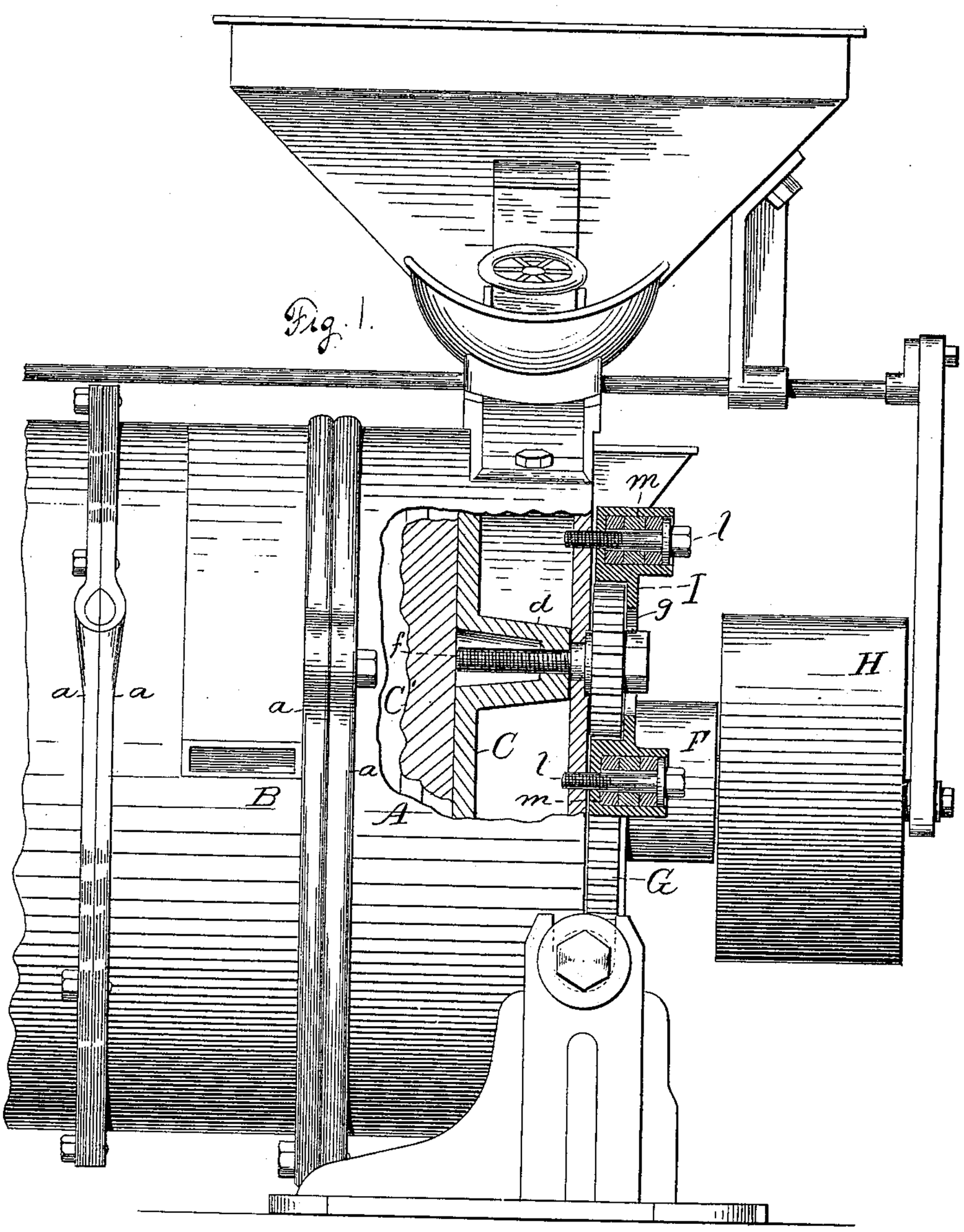
(No Model.)

4 Sheets—Sheet 1.

J. T. CASE.

VERTICAL DISK GRINDING MILL.

No. 332,234. Patented Dec. 15, 1885.



Witnesses.
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By James Shepard
Atty.

(No Model.)

4 Sheets—Sheet 2.

J. T. CASE.

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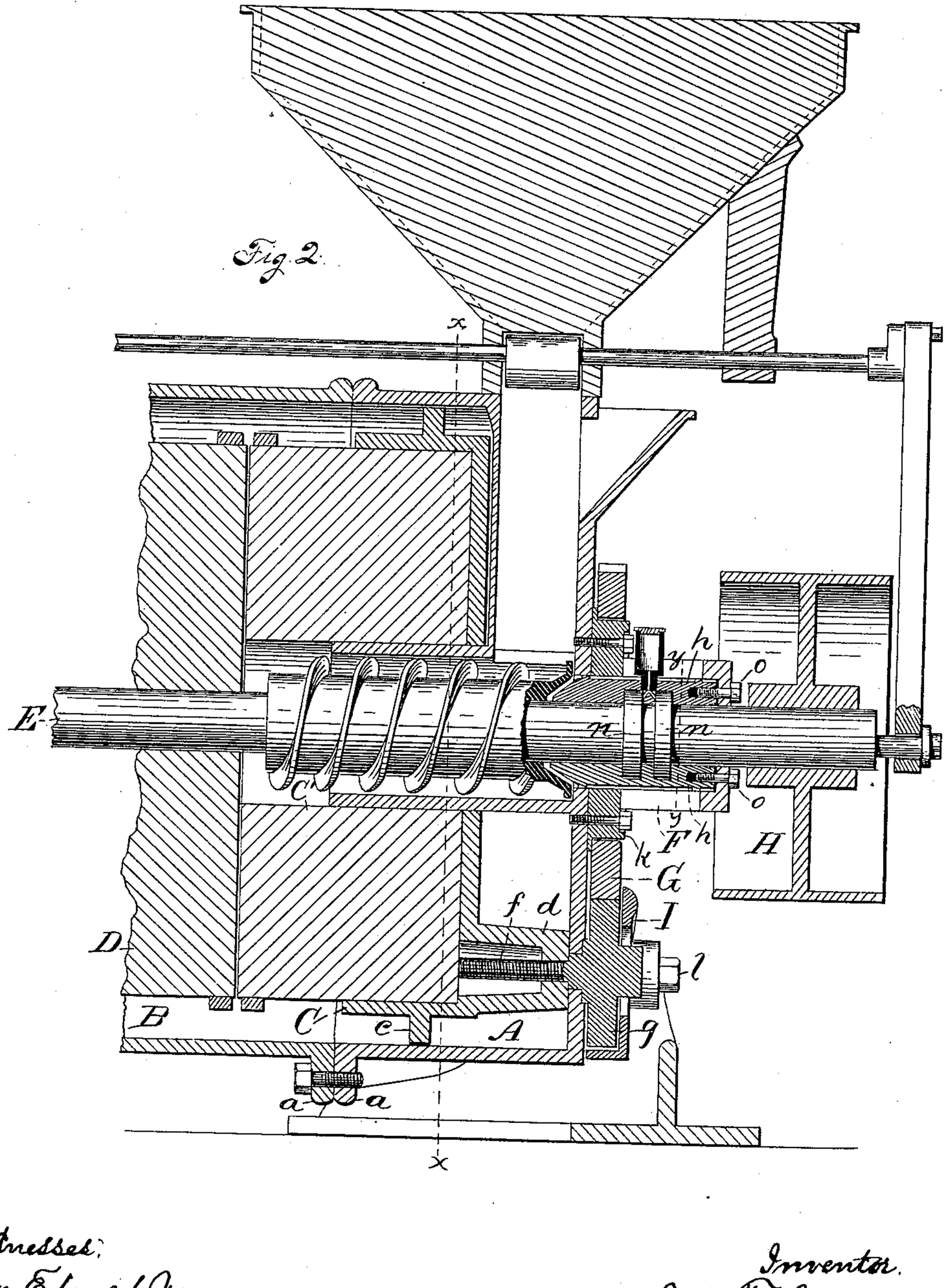
Fig. 2.



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4 Sheets—Sheet 3.

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VERTICAL DISK GRINDING MILL.

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Fig. 3.

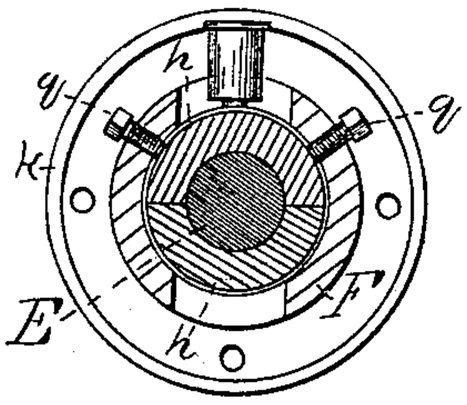
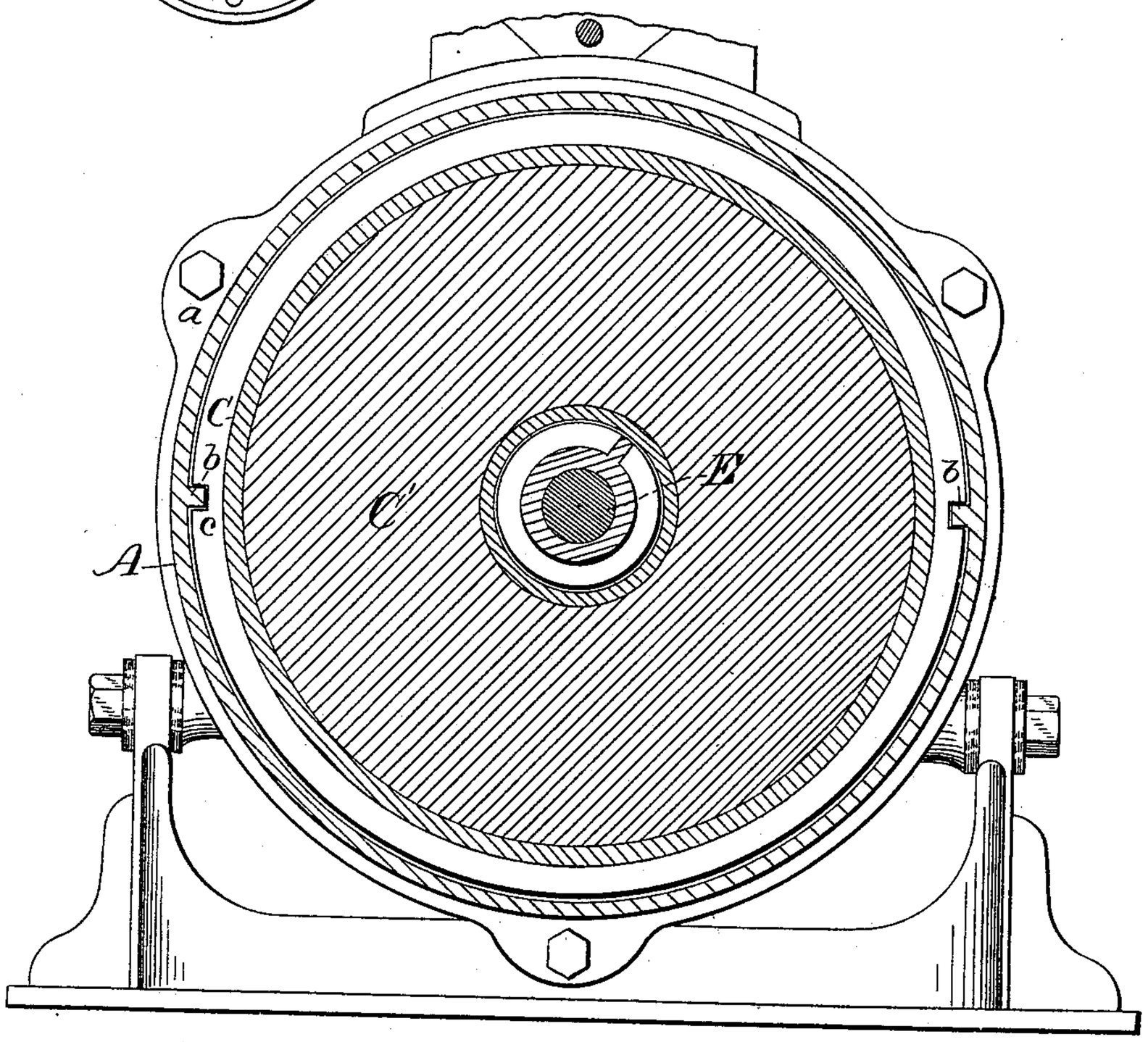


Fig. 4.



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4 Sheets—Sheet 4.

J. T. CASE.

VERTICAL DISK GRINDING MILL.

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Fig. 5.

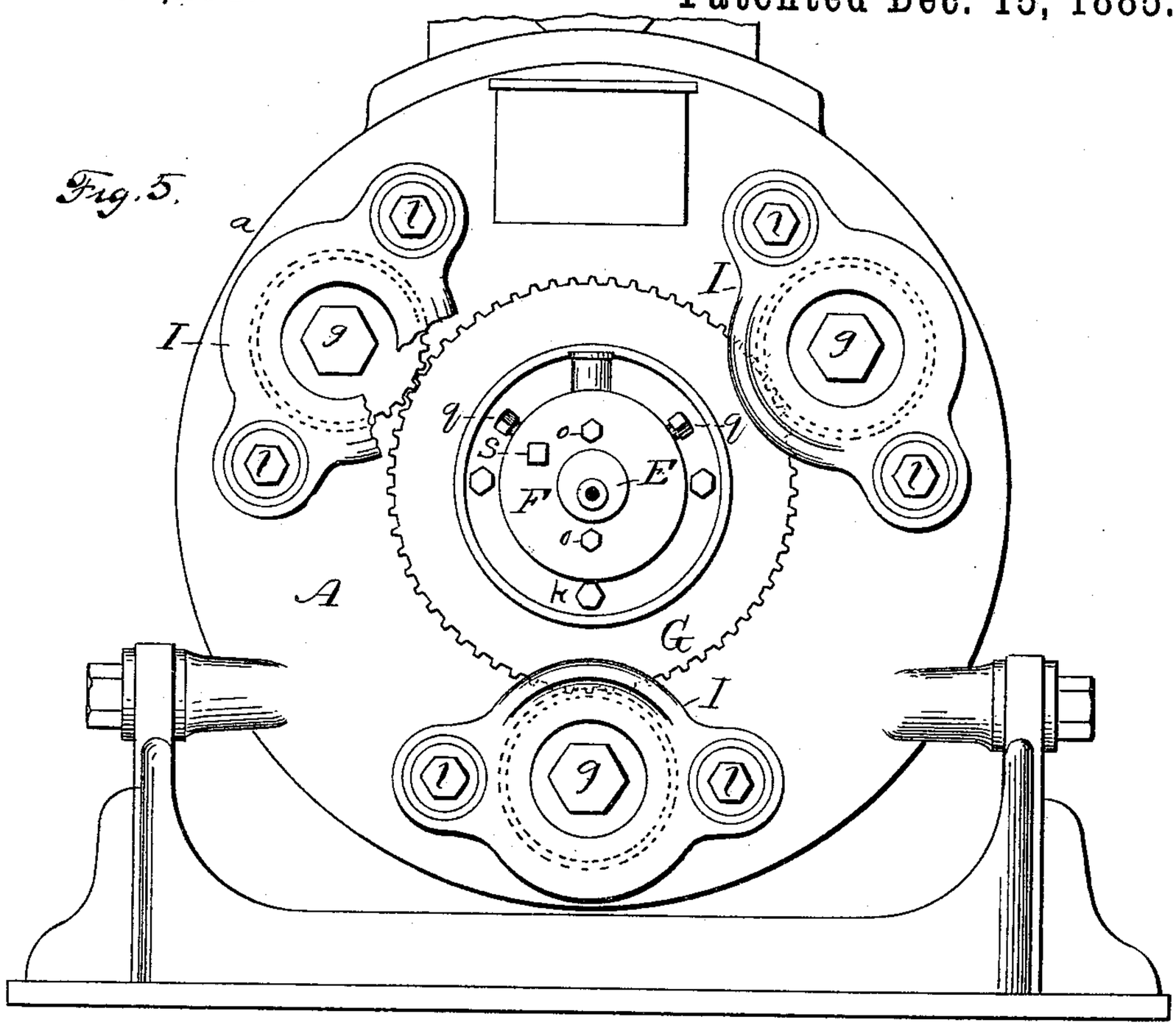
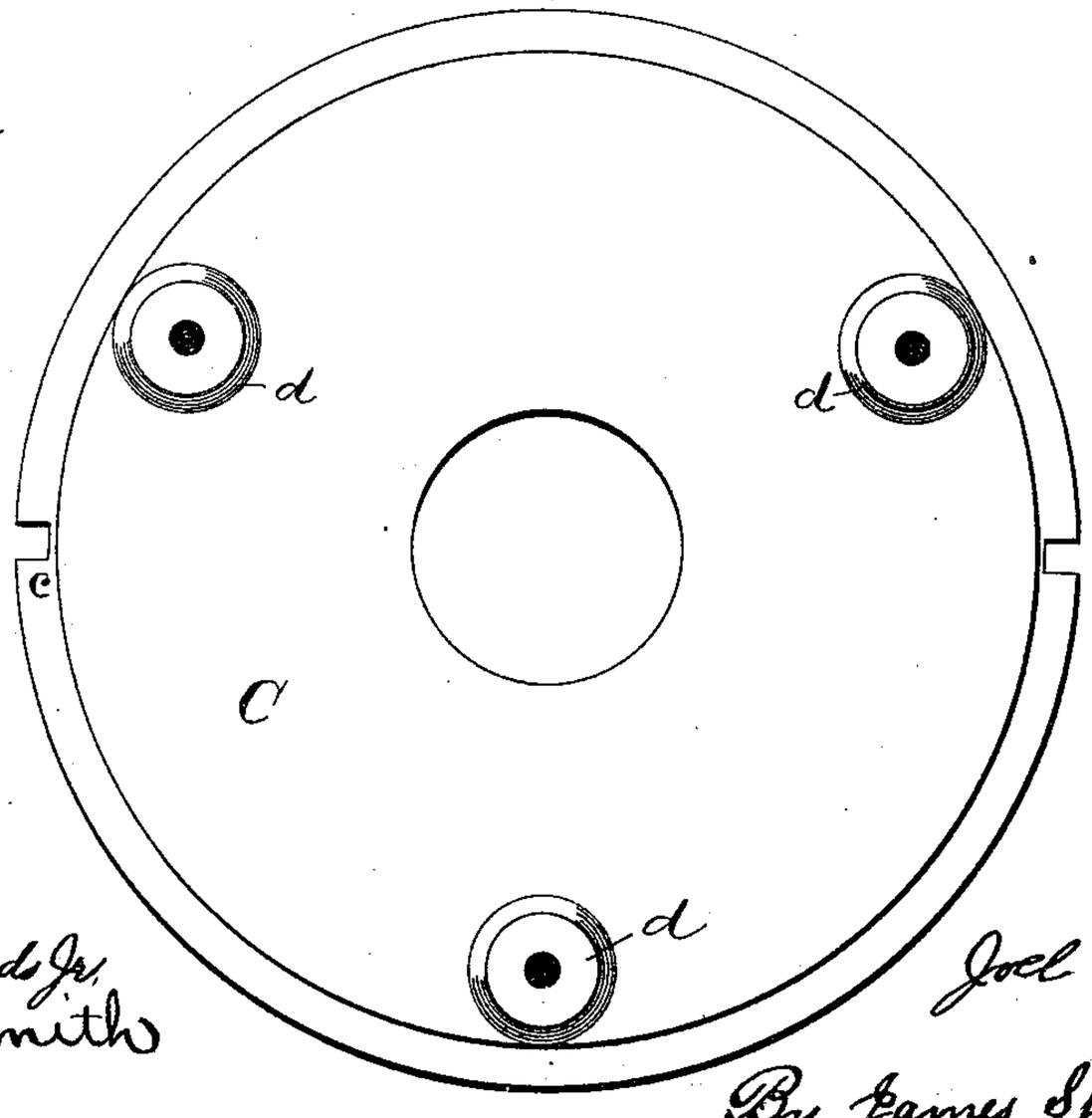


Fig. 6.



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Atty.

UNITED STATES PATENT OFFICE.

JOEL T. CASE, OF BRISTOL, CONNECTICUT.

VERTICAL DISK GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 332,234, dated December 15, 1885.

Application filed February 19, 1885. Serial No. 156,352. (No model.)

To all whom it may concern:

Be it known that I, JOEL T. CASE, a citizen of the United States, residing at Bristol, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Vertical Disk Grinding-Mills, of which the following is a specification.

My invention relates to improvements in the adjustment of the bed-stones and the main shaft.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of one end of my mill. Fig. 2 is a central longitudinal section of the same, partly in elevation. Fig. 3 is a transverse section, partly in elevation, of the bearing for the shaft of my mill on line *y y* of Fig. 2. Fig. 4 is a transverse section, partly in elevation, of my mill on line *x x* of Fig. 2. Fig. 5 is an end view of the major part of my mill, and Fig. 6 is an elevation of one side of the bed-stone frame.

The mill herein illustrated is double, one end being a duplicate of the other in most of its features, so that it is unnecessary to show the whole length of the mill. The improvements herein described may, however, be applied to single mills.

I form the case in four parts. Two of these parts, A and B, are shown in Figs. 1 and 2, while in Fig. 1 a portion of another part like the part B is also shown. These parts are provided with flanges *a a*, in which bolts or screws are placed to secure the parts of the case together, substantially as shown. The inner wall of the part A, which incloses the bed-stone C′, is provided with two inwardly-projecting flanges or ways, *b b*, Fig. 4. The bed-stone frame C is provided with a flange, *c*, having notches at points corresponding in position to the flanges or ways *b b* to receive said ways for supporting the bed-stone frame within the case, and permitting said bed-stone frame to slide thereon in adjusting it to and from the runner D, Fig. 2. The bed-stone frame C is provided with three hollow hubs, *d d d*, which are bored and threaded to receive the adjusting-screws *f*, Figs. 1 and 2. These screws pass through the end of the case formed by the flat part of A, and at their outer ends are pinions or geared wheels *g*, rigidly secured to said screws, so as to necessarily rotate therewith. The hubs *d* allow screws *f* of considerable length to be used without pressing against the bed-stone C′. The heads of the screws *f*, in addition to being pinions *g*, have also a central angular portion like an ordinary bolt-head for the application of a wrench for turning the screws and pinions.

The bearing *h h* for the main shaft E of my mill is formed in the frame or hub F, which is bolted to the end of the case by bolts which pass through the circular flange *k* of said hub. This circular flange *k* forms the axle upon which the ring gear wheel G turns. The pinions *g g g* are all equidistant from the main shaft and the axis of the wheel G, which wheel meshes into said pinions, and constitutes what is known as an "intermediate" wheel. The pinions *g g g* and connected screws *f f f* are prevented from moving toward the driving-pulley H by means of yokes I, placed over said pinions and embracing their edges. These yokes I prefer to secure by means of bolts *l*, which pass through cushions or elastic washers *m* within sockets formed in said yokes, as shown in Fig. 1.

As illustrated, the stones are supposed to be new, and therefore the bed-stone is represented at the extreme limit of its adjustment in the direction which brings it away from the runner. In order to move the bed-stone in the direction which will carry it toward the runner, it is only necessary to apply a wrench to one of its pinions and turn it in the left-hand direction for unscrewing the screw, when the intermediate wheel, G, will cause all the other pinions and the connected screws to simultaneously turn in the same direction, and thereby carry the bed-stone frame evenly and bodily toward the runner. Turning the pinions and screws *f f f* in the reverse direction will separate the stones more widely for coarser grinding. The cushions or elastic washers *m* are stiff enough to ordinarily hold the stones in proper position for grinding; but when any foreign substance gets between the stones the yokes will yield a little to let the pinions and screws which hold the bed-stone fall back until the substance has passed. This action could not, however, take place when the bed-stone frame is clear back, as illustrated in Figs. 1 and 2; but after the bed-stone frame has

been started forward a little the cushions can act in the manner described. It is evident that the same adjustment of the bed-stone may be made by securing the adjusting-screws securely and rigidly to the bed-stone frame, and making the pinions *g* with a centrally-threaded hole, so that they act as nuts instead of bolt-heads; but this is not as desirable as the construction illustrated, because the ends of the screws would project through the pinions upon the outside of the mill, where they might be in the way.

Upon the main shaft, at a point within the boxes or bearings *h h*, I form two shoulders or rigid collars, *n n*. One may answer, but I prefer two. The boxes are made to embrace and fit these collars. Said boxes are also fitted within the frame or hub F so as to slide longitudinally therein, and holding-screws *o o* are passed through holes in the end of the frame or hub F into the threaded holes in the boxes *h h*. Set-screws *q q*, Figs. 3 and 5, passing through threaded holes in the upper part of the frame with their ends bearing upon the top of the upper one of the boxes *h h*, also assist in holding the boxes firmly in place upon the shaft. The screws *o o* will draw both boxes to the left, as shown in Fig. 2, and firmly hold them up against the end of the frame F. When the boxes are worn so as to allow the shaft to move endwise within them, such movement is prevented by forcing one of the boxes endwise upon the other. To do so, I first loosen the screw *o* in the box to be moved, say, the upper box, then turn up the set-screw *s*, Fig. 5. This screw extends through a threaded hole in the end of the frame F, with its end bearing against the end of the upper one of the boxes *h h*. The screw *o* can then be tightened, provided it had been loosened more than was necessary to permit of the desired adjustment.

The delivery-chute, the double hoppers, and agitator, partly shown herein, form no part of this application. Such features are more fully described and claimed in another application, No. 156,029, filed February 16, 1885.

I claim as my invention—

1. The combination of the bed-stone frame, the set of adjusting-screws, means for holding said screws against movement in an axial direction, the set of pinions, and an intermediate gear-wheel meshing into the several pinions, substantially as described, and for the purpose specified.

2. The combination of the bed-stone frame, the set of adjusting-screws, the set of pinions, the yokes I for holding said pinions in place and covering their edges, and the intermediate gear-wheel, G, substantially as described, and for the purpose specified.

3. The combination of the bed-stone frame having the bored and threaded hubs *d d d*, the screws *f f f*, fitted to the holes in said hubs, the pinions rigidly connected to said screws, and means for securing said pinions against movement in an axial direction, and the intermediate wheel, G, substantially as described, and for the purpose specified.

4. The combination of the bed-stone frame, the adjusting-screws, the pinions, the intermediate gear-wheel, G, the yokes I, having sockets, the cushions *m*, and the bolts *l* for securing said yokes over said pinions, substantially as described, and for the purpose specified.

5. The combination of the frame or case of the mill, the main shaft E, the shoulder or collar *n*, the sliding boxes *h h*, inclosing said shoulder *n*, and means for separately adjusting said boxes longitudinally one upon the other, substantially as described, and for the purpose specified.

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Witnesses:
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