

(No Model.)

5 Sheets—Sheet 1.

# J. M. & M. S. BROWNING. MACHINE GUN.

No. 471,783.

Patented Mar. 29, 1892.

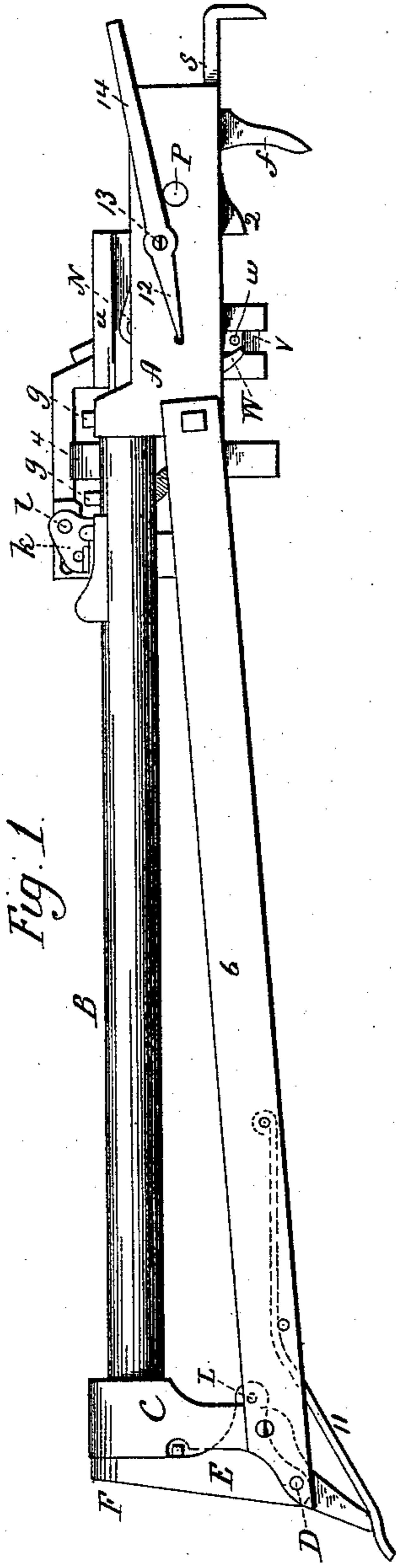


Fig. 1.

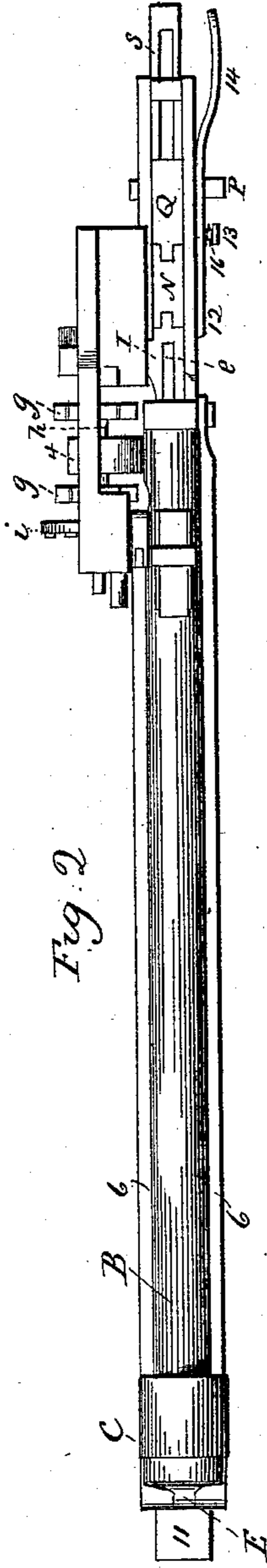


Fig. 2.

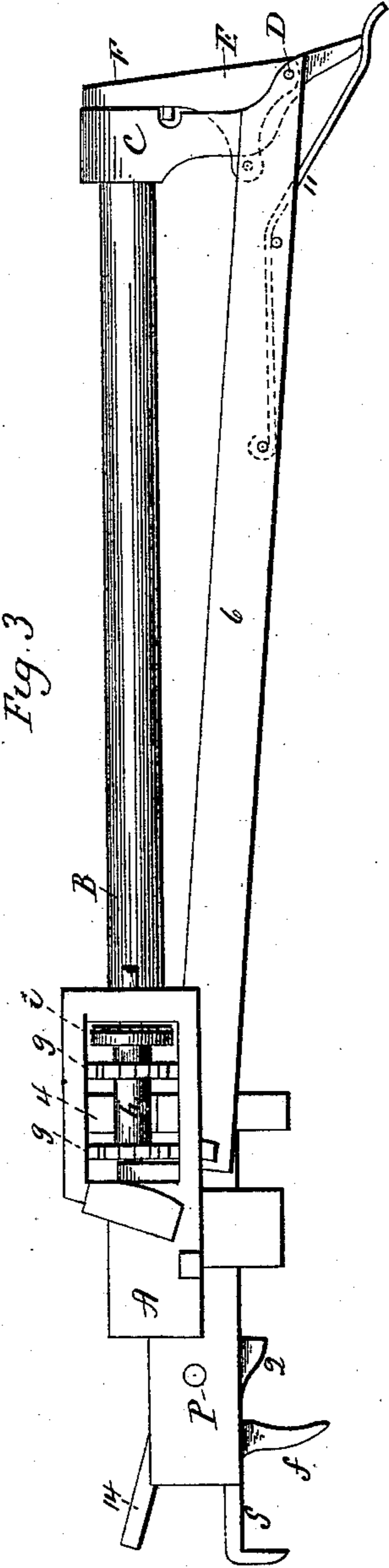


Fig. 3.

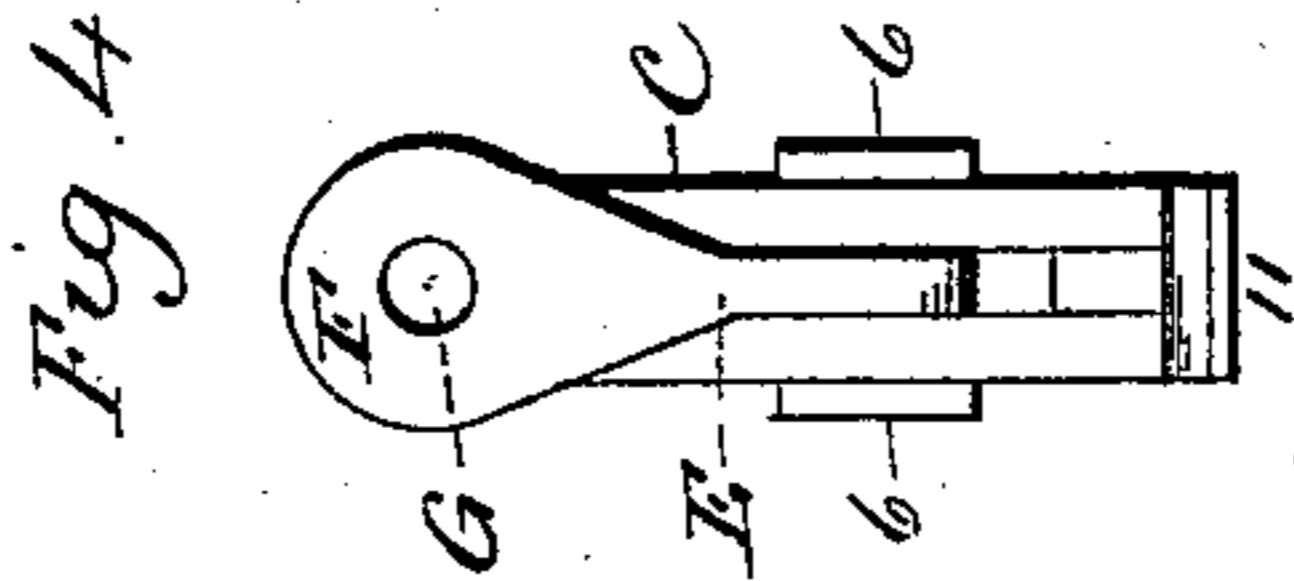


Fig. 4.

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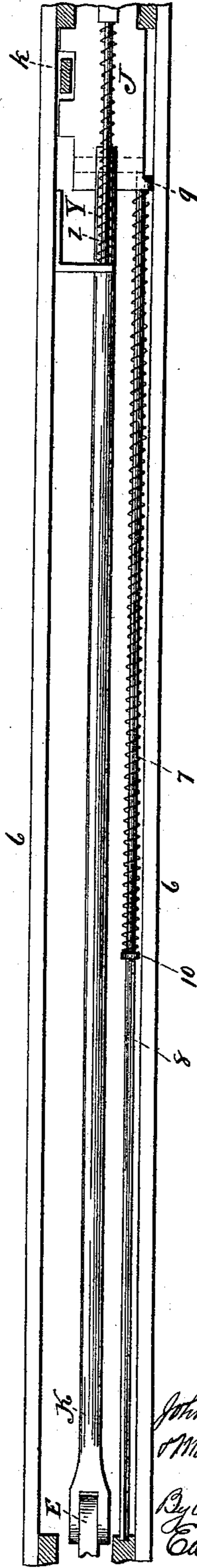
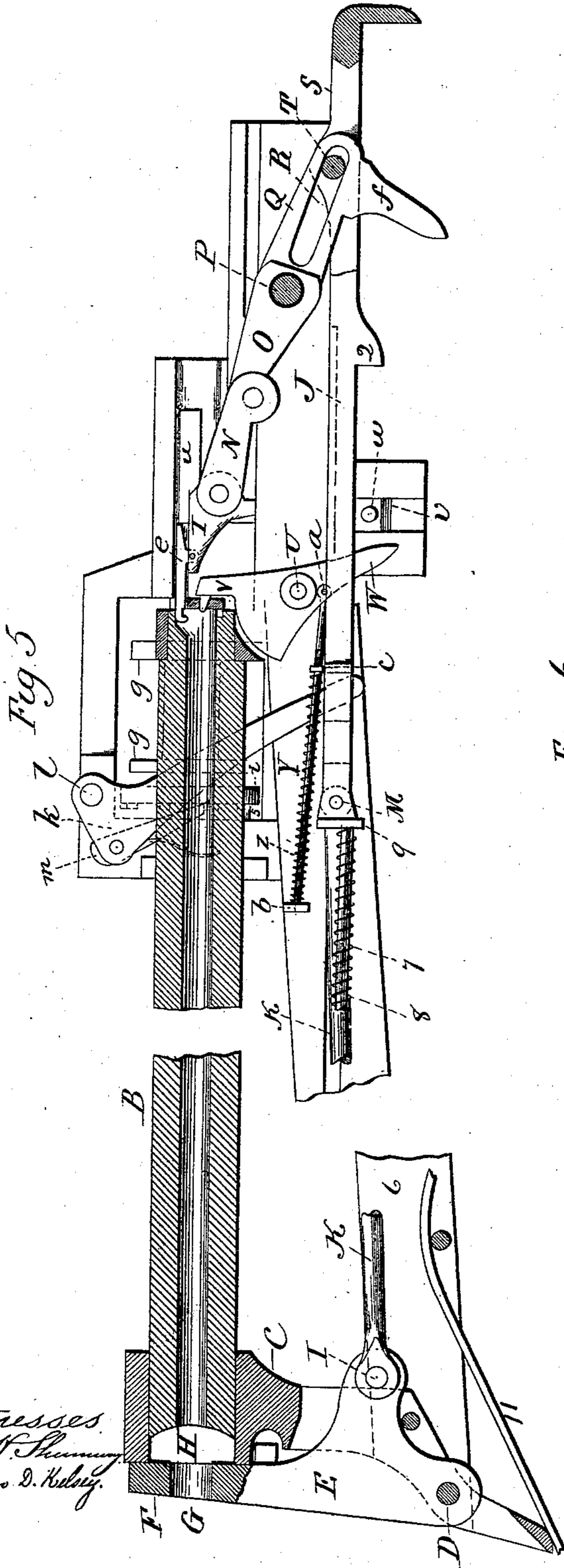
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(No Model.)

5 Sheets—Sheet 3.

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Fig. 7

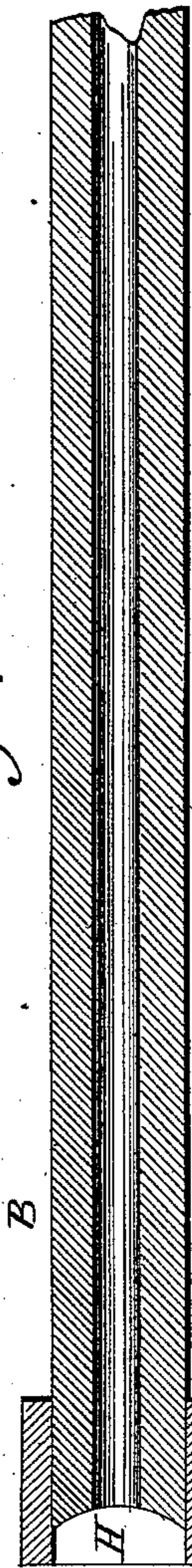


Fig. 10

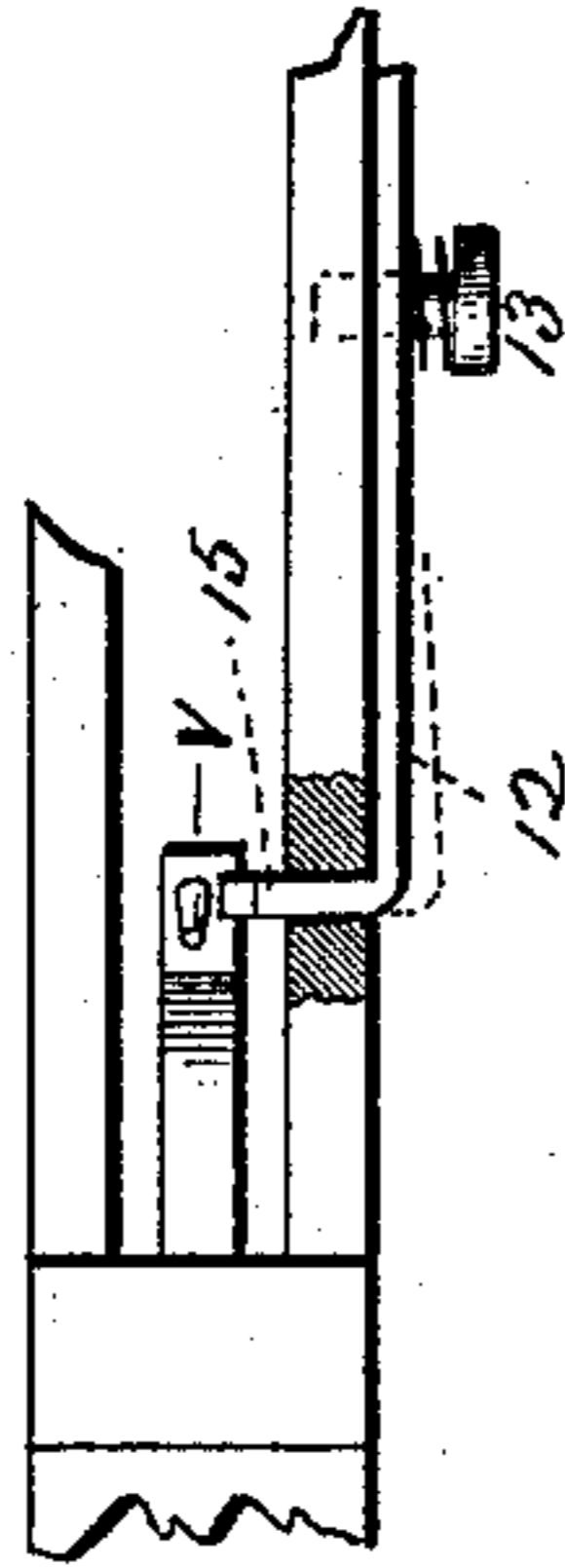


Fig. 8

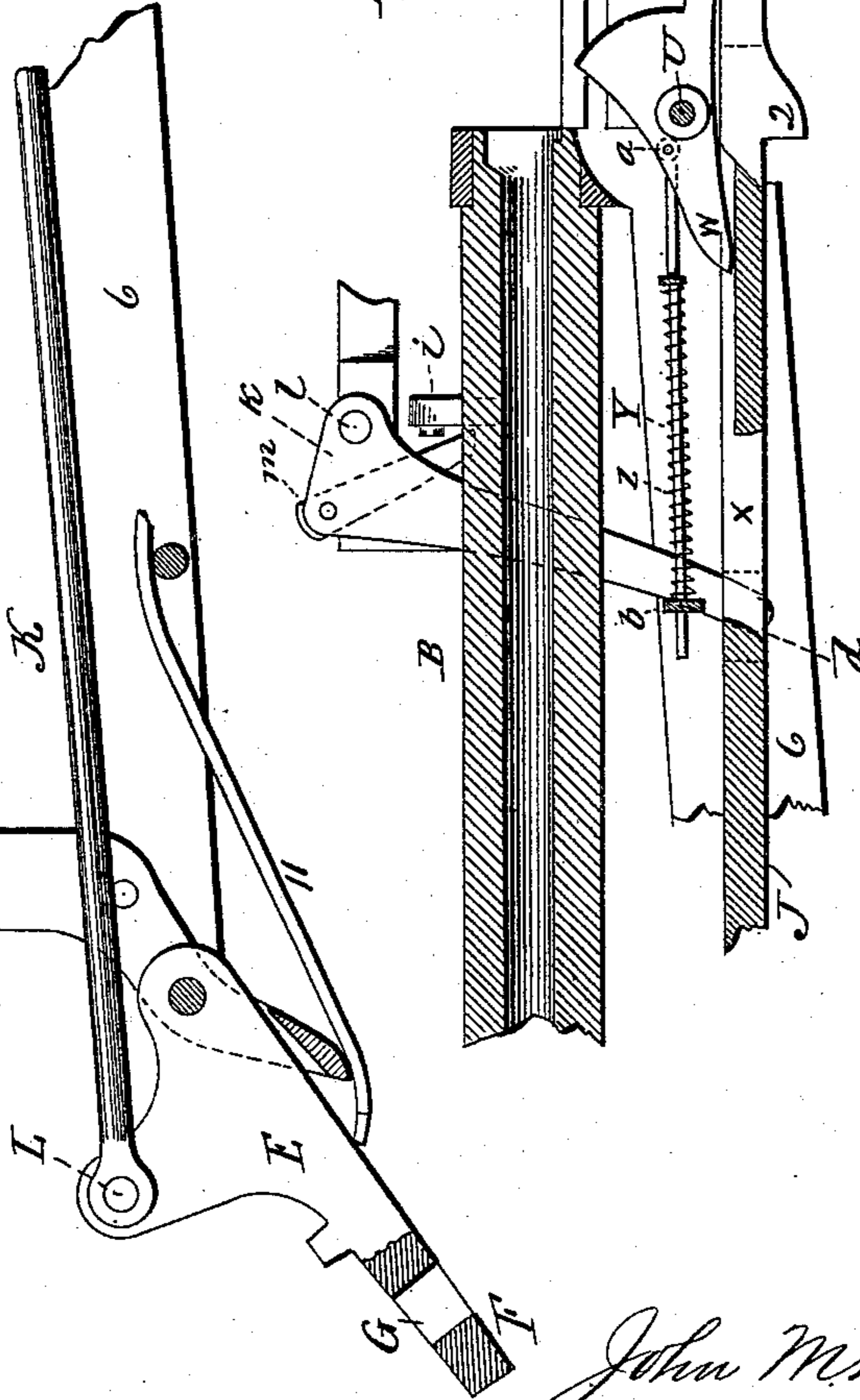
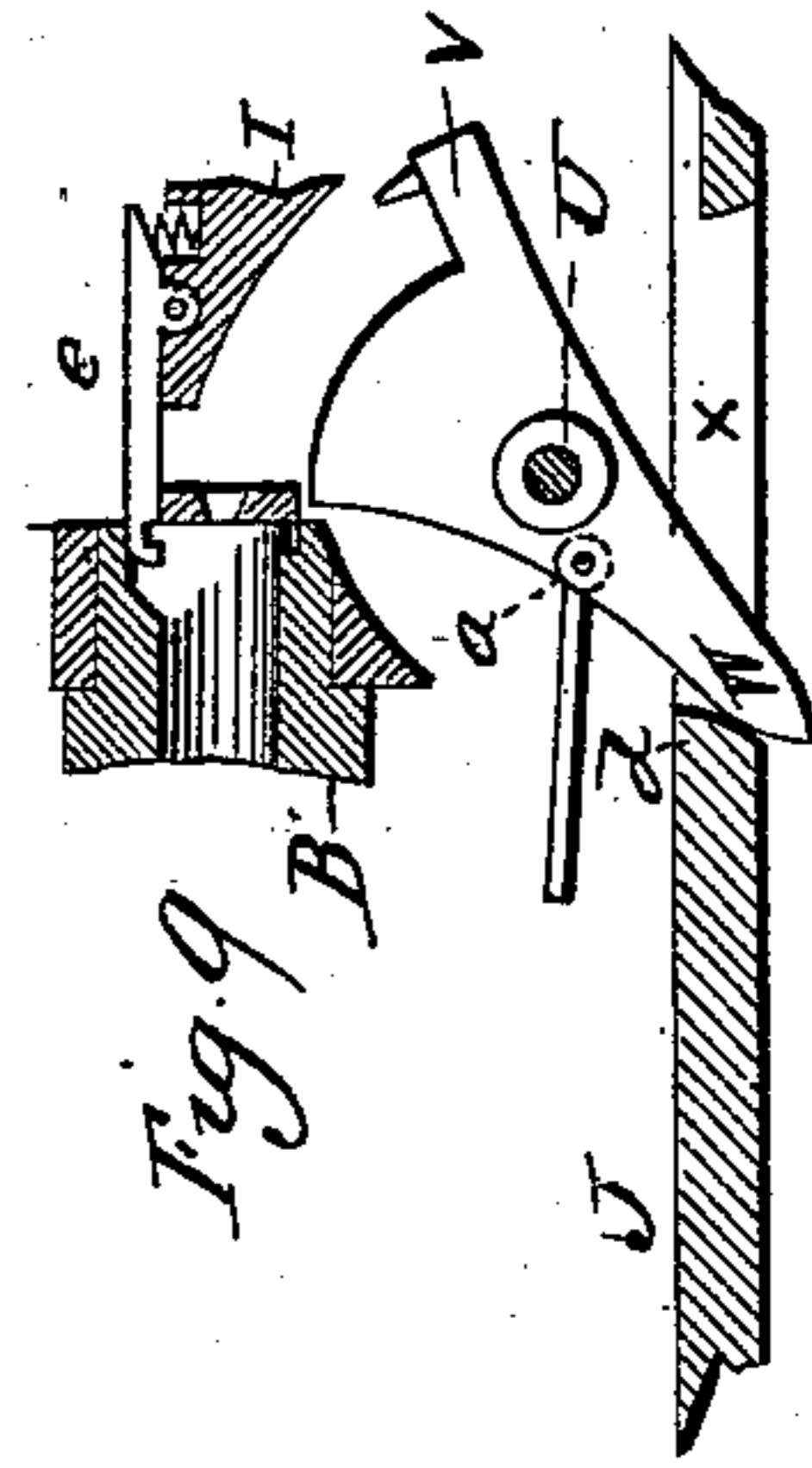


Fig. 9



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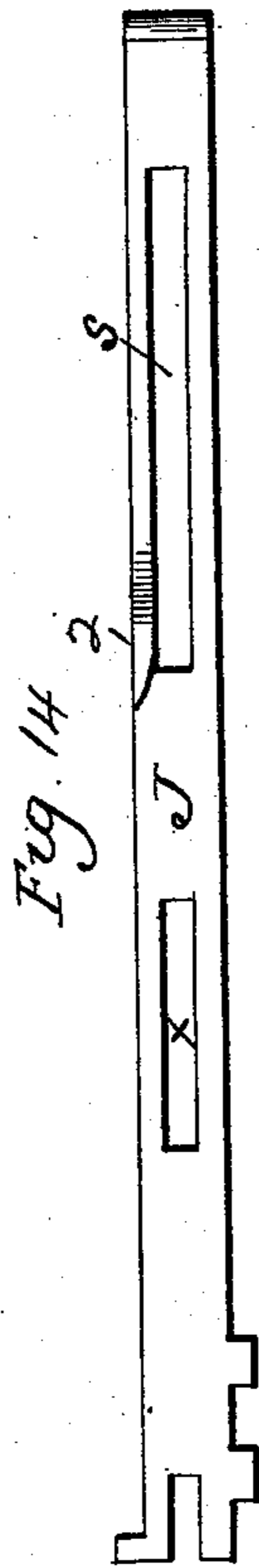
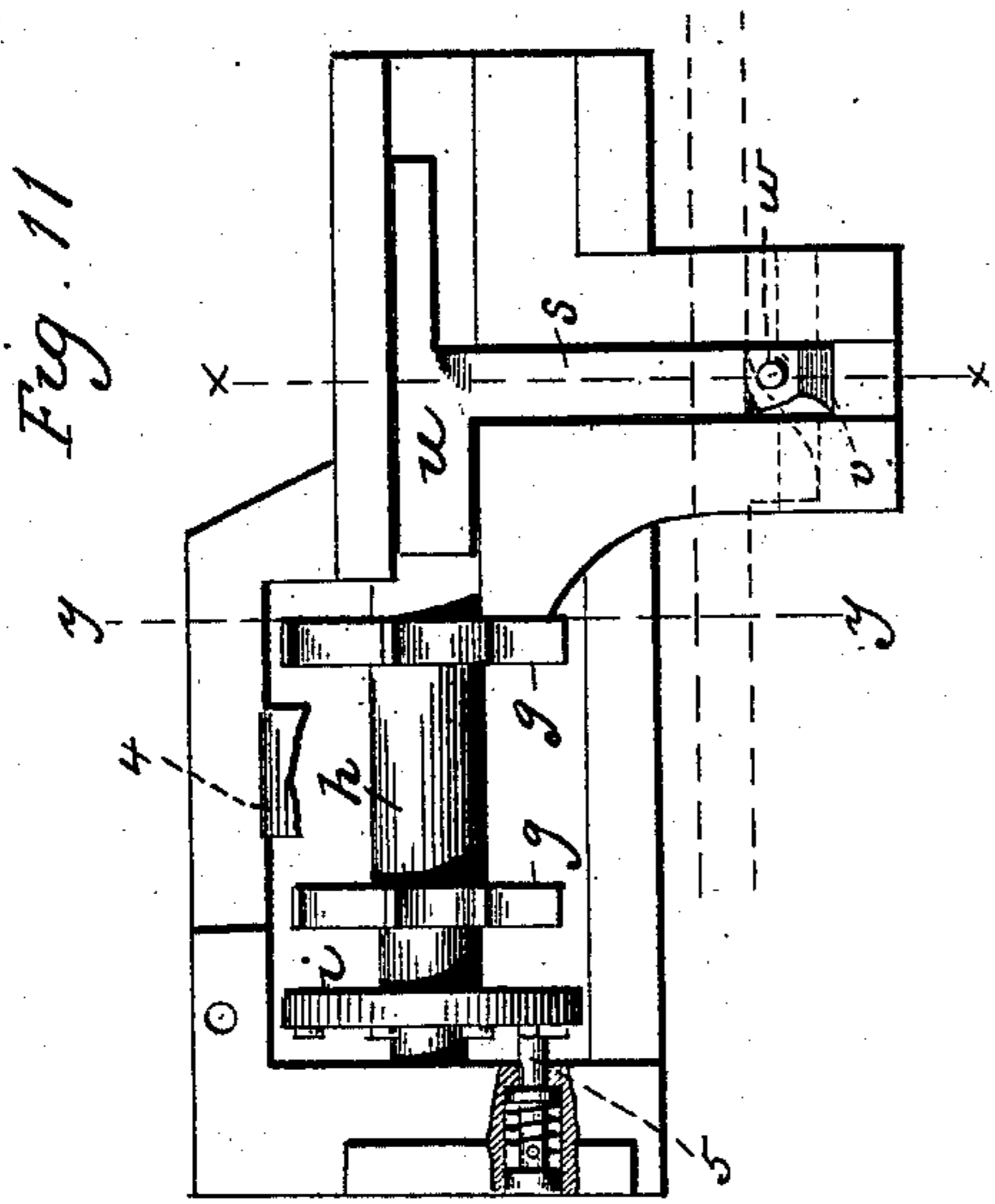
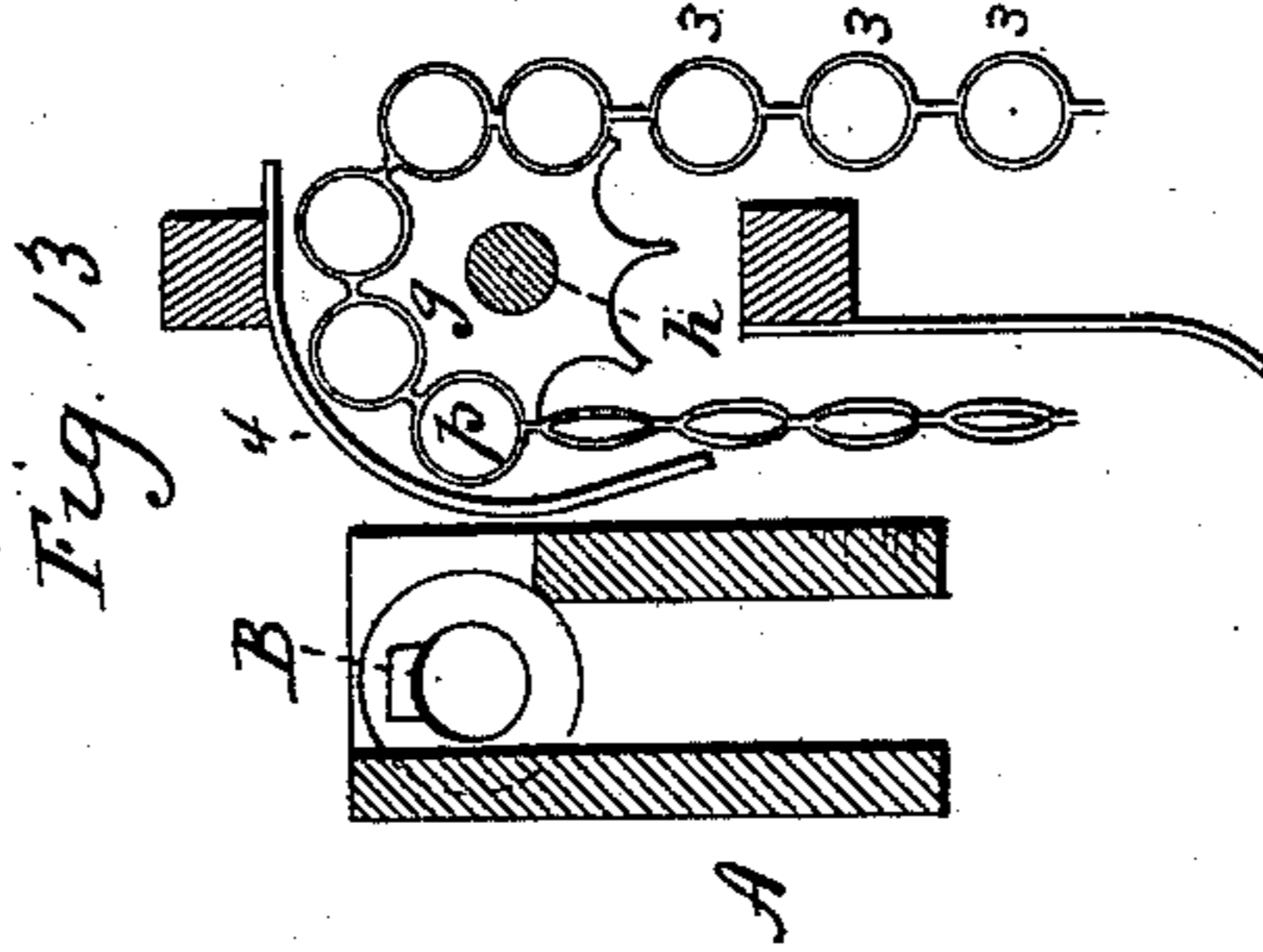
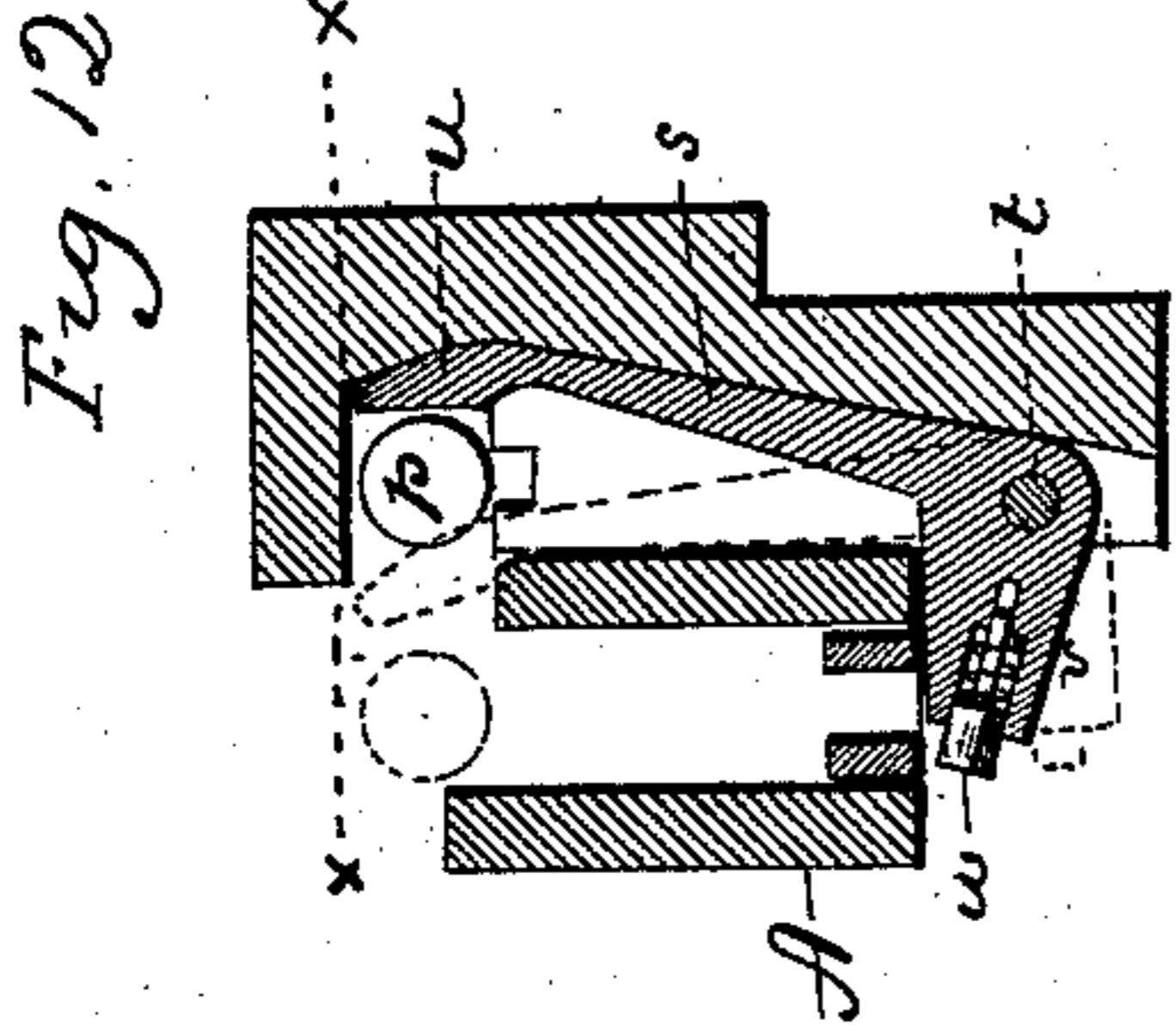
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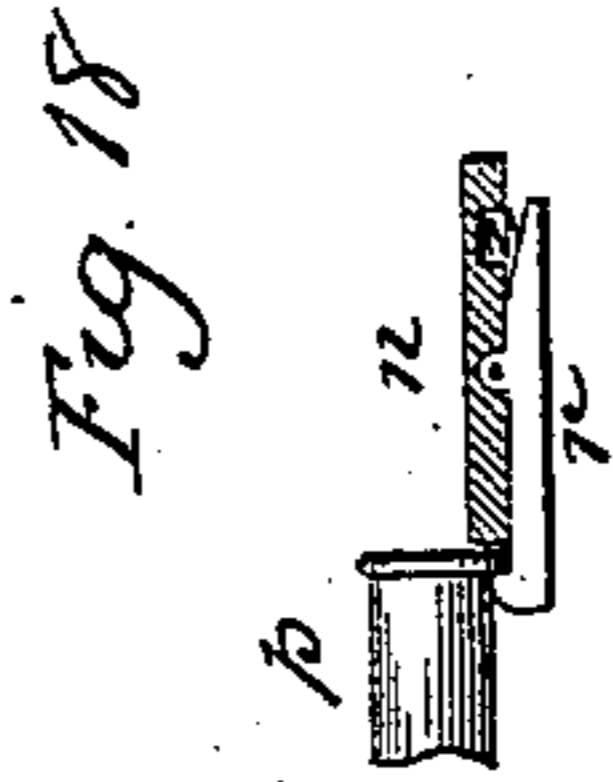
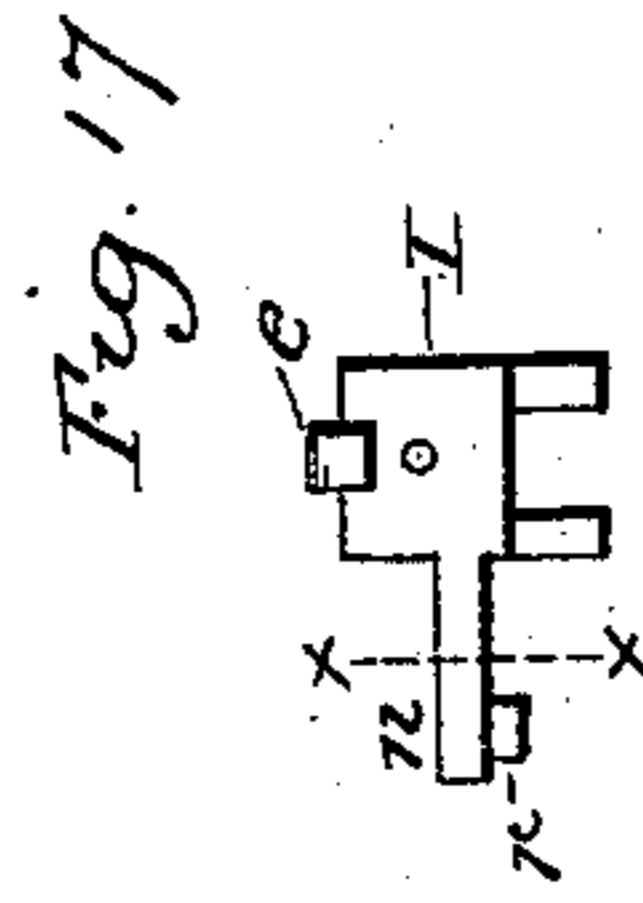
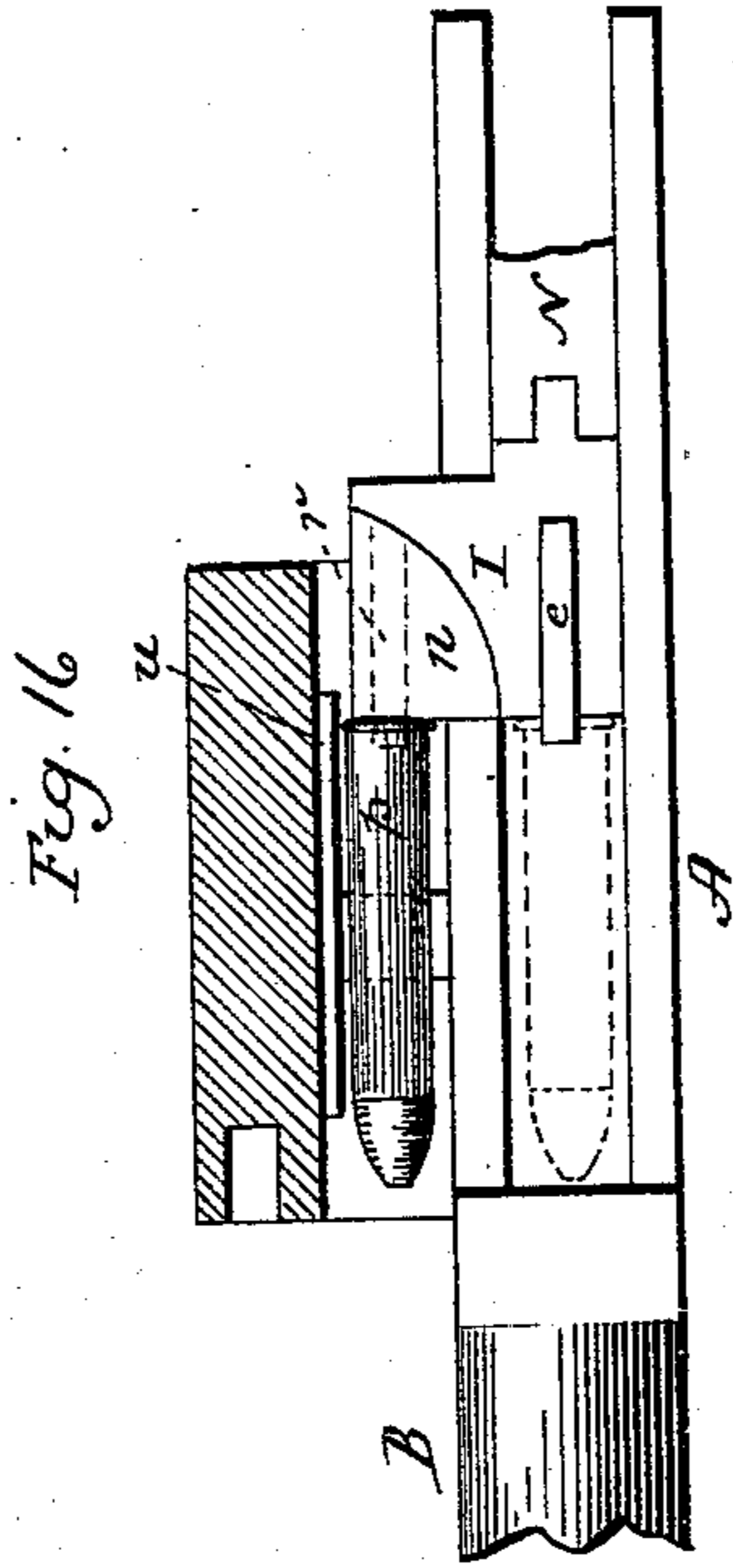
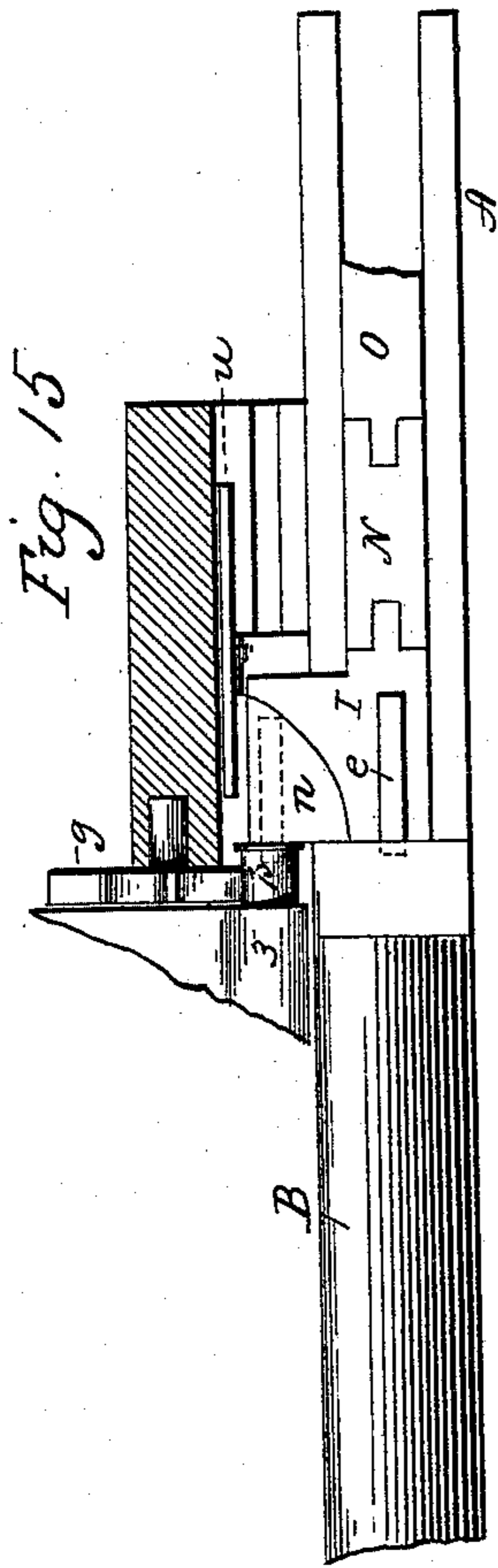
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# UNITED STATES PATENT OFFICE

JOHN M. BROWNING AND MATTHEW S. BROWNING, OF OGDEN, UTAH TERRITORY.

## MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 471,783, dated March 29, 1892.

Application filed August 3, 1891. Serial No. 401,575. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN M. BROWNING and MATTHEW S. BROWNING, of Ogden, in the county of Weber and Territory of Utah, have invented a new Improvement in Machine-Guns; and we do hereby declare the following, when taken in connection with accompanying drawings and the letters and figures of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view of the gun looking from the left; Fig. 2, a top or plan view; Fig. 3, a side view looking from the right; Fig. 4, a front end view; Fig. 5, a longitudinal central section looking from the left, showing parts in side view, all in the closed position; Fig. 6, an under side view looking upward, showing the arrangement of the reacting spring and also the mainspring of the hammer; Fig. 7, a longitudinal section of the forward portion of the gun, showing the lever E in the open position; Fig. 8, a rear portion in longitudinal section, showing the breech-piece as open and the hammer as cocked; Fig. 9, a longitudinal section illustrating the discharge of the hammer; Fig. 10, a top view of the rear portion in partial section to illustrate the means for holding the hammer in the cocked position and releasing it therefrom; Fig. 11, an inside view of the feeding mechanism for the supply of cartridges; Fig. 12, a vertical transverse section cutting on line  $x x$  of Fig. 11; Fig. 13, a vertical transverse section cutting on line  $y y$  of Fig. 11; Fig. 14, an under side view of the slide J; Fig. 15, a horizontal section cutting on line  $x x$  of Fig. 12, showing the breech-piece in the closed position and as engaged with the cartridge on the carrier; Fig. 16, the same section as Fig. 15, showing the breech-piece in the open position and as having withdrawn the cartridge from the receiver preparatory to its transfer to a position forward of the breech-piece; Fig. 17, a front end view of the breech-piece detached; Fig. 18, a longitudinal section through the projection of the breech-piece on line  $x x$  of Fig. 17.

This invention relates to an improvement in that class of machine-guns which are auto-

matically operated by means of the gas produced by explosion as it escapes from the muzzle, the invention having for its object a combination of mechanism whereby the cartridges will be successively presented, introduced into the barrel, the primer struck for explosion, the exploded shell withdrawn, a second cartridge introduced, and that in its turn exploded, such operations being automatic after the explosion of the first cartridge takes place; and the invention consists in the combination of mechanism, as hereinafter described, and particularly recited in the claims.

A represents the receiver, to the forward end of which the barrel B is attached in the usual manner for attaching barrels to the receiver of fire-arms or other guns. At the forward end of the barrel a bracket C is arranged stationary with the barrel, and to this bracket, upon a pivot D, a lever E is hung so as to swing upon the said pivot in the plane of the barrel. At its upper end the lever terminates in a cap or disk F forward of the front end of the barrel, and through this disk is an opening G, corresponding to the bore of the barrel, the inner face of this disk being exposed at the forward end of the barrel, as seen in Fig. 5, and it is preferably arranged a short distance from the end of the barrel, as seen in that figure, so as to form a chamber H between the end of the barrel and the disk, into which the gases may flow as they pass from the barrel and so as to strike the disk around the opening G, and preferably the bracket forms a sleeve around the barrel, which will close the sides of the chamber H, as seen in Fig. 5, thus forming an inclosed chamber between the disk and the end of the barrel. The opening G through the disk should be somewhat larger than the bore of the barrel, so that as the bullet escapes from the barrel it may pass freely through the opening G. The force of the gases under explosion will operate upon the disk end of the lever around the opening G and so as to impart to that lever a forward and downward swinging movement, as represented in Fig. 7, the lever to be returned after the explosion to its normal position, as seen in Fig. 5 and as hereinafter described.

At the rear end of the barrel the breech-



piece I is arranged in longitudinal guides in the receiver, so as to move backward and forward, as from the position seen in Fig. 5 to that seen in Fig. 8 and return, and in similar manner to the operation of the longitudinally-reciprocating breech-pieces in fire-arms. In the receiver below the barrel and breech-piece a longitudinal slide J is arranged, guided in the receiver so as to receive a longitudinally-reciprocating movement. The slide J is connected to the lever E by a rod K, hung by one end to a pivot L on the lever E and at the other end by a pivot M to the slide J. Consequently as the lever E is thrown forward, as from the position in Fig. 5 to that seen in Fig. 7, it will draw with it the connecting-rod K and the slide J from the position seen in Fig. 5 to that seen in Fig. 8. The breech-piece is connected to the slide J, so that as the slide J moves forward the breech-piece will move rearward. This movement is accomplished by means of a toggle-joint, one link N of which is hung to the breech-piece, the other end of the link N being hung to the other link O of the toggle, and the link O hung upon a stationary pivot P in the receiver. The link O has an arm Q projecting from its hub, which is constructed with a slot R, the said arm extending into a slot S in the slide J, a pin T being passed through the slide and through the slot R, so as to connect the arm Q with the slide S, so that when the slide moves forward from the position seen in Fig. 5 to that seen in Fig. 7 it will correspondingly turn the arm Q and accordingly double the link, as represented in Fig. 8. This operation of the link withdraws the breech-piece from its closed position, Fig. 5, to the open position seen in Fig. 8. Then as the slide is returned it will produce the reverse movement and bring the breech-piece to its closed position, the joints of the toggle coming into line between its fixed pivot P and the pivot between the toggle and the breech-piece, so that the toggle serves as a resistance to the breech-piece under explosion.

In the receiver below the rear end of the barrel and upon a pivot U the hammer V is hung, its nose being adapted to strike the primer of the cartridge. The hammer is constructed with a tail W, which, when in the closed position, extends down through a slot X in the slide J, and so that as the slide moves forward the rear end of the slot will strike the back of the tail, and, forcing it forward, will turn the hammer away from the rear end of the barrel and into the cocked position, as seen in Fig. 8, the tail of the hammer passing from the slot onto the upper side of the slide, so that the hammer will be held in the cocked position until the proper time for firing. The mainspring for the hammer, as here represented, is a spiral spring Y, arranged upon a rod Z, hung by one end to the hammer, as at *a*, the other end passing through a stationary guide *b* and so as to slide therein, the spring Y being arranged between the stationary guide

*b* and a collar *c* on the rod Z. Hence as the hammer is brought to the cocked position it will compress the spring, as seen in Fig. 8, the spring being held in the compressed condition until the hammer is again released. As arranged, the pivot between the rod and the hammer passes above the central line of the hammer-pivot as the hammer is brought to the cocked position, as seen in Fig. 8. Consequently the tendency of the spring in this position is to hold the hammer in the cocked position; but as the slide is returned the forward end *d* of the slot will strike the tail of the hammer on its forward side and operate as a cam to turn the tail downward into the slot X, as seen in Fig. 9, and when the tail is thus engaged with the slot the hammer continues its turning movement until the action of the spring is brought below the pivot, as seen in Fig. 9. Then the spring is free to throw the hammer forward to impart its blow. The slot X is of a length considerably greater than the width of the tail of the hammer, as seen in Figs. 7 and 8, and so as to allow the free movement of the hammer, which, when the hammer has been turned sufficiently to bring the spring into action, will leave the hammer free to fly forward and impart its blow, as seen in Fig. 5, thus making the operation of the hammer automatic under the reciprocating movement of the slide J.

The breech-piece is provided with the usual extracting-hook *e*, which, when the breech-piece is closed, will engage the flange of the cartridge which has been inserted into the barrel and so that upon the opening movement of the breech-piece the cartridge-shell will be withdrawn, or the cartridge, if it be not exploded.

To eject the exploded shell (or cartridge, if it be not exploded) and so as to surely make way for the next cartridge, the arm Q of the link O is constructed with a finger *f* projecting therefrom, and which as the breech-piece approaches its open position, as seen in Fig. 8, will strike the shell or cartridge, as the case may be, which is engaged with the extractor and so as to give to the shell or cartridge an upward ejecting force sufficient to throw it from the gun and make way for the next cartridge.

At one side of the receiver, here represented as the right-hand side, the mechanism for the supply of cartridges is applied. This consists of a pair of sprocket-wheels *g g*, hung upon an axle *h* and forming a carrier in a position so far forward of the rear end of the barrel as to bring cartridges which may be carried by the said sprocket-wheels or carrier into a position that the plane of the rear end of the head of the cartridge will be substantially in the plane of the rear end of the barrel, as seen in Fig. 2, the axis of the sprocket-wheels being substantially parallel with the axis of the barrel. An intermittent rotation is imparted to the sprocket-wheels *g* through the reciprocating movement of the slide J.



This is accomplished by arranging a ratchet-wheel *i* on the axis of the sprocket-wheels *g g*. (See Figs. 11 and 5 in broken lines.) Adjacent to the ratchet-wheel *i* a lever *k* is hung upon a pivot *l*, so as to swing in a plane parallel with the plane of the barrel and of the axis of the sprocket-wheels. This lever extends down, its lower end being in engagement with the slide *J* through a corresponding notch or slot in the slide (represented in broken lines, Fig. 5) and so that the forward and back movement of the slide *J* will impart a corresponding vibratory movement to the lever *k*. The lever *k* carries a spring-pawl *m*, hung to it, which is adapted to engage corresponding notches or teeth on the ratchet-wheel *i*, and so that as the lever swings forward, as from the position seen in Fig. 5 to that seen in Fig. 8, which is the opening movement of the breech-piece, the pawl will retreat without action upon its ratchet; but in the return of the slide to bring the breech-piece to its closed position the lever *k* will also be returned, and such return movement will cause the pawl *m* to engage the ratchet and impart thereto a rotation toward the barrel, the sprocket-wheels receiving the same rotation. One of the spaces or recesses in the sprocket-wheels when the sprocket-wheel is at rest lies in substantially the horizontal plane of the bore of the barrel, as seen in Fig. 13. The sprocket-wheels are adapted to receive a succession of cartridges, as will be hereinafter described, and so that in the rotation of the sprocket-wheels these cartridges will be successively presented into the position just described and, as seen in Fig. 13, presenting the foremost cartridge into a plane substantially in the plane of the bore of the barrel and with the head of that cartridge in the plane of the rear end of the barrel, as before described.

The breech-piece *I* projects through the side of the receiver toward the sprocket-wheels, as seen at *n*, Figs. 16 and 17, and in line with the cartridge *p*, which then stands in the sprocket-wheel. This projection *n* of the breech-piece is provided with a hook *r* upon its under side, like the extractor-hook *e* of the breech-piece, as seen in Figs. 17 and 18, and which as the breech-piece is brought forward to its closed position will engage the head of the cartridge then standing in line in the sprocket-wheel, as seen in Figs. 15 and 18. Then as the breech-piece is moved rearward to its open position, the hook *r* of the projection *n*, having engaged the cartridge *p* in the sprocket-wheels, will draw that cartridge from the sprocket-wheels rearward and into a position at one side of the open breech-piece, as seen in Fig. 16, but in the plane of the barrel, thus bringing the cartridge into a position to be moved into the receiver forward of the front face of the breech-piece and in line with the barrel. To transfer the cartridge thus presented at the side of the receiver into its place forward of the breech-piece, a lever *s* is hung upon a pivot *t* on that side of the

receiver and so as to vibrate in a vertical transverse plane. The lever is of T shape, the upper part or cross *u* of the T normally standing outside of the cartridge *p* as it is presented at the side of the receiver, as seen in Fig. 12. This lever at the proper time receives an inward swinging movement, as indicated in broken lines, Fig. 12, which will force the cartridge *p* from the position it occupied as it was withdrawn from the sprocket-wheels into a position forward of the front face of the breech-piece, as indicated in broken lines, Fig. 16, and so that as the breech-piece next moves forward it will force the cartridge so presented into the barrel, and on the retreat of the breech-piece the exploded cartridge-shell will be withdrawn and ejected, as before described, while a second cartridge will be drawn rearward from the sprocket-wheels ready to be introduced at the rear of the barrel in place of the exploded shell or the previous cartridge, if it be not exploded.

The vibratory movement of the lever *s* is imparted by means of the slide *J*. The lever *s* is constructed with an inwardly-projecting arm *v*, (see Fig. 12,) and in the end of this arm is a spring-stud *w*, normally standing outward, but adapted to yield so as to be forced inward. The slide *J* is constructed with a downwardly-projecting cam 2, (see Figs. 8 and 14, also seen in broken lines, Fig. 11,) which normally stands at the rear of the lever *s*, as seen in Fig. 5. The face of the cam 2 next the stud *w* is beveled or inclined inward and backward, as seen in Fig. 14, and so that as the slide moves forward this beveled surface will strike upon the stud *w* and force it inward without effect upon the lever *s*; but the back of the cam 2 is inclined rearward and upward. Hence in the return of the slide the cam will strike upon the top of the stud, as seen in Fig. 11, without tendency to force the stud inward, and the incline of the cam will consequently turn the lever *s*, as seen in Fig. 11, giving it a sudden inward movement sufficient to throw the cartridge into its place forward of the breech-piece, as before described. The operation of the cam 2 is timed so that the cartridge is transferred by the lever *s* before the breech-piece has practically commenced its forward movement and immediately after the ejection of the previously-exploded shell or cartridge, as the case may be.

The cartridges are supplied to the sprocket-wheels by any suitable device which will present the cartridges to the wheels with sufficient rapidity. As here represented, this is done by means of a strap or band having a series of pockets 3, each adapted to receive a cartridge and so that successive cartridges will form a chain adapted to be engaged by the sprocket-wheels, as represented in Fig. 3. The chain being made continuous, the supply of cartridges will be continuous. The sprocket-wheels are provided with a guard 4 to retain the cartridges in their proper position in the wheels, so that the rotation of the wheels



may successively present them into proper position for the transfer to the barrel. A spring-stop is provided for the sprocket-wheels, which will arrest them, so as to prevent over-  
 5 motion in their intermittent rotation. This stop is represented in Fig. 11 and is best made as a spring-stop 5, which will yieldingly engage the sprocket-wheel, but permit its  
 10 thereto, as described—a common expedient in pawl-and-ratchet mechanisms.

The bracket C is connected to the receiver by means of longitudinal bars 6 6, (see Figs. 1, 2, and 6,) the rod *k* working between these  
 15 bars 6. The lever E is thrown outward by the force of the gases. To automatically return the lever after it has thus been thrown outward, a suitable spring is provided, which will be compressed or extended, as the case  
 20 may be, in the opening movement of the lever and so that the reaction of the spring will force the lever to its closed position. As here represented, this spring is a spiral spring 7, arranged upon a stationary rod 8, secured  
 25 to the bracket at the front and extending loosely through an ear 9 on the slide J, one end of the spring bearing against the forward end of the slide, as seen in Figs. 5 and 6, the other  
 30 end of the spring bearing against a collar 10 on the rod 8 and so that as the slide is moved forward under the operation of the gases through the lever E, as before described, the spring will be compressed, so that its reaction may return the slide and the lever to the  
 35 closed position ready for the next explosion. As the opening movement of the lever E throws the breech-piece to the open position, cocks the hammer, and presents a new cartridge forward of the breech-piece, as before  
 40 described, the return of the lever E under the action of its spring brings the breech-piece to the closed position, forces the next cartridge into the barrel, and releases the hammer to explode that cartridge after it shall have  
 45 been properly introduced into the barrel and there supported by the breech-piece. The firing of that cartridge repeats the action of the lever E and brings the parts to the open position. Thus continuing, the cartridges are  
 50 successively exploded, and with a rapidity limited only to the action of the gases in opening the breech-piece and the action of the spring in returning the same, continuous and rapid firing being thereby made practi-  
 55 cable. As a cushion to easily arrest the opening movement of the parts under the action of the gases, a spring 11 is arranged below the lever E and so that as the lever reaches its open position it may strike the said spring  
 60 as a yielding resistance to easily arrest the opening movement of the lever.

Some means is necessary to retain the hammer at full-cock when the breech-piece is in the closed position in order to the firing of  
 65 the first cartridge, and it is also desirable that the operation of the machine may be arrested, notwithstanding cartridges are ready to be

introduced. These objects are here represented as accomplished by a single instrumentality. This consists of a lever 12, ar-  
 70 ranged upon the side of the receiver, with a headed stud 13 through it into the receiver as a support for the lever and the lever extended rearward of this stud to form a han-  
 75 dle 14. The lever is adapted to a lateral movement under the application of force to the handle, so as to turn the forward end of the lever outward, as seen in Fig. 10. The lever at its forward end is turned inward to  
 80 form a nose 15, which, when the lever is in its inward position, will stand in the path of the hammer and so that the hammer being cocked the nose of the lever will serve to hold it in  
 85 that cocked position and thus prevent firing. Between the head of the stud 13 and the lever a spring 16 is introduced, tending to yield-  
 90 ingly hold the lever in its inward position. Before the operation of the gun commences the hammer is brought to the cocked position and engaged by the lever 12. Then a cartridge  
 95 being in the barrel and the breech-piece closed, the hammer is released by pressing the handle 14 of the lever 12 inward, so as to draw the nose of the lever from before the ham-  
 100 mer. Then the hammer will fly forward and explode the cartridge. From that time the firing will continue so long as the cartridges are supplied and the lever 12 is held in that  
 105 out or disengaged position; but when the lever is released, so as to permit it to again move inward forward of the hammer, it will in the next operation catch the hammer in the cocked position, and thus interrupt the action of the gun until the hammer is again  
 110 released.

While representing the cartridges as supplied by means of a chain-like series of pockets, they may be otherwise supplied to the sprocket or feed wheels—as, for illustration,  
 115 by means of a hopper, as represented in broken lines, Fig. 13, the hopper being adapted to receive a mass of cartridges, the mouth of the hopper opening to the wheels or carrier, so that when at rest a cartridge may pass from  
 120 the hopper into the carrier.

It will be understood that the machine is to be supported upon a suitable frame or stock, it not being necessary to illustrate such support in order to the full understanding of  
 125 the invention.

What we claim, and desire to secure by Letters Patent, is—

1. The combination, with a gun-barrel attached to a receiver and opening rearward therein, of a lever arranged near the forward  
 130 end of the barrel and so as to swing in a plane parallel with the bore of the barrel, the lever at its free end forming a cap forward of the front end of the barrel, with an opening through it corresponding to the bore of the barrel, a breech-piece arranged upon longitudinal guides in the receiver at the rear of the barrel and so as to receive reciprocating movement, a toggle-joint the forward link of which



is hung to the breech-piece and the rear link hung upon a stationary pivot in the receiver, the said other link constructed with an arm having a longitudinal slot therein, a slide arranged to reciprocate longitudinally in the receiver below the breech-piece and toggle, the said slotted arm of the link hung upon a pivot in the said slide, a rod connecting the said slide with the said lever, whereby the said slide partakes of the opening movement of the said lever, and a spring opposed to such opening movement of the lever, with a hammer arranged to be brought to the cocked position in the opening movement of the breech-piece and released as the breech-piece closes, substantially as described.

2. The combination of a gun-barrel, a receiver into which the barrel opens at the rear, a lever hung near the forward end of the barrel and so as to swing in a plane parallel with the plane of the barrel, the free end of the lever forming a cap forward of the front end of the barrel, with an opening through it corresponding to the bore of the barrel, a longitudinally-reciprocating slide arranged in the receiver, a rod connecting said slide with the lever, a spring opposed to the opening movement of the said lever, a reciprocating breech-piece arranged in the receiver and connected with said slide, whereby the opening and closing movement of the said lever will impart corresponding opening and closing movement to the breech-piece, and a hammer hung in the receiver below the barrel, its nose adapted to strike the cartridge in the barrel, the hammer constructed with a tail extending through a slot provided for it in the said slide, the two ends of the said slot forming cams against the corresponding rear and front sides of the said hammer-tail, with a mainspring for the hammer, substantially as described.

3. The combination of a barrel, a receiver at the rear of the barrel into which the rear end of the barrel opens, a longitudinally-reciprocating breech-piece arranged in said receiver at the rear of the barrel, and an intermittently-rotating carrier arranged at one side of the barrel, but forward of the rear end of the barrel, said carrier being adapted to receive a succession of cartridges parallel with the barrel, the said breech-piece provided with an extractor adapted to engage a cartridge in the barrel and constructed with a projection upon the carrier side, the said projection carrying a hook or catch adapted to engage the head of a cartridge on the carrier when the breech-piece is in the closed position and whereby in the rear movement of the breech-piece a cartridge will be drawn from said carrier rearward, with mechanism substantially such as described to throw said rearwardly-drawn cartridge into a position forward of the front face of the breech-piece and in line with the barrel, and mechanism, substantially such as described, at the forward end of the barrel and in connection with the said breech-piece, substantially as specified, and whereby the ex-

plosion of the gases operating through said mechanism at the forward end of the barrel will impart reciprocating movement to the breech-piece.

4. In a gun having a barrel opening into a receiver at the rear and a longitudinally-reciprocating breech-piece in said receiver, with mechanism at the forward end of the barrel in connection with said breech-piece, whereby the gases from the explosion will cause said mechanism at the forward end of the barrel to produce the reciprocating movement of the said breech-piece, the combination therewith of an intermittently-rotating carrier arranged at one side of the barrel, the axis of the carrier being substantially parallel with the axis of the barrel, said carrier constructed with recesses in its periphery adapted to receive cartridges and successively present the same in line with the barrel, but forward of the rear end of the barrel, the breech-piece constructed with an extension upon the carrier side, the said extension provided with a hook adapted to engage the head of a cartridge presented thereto by the carrier when the breech-piece is in its closed position and so that in the rear movement of the breech-piece the cartridge so engaged will be drawn rearward from the carrier into a position in rear of but at one side of the barrel, a lever arranged to swing in a plane transverse to the axis of the barrel, the free end of the lever normally outside the cartridge so withdrawn from the carrier, and mechanism substantially such as described to impart an inward movement to said lever, whereby the said lever is transferred to a position forward of the front face of the open breech-piece and in line with the barrel, substantially as specified.

5. The combination of the barrel, a receiver at the rear of the barrel and into which the barrel opens, a lever E, hung near the forward end of the barrel and so as to swing in a plane parallel with the plane of the barrel, the free end of the lever forming a cap forward of the front end of the barrel, said cap having an opening through it corresponding to the bore of the barrel, a longitudinally-reciprocating slide J, arranged in the receiver, connected by a rod K to the lever, so as to partake of the opening movement of the said lever, a spring to return said lever and slide after the opening movement, a longitudinally-reciprocating breech-piece arranged in the receiver at the rear of the barrel and in connection with said slide, so that the opening and closing movement of the said lever will be correspondingly imparted to the breech-piece, the said slide constructed with a slot X, a hammer hung upon a stationary pivot in the receiver between the barrel and the said slide, the hammer constructed with a tail W, extending into said slot X in the slide, and a mainspring for the hammer, connected to the hammer below its pivot and so as to pass above the hammer-pivot when in the full-cocked



position, the forward end of the said slot X in the slide arranged to strike the forward side of the tail as the slide moves rearward and thereby start the hammer for its striking movement, so as to bring the active point of the spring below the central line of the pivot, substantially as and for the purpose described.

6. The combination of a barrel, a receiver into which the barrel opens at the rear, a longitudinally-reciprocating breech-piece arranged in the said receiver at the rear of the barrel, a toggle-joint, one link N of which is hung to the breech-piece, the other link O hung upon a stationary pivot in the receiver at the rear, the longitudinally-reciprocating slide J, arranged below the said stationary pivot of the links, mechanism substantially such as described at the forward end of the barrel, whereby under the influence of the explosion longitudinally-reciprocating movement is imparted to said slide, and a link O, constructed with a slotted rearwardly-extending arm into a slot in the said slide, with a pivot in said slot of the slide through the slot in the said arm, the said arm constructed with a finger *f*, projecting therefrom, substantially as and for the purpose described.

7. The combination of a receiver, a barrel attached to and opening at the rear into said receiver, a longitudinally-reciprocating breech-piece arranged in the said receiver at the rear of the barrel, a toggle-joint, one link N of which is hung to the breech-piece, the other link O hung upon a stationary pivot in the receiver at the rear, a longitudinally-reciprocating slide J, the link O in connection with said slide, whereby the reciprocating movement of the said slide J will impart swinging vibratory movement to said link and consequent reciprocating movement to said breech-piece, a hammer hung upon a stationary pivot in the receiver below the barrel, the hammer constructed with a projection therefrom extending into connection with said slide and whereby reciprocating movement of the slide will impart to the hammer the cocking and discharge movement, the hammer being provided with a mainspring, and mechanism at the forward end of the barrel in connection with said slide, substantially as described, and whereby the explosion of the

gases will produce said reciprocating movement of the said slide.

8. The combination of a receiver, a barrel opening into the receiver at the rear, a lever E, hung upon a bracket at the forward end of the barrel and so as to swing in the plane of the barrel, the bracket forming a cap forward of the front end of the barrel, with an opening through it corresponding to the bore of the barrel, a cushioned spring against which the said lever may strike in the opening movement, breech mechanism in the receiver substantially such as described, and a connection therefrom to said lever, substantially as described, and whereby the swinging movement of said lever will impart corresponding movement to the breech mechanism.

9. A gun having a barrel opening into a receiver at the rear and a longitudinally-reciprocating breech-piece in said receiver, with mechanism to impart such reciprocating movement to said breech-piece, the combination therewith of an intermittently-rotating carrier arranged at one side of the barrel, the axis of the carrier being substantially parallel with the axis of the barrel, said carrier constructed with recesses in its periphery adapted to receive cartridges and successively present them in line with but forward of the rear end of the barrel, the breech-piece constructed with an extension upon the carrier side, the said extension provided with a hook adapted to engage the head of a cartridge presented thereto when the breech-piece is in its closed position, so that in the rear movement of the breech-piece the cartridge so engaged will be drawn rearward from the carrier into a position in rear of but at one side of the barrel, with mechanism substantially such as described to throw said rearwardly-drawn cartridge into a position forward of the front face of the breech-piece and in line with the barrel, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

JOHN M. BROWNING.

MATTHEW S. BROWNING.

Witnesses:

W. G. WRIGHT,

J. H. EMMETT.