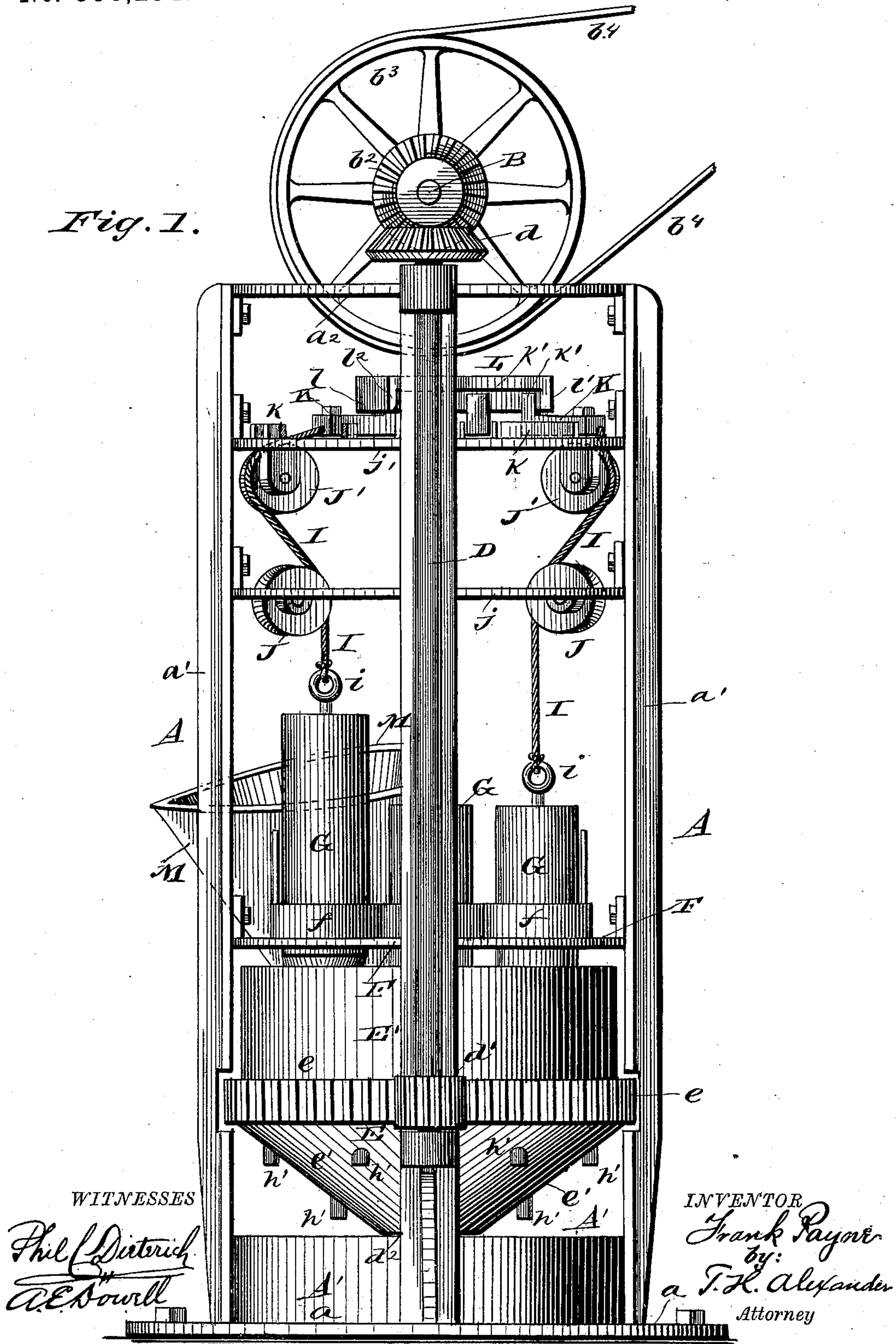


F. PAYNE.  
PULVERIZING MACHINE.

No. 358,294.

Patented Feb. 22, 1887.

Fig. 1.



WITNESSES

Phil. Dietrich  
A. E. Dowell

INVENTOR

Frank Payne  
by:  
a T. H. Alexander  
Attorney

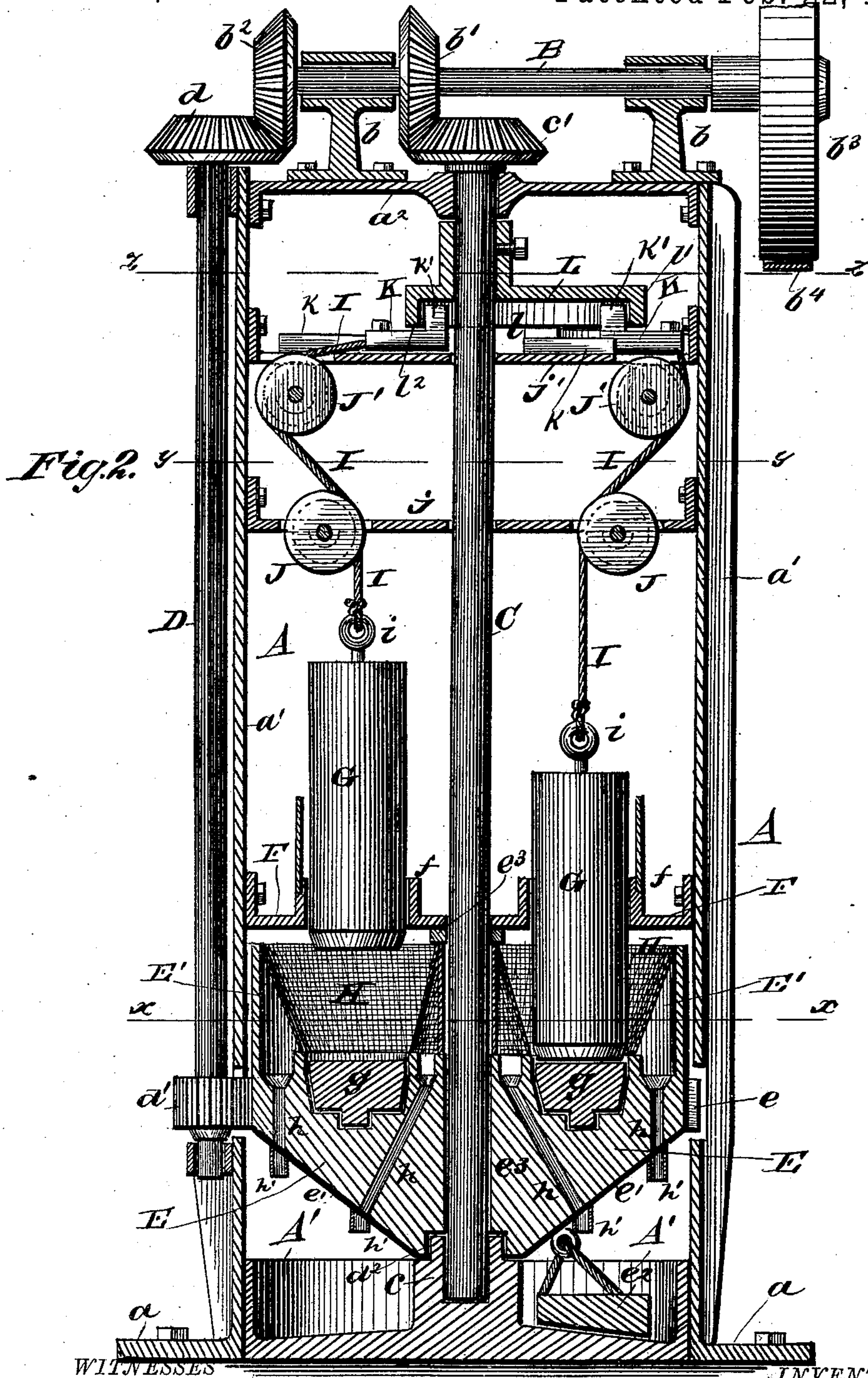
(No Model.)

3 Sheets—Sheet 2.

F. PAYNE.  
PULVERIZING MACHINE.

No. 358,294.

Patented Feb. 22, 1887.



WITNESSES  
Phil Dietrich.  
A. E. Dowell

INVENTOR  
Frank Payne  
By  
T. H. Alexander  
Attorney



(No Model.)

3 Sheets—Sheet 3.

F. PAYNE.  
PULVERIZING MACHINE.

No. 358,294.

Patented Feb. 22, 1887.

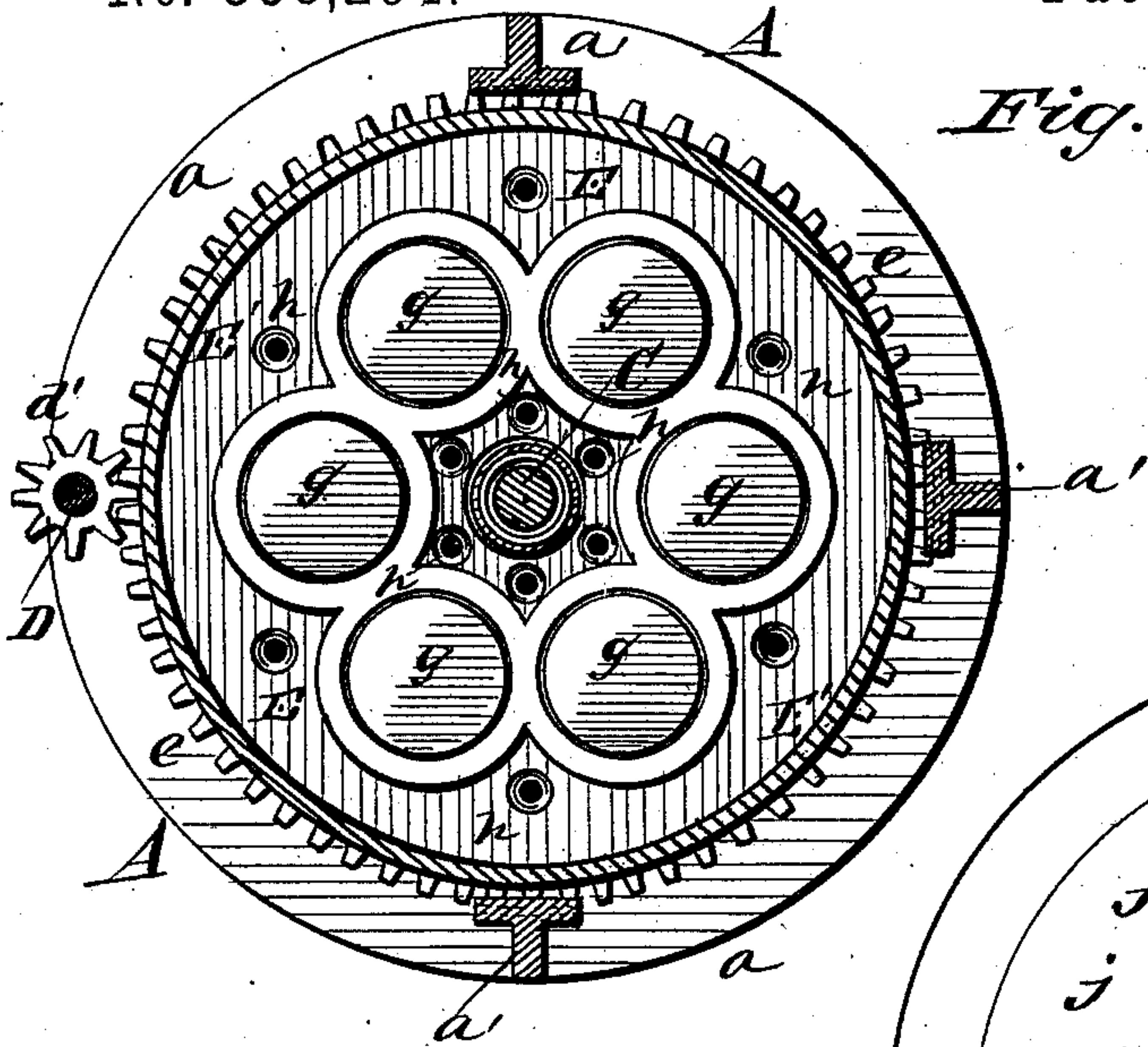


Fig. 3.

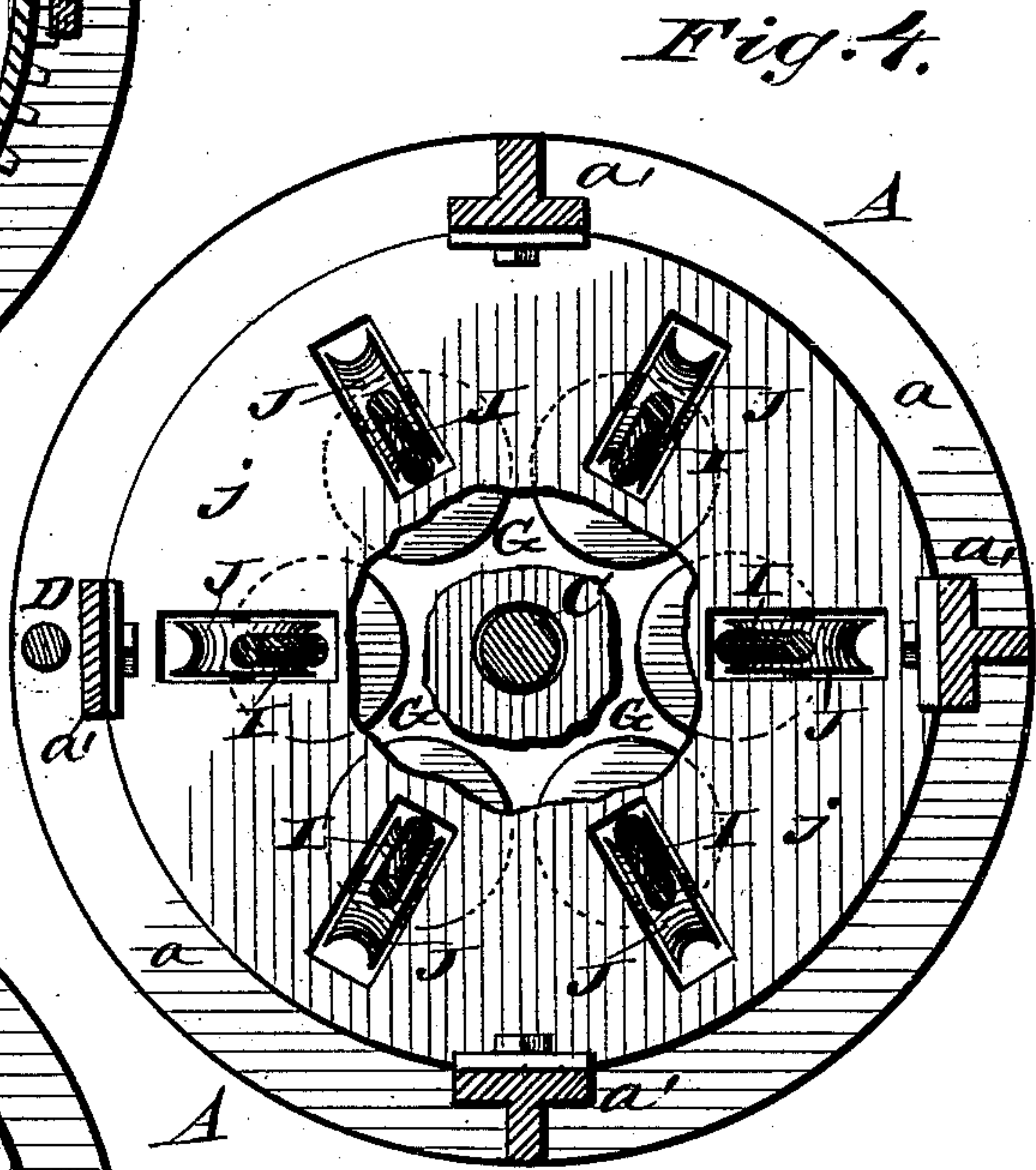


Fig. 4.

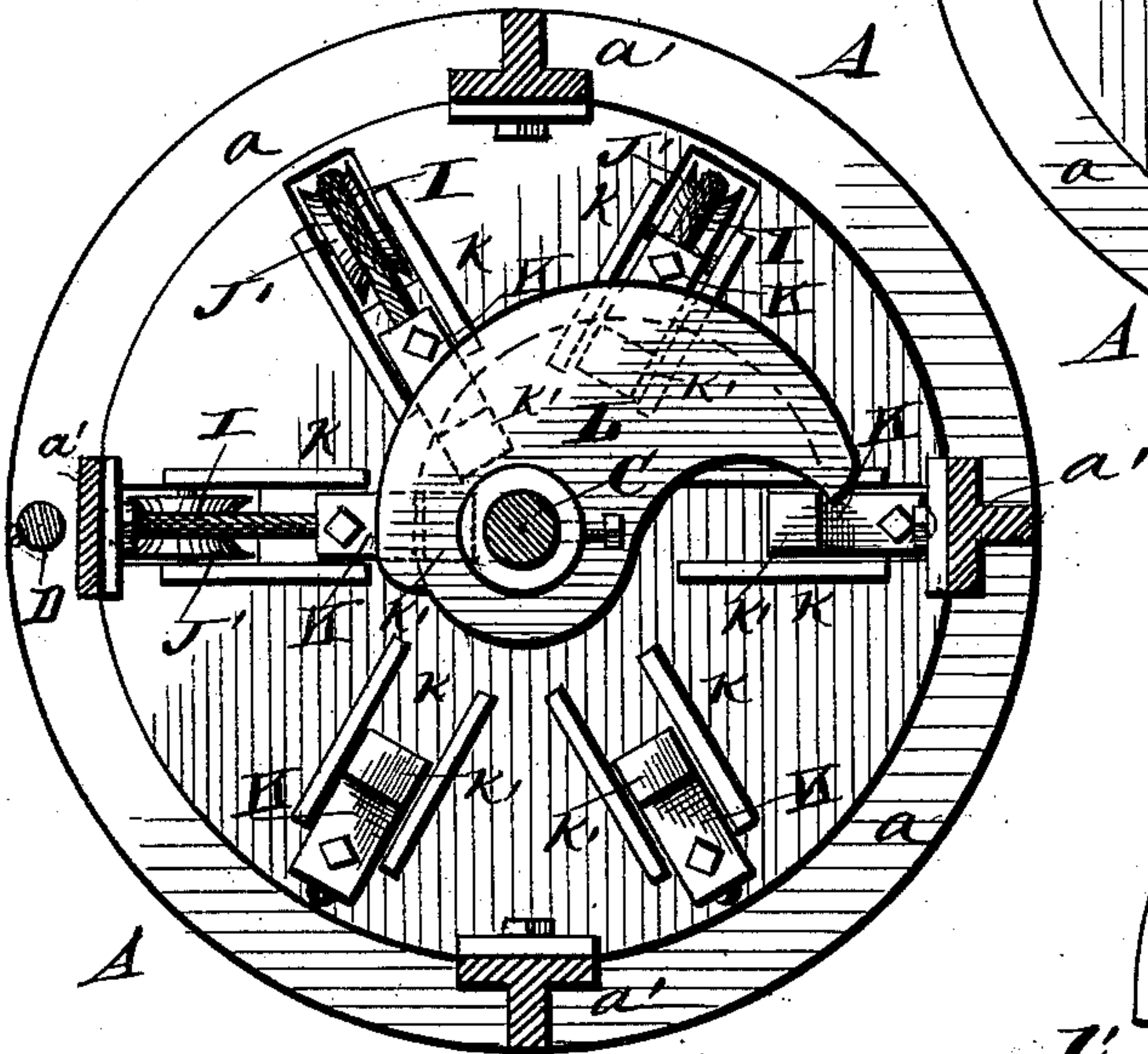


Fig. 5.

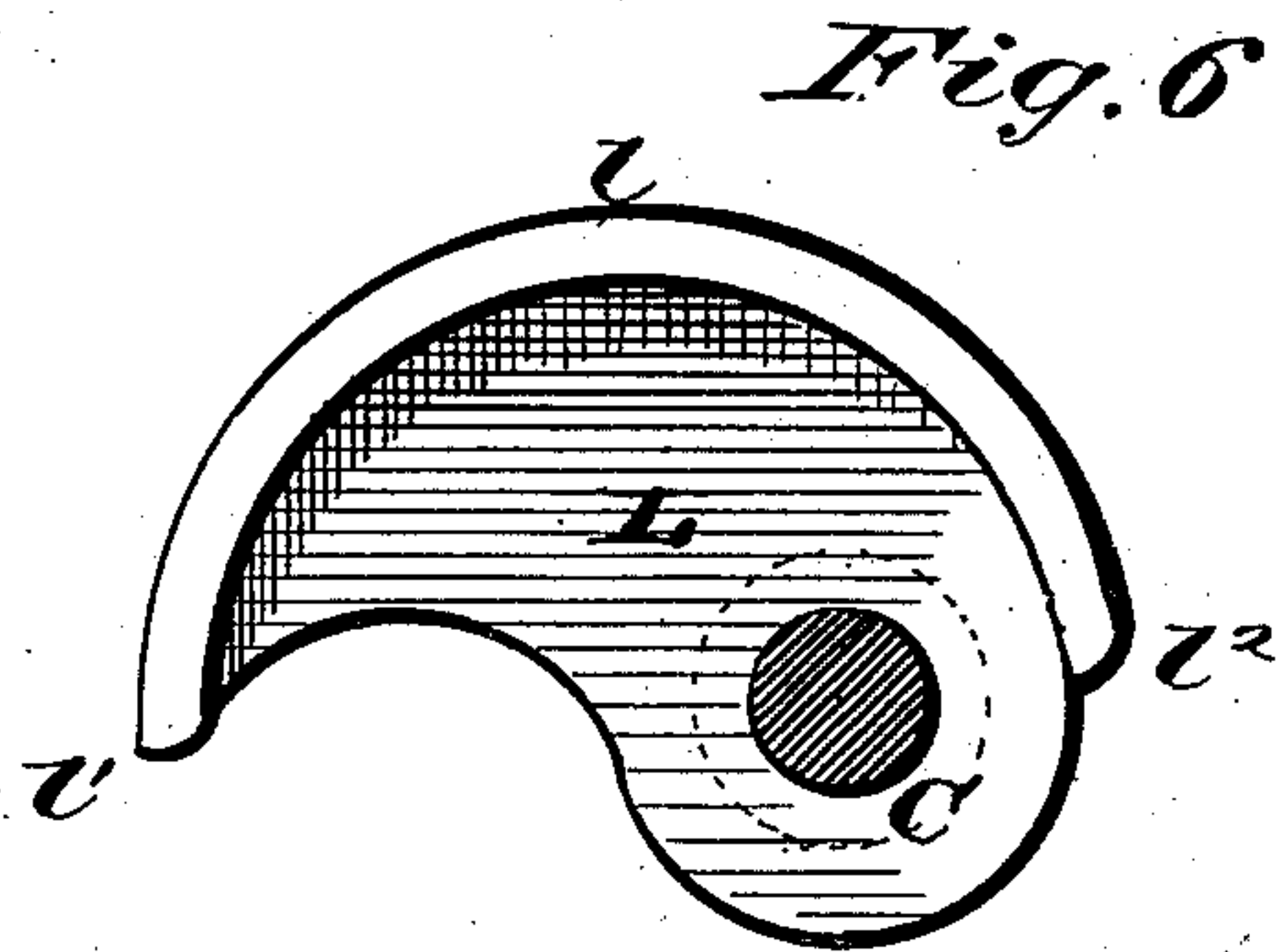


Fig. 6.

WITNESSES

Phil C. Dietrich.  
A. E. Sowell

INVENTOR

Frank Payne  
by  
T. H. Alexander  
Attorney



# UNITED STATES PATENT OFFICE.

FRANK PAYNE, OF EAST PORTLAND, OREGON.

## PULVERIZING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 358,294, dated February 22, 1887.

Application filed April 26, 1886. Serial No. 200,196. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK PAYNE, of East Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Pulverizing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

Figure 1 is a front elevation of my improved quartz-mill. Fig. 2 is a central vertical section of the same. Fig. 3 is a cross-section on line *x x*, Fig. 2. Fig. 4 is a cross-section on line *y y*, Fig. 2. Fig. 5 is a cross-section on line *z z*, Fig. 2. Fig. 6 is a detail of the cam L.

The invention relates to improvements in pulverizing-machines, and particularly to machines to stamp such ores as those of gold and silver; and it consists in the construction and novel arrangement or combination of parts hereinafter described, illustrated in the drawings, and pointed out in the accompanying claims.

Referring to the accompanying drawings, A designates the frame of the machine, composed, essentially, of a disk-shaped base plate or piece, *a*, adapted to be bolted securely to a suitable foundation, the vertical uniting standards or bars *a' a'* and the horizontal frame-work *a<sup>2</sup>* connecting the tops of said standards.

*A'* is an amalgamating-chamber made in the base-piece *a* and of circular form.

*B* is a horizontal shaft having bearings in standards or upright frames *b b*, forming part of the frame-work *a'*, and having secured upon it the beveled gear-wheels *b' b<sup>2</sup>*, and the driving-pulley *b<sup>3</sup>*, which is rotated by means of a belt, *b<sup>4</sup>*, from any proper source of power.

*C* is a vertical shaft having its upper bearing in the center of the frame-work *a<sup>2</sup>* and its lower bearing within a step, *c*, rising from the center of the floor of the amalgam-chamber *A'*.

*c'* is a bevel gear-wheel on the upper end of the shaft *C*, above the upper bearing of the latter, and meshing with the bevel-gear *b'* on the shaft *B*.

*d* is a bevel-gear on the upper end of a vertical shaft, *D*, having bearings made or secured upon one of the standards *a'* of the main frame *A*. The said bevel-gear meshes with the bevel-gear *b<sup>2</sup>* on the shaft *B*, and the shaft

*D* has secured to its lower end, below its lower bearing, a pinion, *d'*, which meshes with an out-standing circumferential gear, *e*, on the lower end of a cylindrical stamping-bed, *E*. The said bed or block has a base, *e'*, below the circumferential gear, shaped like the frustum of an inverted cone, which base has a bearing, *d<sup>2</sup>*, at its center upon the upper end of the step *c*. To the under surface of the said base *e'* is attached, by means of a staple or eyebolt and chain, a drag-shoe, *e<sup>2</sup>*, of suitable dimensions, which moves over the floor of the amalgam-chamber *A'* as the stamping-block rotates.

The floor of the amalgam-chamber inclines slightly down from the step *c* to the surrounding wall of the chambers, and the under surface of the shoe *e<sup>2</sup>* is correspondingly inclined, as shown in Fig. 1.

The upper portion of the stamping-bed *E* is in the form of a cylindrical chamber, *E'*, having the shaft *C* passing through a vertical sleeve, *e<sup>3</sup>*, forming part of the stamping-bed. The outer surface of the said bed turns almost in contact with the standards *a'*.

*F* is a horizontal plate immediately above the chamber *E'*, with its edges securely fixed to the standards *a'*, and having a central opening for the passage of the shaft *C*.

*f f* are equidistant sleeves, rising from the plate *F*, and all equally distant from the shaft *C*, about which the stamping-block rotates.

*G G* are stamps or stamping-cylinders moving in the sleeves *f*, and impinging at their lower ends upon the blocks *g g*, seated in recesses of the stamping-bed *E*, and made preferably of steel. The blocks *g* are equidistant and equal in number to the stamps, which are also equidistant.

*H* is a screen or sieve, circular in plan and with the upper edge of its outer wall secured to the tops of the wall of the chamber *E'*. The upper edge of the inner wall of the screen is secured to a hollow block on the top of the sleeve *e<sup>3</sup>*. The two walls converge downward to the block *E*, and the lower opening of the screen embraces the blocks *g g*. Consequently the lower ends of all the stamps work within the screen.

*h h* are channels or passages running through the base of the stamping-bed or plate-block *E* from both the inner and outer side of the



strainer H, and having secured to their lower ends the discharging-tubes  $h' h'$ , which rotate with said block.

I I are ropes, of wire or other suitable material, which at their lower ends are secured to the stamps by the eyebolts  $i$ , as shown; thence pass upward over the pulleys J and under the pulleys J', and have their upper ends secured to the blocks or carriages K. The shafts of the pulleys J J' have their ends journaled in bearings secured to the horizontal plates  $j j'$ , respectively, the said plates forming part of the main frame. Upon the upper surface of the plate or frame  $j'$  are made the radial ways  $k$ , between which travel the carriages K. The said carriages have secured to their outer ends the upper ends of the ropes I, and on their inner ends have the upstanding flanges  $k'$ .

L is a horizontal cam-block having the downward-standing flange  $l$ , extending about one-half of its perimeter. The said cam-block is secured to the shaft C, above the plate  $j'$ , and turns with said shaft.

$l'$  is the point of the cam  $l$  farthest distant from the shaft C. Thence the said cam approaches the shaft on a suitable curve to the point  $l^2$ , where it ceases, so that the flange  $l$ , passing outside of the flanges  $k'$  and engaging the same on its end  $l'$ , will draw the carriages K inward as it rotates, lifting the stamps G by means of the chains I until the other end,  $l^2$ , of the cam-flange passes beyond the carriage-flange  $k'$ , when the stamp drops upon the ore. The stamps are thus raised in rotation, and the gearing is so proportioned that each stamp will fall successively upon a block,  $g$ , as the stamping bed or block rotates.

M is a hopper fitting into an opening in the plate F, for the purpose of feeding the machine.

In the operation of the machine the ore and a proper amount of water are fed in through the hopper M, and the stamps, descending in

rotation, crush the ore on the blocks  $g g$  and make a pulp thereof. The pulp is strained by the screen H, and descends through the passages  $h$  and tubes  $h'$  to the amalgam-chamber A', where it meets the mercury, and is agitated therein by the revolving drag-shoe  $e^2$ .

Having described my invention, I claim—

1. A pulverizing-machine comprising the frame, the stamping-bed, the reciprocating stamps, the screen surrounding the lower ends of said stamps, the horizontal plate secured to the frame and provided with ways, the flanged carriages, the chains or ropes connecting said carriages to the corresponding stamps, the vertical shaft, and the flanged rotating cam-block engaging the flanges of said carriages and lifting the stamps and suddenly releasing the carriages after the stamps are lifted, substantially as specified.

2. A pulverizing-machine comprising the frame A, the horizontal shaft B, carrying the bevel gear-wheels  $b' b^2$  and pulley  $b^3$ , the vertical shaft C, carrying the bevel gear-wheel  $c'$ , the vertical shaft D, carrying the bevel-gear  $d$  and pinion  $d'$ , the rotating stamping-bed E, provided with the gear  $e$ , the screen H, attached to said bed, the stamps G, the plate F, provided with sleeves  $f$ , the ropes I, the pulleys J J', the horizontal plates  $j j'$ , respectively supporting said pulleys, the carriages K, provided with the flanges  $k'$ , the ways  $k$  on the plate  $j'$ , and the flanged cam-block L, all constructed and arranged substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

FRANK PAYNE.

Witnesses:

C. H. RAFFETY,  
E. V. DUNBAR.