

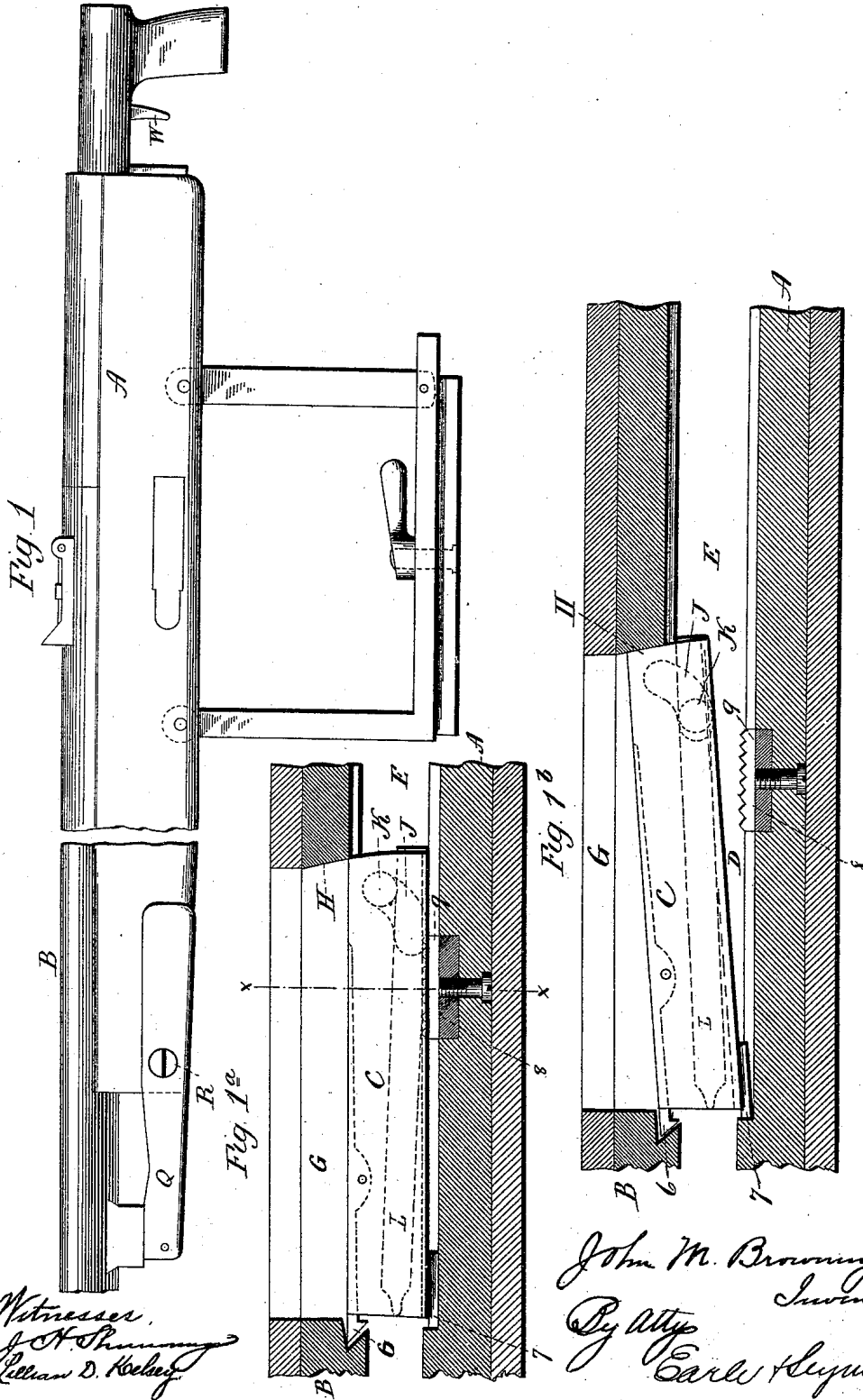
(No Model.)

4 Sheets—Sheet 1.

J. M. BROWNING.
GAS OPERATED MACHINE GUN.

No. 544,657.

Patented Aug. 20, 1895.



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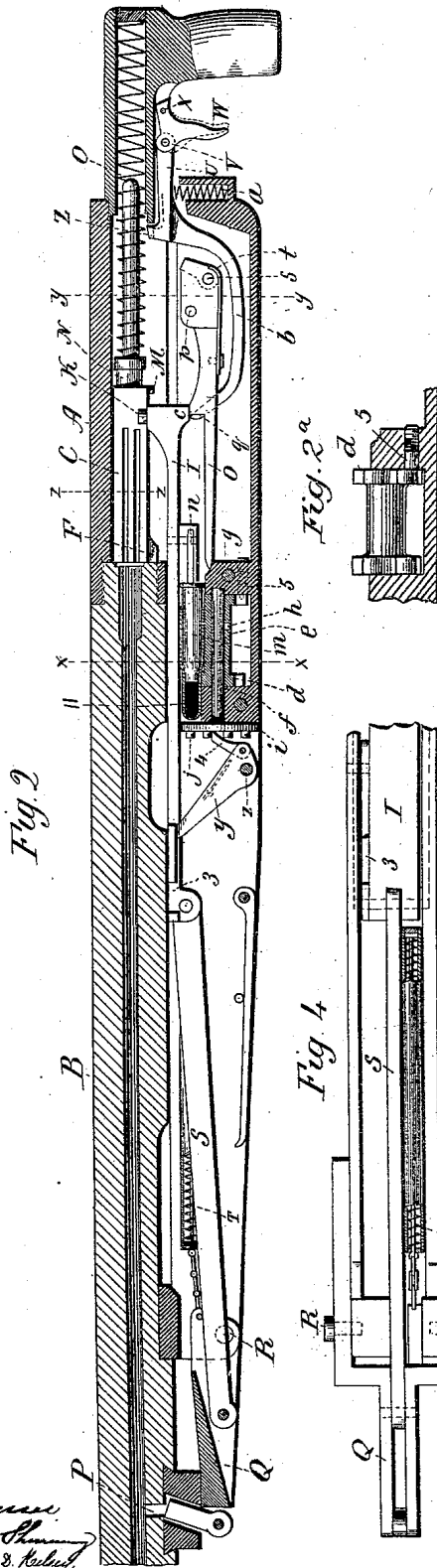


Fig. 2

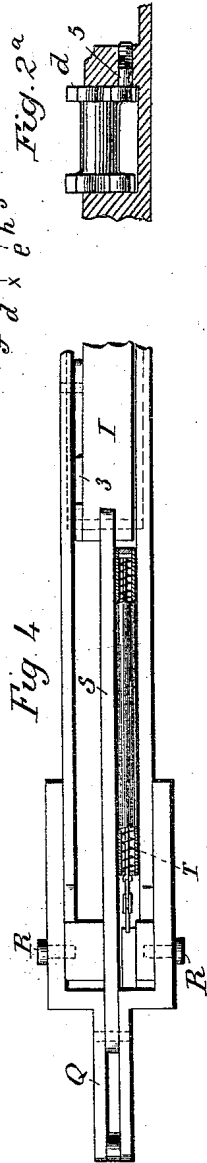


Fig. 4

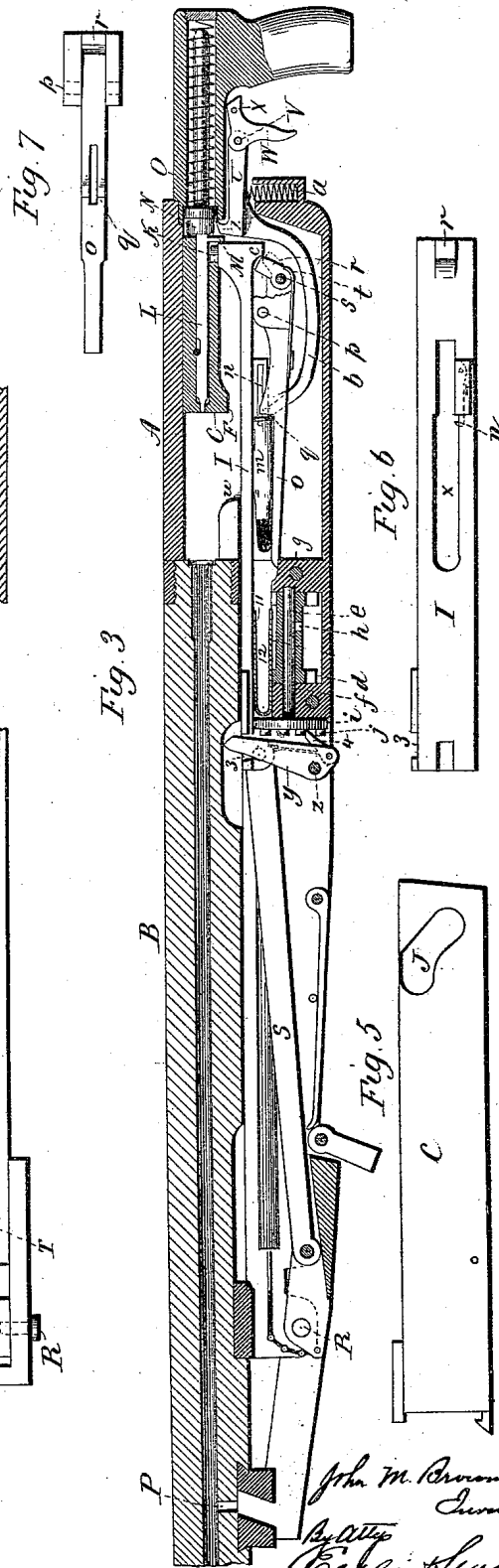


Fig. 3

Fig. 5

Fig. 6

Fig. 7

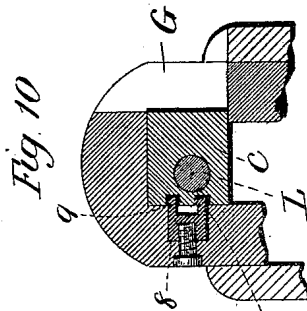
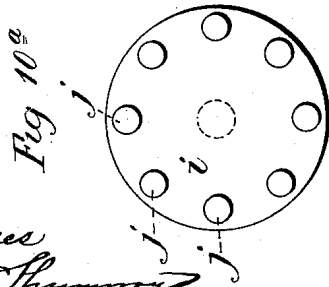
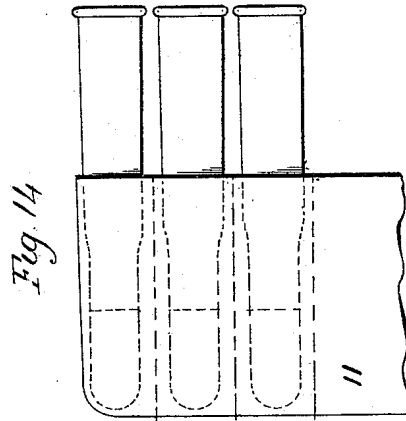
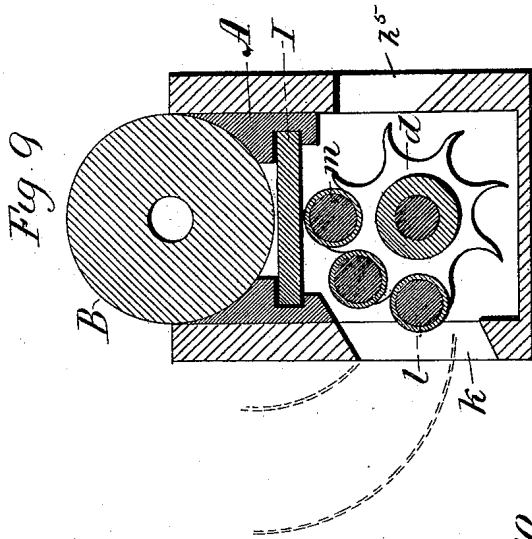
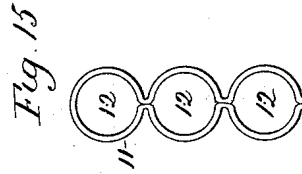
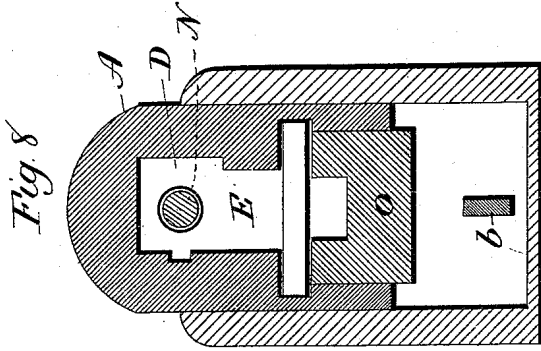
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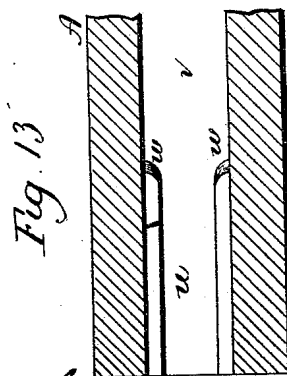
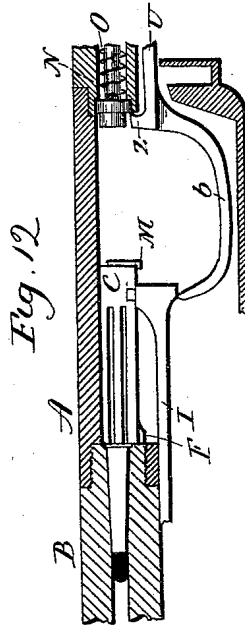
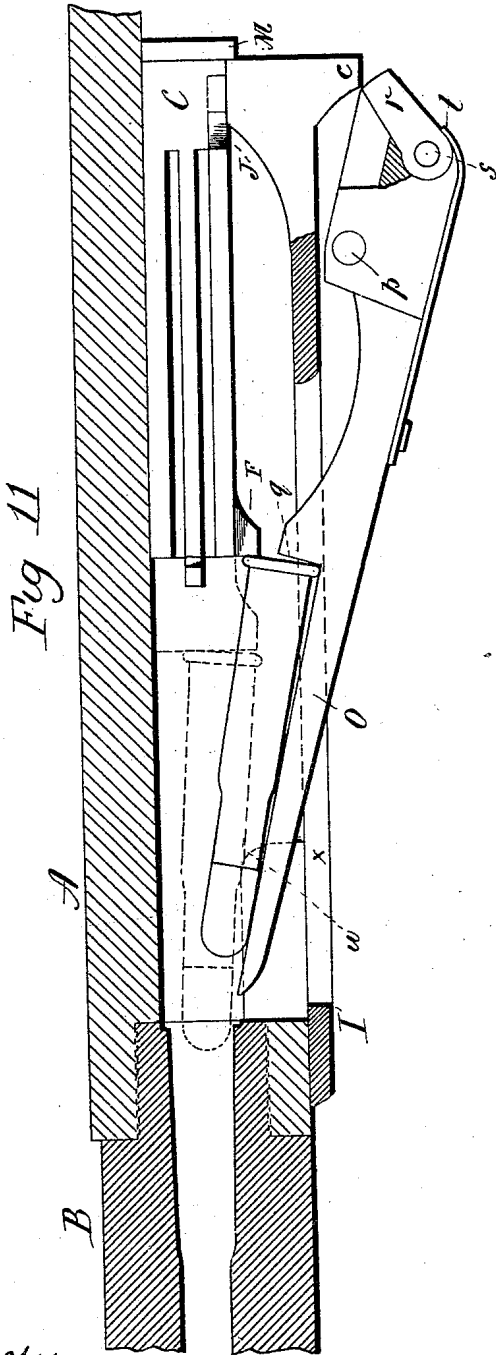
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UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH TERRITORY.

GAS-OPERATED MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 544,657, dated August 20, 1895.

Application filed November 7, 1892. Serial No. 451,181. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. BROWNING, of Ogden, in the county of Weber and Territory of Utah, have invented a new Improvement in Machine-Guns; and I do hereby declare the following, when taken in connection with accompanying drawings, and the letters and numerals of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view of the gun; Fig. 1^a, a horizontal section showing the breech-piece in plan view as unlocked enlarged; Fig. 1^b, the same, showing the breech-piece thrown into its locked engagement enlarged; Fig. 2, a longitudinal sectional view showing the mechanism of the gun in the closed or normal position. Fig. 2^a is a detail view, on an enlarged scale, of the feed-wheel and spring-latch bolt engaging therewith; Fig. 3, the same, showing the parts in the extreme open position; Fig. 4, an under side view of the forward portion of the gun, showing the connection between the slide and the operating-lever; Fig. 5, an under side view of the breech-block enlarged; Fig. 6, an under side view of the slide; Fig. 7, a top view of the carrier; Fig. 8, a transverse section on line *y y* of Fig. 2 enlarged; Fig. 9, a transverse section on line *x x* of Fig. 2 enlarged; Fig. 10, a transverse section on line *x x* of Fig. 1^a enlarged; Fig. 10^a, a face view of the feed-wheel ratchet enlarged; Fig. 11, a longitudinal section showing side view of the breech-piece, carrier and slide enlarged to illustrate the operation of the shoulders *w* in the receiver; Fig. 12, a longitudinal sectional side view illustrating the operation of the sear; Fig. 13, a horizontal section of the forward portion of the receiver, showing the passage through which the cartridge rises and the shoulders *w* enlarged; Fig. 14, a side view of the band with the cartridges therein; Fig. 15, an edge view of the same.

This invention relates to an improvement in that class of guns in which the force of the gases produced by explosion is employed as a means for operating the mechanism of the arm, and whereby under the force of the explosion the breech-piece is opened, the exploded shell extracted, the breech-piece forced

to its wide-open position, the hammer cocked, a fresh cartridge presented forward of the breech-piece for insertion into the barrel, and in the opening movement of the breech-piece a spring is compressed, and so that immediately upon the parts reaching the open position the said spring reacts to return the parts to the closed position, carrying the fresh cartridge into the barrel and discharging it, whereupon a second opening movement is produced and so continuing, the gun being automatic in its operation so long as cartridges are supplied thereto.

In another application for Letters Patent by myself and Matthew S. Browning, Serial No. 485,215, there is described a mechanism adapted to be operated by gases of explosion. The present invention is an improvement upon the invention of that application, and shows certain parts in construction and operation like the corresponding parts in the said application. In that application the breech-piece is arranged so that while it moves longitudinally backward and forward in opening and closing it is permitted at its rear end an up-and-down swinging movement, turning upon its forward end as a pivot, such up-and-down movement of the rear end of the breech-piece being for the purpose of unlocking and locking the breech-piece.

The object of the present invention is specially to arrange the breech-piece so that its locking and unlocking movements are produced by a lateral swing instead of vertically, as in the before-mentioned application, as well as to improve the gun in other points; and the invention consists in the construction and combination of parts, as hereinafter described, and particularly recited in the claims.

A represents the receiver, at the forward end of which the barrel B is arranged and opens into the receiver at the rear.

C represents the breech-piece, which is preferably rectangular in shape in transverse section, and is arranged in a longitudinal recess D in the receiver, so as to be moved freely backward and forward, the said recess corresponding in shape to the shape of the breech-piece. The recess in which the breech-piece moves opens downward through a groove E, as seen in Fig. 8, which is somewhat narrower than the width of the breech-piece, so that

the breech-piece may be supported against vertical movement. At the forward end of the breech-piece is a downward projection F, which slides in the groove E as the breech-piece moves backward and forward. On the right-hand side of the breech-piece when it is in its closed position a lateral opening G is made through the side of the receiver, (see Figs. 1^a and 10,) and when the breech-piece is in the closed position, as seen in the said Fig. 1^a, its rear end stands in line with the rear end H of the opening G, and so that the rear end of the breech-piece may be thrown outward into the said opening, as seen in Fig. 1^b, and so as to bring the rear end of the breech-piece against the end H of the opening G as an abutment to support the breech-piece against recoil.

To open the breech-piece its rear end must be thrown inward, as from the position in Fig. 1^b to that seen in Fig. 1^a, and so as to bring the breech-piece into line with the recess in the receiver in which the breech-piece may move. In this movement of the breech-piece it turns laterally as upon a pivot at its forward end, the downward projection F in the groove below serving as such pivot.

The breech-piece is operated by means of a longitudinal slide I, arranged beneath the barrel and extending through the forward end of the receiver below the breech-piece, and so that it may be freely moved backward and forward, as from the position in Fig. 2 to that seen in Fig. 3, and return.

On the under side of the breech-piece and at its rear end is a cam-groove J. (See Fig. 5.) The main portion of the groove is oblique to the axis of the breech-piece, its inclination being from the left-hand side toward the right-hand side, and as represented in broken lines, Figs. 1^a and 1^b, and the groove also contains the longitudinal portion at its forward end, as shown in Figs. 1^a, 1^b, and 5. At its rear end the slide I is constructed with a stud K, which extends into the cam-groove J of the breech-piece, and when the breech-piece is in its extreme forward and closed position the stud stands in the forward end of the cam-groove J, and as indicated in broken lines, Fig. 1^b. As the slide I commences its rear movement the stud K operates in the cam-groove J of the breech-piece, first moving in the longitudinal portion thereof and causing lateral movement of the breech-piece, and then moving in the inclined portion of the cam-groove to impart to the breech-piece an inward lateral movement, as from the position in Fig. 1^b to that seen in Fig. 1^a, and which brings the breech-piece into its unlocked position and ready for rear movement as the stud K strikes the rear end of the cam-groove in the breech-piece, as seen in Fig. 1^a. Then a continued rear movement of the slide I will force the breech-piece to its rear or open position, as seen in Fig. 3.

Longitudinally in the breech-piece the firing-pin L is arranged and extends through

the breech-piece at the rear, and at its rear end is provided with a downward projection M, and so that the rear end of the slide I will strike this projection M of the firing-pin as it completes the unlocking movement of the breech-piece and so as to retract the firing-pin, as represented in Fig. 3, the firing-pin being held so retracted throughout the rear movement of the breech-piece, and until on the return of the slide I and breech-piece the breech-piece is brought to its forward position. Then the slide continues its forward movement, the stud K returning in the cam-groove J operates thereon to force the breech-piece from its unlocked position seen in Fig. 1^a to its locked position, as seen in Fig. 1^b, and this locking movement takes the end of the slide away from the projection M of the firing-pin, so as to leave that pin free to be forced forward under the blow of the hammer. After the breech-piece has been locked the slide has a further forward movement, during which the stud K moves in the longitudinal portion of the cam-groove J.

In rear of the breech-piece a longitudinally-reciprocating hammer N is arranged, provided with a suitable spring O, and so that as the breech-piece is thrown rearward the hammer will also be forced rearward and compress its spring, the hammer being caught by a suitable trigger when in its full-cocked position and there held until the breech-piece returns. Then the trigger may be pulled to liberate the hammer and the blow be imparted to the firing-pin in the usual manner. The reciprocating movement of the slide I, as here represented, is produced by the same mechanism as that described in the application before referred to, and therefore requires but brief description for its proper understanding.

At a point in the barrel forward of the cartridge-chamber an aperture P is formed, which opens outward. Near this aperture a lever Q is hung upon a pivot R, so as to swing in a plane parallel with the plane of the axis of the barrel. As here represented the lever is hung in rear of the aperture P and extends forward, and is provided at its forward or free end with some device which may permit the gases of explosion to pass through the aperture P, and so act upon the forward end of the lever as to impart to it a swinging movement and throw it to its rear or open position, as seen in Fig. 3. The lever Q is connected to the slide I by means of a rod S, so that the rearward swinging movement of the lever communicates to the slide I its rear movement, and consequently the corresponding rear movement of the breech-piece. In the rear movement of the breech-piece a spring T, which is connected with the lever Q, is compressed, and so that the reaction of the spring, after the rear movement of the lever, as before described, will cause the lever to return to its closed position, and in such return movement will draw the slide I for-

ward and bring the breech-piece to its closed and locked position.

To engage the hammer and hold it in its cocked position, so that it may be released only when the breech-piece is in its closed position, and then automatically released, the same sear and trigger mechanism is employed as that in the before-mentioned application; but according to this invention the sear engages with the slide instead of engaging with the breech-piece, as in the above-mentioned application, and as the slide completes its forward movement after the breech-piece has been fully locked, and while the stud K is moving in the longitudinal portion of the cam-groove J, the slide strikes the sear. The effect of the engagement of the sear with the slide is to put the firing mechanism into operative position, and if the trigger is held in pulled position, as in automatic firing, the engagement of the sear and slide releases the hammer, so that the hammer will be thrown forward and will explode the cartridge. When the sear is not in engagement with the slide, the firing mechanism is out of operative position—*i. e.*, the hammer cannot be released by pulling the trigger. It will therefore be evident that according to this invention the firing mechanism is only in operative position while the stud K of the slide occupies the forward end of or is moving backward or forward in the longitudinal portion of the cam-groove J, which it does during only a short period, and during this period the breech-piece is necessarily firmly held in fully-locked position, while in all other positions of the parts, whether the breech-piece is moving into or out of fully-locked position or is out of locked position, the firing mechanism is out of operative position and the gun cannot be discharged.

U represents the sear, which is hung at its rear end by a pivot V to the trigger W, the trigger being hung upon a pivot X in rear of the pivot V. The nose Z of the sear is adapted to engage a corresponding notch or shoulder of the hammer when the hammer is in the rear position, and a spring *a* is provided, the tendency of which is to force the nose of the sear into such engagement with the hammer, and as seen in Fig. 3. The sear is constructed with a forwardly-projecting finger *b*, which extends to a position below the slide, so that when the slide is in its extreme forward or closed position, as seen in Fig. 2, the end of the finger *b* will bear upon a corresponding projection or point *c* on the under side of the slide, but so that after the slide commences its rear movement it will escape from the end of the finger. When the end of the sear-finger *b* is thus engaged with the slide, that point of engagement serves as a fulcrum for the sear, and so that as the trigger is pulled, as seen in broken lines, Fig. 2, the rear end of the sear will be drawn downward, the sear turning upon its fulcrum or bearing-point *c* of the slide, and so as to draw the nose Z of the

sear from its engagement with the hammer and thereby liberate the hammer. The trigger being held in the pulled position, and as the slide moves rearward and escapes from the end of the finger *b* of the sear, the pivot between the sear and trigger serves as a fulcrum for the sear, and so that as the slide and breech-piece move rearward the sear is free to rise under the action of the spring *a* into a position to engage the hammer when it arrives at the full-cock position, as seen in Fig. 3. The trigger being held in the pulled position, when next the slide with the breech-piece is moved forward *c* on the slide will strike the end of the finger *b* and turn the sear down out of engagement with the hammer, so as to liberate the hammer and permit it to fly forward to produce explosion. Consequently so long as the trigger is held in a pulled position the opening movement of the breech-piece leaves the sear free to engage the hammer; but when the breech-piece has returned and reached its extreme forward and locked position, the sear will be operated upon so as to release the hammer, and thereby automatic engagement and disengagement of the hammer with the sear occurs so long as the reciprocating movement of the breech-piece is continued and the trigger is held; but if at any time the trigger be released, then the slide can have no effect upon the sear and the hammer will remain held by the sear in its cocked position. Cartridges being supplied so that at each forward movement of the breech-piece one will be introduced into the barrel, and then on the return of the breech-piece the exploded shell will be withdrawn, automatic firing will continue so long as the cartridges are so supplied.

To supply cartridges a rotating feed-wheel *d* is arranged below the barrel and near its rear end upon an axis *e*, parallel with the axis of the barrel. This axis is supported at its ends in suitable bearings *f g*, and consists of a spindle or axle, which extends through the feed-wheel, and the feed-wheel is secured to the axle by a set-screw *h* or otherwise, so that the axle and wheel will revolve together. The axle extends through its forward bearing, and on its forward end is provided with a ratchet-wheel *i*, the teeth of the ratchet being pins or studs *j* on the forward face of the wheel, as seen in Figs. 2 and 10*.

The feed-wheel *d* is constructed with longitudinal grooves in its periphery, as seen in Fig. 9, each groove being adapted to engage a cartridge, and through the left-hand side of the receiver is an opening *k*, through which cartridges may be supplied to the feed-wheel, and so that a cartridge, as *l*, resting in one groove will be gradually advanced until it be brought into the position *m*, Fig. 9, where it is in a line directly below the barrel; but the wheel is so arranged that cartridges in the wheel stand with their heads

somewhat forward of the rear end of the barrel, and as clearly seen in Fig 2.

The slide I is provided on its under side with a spring feed-hook *n*, like the extracting-hook usually employed on the breech-piece for the extraction of the cartridge from the barrel, and its arrangement on the slide is in such relative position to the cartridges in the feed-wheel that when the slide is in its forward position and the breech-piece closed, as seen in Fig. 2, the feed-hook *n* will have passed over and engaged the head or flange of the uppermost cartridge *m* in the feed-wheel. Then as the slide commences its rear movement it will take the cartridge *m* so engaged rearward from the feed-wheel and throughout the extent of the movement of the slide. As the slide must move a certain distance in order to unlock the breech-piece before the rear movement of the breech-piece commences, the position of the cartridge in the feed-wheel is normally so far forward of the front face of the closed breech-piece that when the opening movement of the breech-piece is produced by the first part of the rear movement of the slide the slide will have drawn the cartridge so far rearward as to bring its head in a plane just forward of the front face of the breech-piece, and from that time the breech-piece and cartridge will move together.

By providing for the extraction of the cartridges from the feed-wheel by their heads, I am enabled to employ a feed-belt having its forward edge closed, and this I prefer for the reason that in such a belt there is less opportunity for the cartridge to be displaced endwise. Furthermore by feeding the cartridges by their heads from the feed-belt to the carrier, I avoid, even in the most rapid firing of the gun, disfiguring their lead bullets or distorting or displacing the same in their shells, the effect in either case being to militate against accurate firing. Again, by feeding the cartridges by their heads they are kept under control as to rearward movement until engaged by the breech-lock for being pushed into the gun-barrel, whereby they are prevented from getting out of place should the gun be held at a high elevation in firing. The cartridge is drawn by the slide onto a carrier *o*, which is arranged below the breech-piece and slide and so that the cartridge may be drawn onto the carrier, as seen in Fig. 3. The carrier extends to the rear, and is hung upon a pivot *p*, so as to swing in a vertical plane, as usual, and as in the gun of the application before referred to. The cartridge stops against a shoulder *q*, formed on the carrier forward of its pivot, so as to hold the cartridge in its proper position for being raised. The carrier extends at the rear of its pivot, and in its rear end a dog *r* is hung to swing in a vertical plane upon the pivot *s*, the dog extending upward from its pivot and so that the dog stands nearly vertical or slightly inclined rearward. A spring *t* is provided, the

tendency of which is to hold the dog in its forward position against a suitable stop in the carrier, and as seen in Fig. 11. This dog stands in the path of movement of the downward projection *c* on the under side of the slide, and so that as the slide moves rearward in opening the projection *c* will strike the dog *r* and turn the dog rearward without effect upon the carrier, as indicated in broken lines, Fig. 3; but as soon as the projection *c* escapes from the dog, then the dog will return under the action of its spring *t* to its normal position, and so that the projection *c* will stand at the rear of the dog, as seen in Fig. 3. Then when the slide commences its forward movement the projection *c* strikes the nose of the dog and operates thereon as a cam to depress the rear end of the carrier, which causes the carrier to rise and take with it the cartridge to the position seen in Fig. 11, bringing the head of the cartridge just forward of the front face of the breech-piece and so that as the breech-piece advances, as seen in broken lines, Fig. 11, it will force the cartridge forward into the barrel. The passage in the receiver through which the cartridge passes in being raised by the carrier is contracted near its forward end, as seen in Fig. 13, corresponding to the shape of the neck of the cartridge, it being understood that necked cartridges are best adapted for the use of this class of guns, and such as clearly seen in Fig. 11, the said section cutting horizontally and longitudinally through the receiver in the plane of the bottom of the breech-piece. The forward part *u* of the passage from below up through the receiver is slightly wider than that of the forward portion of the cartridge, while the rear portion corresponds in width to the rear portion of the cartridge, the contraction forward producing shoulders *w* in each side of the receiver, and these shoulders are inclined or curved upward and forward, as seen in Fig. 11. The position of the shoulders is somewhat forward of the point where the contraction of the shell commences as the cartridge lies on the carrier, as seen in Fig. 11. As the breech-piece moves forward, as seen in broken lines, Fig. 11, it forces the cartridge forward, the point of the cartridge entering the barrel as the expanding portion of the shell reaches the shoulders *w*, and so that from that time the advance movement of the cartridge will cause the larger part of the cartridge to ride up over the shoulders *w* and raise the rear end of the cartridge nearly into line with the barrel, and as represented in Fig. 11, the contraction of the opening and the shoulders thus raising the cartridge at once taking the cartridge from the support of the carrier, so that the return of the carrier may commence much sooner than would be practicable without such raising of the cartridge, thereby reducing to a very considerable extent the rest which would be required for the carrier were it not for this relieving the carrier from the

support of the cartridge and giving so much more time for the movement of the carrier, which is very important in rapid-firing or automatic guns. The slide is constructed with an opening x (see Fig. 6) upward through it for the passage of the cartridge under the movement of the carrier. As the slide returns, the projection c strikes the carrier in rear of the shoulder q and forces the carrier downward to its home position, as seen in Fig. 2, ready to receive the next cartridge.

An intermittent rotation is imparted to the feed-wheel to bring the cartridges successively to their proper position for transfer, and this intermittent movement is imparted through the ratchet-wheel i . Forward of the ratchet-wheel a lever y is hung upon a pivot z , and so as to swing in a vertical plane. This lever extends upward and is adapted to engage a vertical recess 3 in the side of the slide I. When the slide is in its extreme forward position, the recess 3 is forward of the free end of the lever y , but as the slide moves forward, and while a cartridge is being drawn from the feed-wheel, the recess 3 engages the lever y and throws it rearward to the position seen in Fig. 3. The lever y carries a spring-pawl 4, which is adapted to engage the pins or teeth of the ratchet-wheel i , but in the rear movement the pawl escapes a tooth of the ratchet-wheel and passes to the next tooth. Then as the slide returns the lever y is turned forward to the position seen in Fig. 2, which raises the pawl 4 and through its engagement with the ratchet-wheel i turns that ratchet-wheel one point—that is, so far as to bring the next cartridge carried by the wheel into position to be transferred to the carrier, as before described. A spring latch-bolt 5 is provided, (see Figs. 2 and 2^a), which will engage the feed-wheel at its points of rest, and so as to yieldingly hold it in that position while the cartridge is in place and until the cartridge is transferred, but will yield to the turning of the feed-wheel by the action of the pawl, as before described.

The breech-piece is provided with the usual extractor-hook 6, with corresponding opposing shoulder 7, as seen in Fig. 1^a, so that the cartridge-head will be engaged and withdrawn in the rear movement of the breech-piece and ejected when the shell is drawn sufficiently far from the barrel for the purpose.

The firing in an automatic gun is necessarily so rapid that if the shells be suddenly ejected the force will be so great as to make it dangerous to persons standing near the gun. To avoid this difficulty the force of ejection is reduced by arranging in the receiver upon the opposite side of the breech-piece to the extractor-hook an ejecting-block 8. This block takes the place of the common ejector-stud, which acts instantly when the cartridge-head reaches the stud; but in this case the block is elongated, so as to present a lengthened surface in the path of the head of the

cartridge-shell. It is best grooved on its face, as seen in Fig. 10, so as to produce two flanges 9 and 10, and these flanges are vertically notched, as seen in Figs. 1^a and 1^b, these notches being inclined both forward and backward, so as to form teeth of slight projection, neither of which is sufficient in itself to quite throw the head of the shell out of engagement with the extractor. Consequently the head of the shell as it is being retracted will pass from tooth to tooth until finally it escapes, and such escaping will give it a whirl longitudinally, so as to throw it through the opening in the receiver in a short curve, which will cause it to fall close by the gun, in contradistinction to being thrown directly from the gun to one side, as must be the case when the ejection is made instantaneous by the single ejecting-shoulder.

Cartridges may be fed to the feed-wheel through the opening k by means of a hopper or other conductor which will deliver the cartridges to that opening so that they will be successively taken by the feed-wheel, as represented in broken lines, Fig. 9; but an endless band may be used, which will work over the feed-wheel as a band over a pulley, an opening k^5 being provided (see Fig. 9) in the opposite side frame of the gun, through which the empty end of the cartridge belt or band will escape as the belt is fed in through the opening k over the feed-wheel and after the cartridges have been extracted from the feed-band pockets. This may be as described in the application for patent before referred to, or it may be made as seen in Figs. 14 and 15. The band 11 is constructed in width somewhat shorter than the length of the cartridges, and with a series of transverse pockets 12 equidistant from each other; but instead of extending entirely through the pockets, as in the band before referred to, the pockets are closed at one end, so that the pockets open only at one edge of the band, the other edge of the band being closed, and these pockets correspond in shape to that portion of the shell from the point rearward toward the head; but the depth of the pockets is so much less than the length of the complete cartridge that a portion of the head end will project from the open pockets at one edge of the band, and so that the band may be set on over the feed-wheel, and the grooves of the revolving feed-wheel will engage with the ribs formed by the cartridges in the pockets, and so as to advance the cartridges under the rotation of the feed-wheel. I do not, however, claim my improved band herein, having made the same the subject of a separate application pending concurrently herewith.

The endless band with the cartridges is supplied in cases containing several bands, so that as soon as one is used another may replace it and the discharged band may be resupplied with cartridges.

While all the parts of the gun are especially adapted for automatic operation by means of

the gases of explosion, parts of the invention are applicable to breech-loading and magazine arms in which the magazine is arranged below the barrel, so that cartridges may pass rearward onto the carrier. The invention is therefore not to be understood as limited to a machine or automatic gun.

The connection between the breech-piece and slide is represented as forming the cam-groove in the breech-piece and the stud on the slide; but it will be understood that this order may be reversed, the stud being on the breech-piece and the groove in the slide, should such construction be preferred. This modification is too apparent to require illustration, it only being essential to the invention that there shall be the transverse cam-groove on the one and the stud on the other, whereby the lateral swinging movement may be imparted to the breech-piece when it stands in its closed position, and so as to lock the breech-piece in and unlock it from that position.

In Fig. 1 the gun is represented as arranged upon a support the same as that in the before-mentioned application; but such support, being no part of the present invention, does not require to be particularly described.

I claim—

1. In a gun, the combination with a barrel opening at the rear end into the receiver, of a breech-piece adapted for longitudinal movement backward and forward in said receiver and adapted to swing into locked position at the end of its forward movement, a locking device and a guide-way for said breech-piece, a reciprocating slide and a stud and groove connection between said slide and breech-piece, said groove having a longitudinal portion and a portion at an angle thereto, whereby said slide moves farther forward after swinging the breech-piece into fully locked position and moves a short distance rearward before it commences to swing the breech-piece out of fully locked position, a firing mechanism, and a firing finger arranged to be actuated by the slide for throwing the firing mechanism into and out of locked position, whereby said firing mechanism is in operative position only when the breech-piece is in fully locked position, substantially as set forth.

2. In a gun, the combination with the barrel and the receiver thereof, of a longitudinally and laterally movable breech-piece, located in the said receiver, which receiver is constructed with an abutment for engagement with the rear end of the said breech-piece when the same is in its closed position, and said breech-piece being adapted to be moved laterally in front of said abutment, a longitudinally movable slide connected at its rear end with said breech-piece, which it operates to move both longitudinally and laterally, a longitudinally movable hammer located in the rear of the breech-piece, a trigger located below the hammer and a sear piv-

otally attached to the trigger forward of the pivot thereof and adapted to engage with the hammer when the same is in its cocked position, and constructed with a firing finger which is engaged by the slide when the same is in its forward position, whereby the sear is operated, substantially as set forth.

3. In a gun having the barrel opening into the receiver at the rear, the combination thereof with of a longitudinally reciprocating breech-piece, a longitudinally reciprocating slide below the barrel and extending rearward below the breech-piece, and adapted to impart the reciprocating movement to the breech-piece, a carrier hung upon a pivot in the receiver below said slide, and extending from its pivot forward, adapted to receive a cartridge from the source of supply, the carrier extending in rear of its pivot, and at its rear end provided with a spring-dog hung upon a pivot in the carrier so as to swing in a vertical plane, the carrier constructed with a stop to limit the forward movement of said dog, the said slide constructed with a projection adapted to engage said dog as the slide approaches its extreme rear movement, and to turn the dog so as to escape therefrom, the spring of the dog serving to return the said dog forward of the projection on the slide, substantially as described, and whereby as the slide commences its return or closing movement, the said projection will engage said dog from the rear and raise the carrier.

4. In a gun, the combination with the barrel and receiver thereof, of a longitudinally movable breech-piece, a longitudinally movable slide connected therewith for operating the same, a carrier located within the receiver below the breech-piece, a feed-wheel located forward of the carrier, a feed hook attached to the slide at a point to the rear of the said wheel, and in position to engage with the heads of the cartridges when the slide is moved to the limit of its forward movement, and devices located in front of the feed-wheel for operating the same, and constructed to be actuated by the slide, substantially as set forth.

5. In a gun, the combination with the barrel and the receiver thereof, of a longitudinally movable breech-piece, a longitudinally movable slide connected with the said breech-piece and operating the same, a carrier located below the breech-piece and adapted to have its forward end lifted into the path thereof, a feed-wheel located forward of the carrier, a feed hook attached to the slide at a point to the rear of the said feed-wheel and in position to engage the heads of cartridges carried thereby when the slide is at the limit of its forward movement, an operating lever located in front of the feed-wheel, and pivoted at its lower end to swing in a vertical plane, its upper end being adapted to be engaged by the forward end of the slide, and a pawl attached to the lower end of the said lever in the rear of the pivot thereof, and adapted to engage

with the forward end of the feed-wheel which it operates to turn intermittently, substantially as set forth.

5 6. In a gun having the barrel opening at the rear into the receiver, the combination thereof with of a longitudinally reciprocating breech-piece, the breech-piece provided with an extracting-hook, and an ejector-block arranged
10 of the breech-piece, the said ejector-block constructed on its face with a series of teeth, the said teeth standing in the path of the head of the shell while in the grasp of the extractor, substantially as and for the purpose described.

15 7. In a gun, the combination with the barrel thereof, of a receiver constructed with an interior vertical passage contracted at its forward end by inwardly projecting shoulders, having the upper portions of their rear ends

beveled or inclined, a longitudinally movable
20 breech-piece, a carrier pivoted by its rear end below the same so as to move in a vertical plane, and adapted at its forward end to pass between the said shoulders, and means for
25 feeding cartridges to the said carrier and lifting the same, substantially as set forth, and whereby the said shoulders operate to lift the rear end of the cartridges into line with the
30 bore of the gun as they are moved forward off the carrier by the forward movement of the breech-piece.

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

JOHN M. BROWNING.

Witnesses:

KATE LINEHAN,
W. D. BURGESS.