

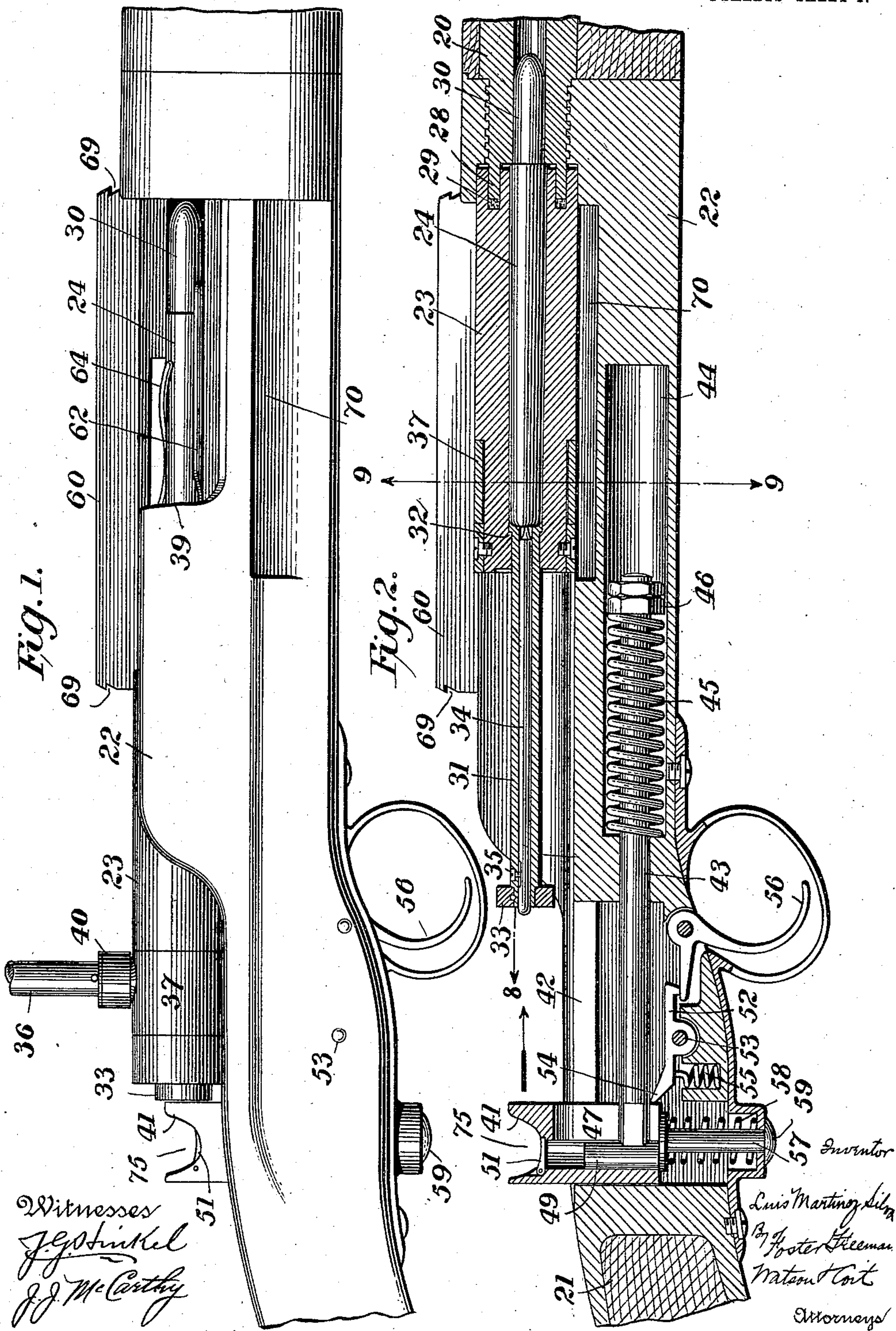
L. M. SILVA.  
FIREARM.

APPLICATION FILED MAY 7, 1908.

Patented Sept. 6, 1910.

4 SHEETS—SHEET 1.

969,500.



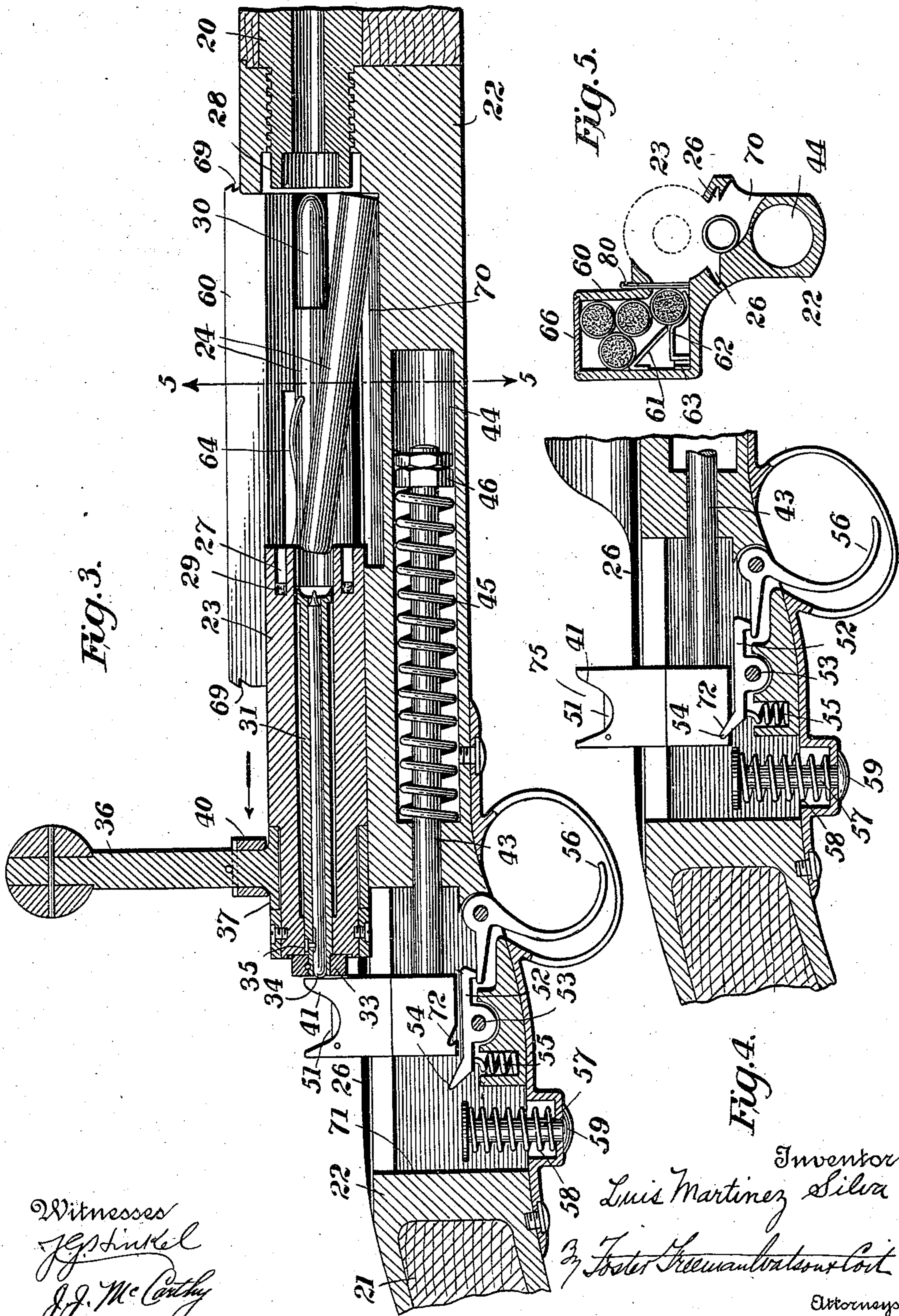


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Witnesses  
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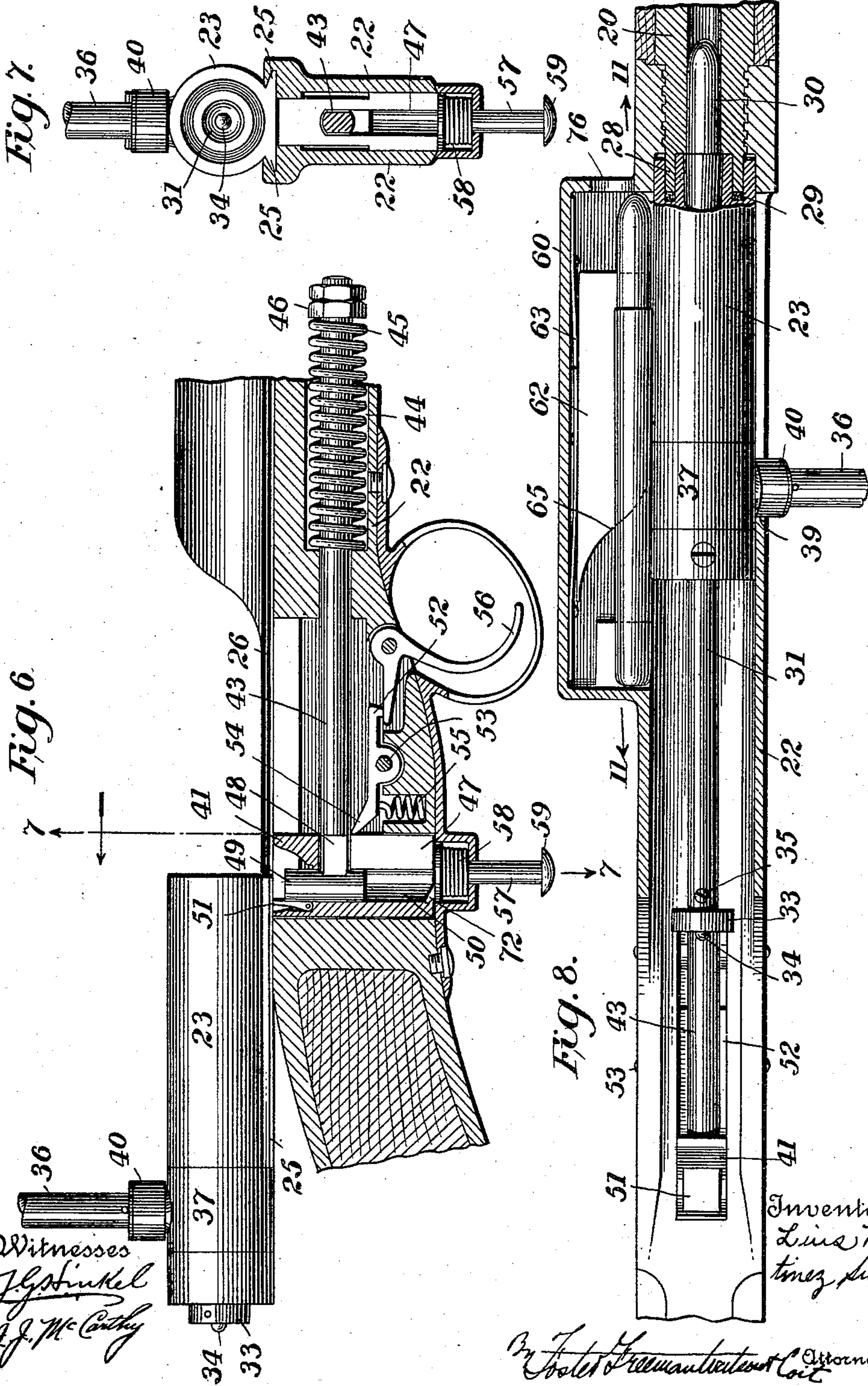
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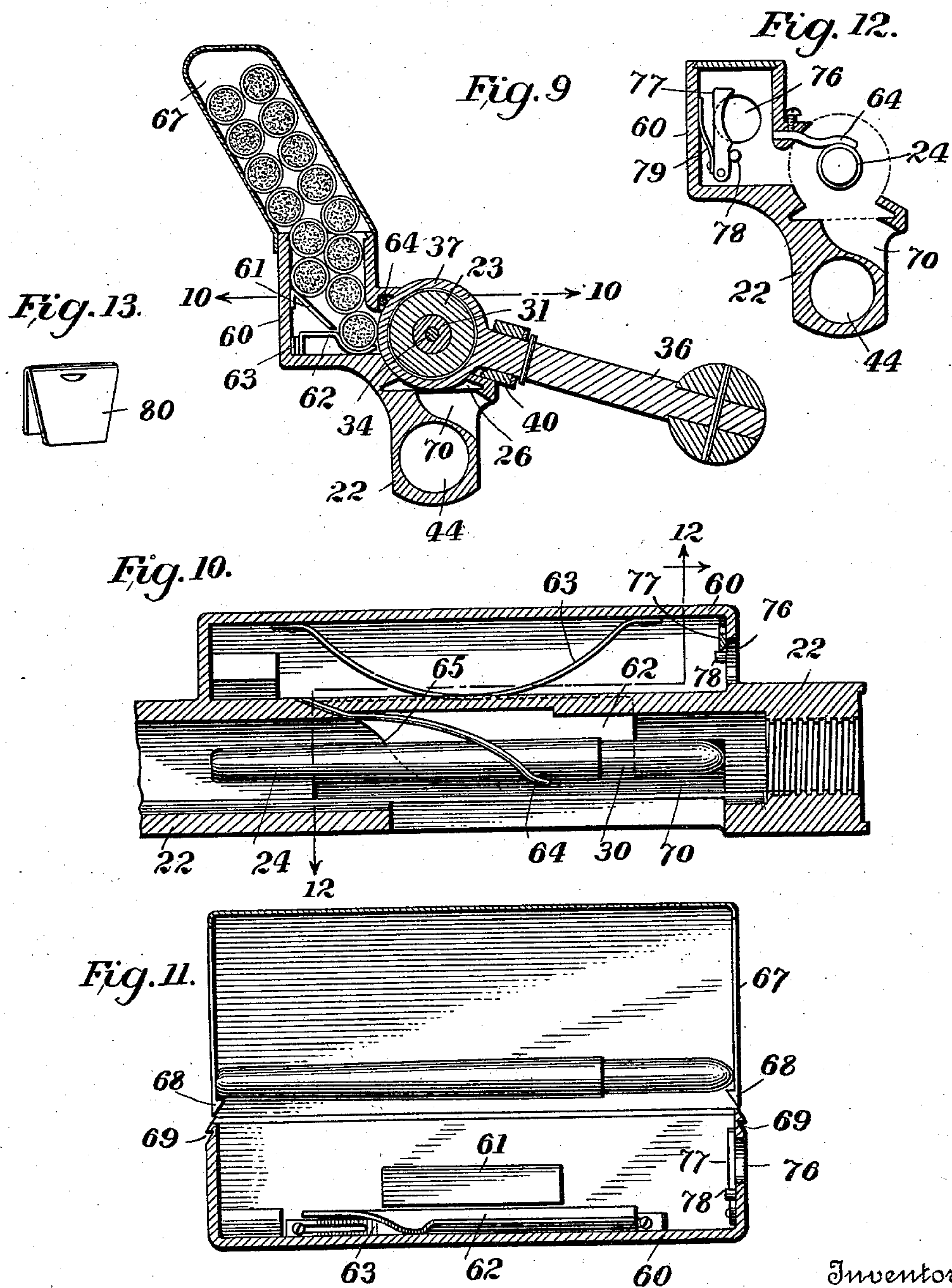




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# UNITED STATES PATENT OFFICE.

LUIS MARTINEZ SILVA, OF BOGOTA, COLOMBIA.

## FIREARM.

969,500.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed May 7, 1908. Serial No. 431,364.

*To all whom it may concern:*

Be it known that I, LUIS MARTINEZ SILVA, a citizen of Colombia, and resident of Bogota, Colombia, have invented certain new and useful Improvements in Firearms, of which the following is a specification.

This invention comprises various improvements in breech loading fire arms, the same being applicable to rifles and guns of both smaller and larger size and caliber. The improvements include a breech block which is arranged to slide longitudinally in the gun and means for automatically feeding cartridges into the forward end of the breech block and for automatically discharging the empty shells. The breech block fits closely to the rear end of the gun barrel and it sustains practically the entire shock of the explosion in firing. Any injury which may result from the explosion is thus imparted to the breech block, which can be readily renewed, and the rifle barrel is preserved indefinitely. Owing to the fact that the breech block mainly sustains the shock and strain of the explosions, the barrel may be made lighter than is customary. The effective length of the barrel and the range of the gun are increased since only the projectile enters the barrel, whereas in fire arms commonly used the entire cartridge enters the rear end of the barrel. As the cartridge shells are pushed, and not pulled, out of the breech block, they may be made of paper or other material which is lighter and cheaper than the ordinary metal shells. The manner in which the cartridges are dropped out at the lower side of the gun is also believed to be novel and to be a substantial improvement over ejectors which toss the cartridge in the air.

The invention will be described in detail in connection with the accompanying drawings, in which,

Figure 1 is a side elevation of a rifle embodying the invention the stock and barrel being broken away; Fig. 2 is a vertical longitudinal central section through Fig. 1 showing the parts in firing position; Fig. 3 is a similar sectional view illustrating the position of the parts at the moment the empty shell is ejected; Fig. 4 is a view of certain of the parts shown in Fig. 3, illustrating the firing hammer in safety position or half cocked; Fig. 5 is a transverse

section on the line 5—5 of Fig. 3; Fig. 6 is a section similar to Fig. 2 illustrating the manner of removing the breech block; Fig. 7 is a section on the line 7—7 of Fig. 6; Fig. 8 is a plan view partly in section on the line 8 of Fig. 2, the parts being shown in firing position; Fig. 9 is a section on the line 9—9 of Fig. 2, the breech block being shown in firing position; Fig. 10 is a section on the line 10—10 of Fig. 9 the breech block being removed; Fig. 11 is a section on the line 11—11 of Fig. 8. Fig. 12 is a section on the line 12—12 of Fig. 10; Fig. 13 is a perspective view of the slide for retaining cartridges in the magazine.

While the invention is illustrated as applied to a rifle it is to be understood that the main features of the invention are applicable to the various kinds of small arms and also to rapid-fire guns and ordnance of larger caliber.

Referring to the drawing, 20 indicates the barrel and 21 the stock of a gun, which parts may be of any desired size or form. Connected with the stock and supporting the barrel is a frame 22 suitably formed to support the loading and firing mechanism. This frame may be integral or constructed of two or more parts securely connected together, as may be convenient.

Supported to slide longitudinally of the frame 22 is a breech block 23 which is adapted to hold the shell 24 of the cartridge when the parts are in firing position. The breech block 23 is provided with guide ribs 25 which slide in longitudinal grooves 26 in the frame 22, as illustrated in Figs. 5 to 9 inclusive. In the forward end of the breech block is an annular groove 27 which is adapted to receive an annular tongue 28 on the rear end of the barrel 20. The tongue 28 has a close working fit in the groove 27 and to further prevent the escape of gases at this joint it is preferred to employ a packing ring 29 in the base of the groove and to so proportion the parts that this packing ring will be compressed between the barrel and the breech block when the parts are in firing position.

The breech block is centrally bored to receive the shell of the cartridge and the ejector and firing pin, the bore being slightly tapering and larger at the forward end to facilitate the ejection of the shells. The



shells are likewise tapered being larger at their forward ends which receive the bullets or projectiles 30 and smaller at their rear ends, which are provided with the usual primers.

A tubular ejector 31 is arranged to slide axially in the breech block the forward end of the ejector being preferably formed to fit the base of the cartridge and being enlarged so that it will engage a shoulder 32 in the breech block to prevent its accidental withdrawal. The rear end of the ejector is provided with a suitable head 33 which prevents the ejector from passing entirely into the breech block and hence the movement of the ejector in the breech block is limited in both directions.

Within the tubular ejector is a firing pin 34, the rear end of which is adapted to project slightly from the tube when the forward pointed end is in contact with the primer of the cartridge, as illustrated in Fig. 2. The movement of the firing pin relative to the ejector is limited by a pin or screw 35 which engages a slot in the pin.

As illustrated the breech block is operated by a handle or lever 36 which is rigidly connected with a ring 37 adapted to turn on the outer surface of the breech block near the rear end thereof. The lever 36 is held in its vertical position, as illustrated in Figs. 1 and 3 when it is used to move the breech block back and forth in the guideways and it is turned down into the position illustrated in Figs. 8 and 9 when it is used to lock the breech block in firing position. When so turned down the lever engages a cam surface 39 on the side of the frame 22 (Fig. 1) which cam is slightly inclined downward and forward and serves to press the breech block tightly against the barrel of the gun. To avoid friction between the lever and the cam 39 an anti-friction roller 40 is preferably mounted on the inner end of the lever 36 in position to bear on the cam when the lever is in locking position. A hammer 41 is movable longitudinally in guideways 42 in the frame 22 and also movable vertically, as will be presently explained.

Connected with the hammer is a rod 43 extending forward into a cylindrical cavity 44 in the frame 22, which cavity contains a hammer spring 45 surrounding the rod 43 and tending at all times to move the rod and the hammer forward. As shown the rear end of the spring bears against the frame 22 and the forward end against a nut or head 46 on the end of the rod 43. The rear end of the rod 43 passes through a vertical groove 47 in the hammer 41 being slightly flattened at 48 to fit the groove. On the rear end of the rod and at right angles thereto is a cylindrical head 49 fitting a cylindrical opening 50 extending vertically

through the hammer, the head 49 forming a guide upon which the hammer can be moved vertically, as will be hereinafter explained. The upper end of the opening 50 is preferably normally closed by a lid or cover 51 (Figs. 4 and 6) which opens when the hammer is depressed, as shown in Fig. 6.

A sear 52 is carried by a transverse pivot pin 53 arranged below the rod 43. The rear end 54 of the sear is slightly upturned and forms a detent for the hammer. This end is pressed upward by a spring 55 to normally hold it in engagement with the hammer and it is adapted to be moved down to release the hammer by a trigger lever 56, one arm of which engages the forward end of the sear.

When the parts are in firing position, as shown in Fig. 2, the sear engages the lower end of the forward face of the hammer and the hammer is held in its upper position by a plunger 57 and spring 58, the spring bearing upon a disk or head at the upper end of the plunger. The plunger is provided with a second head or push-button 59 which normally bears upon the outside of the casing or frame.

The gun is preferably provided with a magazine and with automatic means for transferring the cartridge from the magazine to the firing position, in addition to automatic means for discharging the empty shells. As shown a cartridge box or magazine 60 is arranged at the left side of the casing or frame 22 opposite the breech block when the latter is in firing position, as illustrated in Figs. 5, 8, 9 and 10. The magazine 60 may be integral with the frame or suitably attached, as desired. Within the magazine is an inclined plate 61 which directs the cartridge toward the central line of the gun and permits but one at a time to pass to the bottom of the magazine. A slide 62 on the bottom of the magazine is normally pressed toward the axis of the gun by a flat spring 63. The inner or forward edge of the slide 62 is adapted to receive and sustain a cartridge and when the breech block is withdrawn out of the way the slide moves forward and carries a cartridge into position in line with the axis of the gun barrel, in which position it is retained by a spirally arranged spring finger 64. The inner or forward edge of the slide or tray 62 is inclined, as shown at 65, so that it will be automatically pressed outward when the breech block is pushed forward into firing position. It will be observed that when the slide or tray 62 is in line with the axis of the gun its horizontal rear portion will form a temporary bottom for the magazine and will sustain the cartridges therein. The spring finger 64 is so shaped that it will also be pushed out of the path of the breech block when the latter is moved forward.



The top of the magazine 60 may be closed by a suitable slide or cover 66, as shown in Fig. 5, or it may be removed and a supplemental magazine 67 carrying an additional supply of cartridges may be placed on the regular magazine. As shown in Fig. 11 the supplemental magazine is provided with spring hooks 68 which sustain the cartridges before the supplemental magazine is applied to the regular magazine 60 and which engage notches 69 on the regular magazine and lock the two parts together when the supplemental magazine is applied, at the same time freeing the cartridges from the hooks 68 so that they may descend into the regular magazine.

The operation of the invention is as follows: Assuming all of the parts to be in the positions shown in Fig. 2, in which the projectile extends into the gun barrel 20, it is only necessary to pull the trigger 56 to fire the gun. The movement of the trigger rocks the rear end of the sear 52 downward freeing the hammer 41 which is thrown against the firing pin 34 by the spring 45. The forward end of the firing pin strikes the primer in the rear end of the cartridges, exploding it in the usual manner and firing the projectile. The locking lever or handle 36 is then moved from its horizontal to its vertical position and the breech block 23 being now free to slide longitudinally is pulled to the rear. The hammer rests against the firing pin and the rear end of the ejector 31 and these parts remain stationary as the breech block moves rearward, thus forcing the empty cartridge shell out of the breech block. The breech block is moved rearward quickly and the empty shell is ejected, as shown in Figs. 3 and 5 and as soon as it is freed from the breech block it drops out through an opening 70 in the side of the frame 22. Should the shell stick in the breech block it may not begin to move until the hammer strikes the rear wall 71 of the cavity in which it slides. The operator may then employ his entire strength to eject the shell, but, if for any reason this should not be sufficient, he can quickly move the hammer down to its lower position, as shown in Figs. 6 and 7 and withdraw the entire breech block and then dislodge the shell by striking the rear end of the ejector against a tree, stone or any other convenient abutment. Of course the shells are usually ejected merely by the rearward movement of the breech block in the manner illustrated in Fig. 3. It will be noted that on account of the considerable travel or working distance through which the ejector may move with the breech block, the momentum of the breech block may be used to dislodge the shell when the hammer strikes the stock or frame in its rear. After the hammer is locked in its rearmost position, the breech

block may be reciprocated and the ejector brought violently against the hammer to eject the shell should the latter persist in sticking.

Immediately upon the discharge of an empty shell the loading tray 62 springs forward carrying with it a loaded cartridge and presenting the same in line with the axis of the barrel and immediately in rear of the breech block, as shown in Fig. 10. The breech block is then moved forward, the cartridge passing into it and forcing the ejector and firing pin outward. When the breech block is moved forward into contact with the barrel, the locking lever 36 is turned down to the right, the anti-friction roller 40 traveling on the cam surface 39 and locking the breech block tightly to the rear end of the barrel, thus restoring all of the parts to firing position, illustrated in Fig. 2.

The hammer is provided with a notch 72 in its lower end with which the sear is adapted to engage while the hammer is in mid-position. This notch is "undercut" and when the sear is in engagement with it, it is impossible to release the hammer by pulling the trigger. The hammer may be freed from the sear however by pulling it rearward until its forward edge passes the sear, as shown in Fig. 2. Fig. 4 illustrates the hammer in the half cocked or safety position. The gun may also be rendered safe by drawing the hammer down to its lowest position, as illustrated in Fig. 6, in which position it will remain owing to the friction caused by the pull of the hammer spring 45. If the hammer be in this position and it is desired to fire the gun, it is only necessary to press upward on the button or head 59 of the plunger 57 and then pull the trigger. The hammer is provided with a notch or depression 75 in its upper end (Figs. 1 to 4) with which the thumb or finger may be engaged to cock the gun without using the breech block.

In some instances it may be desirable to feed cartridges into the magazine by hand one at a time as, for instance, when the magazine is exhausted and the gun is being supplied from a cartridge belt. For this purpose I provide an opening 76 (Figs. 10, 11 and 12) in the end of the magazine 60. To prevent cartridges from dropping out of this opening I preferably provide a latch 77 which is normally pressed against a stop 78 by a spring 79 and thus partially closes the opening. The latch is beveled so that it will recede as the cartridge is pushed into the opening, as indicated in Fig. 10.

It is sometimes desirable to shut off the supply of cartridges from the magazine, that is, to prevent the automatic feeding of cartridges from the magazine to the breech block and for this purpose I may insert a stop plate 80 between the magazine and the



space occupied by the breech block, as indicated in Fig. 5. I prefer to use a folded plate of spring metal, as shown in Fig. 13. This plate is inserted by pressing its free edges together and it will be retained in the opening frictionally, although it may be readily withdrawn by inserting the thumb nail in a notch near its upper edge. When the feeding is not done by means of the magazine, the cartridges are inserted by hand between the loading tray and the spring finger, if these are working; if not, the cartridge is placed by introducing the projectile in the end of the barrel.

It will be noted that this improved fire-arm is loaded by passing the cartridge rearward into the breech block instead of forward into the barrel, as is customary with fire-arms now in use. Cartridges may thus be made simpler in form and the usual flange at the end omitted, which permits of forming the shell for the cartridge with fewer operations than are necessary to form the flanged cartridges ordinarily used. It will also be noted that the entire shell containing the powder or other explosive material lies within the breech block when the gun is fired and hence the breech block receives substantially the entire strain and shock of the explosion. This is an important feature of the invention as it protects the gun barrel and greatly increases its life. The breech block which is comparatively inexpensive can be renewed if it becomes unserviceable. In ordinary fire-arms the explosion takes place within the rear end of the barrel which is often burst or otherwise injured, thus rendering the entire barrel useless.

The ejecting means, in the present invention, are an improvement over the ordinary ejecting means now in use, inasmuch as the cartridge shell can be much more reliably and effectively ejected by pushing it from its seat than by pulling it by the flange, as is done by extractors commonly used; and also because the present ejector drops the cartridge out through the side opening where it may be caught by the hand of the operator, if desired, whereas the extractor common in other guns tosses the cartridge in the air. The lateral discharge of the cartridge is particularly desirable when taking a loaded cartridge from the gun as the operator receives it directly in his hand and does not have to pick it up directly from the ground and danger of accidental explosion is obviated.

It will be noted on reference to the drawings, particularly Fig. 2, that when in firing position the forward end of the cartridge shell is securely held against the rear end of the gun barrel, the rear end of the cartridge shell being supported by the ejector 31. The gun barrel thus acts as a relatively immov-

able abutment for the shell, supporting it securely against movement by the firing pin and thus rendering the firing pin uniformly effective to explode the primer and discharge the projectile.

As heretofore stated, this invention is applicable to guns of various sizes and characters including pistols, rifles, rapid-fire guns and ordnance of large caliber. It is also to be understood that the invention is susceptible of various changes and modifications without departing from the spirit thereof and that the claims hereinafter made are not limited to the particular construction and arrangement of parts illustrated and described.

Having described the invention what is claimed is,

1. In a gun, the combination with the barrel and the breech block movable toward and from the barrel and having an opening in its forward end to receive a cartridge, of a magazine arranged at one side of the path of the breech block, and a tray movable transversely of the gun and adapted to carry a cartridge from the magazine into axial alinement with the breech and gun barrel.

2. In a gun, the combination with the barrel and the breech block movable toward and from the barrel and having an opening in its forward end to receive a cartridge, of a magazine arranged at one side of the path of the breech block, a tray movable transversely of the gun and adapted to carry a cartridge from the magazine into axial alinement with the breech block and gun barrel, and means for moving said tray out of the path of the breech block when the latter is moved to firing position.

3. In a gun, the combination with the barrel and the breech block movable toward and from the barrel and having an opening in its forward end to receive a cartridge, of a magazine arranged at one side of the gun, a tray at the bottom of the magazine and movable to carry a cartridge from the magazine into axial alinement with the gun barrel, a spring for moving said tray into such axial alinement when the breech block is withdrawn from the gun barrel, said tray having an incline which is engaged by the breech block on its forward movement, whereby the tray is returned to the magazine.

4. In a gun, the combination with the barrel and the breech block movable toward and from the barrel and having an opening in its forward end to receive a cartridge, of a magazine arranged at one side of the gun, a tray adapted to automatically convey a cartridge from the magazine into axial alinement with the gun barrel, a spring finger cooperating with the tray to hold the cartridge in such axial alinement, the said tray and spring finger being adapted to move out



of the path of the breech block when the latter is moved forward.

5. In a gun, the combination with the barrel and the breech block movable toward and from the barrel and having an opening in its forward end to receive a cartridge, of a tubular ejector slidably mounted in the breech block and a hammer against which said ejector abuts.

6. In a gun, the combination with the barrel and the breech block movable toward and from the barrel and having an opening in its forward end to receive a cartridge, of a tubular ejector slidably mounted in the breech block, a firing pin slidably mounted in the ejector and a hammer against which said ejector abuts.

7. In a gun, the combination with the barrel and the breech block movable toward and from the barrel and having an opening in its forward end to receive a cartridge, of an ejector and a firing pin mounted in the breech block, the said breech block, ejector and firing pin being removably mounted in the gun frame, said firing pin being carried by the ejector and said ejector being carried by the breech block and removable therewith.

8. In a gun, the combination with a barrel and a breech block movable toward and from the barrel, of a hammer arranged to move in a line parallel with the breech block, said hammer also being movable transversely to permit of the withdrawal of the breech block.

9. In a gun having a barrel and a breech block movable axially of the barrel, a hammer in the rear of the breech block, said hammer being movable toward and from the breech block and also transversely into and out of the path of the breech block.

10. In a gun having a barrel and a breech block slidable in the axial line of the barrel, a spring impelled rod 43 having a head at right angles thereto, and a hammer engaged with said head and movable transversely of said rod, the hammer being also movable with the rod to fire the gun.

11. In a gun, a hammer movable longitudinally of the gun to and from the firing pin and having an independent movement transversely of the gun, and a plunger 57 for restoring the hammer to operative position in line with the firing pin.

12. In a gun, a hammer movable longitudinally of the gun to and from the firing pin and having an independent movement transversely of the gun, and a spring impelled plunger 57 for restoring the hammer

to operative position in line with the firing pin.

13. In a gun, the combination with the frame and a barrel connected with the frame, of a hammer slidably connected with the frame, and a breech block arranged between the hammer and the barrel, the said breech block being movable toward and from the barrel and having an opening to receive a cartridge, and an ejector and firing pin movably mounted in the breech block.

14. In a gun, the combination with a frame and a barrel, of a hammer slidably connected with the frame, a breech block slidably connected with the frame and arranged between the hammer and the barrel, said breech block having an opening in its forward end to receive a cartridge, and an ejector mounted in the breech block and arranged to cooperate with the hammer to eject the cartridge shell.

15. In a gun, the combination with the barrel and the breech block movable toward and from the barrel and having an opening in its forward end to receive a cartridge, of an ejector mounted in the breech block and movable relatively to both the barrel and breech block, and a part under spring tension adapted to operate the ejector.

16. In a gun, the combination with the barrel, of a breech block movable toward and from the barrel, an ejector movably mounted in the breech block and also movable relatively to the barrel, and an abutment in the rear of the ejector and breech block and adapted to arrest the ejector when the breech block is moved away from the barrel, said ejector being movable rearward with the breech block through a considerable working distance whereby the momentum of the breech block aids in dislodging the cartridge shell.

17. In a gun, the combination with the barrel, of a breech block slidable toward and from the barrel, an ejector mounted in the breech block and movable relatively to the breech block and to the barrel, a hammer in the rear of the ejector and means holding the hammer in position to arrest the ejector when the breech block is moved to the rear, whereby the ejection of shells from the breech block is facilitated.

In testimony whereof I affix my signature in presence of two witnesses.

LUIS MARTINEZ SILVA.

Witnesses:

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