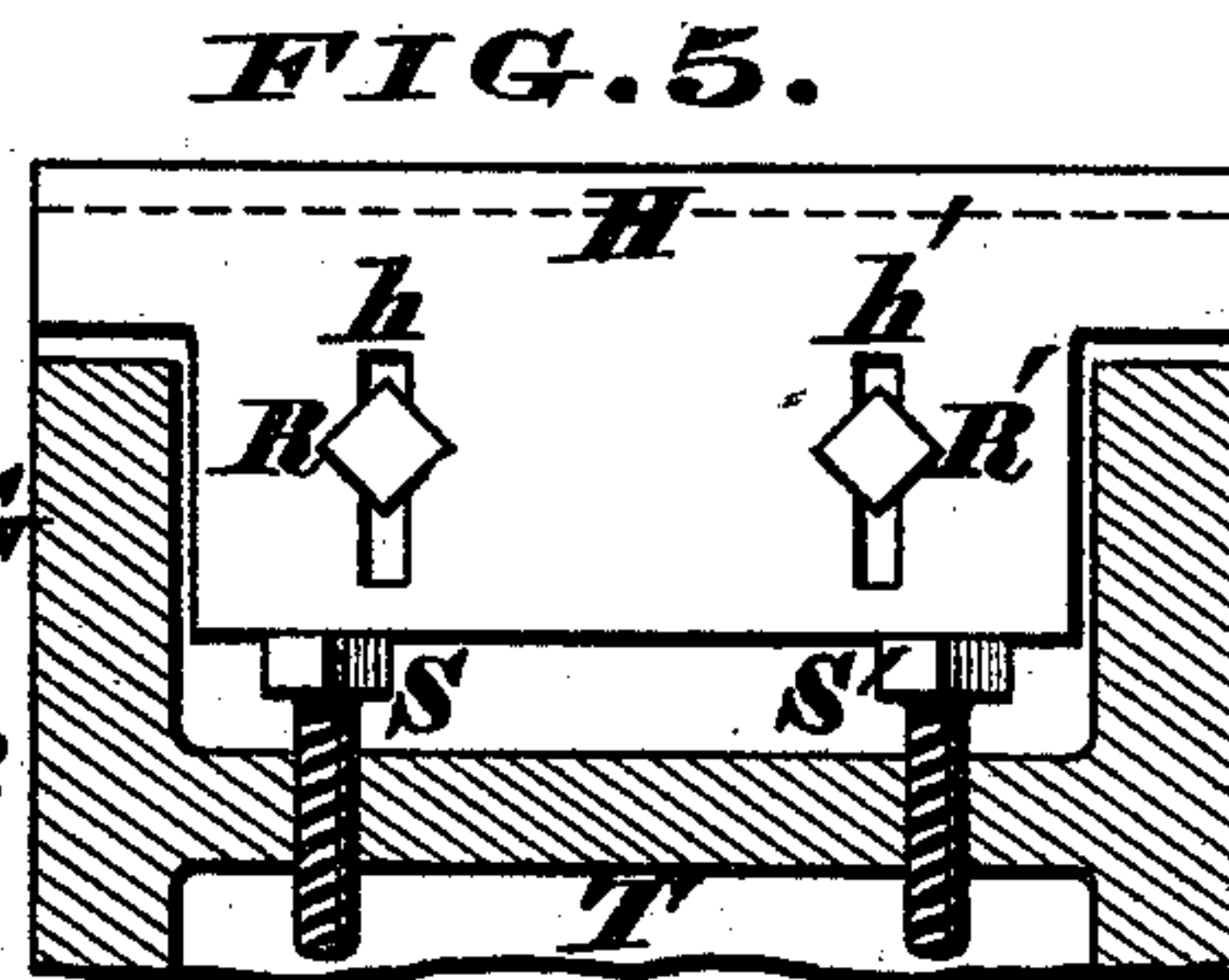
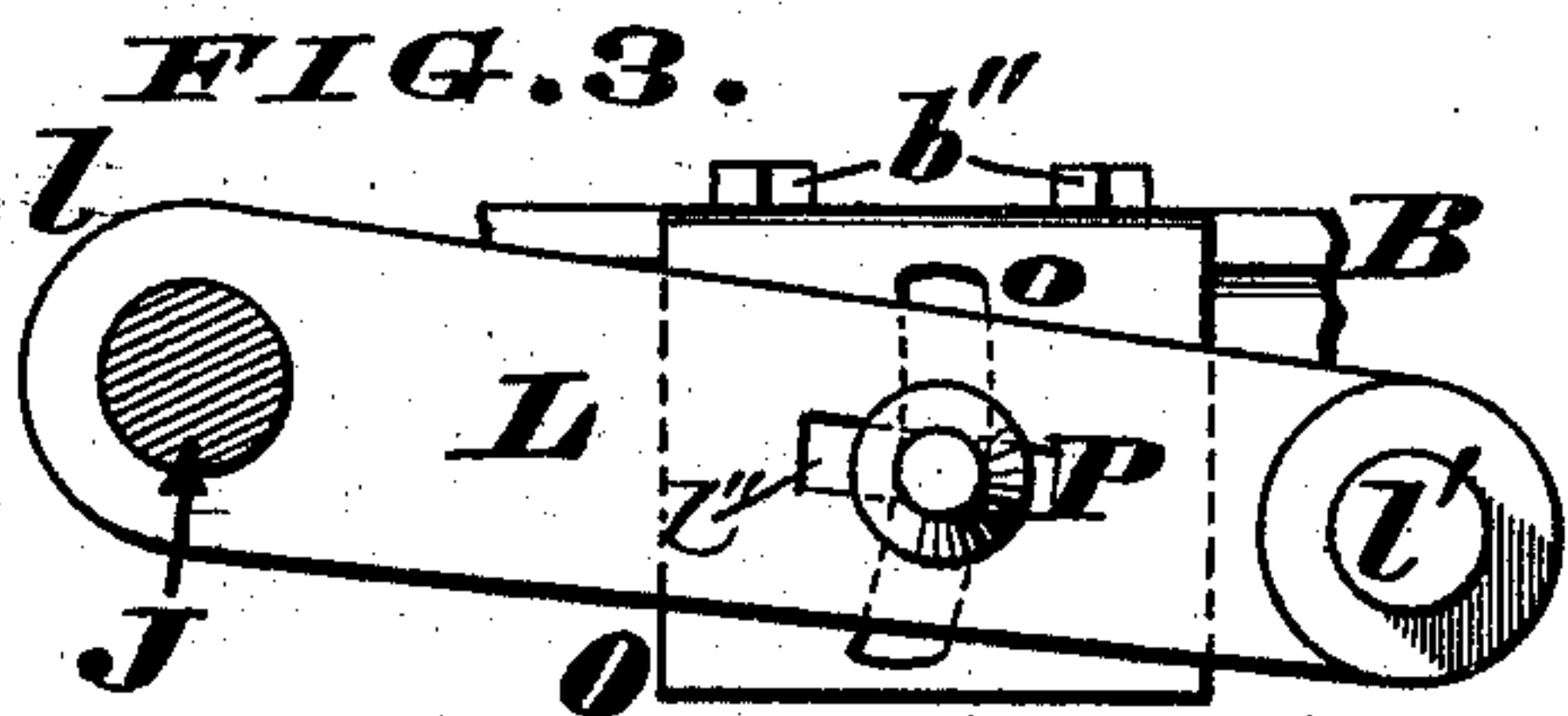
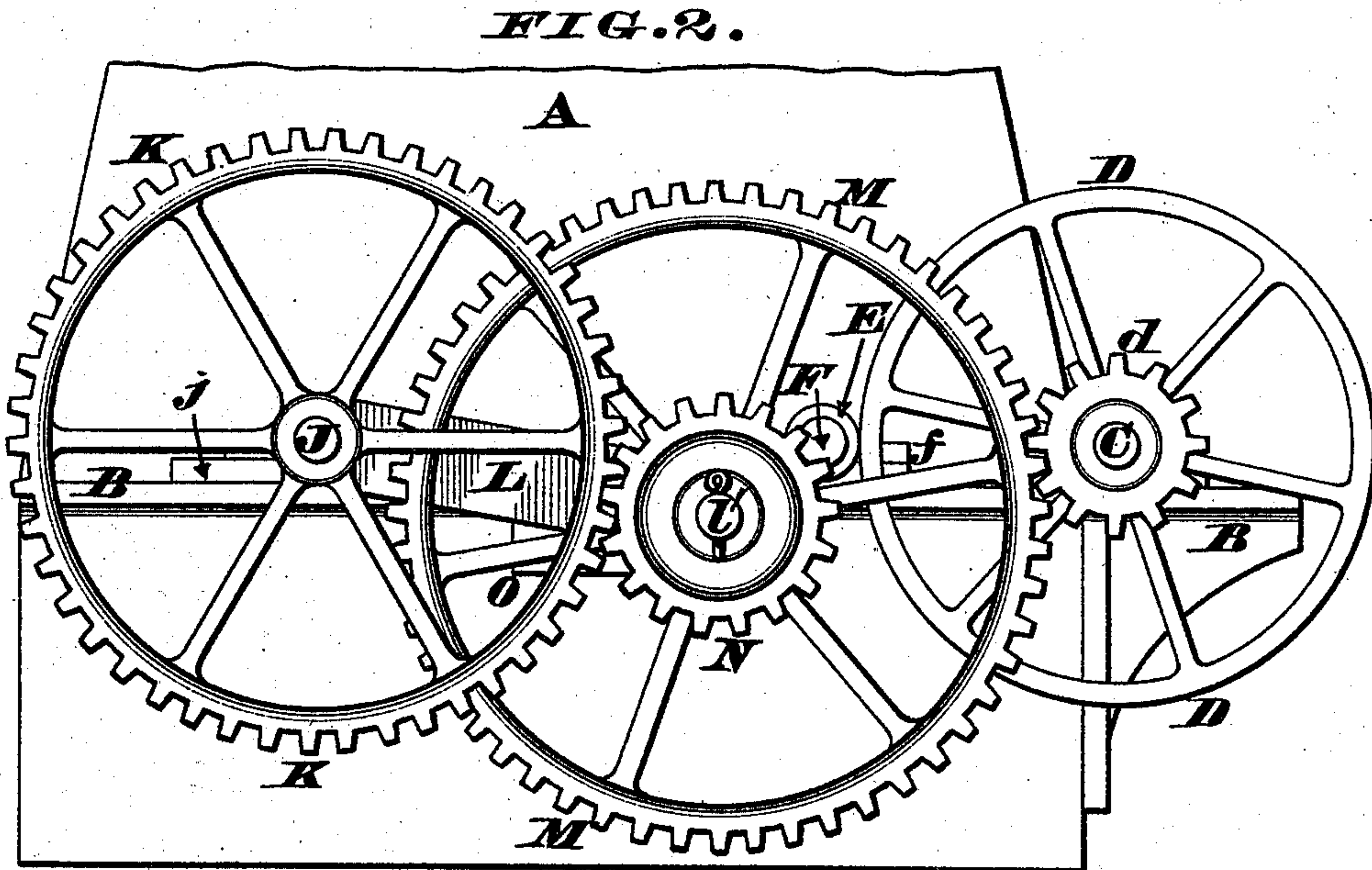
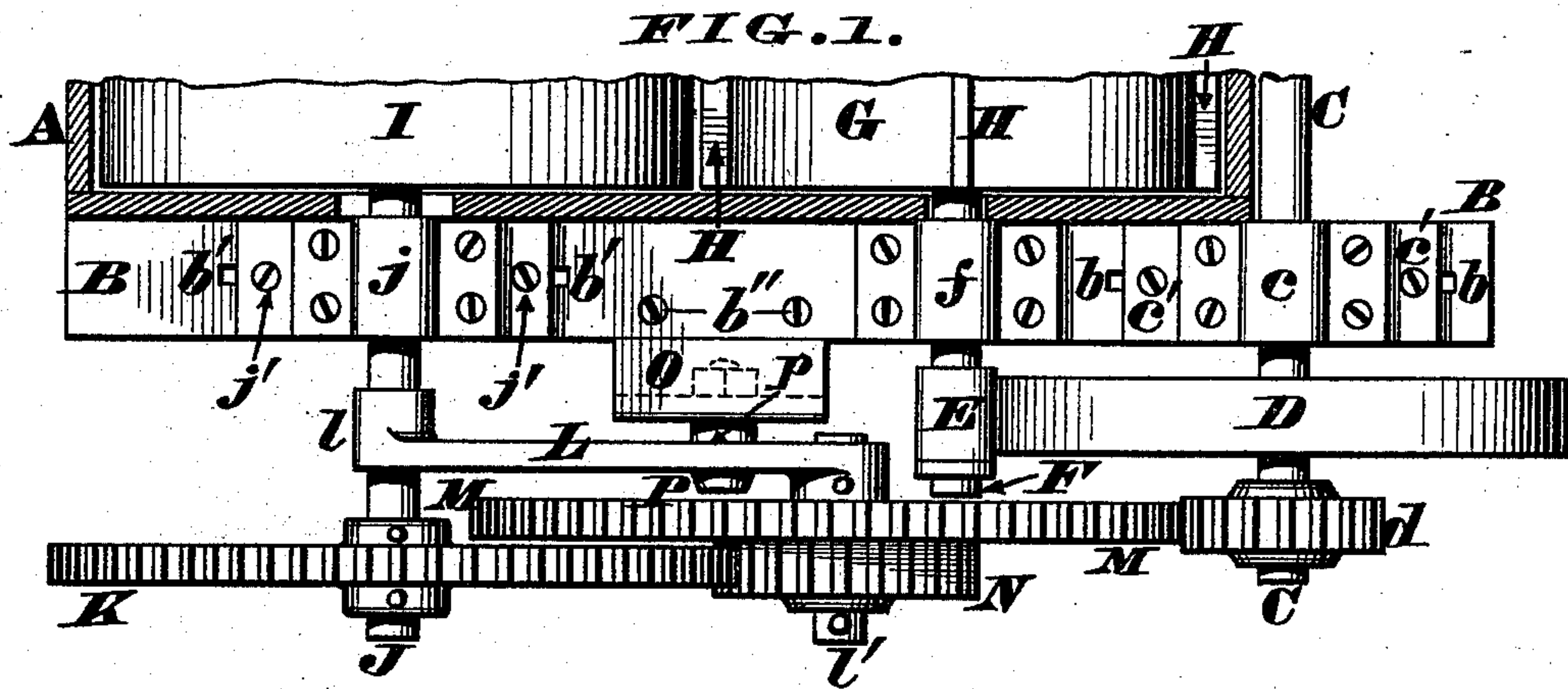


(No Model.)

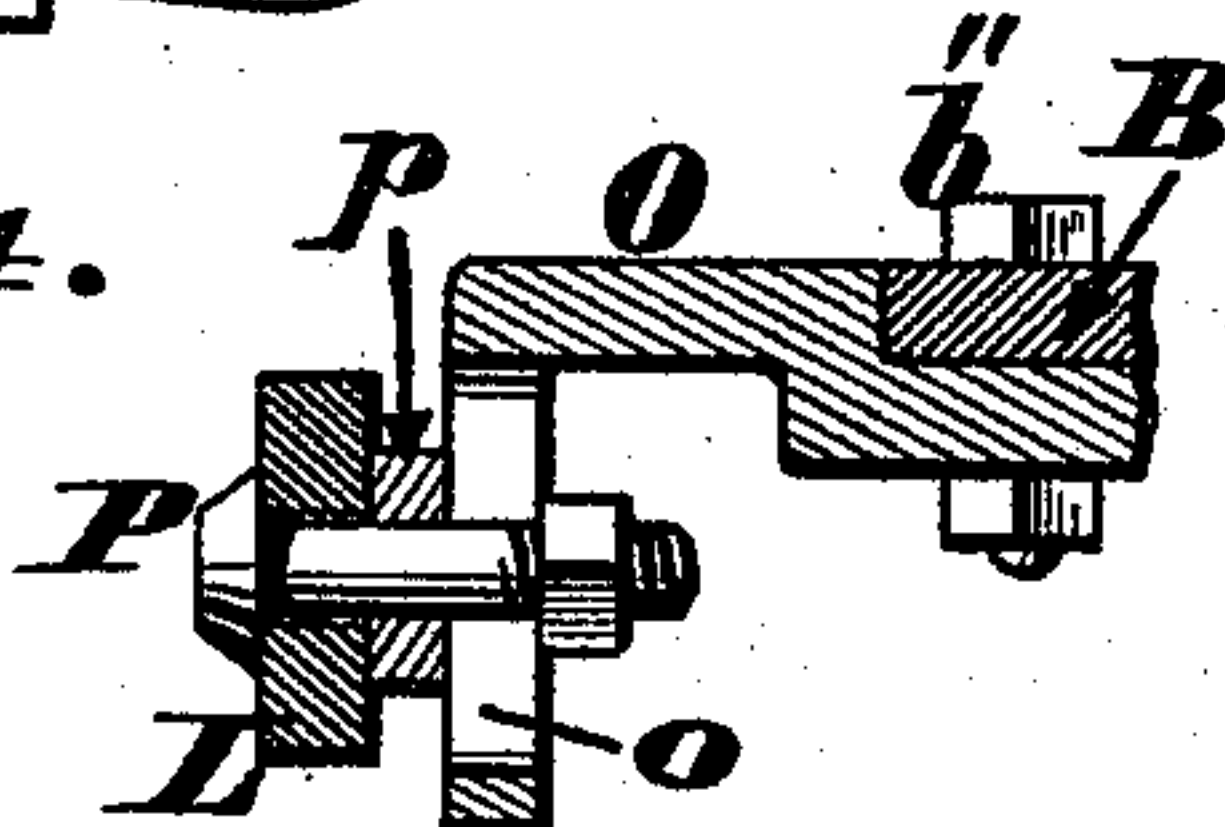
J. CREAGER.
CLAY PULVERIZER.

No. 412,471.

Patented Oct. 8, 1889.



Attest.
S. S. Carpenter,
L. O. Layman.



Inventor.
Jonathan Creager.
By James H. Layman.
Atty.

UNITED STATES PATENT OFFICE.

JONATHAN CREAGER, OF CINCINNATI, OHIO.

CLAY-PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 412,471, dated October 8, 1889.

Application filed April 13, 1889. Serial No. 307,142. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN CREAGER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Clay-Pulverizers; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to those grinding-machines which are used for pulverizing clay and other similar substances; and the first part of my improvements comprises a novel combination of devices for keeping the driving-gears in mesh with each other when the grinding-cylinders are adjusted close together, or separated a greater or less distance for the purpose of pulverizing the clay either finely or coarsely, the details of said devices being hereinafter more fully described, and pointed out in the claims.

The second part of my improvements comprises a novel combination of devices for retaining the blades of the cutting-cylinder of a clay-pulverizer to any specific adjustment, the details of said devices being hereinafter more fully described, and pointed out in the claims.

In the annexed drawings, Figure 1 is a sectionized plan of that portion of a clay-pulverizer to which my driving-gear adjusters are applied. Fig. 2 is a side elevation of said pulverizer. Fig. 3 is an enlarged side elevation of the radius-rod and its accessories. Fig. 4 is a transverse section through said rod in the plane of its clamping-bolt. Fig. 5 is a sectional elevation of one of the cutting-blades and its adjusting devices.

A represents a portion of the hopper or box of a clay pulverizer or disintegrator, and B is a side frame thereof, which frame has secured to it the journal-bearings for the various shafts, C being the driving-shaft, which is operated in any suitable manner. Shaft C is journaled in an adjustable box *c*, having bolts or screws *c'*, capable of being shifted along the slots *b* of the frame B, and said shaft has secured to it a large driving-wheel D and pinion *d*, the wheel D being held in close con-

tact with the periphery of a small friction-wheel E, attached to the shaft F of cutting-cylinder G.

f is the journal-box of shaft F.

Cutting-cylinder G is armed with blades H, and is preferably used in conjunction with a smooth-faced cylinder I, secured to a shaft J, journaled in an adjustable box *j*, having bolts or screws *j'*, capable of being shifted along the slots *b'* of the frame B, the outer end of said shaft having a spur-wheel K secured to it. Furthermore, this shaft turns freely within a box or bearing *l* at one end of a radius-rod L, whose other end has a stud-shaft *l'* rigidly attached thereto. *l'* is a longitudinal slot in said radius-rod, to permit the latter being shifted back and forth, as required. The stud-shaft *l'* has journaled on it a spur-wheel M and pinion N, which wheel and pinion should be a single casting, or, if separate castings, they should be so united as to revolve together. Wheel M gears with the pinion *d* of shaft C, while the pinion N engages with the spur-wheel K of shaft J.

Attached to the frame B, by bolts *b''*, is a bracket O, of the angular shape seen in Fig. 4, which bracket is provided with a curved slot *o*, concentric with the shaft J, said slot being traversed by a clamping-bolt P, which passes through the radius-rod L. *p* is a washer interposed between said bracket and rod.

The blades H are fitted within the cutting-cylinder G, as seen in Fig. 5, each blade being slotted at *h h'* to admit bolts R R', the inner edge of said blade resting against the heads of adjusting-screws S S', tapped in a flange or other bearing T of said cylinder.

In fitting up this machine the box *c* is so adjusted as to cause the wheel D to bear very tightly against the small wheel E, in order that the cutting-cylinder G may be driven at a high velocity; but the gears *d*, M, N, and K cause the other cylinder I to revolve very slowly, the clearance between these cylinders being regulated in the following manner:

If the machine is to grind clay very finely, the cylinder I must be set up quite close to the blades H of the other cylinder G, preparatory to which act the bolts *j' j'* and P are unslackened, so as to allow the box *j* to be

shifted the desired distance, and then said bolts are again tightened. This advancement of cylinder I and shaft J causes a slight lowering of the pinion N, although it is still kept
 5 in gear with the wheel K, and the wheel M still meshes with the pinion *d*. Consequently motion is communicated from the driving-shaft C to the cylinder I, through the connected gears *d*, M, N, and K, at the
 10 same velocity they had previous to this change. If, however, it is desired to grind the clay or other substance or materials very coarsely, the cylinder I must be shifted a proper distance away from the other cylinder G, which
 15 can be readily accomplished after unslackening the bolts *j' j'* P, as above described. Said bolts are again tightened, and the gears *d*, M, N, and K resume their functions. This retraction of cylinder I causes a slight elevation of pinion N; but it still remains in gear
 20 with the spur-wheel K, and the wheel M still meshes with the pinion *d*. This simultaneous raising and lowering of the pinion N and wheel M is due to the fact that they are both
 25 carried by the same stud-shaft *l'* at the free end of radius-rod L, which latter is fulcrumed on the shaft J and is retained at any specific adjustment by the clamp-bolt P.

The knife H should project a suitable distance beyond the periphery of cylinder G, as
 30 indicated by the dotted lines in Fig. 5, and when said knife becomes worn down the bolts

R R' are slackened and the screws S S' are advanced a sufficient distance to render the knife again effective as soon as said bolts R R' are tightened. Finally, the devices for
 35 keeping the driving-gears in mesh with each other are not confined to the special pulverizer herein described; neither are the blade-retainers limited to the form of cutting-cylinder shown, but said retainers are preferably
 40 employed with the peculiar cylinder seen in Letters Patent No. 380,245, granted March 27, 1888, to J. Creager and H. M. Creager.

I claim as my invention—

1. The combination, in a pulverizer, of shafts C F J, driving-wheel D, wheel E, pinions *d* N, spur-wheels K M, vertically and longitudinally shiftable radius-rod L *l*, stud-shaft *l'*, and a fastener, as P, for retaining said
 45 rod at any specific adjustment, the spur-wheel M and pinion N being journaled on said stud-shaft *l'*, for the purpose described.

2. The combination, in a pulverizer, of cylinder G, blade H, slots *h h'*, bolts R R', and adjusting-screws S S', which screws bear against the inner edge of said blade, for the purpose
 55 described.

In testimony whereof I affix my signature in presence of two witnesses.

JONATHAN CREAGER.

Witnesses:

JAMES H. LAYMAN,
 SAM'L. S. CARPENTER.