

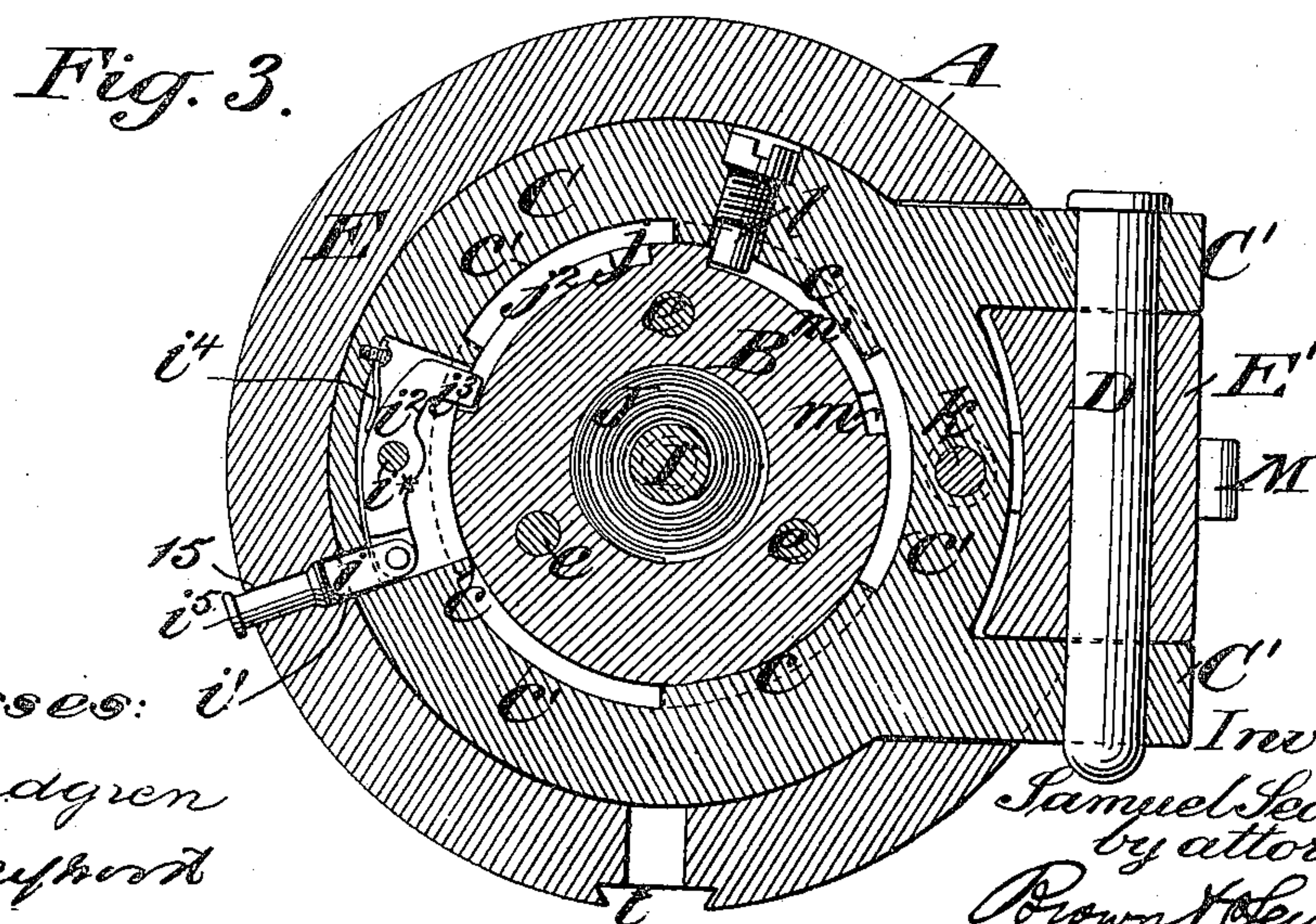
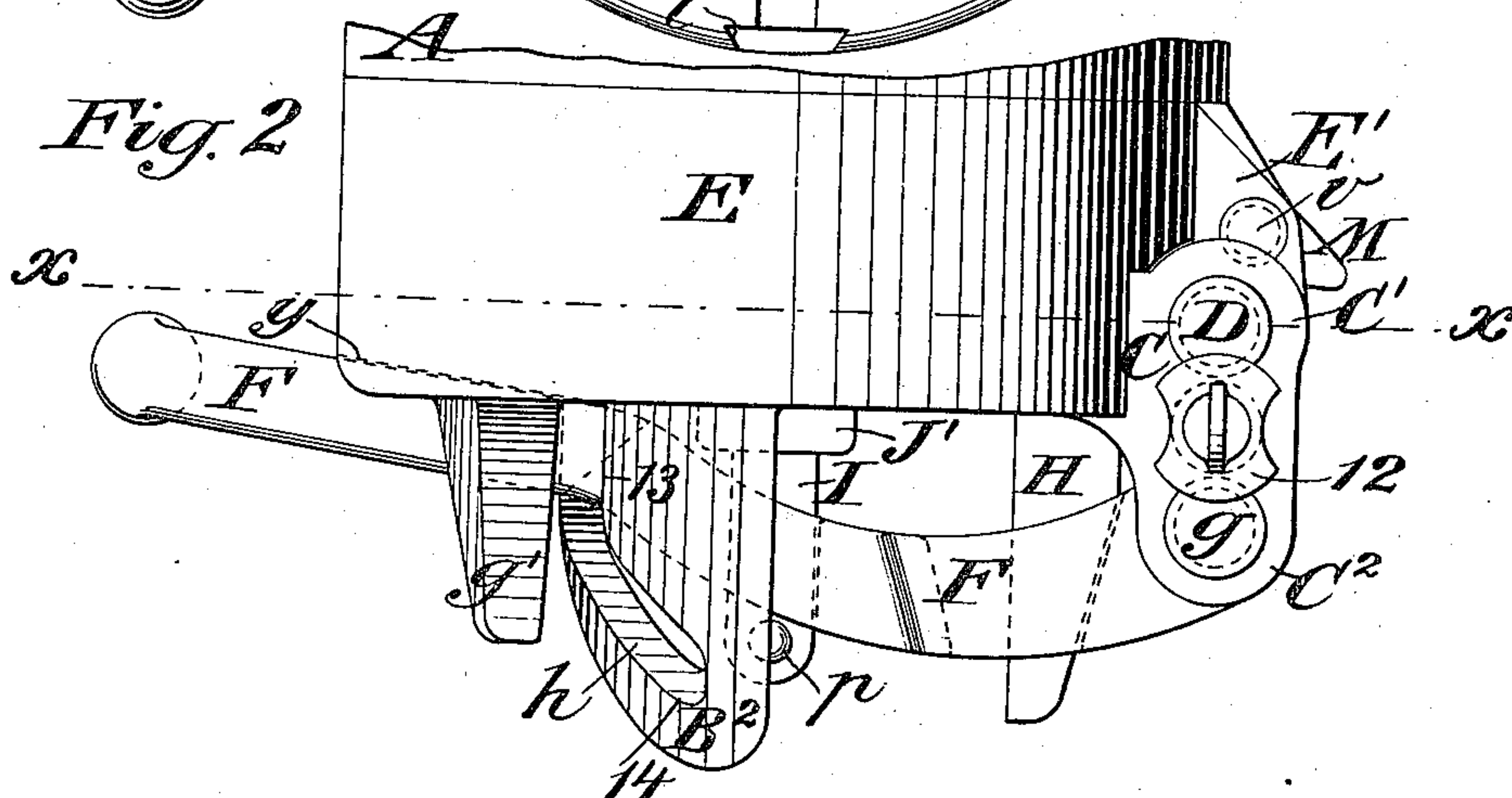
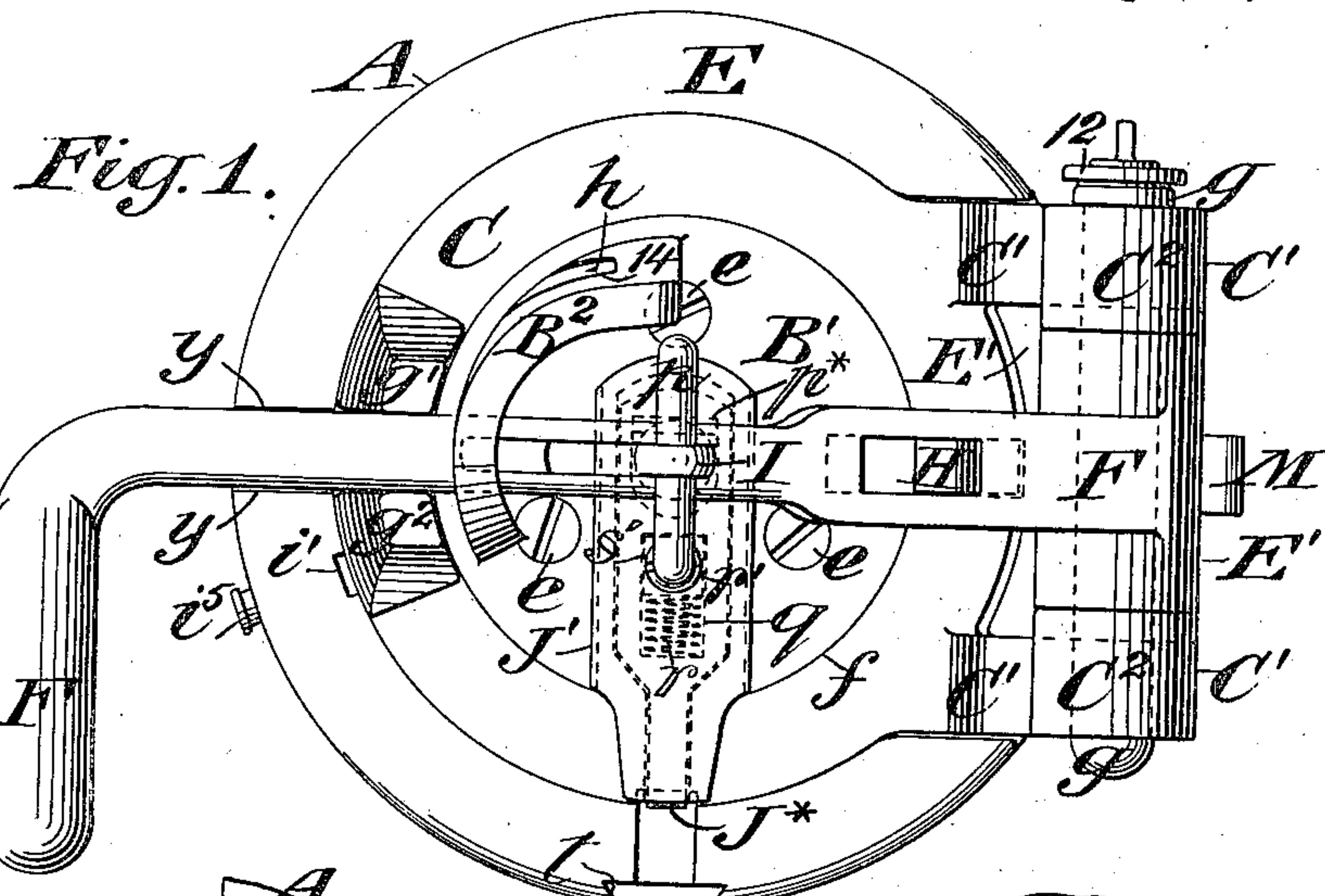
(No Model.)

5 Sheets—Sheet 1.

S. SEABURY.
BREECH LOADING CANNON.

No. 474,974.

Patented May 17, 1892.



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(No Model.)

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Fig. 4.

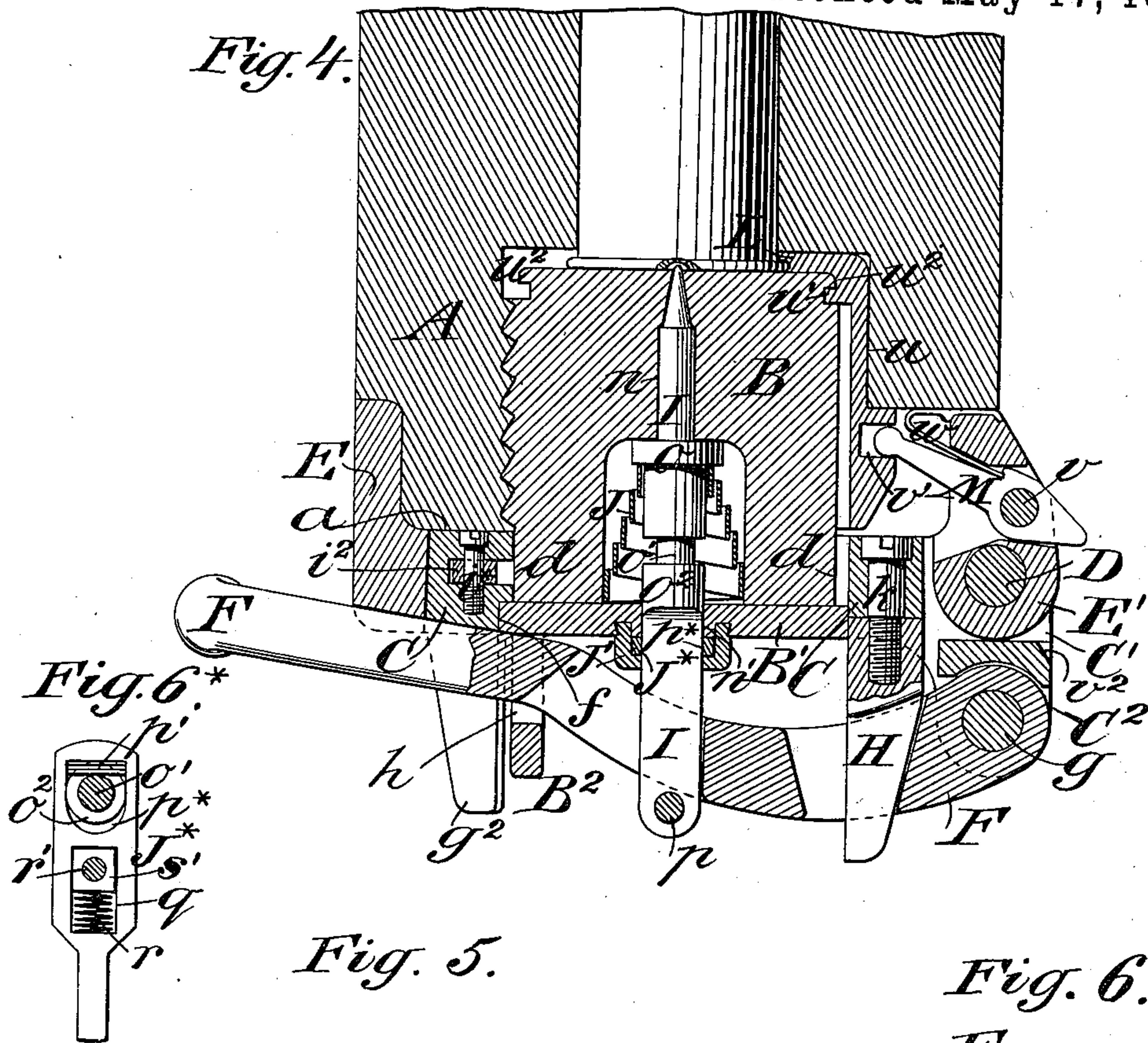


Fig. 6.*

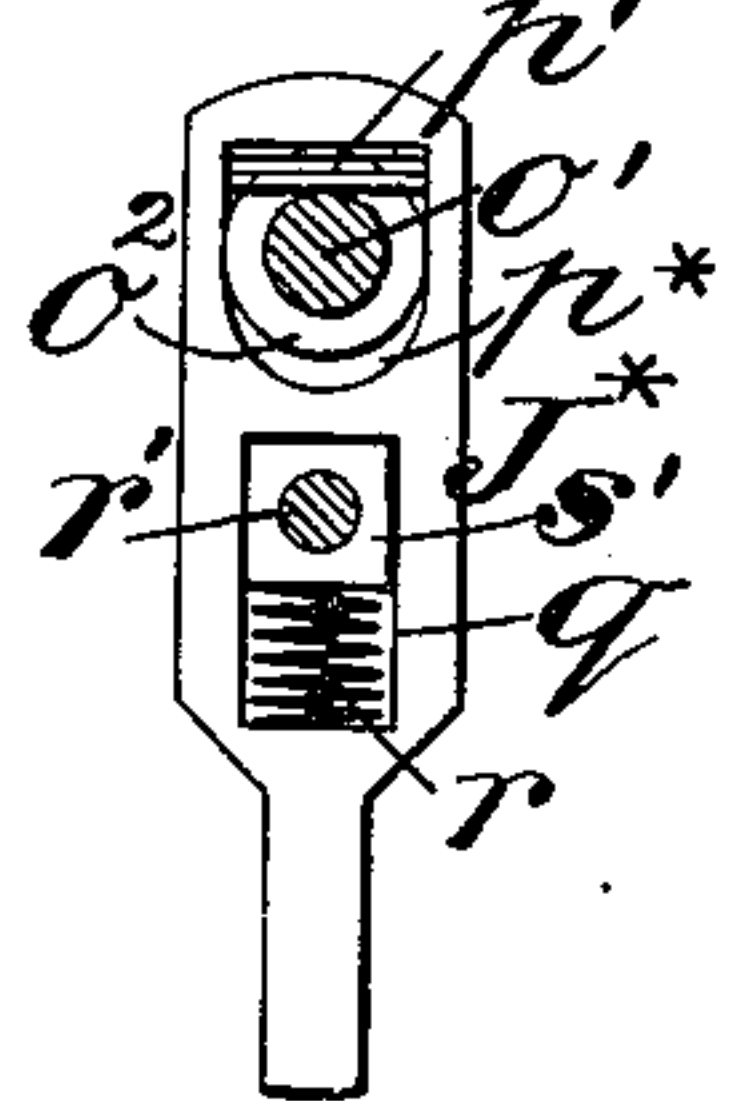


Fig. 5.

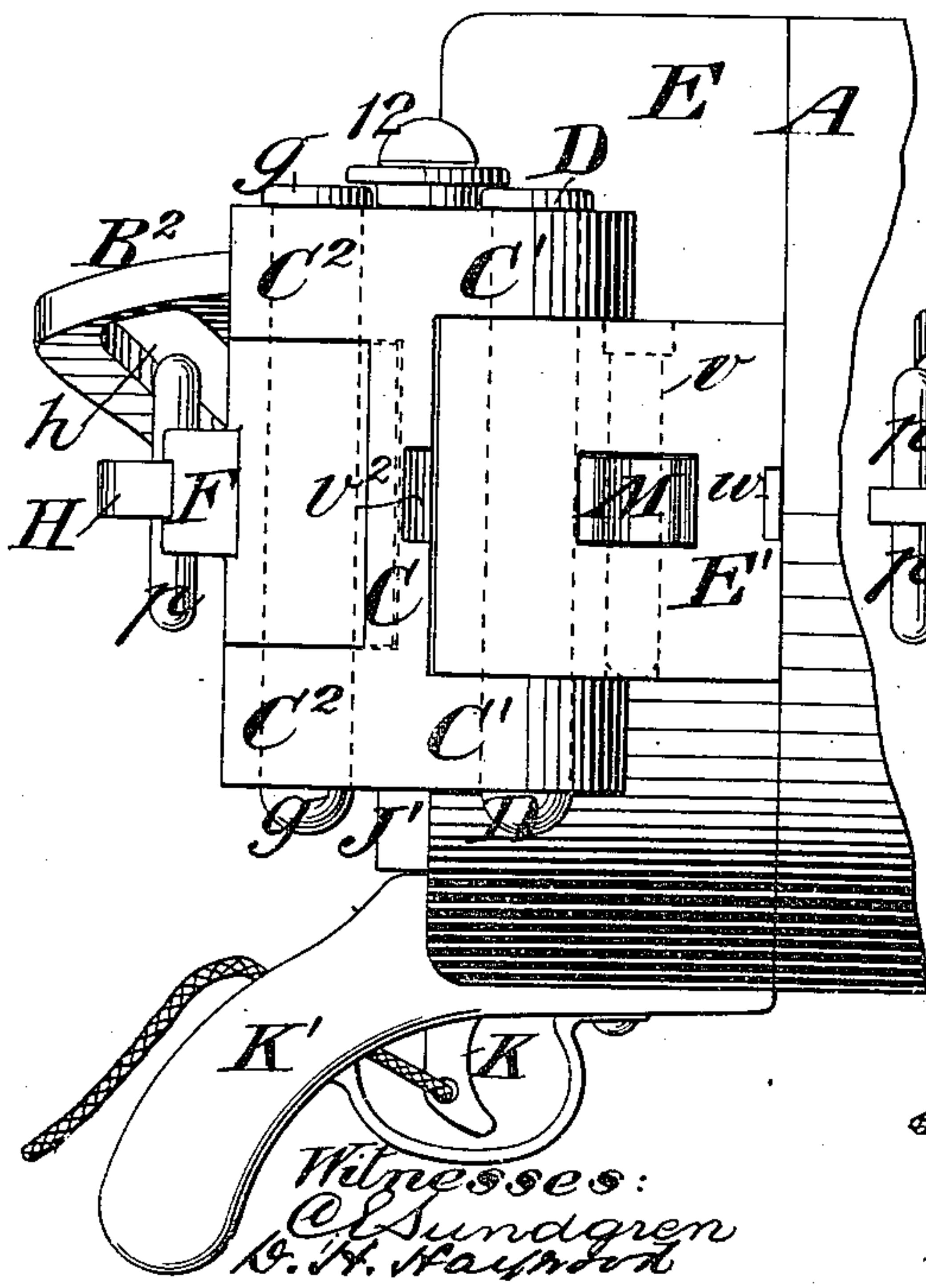
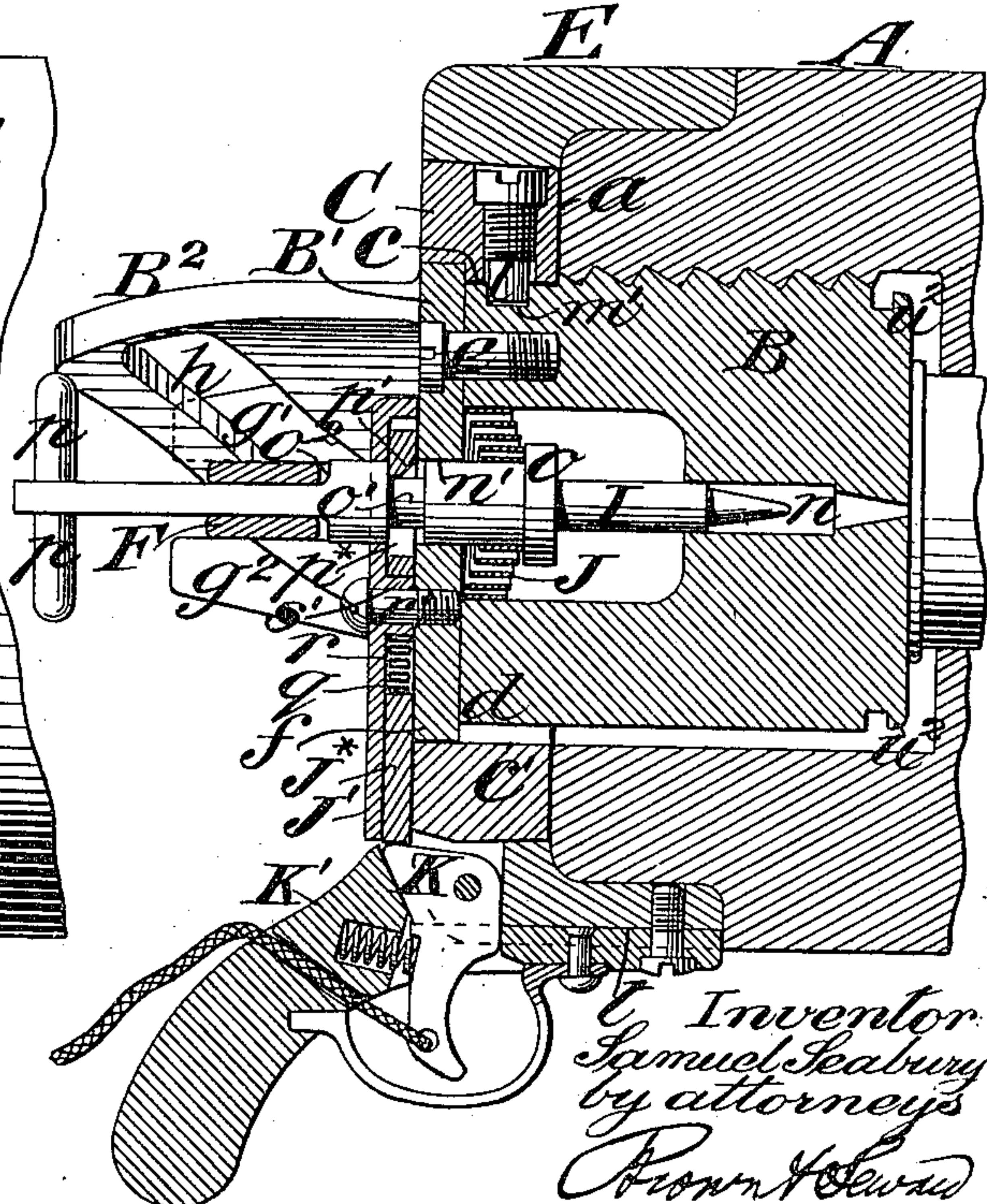


Fig. 6.



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Fig. 7.

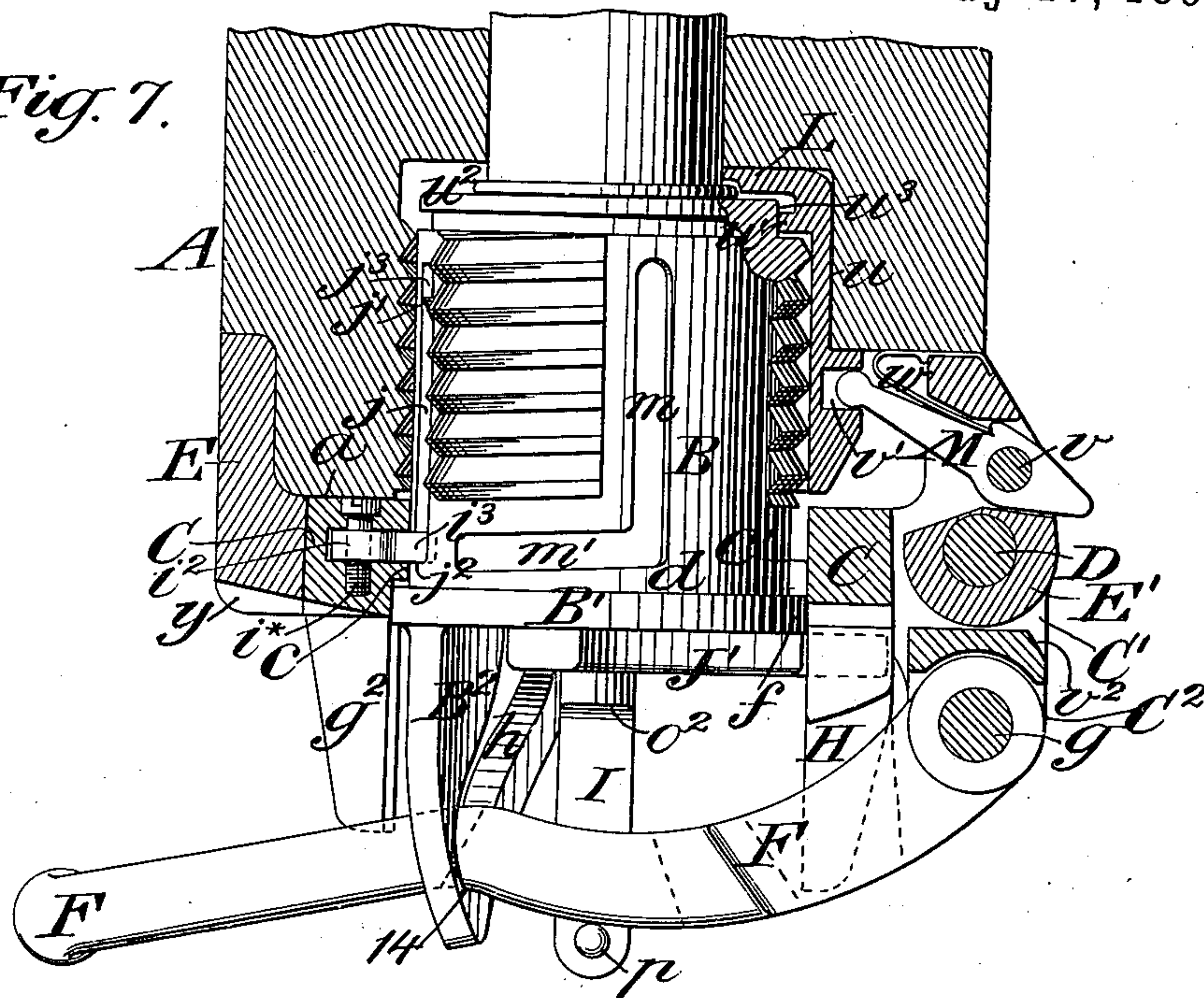
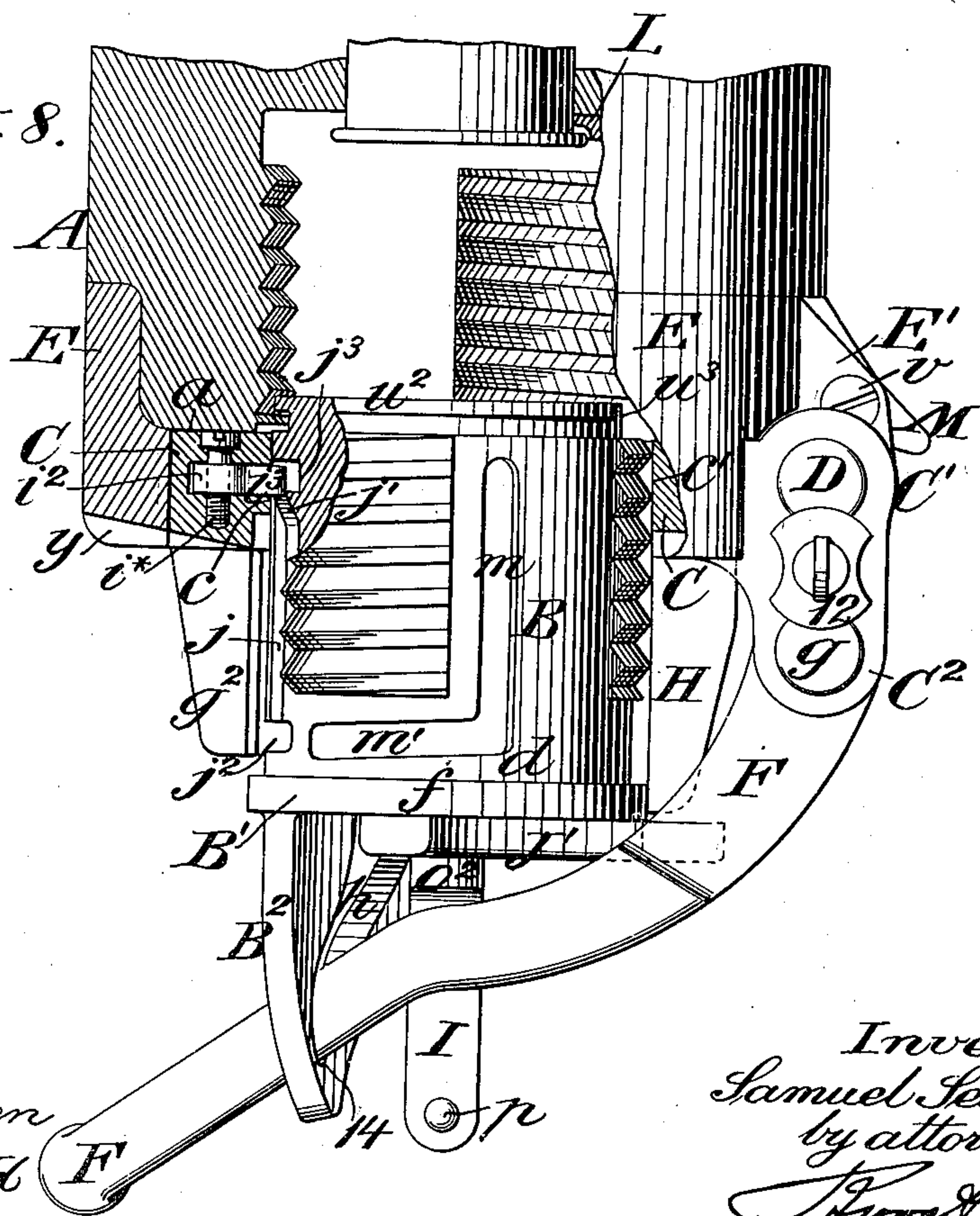


Fig. 8.



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Fig. 9.

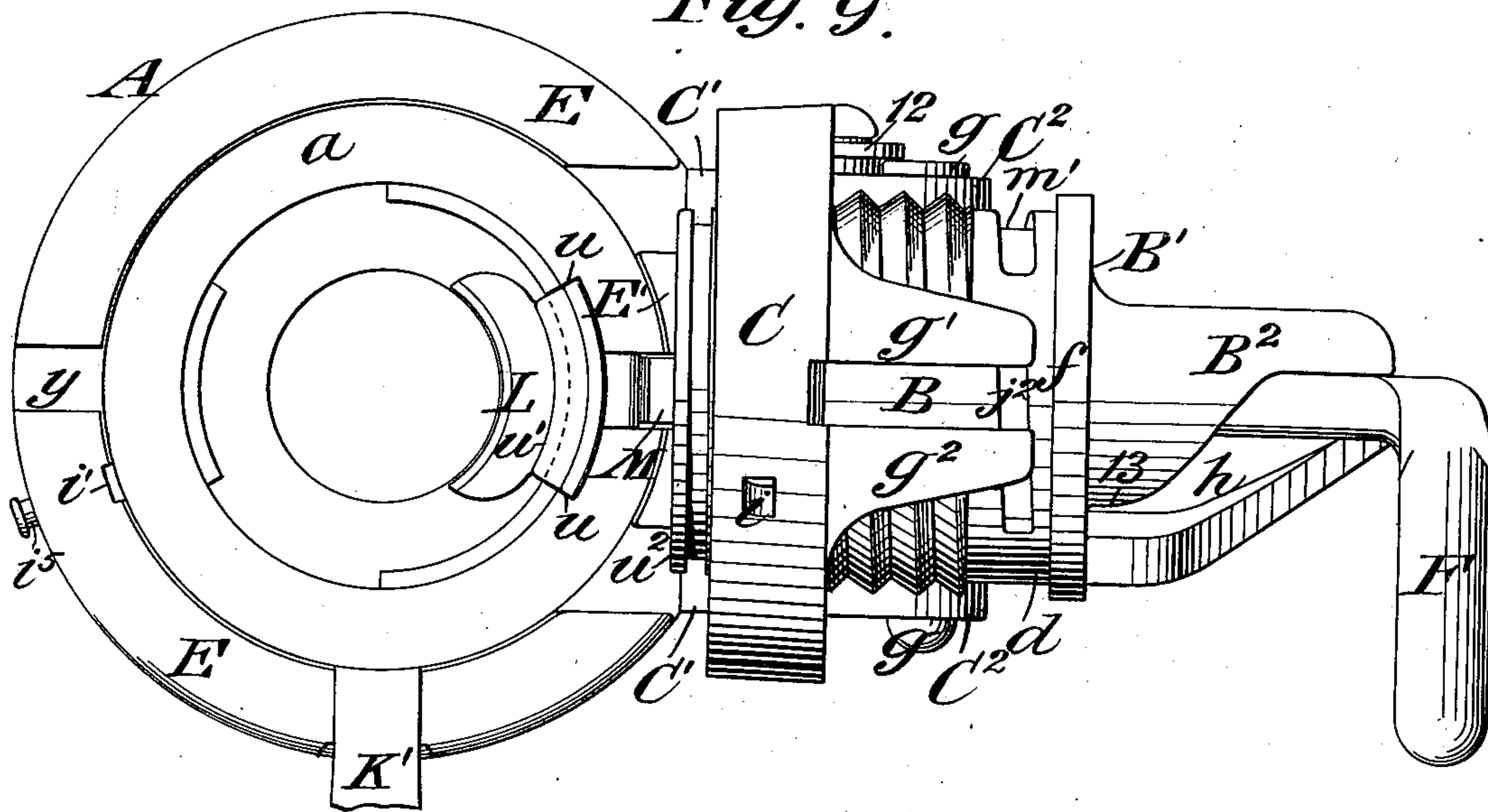
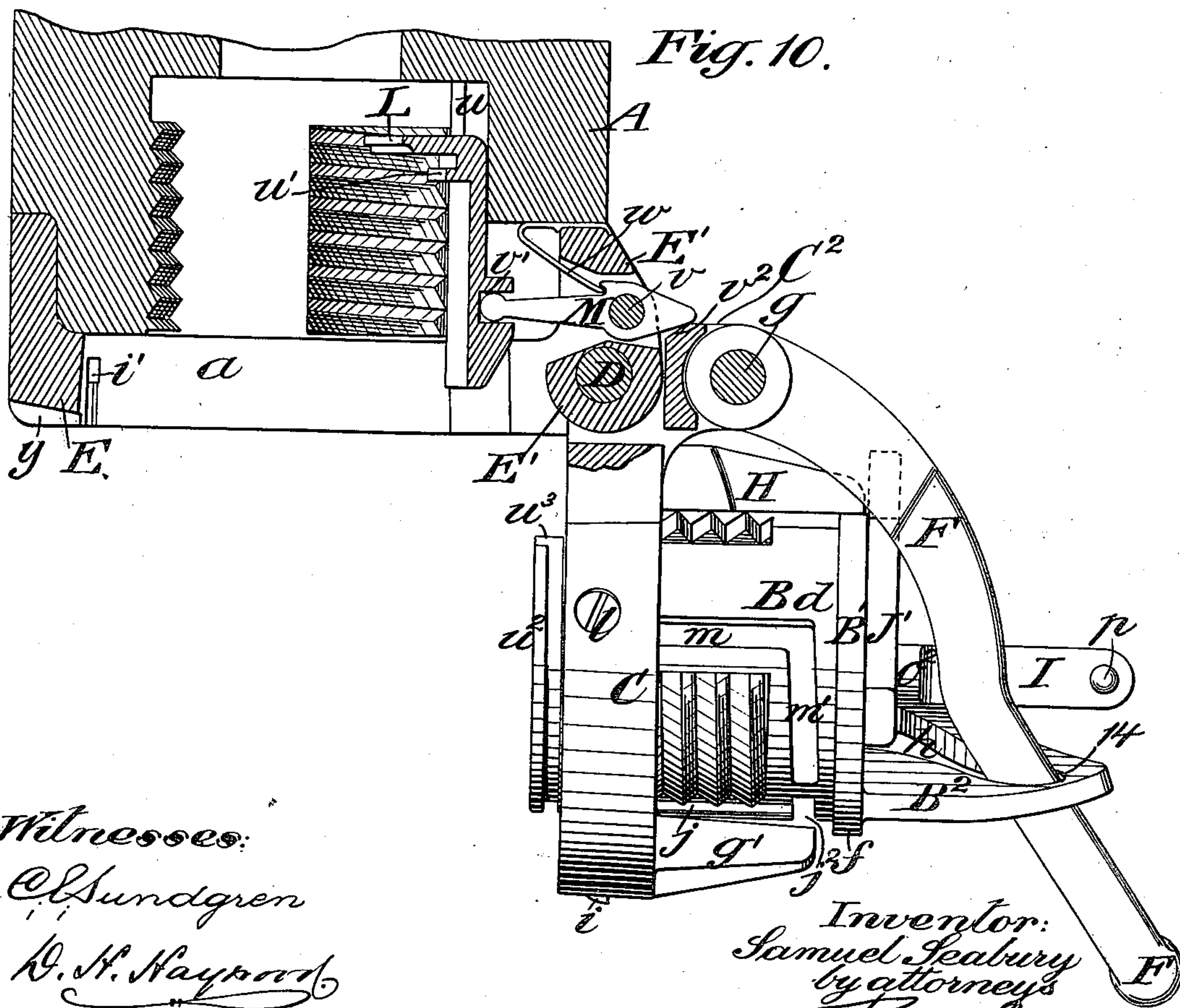


Fig. 10.



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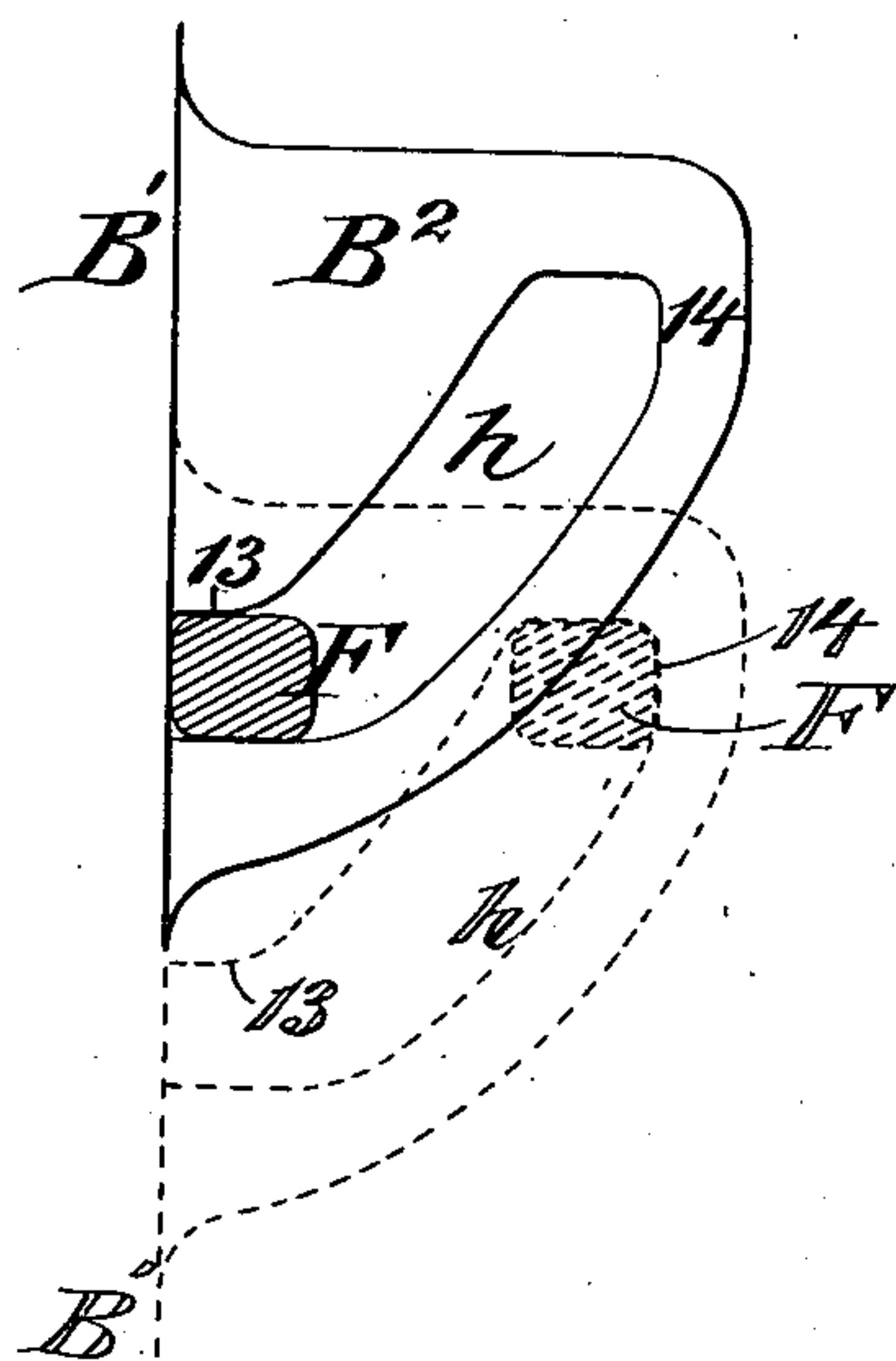
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Fig. 11.



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UNITED STATES PATENT OFFICE.

SAMUEL SEABURY, OF THE UNITED STATES NAVY.

BREECH-LOADING CANNON.

SPECIFICATION forming part of Letters Patent No. 474,974, dated May 17, 1892.

Application filed October 21, 1891. Serial No. 415,708. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL SEABURY, lieutenant United States Navy, residing at Bergen Point, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Breech-Loading Cannon, of which the following is a specification, reference being had to the accompanying drawings.

This improvement relates to breech-loading cannon having a mutilated screw-threaded breech-block which is withdrawn in a rearward direction and which is held by and works within a carrier which is hinged to one side of the breech of the gun. In such a gun there are three movements necessary to open the breech, viz: first, the turning of the breech-block to a position in which it can be withdrawn directly backward; second, the withdrawal of the said block backward out of the breech of the gun, and, third, the swinging aside of the carrier with the block in it. Three corresponding reverse movements have to be made for closing the breech.

The principal object of the present invention is to provide in a more simple manner than heretofore for effecting all these movements in proper succession by the continuous movement of a single lever, which lever may also be employed to effect the cocking of the firing-pin employed for the ignition of the charge and the operation of a cartridge-shell extractor in a gun in which fixed ammunition is used.

I will now proceed to describe the invention with reference to the drawings, and afterward point out its novelty in claims.

Figure 1 is a rear view showing the breech of a cannon embodying my invention with the breech-block closed. Fig. 2 represents a top view corresponding with Fig. 1. Fig. 3 represents a transverse vertical section in the line $x x$ of Fig. 2. Fig. 4 represents a central horizontal section corresponding with Figs. 1, 2, and 3. Fig. 5 is a side view corresponding with Figs. 1, 2, 3, and 4. Fig. 6 represents a central vertical section corresponding with Figs. 1, 2, 3, 4, and 5, except that in this figure the firing-pin is represented as cocked, and in the previously-mentioned figures it is represented in the position it occupies after firing. Fig. 6* is a back view of the sear. Fig. 7 represents a central horizontal section

of the breech and a top view of the breech-block and its operating mechanism, showing the breech-block as turned preparatory to its withdrawal from the breech. Fig. 8 is a plan view, partly in section, representing the breech-block as drawn back within the carrier ready to be swung back with the carrier. Fig. 9 is a view similar to Fig. 1, except that the breech is represented open. Fig. 10 is a horizontal sectional view corresponding with Fig. 9. Fig. 11 is a diagram which will be hereinafter explained.

Similar letters and numerals of reference designate corresponding parts in all the figures.

A is the breech of the gun.

B is the breech-block, and C is the breech-block carrier, hinged on a pin D to one side of the breech. In the example represented the lug or member E' of the hinge which is affixed to the breech is constructed on a metal band E, which is shrunk or so firmly secured upon the breech A as to be practically a part thereof. This construction of the fixed portion E' of the hinge on a band is only a matter of convenience for adapting my invention to a gun already made. It is obvious that the fixed portion or lug E' of the hinge may be constructed directly upon the breech of the gun. The breech-block D is of the well-known kind, having upon its exterior mutilated screw-threads corresponding with mutilated screw-threads in the breech of the gun.

The carrier C consists of a strong ring having upon one side of it hinge-lugs C' C', through which and the fixed lug E' on the breech the pin D passes. The external circumference of the ring of the said carrier is fitted to a cavity a in the breech, the said cavity being in the example represented in the fixed band E, which, as hereinbefore mentioned, is substantially a part of the breech. The fit of the said ring to the breech is represented as slightly tapering to insure closeness and facilitate opening. The opening of the carrier C, in which the breech-block is received, consists, as shown in Fig. 3, of three concentric arc-formed bearings c and three intermediate arcs c' of larger radius concentric with c , the circle of the bearings c fitting the mutilated cylindrical portion of the breech-block between and behind the screw-threads, and the spaces within the arcs

5 c' corresponding with the mutilated portions of the interior of the breech to permit the breech-block to slide back through the closed carrier during the act of withdrawing the block from the breech. The breech-block has a portion d of its circumference in rear of its screw-threads of plain cylindrical form, as shown in Figs. 7 and 8, so that it may turn freely in the bearings c in the carrier, and on the rear end of the block there is secured by screws e a plate B' , the edges of which project around the block in the form of a flange f , the said plate and flange being practically a part of the breech-block. The said plate B' serves, also, the purpose of carrying a rearwardly-projecting yoke B^2 , through which passes the hand-lever F , which serves the purposes of turning the breech-block, giving the said block the requisite longitudinal movement and moving the carrier on its hinge, and may also serve the purpose, as in the present example, of cocking the firing-pin and operating the cartridge-shell extractor. The said lever F has its fulcrum upon a pin g between the lugs $C' C'$ of the carrier C , upon which pin it is capable of moving toward and from the breech of the gun, the said lugs $C' C'$ being extended in a rearward direction beyond the pin D , as shown at $C^2 C^2$ in Figs. 2, 4, and 5, for the purpose of carrying the said fulcrum-pin g . The pins D and g are secured in place by a button 12. The slot h , provided in the yoke B^2 for the lever F to work in, is of such form that the lever in moving backward within said slot from the position shown in Figs. 1 and 2, in which the breech is closed, will turn the breech-block far enough to bring the screw-threads thereon opposite to the mutilations of the screw-threads in the breech and to the recesses or spaces $c' c'$ between the bearings $c c$ in the carrier, and thereby permit the breech-block to move backward. The form which I give this curved slot is shown in the diagram Fig. 11, which shows the outlines of the yoke and its slot and a transverse section of the lever, the full outlines showing the relative positions of the slot and the lever when the breech-block is screwed up, and the dotted outlines showing their relative positions when the block is unscrewed. It will be seen that the forward or lower portion of the curve is in line substantially parallel with the bore of the gun and with the plane of movement of the lever, and that the curvature is thence developed somewhat in the form of a screw-thread with a gradually-diminishing pitch, so that the lever will operate most effectively to turn the breech-block in commencing to unscrew it and in completing the screwing it up. Moreover, when in firing the gun there is tendency to turn the breech-block this tendency to turn is resisted normally by the lever, which serves as an abutment to the portion 13 of the slot. In this resistance the lever is sustained in part by the long support which is provided for it on the fulcrum-pin g and in part by engaging with the breech in a notch

70 y , provided in the latter to receive it, and during the movement of the lever in the slot h the said lever is supported vertically in part by the fulcrum-pin and in part on the opposite side of the carrier to the fulcrum-pin by two horizontal guides $g' g^2$, provided one above and the other below it on the carrier C , which is then supported in the cavity a in the breech. The longitudinal movement of the breech-block within the carrier to withdraw it from the breech, as shown in Fig. 8, after it has been unscrewed and the subsequent swinging aside of the carrier and block to open the breech, as shown in Fig. 10, are effected by the direct action of the lever against the rear portion 14 of the slot h . The breech-block is, during its longitudinal movement, guided rectilinearly in part by a guide II , which projects from the rear of the carrier through an opening in the lever, and in part by a pin l , (see Figs. 3 and 10,) which is screwed into the carrier from the outside thereof and the point of which projects within the carrier and enters a straight groove m (see Figs. 7, 8, and 10) in the block. This pin l also prevents the breech-block from turning during its backward and forward movements and acts as a stop against the front end of said groove to limit the backward movement of the block within the carrier, and also serves by the engagement of the said end of the slot against it to make an operative connection between the carrier and the lever for swinging the carrier backward on its hinge. The said groove m is prolonged at its rear end in the form of a female screw-thread m' , so that although the pin l is always in it the said pin does not prevent the turning of the block in the screw-threads of the breech. The guide II is represented as secured to the carrier by a screw k . To provide for locking the carrier to the breech of the gun when the latter is closed by the breech-block and until the block has been drawn back within the carrier and out of the breech, there is provided in the carrier a small latch-bolt i , (see Figs. 3 and 9,) the said bolt having a beveled end to allow it to enter easily into a notch i' (see Figs. 9 and 10) in the cavity a of the breech. The said latch-bolt i is pivoted to the outer end of a small lever i^2 , (see Figs. 3, 4, 7, and 8,) which works on a pin i^* in a cavity provided for it in the carrier and the inner end of which has an inward projection i^3 , which enters a longitudinal groove j in the breech-block and works back and forth in the said groove as the block moves within the carrier during its movements back and forth from and into the breech, and the said lever i^2 has applied to it a spring i^4 , (see Fig. 3,) which tends to keep its projection i^3 in the said groove and press out the latch-bolt i from the carrier. The said groove j has its front end beveled, as shown at j' in Fig. 8, in such manner that just as the withdrawal of the breech-block from the gun is completed the said beveled front end will act as a wedge on the projection i^3 and so auto-

10 matically withdraw the latch-bolt i within the carrier and unlock the latter from the breech. In front of the beveled end j' of the groove j is a notch j^3 for the reception of the projection i^3 5 to lock the breech-block within the carrier, as shown in Fig. 8. The said groove has at its rear end a lateral turning j^2 to receive the projection i^3 and permit the breech-block to turn in the carrier while screwing it up and unscrewing it within the breech.

15 In order to provide for unlocking the carrier from the breech in case of any failure of the automatic operation above described, I provide an opening from the notch i' directly through the side of the breech, as shown at 15 in Fig. 3, and in this opening I place a pin i^5 , which projects outward in such manner that pressure may be applied to it by the thumb or finger to press in the latch-bolt 20 clear of the breech. This pin has its inner end so enlarged that it can neither be pulled out of the breech nor pressed into the hole provided for the latch-bolt i in the carrier.

25 I is the firing-pin passing centrally through the breech-block and working in a guide at n in the front part of the block itself and a guide n' in the plate B' . The mainspring J , which is coiled around the firing-pin and contained within a central cavity in the 30 breech-block, abuts against the plate B' and presses against a collar or shoulder o on the pin. The pin is prolonged backward and passes through a slot in the lever F and is provided with a cross-head p , with which the 35 said lever engages for the purpose of drawing it back to the cocked position.

40 J^* (see particularly Figs. 6 and 6*) is the sear, consisting of a plate which slides against the back of the breech-block and in which there are two openings $p^* q$, through one of which the firing-pin passes and which is large enough for the larger portions of the firing-pin to pass through it and the other of which 45 receives the sear-spring r . The upper edge of the opening, which constitutes the tooth for engaging in the cocking-notch o' of the firing-pin, is beveled, as shown at p' in Figs. 6 and 6*, so that the shoulder o^2 on the pin may pass by it in the act of cocking. The 50 sear is guided by a box J' , which is secured by dovetailed edges and a screw r' to the plate B' or breech. In this box is a square projection s' , which passes through the opening q of the sear and which constitutes a bearing for the sear-spring r , which pushes downward against the lower part of the said opening. The screw r' passes through this projection s' .

60 K , Figs. 5 and 6, is the trigger, fitted to a stock K' , which is inserted and secured in a dovetail groove t (see Figs. 1 and 3) in the bottom of the breech of the gun. This trigger liberates the firing-pin by pushing upward against the sear, but is only in contact there- 65 with when the breech is closed.

L , Figs. 4, 7, 9, and 10, is the cartridge-shell extractor, which is like that which is part of

the subject-matter of my United States patent, No. 431,214, dated July 1, 1890, consisting of a slide, which works back and forth in a 70 guide u in one side of the cavity which receives the breech-block. This extractor is, as described in that patent, provided with a flange u' , which engages with a flange u^2 on the front of the breech-block for the purpose 75 of starting the cartridge-shell by the slight backward movement given to the block by unscrewing it, the said flange u^2 being mutilated, as shown at u^3 in Figs. 7, 8, and 10, to 80 allow it to escape from said flange u' as the unscrewing of the breech-block is completed and to permit the block to move back without taking the extractor L with it. To provide for pulling back the extractor after the 85 breech has been opened, I now provide within the carrier-hinge a small lever M , which I call the "extractor-lever" and which works horizontally on a fulcrum-pin v , secured in the hinge in front of the pin D , the said pin being, in the example represented, in the hinge- 90 lug E' of the breech-band E , and the said lever working in a mortise in the said lug. The inner end of this extractor-lever M engages in a groove v' in the extractor, and the outer end projects through the lug E' in such man- 95 ner that when the carrier C , with the withdrawn breech-block, is swung aside by the movement of the hand-lever F the part v^2 of the carrier will come in contact with the said projecting outer end of the extractor-lever, 100 and as the said movement is continued the carrier by its action on the said projecting part of the extractor-lever will draw back the extractor and with it the cartridge-shell far enough for the latter to drop or be easily 105 taken from the breech. This operation of the extractor is illustrated in Fig. 10. A spring w (see Fig. 10) is applied to the extractor-lever in such manner as to tend to move the extractor inward when not operated 110 upon either by the flange u^2 or by the part v^2 of the carrier. This spring returns the extractor, as shown in Fig. 7, when the flange u^2 of the breech-block, having started the cartridge, escapes from the flange u' of the 115 extractor.

Having described the construction and separate operations of the different parts of a gun embodying my invention, I will now proceed to summarize briefly the operations of 120 the whole in proper order, first supposing the gun to have been fired and the parts to be left in the positions and conditions represented in Figs. 1, 2, 3, and 4. All that has to be done for performing the several opera- 125 tions is to pull back the lever from the position in which it is shown in the figures above mentioned and return it. During the first part of the backward movement of the said lever it moves in the slot h of the yoke B^3 130 and unscrews the breech-block, as shown in Fig. 7, and at the same time it draws back the firing-pin to the position to be caught by the sear, the unscrewing of the block at the

same time starting the cartridge-shell. The continued movement of the lever in contact with the back of the slot *h* withdraws the breech-block from the gun, as shown in Fig. 8, and just before this withdrawal is completed the wedge-like portion *j'* of the breech-block acts upon the lever *i*², and thereby draws in the latch-bolt *i* and unlocks the carrier C, and as the withdrawal is completed the front end of the slot *m* comes against the pin *l* and the projection *i*³ drops into the notch *j*³, and the carrier is thus compelled to move with the breech-block during the further continued movement of the lever, by which the breech-block and carrier are together swung aside on the pin D, as shown in Figs. 9 and 10. The still further continued movement of the lever and the carrier brings the part *v*² of the carrier against the extractor-lever M and pulls back the extractor and with it the empty cartridge-shell. The said movement of the lever is, however, not intermitted between the several operations above described, but is continuous. The cartridge-shell having been removed and a new charge having been inserted into the chamber of the gun, the lever is returned to the position shown in Figs. 1, 2, 3, and 4. During the first part of this return movement the spring *w* returns the extractor, and as by the continued movement of the lever the carrier passes into the cavity *a* of the breech the beveled end of the latch-bolt *i*, running into the said cavity, causes the said bolt to be pressed inward and at the same time causes the projection *i*³ of the lever *i*² to be thrown out of the recess *j*³ to liberate the breech-block, which then commences to move forward, while the latch-bolt is sprung into the notch *i'* in the breech to lock the carrier. By the continued forward movement of the lever the block must be pushed forward, as the block is prevented from turning by the pin *l* until when the part *m'* of the groove *m* *m'* in the block arrives at the pin the lever by its action in the yoke screws up the block. All is now ready for firing.

It will be understood by reference to Fig. 4 that the firing could not take place until the lever F has entered the notch *x* in the breech and the block has been securely locked, as, if the firing-pin should accidentally let off while the lever is not locked, the cross-head of the pin would strike the lever and the pin would be arrested with its point short of the cartridge or priming.

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

1. The combination, with the gun, the breech-block carrier hinged thereto, and the breech-block fitted to turn within the carrier and the gun, of a yoke affixed to and projecting rearward from the said block and a lever having its fulcrum in the carrier and arranged to move backward and forward relatively to the breech and operating within said yoke to turn the said block, substantially as herein described.

2. The combination, with the gun, the breech-block carrier hinged thereto, and the breech-block fitted to turn within the gun and the carrier, of a curved yoke projecting rearward from said block and a lever having its fulcrum on the carrier to move backward and forward relatively to the breech of the gun and within the said yoke for turning the block and having an engagement with the breech to make it serve as an abutment to the yoke for locking the breech, substantially as herein set forth.

3. The combination, with the gun, the breech-block carrier hinged thereto, and the breech-block fitted both to turn and to move lengthwise within both said carrier and the gun, of a lever having its fulcrum in said carrier and having a yoke connection with the said block for the purposes of producing said turning and lengthwise movements, substantially as herein set forth.

4. The combination, with the gun, the breech-block carrier hinged thereto, and the breech-block fitted both to turn and to move lengthwise within both said carrier and the gun, of a lever having its fulcrum in said carrier and having a yoke connection with said block for the purpose of producing said turning and lengthwise movements, and a stop for limiting the lengthwise movement of the block within the carrier and for engaging the block with the carrier to make operative connection between the carrier and the lever, substantially as herein set forth.

5. The combination, with the gun, the breech-block carrier hinged thereto, and the breech-block fitted to turn within the gun and the carrier, of a curved yoke projecting rearward from said block, a lever having its fulcrum in the carrier to move backward and forward relatively to the breech and within said yoke for turning the block, and a guide on the opposite side of the carrier to the fulcrum-pin for sustaining said lever, substantially as herein set forth.

6. The combination, with the gun, the breech-block carrier hinged thereto, the breech-block fitted to turn within the gun and the carrier, and the firing-pin passing through the breech-block, of a lever having its fulcrum in the carrier and having a yoke connection with the block for turning it and having an engagement with the firing-pin for the purpose of cocking it during the turning of the block, substantially as herein set forth.

7. The combination of the gun, the breech-block carrier hinged thereto, the breech-block fitted both to turn and move lengthwise within the gun and the carrier, a locking device for locking the block in the carrier to cause them to move together on the hinge, a firing-pin passing through the block, and a lever hinged to the carrier and having a yoke connection with the block for turning it and moving it lengthwise and swinging the carrier on the hinge and having an engagement with the firing-pin, said lever serving the several pur-

poses of turning the block and moving it lengthwise, swinging aside the carrier and block to open the breech, and cocking the firing-pin, substantially as herein set forth.

5 8. The combination, with the breech-block and the firing-pin passing through it, of a sliding sear having an opening in it through which the firing-pin passes and a sear-spring pressing against the sear to push its tooth toward the firing-pin, substantially as herein set forth.

9. The combination, with the breech-block and the firing-pin passing through it, of a sliding sear having two openings, one of said
5 openings having the firing-pin passing through it and one end of said opening constituting the sear-tooth and the other of said openings

containing both the sear spring and an abutment between which and the sear the said spring operates with a pushing action, substantially as herein set forth. 20

10. The combination, with the gun, the hinged swinging breech-block carrier and the extractor, of the extractor-lever M, arranged in the hinge of the carrier with its
25 fulcrum-pin in the breech in front of the hinge-pin D and to be operated upon by a portion of the carrier, substantially as herein set forth.

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