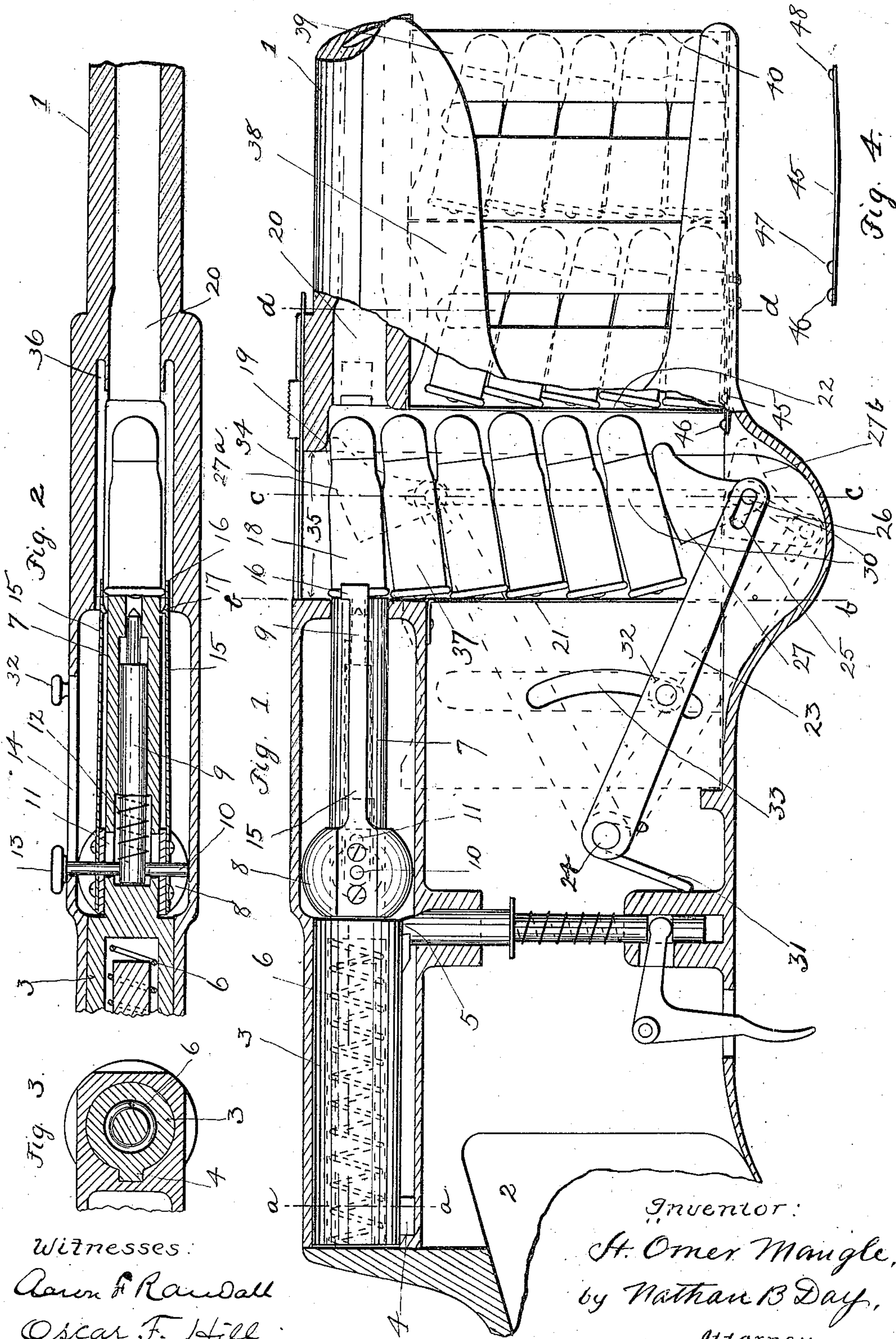


No. 896,453.

ST. OMER MANGLE.
AUTOMATIC FIREARM.
APPLICATION FILED DEC. 10, 1907.

PATENTED AUG. 18, 1908.

2 SHEETS—SHEET 1.



Witnesses:
Aaron B. Randall
Oscar F. Hill

Inventor:
St. Omer Mangle,
by Nathan B. Day,
Attorney

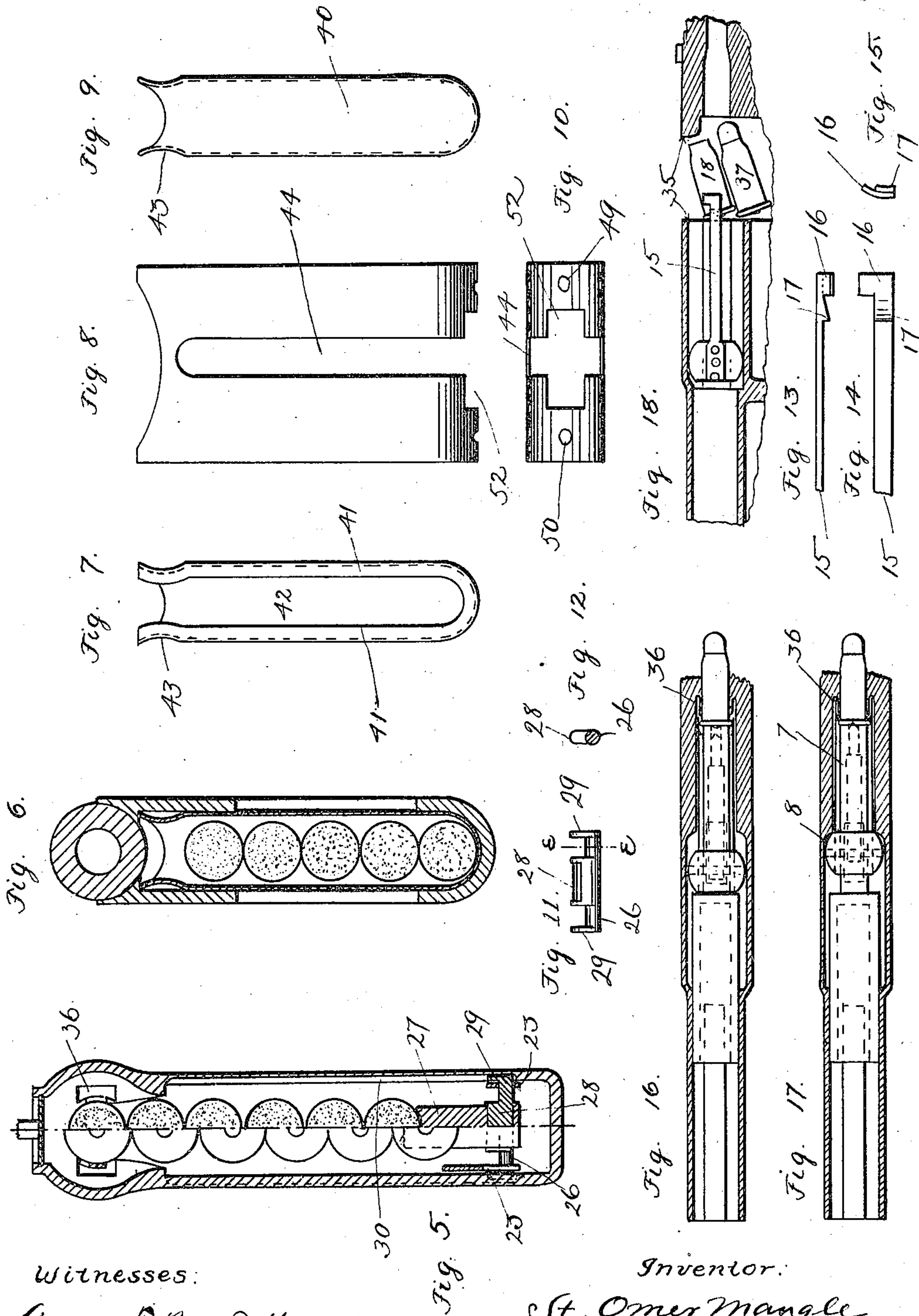
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UNITED STATES PATENT OFFICE.

ST. OMER MANGLE, OF BOSTON, MASSACHUSETTS.

AUTOMATIC FIREARM.

No. 896,453.

Specification of Letters Patent.

Patented Aug. 18, 1908.

Application filed December 10, 1907. Serial No. 405,936.

To all whom it may concern:

Be it known that I, ST. OMER MANGLE, a citizen of the French Republic, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Automatic Firearms, of which the following is a specification.

My invention has for its object the production of an automatically acting firearm, having a magazine with a capacity for storing a plurality of cartridges, and embodying mechanism which when set into action, will cause said cartridges to be successively placed in the discharging chamber, fired, ejected, and replaced by a new cartridge; the process of loading, discharging and ejecting, being automatically continued, so long as the trigger is pulled, without other manipulation, on the part of the gunner, until the cartridges in the magazine are exhausted.

A further object is to provide said firearm with means whereby said magazine may be replenished with a fresh supply of cartridges with a minimum of time and labor.

In the drawings which accompany and form a part of this specification, Figure 1 is a view showing a side elevation, partly in section, of the frame of a rifle embodying my invention. Fig. 2 is a view, chiefly in section, taken on a horizontal plane passing through axis of rifle barrel. Fig. 3 is a section taken on line *a—*a** in Fig. 1. Fig. 4 shows the catch used in connection with the cartridge pack, mentioned hereinafter. Fig. 5 shows, at the left of the central line, a section taken at line *b—*b**, Fig. 1; while at the right of the central line is shown a section at line *c—*c**, Fig. 1, the observer in both cases looking toward the barrel. Fig. 6 presents a section taken on line *d—*d**, Fig. 1, looking towards the barrel of the rifle. Figs. 7, 8, 9, and 10 show the cartridge pack cases, being respectively, views of the rear, side, front, and bottom of the same. Figs. 11 and 12 show details of the guide bar forming a part of the operating mechanism, Fig. 12 being taken on line *e—*e** of said Fig. 11. Figs. 13, 14, and 15, show details of the hooked guides forming a part of the operating mechanism. Figs. 16, 17 and 18 are outline views showing the mechanism of the rifle in various stages of its operation.

Referring to the figures, in which identical parts bear the same reference numeral, 1 is the barrel, and 2 is a portion of the stock of a rifle, the larger part of both barrel and stock being omitted from drawing for lack of room.

Underlying the barrel, and extending rearward between the same and the stock is a hollow frame, containing the operating mechanism of the rifle, which will now be described in detail. Occupying the upper left hand portion of said hollow frame, is the traveler 3, which is mounted so as to be longitudinally slidable therein, but having axial rotation of the same prevented by a key 4 sliding in a cooperating groove. Said traveler is held in the position shown, by the trigger operated latch 5, and incloses a spiral compression spring 6, operating to throw said traveler toward the barrel, when latch 5 is released. Projecting from the traveler, and preferably integral therewith, is the cylindrical pusher bar 7, so positioned as to be coaxial with the rifle barrel, and having the striker 8 slidably mounted thereon. Inside the pusher bar, and longitudinally movable therein is the firing pin 9, (see Fig. 2) one end of which is pointed for indenting the percussion cap of a cartridge, while the other end is bored to receive a pin 10 which also engages striker 8, and by means of which the striker and firing pin are compelled to move in unison. A slot 11 is provided in the pusher bar to permit longitudinal motion of pin 10, striker 8, and firing pin 9, with relation to the pusher bar, said parts being normally held at the left hand end of said slot through the action of spring 12. At one end of pin 10 is a knob 13 by which the striker, pusher bar and traveler may be manually positioned, the wall of the hollow frame being cut away at 14 to provide a slot permitting motion of pin 10 to the extent of the longitudinal travel of the traveler 3.

Attached to the striker at either side, are the hooked guides 15, which are resilient metallic strips having their ends broadened and curved to form guide portions 16 (see Figs. 13, 14, and 15), and having hooks 17 projecting from their inner faces. The curvature and formation of the guide portions of the hooked guides, and the stiffness and resiliency of the said guides are all proportioned to the force with which the cartridges

are impelled upward by the cartridge elevating mechanism, to be shortly described, to the end that the top cartridge 18 may be arrested in its upward motion and held so that its cap end is adjacent to and in substantial axial alinement with the pusher bar. The bullet of the cartridge is in contact with the edge 19 of the entrance to the cartridge chamber 20 so as to be in position to enter the same.

Directly below cartridge 18 is the cartridge magazine, here shown as holding six cartridges in all. The said cartridges are prevented from falling out at the back of said magazine by means of the metallic strip 21 centrally located with respect to the open rear side of the said magazine, but less in width than the same by an amount sufficient to permit the passage past it of the cartridge pack, as will be later described. The cartridges are prevented from slipping out at the front of said magazine by the rear side 22 of the cartridge pack, later described in detail.

The cartridges in the magazine are impelled upwardly as follows: Two arms 23, one only being shown in Fig. 1, consisting of thin metallic pieces of the proportions shown, are fixedly mounted on pivot bar 24, so as to swing angularly in unison. Said arms lie close to either side of the hollow chamber, in which they are inclosed so as to leave room between the same for the passage of a cartridge pack, as will be later described. At the free end of each arm 23 is a slot 25 engaging the guide bar 26 carrying the carrier 27 thereon. Said guide bar 26 is shown in detail in Figs. 11 and 12, and consists of a bar having a central flat portion 28, adapted to engage in a similarly shaped opening in the lower part of carrier 27. At either end of said guide bar are other flattened portions 29, which are adapted to slidably engage in grooves 30, provided at either side of the magazine. The grooves 30 thus operate to control the position of the guide bar 26, and through it the carrier 27 mounted thereon, so that it may be held at the desired inclination throughout its movement from the bottom to the top of the magazine. A spring 31 forces the arms 23 upward, and a knob 32 mounted on one arm, and projecting to the outside of the rifle through the curved slot 33 affords a means of depressing the carrier 27 manually as desired.

The top cartridge 18 in the magazine being in the position shown, with its rear end engaged by guide portions 16 of the hooked guides 15, so as to hold same in line with the pusher bar; and its bullet end being arrested by edge 19 so as to position the same for entering the cartridge chamber, the operation of the mechanism above described is as follows. Slide 34 is first moved toward the right so as to leave an unobstructed space 35

above the cartridge. On pulling the trigger and releasing of the latch 5, the spring 6 will force the traveler 3 toward the right, causing the pusher bar 7 to drive cartridge 18 before it into the cartridge chamber 20, as is shown in Fig. 16. As cartridge 18 comes to rest in the cartridge chamber, the further travel of the pusher bar will be suddenly arrested, but the striker 8 will have acquired a momentum, which will cause it to continue to travel towards the right as far as slot 11 will permit, carrying with it pin 10 and consequently firing pin 9. As said pin 10 approaches the right hand end of slot 11 the point of firing pin 9 will impinge against the percussion cap of the cartridge and will discharge the same. At the same time, the motion of the striker 8, carrying forward the hooked guides 15 will cause the guide portions 16 of said guides to move forward with relation to the cartridge, preferably entering into recesses 36 provided at either side of the cartridge chamber, and causing the hooks 17 on said guides to slip over the rim of the cartridge and engage the front edge of the same. The position of the various parts will now be as shown in Fig. 17.

The cartridge having been discharged as above set forth, the recoil of the same is to a large extent absorbed by the inertia of the traveler and pusher bar. The weight of said traveler and pusher bar, with the parts moving therewith, is however, so proportioned to the propulsive power of the cartridge that a part of the recoil is used to overcome spring 6, and to kick the traveler back into the position in which it is shown in Fig. 1, and in which it is again held by latch 5. In this rearward movement striker 8 shares, carrying with it the hooked guides 15, which being in engagement by means of the hooks 17 with the rim of the empty cartridge shell will extract it from the cartridge chamber. As the bullet end of this empty cartridge shell passes the edge 19 of the entrance to the cartridge chamber, the upward pressure exerted through the cartridge 37 lying next below the same will cause the said empty shell to tip up; occupying the position shown by Fig. 18. At this juncture it is apparent that the whole upward pressure exerted through cartridge 37 will be resisted solely by the grip afforded by the engagement between the hooks 17 and the cap end of the empty cartridge 18; and, provided the hooked guides are of the proper resiliency, they will be of insufficient holding power to resist said upward pressure, permitting the cap end of the empty cartridge 18 to slip up between said hooked guides, to escape from their grasp and to pass out of the gun through the opening 35. As the empty cartridge escapes from the hooks, spring 12 will force striker 8 back into its original position, carrying with it the hooked guides 15 and positioning them so that their guide portions

16 are ready to receive the cartridge 37 which meanwhile is being forced upward from the magazine, and which is finally brought to rest in the position in which cartridge 18 is shown in Fig. 1.

Cartridge 37 is now in position for the second shot, and by pulling the trigger the cartridge 37 will be subjected to a cycle of operations identical with those above described, which may be repeated until the magazine is empty. If the trigger is held pressed the operation of loading, firing and reloading will be automatically and rapidly continued as long as there are unused cartridges in the magazine. After the last cartridge is ejected the carrier 27 will occupy its upward limiting position as shown at 27^a in dotted lines.

The refilling of the magazine is preferably accomplished by means of the cartridge packs 38 and 39, shown in their position in the rifle in Fig. 1, and in detail in Figs. 7 to 10. Said packs comprise a U-shaped case of sheet metal, open at the top, and into which as shown five cartridges may be packed. The front ends 40 of said pack cases preferably are closed, while the rear ends of the same preferably have bent over edges 41, as shown in Fig. 7, leaving between them an opening 42 of sufficient width to permit the passage of strip 21, but yet serving to prevent the cartridges from slipping out of the pack case. The sides are preferably formed with inwardly bulging swells 43 at their tops, and furthermore have slots 44 extending from the bottom nearly to the tops of said sides. Said pack cases are adapted to be slidably inserted in a receptacle located below the barrel, and opening at its rear into the cartridge magazine. By means of a spring catch, preferably comprising a resilient member 45 Fig. 4, having knobs 46, 47, and 48, adapted to enter into cooperating holes 49, and 50, provided in the pack cases, said cases may be retained in predetermined positions as desired.

The magazine chamber having been emptied by the discharge of the cartridges therein, the gunner, may with one hand, by means of knob 32 depress the arms 23, so as to carry the carrier 27 into its extreme low position, as shown by dotted lines at 27^b, Fig. 1. The inclination of grooves 30 are such as to tilt carrier 27 into such a position so that the top surface of said carrier lies wholly below the plane in which the bottom of the pack cases lie. Carrier 27 having been depressed the packs may be then pulled toward the operator until the cartridges contained in the inner pack 38 are substantially in the position of those originally in the magazine, in which position knob 46 will engage in a properly placed cooperating hole (not shown) in the bottom of the pack case. Knob 32 is now released and spring 24 will force carrier 27

upward through an opening 52 in the bottom of the pack case against the bottom of the lowest cartridge; slots 44 permitting further movement of the same, which will operate to push all the cartridges upwardly until the top cartridge engages the guide portions 16 of the hooked guides 15 and is in the position occupied by cartridge 18 in Fig. 1. The cartridges to the first pack may be then discharged, in the manner herein above described. When the cartridges of the first pack 38 are discharged, carrier 27 may be again depressed, and the second pack 39 may be slid into the position previously occupied by the first pack, the first pack case 38 moving rearwardly between arms 23 into the dotted position shown at 53. On releasing the carrier 27 the cartridges of the second pack will be raised into firing position and may be discharged in the manner above set forth. The empty pack cases must now be extracted and the rifle loaded anew.

While the principles of my invention have been above disclosed more particularly in connection with a rifle, they are, of course, applicable for use in a pistol, shot-gun, or firearms of any description whatever.

Having described my invention, I claim

1. In an automatic firearm having a frame, a barrel and a pusher bar slidably mounted in said frame, and adapted to load a cartridge into firing position in said barrel; a normally inoperative firing pin longitudinally movable with respect to the pusher bar, and firing pin actuating means, adapted to acquire a momentum from the loading movement of the pusher bar, and rendered operative by such momentum to discharge the cartridge as the movement of the pusher bar is arrested when the cartridge reaches its firing position.

2. In an automatic firearm having a frame, a barrel, a cartridge chamber in said barrel, and means for positioning a cartridge in substantial axial alinement with said cartridge chamber; in combination, a pusher bar longitudinally slidable in said frame, and adapted to load a cartridge into firing position in the said cartridge chamber, a normally inoperative firing pin located in said pusher bar, and a striker slidably mounted on said pusher bar, and in engagement with the firing pin, said striker being adapted to derive a momentum from the loading movement of the pusher bar, whereby the striker renders the firing pin operative to explode the cartridge as it comes into firing position in the cartridge chamber.

3. In an automatic firearm having a frame, a barrel, a cartridge chamber in said barrel, a cartridge magazine containing a supply of cartridges, means whereby said cartridges are successively expelled from said magazine, and a pusher bar adapted to load said cartridges into firing position in the cartridge

chamber; in combination with a striker mounted on said pusher bar and adapted in one position to actuate the cartridge exploding instrumentalities, hooked guides carried 5 by the striker, adapted in the normal position of the striker to position a cartridge in loading position with reference to the pusher bar, and in the firing position of said striker adapted to engage said cartridge for the purpose of extracting the same from the cartridge chamber. 10

4. In an automatic firearm containing a frame, a barrel, and cartridge loading mechanism adapted to load a cartridge delivered 15 thereto into firing position in the barrel; the combination with a cartridge magazine located in the frame beneath the cartridge loading mechanism and having an open front end, of a cartridge pack, containing a 20 supplementary supply of cartridges, slidingly mounted in the said frame below the barrel, said cartridge pack being initially positioned in the frame so as to close the open forward end of said magazine, and being adapted to 25 be slid rearwardly into the said cartridge

magazine on the exhaustion of the supply of cartridges therein.

5. In a magazine firearm containing a frame, a barrel, and cartridge loading mechanism adapted to load a cartridge, delivered 30 thereto from the cartridge magazine, into firing position in the barrel; a cartridge magazine located in the frame and lying beneath the cartridge loading mechanism and having its forward end cut away to provide 35 an opening adapted to permit the insertion therethrough of a cartridge pack, and a cartridge pack containing a supplementary supply of cartridges, initially positioned in 40 the said frame so as to lie adjacent to, and partially entered within the open end of the cartridge magazine, and being adapted to be slid rearwardly into said magazine when the supply of cartridges therein is exhausted.

In testimony whereof I affix my signature 45 in presence of two witnesses.

ST. OMER MANGLE.

Witnesses:

THOMAS E. HALL,
Mrs. G. J. FORRISTALL.