

(No Model.)

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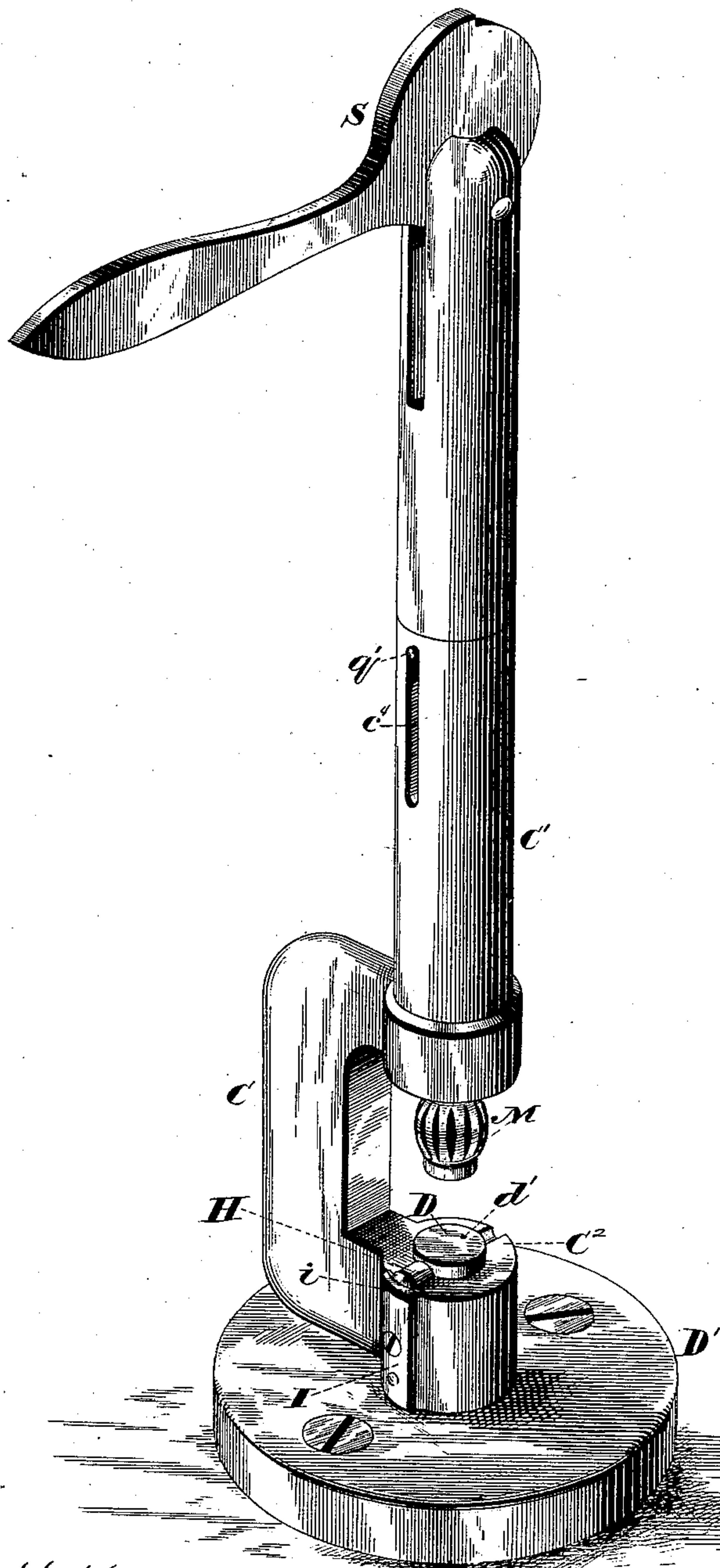
G. E. HUNTER.

MACHINE FOR SECURING GUARD PINS IN ESCAPE LEVERS.

No. 345,636.

Patented July 13, 1886.

*Fig. 1.*



*Witnesses*

*Chas. J. Williamson,*  
*Henry C. Hazard.*

*Inventor*

*Geo. E. Hunter, by*  
*Chandler Russell, his Atty.*

(No Model.)

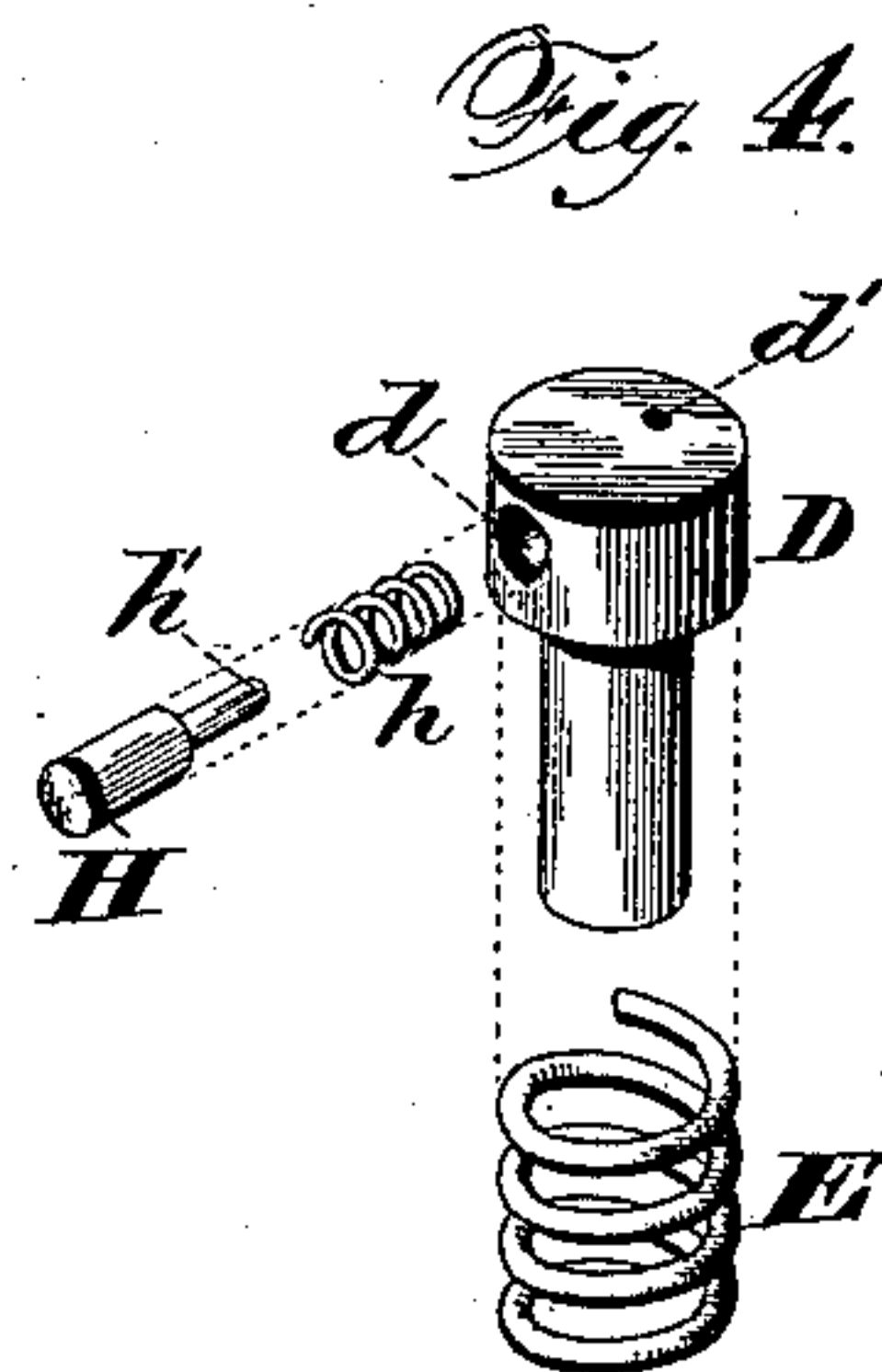
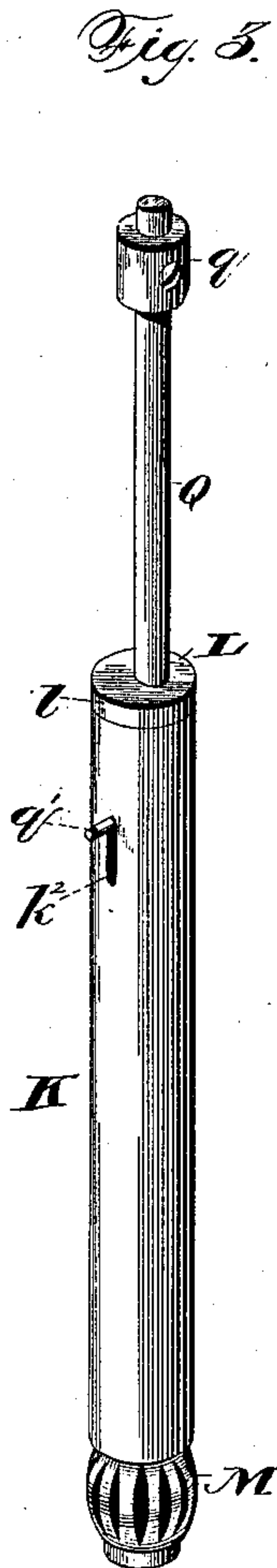
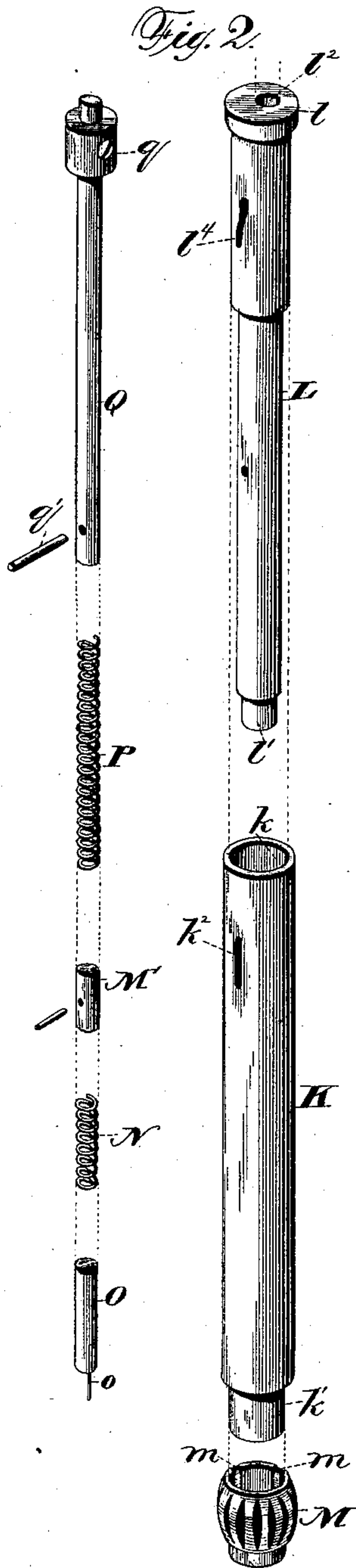
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Witnesses:  
Chas. Williamson.  
Henry C. Hazard.

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(No Model.)

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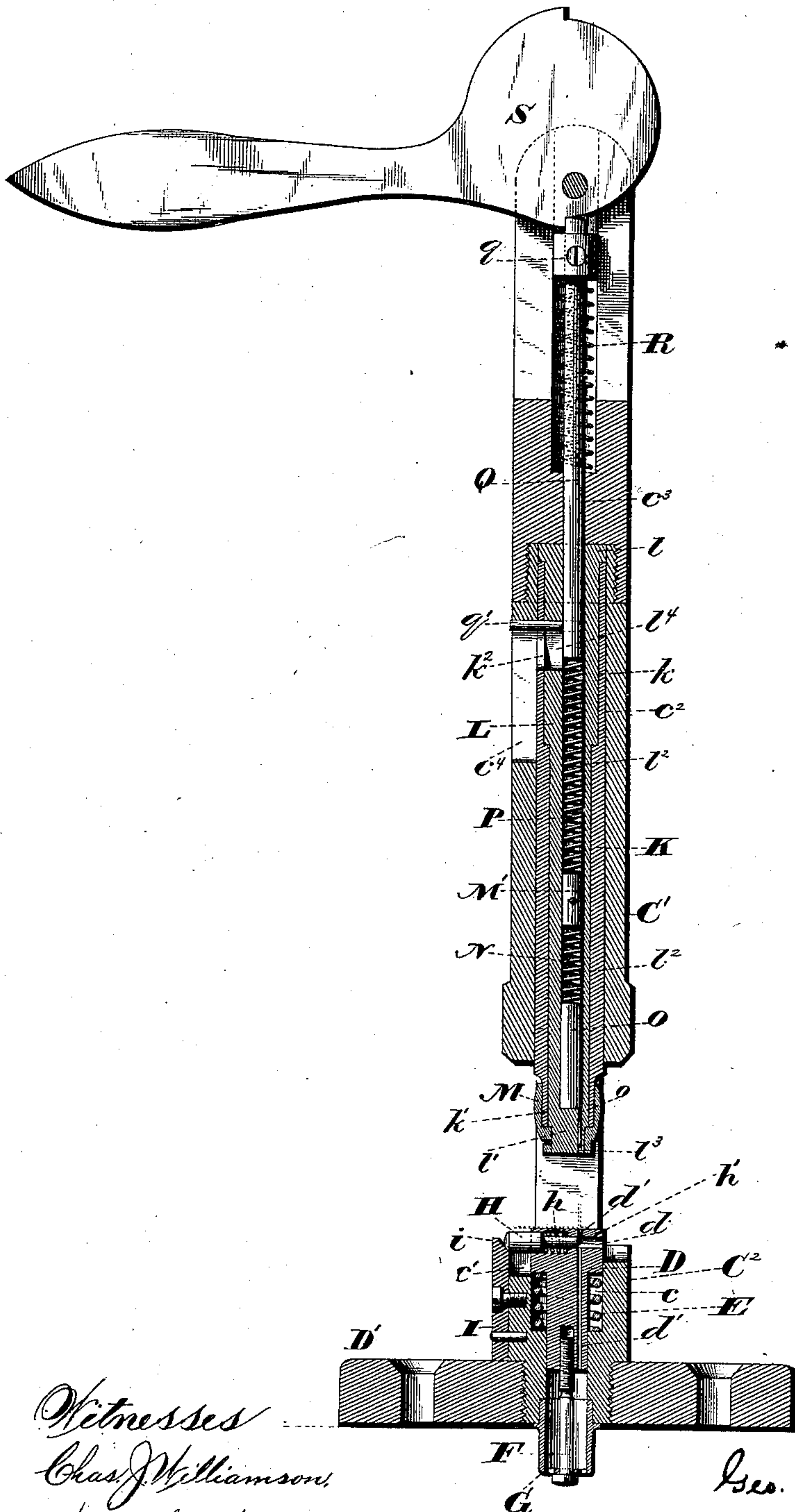
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*Fig. 6.*



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*Kimble and Russell, his Attys*



(No Model.)

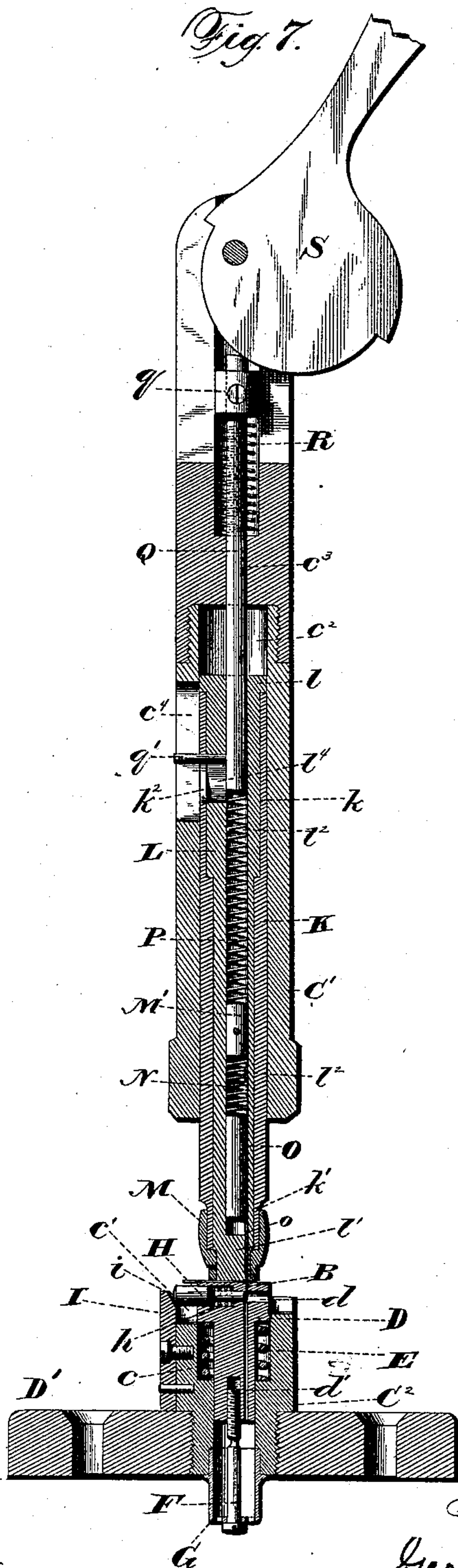
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G. E. HUNTER.

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Patented July 13, 1886.



*Witnesses:*  
*Chas. J. Williamson.*  
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(No Model.)

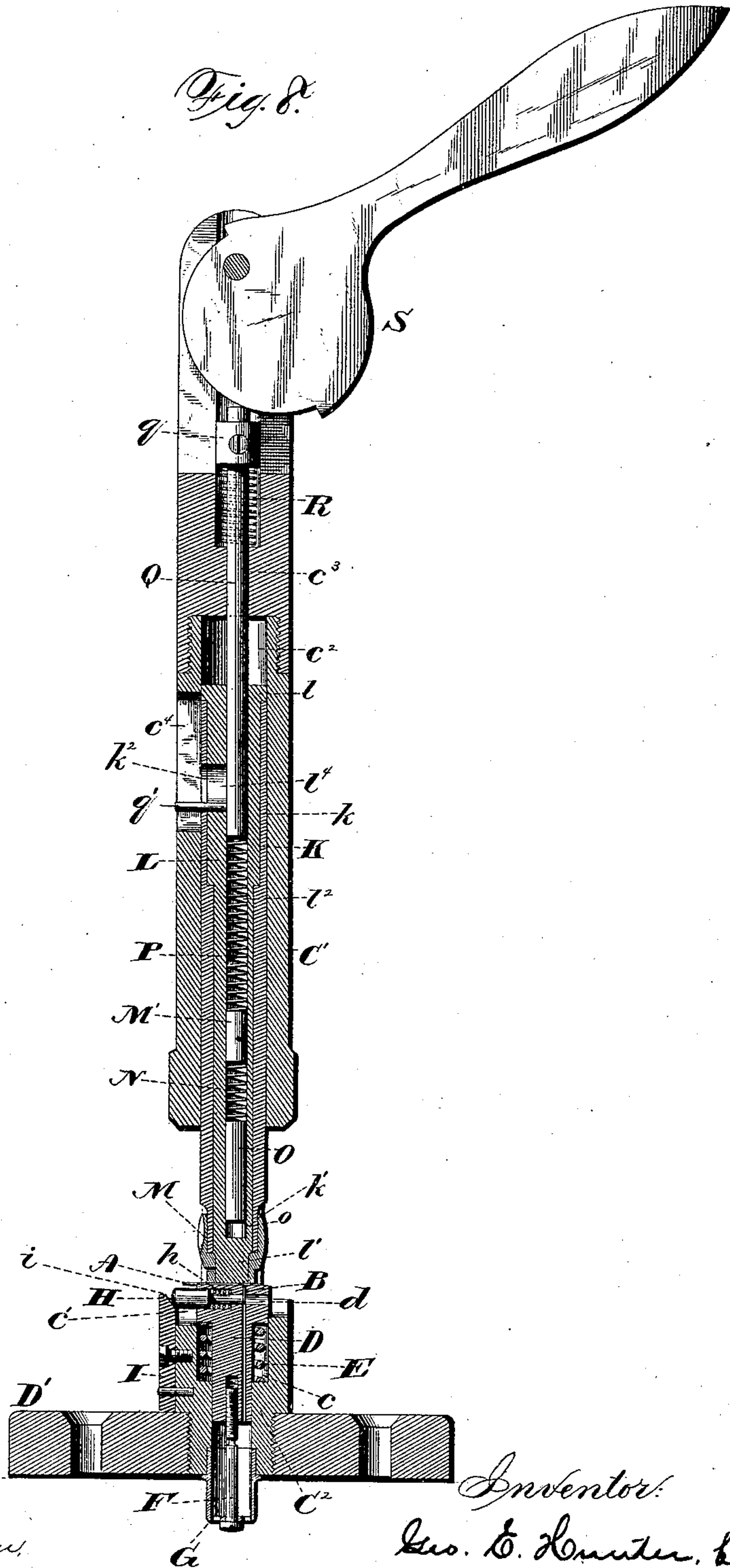
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G. E. HUNTER.

MACHINE FOR SECURING GUARD PINS IN ESCAPE LEVERS.

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Witnesses:

Chas. J. Williamson,

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Inventor:

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(No Model.)

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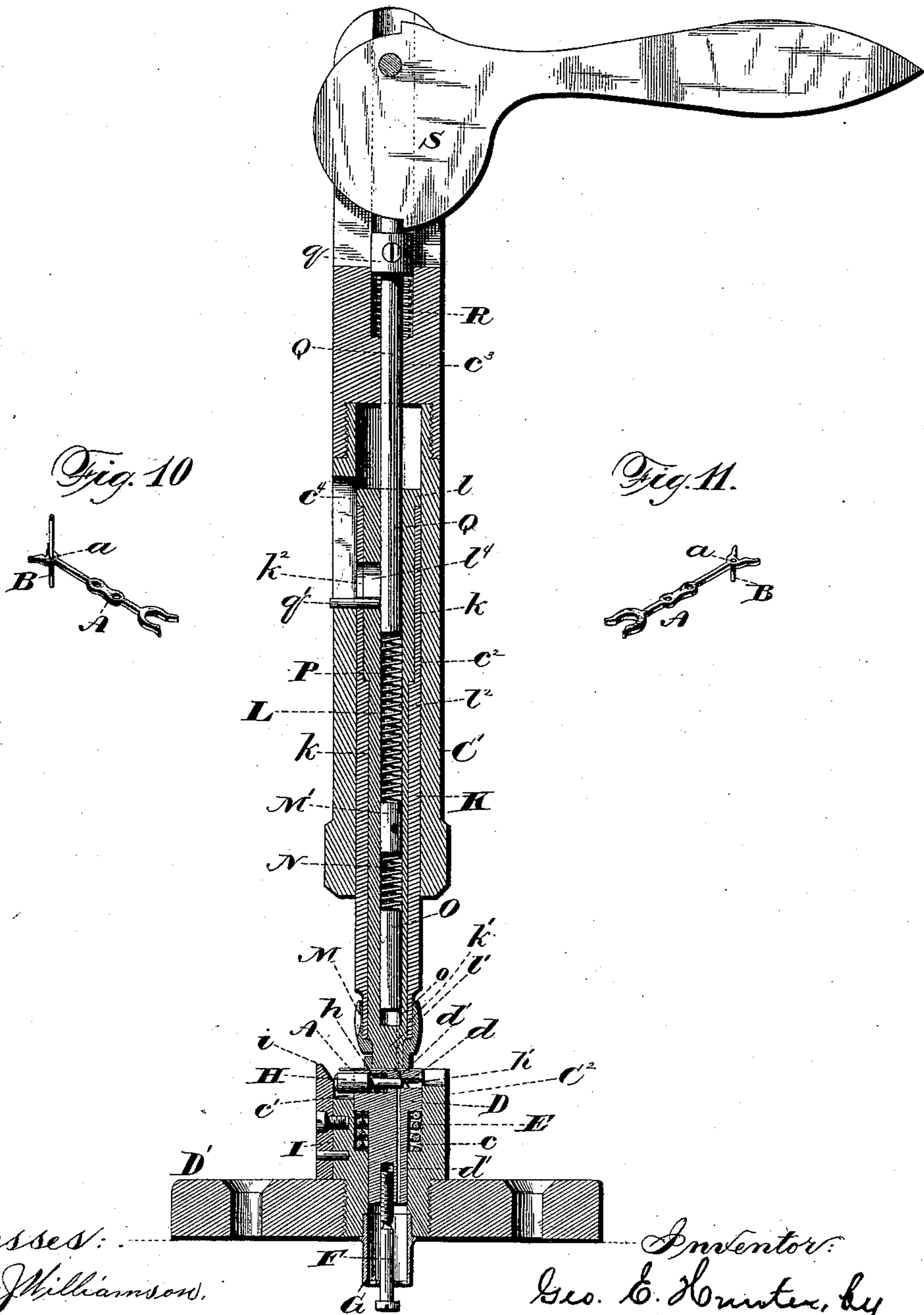
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MACHINE FOR SECURING GUARD PINS IN ESCAPE LEVERS.

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*Fig. 9.*



Witnesses:  
Chas. Williamson,  
Henry C. Hazard.

Inventor:  
Geo. E. Hunter, by  
Kindle & Russell, his Attys



# UNITED STATES PATENT OFFICE.

GEORGE E. HUNTER, OF ELGIN, ASSIGNOR TO THE ELGIN NATIONAL WATCH COMPANY, OF CHICAGO, ILLINOIS.

## MACHINE FOR SECURING GUARD-PINS IN ESCAPE-LEVERS.

SPECIFICATION forming part of Letters Patent No. 345,636, dated July 13, 1886.

Application filed April 1, 1886. Serial No. 197,454. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. HUNTER, of Elgin, in the county of Kane and in the State of Illinois, have invented certain new and useful Improvements in Guard-Pin Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

10 Figure 1 is a perspective view of my machine arranged for use. Fig. 2 is a like view of the upper spindle and its parts separated from each other. Fig. 3 is a perspective view of the same combined, but separated from the  
15 frame of the machine. Figs. 4 and 5 are respectively perspective views of the table and its parts separated from each other and of the same combined. Fig. 6 is a vertical central section of the machine, and shows the normal  
20 positions of parts. Fig. 7 is a like view of the same with the spindle moved downward until the guard-pin has been driven to place. Fig. 8 is a vertical central section of the machine, and shows the relative positions of parts after  
25 the upper cutter has performed its office. Fig. 9 is a like view of the same, and shows the relative positions of parts after the lower cutter has acted; and Figs. 10 and 11 are respectively perspective views of the escape-lever  
30 before and after being operated upon by said machine.

Letters of like name and kind refer to like parts in each of the figures.

35 My invention is designed to facilitate the securing of a guard-pin in place within an escape-lever, and the subsequent removal of the surplus stock from the ends of said pin; and to this end it consists in an organization in which the parts are constructed and combined to operate in the manner and for the  
40 purpose substantially as hereinafter specified.

The work to be done by my machine is to secure within an opening, *a*, in one end of an escape-lever, A, a pin, B, which projects from  
45 the upper side of the same, and is known as a "guard-pin," and for this purpose I employ the following construction, viz:

The frame C is composed of an upper cylindrical part, C', and a lower cylindrical part, C<sup>2</sup>, that have the same axial line, but are  
50 separated by a lateral offset in said frame

which leaves between their contiguous ends a space, as shown in Figs. 1 and 6. The lower end of said frame is screwed into or otherwise secured within a base, D', which, is adapted to  
55 be fastened upon a table so as to insure a vertical position for said frame.

Within the lower part, C<sup>2</sup>, of the frame C is provided an axial opening, *c*, which, from its upper end downward about one-half its  
60 length, has a diameter slightly greater than one-half the diameter of said part, while the lower half of said opening has about one-half the diameter of its upper half.

Fitted loosely within the opening *c* is a block  
65 or table, D, which has the form seen in Figs. 4 and 5, its upper end or head having a diameter slightly less than the diameter of the upper largest portion of said opening, while the lower portion of said table is adapted to fit  
70 into the smaller part of said opening. A spiral spring, E, placed around the smaller portion of said table, with its ends in engagement with the lower side of the head and with the lower  
75 end of the larger portion of said opening *c*, presses said table upward with a yielding pressure, while a screw, F, secured within the lower end of said table, and extending downward to a guide, G, below, limits the upward  
80 motion of the same, while permitting it to be moved freely in a downward direction.

Near the upper end of the table D is a horizontal opening, *d*, which passes entirely through the same at its center, and for about one-half  
85 its length has about twice the diameter of the remainder. Within said opening is loosely fitted a correspondingly-shaped pin, H, and between the largest part of the latter and the inner end of the largest part of said opening is placed a spiral spring, *h*, that operates to hold  
90 said pin with a yielding pressure at the outer limit of its motion. The largest portion of the pin H projects from the table D into a radial slot, *c'*, which is cut in the side of the part C<sup>2</sup>, and has such depth as to enable said table to  
95 be moved vertically the necessary distance. The outer end of said slot is inclosed by means of a plate, I, that extends slightly above the upper end of said part C<sup>2</sup>, and has its upper end beveled inward and downward. When  
100 said table is at the upper limit of its motion, as seen in Figs. 1 and 6, the outer end of said



pin, which end is rounded, rests upon said inclined face  $i$ ; but if said table is moved downward, said pin will be forced longitudinally inward, as seen in Fig. 9. The pin H has such length as to cause it to extend about two-thirds the distance through the opening  $d$  when the table D is at the upper limit of its motion, and at a point at or slightly in front of said end is provided a vertical opening,  $d'$ , which extends entirely through said table and has such diameter as to enable a guard-pin, B, to be inserted within the same from its upper end. The downward motion of said table causes said pin to move entirely across said opening  $d'$ , and by making the corners of its said end  $h'$  sharp it will act as a cutter and sever said guard-pin, so as to leave projecting from the lever A a length equal to the distance between the face of said table and the upper side of said horizontal opening  $d$ .

The upper portion or housing, C' of the frame C is provided with a round axial opening,  $e^2$ , which extends from its lower end to or slightly beyond its longitudinal center, and has about one-half the diameter of said part. From thence upward for about one-half inch extends another opening,  $e^3$ , which has about one-fourth the diameter of said opening  $e^2$ , and from thence to the upper end of the frame has about twice the diameter of its lower end. Said opening  $e^3$ , while vertical, is not in a line axially with said opening  $e^2$ , but is placed slightly to one side of the axis of the same.

Within the axial opening  $e^2$  is fitted a correspondingly-shaped sleeve, K, which is adapted to slide longitudinally therein, and is provided with an axial opening,  $k$ , that from its upper end, about one-third its length, has a diameter somewhat greater than within the lower part of said sleeve.

Fitted within the interior of the sleeve K is a spindle, L, which at its upper end is provided with a peripheral flange,  $l$ , that extends radially over the contiguous end of the former. The lower end of said spindle projects through the corresponding end of said sleeve, and such projecting part is somewhat reduced in diameter. Over the projecting end  $l'$  of said spindle, and over the lower end of said sleeve  $k'$ , which at such point is somewhat reduced in diameter, is fitted a thimble, M, which interiorly is provided with two or more spring-jaws,  $m$ , by means of which said thimble is held in place, and is enabled to prevent independent upward movement of said spindle. The spindle L is provided with a longitudinal opening,  $l^2$ , which extends from its upper end nearly to its lower end, has the same diameter as the lower portion of the opening  $e^3$ , and is in a line axially with the latter, and therefore slightly eccentric with relation to the axis of said spindle.

At a point slightly below the longitudinal center of the opening  $l^2$  of the spindle L is secured a block, M', below which is placed a spiral spring, N, and below the latter a plunger, O, that loosely fills said opening, and is

held with a yielding pressure at the lower limit of the same. Said plunger is provided with an arm,  $o$ , which has a slightly greater diameter than the guard-pin B, and fits loosely into an opening,  $l^3$ , that extends from said opening  $l^2$  downward through the end of said spindle. Above the block M' is a second spiral spring, P, and above the latter a rod, Q, which loosely fills the opening  $l^3$ , and extends upward through the opening  $e^3$ , and near its upper end, within the larger portion of said opening  $e^3$ , is provided with a collar,  $q$ , that loosely fills the latter.

From the lower end of the rod Q a pin,  $q'$ , projects radially outward through vertically-elongated openings  $l^4$ ,  $k^2$ , and  $e^4$ , which are formed, respectively, in the spindle L, sleeve K, and frame-housing C'. Said openings or slots  $l^4$  and  $k^2$  have the same length, while said slot  $e^4$  has nearly three times such length. Said slots  $e^4$  and  $k^2$  are vertical and straight; but said slot  $l^4$  is arranged slightly oblique, so that when said pin is moved downward, said spindle will be partially rotated within said sleeve. A spiral spring, R, placed between the collar  $q$  and the lower end of the upper larger part of the opening  $e^3$ , holds the sleeve K and spindle L with a yielding pressure at the upper limit of their motion, while a cam-lever, S, which is pivoted within the upper slotted end of the housing C', furnishes a means whereby said parts may be moved downward when desired.

The operation of the machine is as follows, viz: An escape-lever, A, is placed upon the table D, with the smaller end of the guard-pin in the opening  $d'$ , after which the cam-lever S is turned, so as to move the sleeve K and its attachments downward. The arm  $o$  of the plunger O now engages with the upper end of said guard-pin, and forces the same downward firmly into its opening  $a$ , when the resistance of the spring N will be overcome, and the farther downward motion of said sleeve will cause said plunger to be pressed relatively upward, the positions of parts being shown in Fig. 7. The lower end of the spindle L being now seated upon the escape-lever A, the rod Q will be moved downward within the slots  $k^2$  and  $l^4$ , and said spindle thereby caused to have a partial rotation, by which means the opening  $l^3$  at the lower end of the latter will be moved out of coincidence with the opening  $d'$  of the table D, and by such operation the pin B, above said escape-lever, will be sheared off close to the face of the latter, the relative positions of parts being shown in Fig. 8. The farther downward movement of said sleeve and spindle will now cause said table to be depressed, when, as before stated, the pin H will be moved inward, so as to cut off the surplus portion of said guard-pin, and leave projecting below said escape-lever the predetermined amount.

Having thus described my invention, what I claim is—

1. As an improvement in the manufacture



of watch-movements, a mechanism in which are combined the following elements, to wit: means for supporting an escape-lever in position to receive a guard-pin, means for forcing the pin firmly into its opening, means for cutting off such pin flush with the face of one side of said lever, and means for removing the surplus length from said pin at the opposite side of the same, substantially as and for the purpose specified.

2. As an improvement in the manufacture of watch-movements, an organization in which are combined, with means for supporting an escape-lever in position, means for forcing a guard-pin into an opening in the lever, means for cutting off said pin flush with one face of said lever, and means for removing the surplus length from said pin at the opposite side of the same, said mechanisms being arranged

to operate in the order named, substantially as and for the purpose shown.

3. As a means for cutting off the surplus length from a guard-pin, a spring-supported table, which is provided with an opening for the reception of the projecting portion of the guard-pin, and a cutter that is arranged at a right angle to said opening, and is automatically moved across or through the same whenever said table is depressed, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 13th day of March, A. D. 1886.

GEO. E. HUNTER.

Witnesses:

W. P. HEMMENS,  
W. H. CLOUDMAN.