

(No Model.)

P. STEINMETZ.

GRINDING MILL.

No. 248,118.

Patented Oct. 11, 1881.

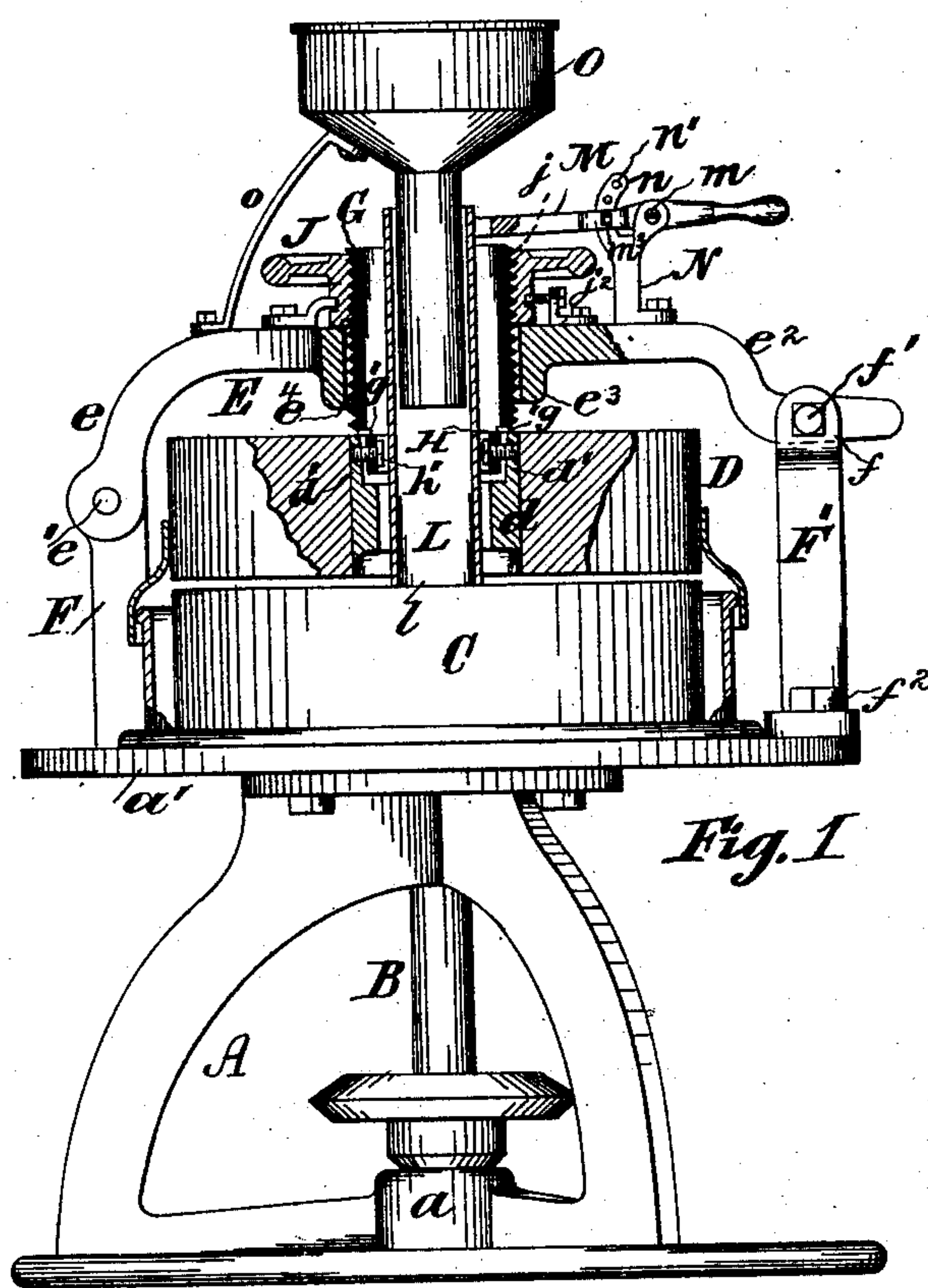


Fig. 1

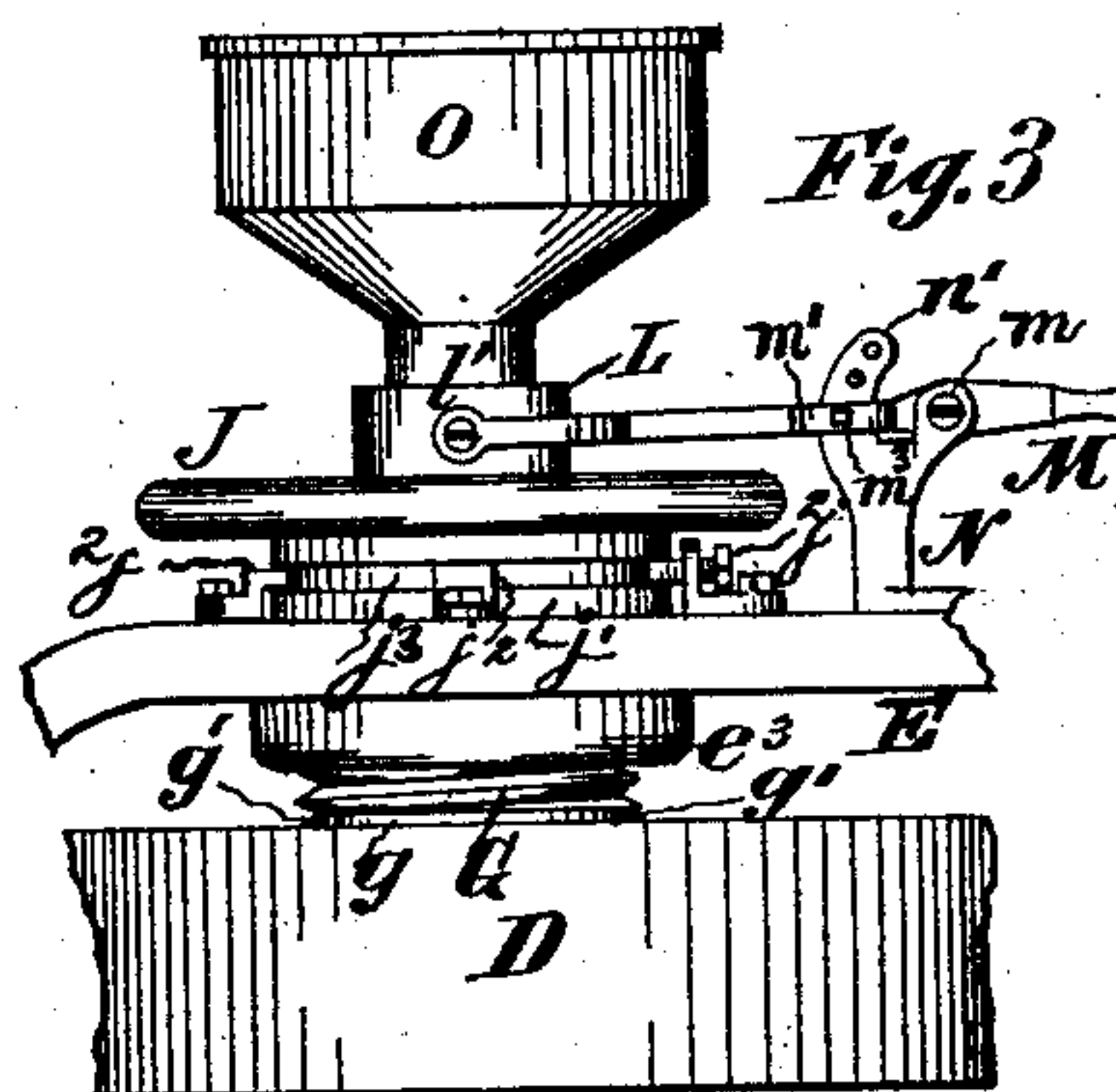


Fig. 3

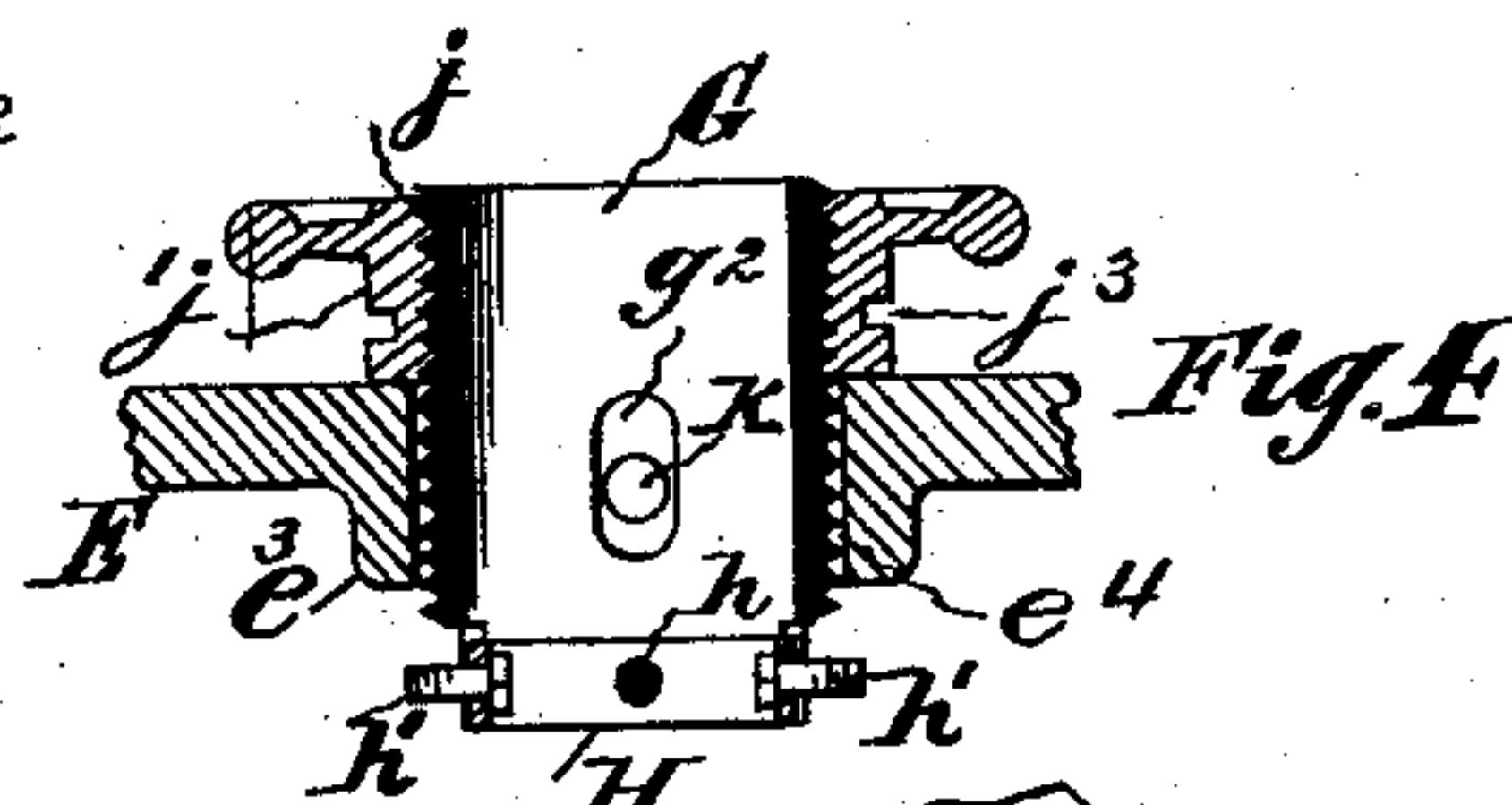


Fig. 4

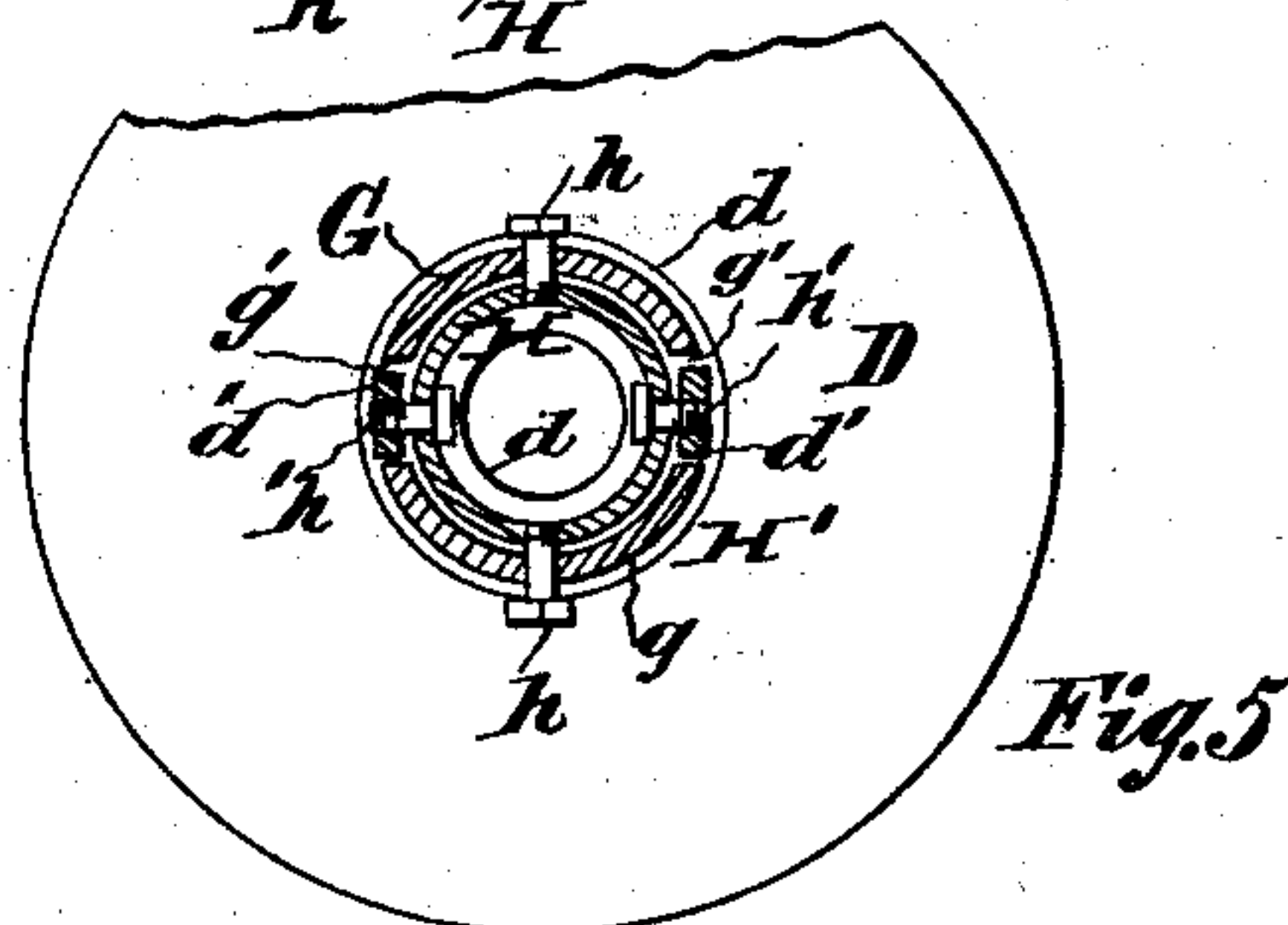


Fig. 5

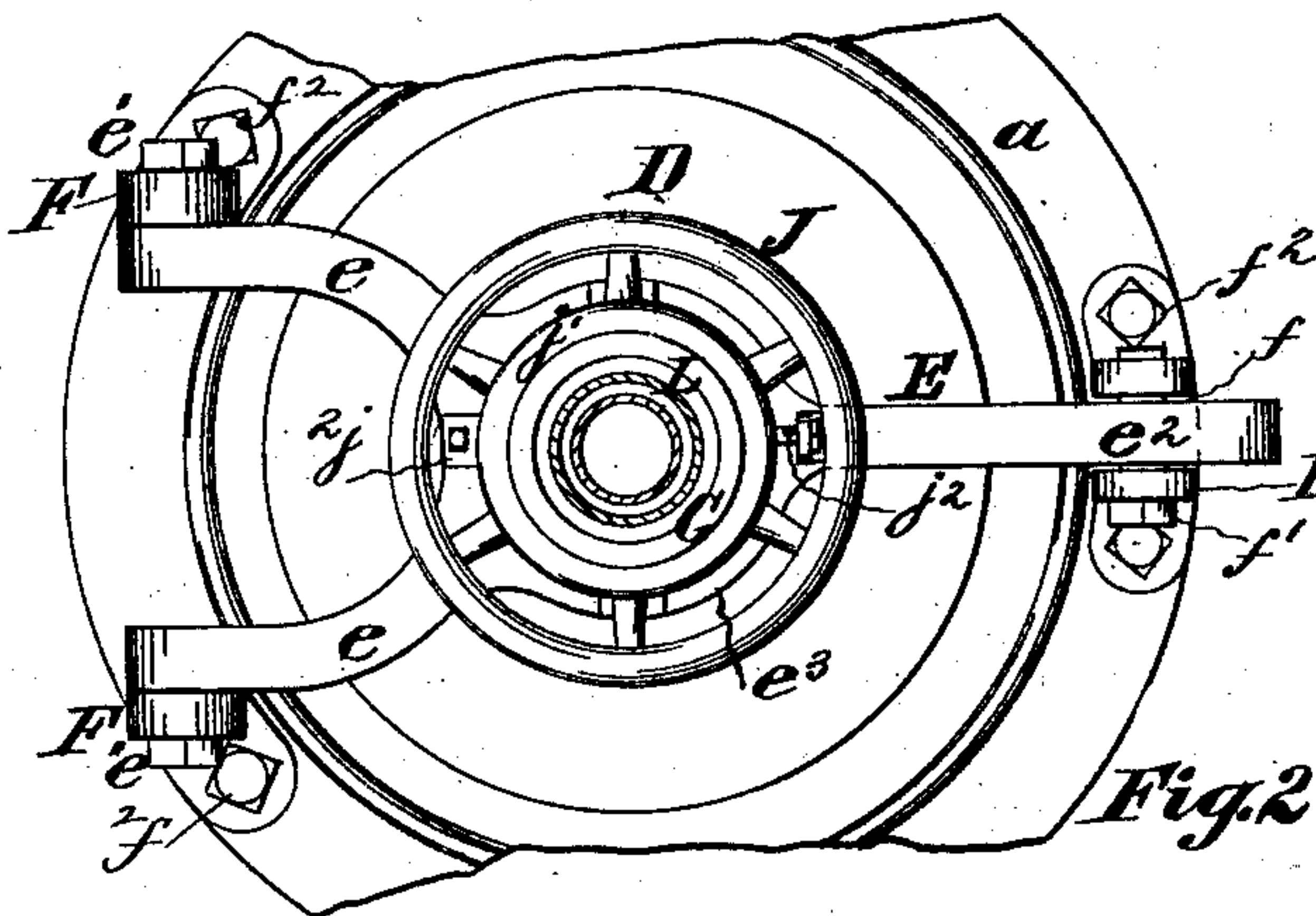


Fig. 2

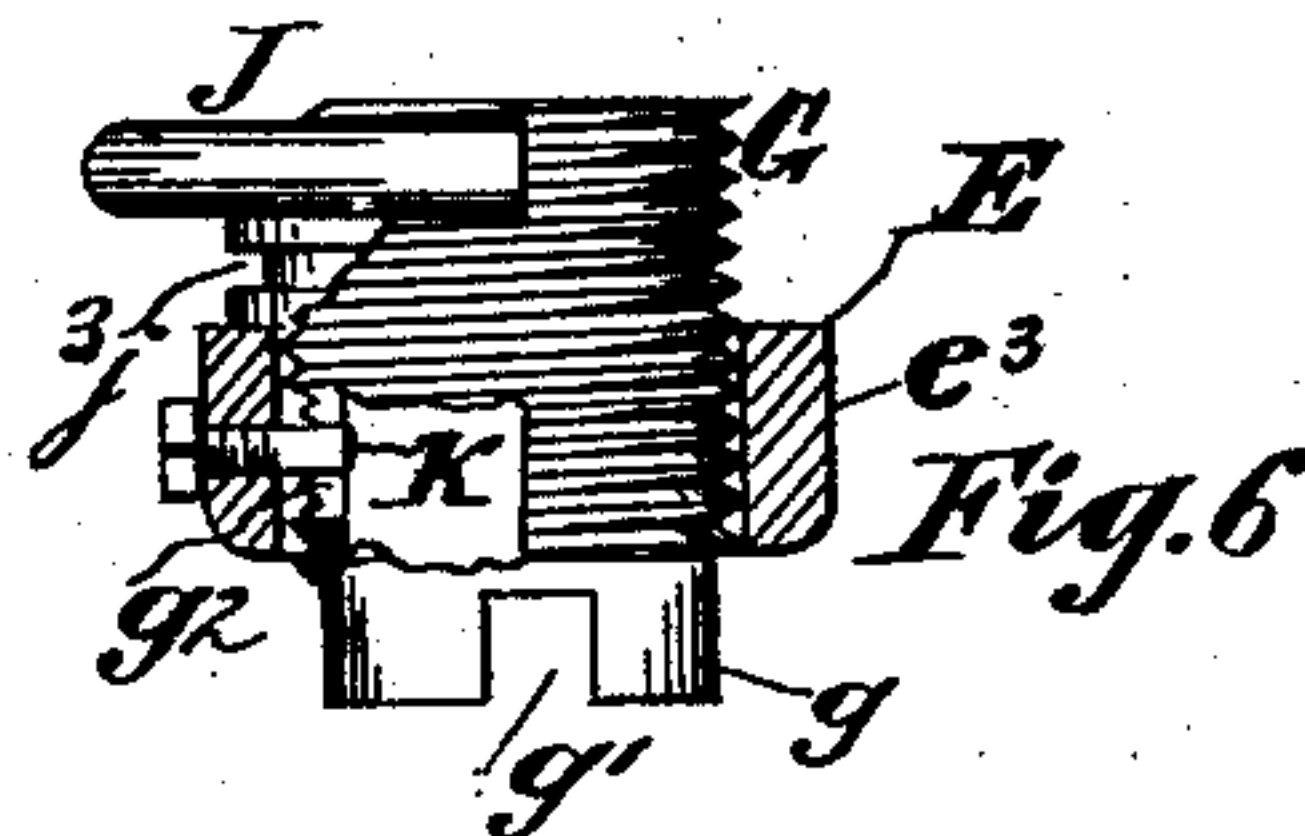


Fig. 6

WITNESSES:  
Frank Blayney  
Thomas Conlin

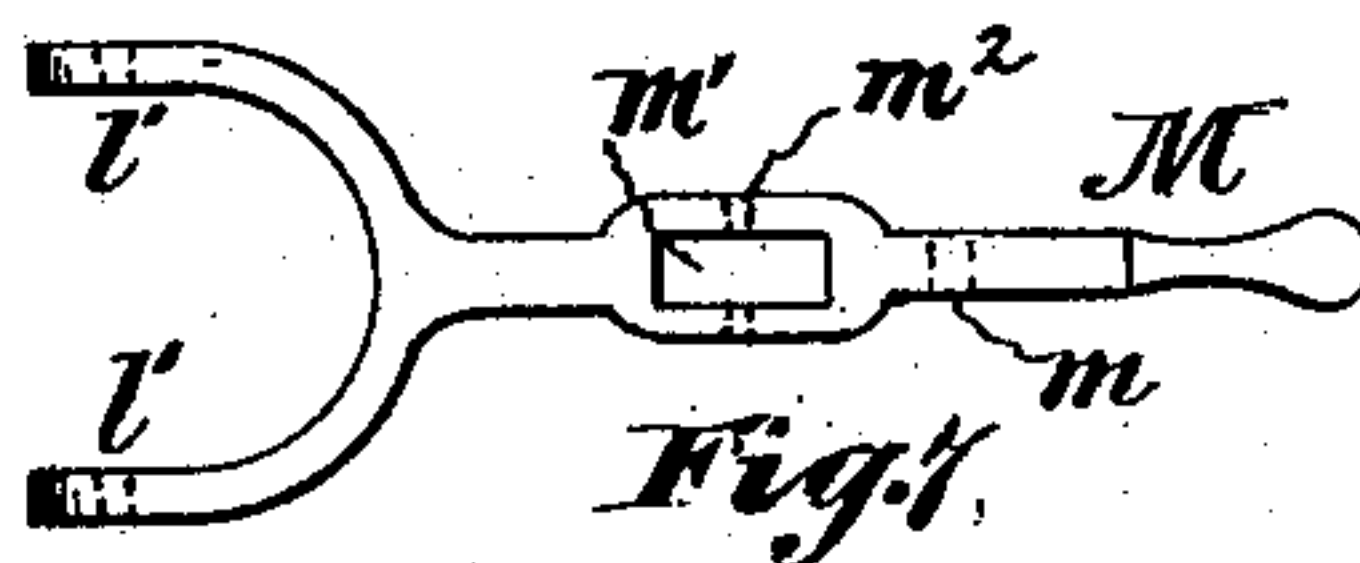


Fig. 7

INVENTOR,  
Philip Steinmetz.



# UNITED STATES PATENT OFFICE.

PHILIPP STEINMETZ, OF PHILADELPHIA, PENNSYLVANIA.

## GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 248,118, dated October 11, 1881.

Application filed January 28, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIPP STEINMETZ, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification, reference being had to the accompanying drawings, wherein—

Figure 1 is a vertical section, partly in elevation, of a grinding-mill embodying my improvements. Fig. 2 is a broken plan of the same, partly in section. Fig. 3 is a broken elevation of the upper part of the mill. Fig. 4 is a detail section of the threaded tube, its operating-wheel, and universal-joint connection. Fig. 5 is a broken plan of the bed-stone and a sectional view of the universal-joint connection. Fig. 6 is a detail elevation, partly in section, of the threaded-tube, hand-wheel, and bail-hub, and Fig. 7 is a detail-plan of adjusting-lever for feed-shoe.

My invention has for its object to provide a grinding-mill of extreme simplicity and durability, having its grinding-surfaces so arranged that they will always be in tram, and which may be easily and readily adjusted to and from one another to vary the degree of fineness or coarseness of the grind.

My invention accordingly consists in the novel construction, combination, and arrangement of parts hereinafter set forth.

Referring to the accompanying drawings, A represents the husk or frame of a portable grain-grinding or other mill provided with a step-bearing, *a*, for the spindle B, and to the upper end of the latter is secured the running-stone C, which is loose or balanced thereon in the usual manner. Said spindle rests and revolves in said step-bearing, and also has a bearing in the top plate, *a'*, of the husk A. It has no vertical or to-and-fro movement, consequently the running-stone affixed thereto always revolves in the same or an unvarying plane.

D represents the bed-stone, in the eye of which is firmly and rigidly secured a ring, *d*, having two projections or lugs, *d'* *d'*.

E is a three-arm bail, its arms *e e* being hinged at *e'* *e'* to standards F F', and its remaining arm, *e''*, resting in the slot *f* in standard F', and is held therein against accidental

displacement by a bolt or pin, *f'*, which passes through openings in said standard and arm. The standards F F' are bolted or otherwise fastened to the top plate, *a'*, of frame A by screws or bolts *f'' f'' f''*. The bail E has also a central annular portion or hub, *e''*, having a plain or unthreaded opening, *e''*, into which slides a pipe, G, exteriorly threaded, as shown. The opening *e''* in bail E is just large enough to admit pipe G, so that the latter can move therein without play or wobbling. The lower portion of said pipe is reduced in diameter or unthreaded, as shown at *g*, Fig. 6, and in the edge of which is formed two opposite recesses or slots, *g'* *g'*; into which project the lugs *d'* *d'* of ring *d* in bed-stone D, as shown.

H represents a ring secured within the lower end of tube G, and held in position therein by the screws *h h* passing through the walls of tube G and into said ring H to form pivotal points for the same to swing upon.

*h' h'* are other screws passing from or through the ring H, and are secured in the lugs *d'* *d'* of the ring *d* in bed-stone D, said construction, as is plainly shown in Fig. 5, forming a universal joint, H', for the attachment of said bed-stone D to said tube G, whereby said bed-stone automatically yields or accommodates and trams itself to the runner C during the grinding.

J is a hand-wheel, having threaded central opening, *j*, to screw upon tube G. On the external face of the hub *j'* of wheel J is formed an annular recess, *j''*, into which project screws or pins *j'''* secured to bail E, as shown. Said pins or screws, working in recess *j''*, serve to retain the wheel J in a fixed plane on the bail E, and at the same time do not interfere with its free rotation in said plane. The wheel J screwing upon tube G holds the latter in position within the opening *e''* of bail E; hence said tube and attached bed-stone D are secured to bail E by said wheel J.

K is a screw passing through hub *e''* of bail E, and enters an elongated slot, *g''*, in tube G, as plainly shown in Figs. 4 and 6. The effect of such construction is that when the wheel J is turned either to the right or to the left the tube G is raised or lowered, (being prevented from turning by the screw K,) and the bed-stone D is thereby caused to recede from or approach the runner C. Thus the bed-stone



is adjusted to and from the running-stone by simply turning wheel J in contrary directions, the amount of said movement being regulated by the desired coarseness or fineness of the grinding, such adjustment being made as readily when the mill is running as when it has ceased to do so, it not being necessary to stop the mill to effect the said adjustment.

L is the feed shoe or tube, its lower edge, *l*, resting upon the running-stone C, as shown in Fig. 1. When in such position the feed is cut off. Said shoe extends upwardly through the eye of the bed-stone and through pipe G, and to its upper end is pivoted, at *l' l'*, a bifurcated lever, M, having a pivotal bearing, *m*, in a bracket, N, secured, as shown, to bail E. Said lever M is formed with a slot, *m'*, through which passes an arm, *n*, projecting from bracket N. Said arm *n* is provided with openings *n' n'*, as shown, whereby when said shoe L is raised or lowered by properly operating lever M, it is held in such adjusted positions by means of a set-screw, *m<sup>3</sup>*, passing through apertures *m<sup>2</sup> m<sup>2</sup>* in lever M, and through one of the openings *n'* in arm *n* that may register therewith. The extent of the raising and lowering of said tube or shoe L regulates the amount of the feed, for the higher the edge *l* thereof is away from runner C the greater will be the feed, and as the distance between said edge and stone is gradually or otherwise lessened the feed decreases until it is cut off when edge *l* impinges on the runner.

O is the hopper, provided with spout or tube leading therefrom to the tube or shoe L, and is supported in position by legs *o o* secured to bail E; or, if desired, it may be supported by tube G, or in any other suitable manner.

The operation is obvious. The fineness of the grind being determined upon the bed-stone D is adjusted in relation to the runner C by turning the wheel J. The shoe L is raised until the necessary amount of feed is provided for, and held in such position by set-screw *m<sup>3</sup>*. The power is now applied to wheel on spindle B. The grain or other material to be ground passes down through shoe L to stone C.

A mill so constructed is exceedingly simple and durable, as none of its parts are exposed to undue wear. The support of the bed-stone being central, and the latter hanging pendent on a universal joint, it automatically trams itself to the running-stone, thereby decreasing the friction of grinding and having the effect of requiring less power to operate said stones to cause them to perform a given amount of work. The adjustments for the bed-stone and feed are made without disconnecting or loosening any of the operating parts of the mill. The bed-stone D being secured to the bail E,

the latter, when turned up and over upon its pivots *e' e'*, carries said stone D therewith, causing the grinding-surface of said stone to be upturned, and exposing that of the runner C. Said stones are so held during the picking or sharpening, which may now be conveniently performed. Said parts are returned to their normal position by reversely turning the bail E, and securing it in position by inserting pin *f'* in bracket F'. The running-stone C being connected to or held supported centrally on the spindle B, and as the bed-stone is suspended from a universal joint, said stones are capable of yielding and accommodating themselves to each other to suit the varying thicknesses of any foreign material that may be fed with the substances being ground. Hence said stones always tram with one another, doing so automatically by reason of the construction of their hangings or supports.

I have shown and described my improvements as applied to a grain-grinding mill in which bed and running stones are used; but it is obvious that they may be applied to mills using iron grinding-plates. So, too, while I have specified my improvements as being peculiarly adapted for portable grinding-mills, they are equally applicable for stationary mills, and that with but slight change, without departing from the spirit of my invention.

What I claim as my invention is—

1. In a grinding-mill, the combination, with a main frame, A, carrying running-stone C, of a supplementary frame or bail, E, pivoted to and locked on said main frame and provided with a central unthreaded opening, *e<sup>4</sup>*, threaded pipe G, bed-stone D, universal joint H', and hand-wheel J, said parts being arranged for operation substantially as shown and described.

2. In a grinding-mill, the combination of main frame A, carrying running stone or plate C, bail E, bed-stone D, pipe G, universal joint H', connecting said bed-stone and pipe, hand-wheel J, screwing on pipe G, and secured to said bail by pins or screws *j<sup>2</sup>*, substantially as shown and described.

3. In a grinding-mill, the combination of stationary stone D, secured to bail E, a hopper, O, rigidly bolted to said bail, a feed-shoe, L, lever M, pivoted at *m* to bail E, said parts being arranged for operation, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of January, 1881.

PHILIPP STEINMETZ.

Witnesses:

JOHN C. CHINE,  
ISAAC H. O'HARRA.