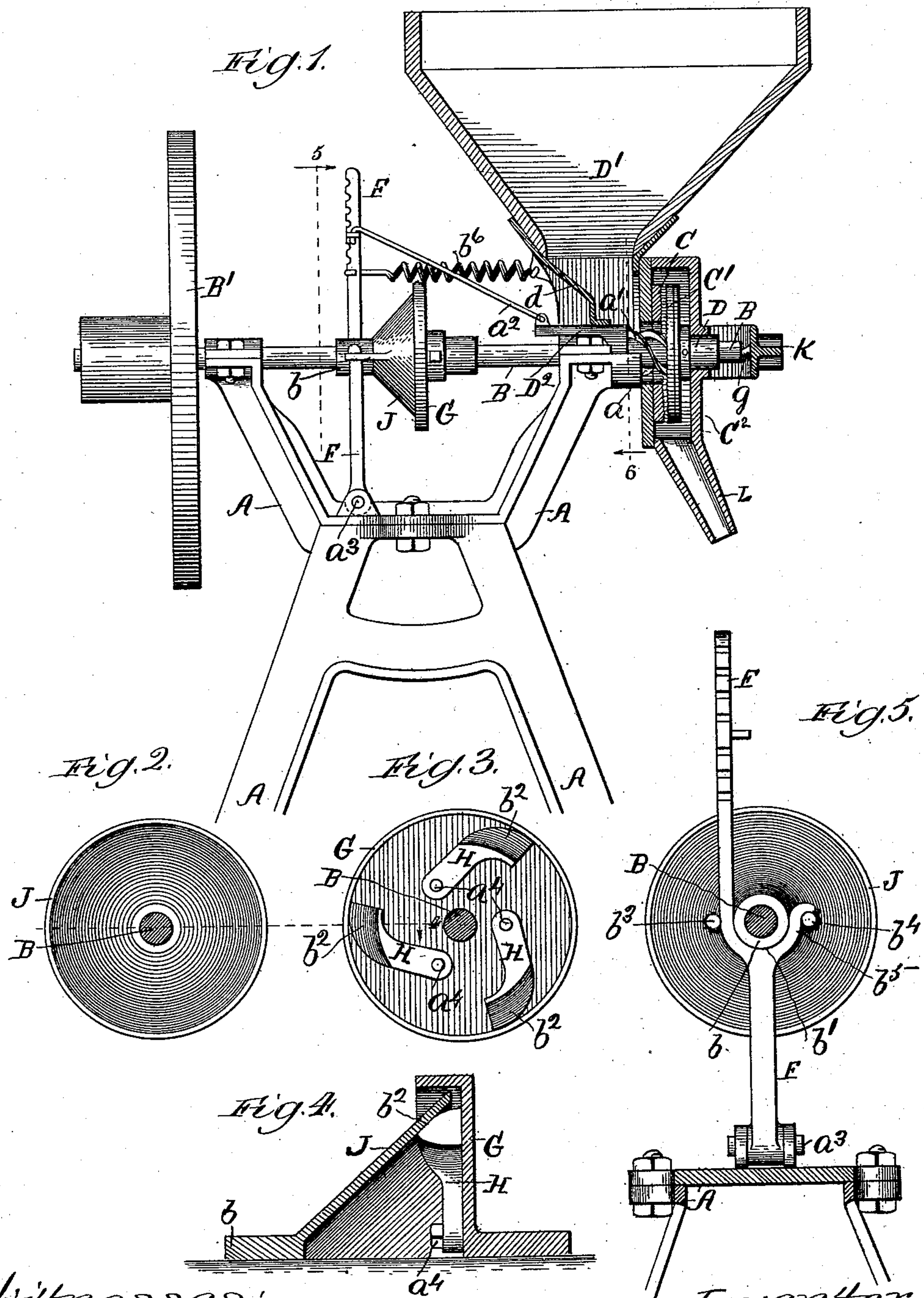


J. G. MOLE.  
PORTABLE GRINDING MILL.

No. 490,812.

Patented Jan. 31, 1893.



Witnesses:  
Edw. C. Gaylord,  
Clifford N. White.

Inventor:  
John G. Mole.  
By G. B. Coupland & Co.  
Attys

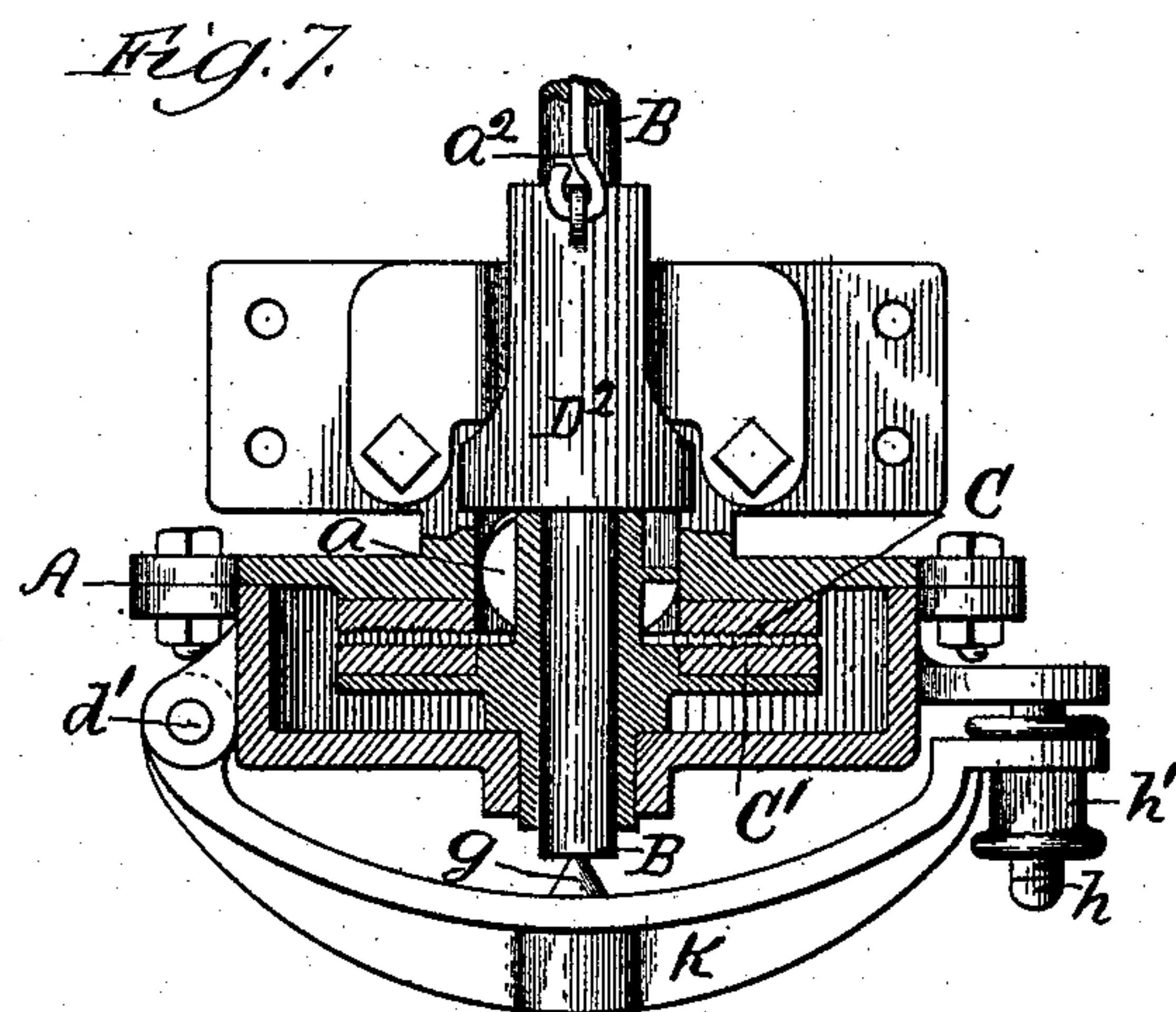
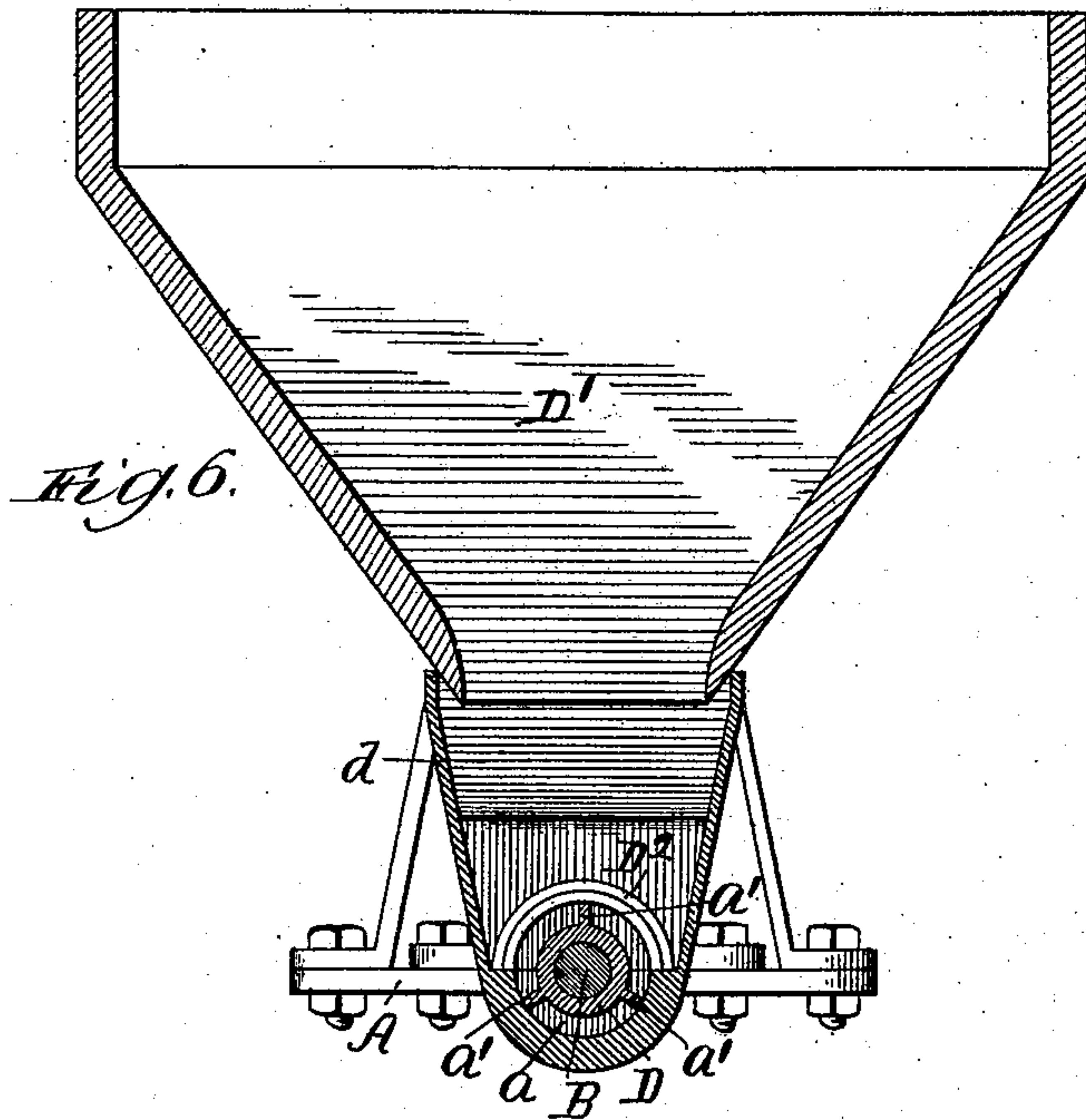
(No Model.)

2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

JOHN G. MOLE, OF BATAVIA, ILLINOIS.

## PORTABLE GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 490,812, dated January 31, 1893.

Application filed December 16, 1891. Serial No. 415,311. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN G. MOLE, a citizen of the United States, residing at Batavia, in the county of Kane and State of Illinois, have  
5 invented certain new and useful Improvements in Portable Grinding-Mills, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this  
10 specification, in which—

Figure 1 is a side elevation and part section. Fig. 2 an inside view of a part of a governing device. Fig. 3 a similar view of  
15 the governor-disk; the driving-shaft being shown in section. Fig. 4 a vertical longitudinal section on line 4, Figs. 2 and 3, looking in the direction indicated by the arrow; the two parts being united. Fig. 5 a broken-away  
20 vertical transverse section on line 5, Fig. 1. Fig. 6, a vertical transverse section on line 6, Fig. 1, looking in the direction indicated by the arrow; and Fig. 7 a broken-away part plan and part section.

25 This invention relates to improvements in portable grinding or feed-mills, and consists of certain novel features in the construction, combination and arrangement of the different parts, as will be hereinafter set forth.

30 Referring to the drawings, A represents the different parts of the supporting-frame, B the driving or mill shaft, and B' the fly-wheel mounted thereon. The driving-shaft is provided with suitable journal-bearings in the  
35 top of the supporting-frame, as shown in Fig. 1.

The grinding-rings, C C' are inclosed in the circular box, C<sup>2</sup>. The ring C is stationary and rigidly secured to the back side of the inclosing-box. (Figs. 1 and 7.) The runner or ring  
40 C' is mounted on the sleeve D, which is in turn rigidly mounted on the driving-shaft. The rear part of the sleeve D extending into the feed-chamber  $\alpha$  below the hopper D' is provided with a number of spiral ribs  $\alpha'$  (Figs.  
45 1 and 6). forming a screw-feed. This spiral or screw arrangement insures a continuous feed and prevents choking or clogging in the feed-chamber; one half of the screw-part being always in the grain.

50 The feed-slide, D<sup>2</sup>, is seated loosely in position, and is adapted to have an endwise adjustment or movement. The inner end of

this slide is of a semicircular form (Fig. 6). and projects into the feed-passage just over the spiral feed. To the opposite end of the  
55 feed-slide is connected one end of the rod  $\alpha^2$ . The other end of this rod is connected to the lever F, shown in Figs. 1 and 5. The lower end of this lever is pivoted to the frame as at  $\alpha^3$ ; thus providing for a reciprocating move-  
60 ment of the upper end and imparting a corresponding movement to the slide in regulating the feed.

The centrifugal shaft-governor will now be described. This consists of the chambered  
65 disk, G, rigidly mounted on the driving-shaft. A number of curved arms, H, have their inner ends pivoted, as at  $\alpha^4$ , to said disk and are arranged at equidistant points with reference  
70 to each other and the axis of rotation, as shown in Fig. 3. The conical cap, J, is loosely mounted on the driving-shaft and has its hub-end, b, resting in the fork or seat b' of the lever F, as shown in Fig. 5. This cap is adapted to  
75 normally seat into the chambered disk and inclose the governor-arms; the outer ends of which bear against the interior conical surface of the cap, as shown in Fig. 4. The surface of the arms having contact are beveled,  
80 as at b<sup>2</sup>, to correspond to the bearing-surface of the cap. This cap has an endwise movement on the driving-shaft, but does not rotate therewith; this being prevented by the  
pin b<sup>3</sup> bearing against one side of the lever F, (Fig. 5). and the companion pin b<sup>4</sup> engaging  
85 with the underside of the curved extension b<sup>5</sup> of said lever. The companion pins are rigid parts of the cap. One end of the spiral-spring b<sup>6</sup> is connected to the hopper-part, and the  
opposite end hooked around the lever F. 90 This lever is provided with a number of notches b<sup>7</sup>, so that the connecting end of the spring may be raised or lowered in regulating the tension with reference to the throw of the lever and the distance that the feed-plate  
95 is to be moved.

In operation, the centrifugal action of the governor-arms forces the inclosing-cap backward therefrom, which movement has the effect of inclining the upper end of the notched  
100 lever, F, in the same direction, thus drawing back the feed-slide and enlarging the passage from the hopper into the feed-chamber. As the flow of grain from the hopper becomes too



great, the speed will thereby be checked and the force of the governor-arms diminished so that the spring  $b^6$  will draw the lever F in the opposite direction bringing the governor members together and moving the feed-slide to partially close the passage from the hopper, and thereby automatically regulate the feed supply. The shelf  $d$  in the bottom of the hopper narrows the passage and carries the material being ground toward the opening in advance of the feed-slide. The screw-spiral always insures a continuous and regular feed in accordance with the speed of the driving-shaft. When the feed-plate is in its normal position, the passage between the hopper and grinding-rings is closed. The spring  $b^6$  serves to draw the lever F back and hold the feed-plate in that position.

One end of the curved bridge-tree-bearing, K, is pivoted, at  $d'$ , to the frame; the opposite end being adjustably secured to the frame, on the opposite side, by means of the screw-stud  $h$  and the hand-nut  $h'$ , as shown in Fig. 7. The conical point  $g$  projects inwardly from the bridge and bears against the end of the driving-shaft. By this arrangement the proper relative distance between the faces of the grinding-disks is adjustably maintained as the work may require. The spring  $b^6$  also serves the purpose of holding the driving-shaft against the bridge-tree, thereby preventing the grinding-rings from rubbing together.

L is the spout through which the ground product is discharged.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a grinding mill, the combination of the feed slide projecting in the feed passage between the hopper and grinding rings, a governor connected to said slide for imparting an endwise movement thereto for regulating the feed in accordance with the speed of the grinding mechanism, and an auxiliary shelf  $d$  in the hopper above the feed slide for carrying the contents toward the opening made by said feed slide, substantially as set forth.

2. In a grinding-mill, the combination with the driving or mill-shaft, of a governing device, consisting of a chambered disk, rigidly mounted on said shaft, a number of curved arms, pivoted to said disk, a conical cap, loosely mounted and having an endwise movement on said shaft and adapted to inclose said arms, a lever, to which the governor-cap is attached, and a spring connected to said lever, substantially as set forth.

3. In a grinding-mill, the combination of the pivoted lever F, provided with the curved extension  $b^5$ , of the conical governor-cap, provided with the pins  $b^3$   $b^4$ , substantially as set forth.

4. In a grinding mill the combination with the driving shaft, an adjustable bridge tree therefor, a feed slide, and a governing device, for controlling said feed slide, of the spring  $b^6$  operating to retract the feed slide and to force the driving shaft against the bridge tree, substantially as set forth.

JOHN G. MOLE.

Witnesses:

L. M. FREEMAN,  
J. B. DONALSON.