

No. 875,209.

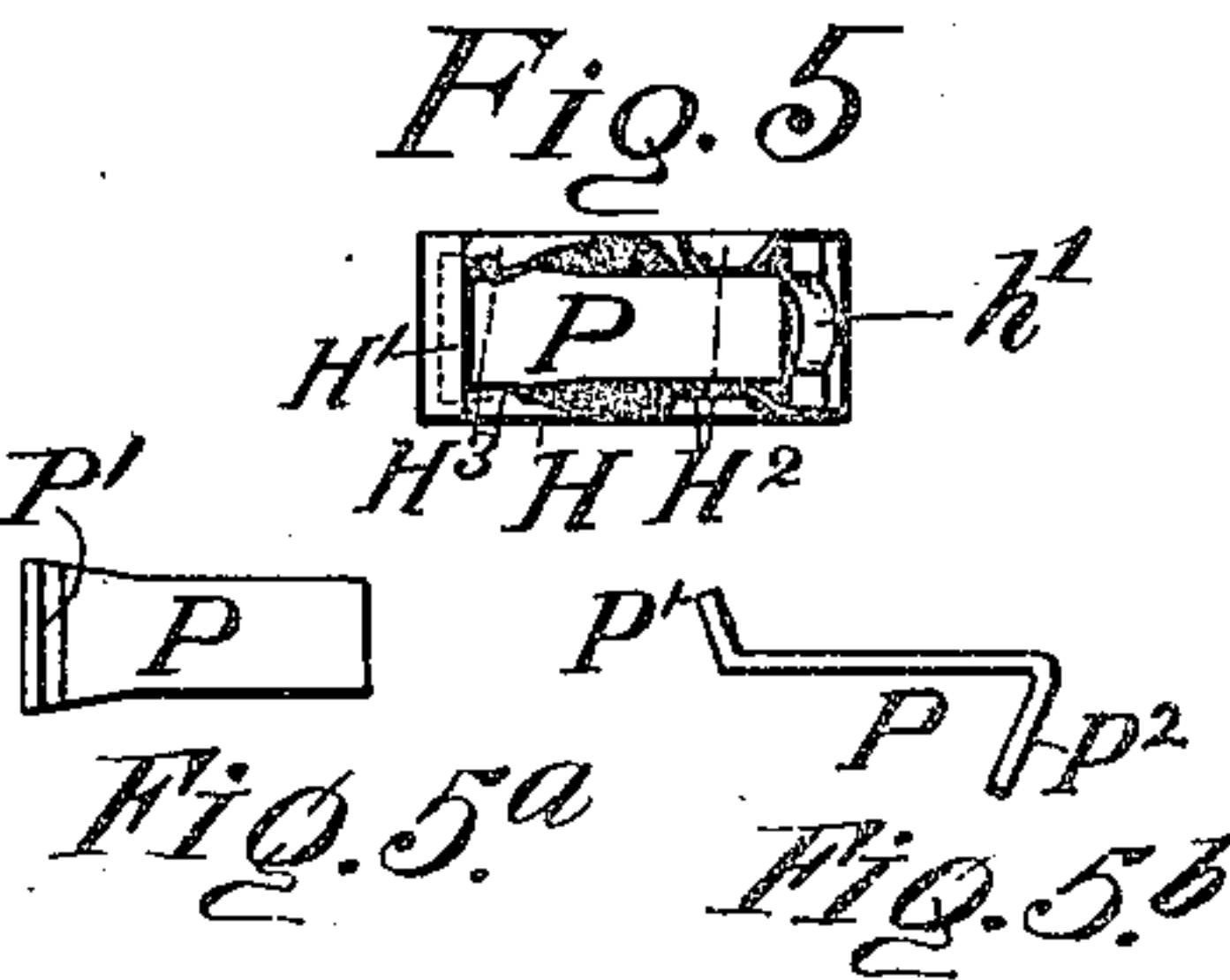
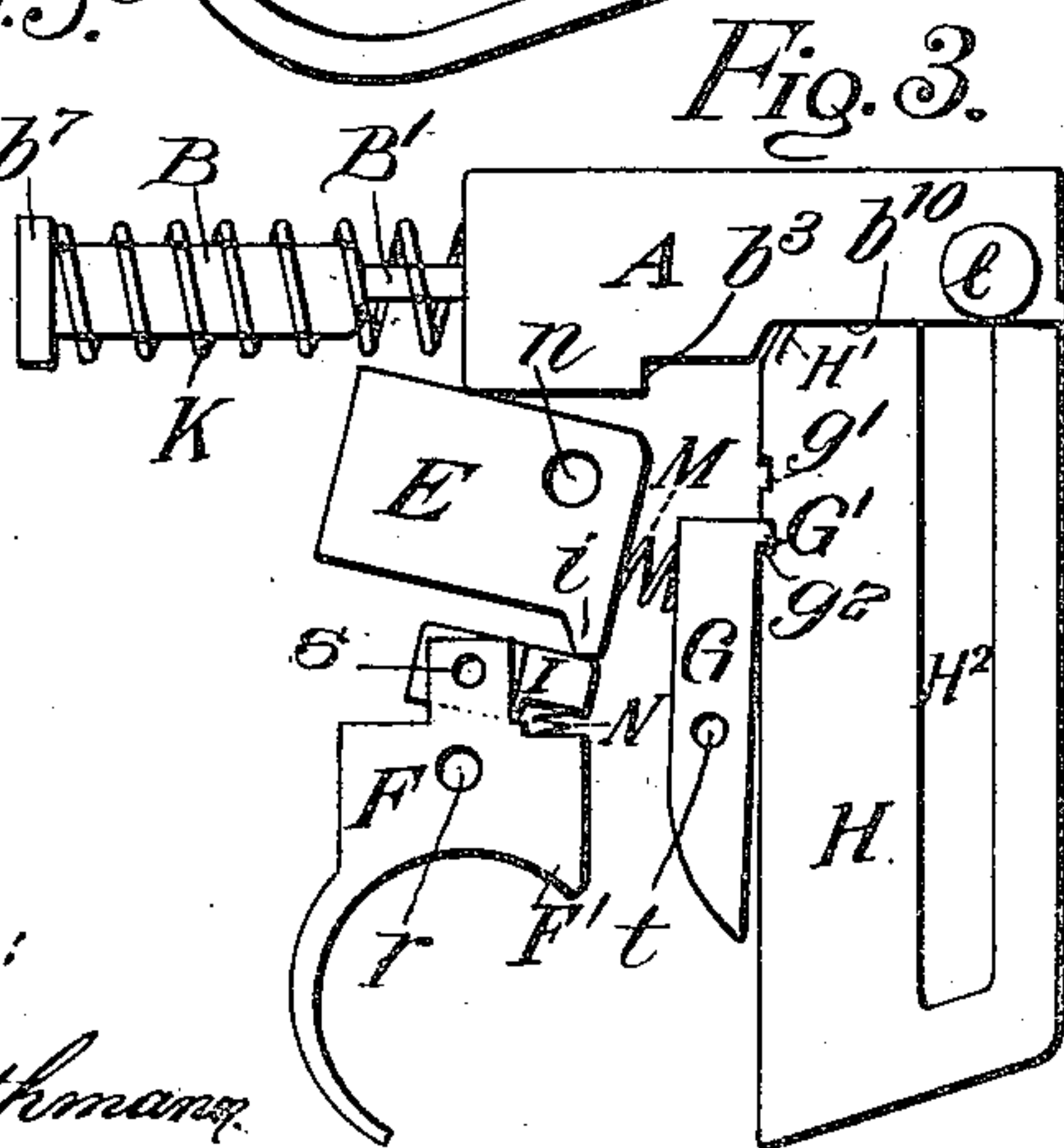
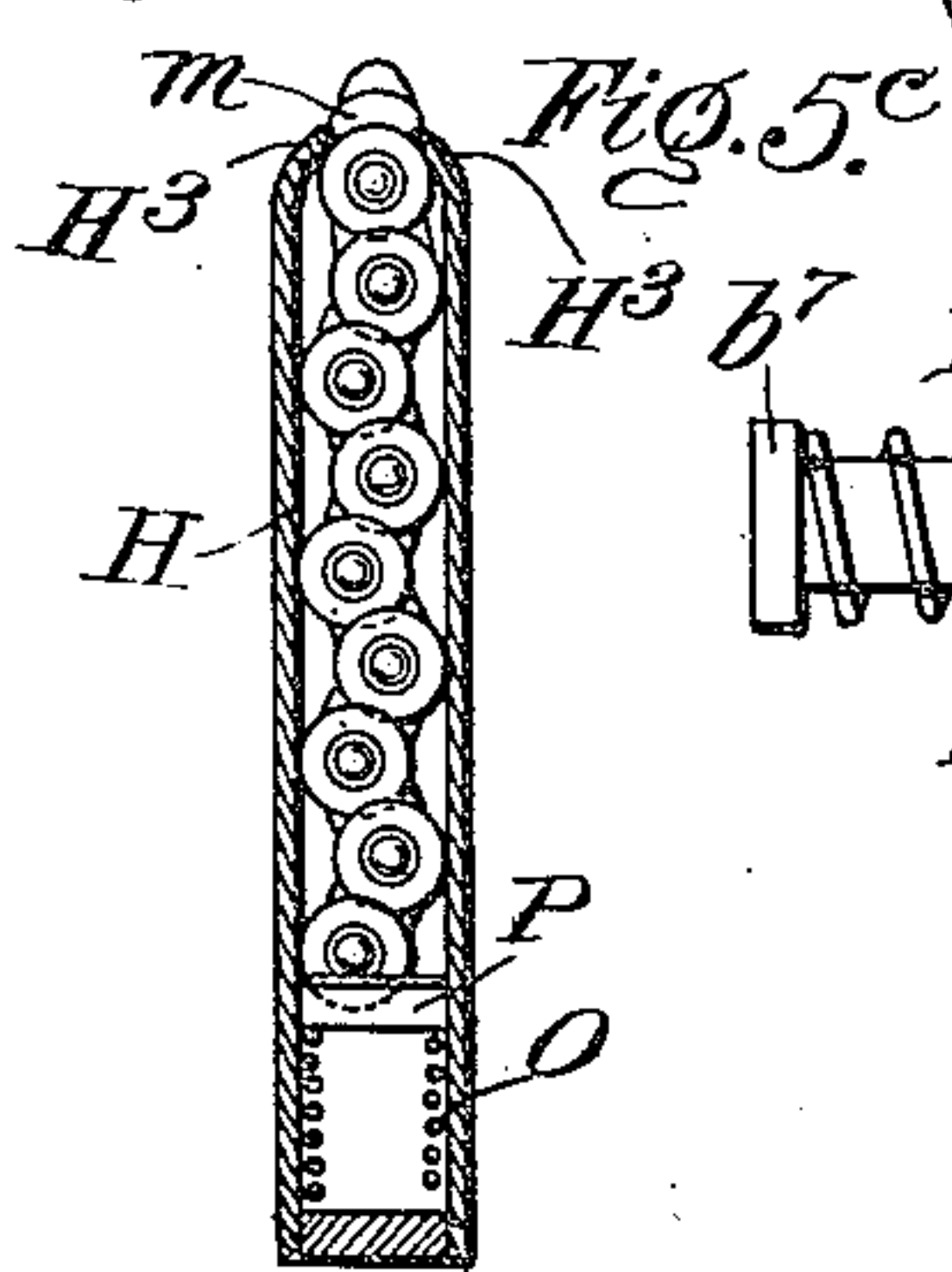
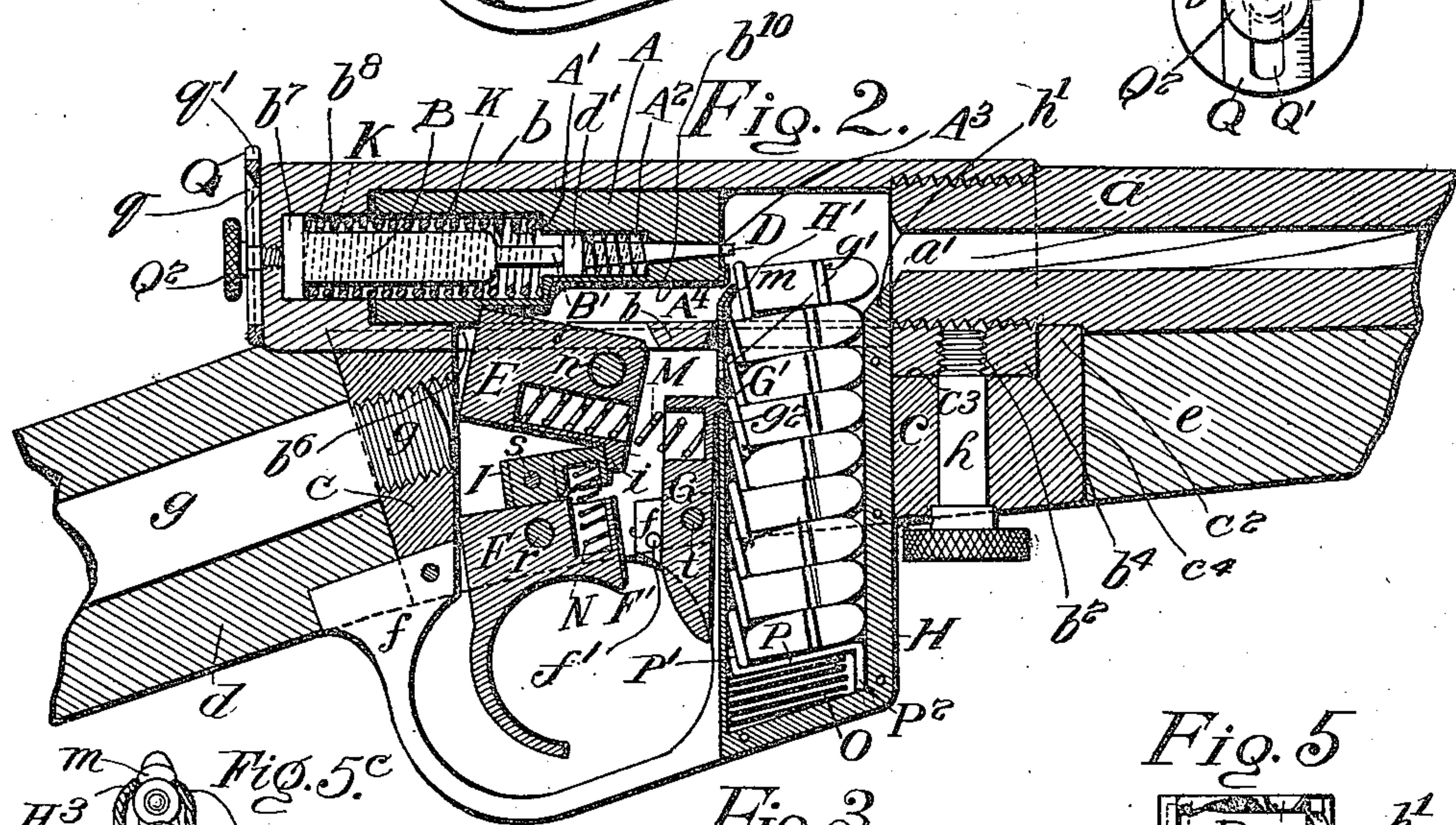
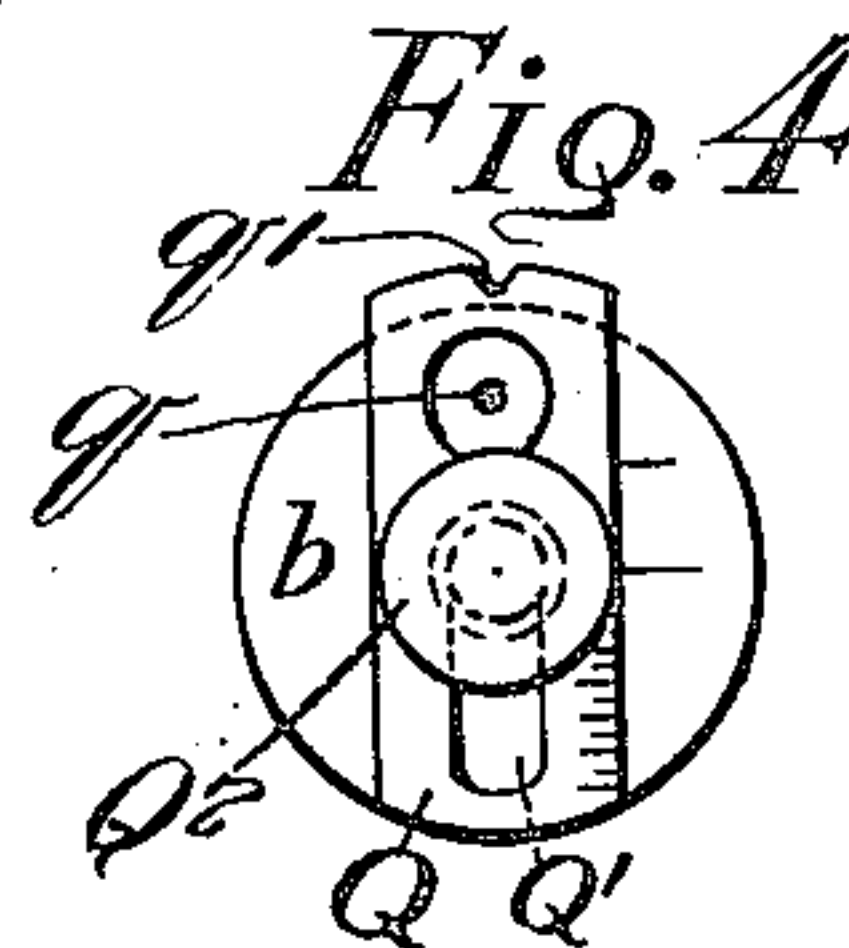
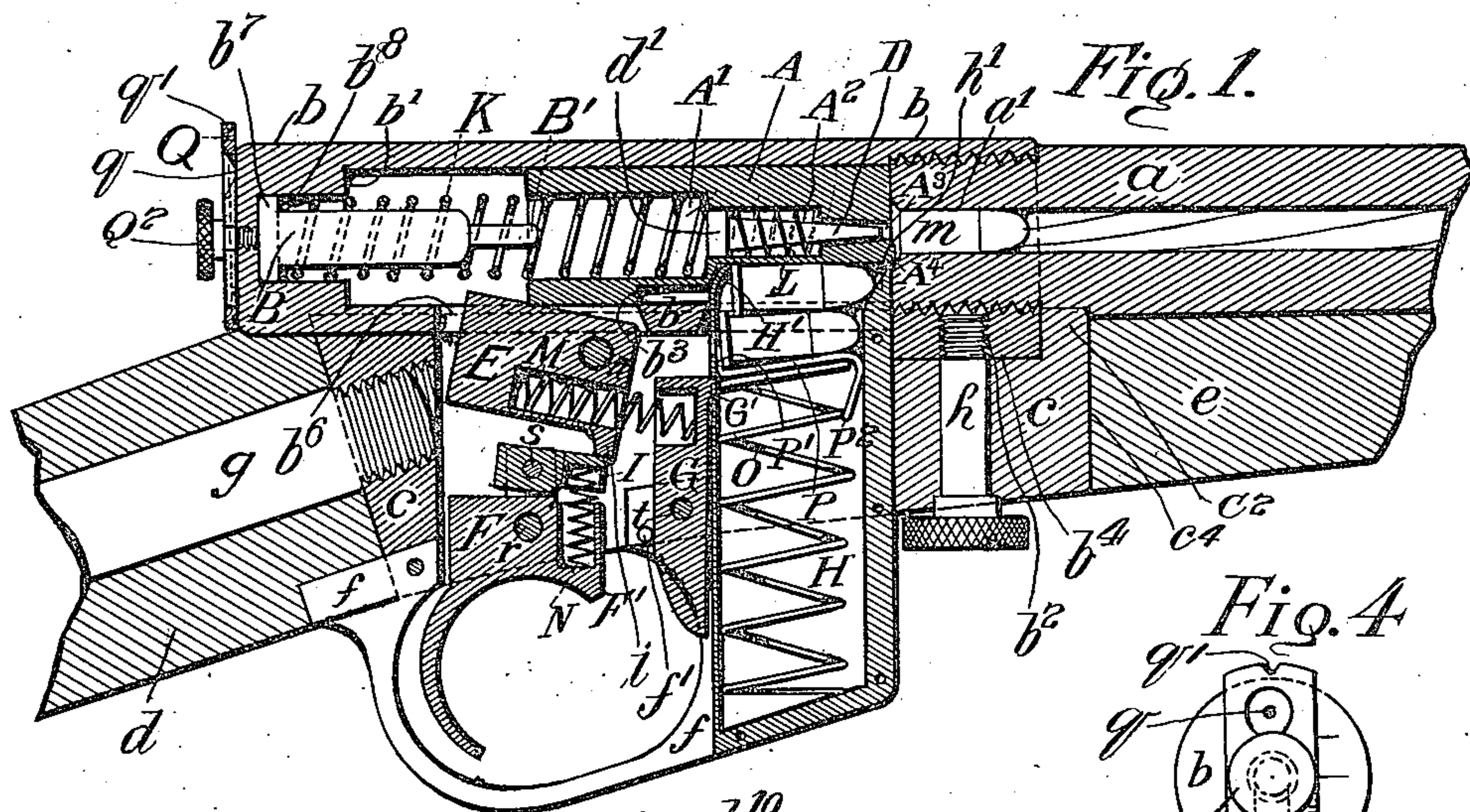
PATENTED DEC. 31, 1907.

C. L. H. PRINKE.

AUTOMATIC FIREARM.

APPLICATION FILED MAR. 28, 1907.

2 SHEETS—SHEET 1.



Witnesses:

Paul J. Gathmann  
C. B. Tranzon

Inventor:  
Carl L. H. Pinker.  
By his Attorneys:  
Baldwin Wright.

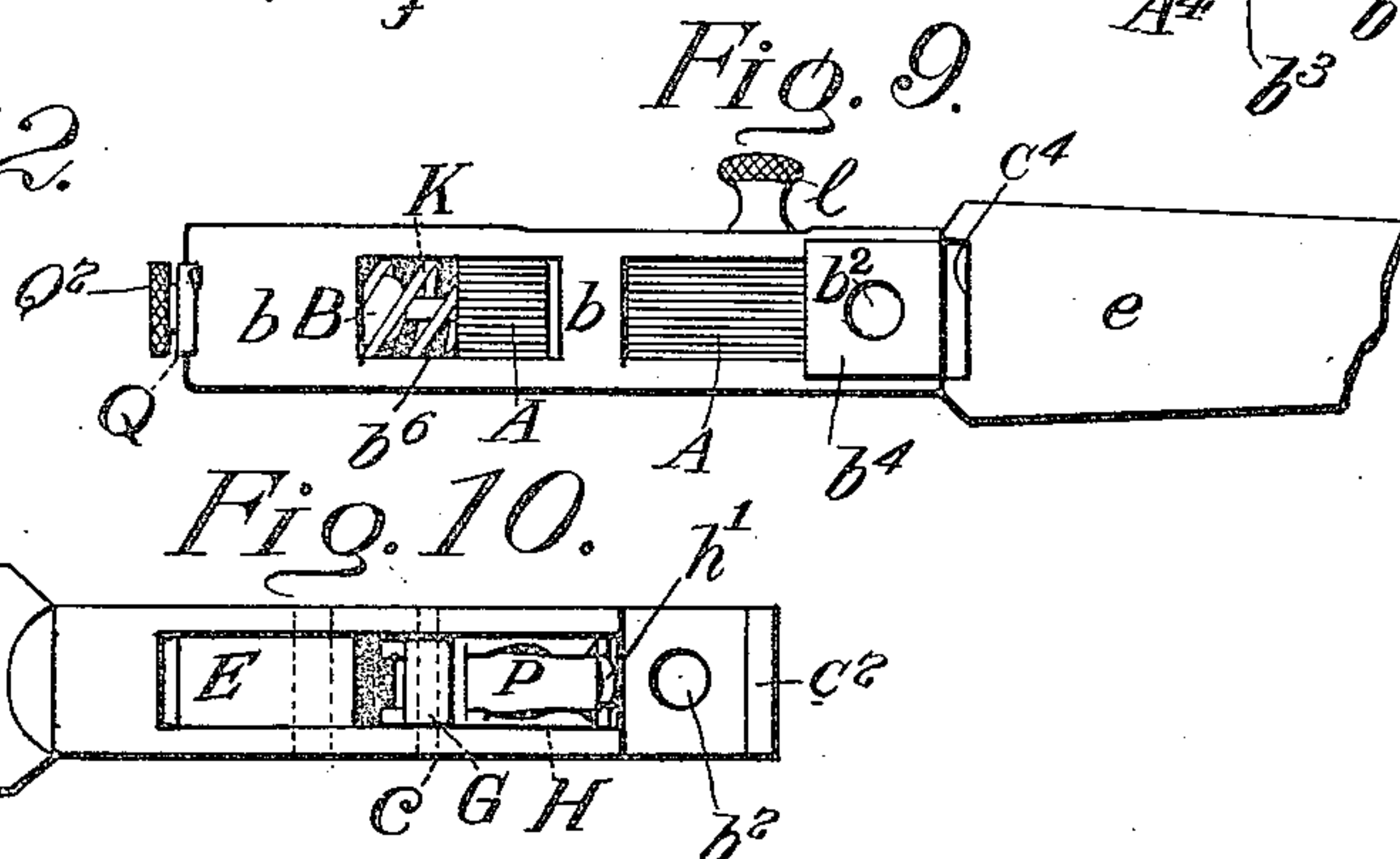
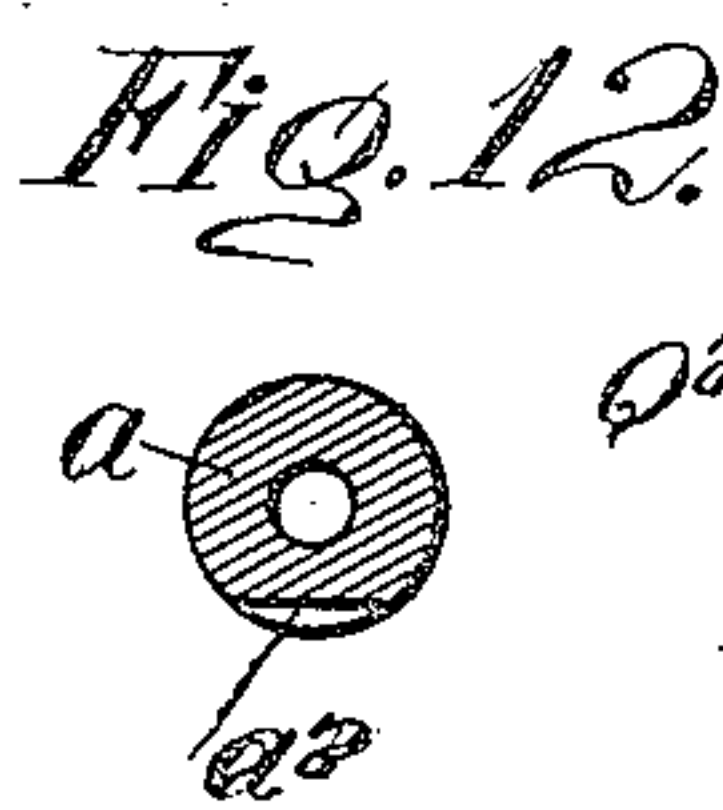
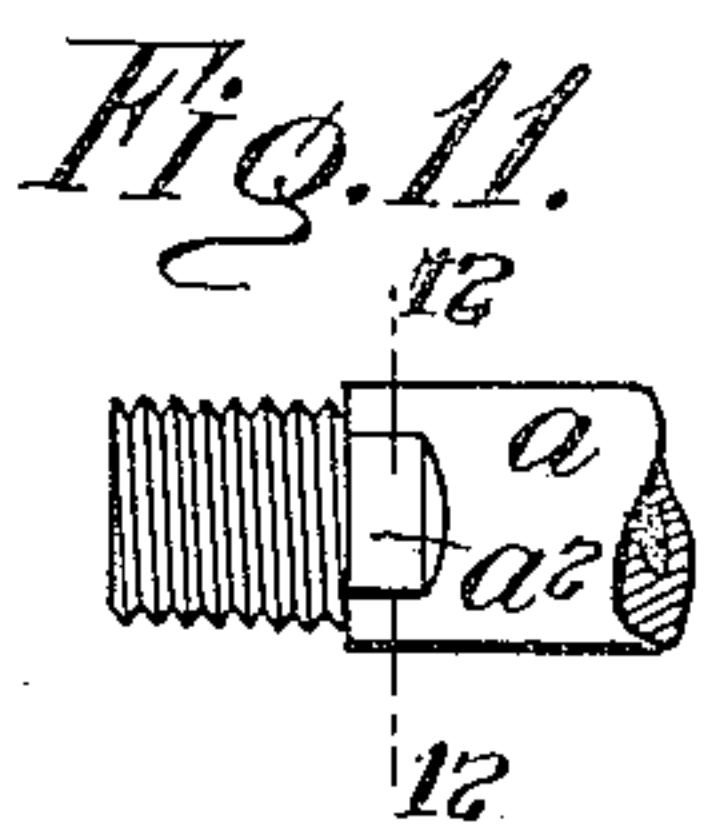
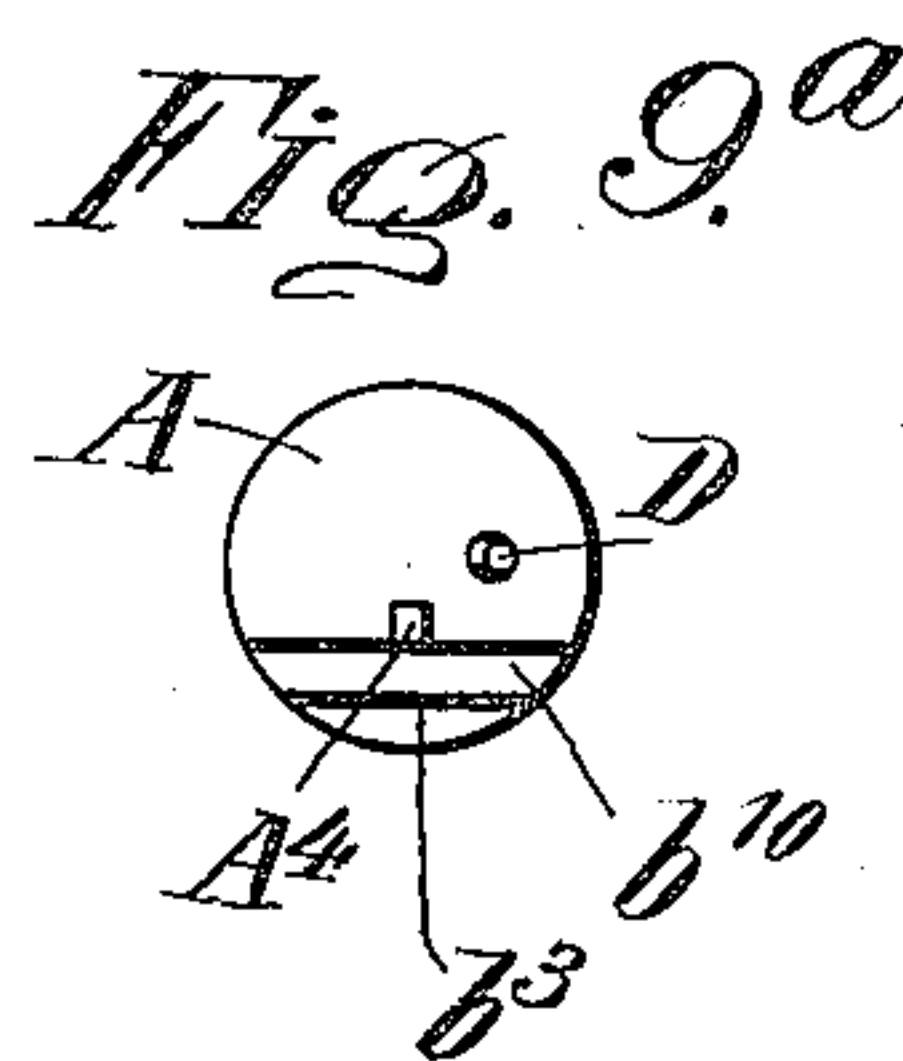
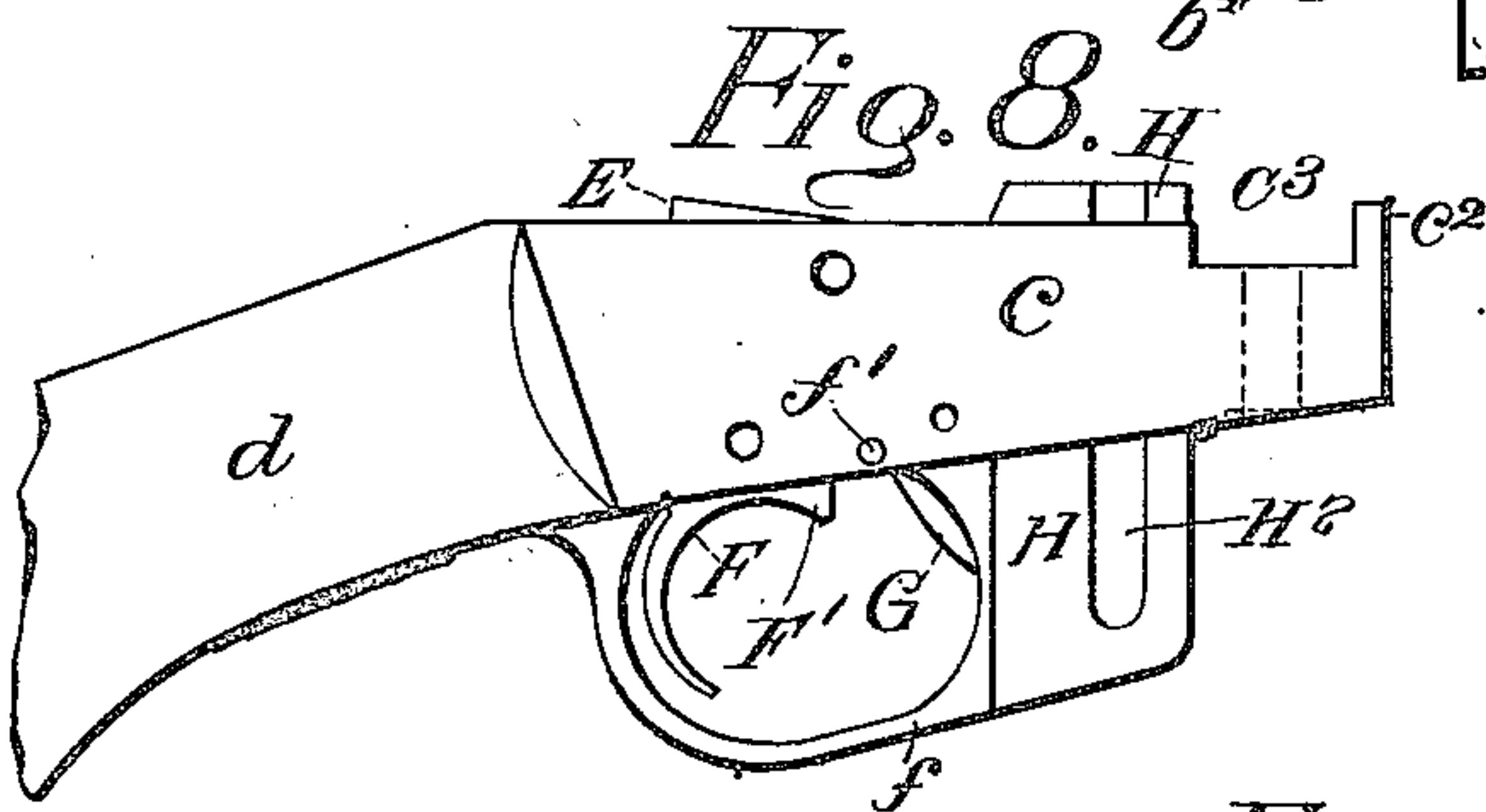
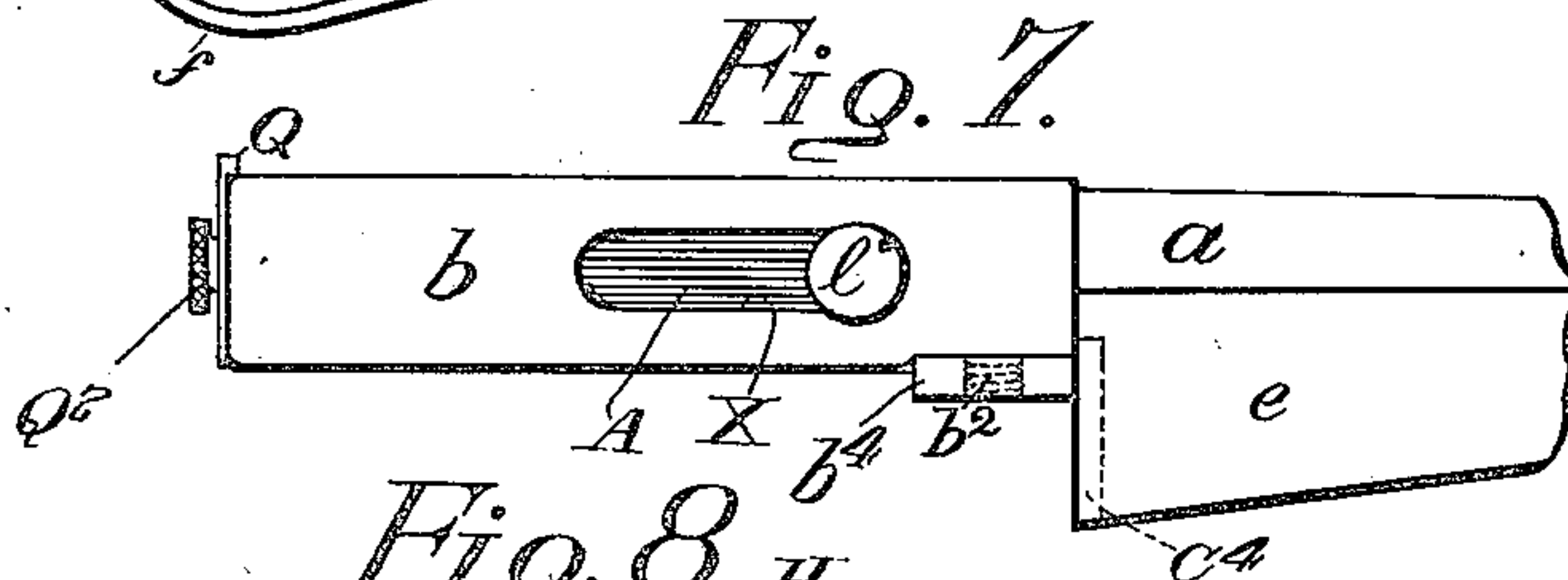
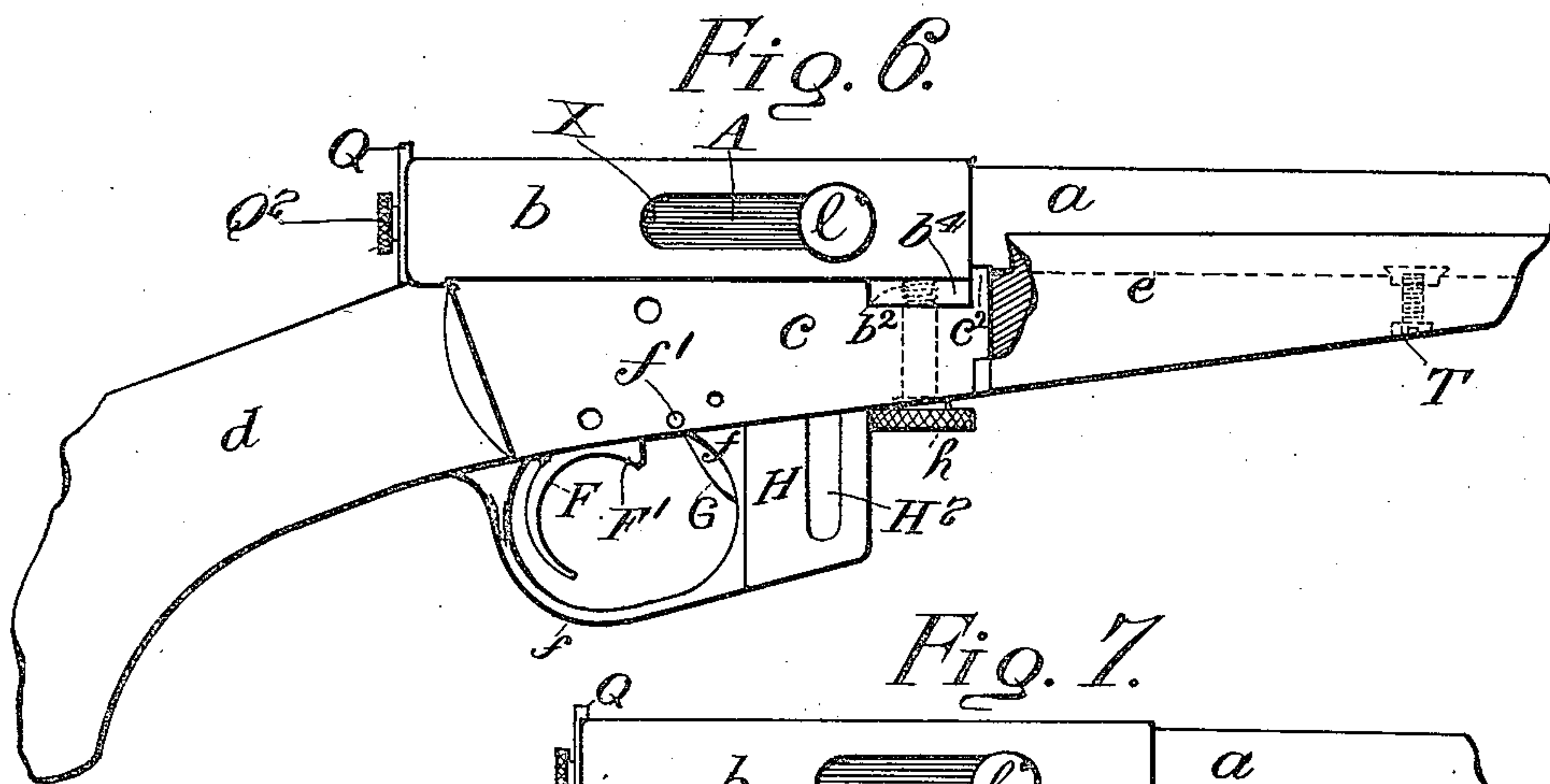


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2 SHEETS—SHEET 2.



*Witnesses.*

Paul J. Gathmann.  
E. D. Franzoni.

*Inventor.*

Carl L. H. Pinke  
By his Attorneys:  
Ransom Wright.



# UNITED STATES PATENT OFFICE.

CARL L. H. PRINKE, OF BALTIMORE, MARYLAND.

## AUTOMATIC FIREARM.

No. 875,209.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed March 28, 1907. Serial No. 364,954.

*To all whom it may concern:*

Be it known that I, CARL L. H. PRINKE, a subject of the Emperor of Germany, residing in the city of Baltimore and State of Maryland, United States of America, have invented certain new and useful Improvements in Automatic Firearms, of which the following is a specification.

This invention relates to that class of firearms in which the force of the expanding gases developed immediately after firing is employed to open the breech, extract and eject the shell, cock the arm and permit the feed of a fresh cartridge. In such arms a fresh load is usually inserted by the breech bolt which immediately moves forward after recoil and the cartridge is exploded by a firing pin carried by and moving independently of the breech bolt.

By my improvements, when the breech bolt moves rearwards after firing, it is cocked in its retracted position and a cartridge is automatically fed from the magazine into the path of the bolt. No independently movable firing pin is used but the breech bolt carries a fixed firing point or spur. When the bolt is unlocked, it moves forward, inserts a cartridge in the cartridge chamber of the barrel and simultaneously fires it. The shell is blown out into the receiver by the explosion gases and it is expelled from the receiver by an ejector carried by the bolt.

My invention involves certain improvements in the mechanism for simultaneously loading and firing, in the trigger or locking mechanism for the bolt, in the magazine or cartridge feed box and in the means for locking the barrel and receiver to the forearm of the piece.

In the accompanying drawings: Figure 1 shows a vertical central section of the breech portion of an automatic fire arm embodying my improvements, some of the interior parts being shown in elevation and these parts being shown in the positions they assume at the moment of firing. Fig. 2 is a similar view showing the parts as they appear when the arm is cocked and ready to load and fire. Fig. 3 shows a side elevation of the working parts of the arm detached from their frames, the parts being shown in the same position as in Fig. 1. Fig. 4 shows a rear elevation of the receiver and a vertically adjustable sight carried thereby. Fig. 5 is a top plan view of the magazine. Fig. 5<sup>a</sup> is a top plan view of the magazine follower. Fig. 5<sup>b</sup> shows

a side elevation of the follower. Fig. 5<sup>c</sup> shows a vertical section through the rear portion of the magazine. Fig. 6 shows a side elevation of the arm with part of the barrel and butt stock broken away. Figs. 7 and 8 show the receiver and barrel separated from the frame carrying the magazine and trigger mechanism. Fig. 9 is a bottom plan view of the parts shown in Fig. 7. Fig. 9<sup>a</sup> is a front view of the firing bolt. Fig. 10 is a top plan view of the parts shown in Fig. 8. Fig. 11 is a detail view of the breech end of the barrel and Fig. 12 shows a vertical section on the line 12—12 of Fig. 11.

The tubular receiver, *b*, is connected with the barrel, *a*, by a threaded joint and it is provided with a threaded socket, *b*<sup>2</sup>, to receive the assembling screw, *h*. The frame, *c*, has the usual shank, *g*, connecting it with the butt stock, *d*, and a recess, *c*<sup>3</sup>, to receive the boss, *b*<sup>4</sup>, in which the socket, *b*<sup>2</sup>, is located and it has a lug, *c*<sup>2</sup>, formed with a flat top and which enters a recess, *c*<sup>4</sup>, in the rear end of the forearm. The barrel, *a*, has a flattened part, *a*<sup>2</sup>, just in front of its threaded portion with which the top of the lug, *c*<sup>2</sup>, engages when the parts are locked together.

The parts are secured together by means of the assembling screw, *h*, in the manner indicated, that is to say, the assembling screw extends vertically through the front portion of the frame, *c*, and engages the socket, *b*<sup>2</sup>, of the receiver. When the parts are thus assembled the top of the lug, *c*<sup>2</sup>, bears against the flat portion, *a*<sup>2</sup>, of the barrel and prevents it from turning and the lug, *c*<sup>2</sup>, and that part of the frame, *c*, below the lug is held tightly in its socket, *c*<sup>4</sup>. A screw, *T*, is employed to attach the barrel to the forearm, *e*, in the usual way. The barrel can be detached from the receiver when they are removed from the frame by merely loosening the assembling screw and when the barrel is removed the front end of the receiver is fully opened so that the firing bolt and other working parts associated therewith can be removed through the front of the receiver, thus enabling me to have a solid or integral rear end for the receiver. It will be observed that the shock of recoil is not taken by the assembling screw but by the frame as the boss *b*<sup>4</sup> fits the recess, *c*<sup>3</sup>, in the frame closely and relieves the screw from the shock or strain of recoil. A shoulder, *b*<sup>1</sup>, is formed near the rear end of the receiver and in rear of this shoulder is a socket, *b*<sup>3</sup>, for a purpose



hereinafter described. The breech bolt, or as I call it, the firing bolt, A, is mounted to slide back and forth in the receiver in line with the barrel and it carries at its front end  
 5 a fixed firing spur, pin or projection, A<sup>4</sup>, located below its axis. The firing bolt is hollow, being formed with three chambers, A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup>, of different diameters, the latter chamber being made to extend through the  
 10 front end of the firing bolt. An action spring or firing spring, K, has its front end arranged in the rear chamber, A<sup>1</sup>, of the firing bolt and it extends back into the socket, b<sup>8</sup>, in which is also arranged the action spring  
 15 guide, B, carrying on its front end an ejector operating pin, B'. The head, b', of the guide, is pressed at all times firmly against the rear wall of the socket, b<sup>8</sup>, and the action spring tends to move the firing bolt toward the  
 20 breech of the barrel.

D indicates an ejector which is guided in the chamber, A<sup>2</sup>, and extends through the chamber, A<sup>3</sup>. When operating to eject a shell, it projects beyond the front end of the  
 25 firing bolt, but is at other times retracted by a relatively light spring, L, which is interposed between the front wall of the chamber, A<sup>3</sup>, and the head, d', of the ejector. The head of the ejector bears against the front  
 30 coil of the action spring which holds it normally in the position shown in Fig. 1, where the relative positions of the firing bolt and the ejector are shown as they appear at the moment of firing, while in Fig. 2 they are  
 35 shown in the positions they assume soon after firing, *i. e.*, after recoil, where it will be observed that the springs, K and L, are compressed and the ejector protrudes from the front of the firing bolt.

It will be observed that the bolt is advanced by the combined pressures of both springs, K and L, and that both springs serve to brake the recoil. By causing the front coil of the spring, K, to bear against  
 45 the rear end of the ejector when the breech is closed the ejector is prevented from falling out should the gun be held in a vertical position with its butt stock lowermost. The front end of the ejector is arranged a little to  
 50 one side of the axis of the bolt so as to strike the rear end of the shell at one side of its axis. This causes the shell to be ejected in the manner hereafter described. On its under side, the firing bolt is formed with a  
 55 shoulder, b<sup>3</sup>, with which the sear, E, engages, and it is formed also on its under side near the front of the recess, b<sup>10</sup>, to permit it to pass over the top of the magazine, H. A side opening, X, is formed in the receiver through  
 60 which extends a handle, I, which projects laterally from one side of the firing bolt and by means of which the bolt may be retracted by hand, if desired. This handle serves to prevent the bolt from turning and serves  
 65 also to retain the bolt in the receiver when

the arm is taken apart. By detaching the handle from the firing bolt, the latter may be easily removed from the receiver.

The magazine or cartridge box, II, is closed at the bottom and on all sides, but is  
 70 open at the top. Its sides, which are of sheet metal, are grooved to form corresponding vertical ribs, II<sup>2</sup>, in the front portion of the box which serve to hold the front ends  
 75 of the cartridge in line one above the other. The rear portion of the box is sufficiently wide to allow of the cartridges being staggered in the manner illustrated in Fig. 5<sup>c</sup>. At the top of the magazine an overhanging,  
 80 forwardly projecting lip, H', is formed on the rear wall and just in front of this lip on opposite sides, lips, H<sup>3</sup>, are formed which prevent the rear end of the top cartridge from rising out of the magazine until it has been  
 85 moved forward by the firing bolt.

The upper edge of the front wall of the magazine is beveled or inclined at h', for the purpose of elevating the front end of the top  
 cartridge to facilitate its passage to the cartridge chamber, a', which is flared as shown  
 90 for a similar purpose. The forwardly projecting lip, H', coöperates with the inclined surface, h', in the following way. As the topmost cartridge in the magazine rises after the recoil of the firing bolt, it is held by the  
 95 lip a little in advance of the others below it with its front end above the inclined surface, h', so that the tendency of the front end of the cartridge to lower into the magazine is prevented. The front end of the cartridge  
 100 under such circumstances will be received by the inclined surface and as the firing bolt moves forward the front end of the cartridge will rise on the incline and enter the barrel. Were it not for this the front end of the car-  
 105 tridge might be depressed to such an extent in the magazine as to become caught in the front wall thereof. The magazine or box, H, is detachably connected with the frame of the arm by means of a spring catch, G,  
 110 pivoted near its middle portion at t and having a tooth, G', above its pivot arranged to engage either of two recesses, g', g<sup>2</sup>, in the rear wall of the box. When the tooth engages the notch, g', the magazine is held be-  
 115 low its feeding position, but when the tooth engages the notch, g<sup>2</sup>, the magazine is held in feeding position and will automatically feed cartridges to the receiver and hold them in  
 120 position to be carried to the cartridge chamber of the barrel by the firing bolt.

The magazine spring, O, is of usual construction and operates in conjunction with a  
 follower, P, which is formed at its rear end with an upwardly projecting rearwardly in-  
 125 clined arm, P', and at its front end with a downwardly projecting rearwardly inclined arm, P<sup>2</sup>. The arms, P' and P<sup>2</sup>, are arranged to bear against the rear and front walls respectively of the magazine. The rear end of  
 130



the bottom cartridge in the magazine lies against the front of the arm,  $P'$ , and this arm, after the last cartridge is fed, strikes the overhanging lip,  $H'$ , at the top of the magazine. The arm,  $P^2$ , prevents the follower from being ejected from the magazine after the last cartridge has been fed. It will be understood that the rear end of the follower cannot leave the magazine by reason of its engagement with the lips,  $H'$  and  $H^2$ , but there are no corresponding lips at the front end of the magazine and the follower tends to rise therefrom but in doing so it swings about an axis coincident with the rear portion of the follower and the arm,  $P^2$ , strikes and binds against the front wall of the magazine and is thus prevented from rising to any great extent.

The sear,  $E$ , is pivoted to the frame at  $n$ , and its upper rear end operates through an opening,  $b^6$ , in the bottom of the receiver and engages at times the shoulder,  $b^3$ , of the firing bolt. The sear spring,  $M$ , engages the catch,  $G$ , above its pivot,  $t$ , and therefore serves the double purpose of pressing the sear into engagement with the firing bolt and holding the catch in engagement with the magazine. It will be observed that the lower end of the catch,  $G$ , is within the trigger guard,  $f$ , in convenient position for being operated by the trigger finger, which, in releasing the catch, moves forward. A stop,  $f'$ , limits the rearward movement of the lower end of the catch. The trigger,  $F$ , is pivoted to the frame at  $r$ , below the sear and it carries a spring pawl,  $I$ , pivoted to the trigger at  $s$ , and adapted to engage a lug,  $i$ , on the lower front side of the sear below its pivot. A spring,  $N$ , interposed between the trigger and the front end of the pawl tends to cause such engagement. When the parts are in the position shown in Fig. 1, the arm is ready to be cocked. When the firing bolt moves rearwards, the sear is depressed in the usual way and then engages the shoulder,  $b^3$ , but in the arrangement shown, the pawl,  $I$ , does not immediately enter behind the lug,  $i$ . It is first necessary to press against the front end,  $F'$ , of the trigger. This causes the pawl to engage behind the lug,  $i$ , and the arm is then cocked, set and ready for firing and the parts will appear as illustrated in Fig. 2. When the trigger is pulled, the sear is swung on its pivot, releasing the firing bolt and the pawl,  $I$ , moves from behind the lug,  $i$ , of the sear and the parts assume the position shown in Fig. 1. By this arrangement it will be observed that the firing bolt may move back to its cocked position while the trigger finger is still on the trigger and while the sear engages the firing bolt and cocks it, the arm is not in firing condition until after the trigger is moved a short distance forward.

It will be observed that the arm is en-

tirely automatic, it being necessary only to operate the trigger to fire the entire charge of cartridges in the magazine. When the arm is in firing condition, as indicated in Fig. 2, and the trigger is pulled, the firing bolt moves forward, the point  $A^4$ , engages the upper, rear end of the top cartridge,  $m$ , in the magazine, first shoves it against the incline,  $h'$ , and then into the cartridge chamber,  $a'$ . It will be observed that the lip,  $H'$ , causes the top cartridge to move slightly forward before it is struck by the bolt and that the point,  $A^4$ , operates just above the lip. As the bolt moves forward after engaging the cartridge, the latter centers itself into line with the axis of the barrel, its rear end sliding up across the face of the pin. Immediately after the cartridge is thus inserted, it is fired by the further advance of the bolt. The force of the gases developed by the explosion causes the firing bolt to retract to its cocked position and it is immediately engaged by the sear while the shell is also at the same time extracted or is driven into the receiver chamber and the ejector,  $D$ , advances from the front of the firing bolt, strikes the shell and expels it through the opening,  $X$ , at the side of the receiver. A cartridge then rises to the top of the magazine into position in front of the lip,  $H'$ , to be engaged by the firing bolt on its next forward movement. After firing and cocking in the manner described, the pawl,  $I$ , is set by moving the trigger forwards and then the arm may be again fired and the operation before described will be repeated.

Inasmuch as there are no parts projecting from the rear end of the receiver, I have attached thereto a vertically adjustable sight,  $Q$ , which has a peep hole,  $q$ , and a top notch,  $q'$ . The sight,  $Q$ , is in the form of a plate having a slot,  $Q'$ , through which extends a clamping screw,  $Q^2$ , engaging the rear end of the receiver.

It will be observed that the firing bolt does not move back fully to the rear end of the receiver but is arrested by the shoulder,  $b'$ , thus permitting me to use more metal at the rear end of the receiver to receive the shock of recoil.

The arm may conveniently be used as a single loader, the cartridges being inserted through the opening,  $X$ .

The arm is easily cleaned as there are but few parts, and these are largely loose and readily detached. The firing bolt, the action spring, the action spring guide, the ejector, its spring, the sear spring, and the pawl spring,  $N$ , are all loose and can be readily taken out and cleaned. The barrel can be detached from the receiver and the firing bolt and parts associated therewith can all be easily withdrawn through the front end of the receiver. This is done by detaching the magazine, loosening the as-



sembling screw and then unscrewing the barrel.

I claim as my invention:

1. An automatic firearm, comprising a receiver, a magazine for automatically feeding cartridges thereto, a firing bolt adapted to engage a cartridge in the receiver on its forward movement to feed it to the cartridge chamber of the barrel and to fire it and which bolt is provided with a spring for advancing it but which is free to recoil by the pressure of gases developed immediately after firing, an ejector carried by but movable independently of the firing bolt, means for automatically cocking the bolt on its recoil and devices for releasing the bolt.

2. An automatic firearm, comprising a receiver, a firing bolt therein, a spring tending to move the firing bolt forwards, a firing point fixed to the firing bolt, trigger mechanism for cocking and releasing the bolt, an ejector carried by the firing bolt, means for withdrawing the ejector into the bolt as the latter moves forward and means for projecting the ejector from the front end of the firing bolt when the latter reaches the limit of its rearward movement.

3. An automatic firearm, comprising a receiver, a magazine connected therewith and feeding thereto, a firing bolt reciprocating in the receiver having a firing point adapted to engage the topmost cartridge in the magazine and feed it to the barrel on its forward movement and to simultaneously fire it, an ejector carried by and movable independently of the firing bolt, a sear for automatically cocking the bolt when it reaches the limit of its rearward movement, and trigger mechanism for releasing the sear.

4. The combination of a receiver, a firing bolt reciprocating therein, a spring tending to move the bolt forwards, an ejector mounted eccentrically within the bolt and adapted to protrude from the front end thereof, a spring for retracting the ejector when the bolt is in its forward position, and means for causing the ejector to protrude from the bolt when the latter reaches its retracted position.

5. The combination with the barrel of a tubular receiver detachably connected therewith and having a solid or integral rear end provided with a shoulder near its rear end and a socket in the rear of said shoulder, a reciprocating firing bolt of less diameter than the front end of the receiver, an action spring engaging the firing bolt and having its rear end arranged in said socket at the rear end of the receiver, and an action spring guide loosely arranged within the receiver having its rear end in said socket, said bolt, spring and guide being removable through the front end of the receiver when the latter is detached from the barrel.

6. The combination of a tubular receiver,

a hollow firing bolt arranged to reciprocate therein and carrying a firing-point below the axial line, a sliding ejector carried eccentrically by the bolt at its front end above the plane of the firing-point, a spring tending to move the ejector rearwards relatively to the firing bolt, an action spring engaging the receiver at its rear end and pressing against the rear end of the ejector when the ejector is in its rearmost position and means for moving the ejector forward and compressing its spring when the firing bolt recoils, the arrangement being such that both the action spring and the ejector spring serve to brake the recoil of the firing bolt.

7. The combination of a barrel, a receiver in rear thereof, a firing bolt in the receiver reciprocating in line with the barrel, means for cocking the bolt, a trigger for firing the arm and a magazine cartridge box arranged in front of the trigger containing a spring-pressed follower and comprising vertical side walls formed with inwardly projecting lips at the top for limiting the upward movement of the cartridges, a vertical front wall formed with an inclined upper edge arranged close to and leading directly to the cartridge chamber of the barrel and a rear wall formed with a forwardly projecting lip which as the cartridges rise in the box causes the topmost cartridge to move forward and assume a position in line with the lower portion of the firing bolt with its front end above but close to the inclined surface on the front wall of the box.

8. The combination of the barrel, the receiver, a magazine having a beveled or inclined front wall at the top, an inturned top lip at the rear, and a reciprocating firing bolt carrying a forwardly projecting firing point below its axial line which engages the topmost cartridge in the magazine, feeds it to the barrel and fires it.

9. The combination of the receiver, the barrel having a threaded connection therewith, a boss on the receiver having a threaded socket for the assembling screw, the frame provided with a recess to receive the boss on the receiver, and an assembling screw for connecting the parts.

10. The combination of the receiver having an integral rear end, the barrel having a threaded connection with the receiver, the firing bolt removable through the front end of the receiver when the barrel is detached, a boss on the receiver having a threaded socket for the assembling screw, the frame provided with a recess to receive the boss and an assembling screw for connecting the parts.

11. The combination of the receiver, the barrel having a threaded connection therewith, a boss on the receiver having a threaded socket for the assembling screw, the forearm having a vertical socket at its rear end, the frame provided with a recess to receive



the boss on the receiver and formed with a lug entering the socket in the forearm and an assembling screw for connecting the parts.

12. The combination of the receiver and  
5 the barrel having a threaded connection  
therewith and provided with a flat surface in  
advance of its threaded portion, a boss on the  
receiver having a threaded socket for the as-  
sembling screw, the forearm having a verti-  
10 cal socket at its rear end, the frame provided  
with a recess to receive the boss on the re-

ceiver and formed with a lug entering the  
socket in the forearm and having a flat top  
surface engaging the flattened surface of the  
barrel and an assembling screw for connect- 15  
ing the parts.

In testimony whereof, I have hereunto  
subscribed my name.

CARL L. H. PRINKE.

Witnesses:

SAMUEL J. FISHER,

ALLAN HERBERT FISHER.