

B. C. SNYDER & J. H. TORNEY.

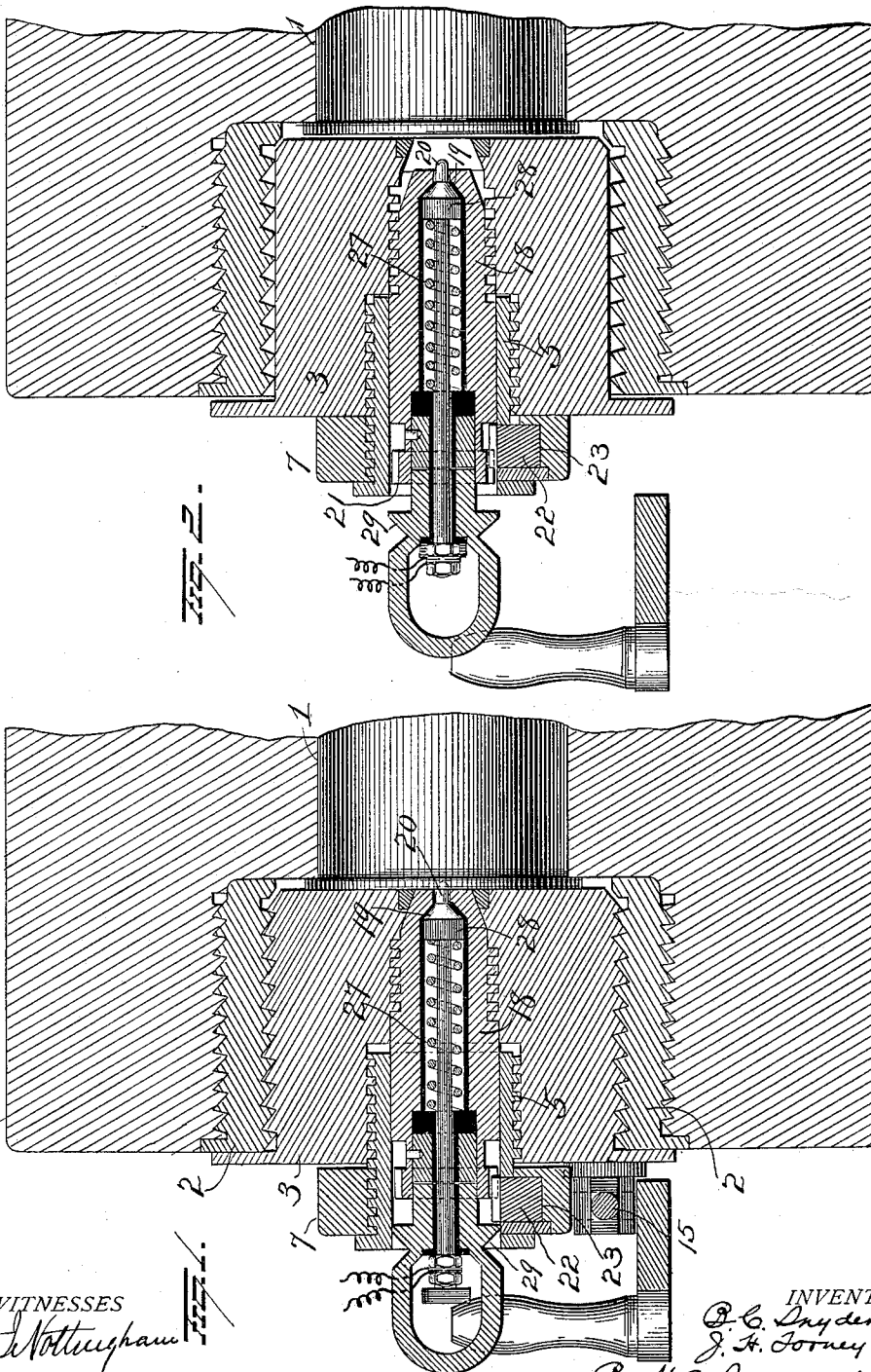
BREECH MECHANISM FOR GUNS.

APPLICATION FILED AUG. 2, 1911.

1,042,048.

Patented Oct. 22, 1912.

4 SHEETS—SHEET 1.



WITNESSES
E. Nottingham
G. J. Downing

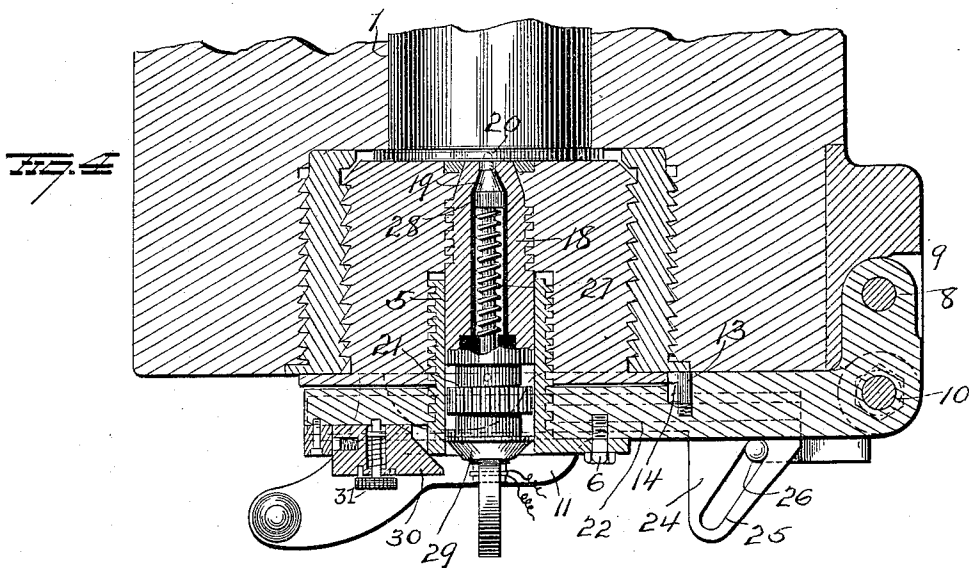
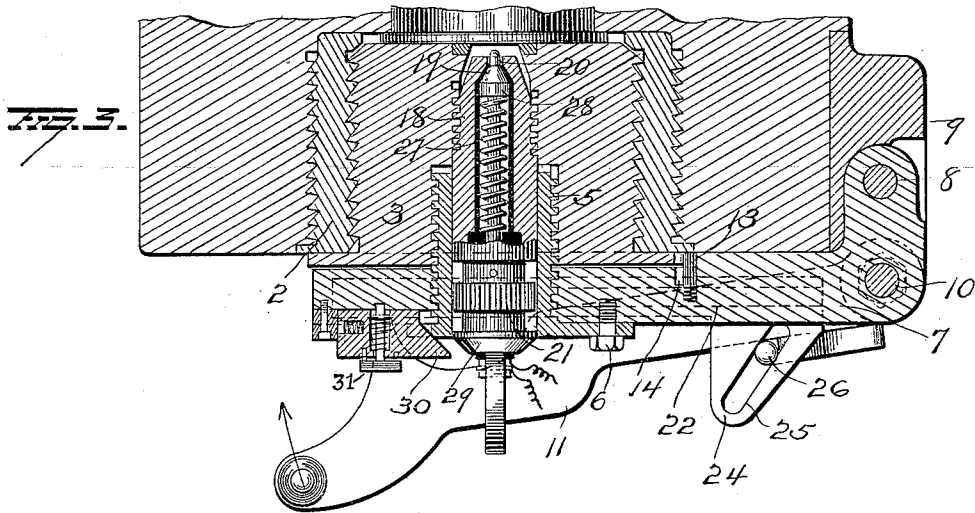
INVENTORS
B. C. Snyder
J. H. Torney
By H. A. Seymour Attorney

B. C. SNYDER & J. H. TORNEY.
BREECH MECHANISM FOR GUNS.
APPLICATION FILED AUG. 2, 1911.

1,042,048.

Patented Oct. 22, 1912.

4 SHEETS—SHEET 2.



WITNESSES
E. Nottingham
G. J. Downing

INVENTORS
B. C. Snyder
J. H. Torney
By H. A. Seymour Attorney

B. C. SNYDER & J. H. TORNEY.

BREECH MECHANISM FOR GUNS.

APPLICATION FILED AUG. 2, 1911.

1,042,048.

Patented Oct. 22, 1912.

4 SHEETS-SHEET 3.

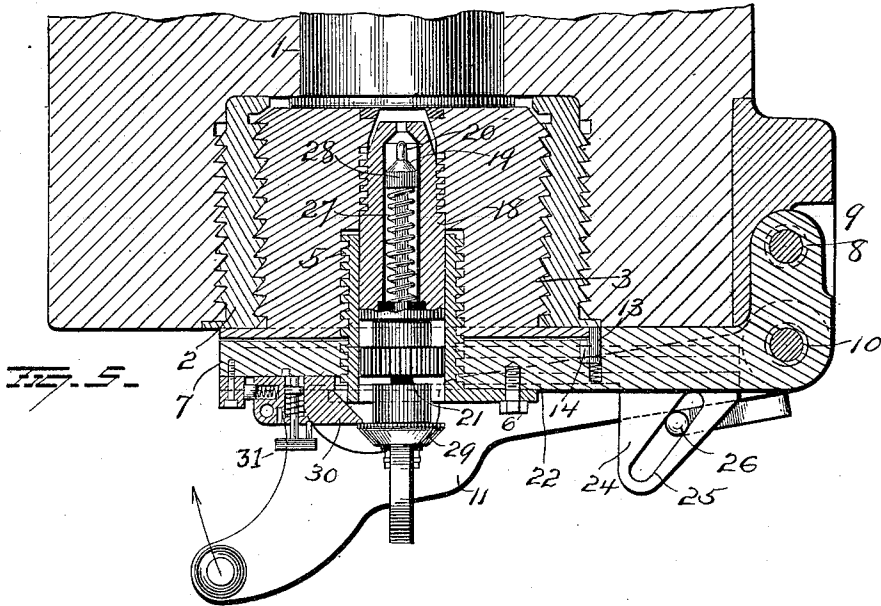
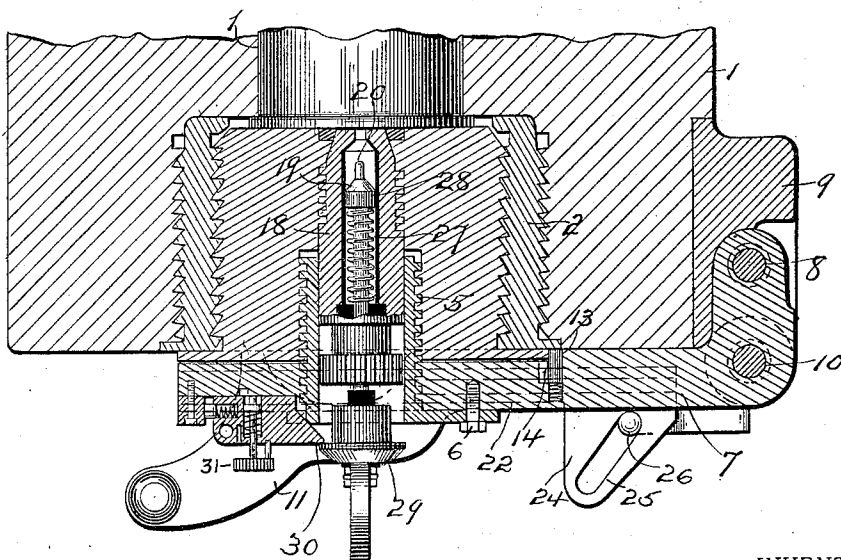


Fig. 5.



WITNESSES

E. Nottingham
G. J. Downing

INVENTORS

B. C. Snyder and
J. H. Torney
By H. A. Seymour Attorney

1,042,048.

4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

BALFOUR C. SNYDER, OF BROOKLYN, NEW YORK, AND JOHN H. TORNEY, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNORS OF ONE-THIRD TO GEORGE E. SMOUSE, OF WASHINGTON, DISTRICT OF COLUMBIA.

BREECH MECHANISM FOR GUNS.

1,042,048.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed August 2, 1911. Serial No. 641,980.

To all whom it may concern:

Be it known that we, BALFOUR C. SNYDER, of Brooklyn, in the county of Kings and State of New York, and JOHN H. TORNEY, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Breech Mechanism for Guns; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in breech mechanism for guns, and particularly guns designed for firing fixed ammunition, the object being to provide automatically operated means for positively preventing premature explosions due to contact of the firing pin with the primer of the explosive charge.

A further object is to provide means whereby the firing pin will be retracted and positively held from contact with the primer of the explosive charge until after the breech plug has been closed and locked in position, thereby rendering it impossible to either intentionally or accidentally fire the charge until safe to do so.

With these and other objects in view, our invention consists in the parts and combinations of parts as will be more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in vertical section through the breech end of a gun, with the breech block locked and the firing pin in firing position. Fig. 2 is a similar view showing the firing pin retracted by its carrying sleeve. Fig. 3 is a view in horizontal section showing the firing pin partly retracted. Fig. 4 is a similar view showing the firing pin in its firing position. Fig. 5 is a view in horizontal section showing the breech block closed and locked, the firing pin cocked and the firing pin sleeve moving to its normal position. Fig. 6 is a view similar to Fig. 5 showing the sleeve in its normal position. Fig. 7 is a rear view of the mechanism and Fig. 8 is a view of the firing pin carrying sleeve, firing pin, rack for rotating the sleeve and the trigger.

1 represents the gun the bore of which is enlarged at its rear end for the reception of the threaded collar 2. This collar is ex-

ternally threaded for engagement with internal threads at the breech end of the gun, and is provided with internal mutilated threads adapted to be engaged by mutilated threads on the breech block 3, so that a partial rotation of the breech block, will disengage the threads on the block from the threads on the collar, and leave the block free to be withdrawn by a straight away pull, in the usual and well known manner. The breech block 3 has a central bore for the sleeve carrying the firing pin, and is counter-bored at its outer end, and the counterbore threaded for the reception of the breech block carrying plug 5 on which the breech block is mounted to turn. The plug 5 is secured at its outer end by one or more screws 6 to the breech block supporting arm 7, pivoted at 8 to the bracket 9 or gun 1.

Pivotally secured at 10 to the supporting arm 7 is the actuating lever 11, carrying the rod 12 which latter is pivotally connected to the lever 11, and also to the breech block at a point beyond the vertical center of the latter as clearly shown in Fig. 7, hence it will be seen that by grasping and pulling rearwardly on lever 11, the latter will turn on its pivot or axis, and operates through rod 12 to give the breech block part of a revolution which frees the mutilated threads on the block 3 from the threads on the collar 2, thus leaving the block free to be withdrawn by a continued rearward pull on the free end of lever 11, the block as before explained being supported, when withdrawn from the breech opening by the arm 7, which latter is also turned on its pivot by the rearward pull on lever 11.

Mounted in a recess in the block supporting arm 7 as shown in Figs. 3 to 6 inclusive, is the spring pressed latch 13, having a side fin 14. When the breech is closed the inner end of latch 13 bears against the rear end of the gun. After the lever 11 has been turned sufficiently to disengage the threads on the block 3 from the threads on the collar 2, the notch 15 in the flange of the block 3 will have been moved into alinement with the fin 14 on the latch 13, so that as the supporting arm is swung rearwardly the latch will be freed from its contact with the gun thus permitting the latch to be projected forwardly by its spring. As the latch moves forwardly, its fin 14 enters notch 15 in the

flange of the breech block and holds the latter against rotation. As this fin enters the notch before the breech block is withdrawn from the breech, and as it remains there until the block is again in its closed position, there will be no chance for any accidental rotary movement of the block 3, during the time the block is out of the breech.

The turning movement of the breech block is limited by the contact of the bearing 16 on the block 3 to which the rod 12 is secured, with the shoulder 17 on the arm 7, and when this position has been reached, the notch 15 in the flange of the block will be in line with the fin 14. A continued pull on the lever 11 withdraws the block, and as the block and latch move away from the gun, the spring engaging the latch forces the latter forwardly thus causing the fin 14 to enter the notch in the flange of the block and lock the latter against rotation as above explained.

Located within the central bore of the breech block is the firing pin carrying sleeve 18, provided with a truncated conical front end 19 adapted when in its normal position to rest flush with the front end of the breech block as shown in Figs. 1-4 and 6. This sleeve is threaded externally to engage female threads in the bore of the breech block, and is provided centrally at its front end with a hole for the passage of the point of the firing pin, 20.

Integral with or secured to the rear end of the sleeve 18 is the pinion 21, which is housed within the hollow carrying plug 5, the latter being cut away at the under side of its outer end so as to permit the pinion 21 to be engaged by the rack bar 22 as shown in Figs. 1 and 2. This rack bar is mounted in a grooved way 23 in the rear or outer face of the supporting arm 7, and is provided with a rearwardly extending wing 24 having an oblique slot 25 therein, in which the upper end of the horn 26 rests and moves. This horn is fast to lever 11, hence it will be seen that as the lever 11 is drawn rearwardly, the horn 26 acting on the wall of slot 25 moves rack bar 22 to the right and rotates the pinion 21, and as the latter is fast to the sleeve 18, the latter will, by its threaded engagement with the block, move outwardly from the position shown in Fig. 1, to that shown in Fig. 2.

Located within the sleeve 18, and surrounding the firing pin is the spring 27, which bears at one end against the shoulder 28 of the firing pin 20, and at its other end against the outer end of the sleeve 18. As the sleeve is moved outwardly, by the longitudinal movement of the rack bar as previously explained, the firing pin moves with it without any opposition whatever, hence at the very beginning of the rearward movement of the lever 11, and before the breech block has begun to rotate to its unlocking po-

sition, the point of the firing pin, will have been moved rearwardly as shown in Fig. 2, to a position out of reach of the primer on the shell. As the sleeve and firing pin move rearwardly, the outer beveled surface of the head 29 of the latter, comes in contact with the front beveled face of the trigger 30, and forces the latter out of the path of the head. As soon as the head passes the end of the trigger, the latter shoots under the head and holds the latter against movement, consequently when the sleeve 18 is moved to its normal position during the closing movement of the breech block, the firing pin will be retained by the trigger and the spring 27 put under compression by the forward movement of the sleeve.

The firing pin is released by actuating the trigger in the ordinary way.

Figs. 1 and 4 show the position of the parts after the charge has been exploded. In the operation of the mechanism, the lever 11 is grasped and pulled rearwardly. The relative position of rod 12 and lever 11 is such that the latter moves outwardly some distance before the rod 12 begins to rotate the breech block, and it is during this initial movement of the lever that the firing pin carrying sleeve is rotated and moved rearwardly from the position shown in Fig. 1 to that shown in Fig. 2, during which movement the trigger engages the head of the firing pin and locks the same in its cocked position. A continued pull on lever 11 rotates the breech plug a part revolution, so as to disengage its mutilated threads from those of the collar 2, and then withdraws the block. To close the breech, the lever 11 is moved to the left and the block properly entered in the breech.

By continuing the inward movement of the lever 11, the breech block will be turned in a direction to cause its threads to interlock with the threads on collar 2, while the final inward movement of the lever moves the rack bar longitudinally and rotates the sleeve in a direction to move it from the position shown in Fig. 5 to that shown in Fig. 6, the inward movement of the sleeve putting the spring of the firing pin under compression. The gun is now securely closed and the breech locked and the charge can be fired at any time by withdrawing the trigger from under the head of the firing pin.

It will therefore be seen that with our improvement the firing pin carrying sleeve is first retracted and carries with it the firing pin, and the latter and its sleeve are held so retracted until the breech is again fully closed and locked so that it is impossible to fire the charge either intentionally or accidentally until safe to do so. With this construction the firing pin is controlled by the position of the carrying sleeve 18,

consequently if the firing pin point should break off and jam or become fused in the hole in the front end of the sleeve, the rearward movement of the lever would carry the broken point away from the shell so that there could be no contact between the point and the primer until after the breech block was fully locked.

If desired, the firing pin may be insulated as shown and connected up by wires to a battery or generator whereby the charge may be fired by electricity. When so used, the trigger is moved outwardly and locked out of the path of the head of the firing pin, by the spring actuated locking pin 31 which latter enters a hole in the supporting arm 7, and holds the trigger in an inoperative position.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of our invention. Hence we would have it understood that we do not wish to restrict ourselves to the exact construction and arrangement of parts shown and described, but

Having fully described our invention what we claim as new and desire to secure by Letters-Patent, is:—

1. In breech mechanism for guns the combination of a breech block, a centrally located and externally threaded sleeve, a firing pin within the sleeve, a lever for actuating the breech block and means connecting the sleeve and lever whereby when the latter is actuated the sleeve will be rotated and retracted, and it and its firing pin held retracted until after the breech block has been locked in its closed position.

2. In breech mechanism for guns, the combination of a breech block, an externally threaded sleeve located centrally therein, a firing pin carried by said sleeve, a lever for actuating the block and means for rotating the sleeve for retracting same and its firing pin prior to any rotary movement of the block in opening, and for holding the sleeve and the firing pin retracted until after the completion of the rotary movement in closing the block.

3. In breech mechanism for guns, the combination with a breech block, a longitudinally movable sleeve mounted centrally in said block and adapted when in normal position to rest with its front end flush with the front end of the block, and a firing pin carried by said sleeve, the front end of said pin projecting through said sleeve and provided with an enlargement engaging the sleeve so as to be limited in its forward movement thereby, of means for retracting the sleeve and the firing pin therein prior to the rotary movement of the block in opening, and also for manipulating the breech block.

4. In breech mechanism for guns, the combination with a breech block, a threaded sleeve having threaded engagement with said block, a firing pin carried by said sleeve, the said pin and sleeve having engaging means whereby the said pin will be moved rearwardly with the sleeve and means for engaging a projection on said pin as the latter is moved rearwardly, for holding it in its retracted position, of means for rotating the sleeve, whereby it will be moved longitudinally in the block, and also for manipulating the breech block.

5. In breech mechanism for guns, the combination with a gun, an arm pivoted thereto, an actuating lever pivoted to said arm and a breech block carried by and mounted to turn on said arm, of a sleeve mounted in the breech block, a firing pin within the sleeve and movable rearwardly with same, means connecting the lever and block whereby the latter is given a part rotation by the movement of the lever, means also connecting the lever and sleeve whereby the latter is moved longitudinally and rearwardly prior to any opening movement of the block and forwardly after the completion of the closing movement of the block and means engaging the firing pin during its rearward movement for holding it retracted after its sleeve has advanced to normal position.

6. In breech mechanism for guns, the combination with a gun, an arm pivoted thereto, a lever pivoted to said arm and a breech block carried by said arm and mounted to turn on same, of a threaded sleeve mounted centrally in the breech block, a firing pin within the sleeve, and means connecting said lever and sleeve whereby when the lever is actuated to remove or replace the block, the sleeve carrying the firing pin will be rotated and moved longitudinally within the block.

7. In breech mechanism for guns, the combination with a breech block, actuating means for same, a longitudinally movable sleeve carried by the breech block, and a firing pin mounted in the sleeve, of means actuated by the breech block actuating means for moving the sleeve longitudinally so as to carry the firing pin out of operative position prior to the release of the block, and restore said sleeve to its forward or normal position after the block has been locked in place, and means for holding the firing pin retracted after the sleeve has been advanced to its normal position.

8. The combination with a breech block and means for rotating same, of a sleeve mounted in and having threaded engagement with the block so as to move longitudinally therein when rotated, means for preventing the front end of the sleeve from projecting beyond the face of the breech block, means for turning the sleeve and a

firing pin mounted in and carried by said sleeve.

9. The combination with an arm, a plug secured thereto, a breech block mounted to turn on said plug, and means for turning the block, of a sleeve located centrally within the plug and having threaded engagement with same, a firing pin within the sleeve, a lever for actuating the block and means connecting the sleeve and lever whereby when the latter is actuated, the sleeve will be rotated and moved longitudinally so as to carry the firing pin rearwardly.

10. The combination with a gun, an arm pivoted thereto, a lever pivoted to the arm, a breech block mounted to turn on said arm and means connecting the lever and breech block whereby the latter may be rotated, of a sleeve mounted in the block and having threaded engagement therewith, a pinion on said sleeve, a rack bar carried by said arm and engaging said pinion and means connecting the lever and rack bar whereby when the lever is actuated the rack bar will be shifted longitudinally.

11. The combination with a gun, an arm hinged thereon, a plug on said arm and a breech block mounted to turn on said plug, of a sleeve centrally mounted in the block and having threaded engagement with the latter, a firing pin within the sleeve, a lever hinged to the arm, means connecting the lever and block for rotating the latter and means connecting the lever and sleeve for rotating the latter within the block.

12. The combination with a gun, an arm hinged thereto, a plug on said arm and a breech block mounted on said plug, of a sleeve within a bore in the block and having threaded engagement with the latter, a spring pressed firing pin within said sleeve, the said pin having a head at its rear end, means connecting the lever and block for rotating the latter, and means connecting the lever and sleeve for rotating the latter,

and a trigger carried by the arm and adapted to engage the head of the firing pin as the latter is moved rearwardly with the sleeve and hold same in its cocked position.

13. The combination with a gun, an arm hinged thereon, a plug on said arm and a breech block mounted to turn on said plug, of a sleeve centrally mounted in the block and having threaded engagement with the latter, a firing pin within the sleeve, insulating material interposed between the pin and sleeve, a lever hinged to the arm, means connecting said lever and block for rotating the latter, and means connecting the lever and sleeve for rotating the latter within the block.

14. The combination with a gun, an arm hinged thereto, a plug on said arm, a breech block mounted to turn on said plug, a sleeve mounted to rotate and move longitudinally within the plug, a firing pin in said sleeve, a spring adapted to project the firing pin and be put under tension when the sleeve carrying the firing pin is moved forwardly, and a trigger adapted to automatically engage the firing pin and hold same retracted, of a lever hinged to the arm, means connecting said lever and block for rotating the latter, and means connecting said lever and sleeve for moving the latter longitudinally.

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

BALFOUR C. SNYDER.
JOHN H. TORNEY.

Witnesses to the signature of Balfour C. Snyder:

AUGUSTUS H. SMITH,
D. J. HURLEY.

Witnesses to the signature of John H. Torney:

A. W. BRIGHT,
GEORGE F. DOWNING.