MAGAZINE FIRE-ARM.

SPECIFICATION forming part of Letters Patent No. 413,734, dated October 29, 1889.

To all whom it may concern:

Be it known that I, SYLVESTER H. ROPER, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Magazine Fire-Arms, of which the following description, in connection with the accompanying drawings, is a specification, the like letters on the drawings representing like parts.

This invention has for its object to improve magazine fire-arms, especially in their mode of operation, whereby the cartridges are taken automatically from the magazine and inserted in the barrel to be fired, the shells being then withdrawn from the barrel and discharged.

To accomplish these steps in a rapid manner and by a mechanism simple in operation, I have devised a carrier which, as herein shown, is adapted to be rotated intermittently, the said carrier, as represented in the drawings, having practically four compartments—

one to receive the cartridge from the magazine, one to receive the shell from the barrel, another to aid in inserting the cartridge into the magazine, and another to contain the firing-pin, that portion of the carrier which receives the firing-pin also serving as the recoil-block.

A cartridge having been inserted within the proper compartment of the carrier from the magazine, the carrier is partially rotated to bring the cartridge in it in line with the bore of the barrel, in which position the cartridge is inserted into the barrel, and the carrier is then again partially rotated, so as to bring the firing-pin and recoil-block in line with the bore of the barrel, when the cartridge may, if desired, be exploded, and thereafter the carrier is again partially rotated to bring the shell-receiving compartment in line with the bore of the barrel, and the shell (supposing the cartridge to have been exploded) is extracted or withdrawn from the barrel into the said compartment, and as the carrier is further rotated the said shell is thrown therefrom.

As herein provided for, when the carrier is in position for the firing-pin to explode the cartridge the cartridge-receiving compartment is in line with the magazine.

To operate the carrier intermittently, I have provided a cam-rod, the said rod, as herein shown, being rotated intermittently by means of or through a hand-piece and suitable intermediate devices. The hand-piece, as herein shown, is made instrumental in operating the combined cartridge inserter and extractor, and, as herein provided for, I have made the said inserter and extractor perform a third function—namely, that of setting the hammer in position for firing.

My invention in magazine-guns consists, essentially, in an intermittently-moving carrier having a compartment for the reception of a cartridge from the magazine, a compartment for the reception of the firing-pin and to furnish the recoil-block, and a compartment or space for the reception of the shell from the barrel, combined with a receiver for the carrier, a barrel, and a magazine; also, in a magazine-gun, a carrier to receive a cartridge to be carried into position in line with the bore of the barrel, and a firing-pin, combined with a cam-rod, to actuate the said carrier intermittently; also, in a magazine-gun, a cam-rod to operate a carrier, combined with a saddle connected with a hand-piece and having a stud to operate the said cam-rod intermittently.

Other features of my invention will be hereinafter described, and referred to in the claims.

Figure 1 in side elevation represents a magazine-gun embodying my invention, the magazine being partially broken out, the carrier being in position for firing; Fig. 2, an enlarged side elevation, the barrel and magazine being partially broken off, the carrier being in position for the shell to be extracted; Fig. 3, an opposite side elevation of Fig. 2; Fig. 4, a longitudinal section of Fig. 1 on a larger scale, the ends of the magazine and barrel being broken off; Figs. 5 and 6, details showing the carrier in different positions; Fig. 7, a detail showing the cam-rod laid out or developed on a flat surface to show the shape of the cam; Fig. 8, a section of Fig. 95 in the dotted line x'x'; Fig. 9, a section of Fig. 2 in the dotted line x'x'; Fig. 10, a section of Fig. 3 in the dotted line x'x'; and Fig. 11 is an enlarged perspective showing the carrier and part of the receiver within which it moves.

The receiver A, of proper shape to contain the carrier, is attached to the stock A', of any usual shape or material.
The receiver A is cut through to receive the carrier B, which, as herein shown, is rigidly attached to one end of a cam-rod C; the inner end of the rod being shown in Fig. 1 as recessed and as taking a bearing in the wall 2 of the receiver, which wall separates the space in which the carrier is placed from the chamber containing the different parts of the lock, to be described.

The carrier B is so shaped as to present a compartment b for the reception of a cartridge c from the magazine D and to present a compartment b' (see Fig. 4) for the reception of the firing-pin b", the latter being surrounded by a spiral spring b", which, acting at one end against the inner wall of the compartment b' and at its other end against an annular shoulder of the firing-pin, normally holds the said pin with its rear end beyond the said shoulder out in position to be struck by the projection 3 of the hammer e, pivoted at c', the said projection 3, when operating the firing-pin, passing through a hole in the partition 2 and into the open rear end of the compartment in which the firing-pin is located, the rear end of the said firing-pin being supported by an adjustable bearing 4, shown as screwed into the compartment b'. The wall constituting the outer end of the compartment b' (see Fig. 11) is left of sufficient width or size to constitute the recoil-block b'.

The carrier B between the compartments b and b' is provided with a third compartment or open space b", or is so shaped as to uncover the bore of the barrel F at the time that the shell is to be extracted or withdrawn from the barrel, as will be described, the said compartment or space being shown in Figs. 11 and 8 as semi-cylindrical, which is the shape preferred. The carrier also has substantially opposite to the compartment b' a compartment or space b'" herein shown as partially bounded by a conceived inclined shelf b", which is employed when filling the magazine, the cartridge at such time being laid upon the said shelf and pushed therefrom longitudinally by hand into the open rear end of the magazine, the first cartridge having its point pressed against the end of the follower da2ted upon, as usual, by a spring d'. The receiver has upon it a spring-latch d", the free end of which is normally held in such position (see Fig. 4) as to retain in the magazine the last cartridge inserted therein, this latch being, however, moved to release the cartridge and permit the spring d" to cause a cartridge to be ejected into the compartment b whenever the cam projection d' of the carrier in the movement of the latter meets the said latch.

The carrier B is provided with a carrier-locking device 5, herein shown as a sliding bolt held loosely in position by a screw 6 in a slot of the said bolt, the end of the bolt entering a suitable notch or recess in the wall 2 of the receiver whenever it is desired to lock the carrier in place against accidental movement, the locking device being herein shown as so located with relation to the carrier as to lock it in position for the proper operation of the firing-pin. I have provided the receiver near each end of the carrier with recesses 7 8 (see Figs. 2 and 3) in the wall of the compartment b, the said slot intersecting also the compartment b', and when the cartridge has been drawn back the carrier will be partially rotated backward by hand until the cartridge comes opposite one or the other of the recesses 7 or 8, and the cartridge may be withdrawn from the compartment through either of the said recesses, whichever may be the most convenient. I have shown the recess 7 as provided with a spring 12, held in place by a screw 13, the free end of the said spring being curved or bent outward to normally act as a stop and prevent the accidental slipping of the cartridge backward from the compartment b in the movement of the carrier. To accomplish the same object for the recess 8, I have provided a stop 15 on the receiver, using a screw 16 for that purpose, and Fig. 6 shows an imperfect cartridge as being removed.

The carrier and cam-rod are herein shown as connected by means of screws 17.

The cam-rod C, which is one of the peculiar and leading features of my improved magazine, has made in it a cam-groove c", the shape of which is well represented in Fig. 7, where the said rod is supposed to be split at one side and laid out flat as a plane surface, and by referring to said figure it will be seen that the said groove from near the inner end of the rod, or nearest the receiver, is made parallel to the axis of the said rod, as at 18, is then curved, as at 19, and again made straight, as at 20; but in the development of the grooves 115 of the rod, as shown in Fig. 7, it will be seen that the straight part 20 referred to is cut longitudinally, or that the part of the said groove marked 20 is shown at each side of the diagram Fig. 7. The straight part 20 is joined to the straight part 22 by a curved part 21, the straight part 22 connecting with the straight part 18 by a curved part 23. The groove of the cam-rod is entered by an adjustable stud 24, made preferably as a screw, extended through a saddle f, which, as herein shown, is shaped to slide upon the magazine D; but it may readily be made to slide upon the barrel F. This saddle has connected with it a bar f', which, extended lengthwise of the barrel F, has its free end entered into a recess 25 of the receiver A, (see Figs. 4 and 11,) the said bar f' having pivoted upon it at 26 the combined inserter and extractor, the same
being shown as a finger \( g \), which, at its under side, near its free end, has a lug or projection \( g' \), the said lug being normally kept pressed toward the center of the barrel \( F \) by a suitable spring \( g'' \). The saddle, as herein shown, has an attached sleeve \( f' \), to which is operatively joined the hand-piece \( H \), which, as herein shown, is made to partially surround the magazine and is to be moved longitudinally therefrom. The forward position of the handle and saddle is determined by the bracket or stop \( k \), attached to the barrel by a screw \( k' \), the saddle or the end of the sliding bar \( f'' \) striking the said bracket. The stop \( k \) also serves

(see Fig. 4) as a bearing for the outer end of the cam-rod \( C \), the said figure also showing the straight part 20 of the groove \( e \), which intersects with the curved parts 19 and 23. The receiver below the recess 25 is slotted, as at 28, for the passage of the projection \( g' \) of the combined inserter and extractor \( g \), the rear end of the barrel being also suitably notched, as at 29, (see Fig. 4,) to permit the projection \( g'' \) to drop down and engage the rim of the shell of the cartridge when it is to be withdrawn, the foot \( g'' \) during such operation traveling through the recess 25. The movement of the bar \( f'' \) into the recess 25 is always far enough to carry the projection \( g'' \) beyond the rear end of the carrier, so that the said projection may be left in proper position when the bar \( f'' \) is moved in the opposite direction to engage the rim of the cartridge in the compartment \( b \) and insert it into the bore of the barrel in position to be fired by the firing-pin. The hammer \( e \) has a finger-piece \( e' \) by which to operate it directly by hand, if desired; but the finger-piece may be omitted. The hammer \( e \) at its rear side is provided with a notch \( e' \), which is engaged by the trigger \( m \), pivoted at \( m' \) and operated by a spring \( m'' \). The hammer is shown as slotted to receive the stirrup \( e' \), pivoted at \( e'' \) and connected to the mainspring \( e' \). The hammer has at its upper end a projection \( e' \).

Fig. 4 in full lines shows the hammer raised; but in dotted lines the hammer is shown as down. Said Fig. 4 by dotted lines shows the combined inserter and extractor as just engaging the projection \( e' \) of the hammer, and as the bar \( f'' \) is moved farther to the right in said figure the projection \( g' \), acting against the hammer, will raise it into its full-line position; but while the projection \( g' \) is so acting the carrier will be moving into a position different from that shown by full lines in said Fig. 4. When the hammer is being set, the barrel will not contain a shell or cartridge.

The usual guard \( a \) to protect the trigger has upon it a trigger-locking device \( n' \), (shown as a screw,) which may be turned in such direction as to act against and form a stop to prevent movement of the trigger in the direction to release the hammer. The hammer is recessed above its pivot \( e' \) to receive a recoil-spring \( o' \), one end of which projecting from the said hammer rests against the wall 2 when the hammer is down.

The outward throw of the mainspring is checked by an adjustable stop \( o' \), (herein shown as a screw,) which is so located as to stop the said spring just before the projection 3 of the hammer strikes the firing-pin; but the momentum of the hammer is such that it has sufficient movement after the spring \( o' \) is stopped to impart to the firing-pin sufficient motion to explode the cartridge, the spring \( o' \), the firing-pin having been operated, thereafter acting as a recoil-spring for the hammer.

When the cartridges are to be inserted in the magazine, a catch \( t' \), pivoted at \( t' \) on the receiver, Figs. 3 and 10, and acted upon by a spring \( o' \), and having a curved end, enters the groove 18 and serves to hold the shelf \( b' \) of the carrier in line with the magazine.

Assuming the different parts referred to to be in the position shown in Figs. 1 and 4, with the magazine filled and a cartridge in the bore of the barrel, and the firing-pin in position to explode the cartridge, the operation will be as follows: The trigger will be pulled to permit the hammer to operate the firing-pin and explode the cartridge. This done, the hand-piece will be drawn backward toward the receiver, and the stud \( p \), at the commencement of the said movement located at the outer end of the groove 20, will travel along the said groove into the curved part 21, passing the dividing-point \( r \), (see Fig. 4,) and entering the groove 22, passing along through it into the curved part 23, and therein entering the straight groove 18, moving therein nearly to the end of the said cam-rod. As the said passes through the curved part 21, the cam-rod is partially rotated, and with it the carrier \( B \), far enough to bring the compartment or space \( b' \) in line with the bore of the barrel, and as the said passes along the straight part 22 the cam-rod and carrier remain at rest, while the lug \( g'' \) engages the rim of the cartridge-shell and extracts it from the barrel.

After the shell has been fully withdrawn from the barrel the stud \( p \) enters the curved part 23, which again effects the partial rotation of the carrier, such movement being sufficient to disengage the rim of the shell from the said projection \( g' \), the said movement of the carrier to release the shell from the projection \( g' \) taking place before the projection \( g' \) reaches the rear end of the carrier and while the said stud is in the outer part of the groove 23. The rim of the shell having been carried beyond the projection \( g' \), the rotation of the carrier is continued until the chamber \( b \), containing the cartridge, is in line with the bore of the barrel, when the carrier is stopped, the stud \( p \) then entering the straight part 18 of the groove \( o' \), and while the hand-piece is moved to complete its inward stroke the projection \( g' \) acts, as before stated, against the projection \( e' \) to raise the hammer. As the
hand-piece is moved forward or away from
the receiver the stud p passes through the
groove 18, the projection g' at such time ac-
ting against the end of the cartridge and push-
ing it into the bore of the barrel. The car-
tridge having been inserted into the barrel, the
stud enters the curved groove 19, which
again partially rotates the cam-rod and car-
ter far enough to bring the firing-pin and
recoil-block in line with the bore of the bar-
rel, again bringing the parts in the position
shown by full lines in Fig. 4.

It will be obvious that the extent of move-
ment of the carrier and its time of movement
and rest with relation to the other working
parts of the gun may be changed to meet any
desired requirement by changing the shape
of the groove in the cam-rod. It is also ob-
vious that a cam ledge or ridge on the cam-
rod would be a mechanical equivalent for the
groove, and hence would be within the scope
of my invention.

I have herein shown the hand-piece as slid-
ning; but in another application, Serial No.
155,067, I have shown the hand-piece as at-
tached to a lever.

I claim—
1. In a magazine-gun, an intermittently-
rotating carrier having a compartment for
the reception of a cartridge, a closed com-
partment opposite thereto for the permanent
reception of a firing-pin and also constitu-
ing a recoil-block, an open compartment or
space for the passage of the shell outward
from the bore of the barrel, and a magazine-
filling shelf, combined with a receiver cut to
receive the rotating carrier and form bear-
ings therefor, a barrel attached to the outer
der end of the said receiver, and a magazine,
substantially as described.
2. In a magazine-gun, the combination, sub-
stantially as described, with a receiver
adapted to retain a carrier and form a sepa-
rating-wall between it and the lock mechani-
sm, a rotary carrier adapted to receive a
cartridge to be carried into position to be in-
serted into the barrel and having a firing-pin
attached to and moving with the said car-
ter, and a recoil-block surrounding the said
firing-pin, of a cam-rod rigidly attached to
and projecting beyond the said carrier to ac-
tuate it at the proper times.
3. In a magazine-gun, a rotating carrier
and a cam-rod rigidly attached thereto, com-
bined with a saddle having an adjustable
stud extended therethrough in operative con-
nection with and to actuate the said cam-rod
by longitudinal movement thereon, substan-
tially as described.
4. The barrel, the magazine, intermittently-
rotatable carrier, and the attached cam-rod re-
duced at its ends to form journals for the said
carrier, combined with a saddle operatively
connected with and adapted to intermittently
rotate the cam-rod, and with a bar attached
to the said saddle rigidly, and its spring-
actuated combined inserter and extractor piv-
ated thereto at a point intermediate its ends,
to operate substantially as described.
5. In a magazine-gun, the barrel, the mag-
azine, the recessed and slotted receiver, and
hammer provided with a projection at its up-
er end, combined with the reciprocating
side-bar adapted to enter the recessed re-
ceiver and having a finger to enter the slot
to insert or extract a cartridge, further move-
ment of the said finger being adapted to act
upon the said projection and set the hammer
automatically after the shell has been ex-
tracted, substantially as described.
6. In a magazine-gun, a barrel, magazine,
acarrier, its rigidly-attached cam-rod, sub-
stantially as described, to actuate the carrier
intermittingly, and a hammer, combined with
a reciprocating slide-bar having a spring-
actuated finger provided with a projection g',
said finger in its inward movement act-
ing to engage the rim of and extract the car-
tridge-shell from the barrel and thereafter to
set the hammer, and upon its outward move-
ment removing the cartridge from the car-
rier and inserting it in the bore of the barrel,
substantially as set forth.
7. In a magazine-gun, the receiver, the bar-
rel, magazine, cam-rod, and means, sub-
stantially as described, to rotate it intermit-
tingly, combined with a carrier rigidly con-
ected to and moving with the said cam-rod
and with a reciprocating slide-bar provided
with the spring-actuated finger g, the said
carrier being moved to carry the rim of the
shell away from contact with the said finger
during the partial rotation of the carrier,
substantially as and for the purpose set forth.
8. The receiver, a magazine, and normally-
operating spring-latch d, attached to the out-
side of and having its free end projecting
within the receiver in front of the mouth of
the magazine to retain the cartridge therein,
combined with a rotating carrier having a
compartment b for the reception of the car-
tridge and provided with the attached cam m
adjacent to said compartment to intermitt-
tingly move and retain the ratchet momen-
tarily out of operative position as the cam is
rotated, substantially as described.
9. The receiver, the carrier having a firing-
pin, and the recessed hammer provided with
the recoil-spring o therein, combined with the
mainspring operatively attached to the ham-
ner, and with an adjustable screw-stop o' to
arrest the mainspring before the hammer
strikes the firing-pin, substantially as de-
scribed.
10. In a magazine-gun, a receiver, barrel,
 magazines, and intermittently-rotatable carrier
having a curved shelf u and an attached cam-
rod to operate the said carrier, combined with
a locking device on said carrier, consisting of
a slotted sliding bolt, its end co-operating with
the notched rear wall 2 of the receiver to hold
the carrier in place while the cartridges are
being inserted from the said shelf into the
magazine to charge the same, substantially as described.

11. The receiver having the notched wall 3 and the intermittingly-rotating carrier combined with a hand-operated locking-bolt attached to the exterior of the carrier and sliding longitudinally thereon and engaging the said notched wall of the receiver at the will of the operator, substantially as described.

12. The receiver, the barrel, and the bracket or limiting-stop, surrounding and fixed upon the said barrel and having a bearing for the reduced outer end of the cam-rod, combined with the carrier and its rigidly-attached cam-rod, substantially as described.

13. The receiver, the magazine, the barrel, and the cam-rod, and means, substantially as described, to rotate it intermittingly, combined with the attached rotatable carrier having a compartment for the reception of a cartridge to be inserted into the magazine, a compartment to receive a cartridge from the magazine, a compartment to receive entirely within it the firing-pin and to constitute the recoil-block, and a compartment or space to permit the outward passage of the shell from the barrel, and with a reciprocating bar sliding in the receiver and having an attached spring-finger to serve both as an inserting device for the cartridge and as an extracting device for the shell, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SYLVESTER H. ROPER.

Witnesses:

G. W. GREGORY,
C. M. CONE.