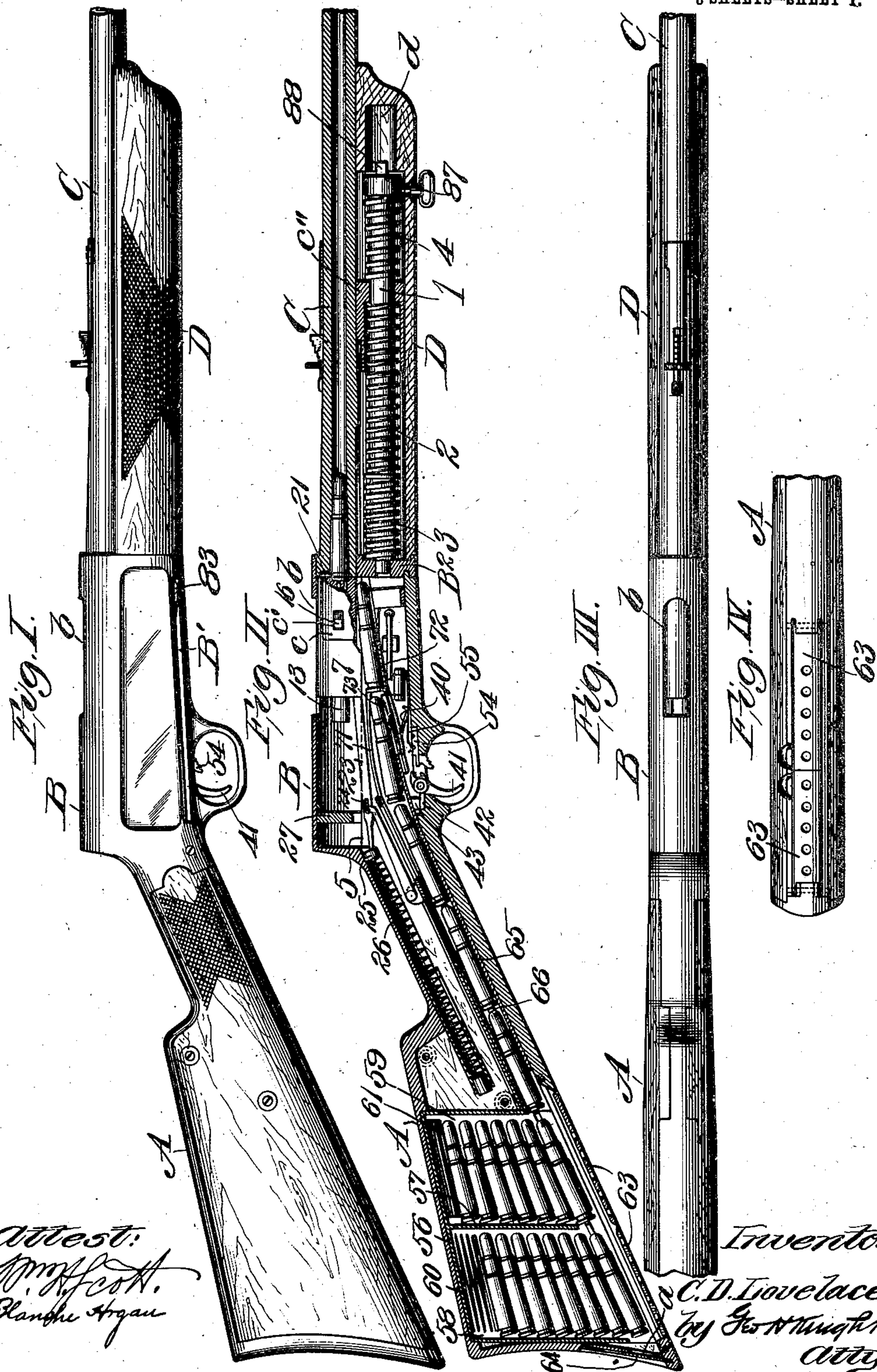


C. D. LOVELACE.  
AUTOMATIC GUN.  
APPLICATION FILED MAR. 2, 1908.

922,173.

Patented May 18, 1909.

8 SHEETS—SHEET 1.

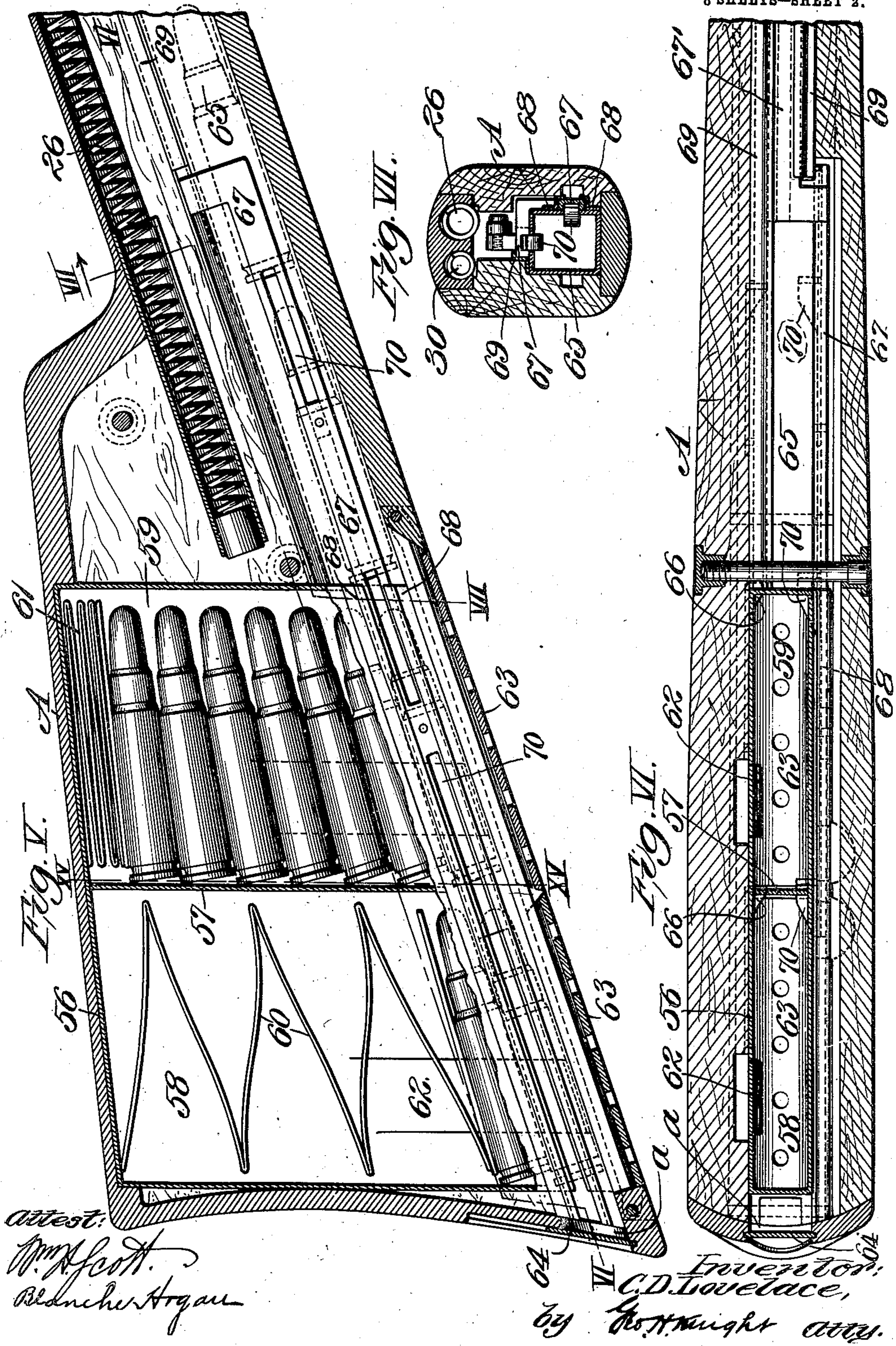


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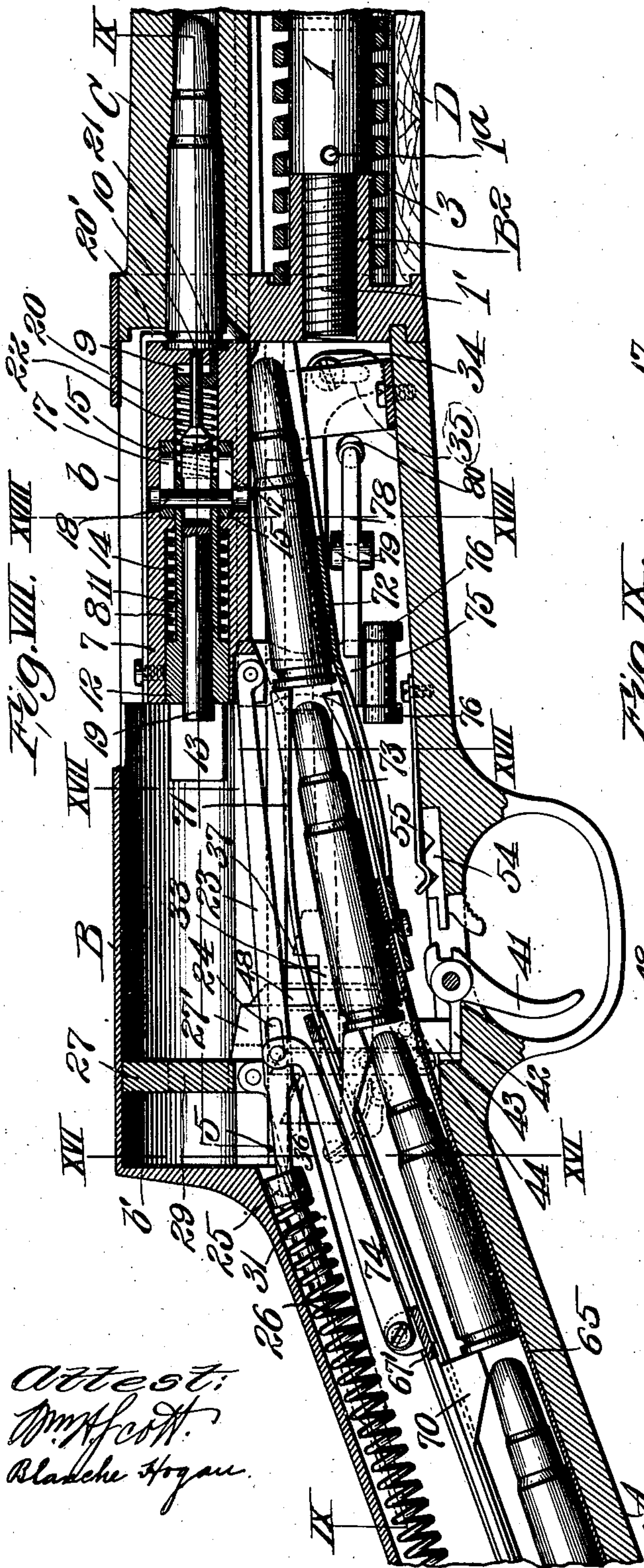
AUTOMATIC GUN.

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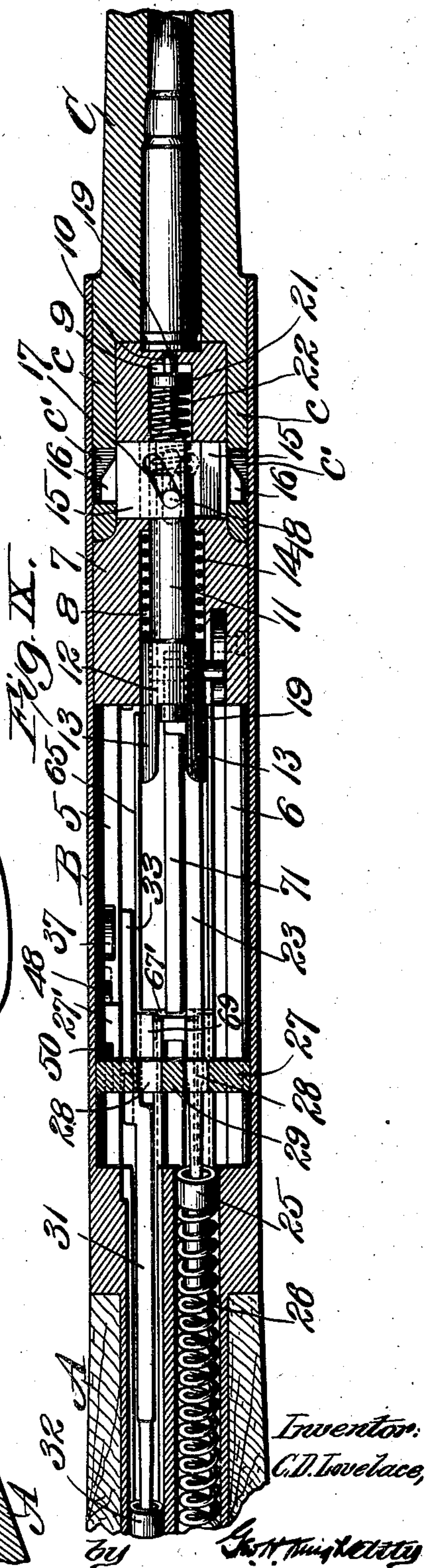
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8 SHEETS—SHEET 3.

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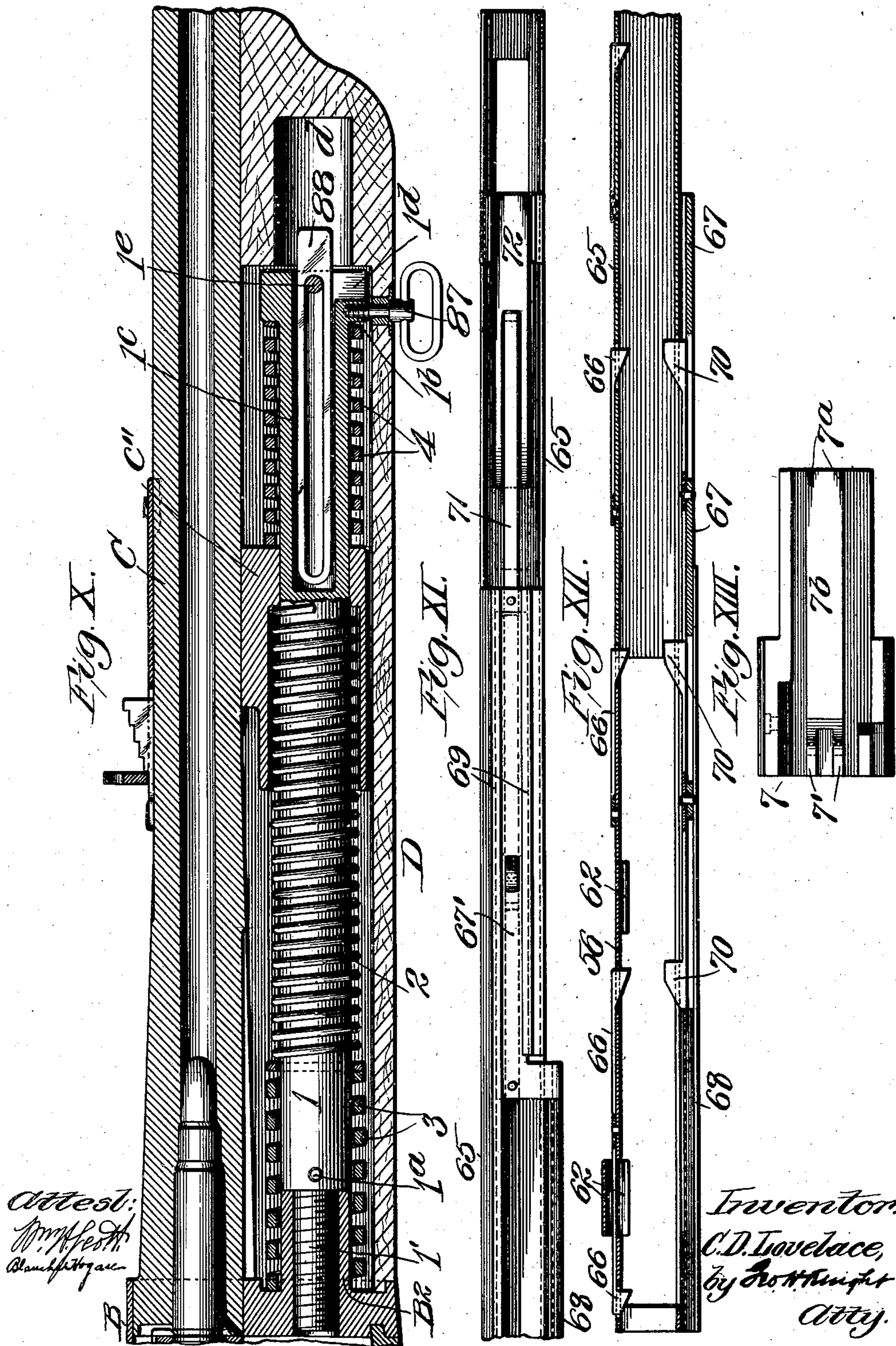


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Patented May 18, 1909.

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APPLICATION FILED MAR. 2, 1908.

Patented May 18, 1909.

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Fig. XIV.

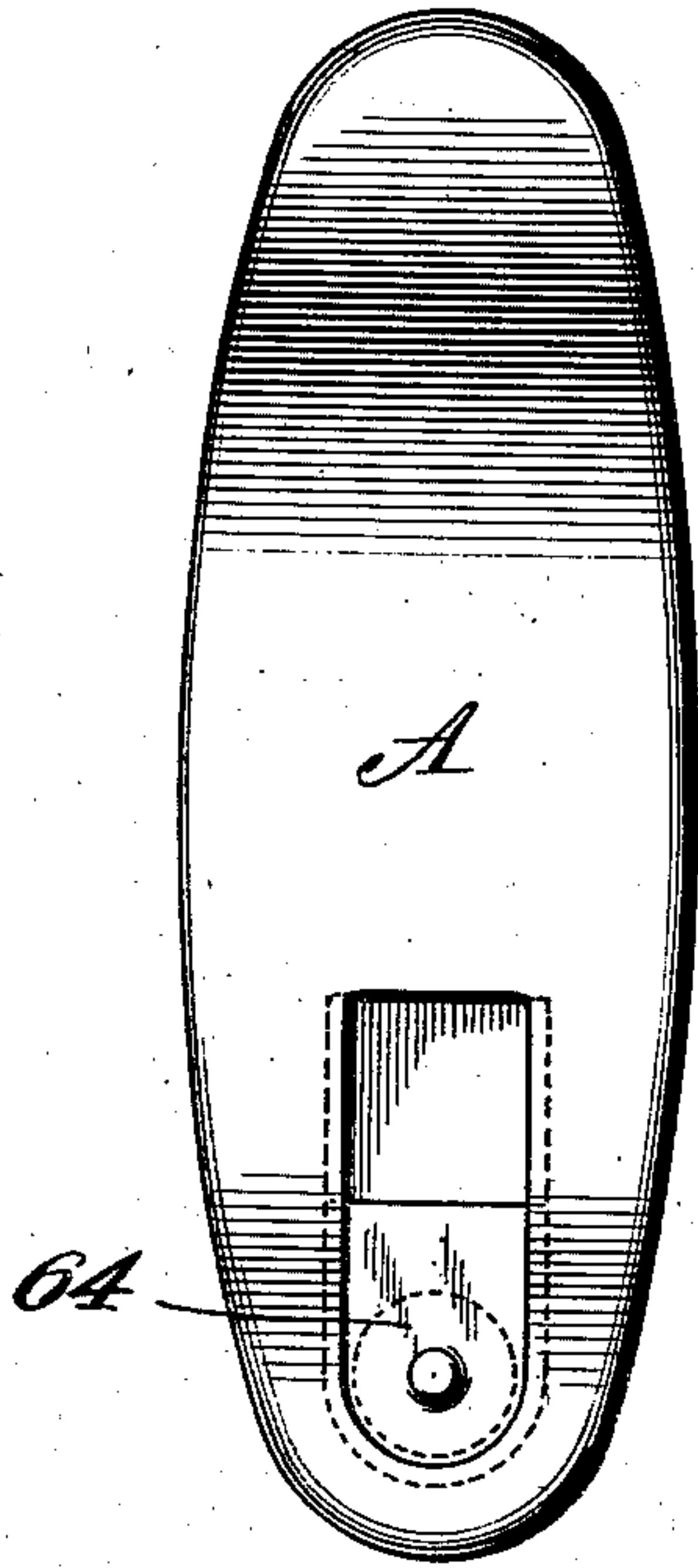


Fig. XV.

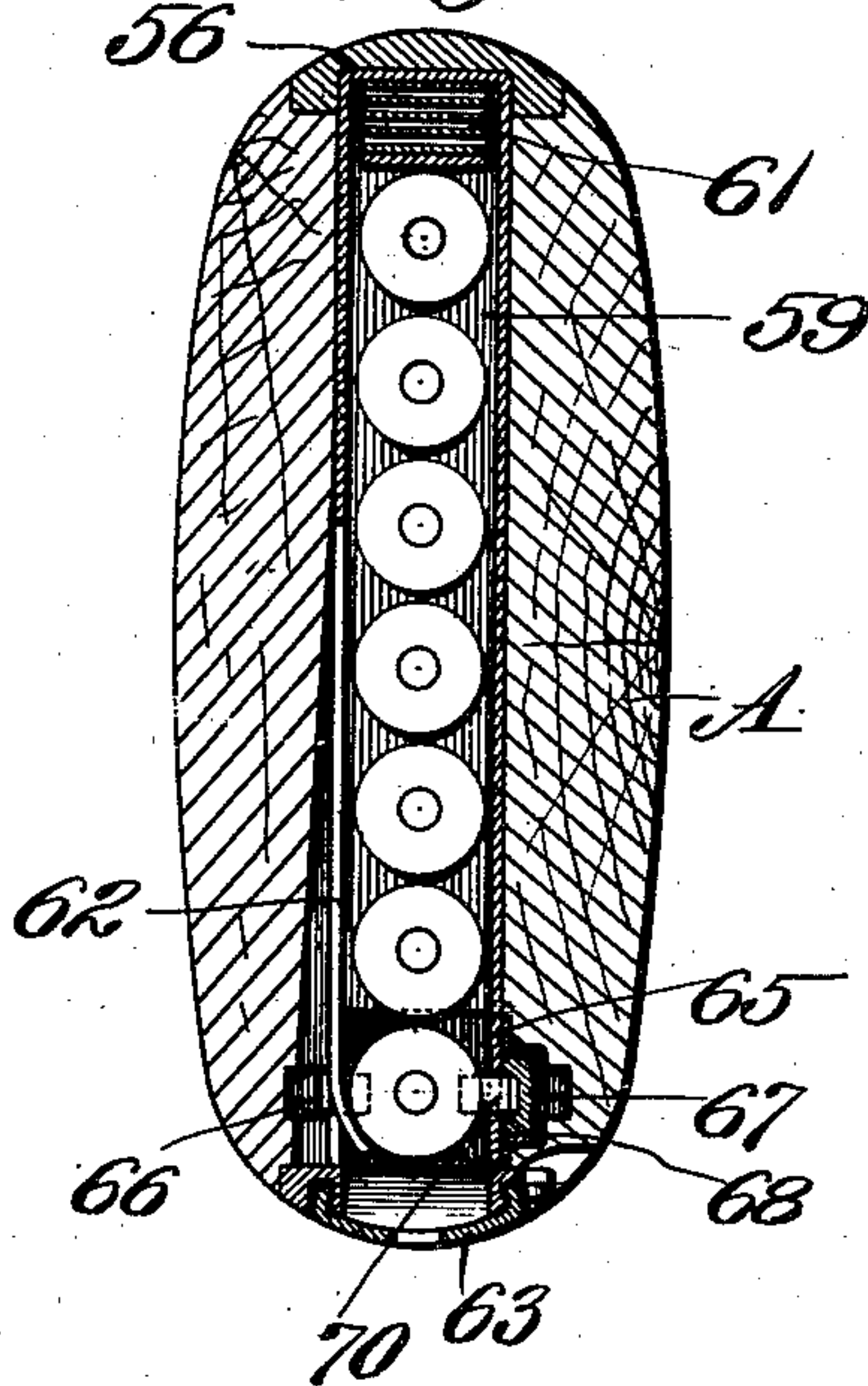


Fig. XVI.

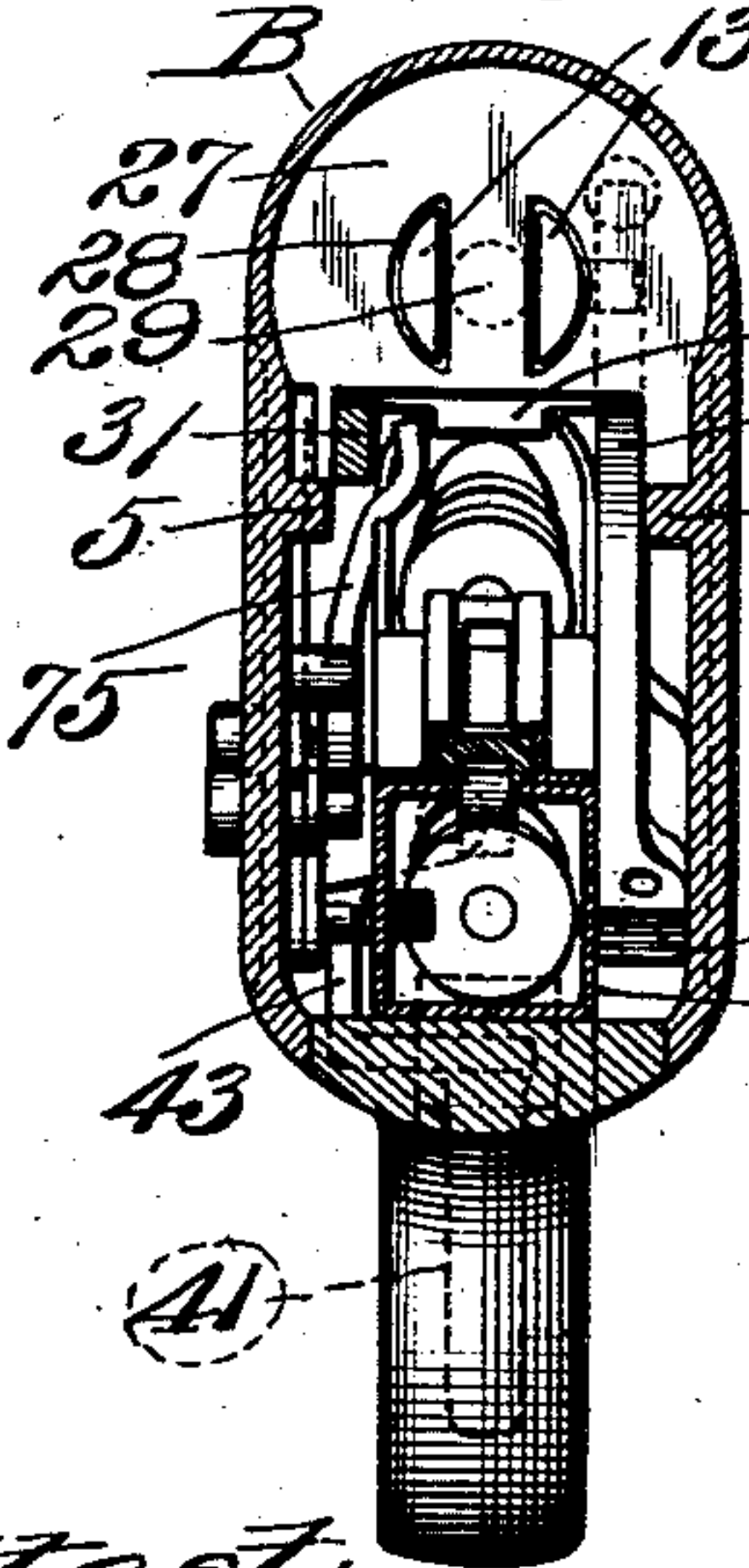


Fig. XVII.

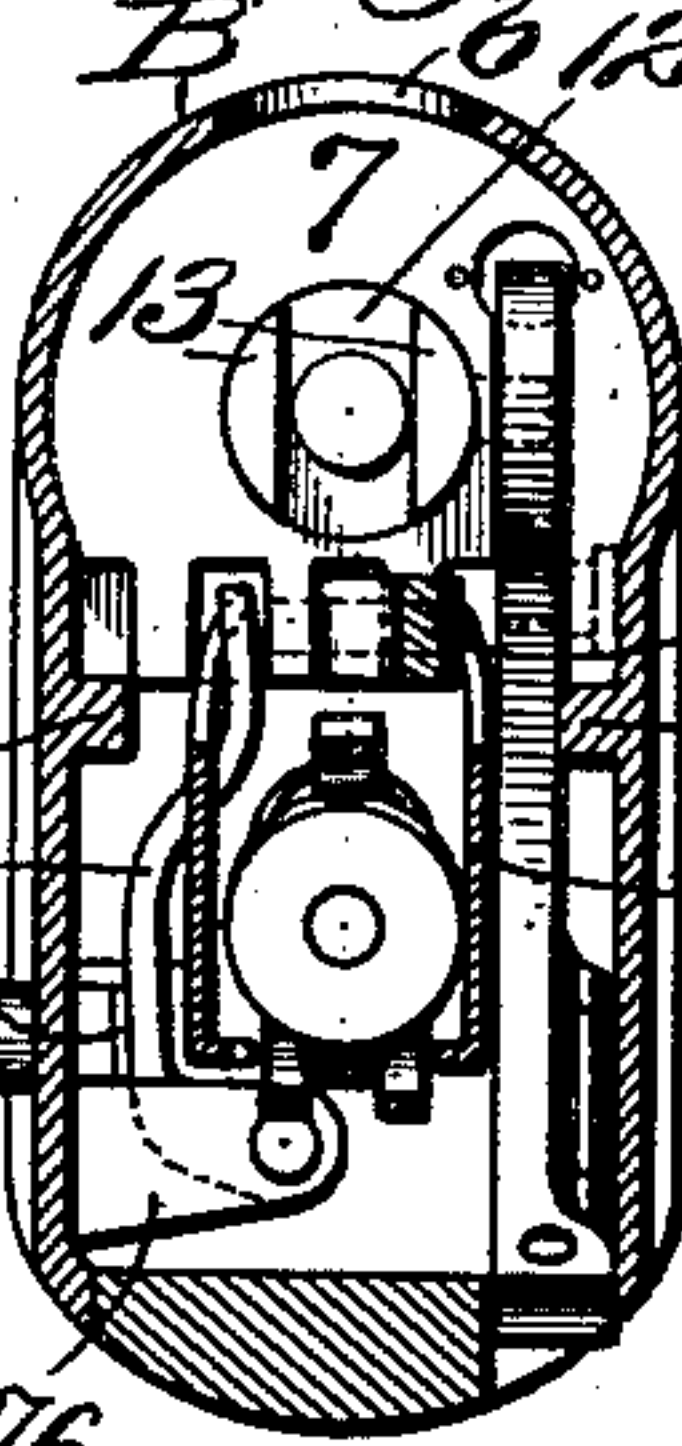


Fig. XVIII.

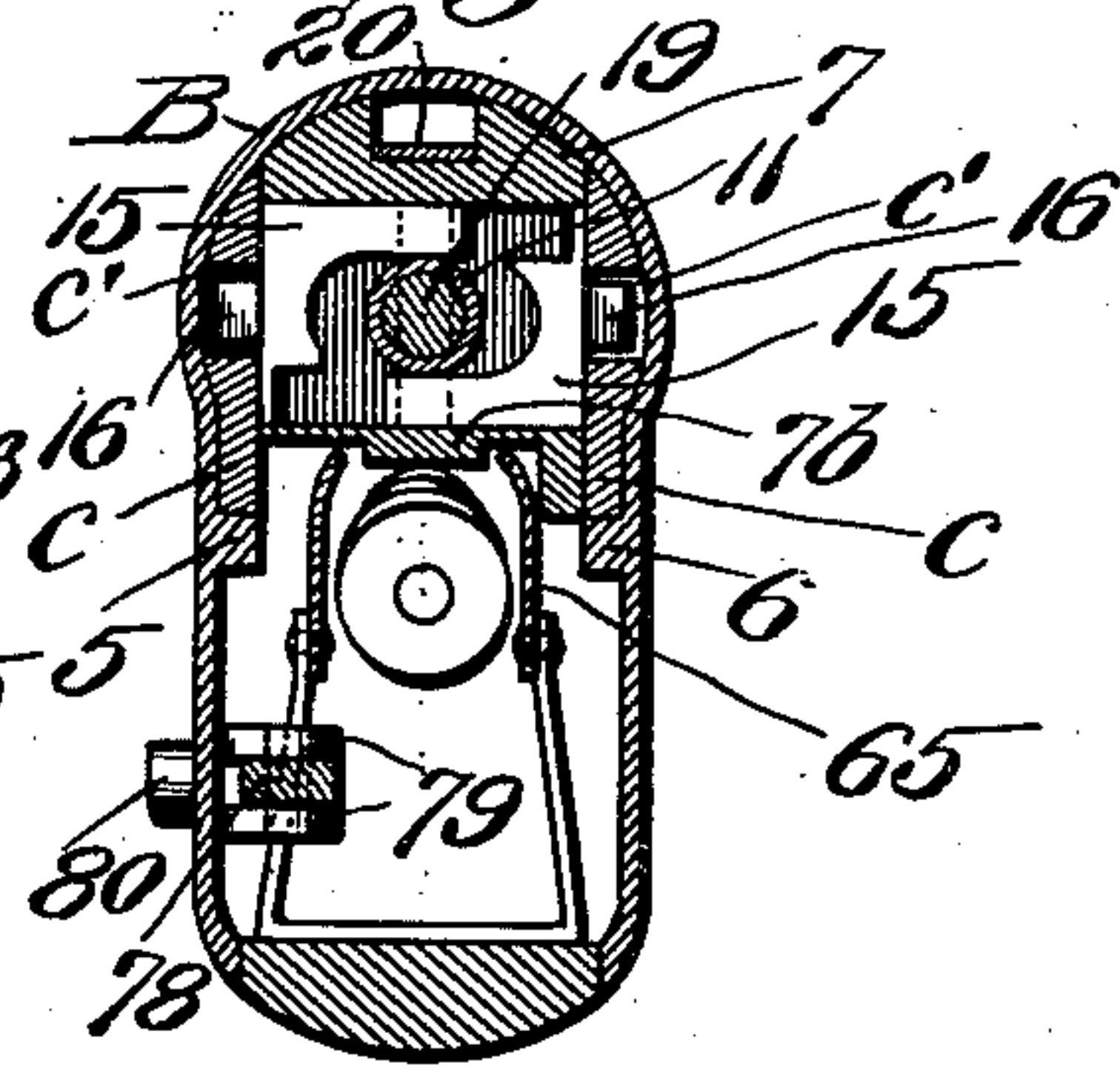
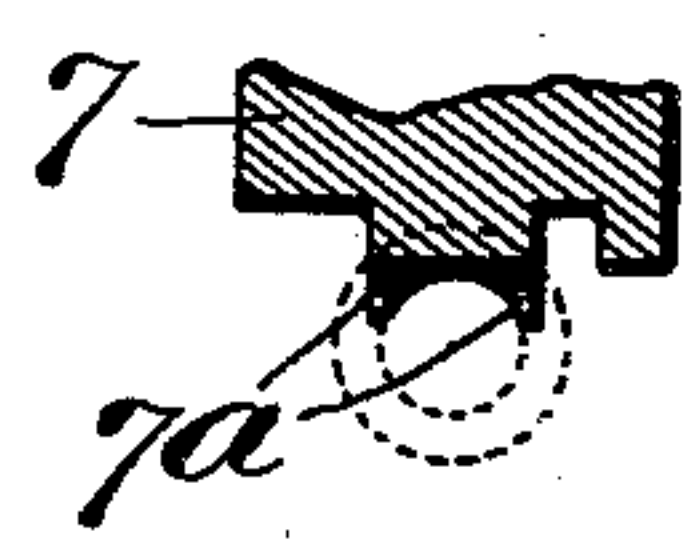


Fig. XIX.



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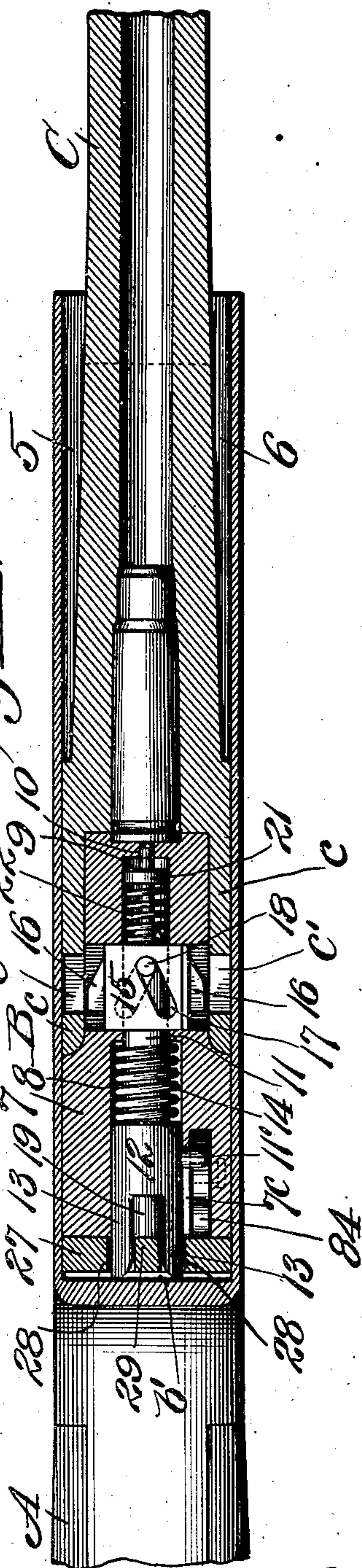
**AUTOMATIC GUN.**

APPLICATION FILED MAR. 2, 1908.

Patented May 18, 1909.

8 SHEETS—SHEET 8.

**922,173.**



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AUTOMATIC GUN.

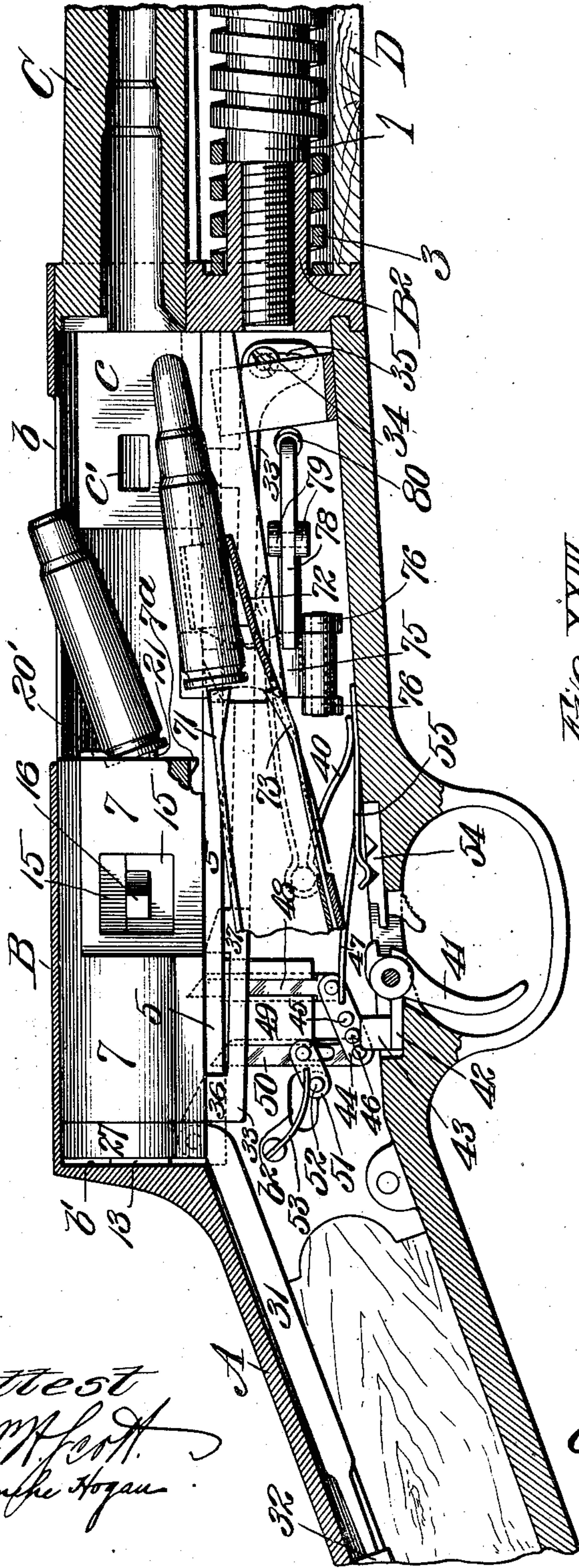
APPLICATION FILED MAR. 2, 1908.

Patented May 18, 1909.

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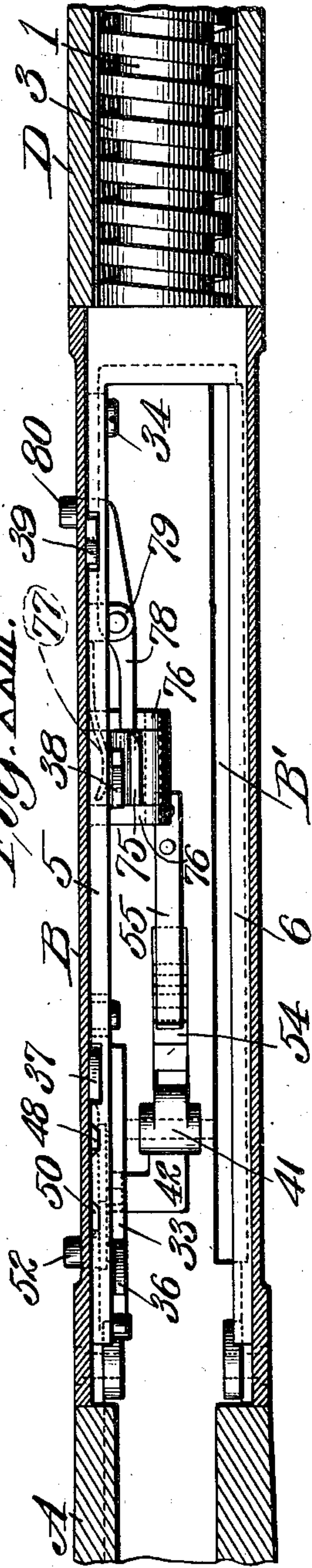
922,173.

Fig. XXII.



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Fig. XXIII.



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Fig. XXIV.

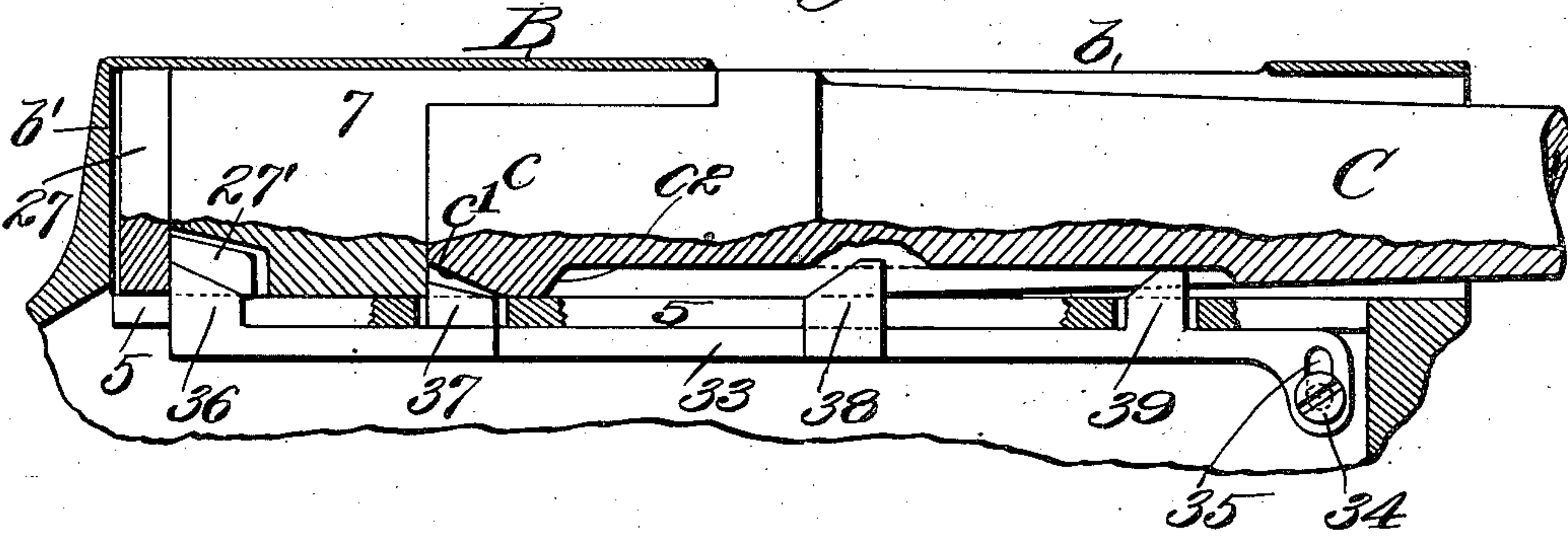


Fig. XXV.

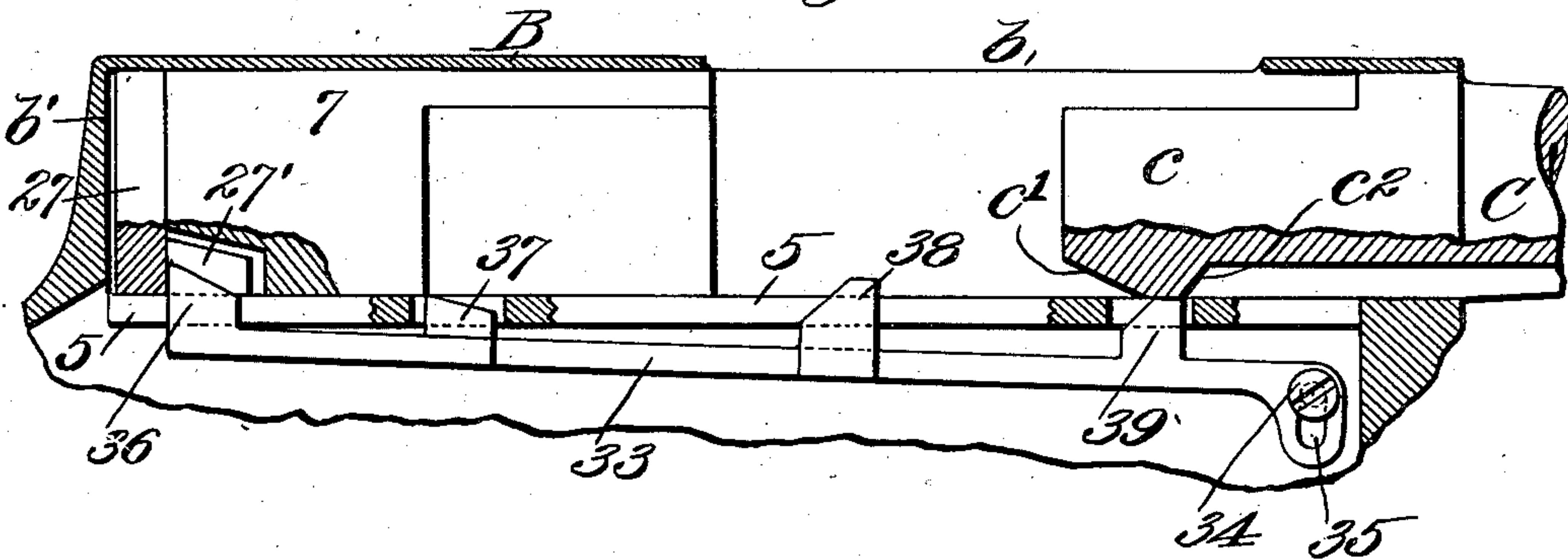


Fig. XXVI.

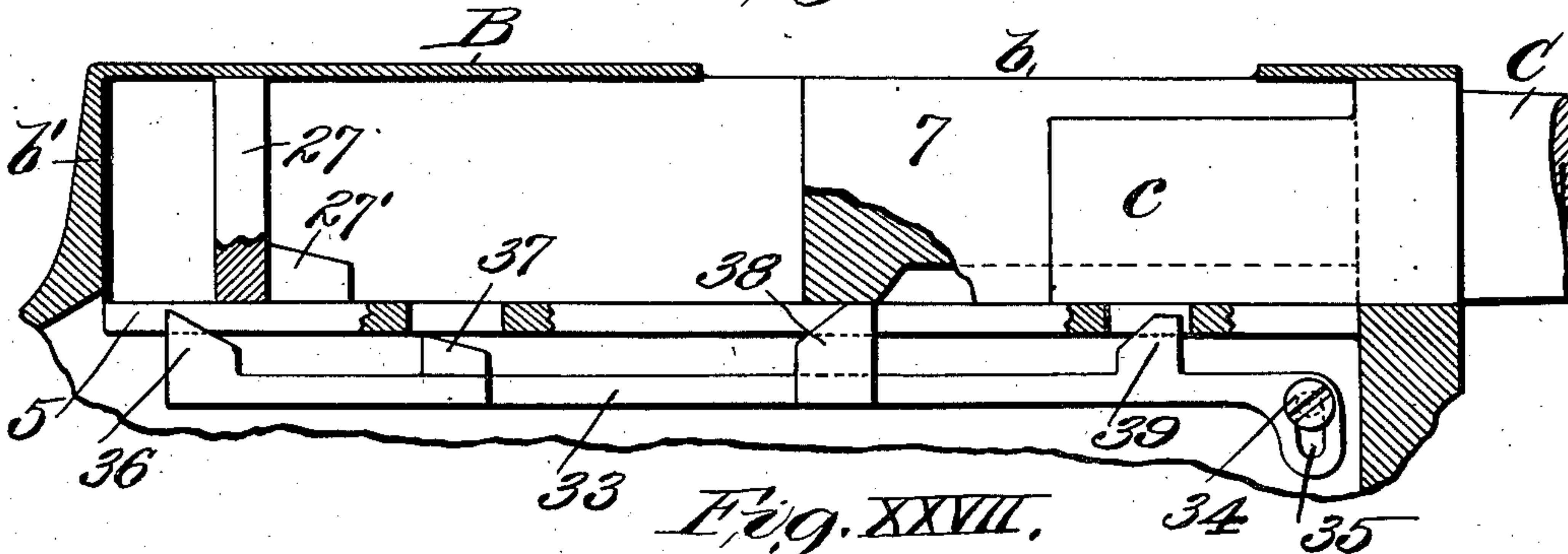
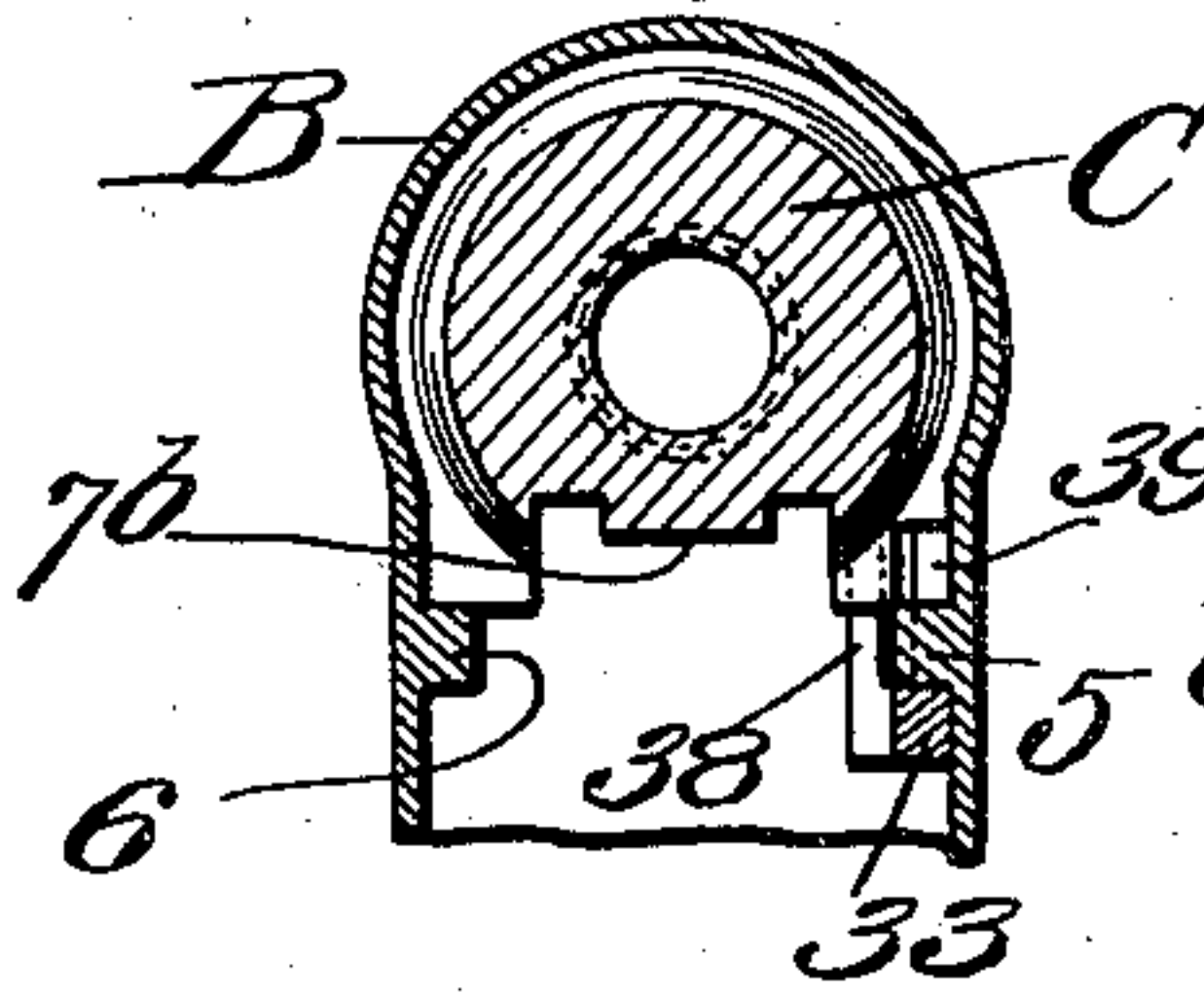


Fig. XXVII.



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# UNITED STATES PATENT OFFICE.

CHARLES D. LOVELACE, OF FORT WORTH, TEXAS.

## AUTOMATIC GUN.

No. 922,173.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed March 2, 1908. Serial No. 418,713.

*To all whom it may concern:*

Be it known that I, CHARLES D. LOVELACE, a citizen of the United States of America, residing in Fort Worth, in the county of Tarrant and State of Texas, have invented certain new and useful Improvements in Automatic Guns, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that character of automatic guns in which the force of the recoil of the gun barrels is utilized as a medium for feeding the cartridges to the barrels and for the actuation of the mechanism by which the empty cartridge shells are ejected from the guns subsequent to each firing action and previous to the delivery of the next cartridge to the gun barrel.

Figure I is a side elevation of my gun. Fig. II is a longitudinal vertical section taken centrally through the gun. Fig. III is a top or plan view of the gun. Fig. IV is an inverted plan view of the rear portion of the butt stock. Fig. V is an enlarged longitudinal vertical section taken centrally through the butt stock and cartridge magazine. Fig. VI is a longitudinal horizontal section taken on irregular line VI—VI, Fig. V. Fig. VII is a cross section taken on irregular line VII—VII, Fig. V. Fig. VIII is an enlarged vertical section taken centrally through the receiver of the gun and the parts immediately back of and in front of said receiver, the mechanism of the gun being illustrated as it appears when the gun is ready to be fired. Fig. IX is a longitudinal horizontal section taken on line IX—IX, Fig. VIII. Fig. X is an enlarged longitudinal vertical section through the rear portion of the gun barrel, the fore-stock and the mechanism by which the barrel is moved forwardly after recoil has taken place. Fig. XI is an enlarged top or plan view of the forward portions of the cartridge runway and carrier. Fig. XII is an enlarged longitudinal horizontal section through rear portions of the cartridge runway and carrier. Fig. XIII is an enlarged inverted plan view of the breech block. Fig. XIV is an enlarged elevation of the heel of the butt stock. Fig. XV is a cross section taken on line XV—XV, Fig. V through the butt of the gun and cartridge magazine. Fig. XVI is a cross section taken on line XVI—XVI, Fig. VIII. Fig. XVII is a cross section

taken on line XVII—XVII, Fig. VIII. Fig. XVIII is a cross section taken on line XVIII—XVIII, Fig. VIII. Fig. XIX is a vertical cross section through the lower portion of the breech block and looking forwardly from the line upon which said section is taken. Fig. XX is an enlarged side elevation of the gun with portions broken away and illustrating the gun barrel, the breech block and the hammer in the positions assumed at the moment that the barrel has recoiled and become separated from the breech block to again move to its forward position. Fig. XXI is a horizontal longitudinal section taken on line XXI—XXI, Fig. XX. Fig. XXII is a longitudinal vertical section taken through the receiver and the parts adjoining it with the gun barrel shown in forward position, the breech block and hammer in the rear positions assumed when an empty cartridge shell is being ejected and a fresh cartridge is being carried toward the barrel previous to the advance of the breech block. Fig. XXIII is a longitudinal horizontal section taken through the receiver above the guides on which the breech block and hammer travel. Figs. XXIV, XXV, and XXVI are diagrammatical views illustrating the positions assumed by the gun barrel, the breech block and the hammer when the barrel has recoiled; when the barrel has moved forwardly and the breech block and hammer are restrained in their rear positions; and when the breech block has advanced to the barrel and the hammer has partially advanced previous to its full release for complete advance to the breech block. Fig. XXVII is a cross section taken on line XXVII—XXVII, Fig. XX.

In the accompanying drawings: A designates the butt stock of my gun, B the receiver which is provided at its top with an opening *b* through which the shells of the spent cartridges are ejected.

C is the gun barrel slidably fitted in the forward end of the receiver and provided at its breech end with side extensions *c* that contain pockets *c'* (see Figs. IX, XVIII and XX to XXII inclusive). The barrel C is provided at its lower side with a lug *c''*, see Figs. II and X.

D is the fore-stock located beneath the gun barrel and in which the lug *c''* is operable.

The barrel C of my gun is adapted to recoil partially into the receiver B when the gun is fired, due to the expansion that takes



place within the gun barrel incident to the explosion of a charge of ammunition. To provide for the recovery of the barrel after it has recoiled I locate within the fore-stock

5 D the following parts: 1 is a rod that is fitted to the forward end of the receiver B beneath the barrel and to which the lug  $c''$  of the barrel is loosely fitted. 2 is a main recovery spring surrounding the rod 1 and bearing at its forward end against the lug  $c''$ . This spring is backed by a buffer or auxiliary spring 3 of greater strength than the spring 2. These springs serve to carry

10 the barrel to its forward position subsequent to each recoil of the barrel. 4 is a cushion spring interposed between the forward end of the lug  $c''$  and the enlarged forward end of the rod 1 and which serves to prevent shock when the barrel moves forwardly.

20 The spring 4 is made interchangeable with and weaker than the spring 3 so that in guns with varying charges of ammunition (as shot guns) the spring 4 may take the place of the spring 3 and still allow lighter charges to be used than which it takes to operate the spring 3.

Referring now to the receiver B, 5 and 6 designate guides at the interior of the receiver, and at its sides, upon which the barrel extension arms, breech block and hammer of the gun ride.

7 is the breech block adapted to travel on the guides 5 and 6. The forward portion of the breech block is of less diameter than the diameter of its rear portion, and which is adapted to enter into a position between the side extension arms  $c$  of the gun barrel, as seen most clearly in Figs. IX and XXI. The breech block is provided with a rear chamber 8 and a forward chamber 9, and a front firing pin hole 10.

11 is a plunger loosely seated in the rear chamber 8 and provided with a head 12 that carries rearwardly extending arms 13 between which is a space adapted to receive a member to be hereinafter mentioned.

14 is a return spring located in the rear chamber 8 in front of the head of the plunger 11 and by which said plunger is moved rearwardly after it has been moved in a forward direction.

15 are locking keys loosely mounted in the breech block and extending above and beneath the forward end of the plunger 11, as seen in Figs. VIII, IX and XVIII. These locking keys are provided at their outer edges with lugs or studs 16 which are adapted to enter the pockets  $c'$  in the barrel extension arms  $c$  for the purpose of locking the breech block to the barrel C and the keys contain inclined slots 17 extending laterally therein and in which is fitted a shift pin 18 that is carried by the plunger 11. The slot 17 in one of the locking keys extends to-

65 ward one side of the gun while the slot in

the other plate extends toward the opposite side of the gun, and consequently the shift pin 18 acts to move one of the keys to and from one of the barrel extension arms and the other key to and from the other of said extension arms. In so far, at this point, as the action of the locking keys 15 is concerned, it is sufficient to note that when the lugs 16 of these keys are in position in the pockets of the barrel extension arms to lock the breech block to the barrel and the breech block is to be released from the barrel, the following operation takes place. Upon a forward movement of the plunger 11 the shift pin 18, by riding in the inclined slots in the locking keys in a forward direction causes each key to be moved inwardly in the breech block so that it will be withdrawn from the barrel extension arm previously engaged by it, thus freeing the breech block and barrel from each other for separation. Then, when the plunger 11 is relieved to be returned to its normal position by the spring 14 after the breech block has become separated from the barrel, the shift pin 18 acts to return the locking keys to their former positions in order that they may again move into locking engagement with the barrel extension arms when the barrel and breech block are again assembled.

19 designates a firing pin that extends longitudinally through the breech block 7, being in part mounted in the plunger 11 through which it extends and in part seated in the firing pin aperture 10 at the forward end of the breech block. The firing pin is slotted, as seen in Figs. VIII and IX, to provide for the passage therethrough of the shift pin 18 by which the locking keys 15 are actuated.

20 is an extractor arm carried by the breech block and having a hook finger 20' at its forward end which extends downwardly at the forward end of the breech block and is adapted to engage the rim flanges of cartridge shells for the purpose of withdrawing the shells of spent cartridges from the gun barrel.

21 is an ejector slide loosely positioned in the forward chamber 9 of the breech block and extending through the forward end of the breech block beneath the firing pin aperture 10. The front end of this ejector slide is adapted to bear against the cartridge shells near the bottoms of their rims when they are held to the breech block by the extractor arm 20. The ejector slide is backed by a pressure spring 22 which rests at its rear end against the forward end of the plunger 11 and which acts when the spent cartridge shell is withdrawn from the gun barrel and the breech block is separated from the gun barrel to throw the ejector slide forwardly and cause it to flip the shell upwardly and discharge it through the opening  $b$  in the



receiver B. This action occurs when the plunger 11 is in a forward position and consequently when the spring 22 is rendered more powerful than normally, due to its being held in a partially compressed condition by said plunger.

The breech block 7 is carried rearwardly with the barrel C each time that a recoil movement of said barrel occurs and the forward movement of the breech block is thereafter occasioned by the following means. 23 is a push rod (see Figs. II, VIII, IX and XVII) which is pivotally connected at its forward end to lugs 7' (see Fig. XIII) at the bottom of the breech block. This push rod is provided intermediate of its ends with a slot 24 and its rear end is fitted to a seat member 25 located at the forward end of a propeller spring 26 in the butt stock A. Each time that the breech block moves rearwardly the propeller spring 26 is placed under tension by the direction of force from the push rod 23 and when the breech block is to again move forwardly said push spring serves to impart the desired movement to the breech block.

27 designates the hammer of the gun (see Figs. II, VIII, IX, XVI and XX to XXII inclusive). This hammer is located within the receiver B and is adapted to travel to and fro longitudinally of the receiver upon the guides 5 and 6. The hammer has a forwardly projecting arm 27'. The hammer (see Figs. IX, XVI and XXI) is provided with apertures 28 through which the side arms of the plunger 11 in the breech block are adapted to pass and intermediate of these apertures is a striker member 29 that is adapted to strike the rear end of the firing pin 19 in the act of firing the gun. The apertures 28 in the hammer provide for the passage of the side arms 13 of the plunger 11 in the breech block through the hammer for impact against the rear wall 6' of the receiver B. It is well to here mention that when the gun barrel recoils, and the breech block and hammer recede with said barrel after the gun is fired, the barrel is unlocked from the breech block to return to its normal forward position while the breech block is temporarily restrained in a rear position. The unlocking of the barrel from the breech block is occasioned by the arms 13 of the plunger 11 striking against the rear wall 6' of the receiver, thus causing the plunger to move forwardly in the breech block, and actuate the locking keys 15 with the result of withdrawing them from the extensions *c* of the barrel. In the act of firing the gun the hammer is propelled forwardly by a propelling spring 30 located in the stock A and a pusher rod 31 that is pivotally connected to the hammer and rests at its rear end in a seat member 32 fitted to the forward end of said spring (see Figs. IX and XXII).

Referring next to the means whereby the breech block and hammer are automatically controlled through the medium of the gun barrel, 33 designates a controlling bar (see Figs. VIII, and XXIV to XXVI inclusive), and which is located beneath the guide 5 in the receiver B upon which the side extensions *c* of the gun barrel, the breech block and the hammer ride. This controlling bar is pivotally connected at its forward end to the adjacent side wall of the receiver by a screw or pin 34 that passes through a vertical slot 35 in the bar, thereby providing not only for vertical swinging movement of the controlling bar but also for direct vertical movement of the forward end of the bar. At the rear end of the controlling bar is a vertical hammer receiving catch arm 36 located alongside of the guide 5 and the upper edge of which is inclined downwardly and forwardly. At a point forward from the hammer receiving arm 36 is a vertical breech block receiving catch arm 37 which extends through an opening in the guide 5 and the upper edge of which is inclined downwardly and forwardly.

38 is a rear trip arm extending upwardly from the controlling bar at a point in front of the breech block catch arm 37 and occupies a position alongside of the guide 5. The upper edge of the trip arm 38 is inclined upwardly and forwardly.

39 is a forward trip arm carried by the controlling bar and extending through an opening in the guide 5 in alinement with the opening through which the breech block catch arm 37 extends. The upper edge of the forward trip arm 39 is inclined upwardly and forwardly similarly to the upper edge of the rear trip arm 38.

The controlling bar 33 is yieldingly supported for the service it is to perform by a spring 40 within the receiver B and which is most clearly seen in Fig. XXII.

The side extension *c* of the gun barrel which rides upon the guide 5 when the breech end of the barrel rides to and fro in the receiver B is provided at its lower edge with a rear beveled face *c*<sup>1</sup> and a forward beveled face *c*<sup>2</sup>, as seen most clearly in Figs. XXIV and XXV, and which inclines are adapted to cooperate with the forward trip arm 39 of the controlling bar 33 during the movements of the gun barrel.

To illustrate the action of the controlling bar 33 and its function it will be assumed that the parts of the gun are in condition for firing and that a cartridge is in position in the gun barrel, which position is shown in Figs. VIII and IX and XXVI. At this time the gun barrel and breech block are in their forward positions and the hammer is restrained in a rearward position by means to be hereinafter explained. The controlling bar is at this time restrained



in a lower position against the action of the lift spring 40, due to the breech block bearing against the upper end of the rear trip arm 38, as illustrated in Fig. XXVI, and consequently there is no interference offered by the controlling bar to the rearward movement of the said breech block. Upon the gun being fired and recoil of the barrel C taking place, the rear portion of said barrel, the breech block and the hammer (it being understood that the hammer has been released and moved forwardly in the act of firing the gun) move rearwardly into the positions in which the parts appear in Figs. XX, XXI and XXIV, and the controlling bar 33 is elevated by the spring 40 so that it lies in a horizontal position immediately beneath the guide 5. While the controlling bar is in the position just mentioned the catch arm 36 is present in front of the hammer 27 and acts to restrain the hammer from forward movement. The catch arm 37 is in front of the breech block and acts to restrain it from forward movement. The gun barrel having been freed from the breech block by the disengagement of the locking keys 15 from the side extensions of the barrel, is then moved forwardly to a recovered position under the influence of the recovery spring 2, and as it moves in this direction the lower inclined forward face  $c^2$  of the side extension  $c$  above the guide 5 strikes the forward trip arm 39 after passing the rear trip arm 38 which moves entirely through the side extension of the barrel. In striking the forward trip arm 39 the side barrel extension acts to depress the forward end of the controlling bar from the position seen in Fig. XXIV to the position seen in Fig. XXV with the result of causing the catch arm 37 in front of the breech block to be lowered from the position in which it acts to restrain the breech block. The breech block is then forced forwardly to the barrel under the influence of its actuating spring 26 to become again locked to the side extensions of said barrel. It should be here stated that the shell of the spent cartridge is withdrawn by the breech block from the barrel when the barrel moves forwardly and the breech block is temporarily restrained from movement and is ejected from the receiver of the gun in the manner previously explained. During the forward movement of the breech block it strikes against the rear trip arm 38, and by so doing acts to cause the controlling bar to be lowered from the position seen in Fig. XXV to the position seen in Fig. XXVI, with the result of withdrawing the rear catch arm 36 from restraining position in front of the hammer 27. The hammer is therefore freed to move forwardly into the position seen in Figs. VIII, IX and XXVI, to be tempo-

rarily held at that position by trigger controlled means to be next described.

41 designates the finger trigger pivotally mounted in the bottom of the receiver B and provided with a rearwardly extending arm 42 having a vertical stem 43, see Figs. VIII, and XVI.

44 is a rocker lever that is pivoted intermediate of its ends at 45 to the side wall of the receiver B that is occupied by the guide 5. At the rear of the pivotal point of this lever is a stud 46 that rests upon the stem 43 of the trigger arm, thereby providing for the rear arm of the lever 44 being elevated and the forward arm of said lever being lowered when the trigger is pulled rearwardly.

47 is a spring attached to the receiver B and bearing against the lever 44. This spring acts normally to so hold the lever 44 that its forward end will be in an elevated position and its stud 46 will act to hold the trigger in a forward position and to return said trigger to a forward position after it has been pulled rearwardly.

48 is a main sear piece pivoted to the forward arm of the lever 44 and vertically positioned in a guide 49 at the inside face of the side wall of the receiver occupied by the guide 5. The sear piece 48 is beveled at its upper end and it extends through the guide 5 in the path of travel of the hammer 27 and its forwardly projecting arm 27'. When the breech block and the hammer recede after the gun is fired the hammer moves rearwardly past the sear piece 48 and is caught by the catch arm 36 of the controlling bar 33 in the manner previously explained, and after said hammer is released by the lowering of the catch arm 36, as previously explained, the hammer moves forwardly to the position illustrated in Figs. VIII, IX and XXVI, to be restrained from further movement until the trigger 41 is again pulled with the result of lowering the sear piece 48 from a position in front of the hammer carried arm 27'.

50 is a supplemental sear piece pivoted to the rear arm of the lever 44 and extending vertically from its connection with said lever to the guide 5 through which it is adapted to operate. This supplemental sear piece is elevated each time that the trigger is pulled and the main sear piece 48 is lowered, and it has the utility of a guard that will arrest forward movement of the hammer in the event of the user of the gun involuntarily keeping his finger upon the trigger to exert a pull thereupon with the result of the main sear piece being lowered when the user of the gun is not ready to fire the gun. The supplemental sear piece is pivotally connected to the lever 44 in order that it may be thrown rearwardly out of operative position



when the gun is to be used for automatic shooting, one shot after another, until the user releases the trigger 41, thereby permitting the main sear piece to rise and stop firing by engaging the arm 27', and said supplemental sear piece is at such time thrown rearwardly by the actuation of a pull arm 51, see Fig. XXII that has slot and pin connection with the sear piece and is provided with a button stem 52 that extends through a slot  $b^2$  in the receiver B, in which it may be moved rearwardly for the purpose of throwing the supplemental sear piece out of operative position. The button stem 52 is held in a suitable notch at the bottom of the slot  $b^2$  by a spring 53.

54 is a safety catch slidably fitted in the receiver B in front of the trigger 41 and held from accidental movement by a spring arm 55. This catch is adapted to be moved rearwardly into engagement with the trigger when it is desired to prevent operation of the trigger.

Referring now to the magazine of the gun which is located in the stock A, 56 designates the magazine housing, subdivided by a vertical partition 57 into a rear compartment 58 and a forward compartment 59. In the compartment 58 is a pressure spring 60 and in compartment 59 is a pressure spring 61, both of said springs having the utility of exerting downward pressure upon the cartridges that are introduced into the compartments in which the springs are present. One of the side walls of the magazine housing is provided with spring tongues 62 cut from the wall and extending inwardly at the bottom of the compartment, as seen most clearly in Figs. VI and XV. These tongues serve as yielding supports for the lowermost cartridges in the magazine compartments. At the bottom of the stock A and beneath the magazine housing compartments are doors 63 preferably hinged to the stock and which control openings through which the cartridges may be introduced in filling the compartments 58 and 59 and the runway 65. The cartridges may, however, where desired, be introduced into the butt-stock through an opening  $a$  in the butt of the stock that is controlled by a door 64.

65 designates a cartridge runway that is located in the stock A and extends forwardly from the magazine housing. The cartridge runway is seen in Figs. II, VII, VIII, XI, XII, XVI and XVII, but is most clearly illustrated in Figs. XI and XII, in which it appears in detail.

66 are restraining dogs secured to one wall of the runway. These dogs are preferably in the shape of spring arms located at the exterior of the runway and extending through openings in the wall of the runway so as to be in the path of travel of the car-

tridges that are conducted through the runway. The dogs serve as means for preventing rearward movement of the cartridges.

67 designates a carrier bar located exterior of the runway 65 and the magazine housing 56, in suitable guides 68 attached to the runway and magazine walls, see Figs. V and VII. The rear portion of this carrier bar is located alongside of the wall of the runway opposite to that at which the dogs 66 are located and the carrier bar is bent upwardly back of its forward end to the top of the runway and has a front extension 67' that operates in guides 69 at the top of the runway, as seen most clearly in Figs. V and XI.

70 are carrier dogs attached to the carrier bar 67 and its extension and operable in the magazine housing and runway 65 into which they extend to engage the cartridges to move them forwardly in the runway.

71 is a pusher finger extending forwardly from the forward end of the carrier bar extension 67', see Fig. VIII.

The bottom of the forward portion of the cartridge runway 65 is cut out and attached to the bottom of said runway is a spring rest plate 72 onto which the cartridges are delivered into a position beneath the breech block when it is in its forward position and pass over a front restraining dog 73 that is located above and allowed to operate through the slot in said rest plate.

During the operation of my gun, the cartridges descend from the magazine compartments 58 and 59 and into positions in front of the carrier pawls 70 that are beneath said compartments in a manner to provide for the cartridges being conducted in single file through the runway 65, the cartridges in the rear compartment 58 being those first delivered. To provide for the automatic actuation of the cartridge carrier comprising the carrier bar 67, its extension 67' and the pawls 70, I furnish connection between the carrier bar and the push rod 23 that actuates the breech block of the gun. This connection is preferably furnished by a link 74 pivotally attached to the extension of the carrier bar and pivoted to the breech block push rod at the slot 24 in said rod. Each time that the breech block is moved rearwardly upon the recoil of the gun barrel, the link 74 is carried rearwardly with the breech block, thereby causing the entire series of the carrier pawls of the carrier bar to be moved rearwardly and engage cartridges that have been located at the rear of the pawls. Then, as the breech block moves to its forward position the cartridge carrier members are advanced and the cartridges are moved by the pawls 70 a single step in a forward direction. The carrier members are so disposed that a cartridge is always lo-



cated on the spring rest plate 72 previous to the rearward movement of the breech block, and immediately upon said breech block moving rearwardly the cartridge on this rest plate is relieved from pressure previously exerted upon it by the breech block, and is elevated by the rest plate into the positions shown in Fig. XXII. The breech block immediately thereafter moves into engagement with the head of the cartridge, an engagement that is rendered more perfect by the provision of spurs 7<sup>a</sup> at the forward end and bottom of the breech block (see Figs. XIII, XIX and XXII) and the cartridge is carried by the breech block into the gun barrel.

I provide in my gun means whereby the breech block may be restrained in a rear position when the last shell that has been loaded into the gun has been fired and this means comprises the following parts: 75 is a locking arm pivoted to one of the side walls of the receiver B through the medium of lugs 76 secured to said wall. This locking arm is seen in Figs. VIII, XVI, XVII, XXII, and XXIII, and it occupies a vertical position within the receiver alongside of the rest plate 72 toward which it is adapted to be moved by a spring 77. 78 is a retracting lever that is horizontally positioned in the receiver and is pivotally mounted in lugs 79. The rear free end of this retracting lever occupies a position alongside of the locking arm 75, see Figs. VIII and XXII, and the forward arm of the lever is provided with a button 80 that extends through the adjacent side wall of the receiver in order that the retracting lever may be operated by pressure upon said button to throw the locking arm outwardly, or in a direction toward the adjacent wall of the receiver and away from the rest plate 72. When the breech block of the gun is moved forwardly to become locked to the gun barrel, a rib 7<sup>b</sup> at the bottom of the breech block and extending longitudinally thereof acts upon the locking arm to move it laterally but this condition is only possible when a cartridge is present upon the rest plate 72. When the last cartridge in the magazine of the gun has been delivered first onto the rest plate and then transferred therefrom to the gun barrel to be exploded, and the breech block recedes subsequent to the explosion of the last cartridge, the locking arm is moved by the spring 77 into a position in front of the breech block. As a consequence, the breech block is held in its rear position, thereby enabling the user of the gun to reload it without the necessity of retracting the breech block for the introduction of a cartridge into the gun barrel in connection with the refilling of the magazine. While the breech block is held back the operator may open the forward door 63 and insert one cartridge at a time into the runway 65. When the first car-

tridge passes onto the rest plate 72 said rest plate will be raised upwardly and retract the locking arm 75, allowing the breech block to carry the cartridge into the barrel, and the gun is then ready to fire.

I will next describe the means by which the breech block is manually released from the barrel extension arms and drawn rearwardly when the barrel and breech block are in forward positions and it is desired to separate the breech block from the barrel to permit loading of the gun.

81 is a pull lever that is pivoted at 82 to the breech block, see Fig. XX. This pull lever is operable in a vertical slot B' in the receiver and is adapted to move longitudinally of the receiver when the breech block moves forwardly and rearwardly in the use of the gun.

83 is a finger arm that is pivoted to the lower end of the pull lever so that it may be swung outwardly and upwardly when the pull lever is drawn rearwardly to bring its lower end to a position exterior of the slot B'. The object in providing the finger arm 83, attached to the pull lever as stated, is to allow the operator to gain a better hold upon the pull lever for the actuation thereof.

The pull lever 81 is provided at its upper end with a hook 84 that normally seats against a button 85 located at the rear of a spring 86. The spring 86 and the button 85 are located in the breech block and these parts serve to normally hold the pull lever in the position shown in Fig. XX in order that it will ride to and fro within the receiver B. The hook 84 of the pull lever is adapted to engage a stud 11' projecting from the plunger 11 in the breech block, see Figs. IX, XX and XXI which is operable in a slot 7<sup>c</sup> in the breech block. When the gun barrel and breech block are in forward positions and it is desired to unlock the breech block from the barrel and retract it from the barrel, the pull lever is moved rearwardly by first drawing the finger arm 83 downwardly out of the slot B' in the receiver, then swinging said arm upwardly and exerting a pull rearwardly upon the arm and the lower end of the pull lever 81 to move the hook 84 of said lever forwardly. When the pull lever is moved as just explained, its hook is carried into engagement with the stud 11' of the plunger 11 and as a consequence said plunger is moved forwardly to cause it to actuate the locking keys 15 and disengage said keys from the barrel extension arms c. Then, upon a continued pull upon the finger arm 83, the breech block is drawn rearwardly until it becomes engaged by the catch arm 37 of the controlling bar 33 or the locking arm 75 to be held in a retracted position.

\* For the purpose of facilitating the packing of the parts of the gun when the gun is



taken down, I construct the barrel recovery parts as follows: The rod 1 of the barrel recovery parts is provided at its rear end with a screw threaded stem 1' that is adapted to be seated in a nipple shaped member B<sup>2</sup> at the front end of the receiver for the purpose of connecting the rod to the receiver. In the rod 1 adjacent to its stem 1' is a screw hole 1<sup>a</sup> and at the opposite or forward end of the rod is a screw hole 1<sup>b</sup>. 87 is a retaining screw that is seated in the chambered fore-stock D and which enters into the screw hole 1<sup>b</sup> in the rod 1 when said rod is in position for service in the gun. The rod 1 is provided with a chamber 1<sup>c</sup> extending inwardly from its forward end and contains a notch 1<sup>d</sup> which leads outwardly from said chamber. 1<sup>e</sup> is a cross pin mounted in the forward end of the rod and in juxtaposition to the notch 1<sup>d</sup>. 88 is a slotted turn bar that is fitted to the cross pin 1<sup>e</sup> and is adapted to occupy the chamber in the rod when the gun is in use as seen in Fig. X. When the gun is to be taken down the retaining screw 87 is first withdrawn from the fore-stock and from its seat in the screw hole 1<sup>b</sup> in the rod 1 and the fore-stock D is then separated from the barrel of the gun and from the nipple shaped member B<sup>2</sup> at the front end of the receiver. The turn bar 88 is then withdrawn from the rod 1 and manipulated in a circular path for the purpose of unscrewing the rod from the nipple shaped member B<sup>2</sup> to disconnect the rod from the receiver. The rod may then be withdrawn through the lug c'' carried by the gun barrel and the recovery spring and buffer spring are stripped from the rod. I then insert the rod 1 through the lug c'' and replace the recovery spring and buffer spring upon the rod with the rod lying in the fore-stock so that its stem 1' occupies the cavity d at the forward end of said fore-stock. The barrel and fore-stock will be assembled. The retaining screw 87 is then inserted through the fore-stock and entered into the screw hole 1<sup>a</sup> in the rod 1 which screw hole is at this time in registration with the hole in the fore-stock through which the retaining screw passes. When the parts have been arranged in the fore-stock as explained, the rod 1 and the springs thereon are securely held in the fore-stock in which connection it is to be noted that the springs are prevented from escaping at the rear end of the fore-stock, due to the existence of the head at the front end of the rod 1 against which the cushion spring 4 rests.

I claim:

1. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction after it has moved rearwardly with said barrel, a cartridge magazine in said butt-stock,

and means operable by said breech block moving means whereby cartridges may be conducted into said receiver from said magazine, substantially as set forth.

2. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction after it has moved rearwardly with said barrel, a cartridge magazine in said butt-stock, and a reciprocatory carrier operable by said breech block moving means whereby cartridges may be delivered from said magazine to said receiver, substantially as set forth.

3. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction after it has moved rearwardly with said barrel, a cartridge magazine in said butt-stock, a reciprocatory carrier operable by said breech block moving means whereby cartridges may be delivered from said magazine to said receiver, and means in the path of travel of said cartridges whereby they are prevented from retrograde movement, substantially as set forth.

4. In an automatic gun, a butt stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction after it has moved rearwardly with said barrel, a cartridge magazine in said butt-stock, a reciprocatory carrier operable by said breech block moving means whereby cartridges may be delivered from said magazine to said receiver, and restraining dogs in the path of travel of said cartridges whereby the cartridges are prevented from retrograde movement during the operation of said carrier, substantially as set forth.

5. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction after it has moved rearwardly with said barrel, a cartridge magazine in said butt-stock, and which includes a runway, a reciprocatory carrier bar movable relative to said runway and having connection with said breech block moving means, and carrier dogs attached to said carrier bar and operable in said runway, substantially as set forth.

6. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction after it has moved rearwardly with said



barrel, a cartridge magazine in said butt-stock, and which includes a runway, a reciprocatory carrier bar movable relative to said runway and having connection with  
 5 said breech block moving means, carrier dogs attached to said carrier bar and operable in said runway, and cartridge restraining dogs extending into said runway to prevent retrograde movement of the cartridges, sub-  
 10 stantially as set forth.

7. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction  
 15 after it has moved rearwardly with said barrel, a cartridge magazine in said butt-stock, and which includes a runway, a reciprocatory carrier bar movable relative to said runway and having connection with  
 20 said breech block moving means, carrier dogs attached to said carrier bar and operable in said runway, and spring restraining dogs entering into said runway to prevent retro-  
 25 grade movement of the cartridges, substantially as set forth.

8. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction  
 30 after it has moved rearwardly with said barrel, a cartridge magazine housing in said butt-stock, a runway leading from said magazine housing to said receiver, and  
 35 means operable by said breech block moving means, whereby the cartridges may be delivered from said housing through said runway to said receiver, substantially as set  
 40 forth.

9. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver a breech block operable in said receiver movable with said barrel upon its recoil, a butt-  
 45 stock, a magazine housing in said butt-stock, a runway leading forwardly in said butt-stock from said magazine housing to said receiver, a carrier associated with said runway and adapted to conduct cartridges  
 50 therethrough, means whereby said carrier is rendered coöperable with said breech block, and a pusher finger at the forward end of said carrier, substantially as set forth.

10. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction,  
 55 a cartridge runway in said butt-stock, a carrier for moving the cartridges in said runway and which is coöperable with said breech block moving means to deliver cartridges into said receiver, and means associated with said carrier whereby the car-  
 60 tridges are delivered into a position in front

of said breech block to be delivered by the breech block into said barrel, substantially as set forth.

11. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said  
 70 receiver, a breech block independent of said barrel adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction, a cartridge runway in said butt-stock, a carrier for moving the  
 75 cartridges in said runway and which is co-operable with said breech block moving means to deliver cartridges into said receiver, and a pusher finger carried by said carrier and whereby the cartridges are de-  
 80 livered into a position in front of said breech block to be delivered by the breech block to said barrel, substantially as set forth.

12. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said  
 85 receiver, a breech block adapted to move rearwardly with said barrel, means for moving said breech block in a forward direction, a cartridge runway in said butt-stock, a yieldable rest member in said receiver  
 90 at the forward end of said runway, a carrier coöperable with said breech block moving means, whereby cartridges are moved in said runway and delivered to said rest member to be delivered from said rest mem-  
 95 ber to said barrel by said breech block, substantially as set forth.

13. In an automatic gun, a butt-stock, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move  
 100 rearwardly with said barrel, means for moving said breech block in a forward direction, a cartridge runway in said butt-stock, a yieldable rest member in said receiver at the forward end of said runway, a carrier  
 105 coöperable with said breech block moving means whereby cartridges are moved in said runway toward said rest member, and a pusher finger carried by said carrier whereby the cartridges are delivered to said rest  
 110 member to be delivered into said barrel by the breech block, substantially as set forth.

14. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel after it  
 115 has recoiled, a breech block and a hammer reciprocally mounted in said receiver and adapted to move rearward with said barrel, mechanisms independent of each other for moving said breech block and hammer  
 120 forwardly, and a controller operable by said barrel whereby said breech block and hammer are temporarily restrained in rear positions when said barrel is moved to recovered position, substantially as set forth.  
 125

15. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel, after it has recoiled, a breech block and a hammer reciprocally mounted in said receiver and  
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adapted to move rearwardly with said barrel, mechanisms independent of each other for moving said breech block and hammer forwardly, and a vertically movable controller operable by said barrel whereby said breech block and hammer are temporarily restrained in rear positions when said barrel is moved to recovered position, substantially as set forth.

10 16. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel after it has recoiled, a breech block and a hammer reciprocally mounted in said receiver and  
15 adapted to move rearwardly with said barrel, mechanisms independent of each other for moving said breech block and hammer forwardly, and a movable controller operable by said barrel and having catch arms  
20 adapted to engage said breech block and hammer to temporarily restrain them in rear positions when said barrel is moved to recovered position, substantially as set forth.

25 17. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel after it has recoiled, a breech block and a hammer reciprocally mounted in said receiver and adapted  
30 to move rearwardly with said barrel, mechanisms independent of each other for moving said breech block and hammer forwardly, and a controller for governing the forward movement of said breech block and  
35 hammer; said controller being provided with a catch arm adapted to engage said breech block and hammer, and a trip arm adapted to be engaged by said barrel when the barrel moves to recovered position, substantially as  
40 set forth.

45 18. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel after it has recoiled, a breech block and a hammer reciprocally mounted in said receiver and  
50 adapted to move rearwardly with said barrel, mechanisms independent of each other for moving said breech block and hammer forwardly, and a controller for governing the forward movement of said breech block  
55 and hammer; said controller being provided with a catch arm adapted to engage said hammer, and a trip arm adapted to be engaged by said breech block to move the controller for the release of said hammer, substantially as set forth.

60 19. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver and provided with extension arms, means for recovering said barrel after it has recoiled, a  
65 breech block reciprocally mounted in said receiver, locking keys slidably mounted in said breech block and adapted to engage said barrel extension arms, and a plunger in said breech block coöperable with said keys and  
70 whereby the keys are disconnected from said

barrel extension arms when the plunger is moved in the breech block, substantially as set forth.

20. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver and  
70 provided with extension arms, means for recovering said barrel after it has recoiled, a breech block reciprocally mounted in said receiver, locking keys slidably mounted in said breech block and adapted to engage said  
75 barrel extension arms, and a spring controlled plunger in said breech block coöperable with said keys and whereby the keys are disconnected from said barrel extension arms when the plunger is moved in the  
80 breech block, substantially as set forth.

21. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver and provided with extension arms, means for recovering said barrel after it has recoiled, a  
85 breech block reciprocally mounted in said receiver, locking keys slidably mounted in said breech block and provided with slots diagonally disposed therein, and a plunger provided with a shift pin operable in the  
90 slots in said keys and whereby said keys are disconnected from said barrel extension arms when said plunger is moved in said breech block, substantially as set forth.

22. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver and provided with extension arms, means for recovering said barrel after it has recoiled, a  
95 breech block reciprocally mounted in said receiver, locking keys slidably mounted in said breech block and provided with slots diagonally disposed therein, and a spring controlled plunger provided with a shift pin operable in the slots in said keys and whereby  
100 said keys are disconnected from said barrel extension arms when said plunger is moved in said breech block, substantially as set forth.

23. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver and  
110 provided with extension arms, means for recovering said barrel after it has recoiled, a breech block reciprocally mounted in said receiver, a hammer reciprocally mounted in said receiver, mechanisms independent of  
115 each other for moving said breech block and hammer forwardly, locking keys movably mounted in said receiver adapted to engage said barrel extension arms, a plunger in said breech block for actuating said locking keys,  
120 and which is provided at its rear end with arms; said hammer being apertured to permit the passage of said plunger arms there-through to strike the rear wall of said receiver when the breech block is moved rear-  
125 wardly, substantially as set forth.

24. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver and provided with extension arms, means for recovering said barrel after it has recoiled, a  
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breech block reciprocally mounted in said receiver, a hammer reciprocally mounted in said receiver, mechanisms independent of each other for moving said breech block and hammer forwardly, locking keys movably mounted in said receiver adapted to engage said barrel extension arms, a spring controlled plunger in said breech block for actuating said locking keys, and which is provided at its rear end with arms; said hammer being apertured to permit the passage of said plunger arms therethrough to strike the rear wall of said receiver when the breech block is moved rearwardly, substantially as set forth.

25. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel after it has recoiled, a breech block in said receiver, a hammer reciprocally mounted in said receiver, a vertically movable spring controlled sear piece in said receiver adapted to be engaged by said hammer, a trigger by which said sear piece is actuated for the release of said hammer, and a supplemental sear piece coöperable with said first named sear piece and movable into the path of travel of said hammer and means whereby said supplemental sear piece may be thrown out of operative position, substantially as set forth.

26. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel after it has recoiled, a breech block in said receiver, a hammer reciprocally mounted in said receiver, a vertically movable sear piece in said receiver, a lever by which said sear piece is carried, a trigger for actuating said lever, and a supplemental sear piece carried by said lever and operable in a position parallel with said first mentioned sear piece, substantially as set forth.

27. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel after it has recoiled, a breech block in said receiver, a hammer reciprocally mounted in said receiver, a vertically movable sear piece in said receiver, a lever by which said sear piece is carried, a trigger for actuating said lever, a supplemental sear piece carried by said lever and operable in a position parallel with said

first mentioned sear piece, and means whereby said supplemental sear piece may be thrown out of operative position, substantially as set forth.

28. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, a breech block adapted to move rearwardly with said barrel in said receiver, means for moving said breech block forwardly, a spring controlled locking arm hinged to said receiver at the interior thereof whereby said breech block may be restrained from forward movement when the magazine of the gun has been emptied, and a lever in said receiver having a button protruding through the receiver whereby said locking arm may be retracted to free said breech block, substantially as set forth.

29. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver, means for recovering said barrel after it has recoiled, a breech block, means whereby said breech block is locked to said barrel, a pull lever pivoted to said breech block whereby said locking means may be actuated to release the breech block and the breech block may be retracted from said barrel, and spring controlled means whereby said lever is moved to place it out of interference with the automatic action of said locking means, substantially as set forth.

30. In an automatic gun, a receiver, a barrel recoilably mounted in said receiver and provided with a lug, a fore-stock detachably fitted to said receiver and barrel, a rod within said fore-stock to which said lug is loosely fitted and which is detachably connected to said receiver, barrel controlling springs associated with said rod, and a retaining screw passing through said fore-stock; said rod being provided at or near each of its ends with screw holes adapted to receive said retaining screw; whereby the fore-stock is held to the barrel when the gun is in condition for use, and also whereby said rod may be held in said fore-stock when the fore-stock and rod are detached from the barrel and receiver, substantially as set forth.

CHARLES D. LOVELACE.

In presence of—

T. B. NEWMAN,  
D. H. B. TODD.