

(No Model.)

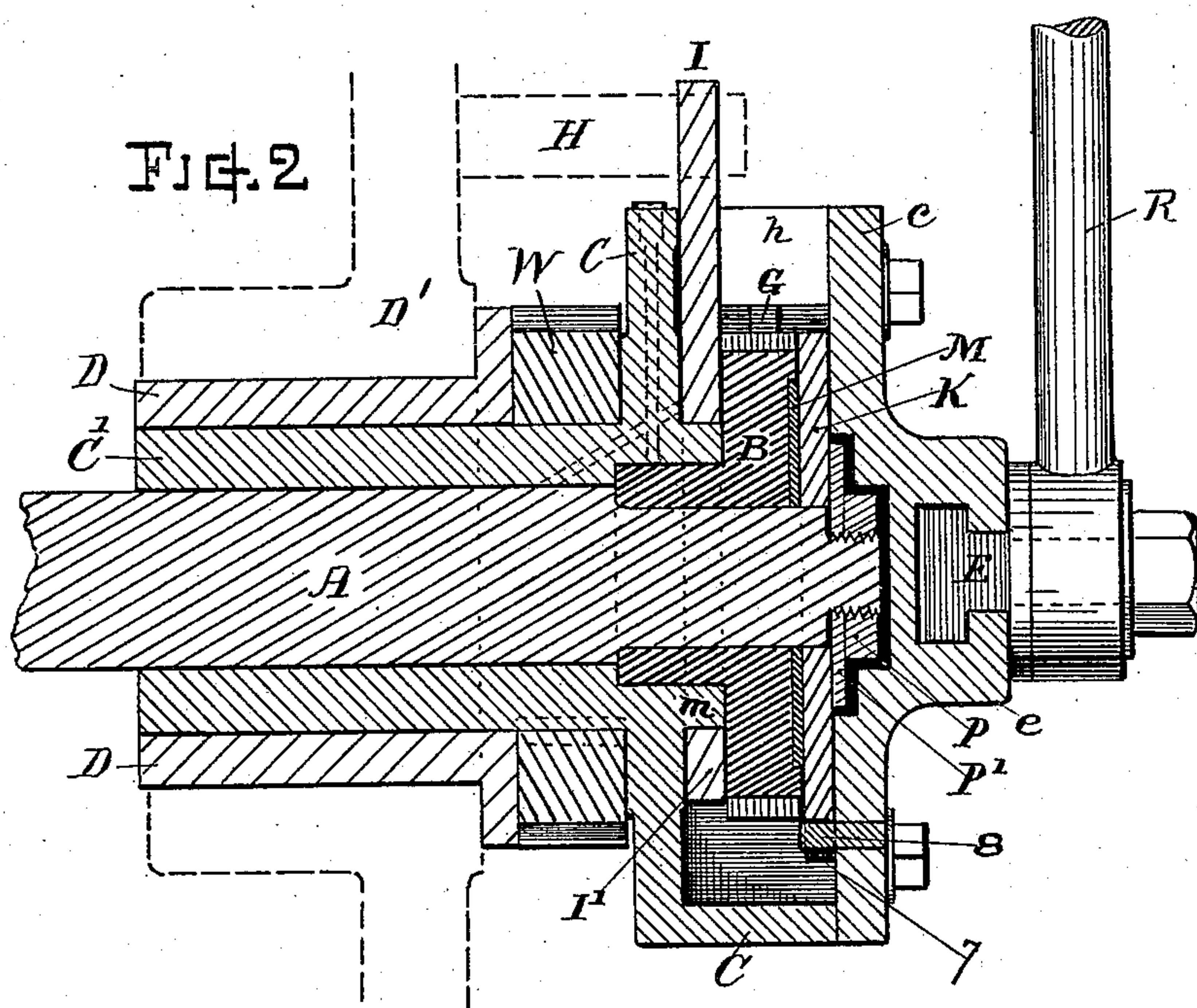
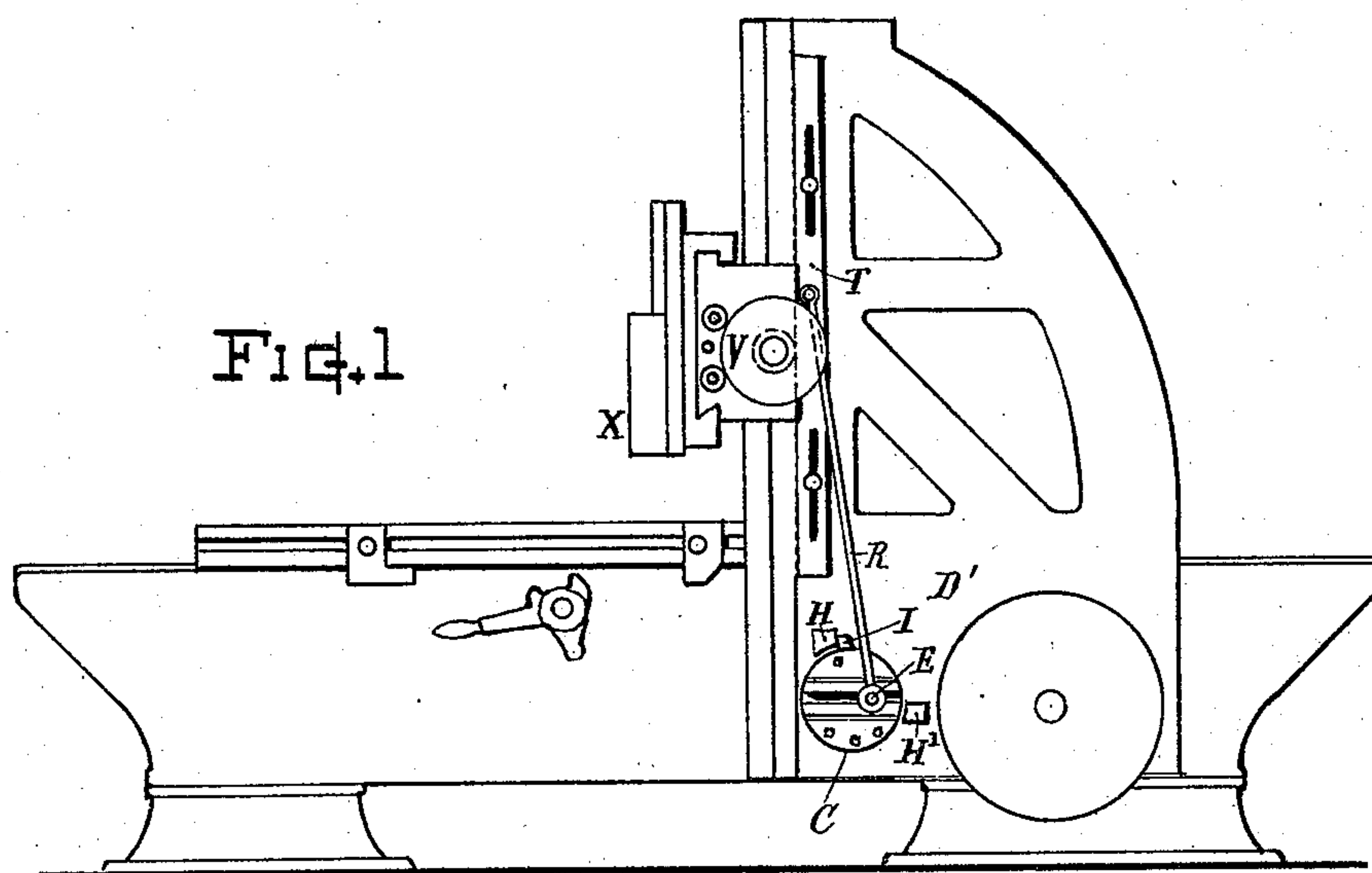
2 Sheets—Sheet 1.

A. M. POWELL.

FEED OPERATOR FOR METAL PLANING MACHINES.

No. 570,953.

Patented Nov. 10, 1896.



Witnesses.

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Inventor.

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(No Model.)

2 Sheets—Sheet 2.

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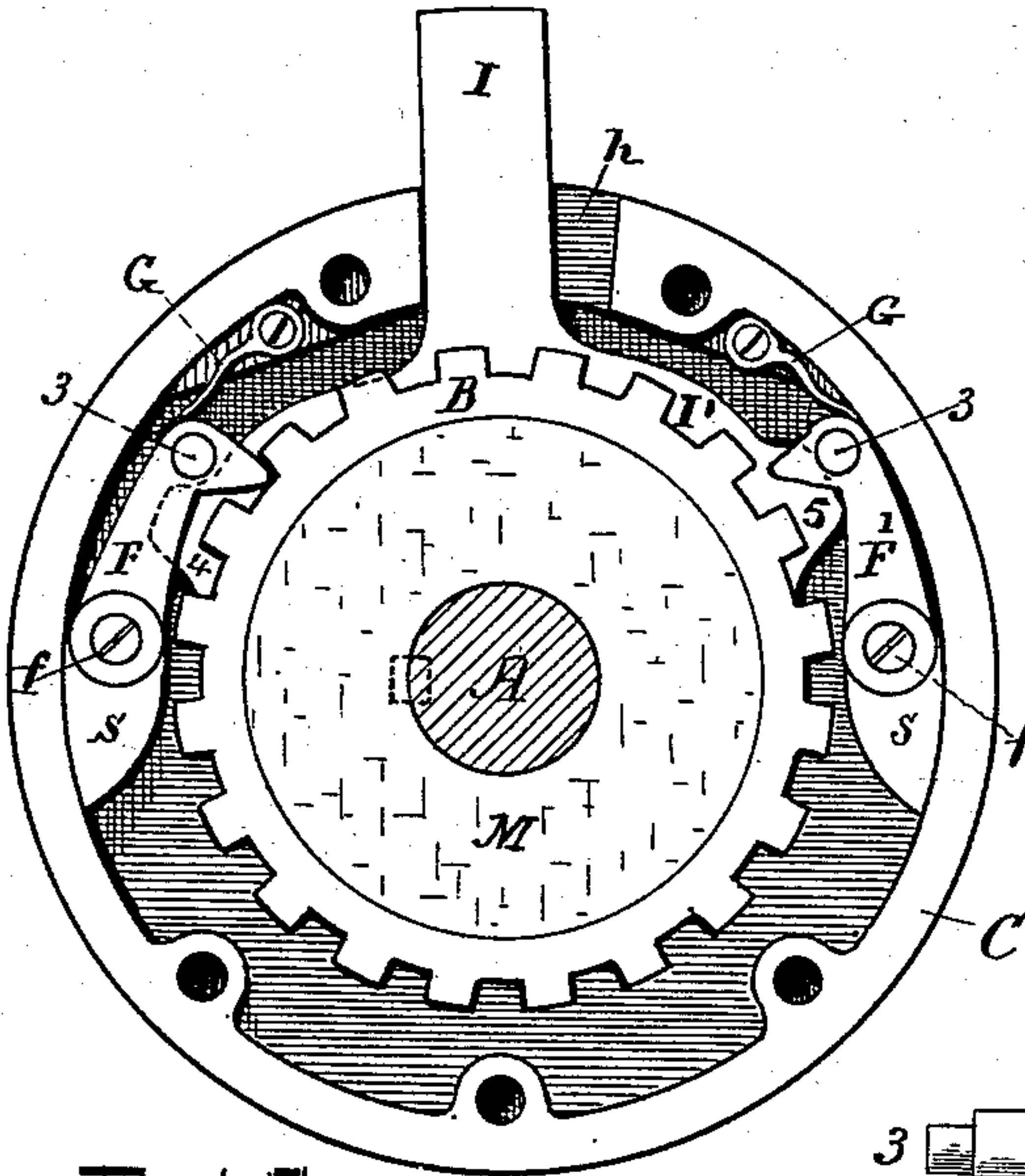


FIG. 3

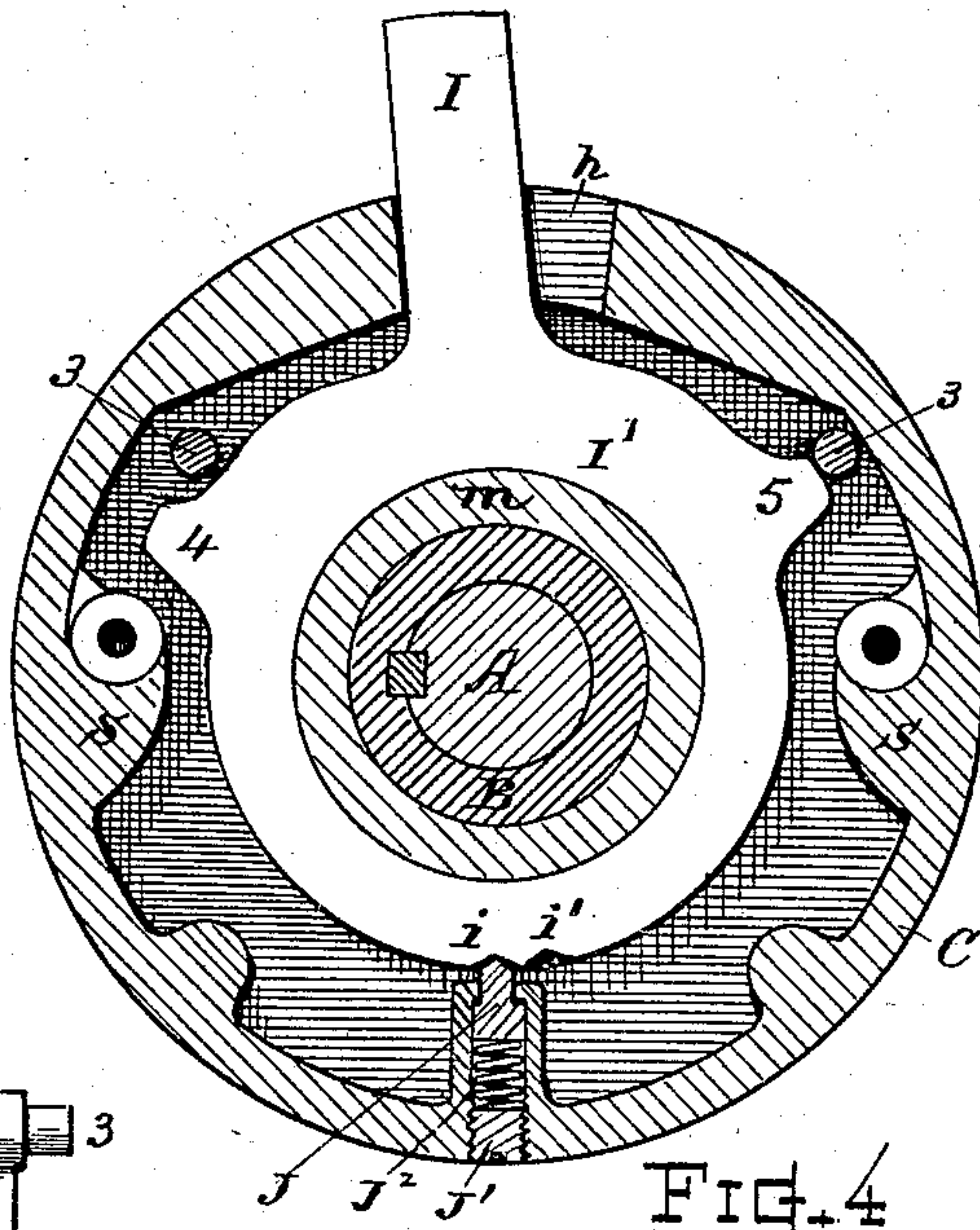


FIG. 4

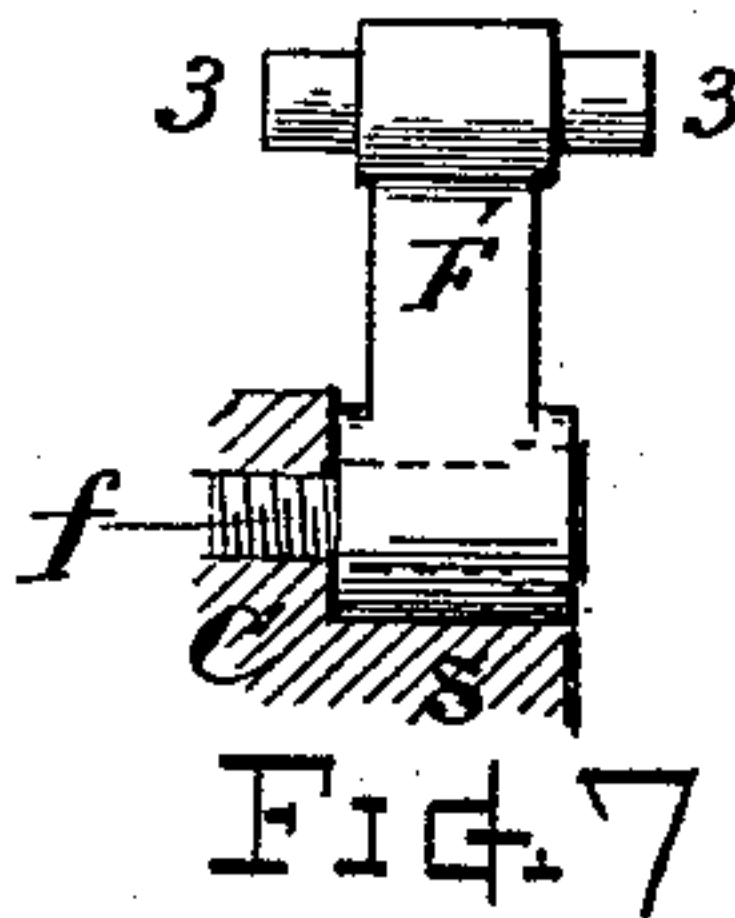


FIG. 7

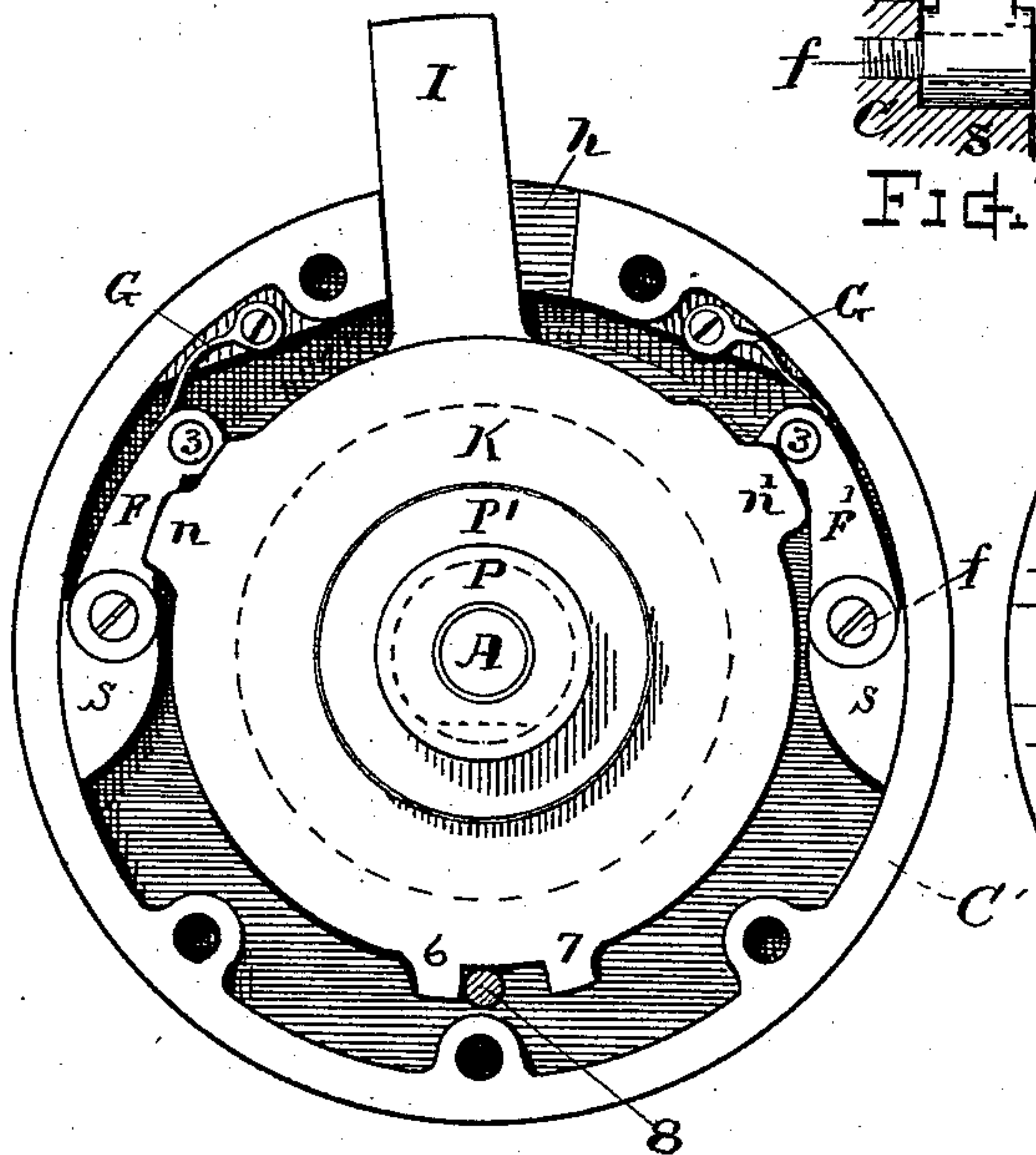


FIG. 5

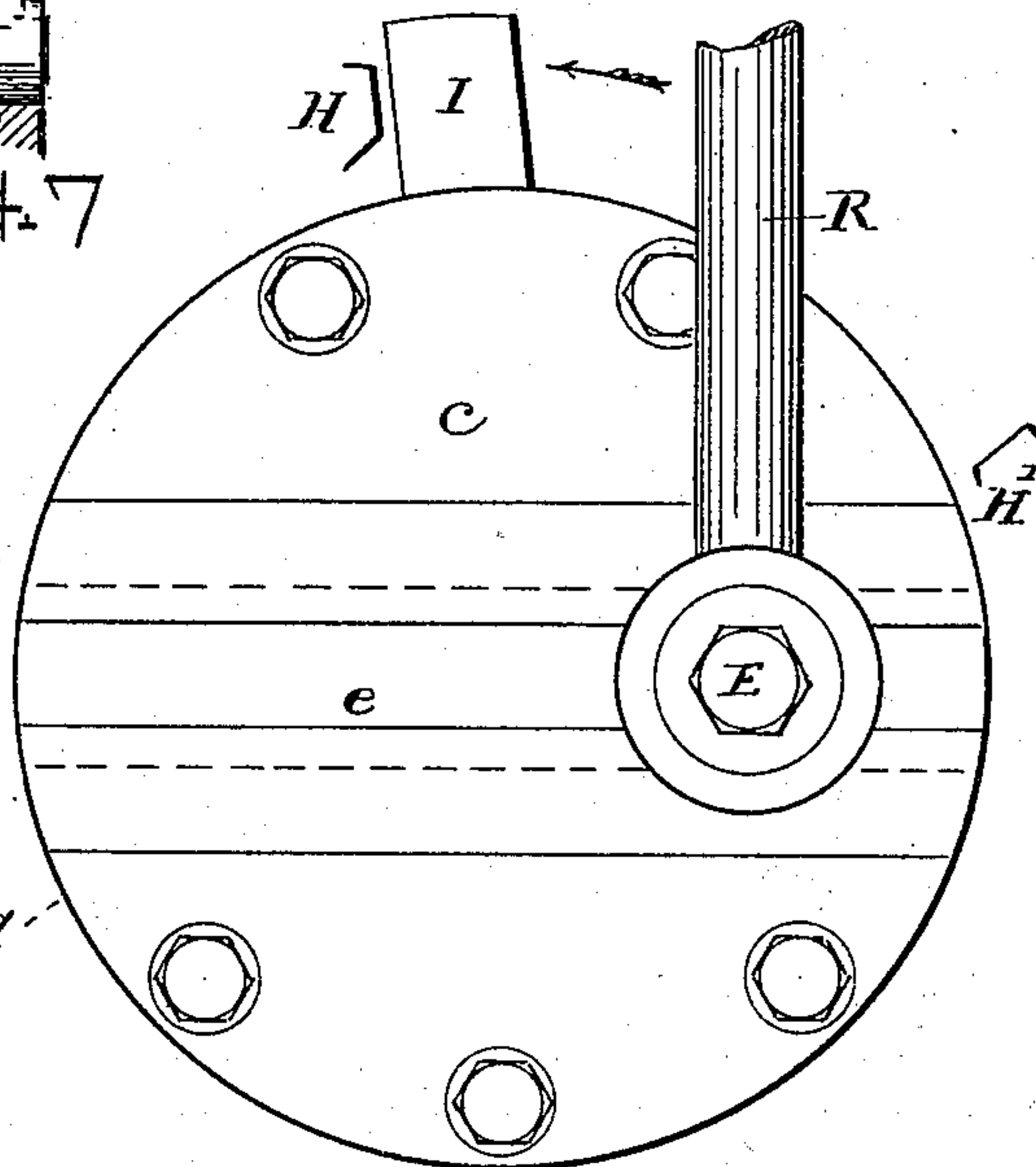


FIG. 6

Witnesses.

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UNITED STATES PATENT OFFICE.

ALBERT M. POWELL, OF WORCESTER, MASSACHUSETTS.

FEED-OPERATOR FOR METAL-PLANING MACHINES.

SPECIFICATION forming part of Letters Patent No. 570,953, dated November 10, 1896.

Application filed April 25, 1896. Serial No. 589,012. (No model.)

To all whom it may concern:

Be it known that I, ALBERT M. POWELL, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Feed-Operator for Metal-Planing Machines, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide a highly-efficient mechanism for the purpose named, one that will operate with precision and at once release positively, and which will waste no material amount of power for its running; also, to afford therein means for the retention of the engaging parts out of contact after the stop and until the direction of motion of the feed power-shaft is reversed. These objects I attain by the mechanism shown in the drawings, wherein—

Figure 1 is an outline side view of a metal-planer, illustrating the application of my invention in use thereon. Fig. 2 is a longitudinal vertical section of my feed-operator mechanism. Fig. 3 is a front view with the cap-plate and annular guard-plate removed. Fig. 4 is a transverse section at a position back of the ratchet-head. Fig. 5 is a front view with the cap-plate removed, showing the relation of the pawls and guard-plate. Fig. 6 is a front view, and Fig. 7 is a separate view, of the pawl.

This feed-operator mechanism is constructed of parts, in combination, as follows:

A denotes the feed power-shaft, to which alternating forward and backward rotative movement is imparted in connection with the reciprocation of the planer-table by any convenient arrangement of gearing, which it is not necessary to herein show.

B indicates a ratchet wheel or head rigidly keyed to the end of the shaft. The periphery of this head is provided with teeth and indentations.

C indicates the feed box or case surrounding the ratcheted head and having a supporting sleeve or journal C', that is revoluble upon the shaft A and within the bearing D, which latter is secured to the bed or frame D' of the planing-machine. (See Figs. 1 and 2.) The

front of the feed-box is provided with a cap-plate c, bolted to the casing-rim and carrying thereon a crank or wrist pin E for the connection-rod of the feed-rack. The cap-plate c is in the present instance provided with the usual transverse undercut guide-way e to facilitate adjustment of the wrist-pin to give more or less feed movement.

F F' indicate pawls oppositely supported within the feed-box, and provided with suitable points shaped so as to engage the detents or ratchets on the head B when the latter move toward the pawl, but so as to pass without engaging when the head moves in opposite direction. The pawls are respectively seated at their pivot-hubs in semi-circular seats formed on support-lugs S, integral with the rim of the feed-box casting, to give firm support against working strains while they are retained by pivot-screws f, so that their point ends can swing to and from the indented periphery of the head B. Stud or projections 3 are formed on the pawls at or near their engaging ends. (See Figs. 3 and 7.) Suitable springs G are provided that normally press the pawls inward or toward the ratchet-head.

I' indicates a plate having projections or cams 4 and 5, that engage the studs 3 for retracting the pawls; also with a striker-arm I, that projects through an opening h in the side of the feed-box C sufficiently to engage with stationary stop-lugs H H' on the machine-frame. The cam-plate is mounted to turn on an annular portion m of the box concentric with the shaft A, and the opening in the case is of sufficient width to allow a swing of the cam-plate to bring either the right or left cam 4 or 5 under the projection 3 of the respective pawls and thereby throw one of such pawls out of engagement while permitting the other to fall into engagement with the head B, accordingly as the striker-arm I is moved to the right or left in relation to its opening h.

The cam-plate can be made to have friction against the feed-box rim to prevent its jarring out of position, or any suitable means can be employed for retaining it at adjusted position. In the present instance a spring-pressed latch-dog J and engaging lugs or notches i i' are used for this purpose, as in-

licated in Fig. 4. A screw J' is preferably provided for regulating the force of the latch-dog spring J².

The cams 4 and 5 are best located in such manner that when the cam-plate is at central position between the limits of its movement by the arm I then both of the pawls F and F' can together fall into engagement with the toothed head B. This avoids any position of total non-engagement and insures the taking of movement in whichever direction the head may be moving.

K indicates an annular ring or guard-plate arranged adjacent to the head B and free to turn loose on the end of the shaft A. This plate has lugs that engage a pin or lug 8, fixed in the feed-box or its cap, for limiting its action in relation to the feed-box. Said plate is provided on its periphery with protuberances or guards *n* and *n'*, (see Fig. 5,) that respectively act against the projections 3 of the pawls for temporarily sustaining one or the other of said pawls out of engagement, accordingly as the guard-plate K is at its right or left limit of movement.

M indicates a disk, of leather or other suitable material, arranged between the plate K and head B, preferably in a recess formed in the head, and serving to give frictional engagement between the surfaces, so that the plate K will change position from one limit to the other automatically with the action of the head B. A nut P and washer P' are arranged upon the screw-threaded end of the shaft for regulating the degree of friction between the head and guard-plate K. The connecting-rod R, feed-rack T, and feed-gearing V of the planer can be of usual or any suitable construction.

When used on planers in which side-planing heads are employed, the feed-box is best provided with a gear W or arm keyed thereon for imparting motion to the feed mechanism of the side heads; but for planers employing only the usual single planing-head X this gear can be omitted.

The operation is as follows: the shaft A and head B being rotated one way and the other in unison with the table movement. When moving in the direction indicated by the arrow, Fig. 6, the pawl F engages the teeth on head B and the feed-box is moved with the head B, carrying the crank E, operating the rod R and feed-rack T until the cam-plate arm I strikes the stop-lug H, which arrests the movement of the cam-plate, and the further movement of the feed-box changes the relative position of the arm I and plate to the other side of the opening *h*, causing the stud 3 of pawl F to move onto the cam 4, thereby disengaging said pawl F and stopping the motion of the feed-box, while the shaft and head continue their further rotation. At the same time the stud 3 of pawl F' is released from the cam 5, ready to fall into engagement with the head B whenever the motion of the shaft A is reversed with the reverse movement

of the planer-table, said pawl, however, not engaging until such reversal. With the reverse movement of the ratchet-head the friction M, acting upon the guard-plate K, causes said plate to move with the head so far as permitted by its limiting-lugs 6 and 7, which is far enough to swing its guard *n'* from beneath the projection 3 of pawl F', thus allowing said pawl to fall into engagement and at the same time to bring its guard *n* beneath the projection 3 of pawl F for holding the latter pawl clear from the teeth of the moving head B. The pawl F', now engaging with the toothed head, causes the feed-box to rotate until the cam-plate arm I strikes the stop H', when pawl F' is thrown out of engagement and further rotation of the feed-box in that direction arrested, the guard *n* of plate K meanwhile retaining the pawl F' elevated clear of the teeth and until the motion of shaft A is again reversed, when the operation, as above, is repeated. Thus the alternate right-and-left movement of the feed-box is effected within the limit of the stops H and H' and any extent of movement of the shaft permitted with free action otherwise than the slight friction of the pad M against plate K, which is uniform, and creates practically no loss of power, the feed-operator requiring no power except while in actual movement of the feed.

The mechanism can in some instances be made and employed without the guard-plate K, limiting-pin 8, and friction-disk M; but in such cases the disengaged pawl will give a clicking noise by dragging upon the ends of the teeth of the ratchet-head B. I therefore prefer to employ this guard-plate as illustrated, since the idle-pawl is thereby held clear from the ratchet-teeth and noise avoided.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. The combination of the power-shaft, the peripherally-toothed head or wheel fixed thereon, the feed-box mounted loose on said shaft, right and left pawls pivoted within the feed-box and having points that engage with said head, as described, the oscillating cam-plate mounted upon the annular central portion of the feed-box concentric with the power-shaft, and provided at its peripheral edge with cam-lugs for alternately disengaging said pawls, and also provided with a radial striker-arm that projects through an opening in the side of the feed-box for exterior contact with the stops, the feed-box cap carrying the crank or wrist pin, and exterior stationary stops that arrest the movement of said arm, substantially as set forth.

2. In combination, substantially as described, the feed power-shaft, the toothed head or wheel fixed thereon, the feed-box rotative about said shaft and head, the pawls pivotally supported within the feed-box and disposed at the right and left for engagement with said toothed head, said pawls having studs projecting from their sides, the cam-

plate having cams for lifting the pawls, and a striker or arm projecting from the feed-box, the guard-plate having protuberant guards for holding up said pawls, means for limiting the movement of said guard-plate relatively to the feed-box, the frictional engaging surfaces or disk between said head and guard-plate, and external arresting-stops, for the purposes set forth.

3. The combination, in a feed-operating mechanism, comprising the shaft, the toothed head, the feed-box, the right and left engaging pawls, the cam-plate, its striker-arm and external stationary stop-lugs for engaging said arm; of the frictionally-controlled guard-plate having protuberances for holding off said pawls, a stop for limiting the action of said guard-plate, and an adjusting-disk and nut for regulating the frictional tension on said guard-plate, substantially as set forth.

4. In feed-operating mechanism of the character described, the feed-box having on its rim integral internal projections S with seat-

ing-cavities therein for sustaining the hubs of the pawls; in combination with the pawls externally fitting said seating-cavities, the pivoting-screws *f*, and the toothed operating head or wheel that engages said pawls, as set forth.

5. The combination of the ratchet-head, the box surrounding said head, oppositely-directed spring-pressed pawls pivoted to said box and adapted for engagement with the ratchet-head, a cam-plate having projections for alternately throwing off the pawls, a striker for shifting the cam-plate, and means for retaining said cam-plate at positions of adjustment, when released from the striker, substantially as set forth.

Witness my hand this 11th day of February, 1895.

ALBERT M. POWELL.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.