

C. P. E. SCHNEIDER & E. RIMAILHO.
BREECH LOADING GUN.
APPLICATION FILED AUG. 20, 1906.

946,826.

Patented Jan. 18, 1910.
5 SHEETS—SHEET 1.

Fig. 2.

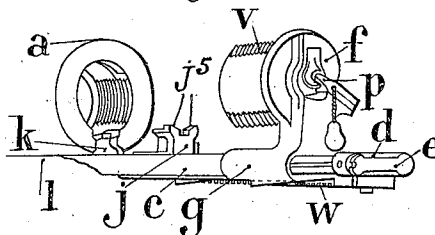


Fig. 3.

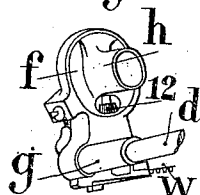


Fig. 1.

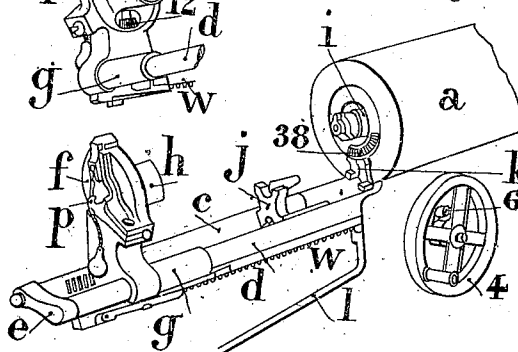


Fig. 12.

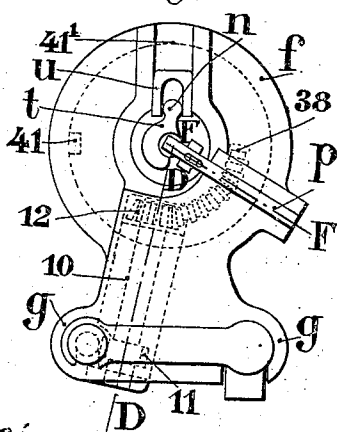
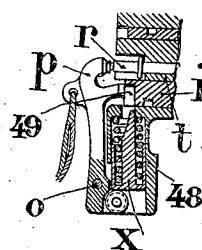


Fig. 13.



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BREECH LOADING GUN.

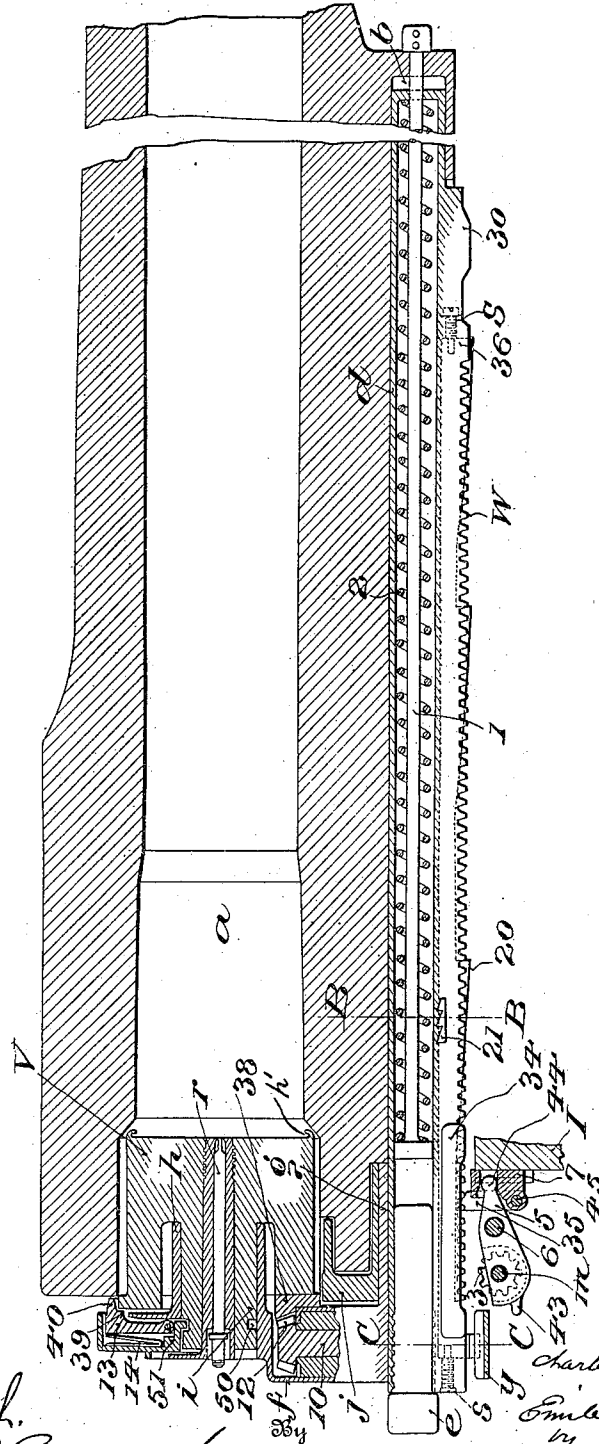
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5 SHEETS—SHEET 2.

Fig. 4.



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5 SHEETS—SHEET 3.

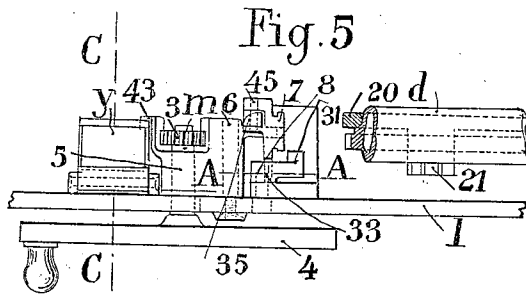


Fig. 6.

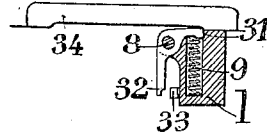


Fig. 6^a.

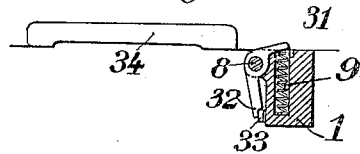


Fig. 8

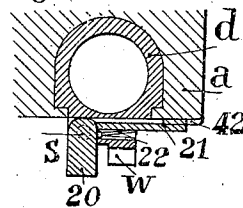


Fig. 9.

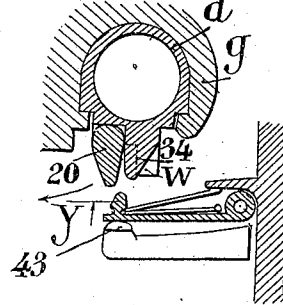
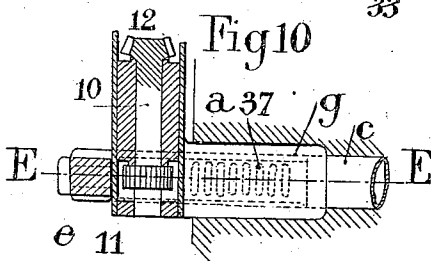
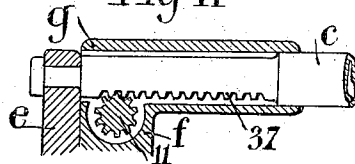


Fig. 11



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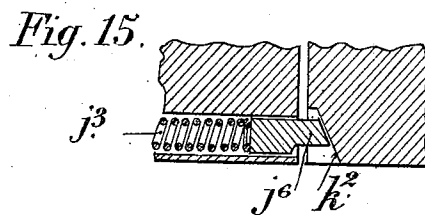
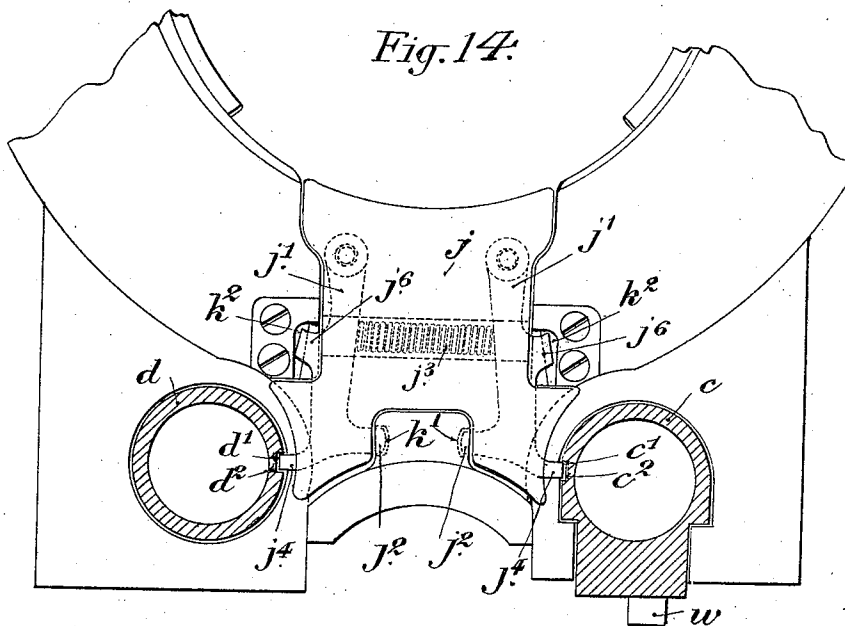
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5 SHEETS—SHEET 4.



Witnesses:

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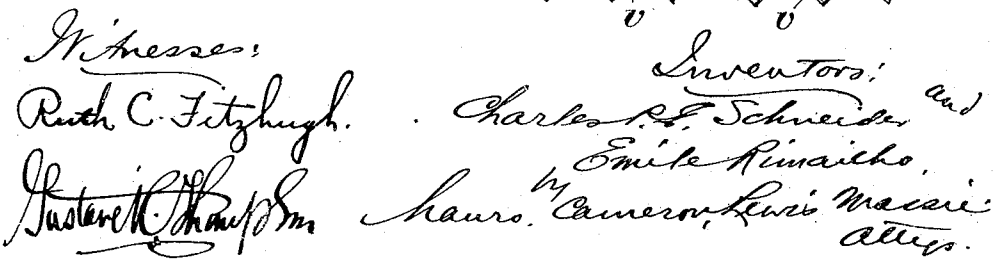
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Fig. 16.



UNITED STATES PATENT OFFICE.

CHARLES PROSPER EUGÈNE SCHNEIDER, OF LE CREUZOT, AND EMILE RIMAILHO, OF
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BREECH-LOADING GUN.

946,826.

Specification of Letters Patent.

Patented Jan. 18, 1910.

Application filed August 20, 1906. Serial No. 331,268.

To all whom it may concern:

Be it known that we, CHARLES PROSPER EUGÈNE SCHNEIDER and EMILE RIMAILHO, residing, respectively, at Le Creuzot, Saône-et-Loire, France, and at 54 Boulevard Maillot, Neuilly-sur-Seine, Seine, France, have invented a new and useful Improvement in Breech-Loading Guns, which is fully set forth in the following specification.

When a breech loading gun is to be loaded after being fired at a high angle of elevation and its projectile is heavy (particularly if the projectile and the powder charge should be inserted in succession) the loading cannot be effected without first bringing the gun to a loading position *i. e.* an angle of elevation approximating the horizontal and after loading the breech has again to be lowered to bring the gun to the firing position.

The present invention has for its object a device for obviating these two successive operations which considerably retard the speed of firing, for which purpose the breech screw is constructed in such a manner that it serves as a rammer for effecting the loading at all angles of elevation.

The invention is represented in detail in the accompanying drawing.

Figures 1 and 2 are two general perspective views showing the parts of the breech-screw-rammer in two different positions. Fig. 3 is a partial perspective view showing the front of the breech-screw-carrying shutter. Fig. 4 is a general longitudinal section through a gun provided with the breech-screw-rammer, the parts being represented in the closed position. Fig. 5 is a corresponding partial plan. Fig. 6 is a section on the line A—A of Fig. 5. Fig. 6^a is a view similar to Fig. 6 with the parts shown in a different position. Fig. 7 is a section on a larger scale through the bolt 35 at the moment when the bar 20 is about to encounter it. Figs. 8 and 9 are cross-sections on a larger scale on the lines B—B and C—C of Fig. 4 respectively. Figs. 10 and 13 are sections taken respectively on the lines D—D and F—F of Fig. 12, which is a rear elevation of the shutter. Fig. 11 is a section on the line E—E of Fig. 10. Fig. 12 is an end view of the shutter; and Figs. 14, 15 and 16 are detail sections on a larger scale.

The mechanism comprises broadly a rigid U-shaped frame *c—d—e*, the arms *d—c* of which are parallel with the axis of the gun

and slide in housings *b* formed in the gun, or in any other appropriate guide solid with the gun. One of the arms *d* of this frame carries a rack *w*, which may be actuated by mechanism (4, *m* 3, 5, 7, 35) that is independent of the gun, and carried for example by one of the cheeks of the gun slide *l*. The said frame serves as a guide-support for a shutter *f*, mounted upon the arms *c—d* by means of sleeves *g*. The shutter in its turn, by means of a sleeve *h* which projects from its front face, serves as a support or bearing for the breech screw with interrupted threads *v*, said breech screw being fitted into the sleeve *h* by means of a trunnion *i*. The breech screw carries on its rear face a toothed segment 38 (Fig. 1) which meshes with one of the parts (pinion 12) of a transmission device 12—10—11 (Figs. 4, 10, 11, 12) situated in the shutter and actuated by one of the arms (*c*) of the movable frame which for this purpose is provided with lateral teeth 37.

The mechanism which has thus been briefly described comprises the parts necessary for obtaining the following movements and effects:—

1. The engagement of the operating mechanism with the rack *w*, and the automatic disengagement of this mechanism when the breech is completely closed or open; this automatic release being necessary in order to avoid the extremely rapid and useless rotation of the operating hand wheel 4 during firing under the influence of the recoil of the gun upon the gun slide *l*. As shown in Figs. 4 and 5, the shaft *m* upon which the hand wheel 4 and the pinion 3 are keyed, is carried by a small supporting beam 5 pivoted on a shaft 6 fixed to the gun slide *l*. The beam 5 carries at its extremities fingers 43 and 44. The finger 44 is constantly engaged in a slide block 7 guided in the gun slide *l* normally toward the axis of the gun. If the hand wheel 4 is raised in order to produce engagement (that is to say the meshing of the pinion 3 and the rack *w*) its supporting beam 5 rocks about the fixed shaft 6, whereby the arm 44 of the said beam is depressed, carrying with it the slide block 7 which brings a lug 33 carried by it, opposite to the extremity 32 of a bent lever 32—31 pivoted at 8 to the gun slide. A spring 9, lodged in a recess in the gun slide, constantly tends to raise the arm 31 of the bent lever. This arm, in the closed position of the breech

screw (Figs. 4 and 6), is maintained parallel with the axis of the gun by the pressure of a boss 34 on the rear extremity of the rack; it is held in this position until, by operating the hand wheel 4, the rack *w* and consequently the frame *c-e-d* have been caused to recede sufficiently to start the angular displacement of the breech screw by the action of the teeth 37 upon the transmission device 11, 10, 12. At this moment the boss 34 leaves the arm 31 of the lever 31—32, whereupon this arm is lifted by the counter-spring 9, the lever rocks about its pivot 8 and its arm 32 becomes locked above the lug 33 on the slide block 7. This latter is then locked and the pinion 3 remains in mesh with the rack *w* even if the hand wheel be released. If the rotation of the hand wheel is continued, the frame *c e d* may be brought to the end of its rearward travel. At this moment a boss 30 on the front extremity of the rack depresses the arm 31 of the bent lever 31, 32 and the arm 32 of this lever leaves the lug 33 on the slide block 7, which then becomes free and the supporting beam 5 rocks about the shaft 6 under the influence of the weight of the hand wheel which descends. The pinion 3 and the rack *w* therefore cease to be in mesh. This rearward movement of the frame *c e d* relatively to the gun, (which movement was necessary for first unlocking the breech screw and bringing it rearward with the shutter, ready to receive the projectile and subsequently force it into the breech chamber as will hereinafter appear) frequently takes place when the gun is at a high angle of elevation and consequently when the weight of the breech screw and projectile is difficult to raise. Accordingly in order to facilitate the movement, recuperating means have been provided. In the constructional form represented, the rods *c* and *d* of the frame *c d e* are hollow, and each receives a rod 1 (Fig. 4) attached to the front portion of the gun; around this rod there is a coiled spring 2 which bears at one end against the front of the hollow rod *c d* and at the other end against the head of the rod. When the frame *c e d* is caused to recede, the springs 2 are compressed and their extension, on the return, facilitates the forward movement. In accordance with the weight of the charge, this arrangement may be modified; the springs 2 may be replaced by hydraulic, pneumatic, hydro-pneumatic, or other recuperators sufficiently powerful to permit either of balancing the charge, if it is merely desired to cause it to enter by hand, or to produce a completely automatic entrance. In any event, when the frame *c d e*, carrying the shutter *f* and the breech screw *v* is being advanced, it is desirable to prevent its immediate entrance which would take place under the influence of the recuperators just above described. This result is obtained

by an automatic locking operation. To this end, when the frame *c e d* is at the extremity of its outward stroke automatic disengagement takes place between the rack *w* and its actuating pinion, owing to the fall of the hand wheel 4. The lifting of the slide block 7 which results therefrom, likewise entails the lifting of a spring bolt 35 (shown in elevation at Fig. 4, in plan at Fig. 5 and in vertical section at Fig. 7). This bolt is provided at its lower extremity with a slot by means of which it is mounted upon a spindle 45 carried by the slide block, in such a manner that it is able to rock around this spindle while at the same time it may be given a longitudinal displacement, an internal spring 46 constantly tending to push the bolt in a direction to separate the nose of the bolt from its pivot. This nose bears against a longitudinal ratchet plate 20 hinged to the hollow rod *d* by two pivot screws *s* parallel with the axis of the rod *d* said ratchet plate having a series of long ratchet teeth or notches. When the rods *c d* have reached the end of their travel outward the bolt which has been kept away from the ratchet plate is lifted by the slide block 7 and engages behind the extreme notch 36 of the ratchet plate, thereby preventing any forward movement of the frame *c d e*. The arrangement of the bolt 35 in the slide block 7 prevents the bolt from rocking forward and its rearward rocking is limited by the beam 5 or by any other appropriate means. It will readily be understood that in order to disestablish this automatic engagement for the purpose of permitting of the return of the frame *c d e* automatically or by hand, it is only necessary to raise the hand wheel 4, thereby depressing the slide block 7 and removing the bolt 35 from its engagement with the ratchet plate.

2. Automatic engagement and disengagement between the breech screw and the shutter. On the bolt 51 there is pivoted a latch 13 (Fig. 4) which a spring 14 constantly tends to press forward. This latch is provided with a nose having two projections 39 and 40. In the closed position the nose 40 is pressed back by the rear face of the gun, while the nose 39 lies opposite the rear face of the breech screw. It has been seen that when the parts are in the position represented in Fig. 4, the beginning of the rearward movement of the frame *c e d* produces in the first place the angular displacement of the trunnion *i* of the breech screw *v* in the shutter *f*, owing to the rotation of the pinion 11 by the rack 37 of the arm *c* of the frame. When the screw has rotated a quarter revolution, its threads come opposite the plain segments or gaps of the gun breech and a notch with which said screw is provided at 41 (Fig. 12) reaches the position 41' in which it is opposite the nose 40 of the latch

13. The said latch, rocking under the influence of the spring 14, effects, at the moment at which the shutter tends to move rearwardly, an engagement between the shutter and the screw, simultaneously with the unlocking of the screw from the breech threads of the gun. The frame *c e d* continuing to recede, the whole of the parts constituted by this frame, the shutter and the screw, are then carried backward together. When the said parts have reached the end of the rearward travel, the frame is locked as has been seen and is ready to act as the rammer. When the charge consists of a complete cartridge it is only necessary to insert the ogival end of the projectile into the gun and to engage the flange of the cartridge case in the rabbet on the face of the breech screw. On the return or advance movement of the frame *c e d* together with the shutter and the breech screw, the cartridge will be introduced into the breech chamber whatever may be the inclination of the gun.

If the projectile forms a separate part of the charge, its base is supported upon the heel of a loading plate *j*. This carriage or plate, which normally, when the breech is entirely closed, occupies the position indicated in Figs. 4 and 14, is provided with two locking levers *j'* each of which engages by means of a tenon *j²*, with a mortise *k'* formed in the cavity *k* of the breech, or lodges in the body of the carriage. A spring *j³* constantly tends to expel the tenons *j²* from their mortises, but to hold two tenons *j⁴* in engagement with their grooves *c'* and *d'* formed in the rods *c* and *d* respectively. At their inner ends each of these grooves is deepened so as to form a locking notch *c² d²* for locking the tenons *j⁴* in the rod. When during the recoil movement of the frame *c e d* the front walls of the notches *c² d²* engage with the tenons *j⁴*, the carriage *j* is moved rearwardly thus enabling the spring *j³* to force the levers *j'* outward until the tenons *j⁴* are fully engaged with the notches *c² d²*, and at the same time to expel the tenons *j²* from the mortises *k'*. The latter are made sufficiently large to allow the tenons *j²* a certain amount of play in order that the carriage *j* may move outward a sufficient distance to free projections *j⁶* (hereinafter described) from inclines *k²*. It follows that the carriage *j* is released from the breech and is consequently able to move with the frame *c e d*. From this moment it recoils with the latter and at the end of the recoil occupies the proper position for the reception of the projectile (Figs. 1 and 2). The projectile may then be placed in position. Its base rests upon shoulders *j⁵* on the carriage, while the ogival portion enters the bore of the gun. The rim of the cartridge case is engaged in the groove *h'* formed in front of the breech block *v*. If in order to move the frame for-

ward the pinion 3 is first of all engaged and the hand wheel 4 then operated in the opposite direction to that of the preceding operation, the frame simultaneously displaces the shutter *f* with the breech block, and the cartridge case that it carries, and the carriage *j*, which rams the projectile. At the proper moment, that is to say, when it has completely entered its recess *k*, the carriage *j* is released from the frame *c e d* and reengages with the breech. This is effected by the encounter of two beveled projections *j⁶* on the levers *j'* with inclined surfaces *k²* formed on the walls of the recess *k*; the levers are forced inward and compress the spring *j³*, while the projections *j⁴* leave the notches *c² d²* and the tenons *j²* enter the mortises *k'*. The carriage having been moved within the breech and arrested, but released from the frame, the latter is able to continue its forward movement, still carrying with it the shutter *f* which rams the cartridge case, which, in turn, rams the projectile. When the breech rammer is intended to ram cartridges (projectiles formed in one with their cartridge case) the carriage *j* is superfluous.

When the breech screw presents itself at the entrance to its housing in the gun breech, the screw-threaded segments which have not rotated are situated opposite the plain segments or gaps of the breech chamber. When the screw enters, the nose 40 of the latch 13 is pressed rearward by the rear face of the gun against which it strikes, and the nose 39 leaves the notch 41 of the screw. Automatic disengagement between the shutter and the screw is thus obtained at the moment at which the latter is again engaged in the breech chamber. Now the pinion 11 is still in mesh with the rack 37 of the frame *c e d*. This latter continuing to advance the pinion 11 rotates and the trunnion *i* of the breech screw rotates in the shutter, thus locking the breech screw to the breech chamber. When the locking is complete, the boss 34 of the rod *d* of the frame depresses the nose 31 of the bent lever 31 32. The nose 32 releases the slide block 7 which rises, while the pinion 3, descending with its support, frees itself from the rack *w*. Disengagement therefore takes place automatically when the breech is completely closed and locked. The parts are then situated in the position shown in Fig. 4. After firing, which is effected by the means hereinafter indicated, the gun recoils in its slides, and during this time all relative movement between the frame and the gun should be prevented. To this end the ratchet plate 20 pivoted upon its pivot screws 8, carries a transverse finger 21 (Figs. 4, 5 and 8). This finger is pressed upward by a spring 22 which maintains it engaged in a recess 42 in the gun (Fig. 8) when the breech is closed. In the recoil, the gun and the frame *c d e* therefore remain rigidly connected. The

gun recoiling upon its slides, the ratchet plate 20 slides over the spring bolt 35 which at the end of the recoil has become engaged, under the influence of its spring 46, behind the extreme notch 36, which automatically effects the engagement of the frame when it reaches its rearward position. At the end of the recoil, the frame *c e d* is therefore locked by the bolt 35. At the moment at which the return of the gun to battery begins the front extremity of the ratchet plate 20 strikes against the bolt 35. This extremity and this bolt are arranged in such a manner that the shock due to the ratchet plate striking the bolt causes the ratchet plate to rock slightly inward, the notch 36 being cut with a helicoidal surface for this purpose (Fig. 7). Owing to this rocking the finger 21 is depressed and the gun ceases to be solid with the frame, which alone remains locked. At the beginning of the return to battery, the gun carries with it the breech screw *v* and the shutter *f*; but the pinion 11 is then revolved by the rack 37 which remains fixed; the trunnion *i* rotates and unscrews the breech screw from the breech threads. The breech screw therefore unlocks automatically on the return of the gun to battery and is left behind in the correct position for forming a rammer as soon as the breech is completely opened.

In order to permit of operating the frame *c d e* by hand and opening the breech before firing, it has been explained that the hand wheel 4 is raised in order to cause the pinion 3 and the rack *w* to mesh. In this movement a finger 43 of the beam 5 lifts a pallet *y* pivoted to the gun slide *l* (Figs 4, 5 and 9) a projecting edge of this pallet pressing against the ratchet plate 20 and causing it to rock upon its pivots *s* thus depressing the finger 21 and releasing the frame from the gun. The breech-screw rammer arrangement described also comprises special firing mechanism. If the breech screw has an obturator, its rod is lodged in the trunnion *i* and the primer is arranged in the ordinary manner. If the charge comprises a cartridge case, it is primed at its center, and the firing pin is lodged in the trunnion *i*. A hammer *p* pivoted at the rear of the shutter strikes the rear extremity of the firing pin *r*. This hammer is drawn back by hand and released to permit it to strike the firing pin under the influence of a spring. This arrangement necessitates safety devices:—

1. The loading taking place by a movement of translation, it is indispensable that the firing pin should not be opposite the center or primer of the cartridge case during this translation.

2. It should not be possible to operate the hammer for striking the firing pin until after the rotation of the breech screw has been completed.

In the trunnion *i* there is formed eccentrically and parallel with its axis a screw-threaded hole into which a cylindrical part *t* is screwed; and eccentrically arranged in this element *t* is a passage in which the firing pin is lodged. The part *t* is provided with a tail *n* which is maintained between the arms of a slotted piece *u*, solid with the shutter and consequently immovable relatively to the screw. When the breech is open, the firing pin is eccentric relatively to the axis of the gun, and consequently it is not opposite the primer of the cartridge. It remains in this position during the entire translation or loading movement of the cartridge. When the breech screw is angularly displaced in the closing of the breech, the tail *n* being unable to turn, rises between the arms of the slotted piece *u* and the firing pin assumes a position in the center of the trunnion. Consequently the firing pin is only opposite the primer after the angular displacement of the screw has been effected to lock it to the gun. This condition alone will be sufficient for safety, but by reason of the width of the primer it may be said that the firing pin is opposite it slightly before the completion of the angular displacement of the breech screw; a safety device has therefore been added which prevents the hammer from being retracted before the angular displacement is completed.

In order to retract the hammer *p* which is carried by the shutter *f* it must be caused to turn about the spindle *o*. Its tail presses the plunger *x* upward which movement compresses the spring 48. But in order that the plunger *x* may be able to thus move upward, it is essential that it should not strike against the trunnion *i* of the screw. A hole 49 is formed in this trunnion and only comes opposite the nose of the plunger *x* when the screw has completed its angular displacement so as to be in engagement with the breech threads. It is only then that the hammer can be drawn back and firing effected.

When the trunnion *i* of the breech screw is fitted into the shutter, these two parts must be connected in order to prevent the longitudinal forward movement of the screw. For this purpose the trunnion *i* (Fig. 4) is provided with a groove 50. A bolt 51 is let down into a recess in the shutter, the circular end of this bolt engaging in the groove 50 and thereby preventing the screw from separating from the shutter without impeding the angular displacement of the latter. In order to separate the screw from the shutter, the breech being closed, it is only necessary to lift the bolt 51 and to actuate the frame *c e d*. It then operates the shutter alone, leaving the screw in the gun; the internal parts of the shutter may then be reached.

If the gun is carried on a special vehicle comprising a slideway, it will be seen that it is only necessary to provide this slideway at its lower part with a finger acting like the bolt 35 to render it possible by causing the gun to advance on its slideway, to open the breech automatically or to effect the dismounting as has just been stated.

What we claim and desire to secure by Letters Patent of the United States is:—

1. In a gun, the combination of a barrel, a support therefor, a frame movable parallel with the axis of the barrel, a shutter mounted on said frame, a breech screw carried thereby, a rack mounted on said frame, gear teeth formed on said breech screw, connections between said rack and gear teeth, a second rack carried by said frame, and operating mechanism engaging said second-mentioned rack to move said frame.

2. In a gun, the combination of a barrel, a support therefor, a frame movable parallel with the axis of the barrel, a shutter mounted on said frame, a breech screw carried thereby, a rack mounted on said frame, gear teeth formed on said breech screw, connections between said rack and gear teeth, a second rack carried by said frame, operating mechanism engaging said second-mentioned rack to move said frame, and means automatically locking said frame to the barrel during recoil and means unlocking said frame and barrel during the movement of the gun to battery.

3. In a gun, the combination of a barrel, a frame adjacent to and movable parallel with the axis of the barrel, a shutter mounted on said frame, a breech screw carried thereby, driving connections between said breech screw and frame, means for effecting the longitudinal movement of said frame to rotate the breech screw to unlock the same and then carry the shutter together with the breech screw rearward, means automatically locking said frame and the barrel together during the entire recoil, means for locking the said shutter and breech screw in their retracted position, and means for automatically locking the breech screw in place upon the completion of its forward movement.

4. In a gun, the combination of a barrel, a frame movable parallel to the axis of the barrel, a breech screw carried by said frame and locked in the breech during the recoil of the gun, a rack carried by said frame, a rack on said breech screw, and a transmission device connecting said racks to disengage the breech screw from the breech shortly after the commencement of the return of the gun to battery.

5. In a gun, the combination of a barrel, a sliding frame movable parallel with the axis of the barrel, a breech screw carried thereby, rack teeth formed on said frame, a transmission device with which said rack

teeth engage, and a toothed segment on the breech screw engaging said transmission device to rotate the breech screw.

6. In a gun, the combination of a barrel, a sliding frame movable parallel with the axis of the barrel, a shutter, a breech screw carried thereby, driving connections between said frame and breech screw whereby the latter is rotated, and means for connecting and disconnecting said breech screw and shutter.

7. In a gun, the combination of a barrel, a sliding frame movable parallel with the axis of the barrel, a shutter carried by the frame, a breech screw provided with a notch and carried by said shutter, driving connections between said frame and breech screw whereby the latter is rotated, a spring bolt on the shutter adapted to engage the notch in the breech screw after the rotation has been effected, and means whereby said bolt is automatically released by contacting with the rear face of the gun.

8. In a gun, the combination of a barrel, a sliding frame movable parallel with the axis of the barrel, and provided with rack teeth, a breech screw carried by said frame, driving connections between said breech screw and frame means engaging said rack teeth to move said frame to rotate and longitudinally move said breech screw, and means for automatically disengaging said actuating means from said rack teeth.

9. In a gun, the combination of a barrel, a sliding frame movable parallel to the axis of the barrel and provided with rack teeth, a breech screw carried by said frame, driving connections between said breech screw and frame means engaging said rack teeth to move said frame to rotate and longitudinally move said breech screw, means for automatically locking said actuating means to said rack teeth, and means for automatically disengaging said actuating means from said rack teeth.

10. In a gun, the combination of a barrel, a sliding frame movable parallel to the axis of the barrel, and provided with rack teeth, a breech screw carried by said frame, driving connections between said breech screw and frame means manually movable into engagement with said rack teeth to move said frame to rotate and longitudinally move the breech screw, means for automatically locking said actuating means in engagement with said rack teeth, and means for automatically disengaging said actuating means from said rack teeth both when the breech screw is locked to the gun and when said frame is in a retracted position.

11. In a gun, the combination of a barrel, a sliding frame movable parallel with the axis of the barrel and provided with rack teeth, a breech screw carried by said frame, means manually movable into engagement

with said rack teeth to move said frame, comprising a pivoted beam and a pinion carried thereby to engage said rack teeth, a slide block in engagement with one end of
 5 said beam, a spring-pressed catch, and a lug or stop carried by said slide block which are automatically engaged when said pinion engages said rack teeth, and bosses on said sliding frame which automatically disengage
 10 said spring-pressed catch and lug both when the breech screw is locked to the gun and when the movable frame is in a retracted position.

12. In a gun, the combination of a barrel,
 15 a sliding frame movable parallel with the axis of the barrel, a breech screw carried by said frame, driving connections between said screw and frame, means engaging said frame to move the same to rotate and longitudinally move said breech screw, means for
 20 automatically disengaging said actuating means from said frame both when the breech screw is locked to the gun and when said frame is in a retracted position, and means
 25 for automatically locking said frame in said retracted position.

13. In a gun, the combination with a barrel, a sliding frame movable parallel to the axis of the barrel, a breech screw carried by
 30 said frame, driving connections between said breech screw and frame means engaging said frame to move the same to rotate and longitudinally move said breech screw, a slide block and a bolt carried thereby which auto-
 35 matically engages said sliding frame to lock the same, and means for disengaging said bolt and sliding frame.

14. In a gun, the combination with a barrel, a sliding frame movable parallel to the axis of the barrel, a breech screw carried by
 40 said frame, driving connections between said breech screw and frame means engaging said frame to move the same to rotate and longitudinally move said breech screw, a ratchet
 45 plate carried by said sliding frame, a slide block, a bolt carried thereby which automatically engages said ratchet plate to lock the sliding frame in its retracted position, and means for disengaging said bolt and
 50 ratchet plate.

15. In a gun, the combination of a barrel, a sliding frame movable parallel to the axis of the barrel, a breech screw carried by said frame, means for automatically locking said
 55 sliding frame to the gun during the recoil, and means for disengaging said sliding frame and barrel to permit the latter to return to battery independent of said frame.

16. In a gun, the combination of a barrel
 60 having a recess therein, a sliding frame moving parallel to the axis of the barrel, a plate pivoted to said frame, a finger on said plate for engagement with said recess in the barrel, and means engaging said plate to dis-
 65 engage said finger from said recess.

17. In a gun, the combination of a barrel having a recess therein, a sliding frame moving parallel to the axis of the barrel, a plate pivoted to said frame, a finger on said plate for engagement with said recess in the barrel, and a spring-pressed bolt arranged in the path of said plate to rock the same and disengage said finger from said recess to permit the gun to return to battery independent of said frame.

18. In a gun, the combination of a barrel, a sliding frame movable parallel to the axis of the barrel, a breech screw carried by said frame, means for automatically locking said sliding frame to the barrel, means for auto-
 80 matically disengaging said sliding frame and barrel and means for manually disengaging said sliding frame and barrel.

19. In a gun, the combination of a barrel having a recess therein, a sliding frame moving parallel to the axis of the barrel, a plate pivoted to said frame, a finger on said plate for engagement with said recess in the barrel, and a pivoted element movable into contact with said plate to rock the same and dis-
 90 engage said frame from said barrel.

20. In a gun, the combination of a barrel, a breech screw provided with a trunnion having a notch formed therein, a firing pin, a carrier therefor eccentrically arranged
 95 within said trunnion, and a spring-pressed bolt which is in alinement with said notch to permit the gun to be discharged only when the breech screw is locked in place.

21. In a gun, the combination of a barrel,
 100 a frame movable parallel to the axis of the barrel, a shutter carried by said frame, a breech screw mounted on said shutter and means for locking said shutter and breech screw together and unlocking the same to
 105 permit said frame to be actuated to move said shutter and breech screw as a unity or to remove said shutter from said breech screw.

22. In a gun, the combination of a barrel,
 110 a frame movable parallel with the axis of the barrel, a shutter carried by said frame, a breech screw mounted on said shutter and provided with a groove, and a locking bolt mounted on said shutter and arranged to
 115 engage said groove for locking said shutter and breech screw together and unlocking the same, to permit said frame to be actuated to move said shutter and breech screw as a unity or to remove said shutter from said
 120 breech screw.

23. In a gun, the combination of a barrel, a support therefor, a frame movable parallel with the barrel of the gun, a breech-block mounted on said frame, means for engaging
 125 said frame and support at the end of the recoil, and a rack and pinion engagement between said frame and breech-block whereby the latter is automatically disengaged from the breech on counter-recoil.

24. In a gun, the combination of a barrel,
a support therefor, a frame movable parallel
with the axis of the gun, a breech-block
mounted on said frame, a rack carried by
5 said frame, and connections between said
rack and breech-block whereby the latter is
automatically disengaged from the breech on
counter-recoil.

25. In a gun, the combination of a barrel,
10 a support therefor, a frame movable parallel
with the axis of the barrel and comprising
two hollow rods, a spring carried by each of

said hollow rods, and an abutment connected
to the gun and carried by each hollow rod
whereby said springs are compressed on 15
counter-recoil of the gun.

In testimony whereof we have signed this
specification in the presence of two subscrib-
ing witnesses.

CHARLES PROSPER EUGÈNE SCHNEIDER.

EMILE RIMAILHO.

Witnesses:

EUGÈNE E. BANES,

PIERRE GALEON.