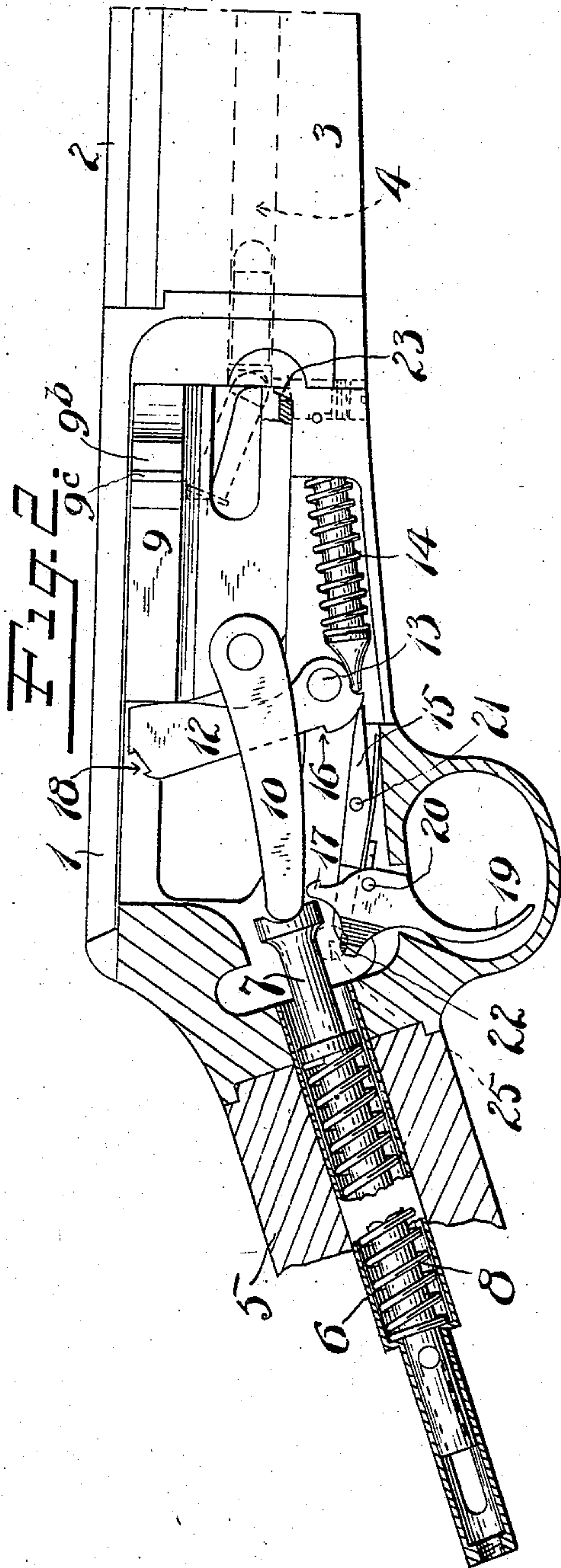


APPLICATION FILED JUNE 3, 1908.

4 SHEETS—SHEET 1.



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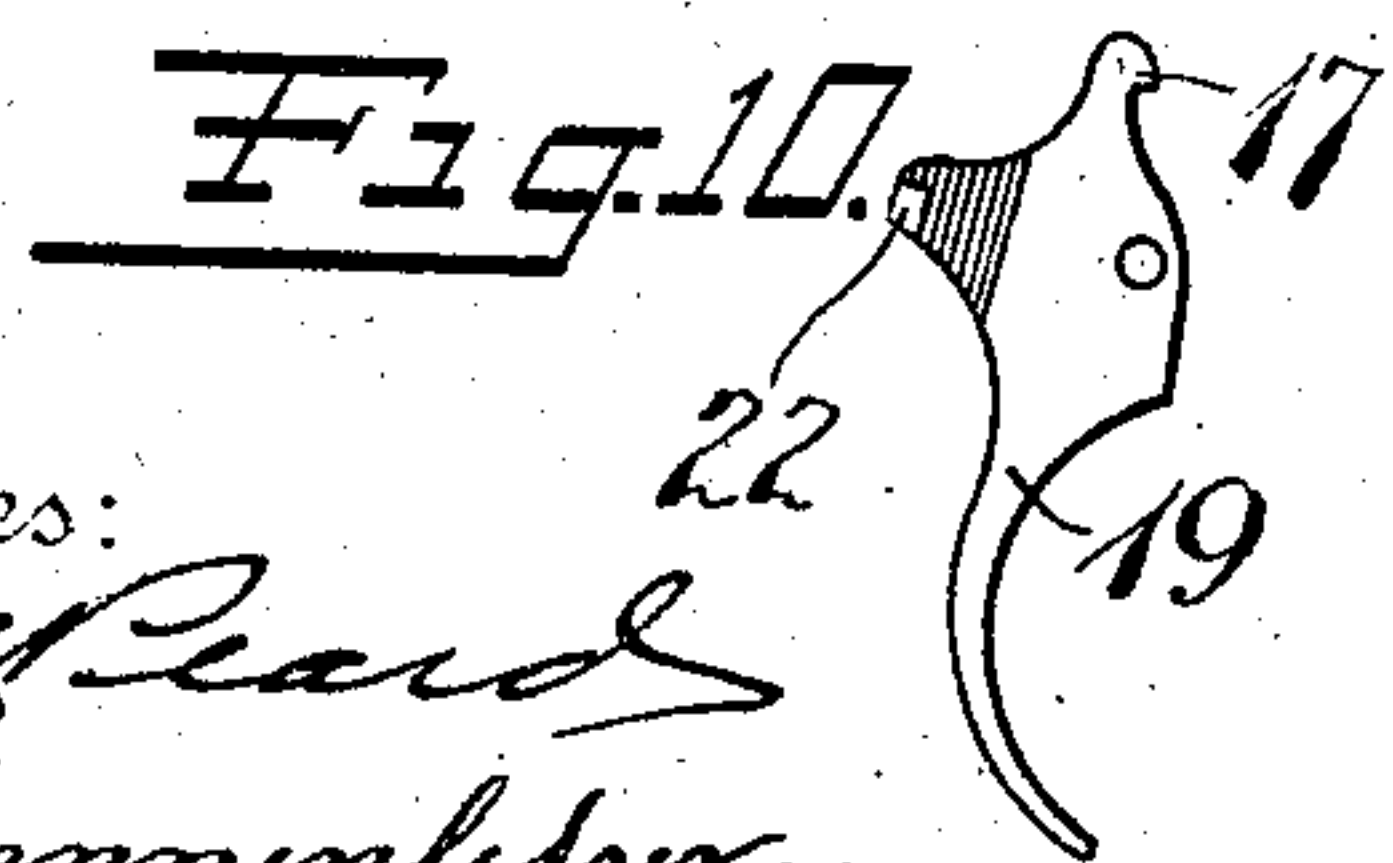
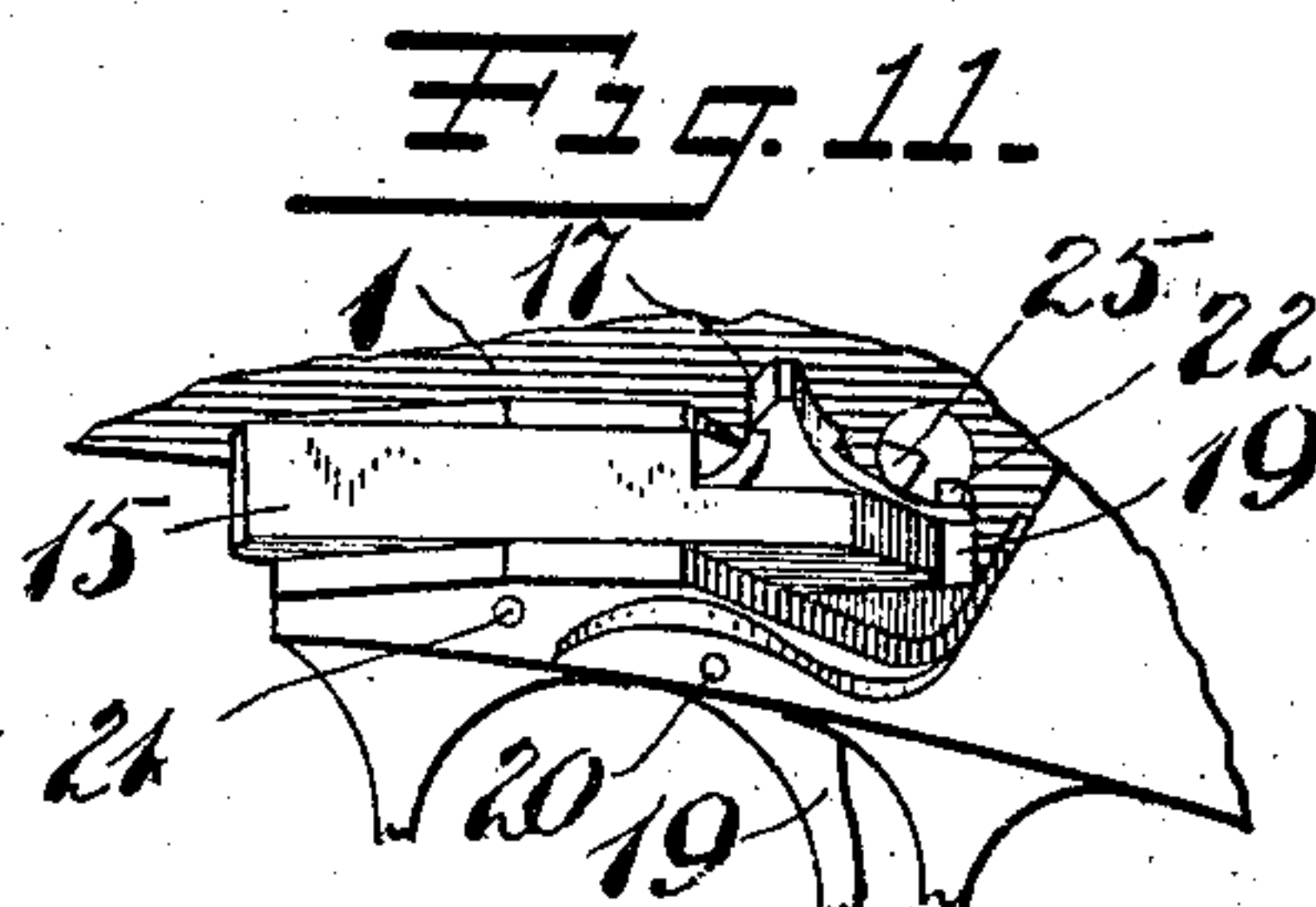
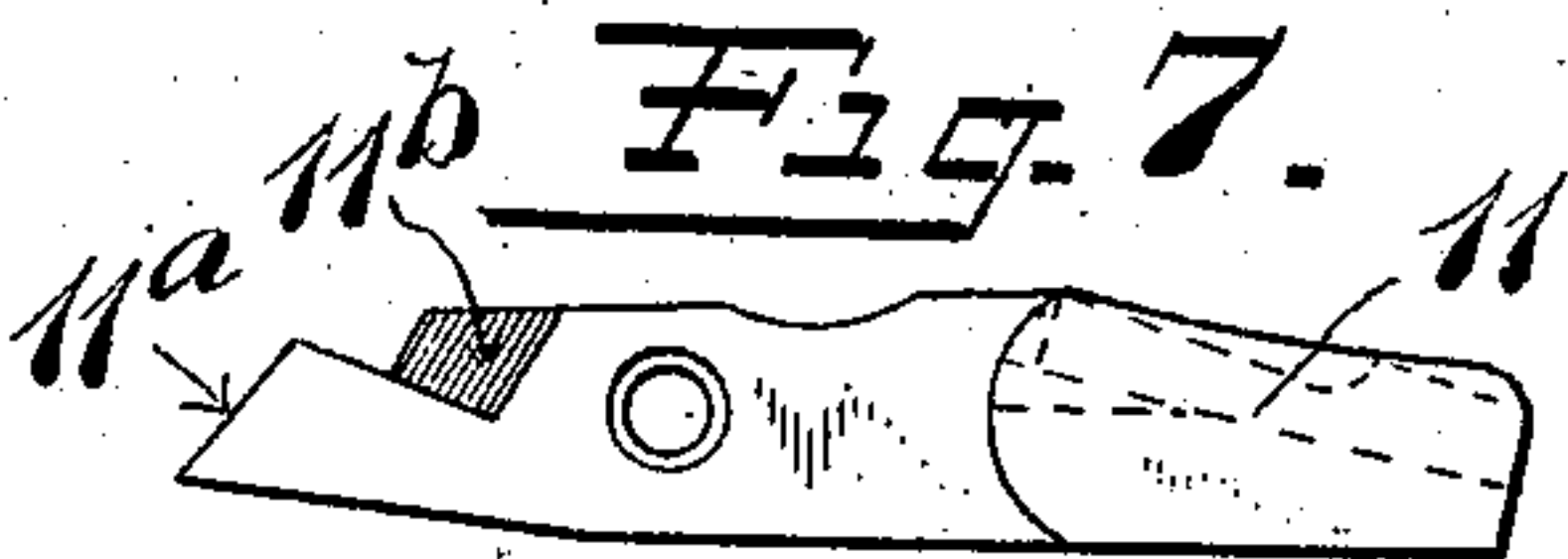
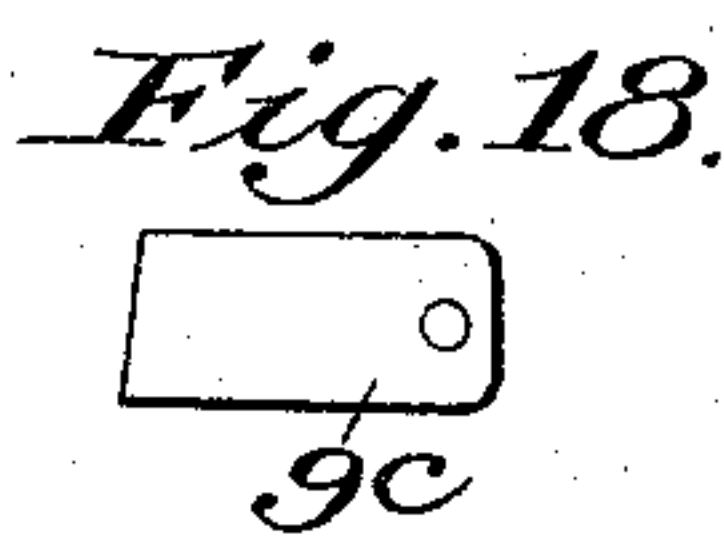
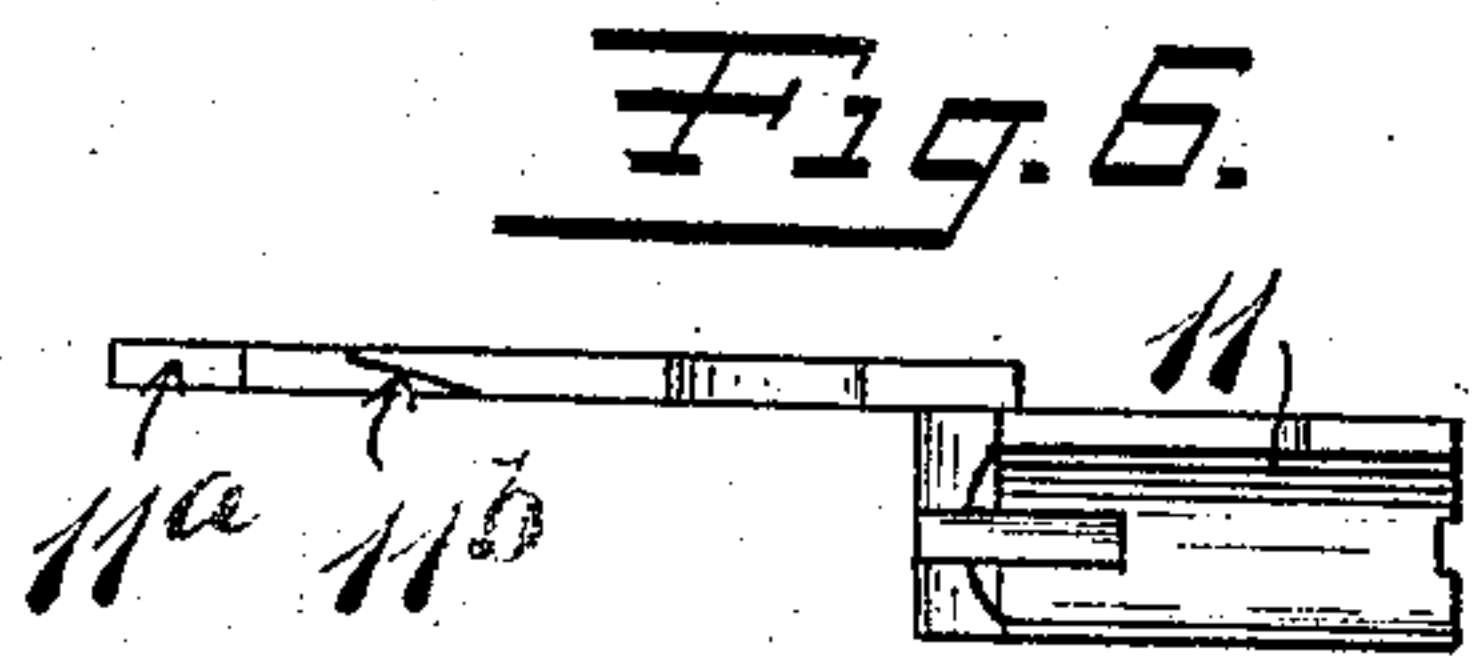
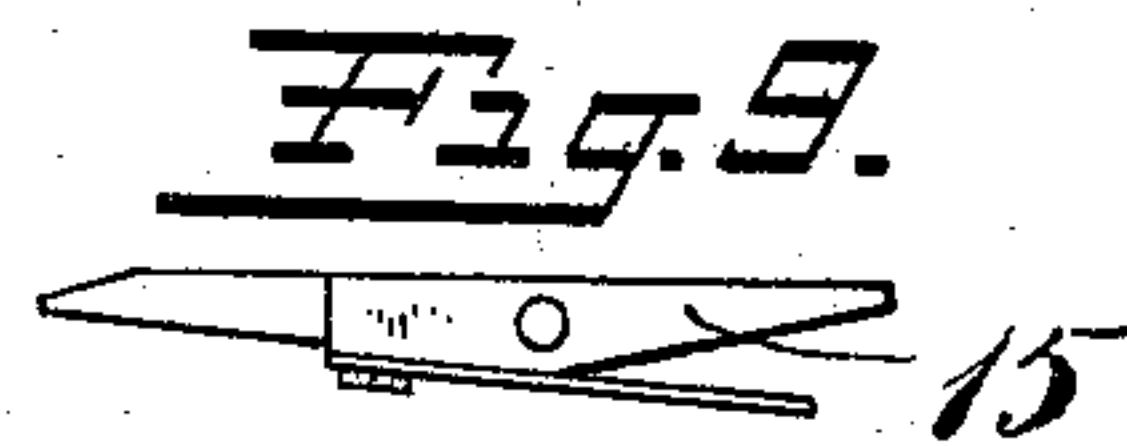
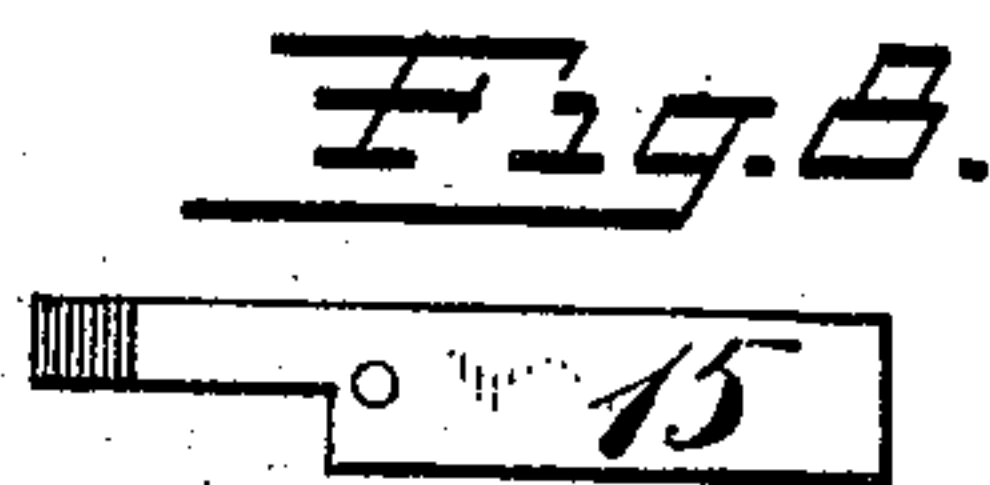
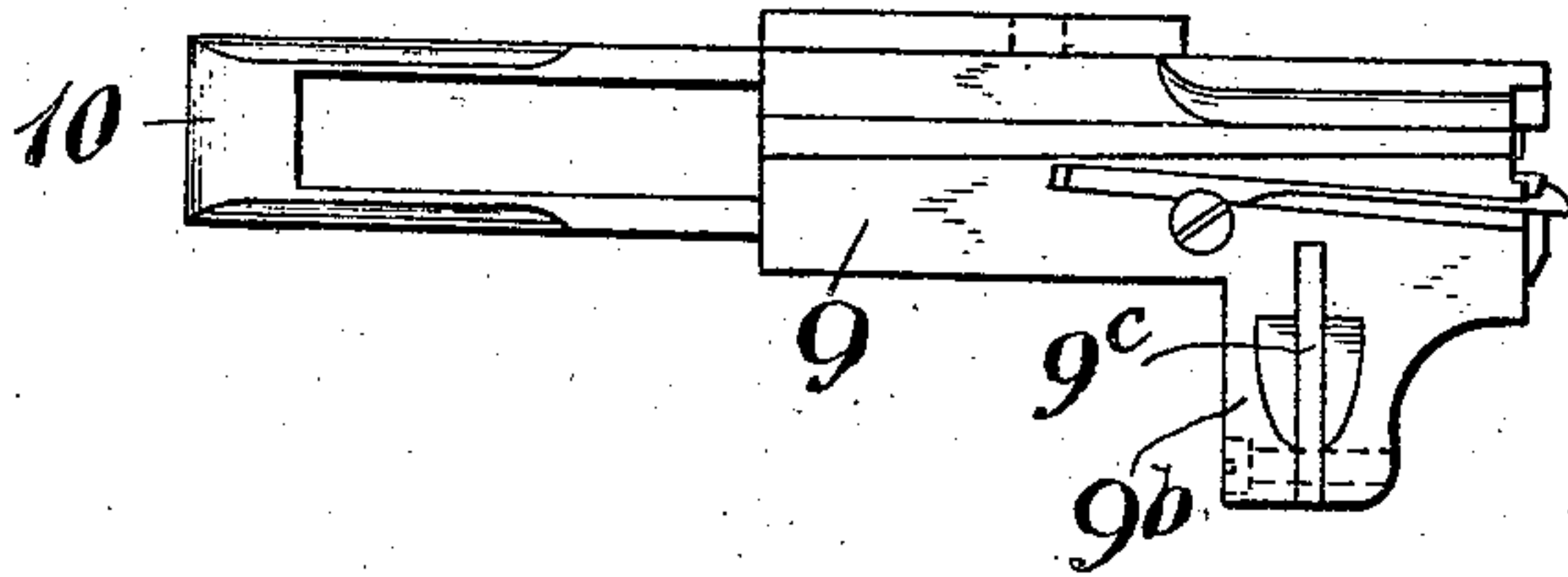
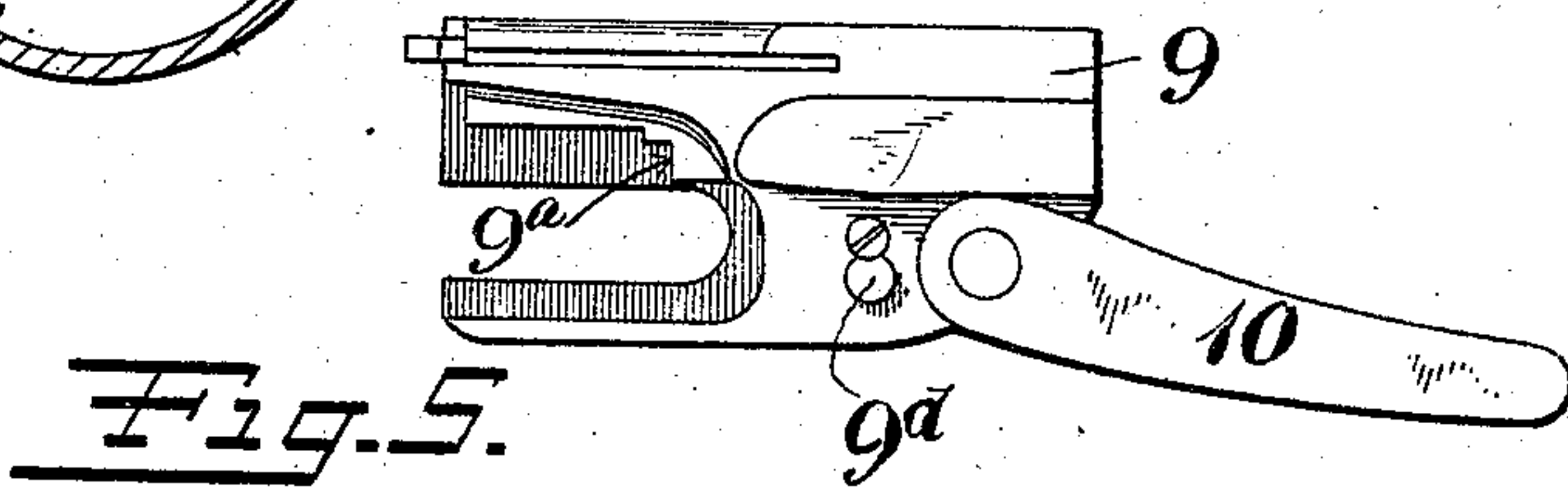
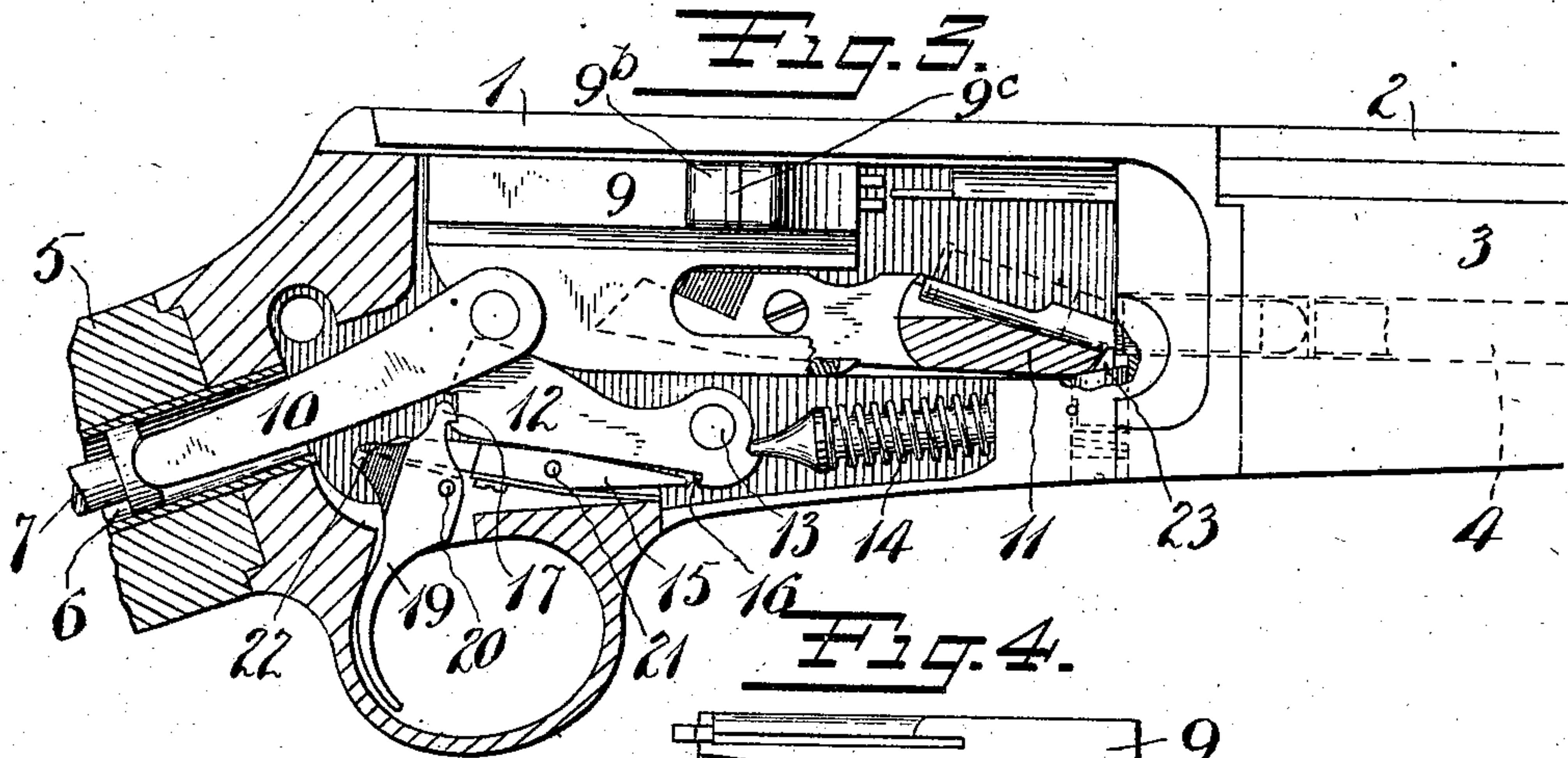
FIREARM.

APPLICATION FILED JUNE 3, 1908.

918,447.

Patented Apr. 13, 1909.

4 SHEETS—SHEET 2.



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918,447.

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FIREARM.
APPLICATION FILED JUNE 3, 1908.

Patented Apr. 13, 1909.
4 SHEETS—SHEET 3.

Fig. 12.

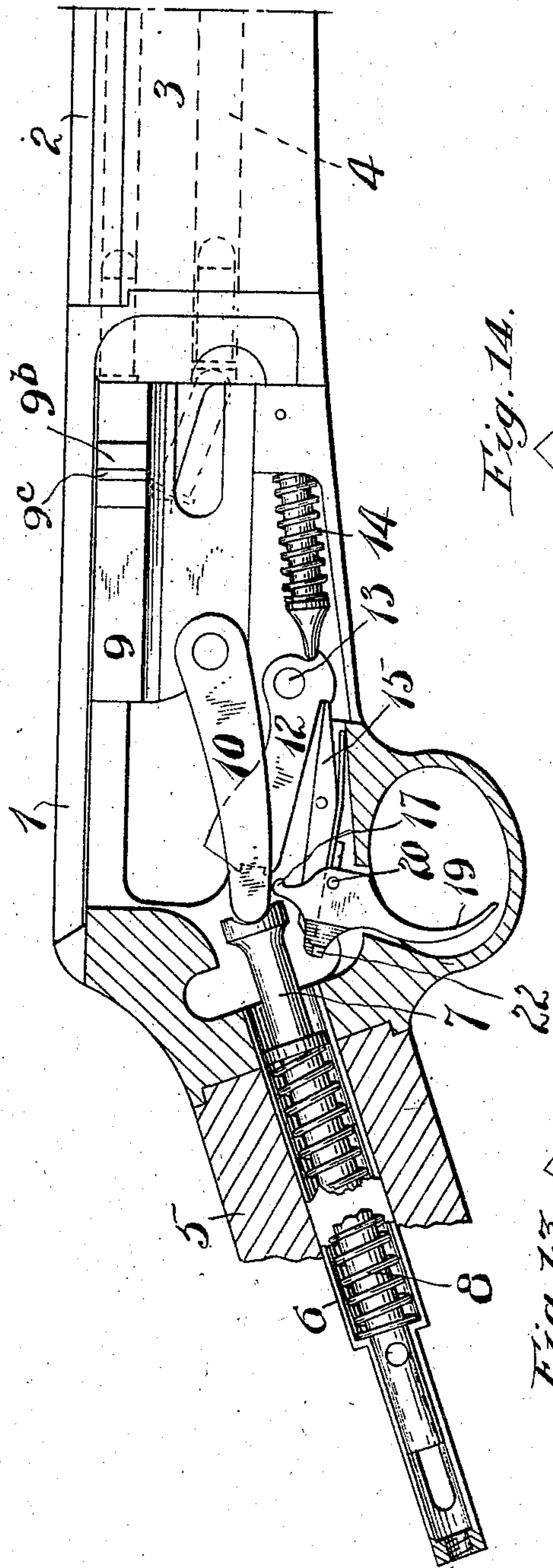


Fig. 14.

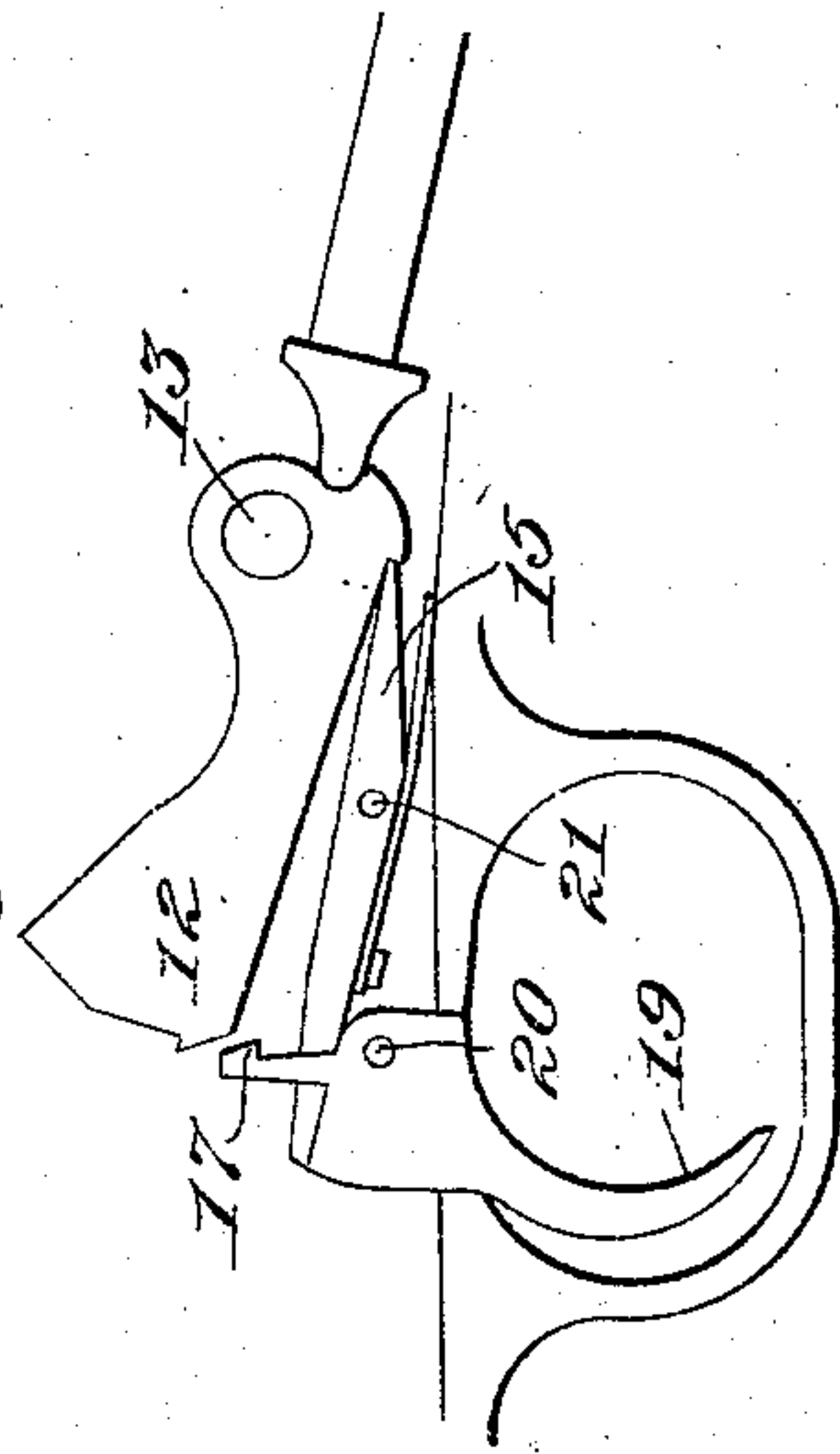
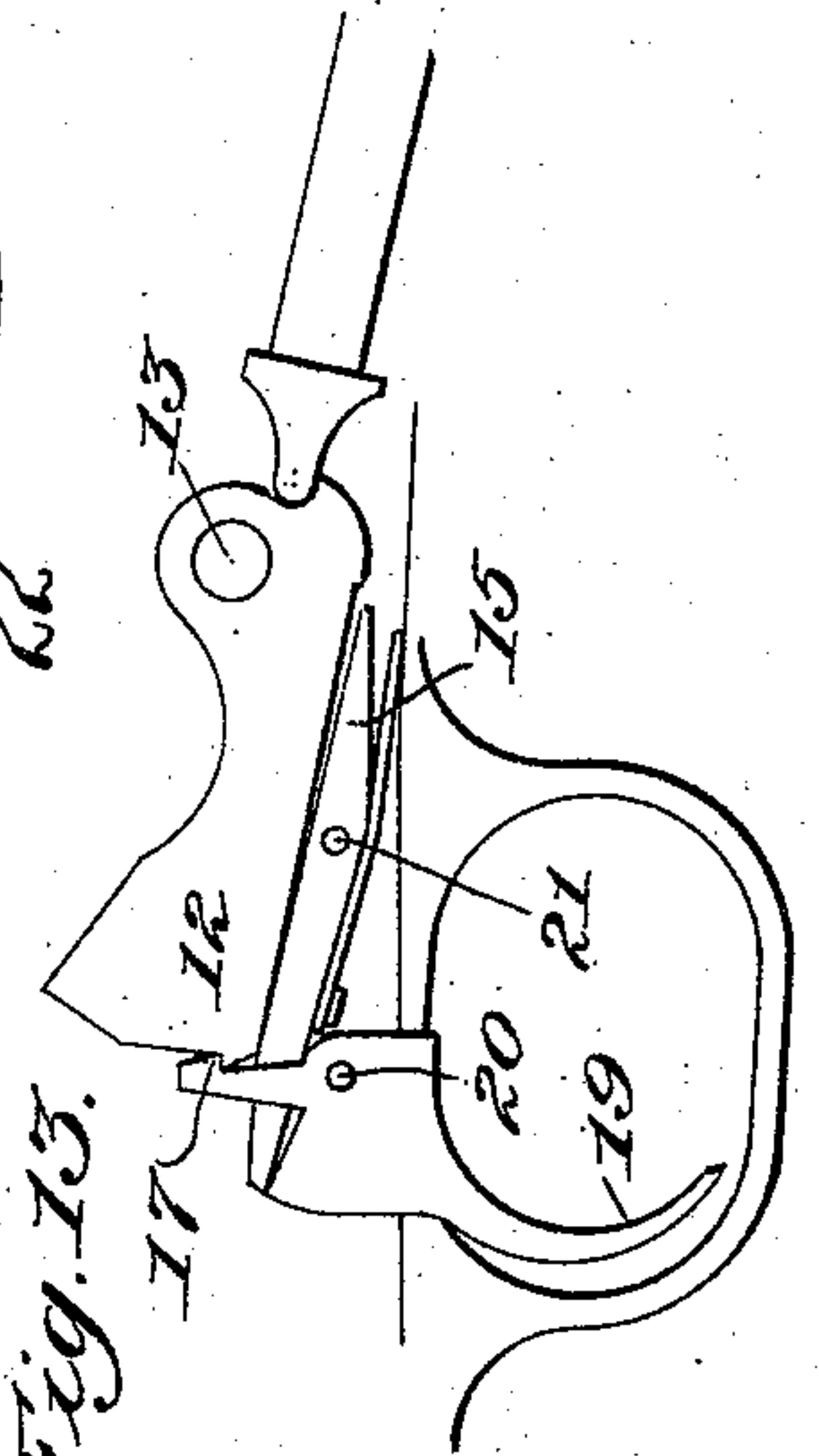


Fig. 15.



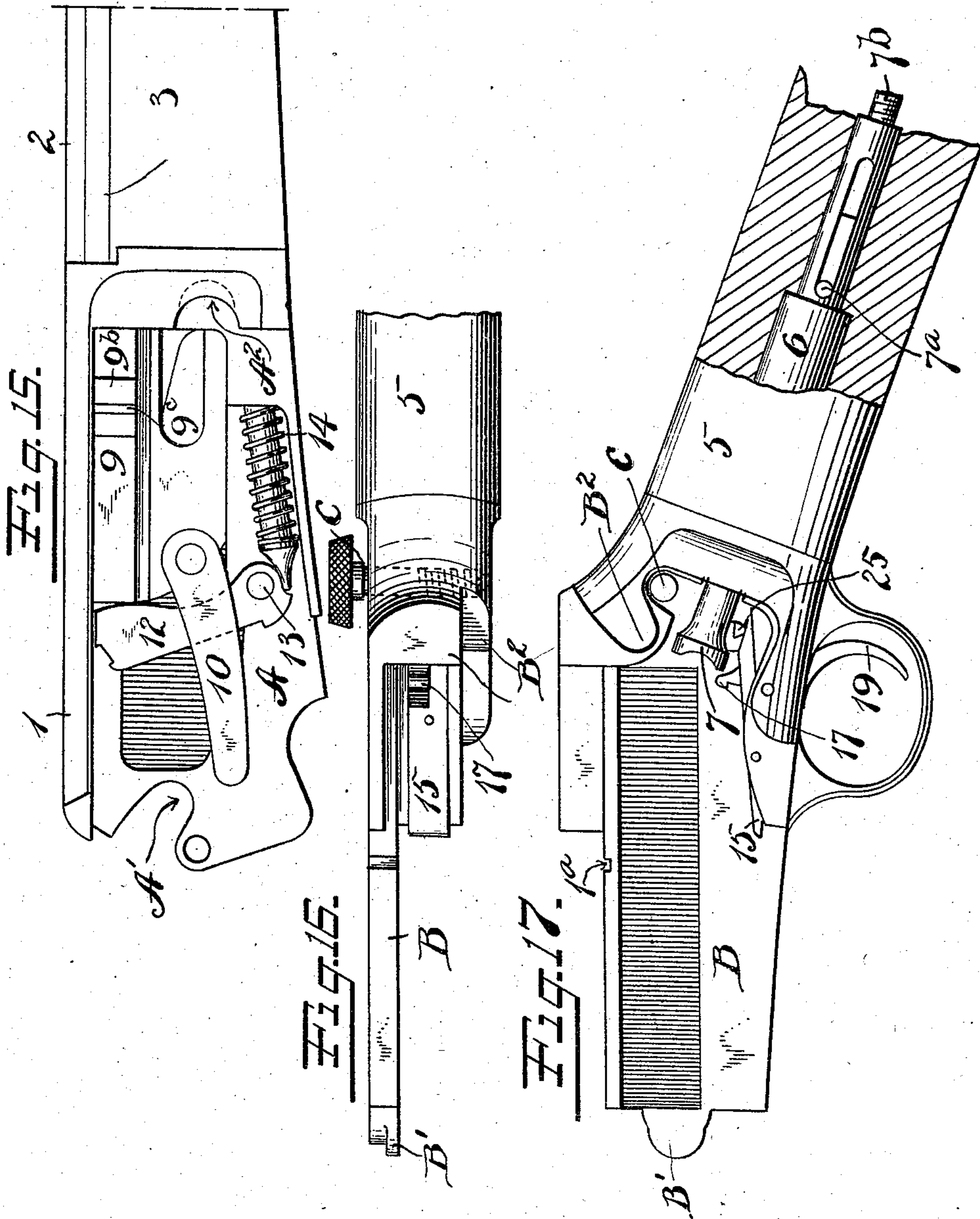
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918,447.

Patented Apr. 13, 1909.

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UNITED STATES PATENT OFFICE.

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FIREARM.

No. 918,447.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed June 3, 1908. Serial No. 436,333.

To all whom it may concern:

Be it known that I, LEWIS L. HEPBURN, a citizen of the United States, residing at New Haven, county of New Haven, State of Connecticut, have invented certain new and useful Improvements in Firearms, of which the following is a full, clear, and exact description.

My invention relates to automatic firearms, the object being to provide certain new and improved features of construction, more particularly directed to a so-called "closing spring", a breech bolt latch, a magazine cut-off, and various emergency and safety devices. Among the latter is an improved feature of construction whereby if the trigger is inadvertently held back during the automatic action of the gun, the hammer will not operate to discharge the next cartridge until the trigger has been properly released and again drawn back.

The construction, operation and advantages of this firearm will be well understood by a mechanic familiar with this art from a reading of the following specification and an examination of the accompanying drawings, in which—

Figure 1 is a side elevation of a firearm constructed to embody my invention, the forward end of the barrel and forearm being broken away and the rear end of the stock being also broken away. Fig. 2 is a side elevation of the interior mechanism in the same position as indicated in Fig. 1, certain parts being shown in section. Fig. 3 is a similar view, certain parts being in a different position from that indicated in Fig. 2. Fig. 4 is a view of the reverse side of the breech block, and certain associated parts, detached. Fig. 5 is a plan view thereof. Fig. 6 is a plan view of the carrier. Fig. 7 is a side elevation thereof. Fig. 8 is a plan view of a sear. Fig. 9 is an edge elevation thereof. Fig. 10 is a side elevation of the trigger. Fig. 11 is a fragmentary perspective view of the trigger action. Fig. 12 is a view similar to Fig. 3, but showing the parts in a different position. Figs. 13 and 14 are diagrammatic views of the same parts showing the same in different positions. Fig. 15 is a side elevation of the rear end of the forward separable section of the firearm. Fig. 16 is a plan view of the forward end of the rear separable section of the firearm. Fig. 17 is a

side elevation of the parts shown in Fig. 16, also partly in section. Fig. 18 is a side elevation of a detached detail of construction.

1 is the breech-frame. In this particular instance said frame is separable, whereby the gun may be readily "taken down", the construction of said "take-down" mechanism being substantially such as set forth in my former patent No. 882,561, dated March 24, 1908.

2 is a barrel.

3 is the forearm, which may contain the well-known tubular magazine 4 arranged to hold cartridges in the usual manner to feed them successively rearwardly into the breech-frame, there to be manipulated by the cartridge-handling mechanism, hereinafter described.

5 represents a portion of the stock.

6 represents a "tang" so-called, which projects rearwardly from the rear reinforce of the breech-frame, and is housed within a bore in the stock 5. This tang is hollow or tubular and contains therein a reciprocating plunger 7 and a so-called "closing spring" 8 pressing said plunger 7 ahead.

9 is a reciprocating breech-block mounted in the receiver-frame 1, the normal position of the same being advanced to close said breech, said advance movement in this particular instance, and in the preferred form, being secured through the medium of an open link 10, between said breech-block and plunger 7, whereby the influence of the closing spring 8 is transmitted to said breech-block.

11 is a carrier mounted in the breech-frame and constructed for operation in substantially the same manner as shown in my former patent No. 776,243, dated November 29, 1904.

12 is a hammer pivoted at 13 and operated by spring 14.

15 is a sear arranged to engage in a notch 16 in the hammer, at the proper time.

17 is a hook arranged to engage in a notch 18 in the hammer, in the event the same is thrown back and the trigger is still being held down by the finger.

19 is a trigger pivoted at 20. In this instance, by preference, the hook 17 is formed upon the trigger. The sear 15 is pivoted at 21, while its rear end rests upon the tail of the trigger 19 so as to be tilted thereby.

23 is a spring-pressed cut-off, the same being arranged to project into the path of discharge of the cartridges in the magazine, until such time as it is desired to release a single cartridge from said magazine to permit it to be forced back into the breech-frame for further manipulation by the mechanism therein.

The parts thus far described comprise the main features of construction, so that I may now refer to the operation of the arm, describing at the same time minor features of construction to enable one to observe and learn precisely how the arm operates.

Let us first assume that the magazine 4 is filled with cartridges, and that the breech-block and various parts stand in the position indicated in Fig. 1. In this position, a portion of the forward end of the breech-block rests on an incline at the rear side of the cut-off 23, so as to repress its nose from the path of the cartridges in the magazine. The usual "follower-spring" (not shown) forces the column of cartridges rearwardly, so that the rearmost one stands substantially in the position indicated in Fig. 2, in which its rear end is checked by a stop shoulder 9^a (Fig. 4) on the breech-block. While in this position, the forward end of this cartridge still projects slightly into the magazine, so as to hold the next succeeding cartridge just forward of the cut-off 23, as shown. In this position, the first-mentioned cartridge (that is, the one within the breech-frame) rests upon the forward end or platform of the carrier 11. The breech-block being provided with a projecting handle 9^b, the operator may now grasp this handle and draw the breech-block rearwardly. By so doing the hammer 12 is swung back until the sear 15 engages in the notch 16. Upon releasing the handle 9^b, the breech-block moves forwardly under the action of the "closing spring" 8. On this forward excursion the forward end of the carrier 11 is lifted by means of a spring-pressed stud 9^d coacting with an incline 11^a on the rear end of the carrier 11. This movement of the carrier elevates the cartridge thereon to position in front of the advancing breech-block 9, by which means said cartridge is forced into the chamber of barrel 2. It should be stated that the very first rearward movement of the breech-block 9 permits the spring-lifted cut-off 23 to rise before a succeeding cartridge can escape from the magazine, the nose of said cut-off holding back all the cartridges in the magazine, save the one being handled by the automatic mechanism. As soon, however, as the breech-block reaches its forward position, and has introduced the first-mentioned cartridge freely into the chamber of the barrel, the cut-off 23 is again operated to release another single cartridge from the magazine, so that it, in turn, would assume the position indicated in

dotted lines, Fig. 2. The firearm is now loaded. By pulling trigger 19, sear 15 is released from the hammer, which latter springs ahead and strikes against the firing pin (not shown) carried by the breech-block 9, exploding the cartridge in the chamber of the barrel. The "blow-back" or recoil of the cartridge in the barrel forces the breech-block 9 rearwardly, the force of the recoil being substituted for the manual power first described. The rearward excursion of the breech-block withdraws the empty shell, which is duly ejected, the extractor and ejecting mechanism being of any well-known pattern, no claim of novelty being predicated thereon herein. On the next advance of the breech-block, the cartridge on the carrier is lifted into position, and forced into the barrel, and simultaneously another cartridge in the magazine is released to take its position upon the carrier, as previously described.

As already stated, the construction of the carrier is substantially such as set forth in my former patents and need not be described at length herein, it being merely necessary to mention that as soon as the stud 9^d on the breech-block has performed its function of tilting the carrier, it clears the incline 11^a and approaches a second incline 11^b at the side of the carrier, up which incline it rides, said stud receding so as to rest upon the side of the carrier. The advance of the breech-block at this time engages the carrier positively and forces its forward end down, so that its platform will be in position to receive the next succeeding cartridge from the magazine the moment the breech-block has reached the limit of its forward movement and has operated the cut-off 23.

If, by inadvertance, the operator of the gun has held back the trigger 19 during a full automatic action of the breech mechanism following the discharge of a cartridge, the hook 17 stands in a position to catch and hold back the hammer 12 (see Fig. 3), so that by no chance can the hammer advance when the breech-block advances or until it has been released in the proper manner. As will be seen, the sear 15 (in Fig. 3) does not engage in the notch 16 in the hammer in case the trigger is drawn back, but when the trigger is released from the position shown, the sear 15 will be tilted (under the action of its spring) so as to be ready to engage in said notch 16 just as hook 17 releases said hammer. It follows from the above that the hammer is held back at each action of the automatic parts, and, since it requires a releasing of the trigger and a separate pull thereon for the discharge of each successive cartridge, safety in this respect is guaranteed.

If, for any reason, it becomes desirable to hold the breech-block open, I provide a

simple and effective means therefor, comprising a horizontally pivoted manually operable latch plate 9^c mounted vertically in the handle 9^b. To lock the breech block back, this latch is merely depressed to engage in notch 1^a in the frame 1 (see Fig. 1). So long as the latch 9^c stands in notch 1^a, the block 9 is held back against the forward impulse of the "closing spring" 8. To release the breech block, the latch is pressed upwardly.

A further safety device for the trigger may also be employed. This device comprises a pivotally mounted handle 24, the inner end of the handle pivot having a lug 25, which, by turning said handle, may be brought into position over an offset or tail 22 at the rear of the trigger (see Fig. 2), so that said trigger cannot be pulled. By swinging the handle 24 into the position indicated in dotted lines (Fig. 1) the lug 25 is moved away from the tail 22, thus freeing said trigger.

It should be noted that the location of the "closing spring" 8 is particularly advantageous, and, indeed, very economical, since the tang 6 performs not only its usual function as a connector for the stock to the rear reinforce, but also performs the second function of a container for said "closing spring" and its associated plunger 7. Furthermore, by this arrangement the direction of the action of said spring relatively to the line of movement of the breech-block is very efficient in that it reduces to a minimum, and indeed practically eliminates, undue wear, side strain and a tendency to cramp or bind the block within the breech frame. This is due to the fact that the line of force is applied directly behind and almost directly in the line of reciprocation of the breech-block. The usual connecting screw 7^b entering in the usual way from the rear end of the stock connects the latter with the rear end of tang 6.

I desire to particularly emphasize the fewness of parts, the simplicity of the same, and the accessible and superior arrangement thereof, since, to the successful automatic firearm these features are of the utmost importance.

In Fig. 12 I have shown the position of the hammer as it appears cocked, the gun being loaded ready for firing. On comparing this view with Fig. 3, it will be seen that the trigger 19 has been released, so that hook 17 has freed the hammer 12, which has been allowed to spring forward until the front end of sear 15 stands in engagement with the notch in the hub of the hammer. In this position the breech-block is advanced, a loaded shell is shown in dotted outline in the chamber of the barrel, another on the carrier, and a preceding one in the magazine. In actual practice it is preferable that in the majority of instances one could not pull the

trigger and release the same quick enough to eliminate the action of the hook 17, but in such instances obviously the sear 15 will work in the intended manner to engage the hammer in the cocked position without the assistance of such hook. The presence of the latter, however, guarantees safety.

Another feature of invention to which I desire to call attention is the employment of only a single spring for restoring both the sear 15 and trigger 19 to the normal position in which the sear would engage the hammer and the trigger would be in the advanced position ready to pull. This action is brought about by the flat bearing which the sear 15 takes upon the trigger to the rear of the pivot 20. By this means, when the sear 15 tends to resume its normal position, it at once moves the trigger 19 to the position indicated in Fig. 12.

The take-down construction will best be understood by referring to Figs. 15 to 17, in which it will be seen that the line of division upon which the receiver or breech frame may be separated extends longitudinally thereof, forming thereby the two separable side plates A and B. The side plate B has the part B' adapted to engage in a recess A² of the other separable section, and also has a part B² adapted to engage in a recess A' in the other separable section, so that when the two separable parts are placed together they will be held firmly against displacement, the final connection being effected by a thumb screw C carried by one part and arranged to take into the other part. A further detailed description is unnecessary, in view of the disclosure in the former patent referred to.

It will be seen that although the separate parts of the firearm may be taken down, the plunger 7 will be held by pin 7^a in such a position that the said separable parts may be placed together quickly without difficulty. Were it not that the plunger is provided with means for limiting its forward excursion when the gun is taken down, it would be exceedingly difficult, if not impossible, to assemble the parts. It should be understood that the particular form of limiting means to permit the connection of the closing spring with the breech-block upon the putting together of the gun is not essential to this invention, but may be modified in a variety of ways.

What I claim is:

1. In an automatic repeating firearm, a barrel, a stock, a breech frame, a reciprocating breech-block therein, a tang projecting rearwardly from said frame and located centrally in said stock, and a closing spring carried within said tang and operatively connected with said breech-block, and means to limit the forward excursion of said connecting means.

2. In an automatic repeating firearm, a

breech frame, a reciprocating breech-block, a stock carried thereby, a slotted tang projecting rearwardly from said frame and centrally into said stock, and a closing spring inclosed within said tang, a plunger connection between said spring and breech-block, and a pin on said plunger projecting into the slot of the tang to limit the excursion of said plunger in said tang.

3. In a repeating firearm, a breech frame, a magazine leading into the same, a cartridge cut-off for said magazine, a breech-block movable in said breech frame and co-operating directly with said cut-off to release a cartridge in the magazine when said breech-block is in its closed position, a rigid stop shoulder on said breech-block to check at such time any cartridge released from the magazine and before it is wholly discharged therefrom, and a carrier arranged to receive and support such cartridge at such time.

4. In a repeating firearm, a breech frame, a magazine leading into the same, a cartridge cut-off for said magazine, a breech-block movable in said breech frame and coöperating directly with said cut-off to release a cartridge in the magazine when said breech-block is in its closed position, a stop shoulder on said breech-block to check at such time any cartridge released from the magazine and before it has been wholly discharged therefrom, a carrier arranged to receive and support such cartridge at such time, and means carried by the breech-block for operating said carrier.

5. In an automatic repeating firearm, a breech frame, a breech-block movable therein, a hammer, a trigger, and two independent hammer-engaging means operable by said trigger, one means being carried by said trigger and engaging the hammer away from its hub, the other engaging said hammer at its hub.

6. In an automatic repeating firearm, a hammer, a trigger, and two independent hammer-engaging means operable by said trigger and arranged to engage the hammer at different times, and at different parts thereof one of said hammer engaging means being integral with said trigger.

7. In an automatic repeating firearm, a pivoted hammer and spring-pressed sear for engaging said hammer in its cocked position at its hub, a trigger for operating said sear and a second hammer-engaging device carried by said trigger for catching the hammer away from its hub on the recoil and for holding said hammer against advance movement prior to the engagement of the latter by said sear.

8. In an automatic repeating firearm, a hammer, a trigger, a sear arranged to engage said hammer at its hub to hold it retracted, and a second hammer-engaging means carried upon and controlled by said trigger for

engaging and holding said hammer away from its hub preparatory to engagement thereof by the sear.

9. In an automatic repeating firearm, a hammer, a trigger, means for automatically repressing or cocking said hammer, means carried by and controllable by the trigger for engaging the hammer away from its hub and holding said hammer retracted while said trigger is drawn back, and a second means separate from the first mentioned means for engaging said cocked hammer, to hold the latter while said trigger is in its normal position, both of said means being operable by said trigger.

10. In an automatic repeating firearm, a spring-actuated pivoted hammer, a movable breech-block arranged to repress or "cock" said hammer, a spring-pressed trigger, means controllable by said trigger to engage said hammer away from its hub while cocked and while said trigger is drawn back, and a second means to engage said repressed hammer at its hub when said trigger is released.

11. In an automatic firearm, a hammer and means for repressing or cocking the same, a trigger, a latch carried thereby and arranged to engage said hammer when the latter is repressed and while the trigger is drawn back, a spring-pressed sear coöperating with and operated by said trigger for engaging said hammer in a cocked position when the latter is released by said latch upon an advance of the trigger.

12. In an automatic firearm, a hammer and means for repressing or cocking the same, a trigger, a latch carried thereby and arranged to engage said hammer when the latter is repressed, a spring-pressed sear co-operating with and operated by said trigger for engaging said hammer in a cocked position when the latter is released by said latch upon the advance of the trigger, said hammer making a partial forward movement after being released by said latch and before being engaged by said sear.

13. In an automatic repeating take-down firearm, a barrel, a stock, a divided breech frame, one part being connected to the stock, the other part being connected to the barrel, a reciprocating breech-block carried by one section of said breech frame, a tang projecting rearwardly from the other section of said breech frame and embedded in said stock, a closing spring carried within said tang, a plunger operated by said spring and carried within said tang and a means for limiting the forward excursion of said plunger, and means for operatively connecting said plunger with said breech-block when said parts are assembled, and means for connecting and disconnecting the two separable parts of the breech frame to permit said barrel and stock to be connected and disconnected.

14. In an automatic repeating take-down

firearm, a receiver divided longitudinally to permit the barrel and stock portion to be separated by lateral movement of one part relatively to the other, a reciprocating breech-block carried by one of the separable sections of said firearm, a closing spring carried by the other separable section of said firearm, and means for permitting said closing spring and breech-block to be operatively connected simultaneously with the connecting of the two parts of the divided receiver and to be disconnected simultaneously with the separation of said parts.

15. In an automatic repeating take-down firearm, a receiver divided longitudinally to constitute two separable side plates unclosing when assembled the breech mechanism, a reciprocating breech-block carried by one of the separable sections of said firearm, a closing spring carried by the other separable section of said firearm, and means for permitting said closing spring and breech-block to be operatively connected and disconnected simultaneously with and by the act of connecting and disconnecting, respectively, the two separable take-down sections of said arm.

16. In an automatic repeating take-down firearm, a barrel and a stock, a receiver or breech-frame comprising two separable parts, one part being carried by the barrel, the other part being carried by the stock, breech mechanism carried partly by one portion of said breech frame and partly by the other portion of said breech frame, and including a breech-block and hammer carried by that portion of the breech frame connected to the barrel, and a breech-block closing spring and trigger carried by that portion of the breech-frame connected to the stock, and means for connecting and disconnecting said parts of the breech-frame and breech-mechanism, whereby said barrel and stock may be connected and disconnected.

17. In an automatic repeating take-down firearm, a barrel and a stock, a receiver or breech-frame comprising two separable parts, one part being carried by the barrel, the other part being carried by the stock, breech-mechanism carried partly by one portion of said breech-frame and partly by the other portion of said breech-frame, and including a breech-block and hammer carried by that portion of the breech-frame connected to the barrel, and a breech-block closing spring and trigger carried by that portion of the breech-frame connected to the stock, means for connecting and disconnecting said parts of the breech-frame and breech-mechanism, whereby said barrel and stock may be connected and disconnected, and means to limit the forward excursion of the closing spring to permit the parts to be readily connected.

18. In an automatic repeating take-down firearm, a barrel, a stock, a breech-frame or receiver divided longitudinally into two separable sections, the forward extremity of one section projecting beyond the rearward extremity of the other section to reinforce the line of connection of said parts when assembled in operative relation, automatic breech operating mechanism carried by said receiver, part of said mechanism being carried by one of the separable sections of said receiver, the balance of said automatic breech mechanism being carried by the other separable section of the receiver, means for connecting and disconnecting the two separable sections of the receiver, and means for operatively connecting the various operative parts of the automatic breech mechanism by the act of connecting and securing the two separable sections of said receiver in operative position.

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