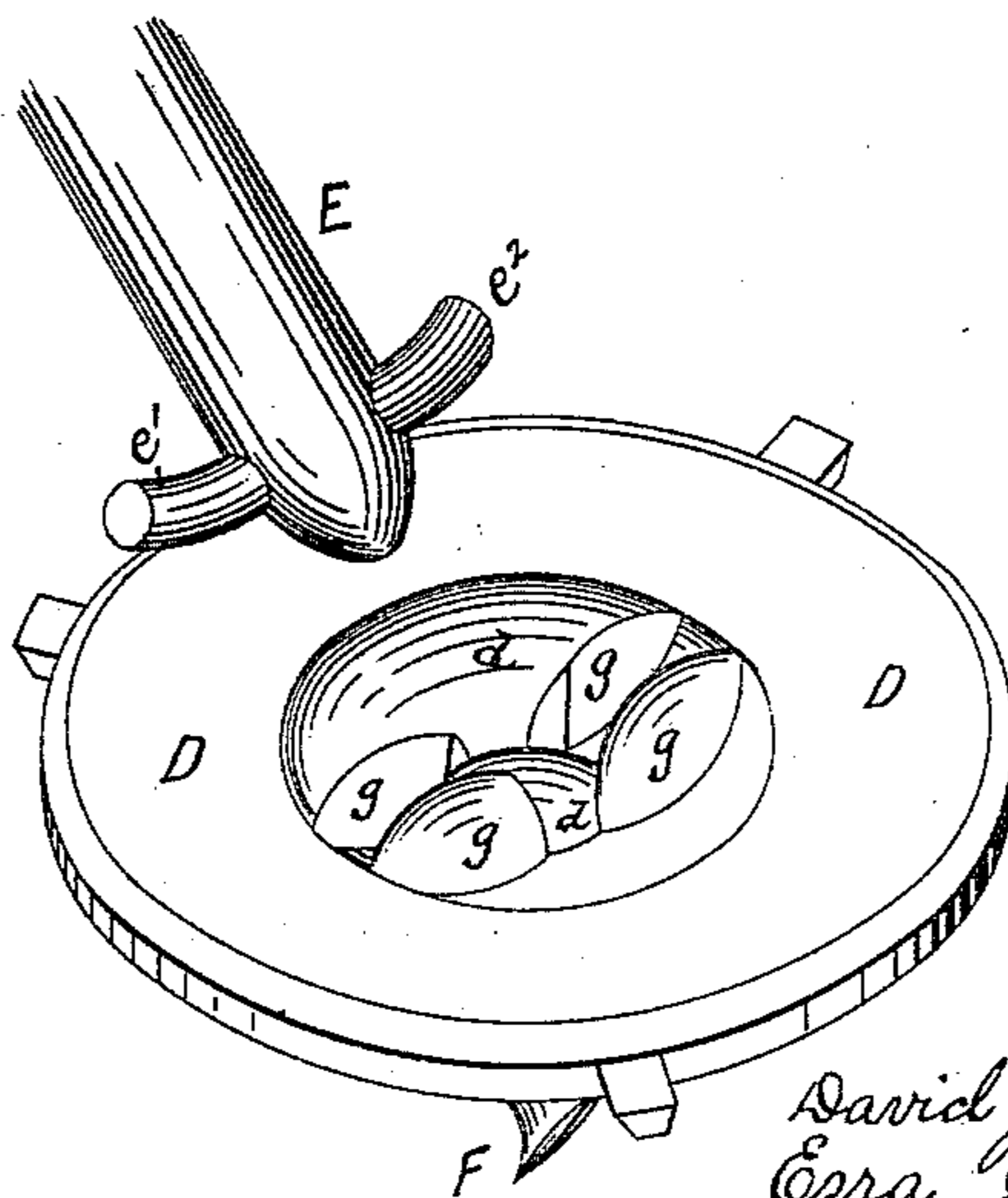


FIG. IV



WITNESSES.

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UNITED STATES PATENT OFFICE.

DAVID J. AMES AND EZRA J. AMES, OF AUSTIN, MINNESOTA.

FEED-GRINDING MILL.

SPECIFICATION forming part of Letters Patent No. 226,152, dated April 6, 1880.

Application filed October 20, 1879.

To all whom it may concern:

Be it known that we, DAVID JACKSON AMES and EZRA JASPER AMES, both of Austin, Mower county, Minnesota, have made certain new and useful Improvements in Feed-Mills, which improvements are fully set forth in the following specification and accompanying drawings, in which—

Figure I is a sectional side elevation. Fig. II is a semi-sectional front elevation. Fig. III is a perspective view of a portion of the spiral feeding conveyer or screw. Fig. IV is a perspective view of the rear of the runner-burr and a portion of the spindle, showing the method of driving the runner; Figs. V and VI, side elevations of the two burrs detached.

This invention relates to grinding-mills, &c., and is an improvement on our patent of April 30, 1878, and numbered 203,100.

The invention consists in the manner of driving the runner-burr, whereby a universal or swivel movement is obtained to enable the burr to adapt itself to any irregularities that may occur, and whereby the runner-shaft does not pass through the hopper, as hereinafter shown.

The invention further consists in a circular plate or disk provided with fine cross grooves or furrows on the outer rim and a spiral cone at the center, provided with coarse radial grooves sunk below the fine cross-grooves, as hereinafter more fully set forth.

A is the casing or shell, made in any suitable manner, and provided with a stationary annular ring or burr, B, having its inner periphery cut into large tangential grooves and wings *a*, and with its lower half, *b*, projecting outward into the lower part of the feed-hopper C. The outer edge of the inner surface of this ring or burr B is cut into tangential channels, and these are crossed by a series of back cut grooves or channels, as shown and described in our patent above referred to.

D is a circular plate, having the same kind of cross-grooves near the rim as the ring B, and provided at its center with a cone-shaped projection, having tangential wings *c* and cavities *c'* on its edge and a spiral or screw-shaped conveyer, F, rising from its center, said cone and spiral being made to conform

to the shape of the inner edge of the annular ring B and the curved projection *b*, as shown in Figs. I, V, and VI.

The cavities *c'*, it will be observed, are sunken below the lower surface of the small cross-grooves, and thus form reservoirs or chambers, into which a large percentage of the grain runs before being finally ground, and from which it is spread out between the fine cross-grooves by the centrifugal action of the runner. By this means the capacity of the mill is increased, and the grain is fed much faster than where the cavities or furrows are shallow at this point. It also prevents choking or clogging, as these cavities act as relievers to take up the extra grain. In the rear side of this inner burr, D, is a semi-spherical cavity, *d*, into which the rounded end of the spindle E sets, and by which the two burrs are held in contact. Two pins, *e'* *e''*, project from the sides of the spindle near its end, and rest between four lugs, *g*, upon the burr D, by which means the burr is driven. By this arrangement the burr D is free to move about in any direction, to a limited extent, upon the point of the spindle, to adapt itself to any irregularities that may occur on the surface of either of the burrs; but the principal advantage we obtain by this arrangement is that we are enabled to drive the burr from the rear, and thereby avoid running the spindle through the hopper C, which obstructs the passage of the grain and reduces the capacity of the mill. By our arrangement, however, no obstruction is placed in the hopper, but all the space is utilized for the grain.

By our arrangement of the spiral conveyer F and tangential wings *c*, the grain is drawn from the hopper C and forced outward between the grinding-surfaces of the burrs with considerable power, and thus the capacity of the mill greatly increased.

Another great advantage gained by this arrangement is that no screws or bolts are required to hold the burrs in place, thereby greatly simplifying the construction of the machine and utilizing the parts of the grinding-surfaces heretofore required for the bolt or rivet heads.

Having thus described our invention, what

we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the runner-burr D, provided with the semi-spherical cavity *d*,
5 having the lugs *g g*, of the spindle E, having the rounded end, and curved pins *e' e'*, adapted to fit into the semi-spherical cavity and between the lugs, whereby the runner, while being revolved by the pins and lugs, is free to
10 move in any direction on the rounded head of the spindle, and the runner-shaft does not pass through the hopper, substantially as described.

2. The runner-burr D, having fine cutting-
15 grooves at the outer edge and a spiral conveyer, F, at right angles thereto at its center,

said spiral conveyer being provided with tangential wings *c*, with deep-cut tangential furrows *c'* arranged between them, said furrows being sunk below the fine cutting-grooves, to
20 serve as reservoirs or chambers to assist in conveying the grain to the grinding-surfaces, substantially as set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing
25 witnesses.

DAVID JACKSON AMES.
EZRA JASPER AMES.

Witnesses:

W. L. HOLLISTER,
G. M. CAMERON.