

(No Model.)

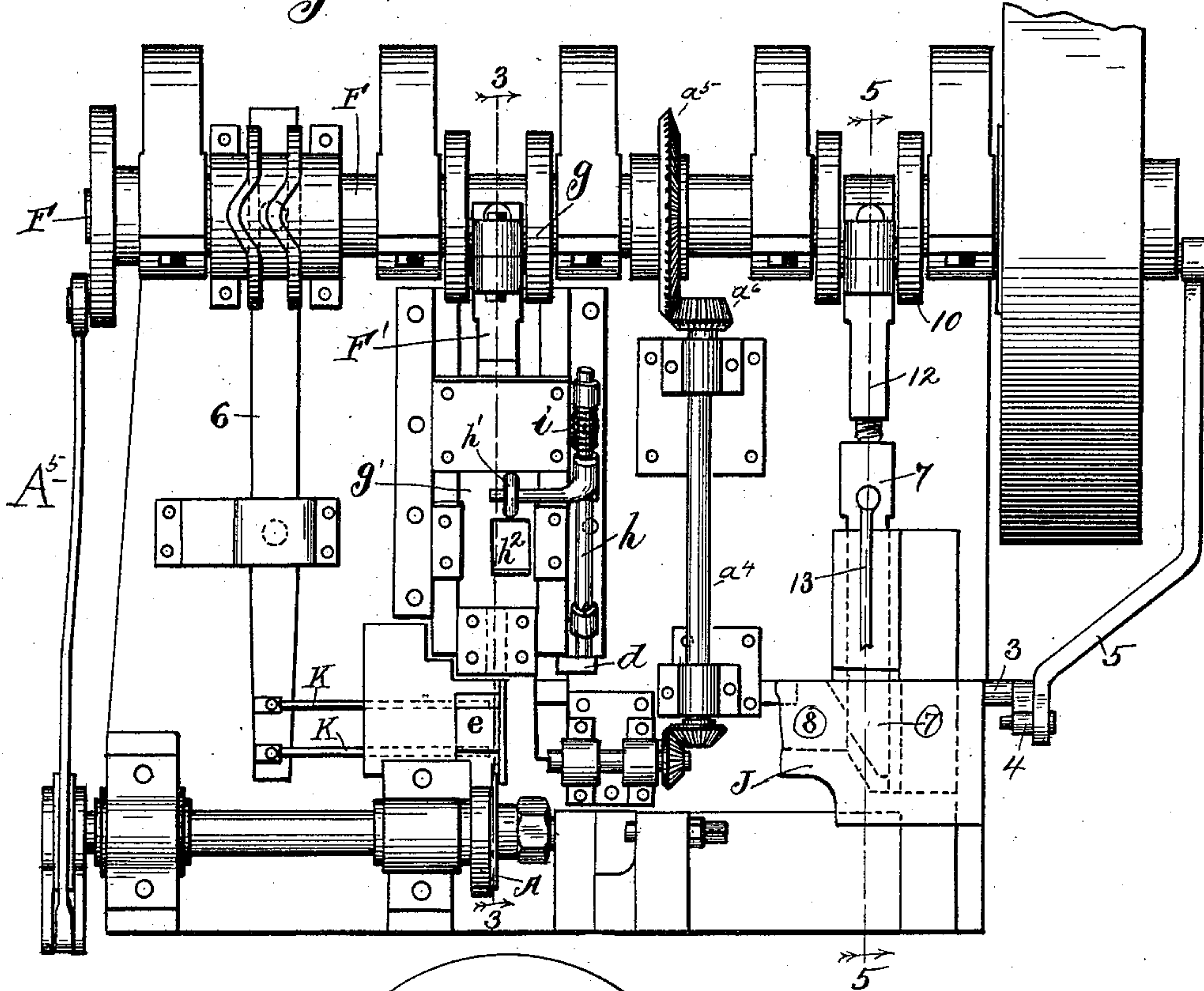
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G. BARR.  
SPIKE MACHINE.

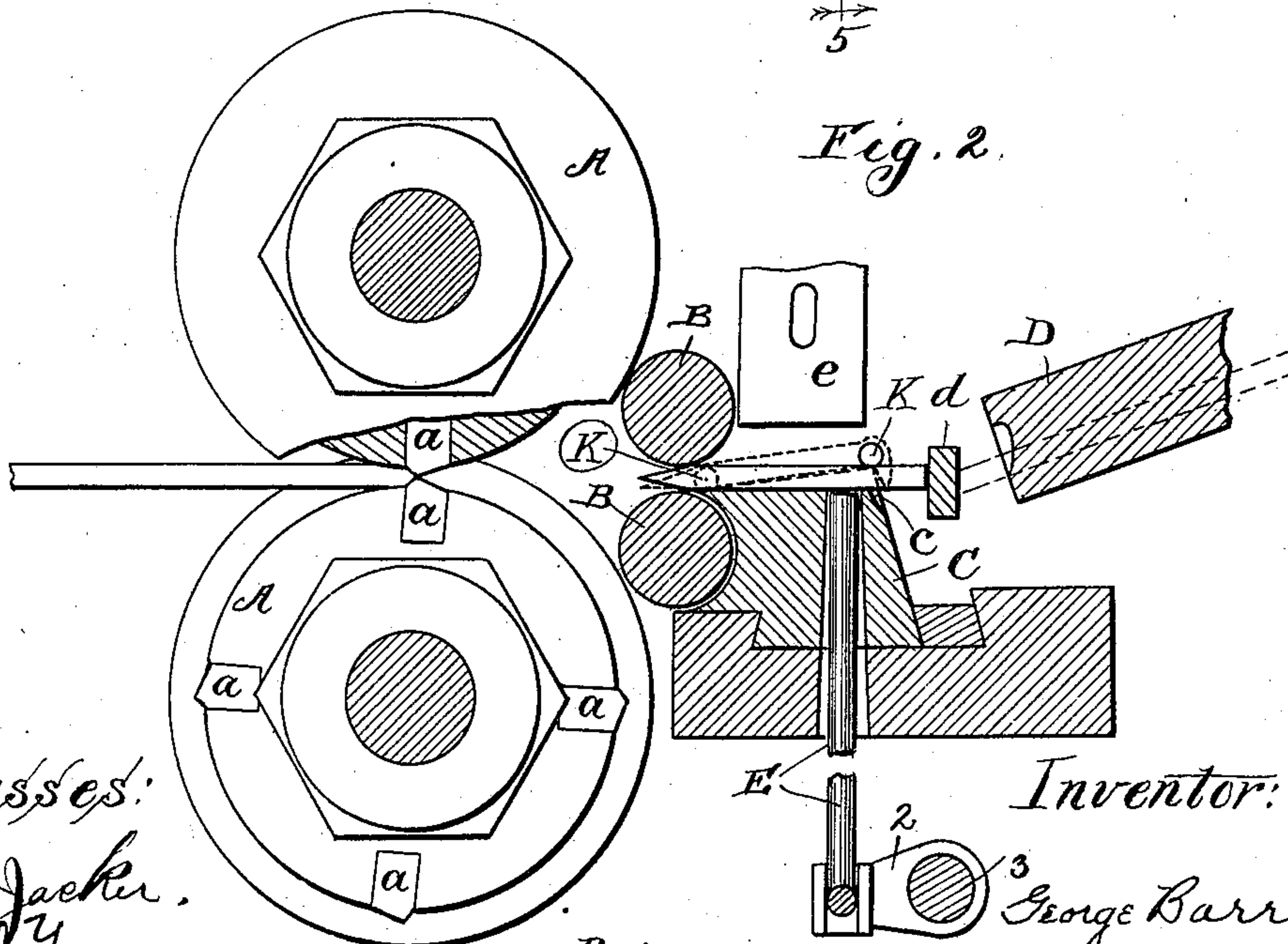
No. 576,536.

Patented Feb. 9, 1897.

*Fig. 1.*



*Fig. 2.*



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R. J. Jacker,  
Chas. J. Young.

Inventor:  
George Barr  
By Frank D. Thompson,  
Atty

(No Model.)

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G. BARR.  
SPIKE MACHINE.

No. 576,536.

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Fig. 4.

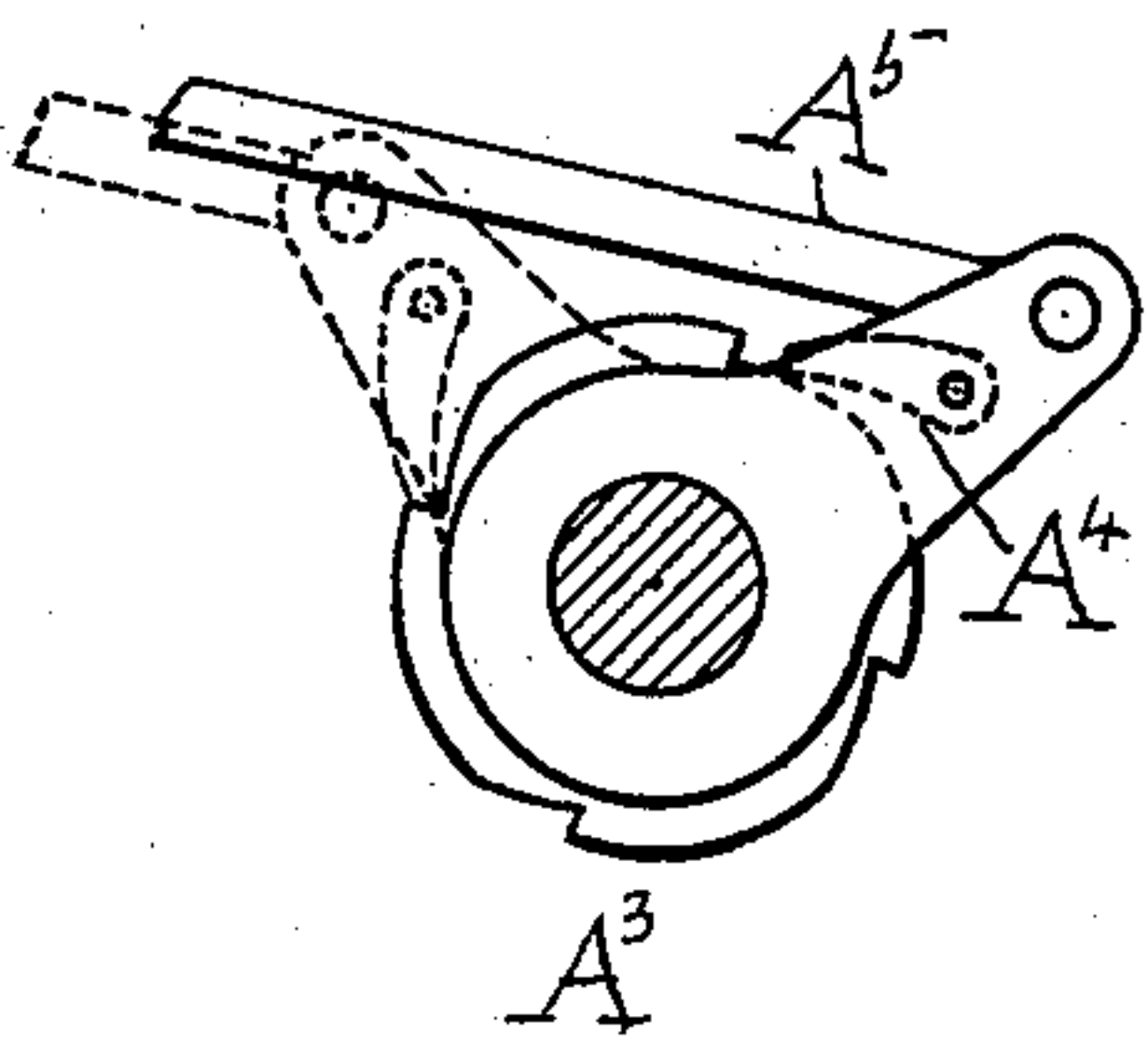


Fig. 3.

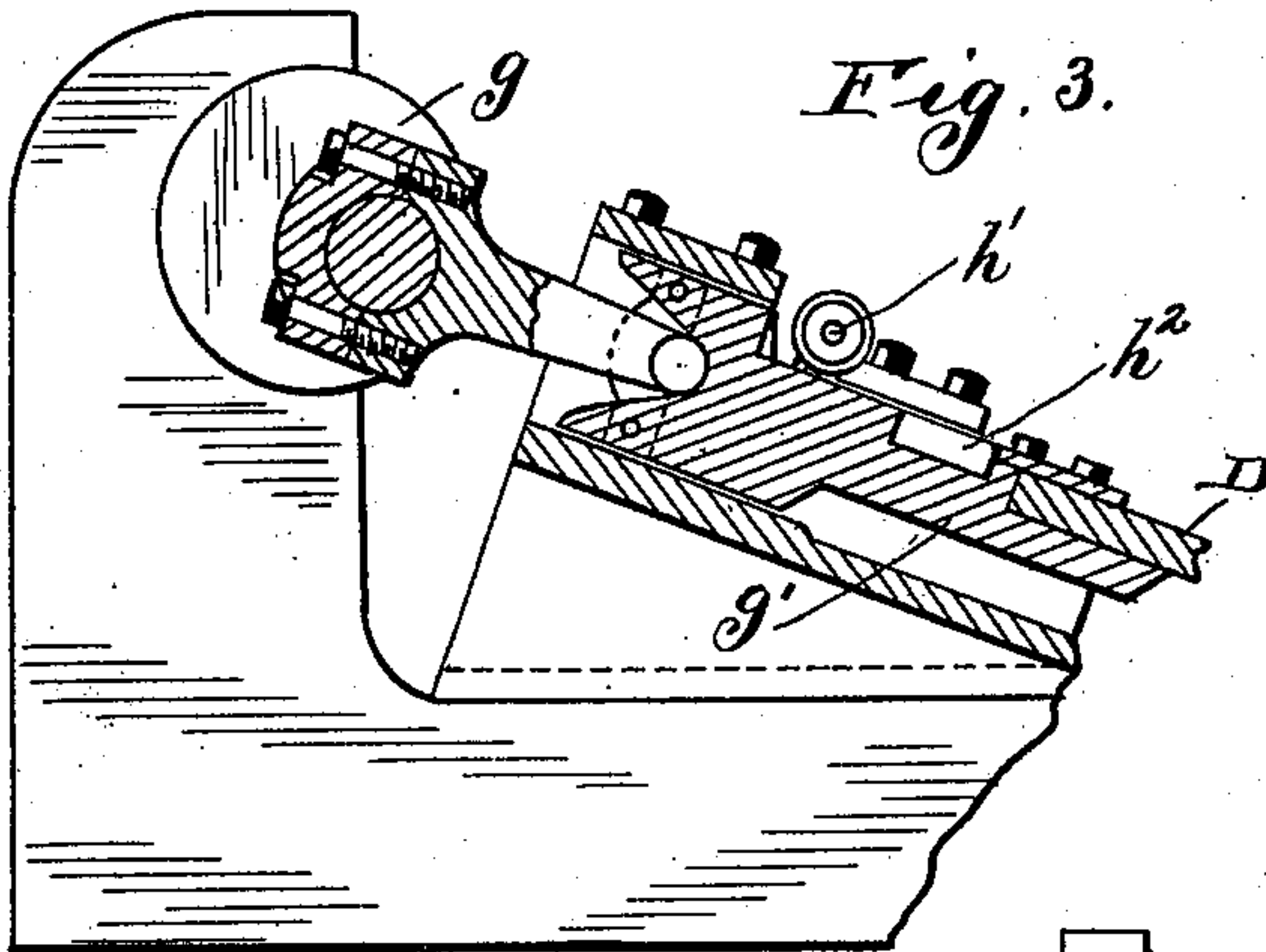


Fig. 5.

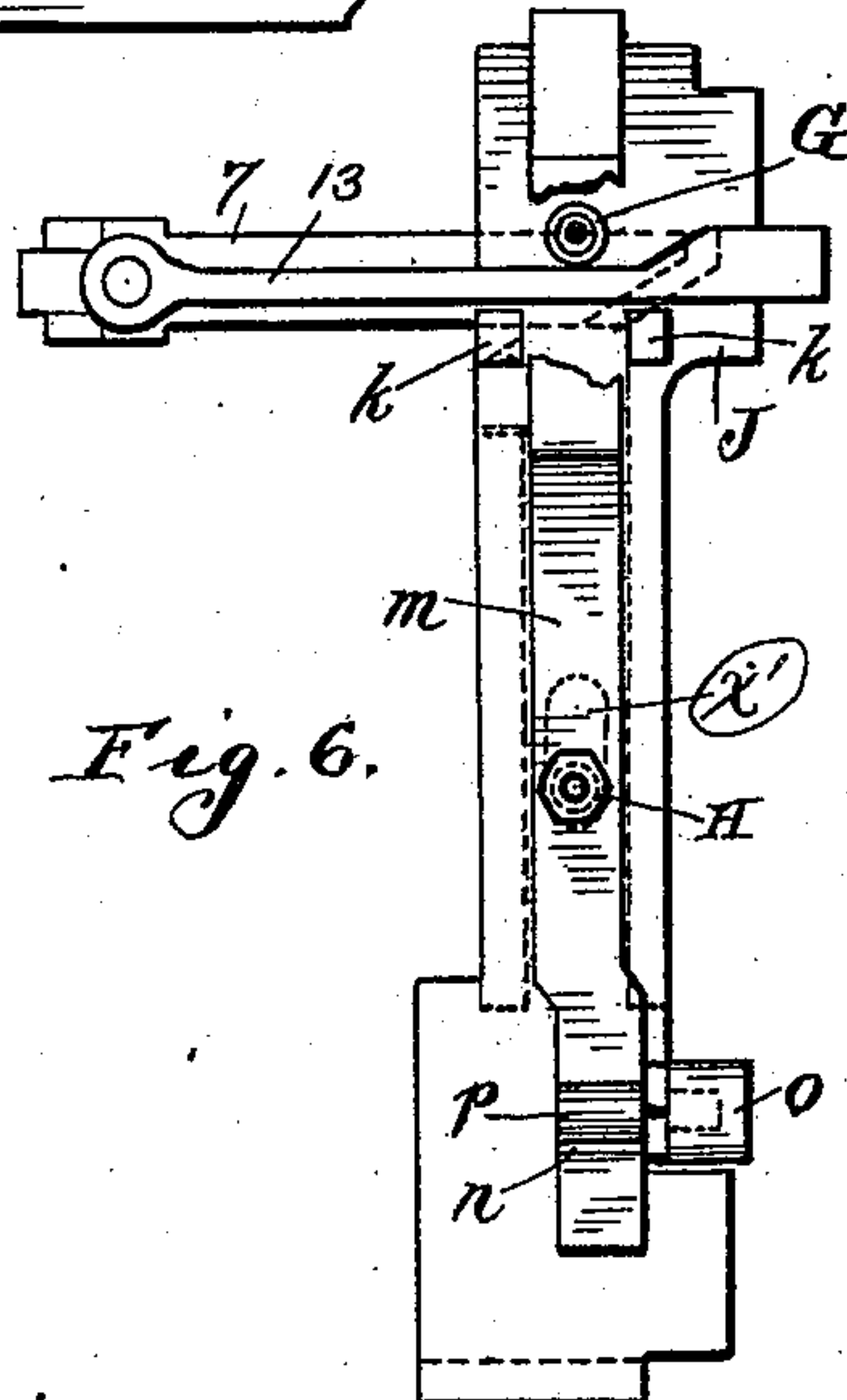
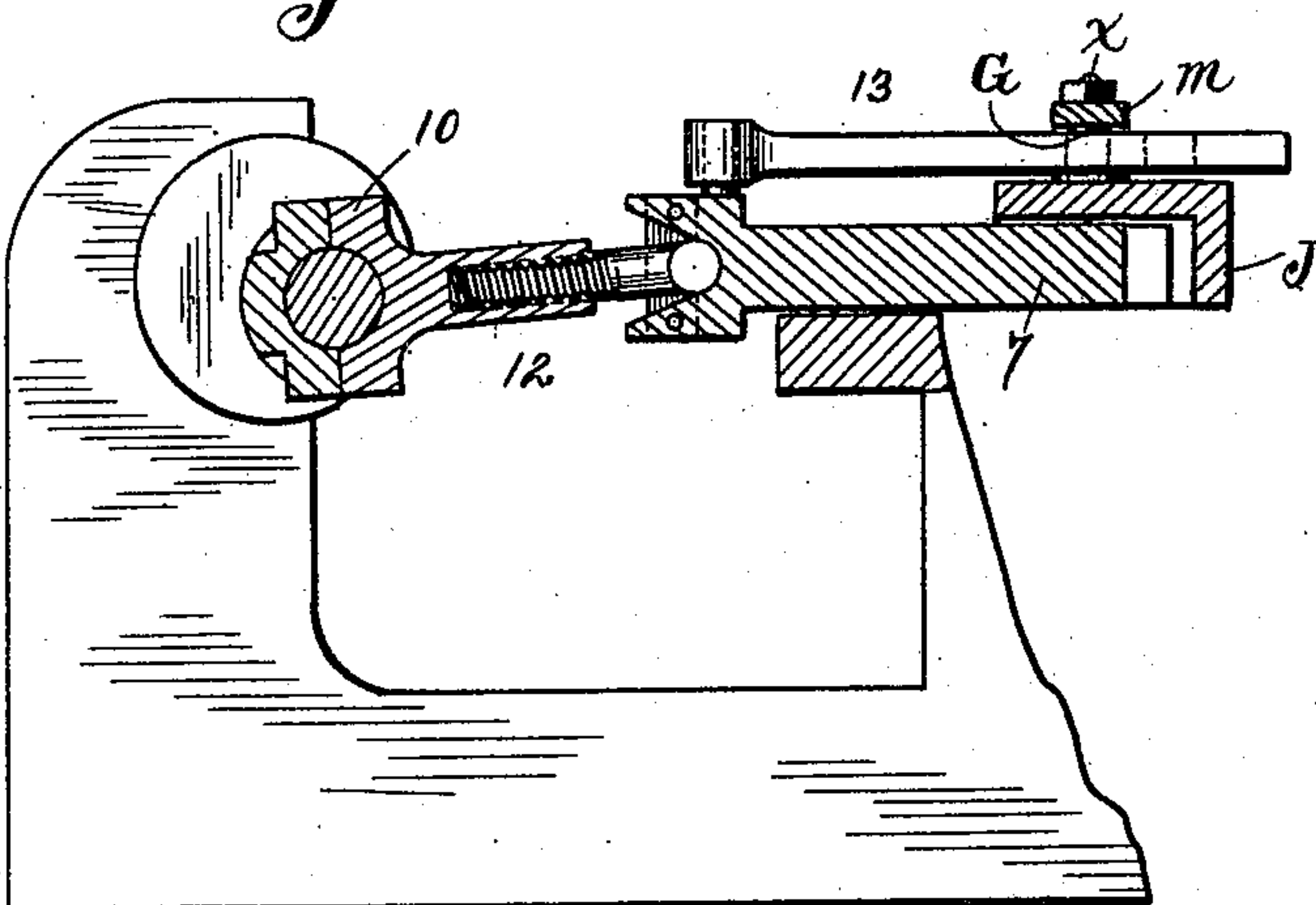


Fig. 6.

Fig. 8.

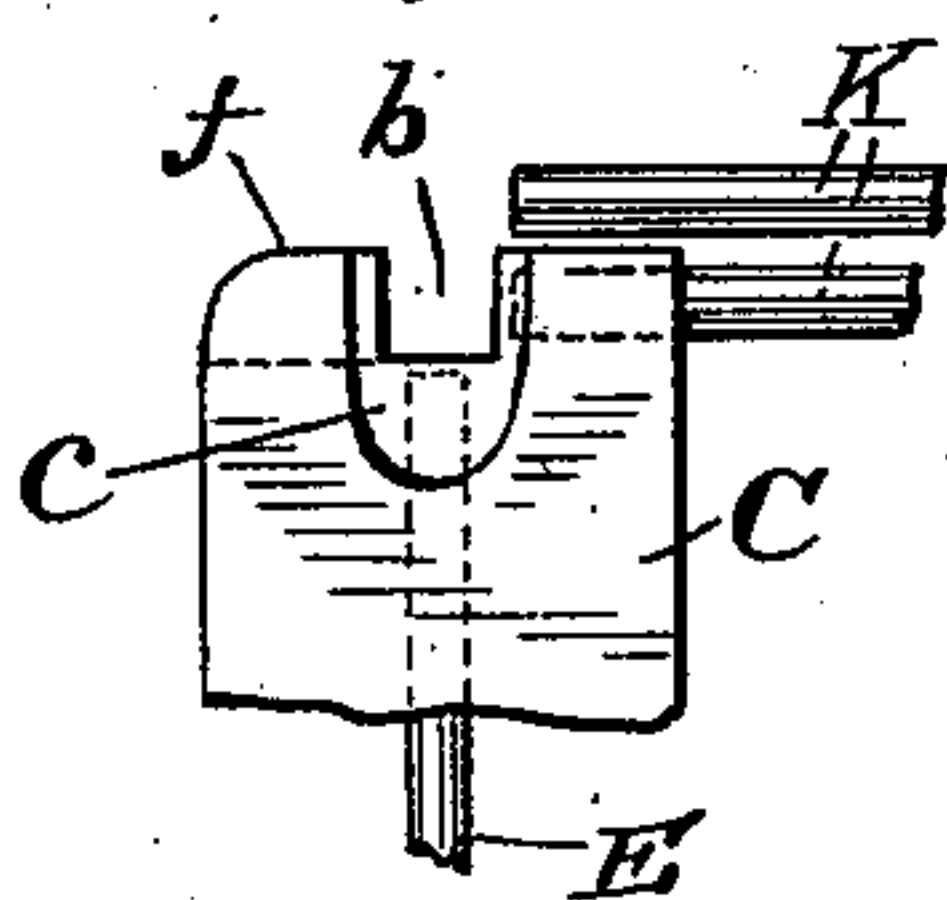
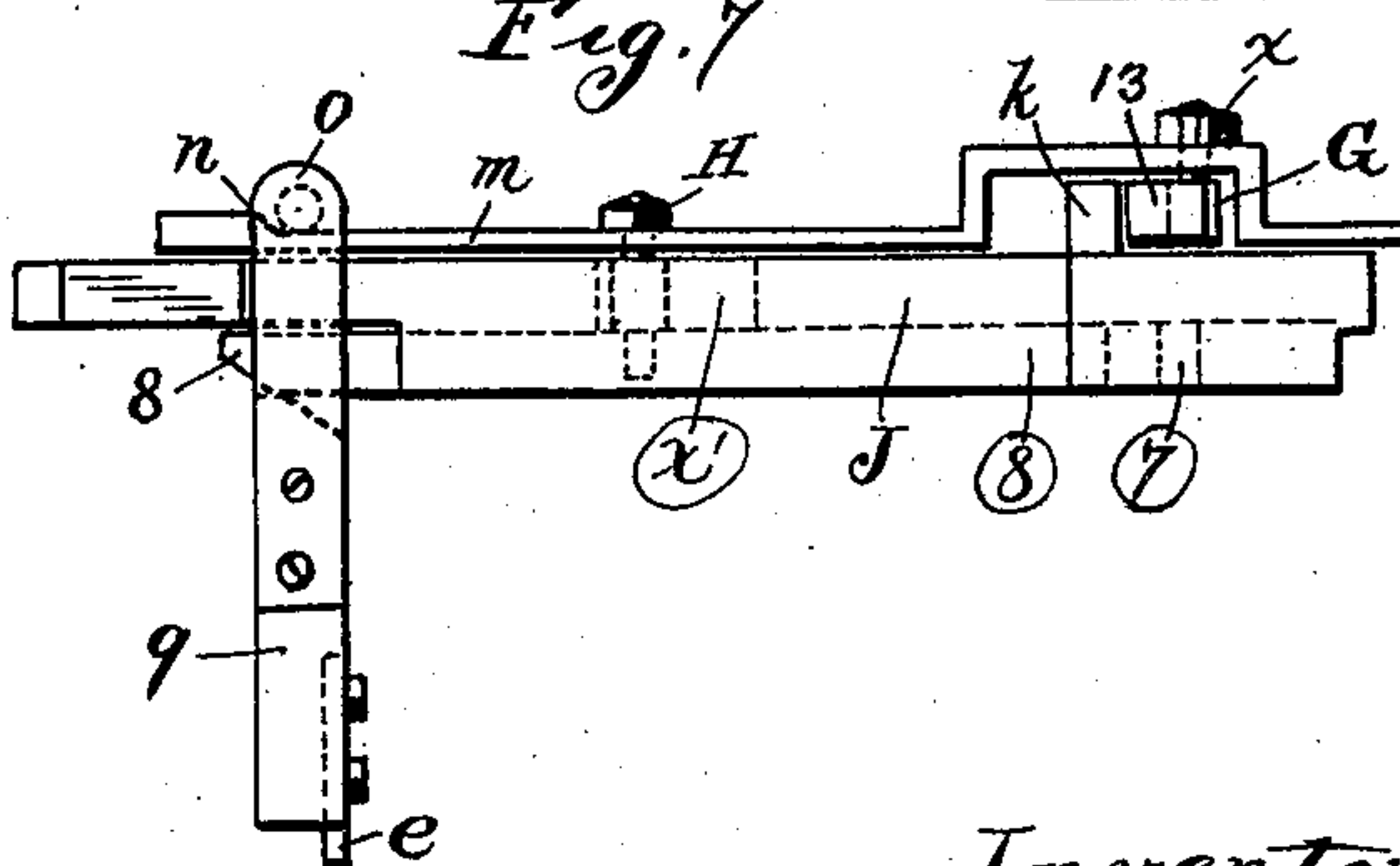


Fig. 7.



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(No Model.)

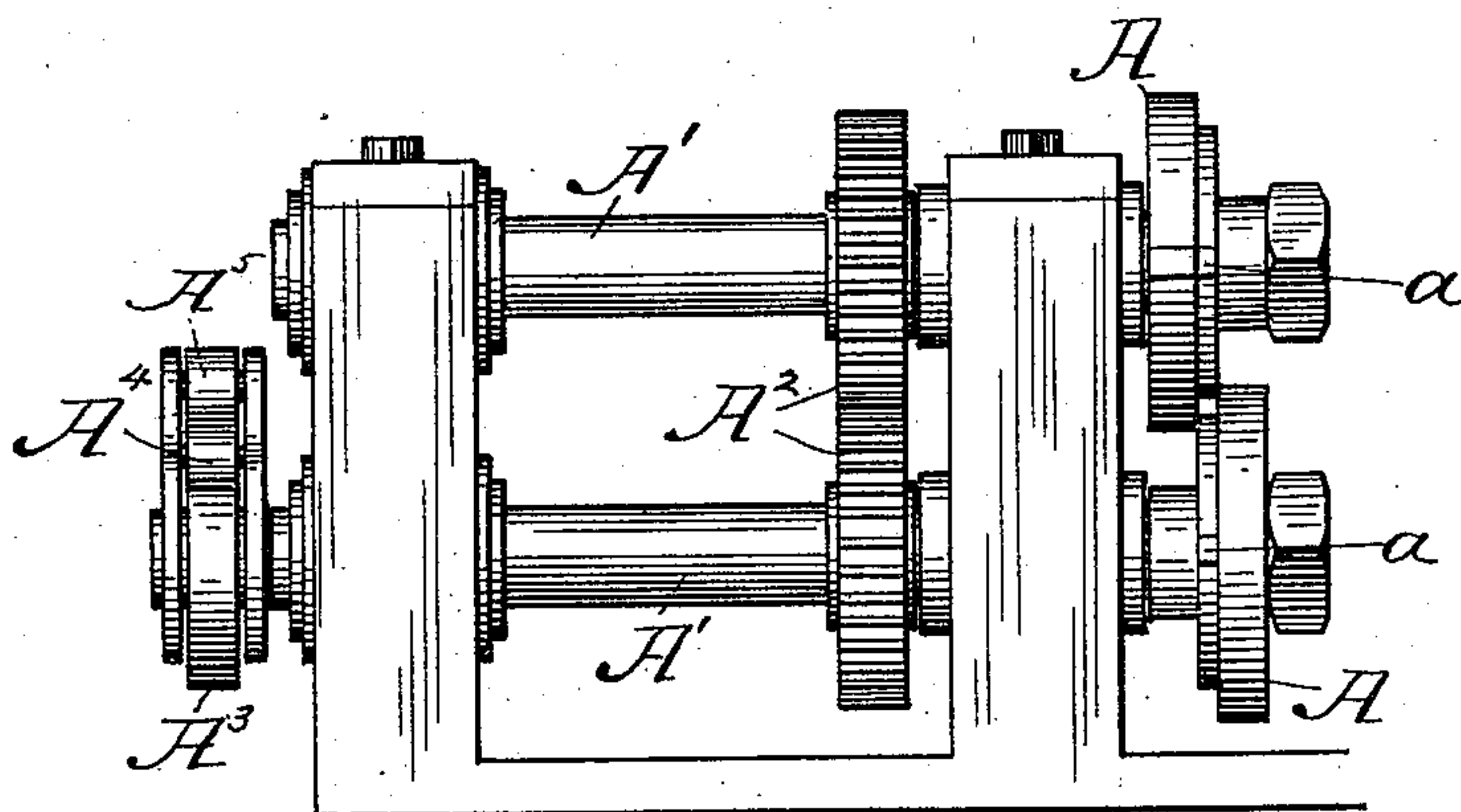
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G. BARR.  
SPIKE MACHINE.

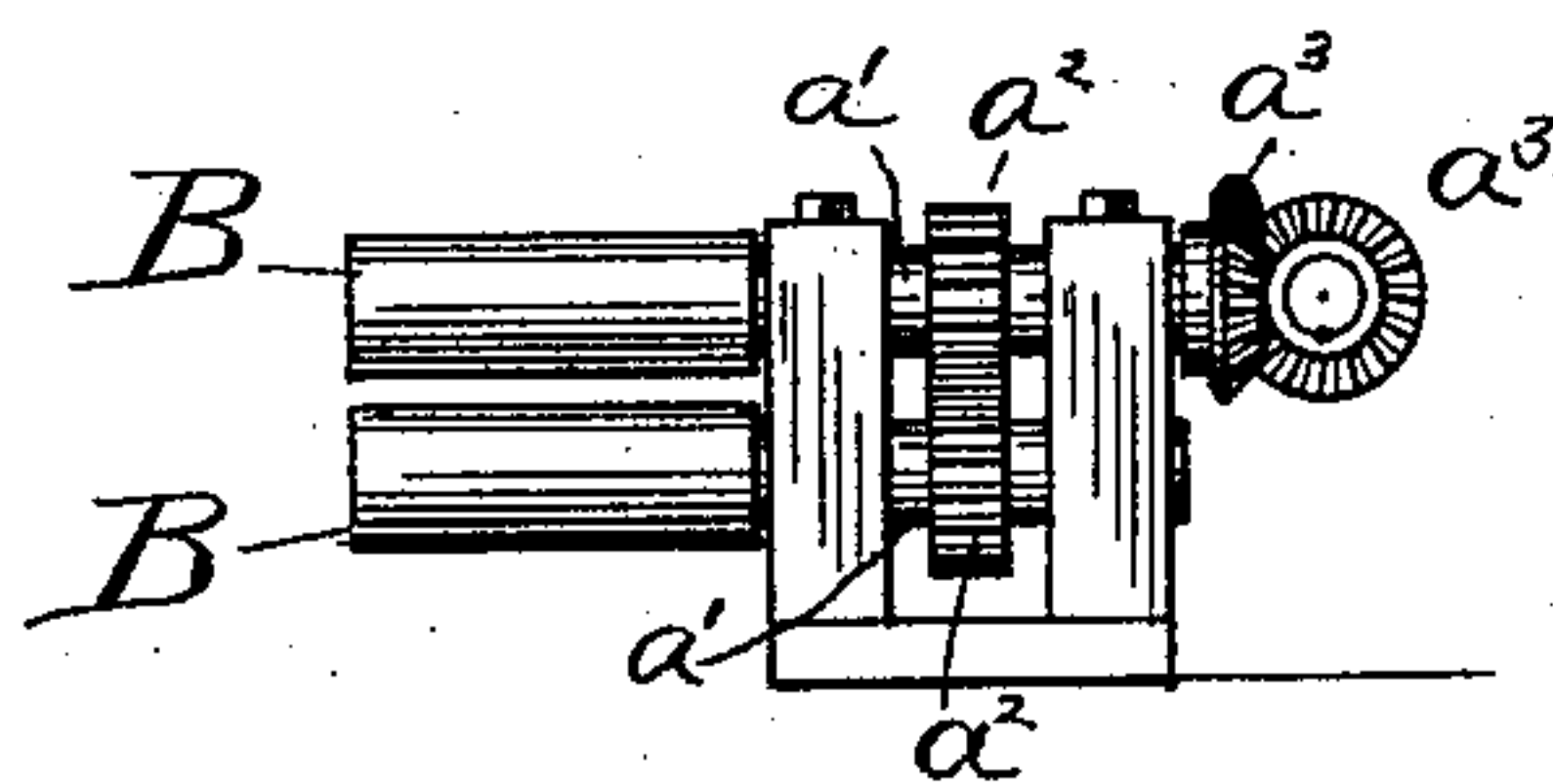
No. 576,536.

Patented Feb. 9, 1897.

*Fig. 9*



*Fig. 10*



*Witnesses:*  
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# UNITED STATES PATENT OFFICE.

GEORGE BARR, OF CHICAGO, ILLINOIS.

## SPIKE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 576,536, dated February 9, 1897.

Application filed February 10, 1896. Serial No. 578,733. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE BARR, a citizen of the United States, and a resident of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Spike-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon.

Heretofore considerable difficulty has been experienced by manufacturers of railroad-spikes in obtaining spike-machines which will discharge the spikes so that there can be no possibility of said spikes remaining in the dies or in such near vicinity as to clog the machine.

The object of my invention, aside from the fact of making a perfect-shaped railroad-spike, is to release the spike from the dies and to discharge the same quickly and in such manner that the dies are cleared and no possible interference can be presented either to the next spike-blank or to the action of the dies thereon. This I accomplish by means of a continuously-revolving feed-roller, peculiarly-constructed forming-dies, vertically and laterally reciprocating spike-discharging bars, and conjunctive pointing-dies and heading-dies, substantially as hereinafter fully described, and as illustrated in the drawings, in which—

Figure 1 is a plan view of my improved mechanism with the supporting-frame thereof omitted. Fig. 2 is a vertical longitudinal section taken through the spike-forming dies and conjunctive mechanism separated from the remainder of the machine. Fig. 3 is a vertical longitudinal section of the heading-die carrier with the end near the spike-holding dies broken away, taken on dotted line 3 3, Fig. 1. Fig. 4 is a detail view of the pawl and ratchet for operating the cutting-dies. Fig. 5 is a longitudinal vertical section of the upper part of the machine, taken on dotted line 5 5, Fig. 1. Fig. 6 is a plan view of the gripper-die-operating mechanism separated from the rest of the machine. Fig. 7 is a plan view of the same. Fig. 8 is a detail view showing a front elevation of the female die. Fig. 9 shows a front view of the left-hand portion of the machine, (the right-hand

portion being broken away,) illustrating the cutting-dies and driving mechanism therefor. Fig. 10 is a detail showing a front view.

In the drawings, A A represent two intermittently-revolving disks or pointing-dies, each of which is provided with a circumferential flange projecting from one edge thereof in such manner that the flange of one disk laps past and engages the unguarded edge of the other, and vice versa. The metal billet or blank is fed to my improved machine between these disks, which at corresponding points on their peripheries are provided with inset-dies *a*, that are such shape that they point the rear end of the spike-blank which has passed between the disks and sever it from that which follows.

When the spike-blank has been severed by the cutting-dies from the billet, the cutting-dies remain stationary and continue so during the interim the spike-blank is being forged by suitable dies into a perfect spike. They revolve, drawing the billet forward and pointing and feeding it to and between the continuously-revolving feed-rollers B and B, which latter moves the spike-blank forward until the pointed end of the same is reached and until said blank is moved directly into proper position in the groove *b* of the female die C.

The cutting-dies A A are secured to the ends of parallel shafts A' A', that are geared together by the corresponding gears A<sup>2</sup> A<sup>2</sup>. One of said shafts A<sup>2</sup> has a ratchet A<sup>3</sup> on its end opposite the cutting-die, which is engaged by a pawl A<sup>4</sup>. The latter is actuated from the drive-shaft, through the medium of a crank A<sup>5</sup> and a connection-rod A<sup>6</sup>, in such manner that with each engagement thereof the shafts A' simultaneously move a quarter of a revolution.

The feed-rollers are secured on the extended ends of short shafts *a'* *a'*, suitably journaled in the supporting-frame of the machine, and are geared together by the gears *a*<sup>2</sup> *a*<sup>2</sup>. One of said shafts *a'* is driven, through the medium of the miter-gears *a*<sup>3</sup> *a*<sup>3</sup>, by the idle-shaft *a*<sup>4</sup>, and the latter is driven by the drive-shaft, through the medium of the beveled gear *a*<sup>5</sup> and the beveled pinion *a*<sup>6</sup>.

The die C is a stationary solid block of steel with a longitudinal groove *b*, the transverse



dimensions of which at the end thereof farthest from the feed-rollers correspond to the lateral dimensions of the spike-blank and which is placed in alinement with the path of said blank so as to receive it as it leaves said feed-rollers. The sides and bottom edges of the end of the groove farthest from the feed-rollers are suitably countersunk, so as to form the depression *c* necessary to form the head of the spike.

When the spike-blank has been fed to the dies and past the feed-rollers, its forward end will have advanced beyond the farthest end of the groove *b* a suitable distance and until stopped by a stop-gage *d*, which will hereinafter be more fully described. Suffice it to say here that this stop-gage moves out of the way when the heading-die *D* advances to its work. Immediately the spike-blank is in proper position in the female die *C* the vertically-reciprocal gripping-die *e* moves down and bears with sufficient pressure upon the spike-blank, so as to hold it securely while the head thereof is being formed, whereupon the heading-die *D* advances at a suitable downwardly-inclined angle with sufficient force against the advanced projecting end of the spike-blank as to upset and force it into the heading depression *c* and thus complete the spike.

Now I make no claim as inventor of any of the mechanism hereinbefore described excepting the continuously-revolving feed-roller, by the use of which I am enabled to better bring the spike-blank into position to be finished and to pivot the pointed end of the spike during its discharge from the dies. It is the mechanism for discharging the spike easily, quickly, and thoroughly that I consider constitutes the principal feature of my improvements.

In order to render effective the operation of the elements used to discharge the spike, I incline the upper surface *f* of the female die, located on the side of the groove over which the spike is pushed when being discharged from the edge nearest the heading-die, to a plane coinciding with the bottom of said groove at the edge of said die nearest the feed-rollers, and I round the outer side edge of the said surface *f*, so that the spike cannot, when once pushed out of the groove *b*, find lodgment there.

After the spike has been headed the gripping-die *e* releases the same by being raised vertically, and at the same time a lifting-rod *E*, which, reciprocating in a vertical guide-opening whose upper end opens into the floor of groove *b*, preferably nearest the heading end of the die *C*, moves upward and lifts the head end of the spike until it is just above the incline plane of the surface *f*. This causes the spike to tilt toward its point end, (which would still be between the feed-rollers,) in which position it is pushed laterally away from the groove *b* over the surface *f* of the die by the laterally-reciprocating push-

bars *K K*, and has an unobstructed fall from thence to the ground or such receptacle as may be placed thereunder to catch them. These two push-bars *K* are so placed that one pushes against the completed spike near the head thereof and the other against the spike near the pointed end. This requires the bar *K* nearest the pointed end of the spike to reciprocate on a slightly lower plane than the other. These two push-bars may, however, operate on the same horizontal plane by producing two lifting-rods *E* instead of one, and in this latter event it is possible, although not desirable, to use but one push-bar.

As stated above, I make no claim herein to the mechanism employed by me to operate the several parts of the spike-forming members, although some parts thereof are considered new and necessary to the proper operation of said members. Suffice it to say the machine is provided with a main driving-shaft *F*, which drives all the mechanism hereinbefore alluded to. The head-die is reciprocated by a crank *g* on shaft *F* through the medium of a suitable pitman *F'*.

The carrier *g'* of the heading-die moves in suitable parallel guide-frames to bearing, secured to one of which the rock-shaft *h* is journaled, and on the end of this rock-shaft *h* nearest the female die the stop-gage *d* is secured. This rock-shaft has a suitable coil-spring *i* encircling a portion of its length, which has its ends so fastened that when moved said shaft *h* returns to its normal position. In order to rock the shaft *h* when the heading-die advances to its work, and thus swing the stop-gage out of its path, I have provided the said shaft with an arm *h'*, which projects laterally to and over the heading-die carrier and has a friction-roller on its end, which bears upon said carrier when the latter is advancing toward the die *C*, but which drops into an opening *h<sup>2</sup>* therein when the carrier is at the limit of its withdrawal movement and moves the stop-gage (which is practically nothing more nor less than a lateral arm) into position so as to stop the next spike-blank.

The lifting-rod *E* is pivotally connected to the end of an arm 2, projecting from the transverse rock-shaft 3, which latter is suitably journaled in the frame of the machine and has an arm 4 on one end, which is connected to the drive-shaft *F* by a connecting-rod 5 in such manner that shaft 3 is rocked with every revolution of said drive-shaft.

The push-bars are operated by means of a lever 6, which is fulcrumed at a suitable point between its ends, has one end engaged by a cam *I* on the drive-shaft, and has the push-bars suitably connected to the other end.

The mechanism for operating the gripping-die consists of a system of bolts or wedges 7, 8, and 9, which are so connected that the moving of wedge 7 moves the other bolts. Wedge 7 reciprocates horizontally in a direction at right angles to shaft *F* in guides se-



cured to one of the side frames of the machine, and its engaging end on the side facing the dies is beveled at a suitable angle. This wedge engages the correspondingly-beveled corner of a wedge 8, arranged in a horizontal position at right angles to it, and moves toward and laterally over the dies. Wedge 8 moves in a suitable groove in an overhead cross-frame J of the machine, and its end opposite that engaged by wedge 7 has the under surface thereof beveled, so as to engage the correspondingly-beveled end of and push downward the carrier  $g'$ , to which the gripping-die is secured.

The wedge 7 is reciprocated by a crank 10 on shaft F through the medium of a suitable pitman 12. In order to return wedge 8 and carrier-head  $g$  to their original positions, I connect to a post arising from the end of wedge 7 nearest shaft F a rod 13, which extends from thence to and over frame J, its end portion extending over said frame being nearly twice as wide and having its edge on the side opposite the dies which connects the greater with the lesser width beveled. Arising from the frame J next the side of the said rod 13, facing the location of the dies, are two lugs  $k$ , and movable between these lugs in a direction at right angles to rod 13 is a reciprocal bar  $m$ . This bar  $m$  extends from the end of cross-frame J to and beyond the vertical plane of the gripping-die, near which it is shown as deflecting to the side, and is provided with an inclined surface  $n$ .

The bar  $m$  rests and moves on the cross-frame J, but in order not to interfere with rod 13 I arch it over the same and provide it with a friction-roller G, which is journaled beneath said arch on a depending stud  $x$ , as shown.

About midway the length of bar  $m$  it is connected by means of a tie-bolt H, which passes down through a longitudinally-elongated opening  $x'$  in cross-frame J to the wedge 8. The wedge 8 and the lugs  $k$  insure the bar  $m$  moving in the right direction. The gripping die head or carrier is provided with an arm  $o$ , which projects up above it and to and slightly above the plane of the deflected end of bar  $m$ , and it is provided with a lateral stud on its upper end on which is journaled a friction-roller  $p$ , which rests upon said bar, as shown. Now when the wedge 7 is moved toward the main shaft F the rod 13 is also moved in the same direction, and the oblique edge connecting its wider end portion with

its narrower portion wedge-like, pushes against the friction-roller G and causes said bar to move in such direction as to thereby return wedge 8 to its normal position and so as to move the inclined surface  $n$  under the friction-roller  $p$  and lift it and the gripping-die to their original elevated position. While this way of operating the gripping-die is preferred, there may be others which could be adopted with more or less satisfaction. All such changes as well as other changes of construction of the actuating mechanism of my machine I desire to be considered as contemplating as coming within the spirit of my invention, so long as the effect thereof on the forming-dies and discharging devices is not changed.

What I claim as new is—

1. In a spike-machine the combination with the intermittently revolving pointing-dies, and revolving feed-rollers, of the stationary female die having a suitable groove in its upper surface the end of which farthest from said feed-rollers is countersunk, and having the upper surface on the side of said groove over which the spike is discharged inclined from the edge farthest from said feed-rollers to the parallel edge nearest thereto, a reciprocal gripping-die, a reciprocal beading-die, and vertically-reciprocal and horizontally and transversely reciprocal bars for ejecting the finished spike from the dies, as and for the purpose set forth.

2. In a spike-machine the combination with the intermittently-revolving pointing-dies and revolving feed-rollers, of the stationary female die having a suitable groove in its upper surface, the end of which farthest from said feed-rollers is countersunk and the upper surface of which on the side over which the spike is discharged being inclined from the parallel edge farthest from said feed-rollers to the parallel edge nearest the same, and the outer side edge of said inclined surface rounded, a stop-gage, a vertically-reciprocal gripping-die, a longitudinally-reciprocal heading-die, a vertically-reciprocal lifting-bar for ejecting the spike from the groove of the female die, and horizontally and transversely reciprocal push-bars one of which moves in a plane slightly lower than the other, as set forth.

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Witnesses:

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