No. 810,571. PATENTED JAN. 23, 1906.

A. J. SAVAGE.

FIREARM.

APPLICATION FILED JUNE 26, 1905.

2 SHEETS—SHEET 1.

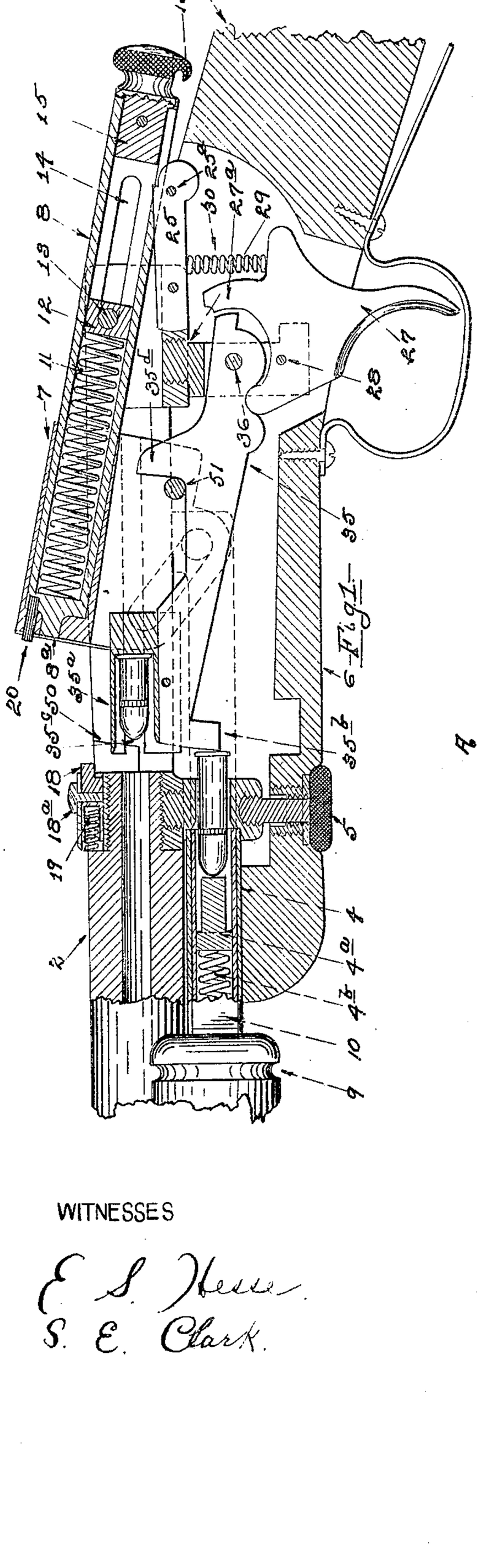

Fig. 1.

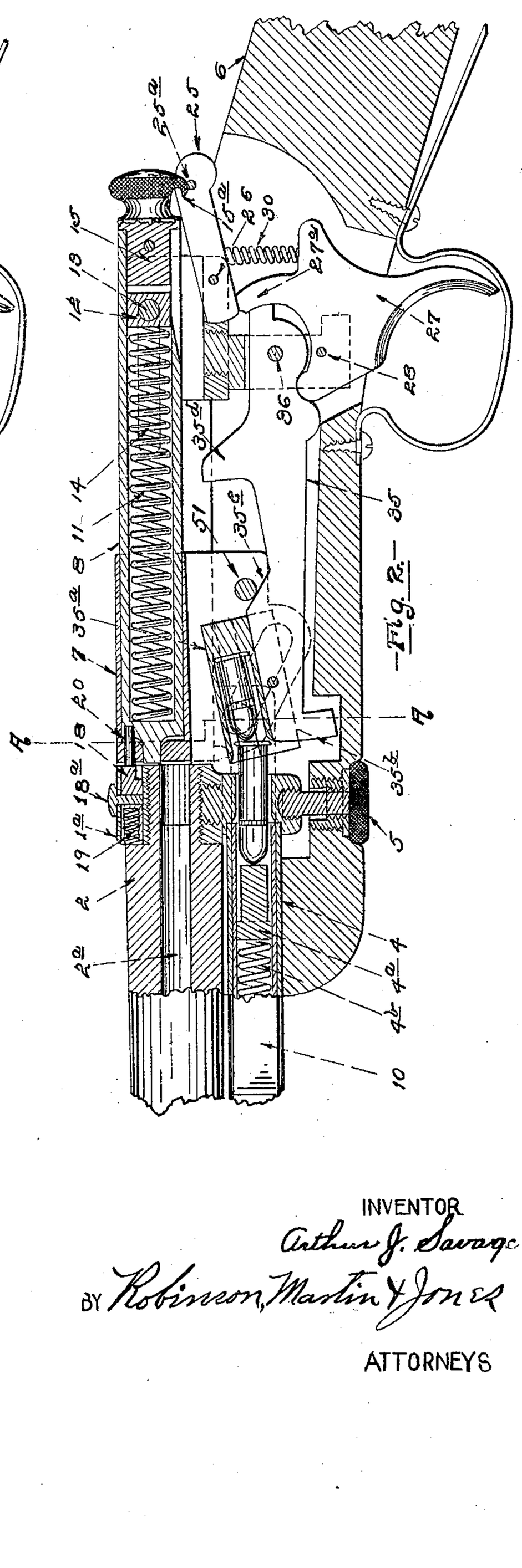

Fig. 2.

WITNESSES

E. S. Hesse.
S. E. Clark.

INVENTOR
Arthur J. Savage
BY Robinson, Martin & Jones
ATTORNEYS

No. 810,571. PATENTED JAN. 23, 1906.

A. J. SAVAGE.

FIREARM.

APPLICATION FILED JUNE 26, 1905.

2 SHEETS—SHEET 2.

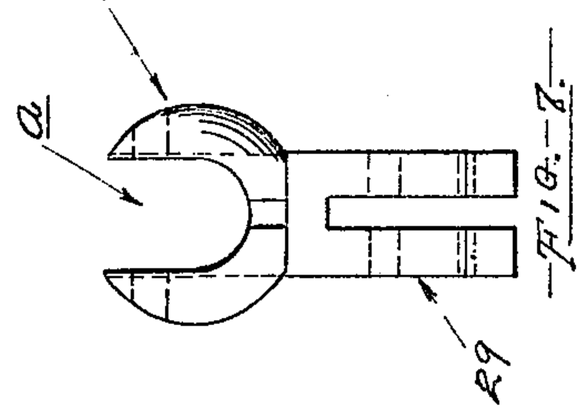
FIG. 7.

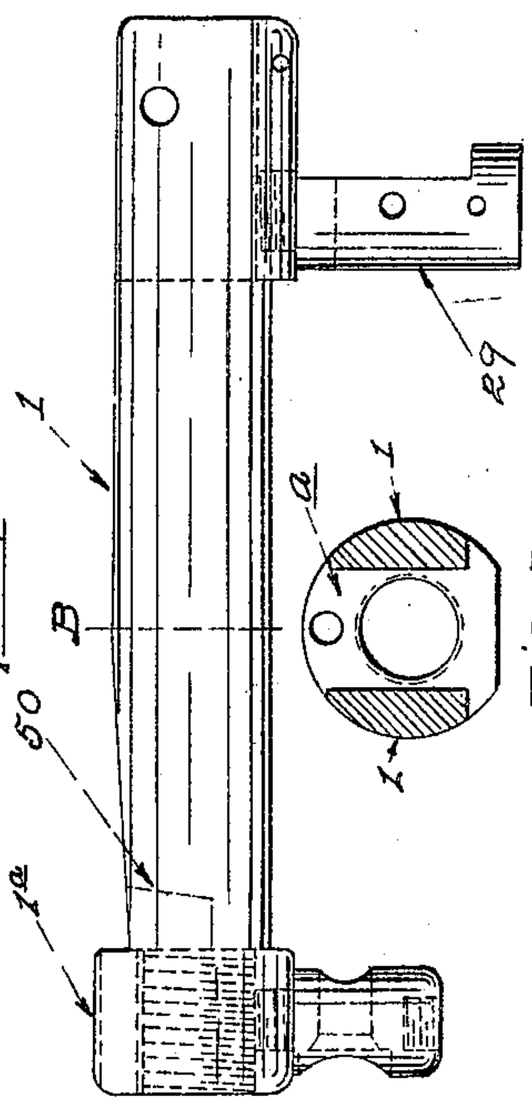
FIG. 4.

FIG. 5.

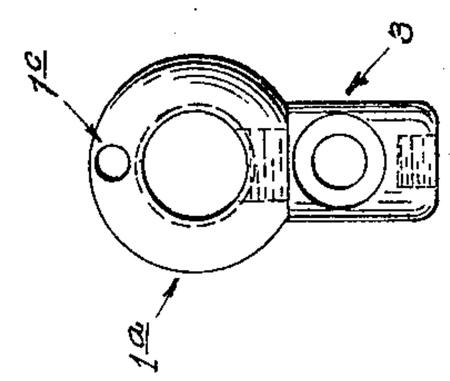
FIG. 6.

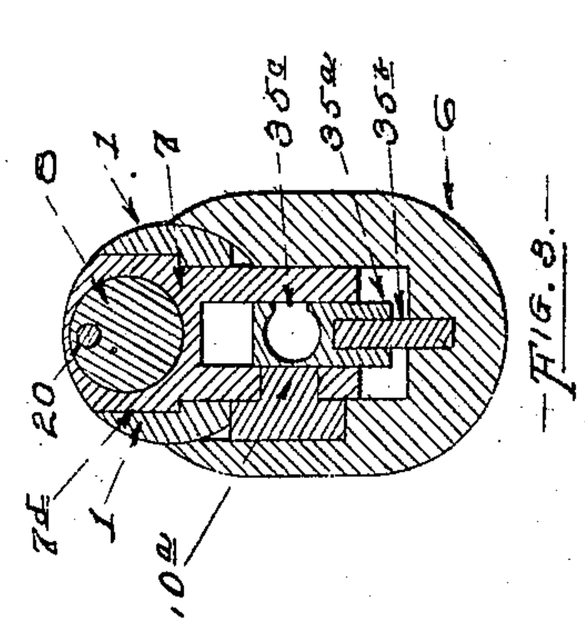
FIG. 8.

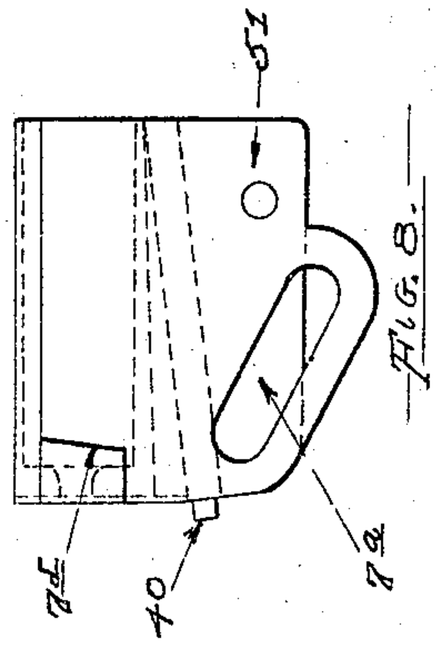
FIG. 9.

WITNESSES

E. S. Hesse

S. E. Clark.

INVENTOR

Arthur J. Savage

BY Robinson, Martin & Jones

ATTORNEYS

UNITED STATES PATENT OFFICE.

ARTHUR J. SAVAGE, OF UTICA, NEW YORK, ASSIGNOR TO J. STEVENS ARMS & TOOL COMPANY, OF CHICOPEE FALLS, MASSACHUSETTS.

FIREARM.

No. 810,571. Specification of Letters Patent. Patented Jan. 23, 1906.

Application filed June 26, 1905. Serial No. 267,004.

To all whom it may concern:

Be it known that I, ARTHUR J. SAVAGE, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Firearms; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form part of this specification.

The object of my invention is to provide a firearm embodying new features which increase the utility and efficiency and reduce the cost of construction.

Generally, the present construction belongs to that class of repeating rifles having a tubular magazine arranged under the barrel and in which the breech mechanism is operated by a sliding handle under the barrel.

Figure 1 shows a vertical longitudinal section of the frame and adjacent parts of the stock, barrel, &c., together with other working parts, taken substantially on the central line of the frame and with the breech-bolt in open position. Fig. 2 shows a similar section with the breech-bolt in closed position. Fig. 3 shows a section taken on line A A of Fig. 2. Fig. 4 shows a side elevation of the receiver or frame detached from all other parts. Fig. 5 shows a section taken on line B of the frame. Fig. 6 shows an end view of the left-hand end of the frame as same is shown in Fig. 4. Fig. 7 shows an end view of the right-hand end of the frame. Fig. 8 shows a side elevation of the breech-bolt. Fig. 9 shows a front end view of the breech-bolt.

Referring to the reference letters and figures in a more particular description, 1 indicates the receiver or frame, which consists in the main of what is known as a "screw-machine" piece. At the forward end this piece has a collar portion 1^a, which, among other things, is internally screw-threaded to receive the reduced screw-threaded rear end of the barrel 2. Screw-threaded into the lower side of the collar part 1^a is a stud 3, which provides a support for the rear end of the tubular magazine 4 and is adapted to receive in its lower end a screw 5 for securing the stock 6 to the frame. The frame is longitudinally recessed, as indicated at *a*, to receive the breech-bolt 7 and the firing-pin 8. At the middle portion the frame is recessed to the top and bottom, affording an opening through the frame, as shown particularly by Fig. 5. In this opening more particularly is located the breech-bolt 7, which is of a block-form construction, and the same is adapted to reciprocate longitudinally of and rise and fall within the slotted opening *a* in the frame.

For operating the breech-bolt there is provided under the barrel 2 and preferably embracing the magazine-tube 4 a sliding handle 9, connecting by means of the action-bar 10 with the breech-bolt 7, the action-bar being provided adjacent to its rear end with a stud or projection 10^a, which enters an inclined slotted opening 7^a in one of the depending walls or flanges of the breech-bolt 7. The breech-bolt 7 is further mounted and held for action in the frame by the firing-pin 8, which enters at its forward end a longitudinal opening in the breech-bolt.

The firing-pin, it will be noted, is of a tubular construction and within the tube receives the firing-spring 11, the forward end of which impinges upon the front closed end of the firing-pin, while the rear end of the spring engages upon a cylindrical block 12, arranged within the bore of the firing-pin and supported in the rear end of the frame on a cross-pin 13, on which it is adapted to rock freely. The side walls of the rear end of the firing-pin 8 are slotted longitudinally of the same, as indicated at 14, to provide clearance for the pin 13 and allow the reciprocating motion of the firing-pin. The rear end of the tubular firing-pin is closed by a plug 15, secured in place therein, the forward lower end of which affords the sear catch-shoulder, while the rear end forms a knob or handle with another catch-shoulder, as will hereinafter appear.

The forward end of the firing-pin 8 is provided with the cartridge-striking projection 8^a, which projection is adapted to operate through an opening in the front wall of the breech-bolt, which front wall also acts as a stop for the firing-pin in its forward movement and particularly so when the breech-bolt is in its open position. The striking projection 8^a is preferably not adapted to strike opposite the bore or opening 2^a of the barrel, but against the end of the barrel at the upper edge of the opening, as appears quite clearly from Fig. 2 of the drawings. In

order to lock the breech-bolt in closed position when the breech-bolt is breeched up and ready for firing, there is provided a sliding catch 18. This catch is mounted in a longitudinal hole or opening 1^c in the front collar portion of the frame and is provided with a projecting knob 18^a, by which it may be manually operated, and is backed by a spring 19, arranged to throw it into its projecting and locking position, the projecting position being shown in Fig. 1. The rear end of the catch 18 is adapted to engage in an opening 7^c in the forward end of the breech-bolt and secure the breech-bolt in closed position. In order to automatically retire the catch 18 after the gun has been fired, there is provided in the front end of the firing-pin a projecting-pin 20, adapted to pass through the opening 7^c and strike the front end of the catch 18 and retire it when the firing-pin operates to strike the cartridge.

The sear 25 is pivoted at 26 in the rear end of the frame and is provided on its rear swinging end with a shoulder, as shown, adapted to catch on the front lower corner of the part 15, as before suggested. The trigger 27 is pivoted at 28 in a downwardly-projecting stud 29, provided on the rear end of the frame, and has an arm 27^a, adapted to strike the forward swinging end of the sear 25 when the breech-bolt is closed and the firing-pin drawn back preparatory to striking and adapted to operate the sear. Interposed between the sear 25 and a rearwardly-extending projection of the trigger 27 is a spring 30, adapted to operate both the trigger and the sear. In the rear end of the sear 25 there is also provided a cross-pin 25^a, adapted under certain circumstances to engage with the hook 15^a on the head of the firing-pin and secure the firing-pin in a slightly-retired position—namely, with the striking-projection 8^a held back, so as to not strike the cartridge.

The cartridge-carrier consists of a plate-like piece 35, pivoted adjacent to its rear end at 36 in the frame-stud 29 before mentioned. The rear end of the carrier 35 is extended to provide a stop or block for the trigger, it being adapted to engage with the arm 27^a thereof, particularly as shown in Fig. 2. On the forward end the carrier 35 is provided with a socket part 35^a, having a socket let into the same from the front end to receive the cartridges. The socket is rigidly attached to the front end of the carrier 35, and the socket is somewhat cut away on the lower side, and there is provided a cam end 35^b on the front end of the carrier adapted to engage and cam back into or toward the magazine the cartridge at the magazine-outlet.

This firearm is adapted to automatically take and handle three or more sizes of cartridges promiscuously placed in the magazine, if desired, and to that end the arrangement of the socket in the socket part 35^a, the shape of the cam projection 35^b, and its relation to the rear end of the magazine are all features requiring particular attention in order to secure the desired result.

The manner in which the cam projection 35^b cams back the cartridge in the mouth of the magazine and prevents it being expelled into the frame when the carrier is in its upward position is shown in Fig. 1. At this point it may be noted that within the tubular magazine 4 there is provided a follower 4^a and a follower-spring 4^b, the two operating to move the cartridges toward the rear or delivery end of the magazine.

One of the side walls of the carrier-socket piece 35^a is slotted, as shown at 35^c, and in this slot is adapted to operate on the forward movement of the bolt the extractor 40, which is a spring-hook provided on the bolt in an ordinary manner.

The breech-bolt is provided on its opposite sides near the front end with shoulders 7^d, preferably inclined and adapted to engage with the breech-up shoulders 50 in the forward end of the frame adjacent to the end of the barrel. In the rear lower corner of the breech-bolt there is provided a clipping-pin 51, adapted to engage, when the breech-bolt is moved to the rearward position, with projection 35^d on the carrier at a point above the plane of the pivot 36 and swing the carrier from its lower to its upper position. In its forward movement the pin 51 on the breech-bolt is adapted to engage with the inclined shoulder 35^e on the carrier and ride the carrier down into its lower position.

The operation of the arm may be briefly described as follows: Starting with the parts in which they are shown in Fig. 1, the operator slides the handle 9 forwardly along the tubular magazine. This movement first tends to move the breech-bolt 7 and the firing-pin 8 toward the barrel. Almost immediately the firing-pin is caught by the sear 25 and its movement restrained. The breech-bolt continues to move forward the lower ends of the shoulders 7^d, riding on the upper edge of the receiver-walls until the shoulders 7^d are enabled to drop in or pass in front of the breech-up shoulder 50, when the breech-bolt moves downwardly into closed position. Immediately upon its reaching the closed position the same is locked by the catch 18. As the breech-bolt moves forward the extractor 40, operating through the slot 35^c in the carrier-head, engages with the cartridge in the socket and moves it forward into the barrel. While the cartridge may not be entirely forced to its seat in the barrel, it may be forced in sufficiently so that the lower front edge of the breech-bolt can engage with the same and cam it home as it drops into its final position. As the breech-bolt makes its downward movement into final locked position

the breech-bolt and firing-pin rock or turn on the pin 13 as a pivot and the forward end of the firing-pin will be drawn back considerably within the breech-bolt, allowing it considerable movement under the influence of the firing-spring to strike the cartridge. It will be noted that the sear is so arranged and constructed as to allow it to follow the swinging movement as the firing-pin and breech-bolt swing around the pin 13, and the arrangement is such that at the completion of the movement the sear will be in close relation to the trigger 27, so as to be conveniently operated thereby. When the trigger 27 is operated, it operates through the medium of the sear to release the firing-pin 8, which immediately is impelled forward by the spring, and the striker 8ª engages and explodes the cartridge. In so doing the pin 20 also comes forward and disengages the catch 18, so that the mechanism is free to be operated into open position by the sliding handle under the barrel. In case the cartridge fails to be exploded by the blow of the hammer or firing-pin the same can be cocked for a repetition by the operator grasping the knob on the rear end of the firing-pin and drawing it backward until it is caught by the sear 25. When the cartridge-carrier is in its lower position and the socket in the head part thereof is empty, a cartridge will be expelled from the magazine and delivered into the socket in the carrier. When the mechanism is opened by drawing back on the sliding handle 9, the breech-bolt first rises substantially vertically and until the extractor-hook 40 moves up and becomes engaged with the rear end of the spent shell. The movement of the breech-bolt is then rearwardly, which extracts the shell from the chamber in the barrel and also compresses the firing-spring. The shell is drawn out on top of the carrier-head 35ª and is thrown out of the top of the frame when the carrier is moved into its upper position.

In case it is desired to open the gun when same is in firing condition without firing it can be done by manually releasing the catch 18 by means of the projecting knob provided in connection with this catch. It may also be noted at this point that when the gun is in breeched-up condition, cocked and ready for firing, it cannot be opened by operating the slide 9, which is quite important, in that many shooters in aiming the gun unintentionally draw back on the handle 9. In case it is desired to carry the gun practically in condition ready for shooting for some time, but still have it safe, the firing-pin can be let down by the operator grasping the knob on the rear end of the firing-pin, pulling the trigger to release the same, and let the firing-pin move forward slowly until it is caught and held by the cross-pin 25ª engaging with the hooks 15ª on the under side of the head of the firing-pin. The position of these hooks with reference to the sear and other parts is such that when so engaged the striker 8ª will be held retired to some extent and so that it is in position for the striker to become engaged with the cartridge, and the pin 20 is also held retired, so as not to release the catch 18. The arm may be readily and quickly placed in firing condition by the operator grasping the firing-pin head and drawing the same back until it becomes caught by the sear.

It is evident that numerous changes and modifications in and from the construction shown and described may be made without departing from the spirit of my invention or the equivalents of the construction.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a firearm of a frame, a breech-bolt slidingly mounted with reference to the frame, and a firing-pin engaging the breech-bolt and slidably connected with the frame and serving as a support and guide for the breech-bolt, substantially as set forth.

2. The combination in a firearm of a frame, a breech-bolt, means to operate the breech-bolt, a firing-pin mounted in part in the breech-bolt and in part on the frame pivotally and slidably connected to the latter and serving as a guide for the breech-bolt in opening and closing, substantially as set forth.

3. A frame for firearms, consisting of a general cylindrical body with an applied magazine-supporting stud or projection at the front, and an applied mechanism-carrying stud or projection at the rear, substantially as set forth.

4. A frame for firearms, consisting of the body having the collar part 1ª at the forward end, the U-shaped form at the rear end and longitudinally slotted in a vertical plane between the forward and rear ends, and having the magazine-supporting stud 3 attached to the collar at the forward end, and the mechanism-supporting stud 29 attached to the U-shaped rear end, substantially as set forth.

5. The combination in and with the operating parts of a firearm of the breech-bolt mounted in part upon the firing-pin and adapted to swing around a pivot into locking and unlocking position with reference to the frame, of a seat adapted to engage the firing-pin and permit the swinging movement of the breech-bolt and firing-pin without becoming disengaged, substantially as set forth.

6. The combination in a firearm of the frame slotted longitudinally, a breech-bolt received in the slot of the frame and longitudinally recessed, a tubular firing-pin received within the longitudinal recess of the breech-bolt, a firing-spring within the firing-pin, a fixed pin secured in the rear of the frame and passing through slotted openings in the sides of the firing-pin and affording a support for

the firing-pin, mechanism for operating the bolt, substantially as set forth.

7. The combination in a firearm of the frame, the breech-bolt arranged to have a rising-and-falling movement at the rear end of the barrel, mechanism for operating the breech-bolt, a firing-pin arranged in the breech-bolt and a safety-catch arranged in the frame at the rear end of the barrel and adapted to engage the breech-bolt to secure the same, a firing-pin arranged to operate said catch to unlock position and means for independently and manually operating said catch, substantially as set forth.

8. The combination in a firearm of a frame having longitudinal ways and recoil-shoulders, a relatively short breech-bolt having shoulders adapted to be moved in and out of engagement with the recoil-shoulders by a lateral movement and for longitudinal movement on said ways, a firing-pin slidably mounted in the breech-bolt at its forward end and mounted for a rocking and sliding movement in the frame at its rear end, and means for operating the breech-bolt and the firing-pin, substantially as set forth.

9. A frame for firearms consisting of a general cylindrical body with an applied stock and mechanism-supporting stud or projection at the front and an applied mechanism-supporting stud at the rear, substantially as set forth.

10. The combination in a firearm of a frame having longitudinal ways and recoil-shoulders, a breech-bolt having shoulders to engage the recoil-shoulders and adapted to slide on said ways, a firing-pin engaging with the breech-bolt at its forward end and longitudinally slotted at its rear end, a pin supported in the rear end of the frame and passing through the slot of the firing-pin and serving as a support and pivot for the bolt, and means for operating the bolt and operating the firing-pin, substantially as set forth.

In witness whereof I have affixed my signature, in presence of two witnesses, this 24th day of June, 1905.

ARTHUR J. SAVAGE.

Witnesses:
S. I. De Vine,
E. S. Hesse.