

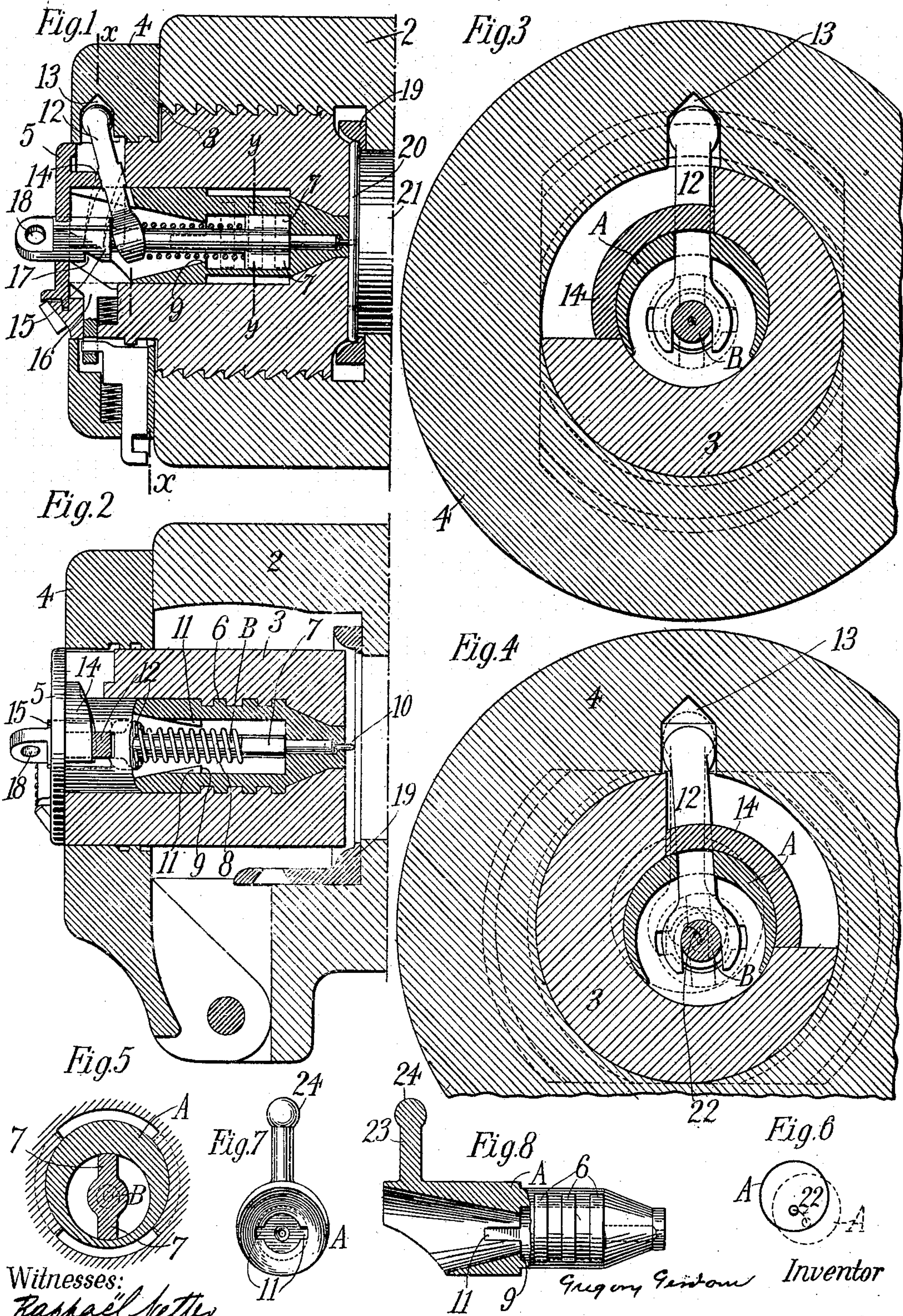
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G. GERDOM.

FIRING MECHANISM FOR BREECH LOADING GUNS.

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UNITED STATES PATENT OFFICE.

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FIRING MECHANISM FOR BREECH-LOADING GUNS.

No. 809,107.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GREGORY GERDOM, of Watervleit, county of Albany, State of New York, have invented a new and useful Firing Mechanism for Breech-Loading Guns, of which the following is a specification.

My invention relates to improvements in firing mechanism for breech-loading guns, its object being to provide breech-loading guns using fixed ammunition with firing mechanism operative only while the breech-block is in closed position, whereby premature discharge of the cartridge is prevented.

To this end my invention consists in the features hereinafter described and claimed.

In the ordinary types of such mechanism having an interrupted-thread breech-block the block is arranged axially with the gun and the firing-pin axially in the block, and consequently the pin at all times aligns with the axis of the gun. Hence if the pin from any cause protrudes from the block when the latter is inserted into the gun before it is rotated into closed position the pin will strike the cartridge-primer and cause premature explosion of the charge, with consequent injury to the gun and danger to the gunners. I obviate this danger by providing means constituting a functional barrier to the firing-pin adapted to be automatically interposed to prevent its contact with the primer. The means which I have devised for that purpose is a guide for the pin-point fitted to the block and which is automatically shifted as the block is rotated, so as to prevent the pin-point from making contact with the primer accidentally when the breech-block is out of closed or locked position, but serving to direct it into such contact when the block is in closed position. Preferably such guide is adapted to be shifted laterally with relation to the axis of the gun by the rotative movement of the breech-block. Hence when the block stands entered in the breech, but unlocked, the guide stands eccentric with the axis, and the pin cannot by any possibility strike the primer; but when the block has been rotated into locked position the guide stands in line with the axis of the gun and the primer, thus permitting the protrusion of the pin and directing it into contact with the primer when actuated by the firing mechanism. I also prefer to form the guide-support for the pin as a core or sleeve disposed

longitudinally in the breech-block, about which the block turns or rotates in its locking and unlocking movement. The guide for the firing-pin in the core is disposed eccentrically in the core in the same degree as said core is eccentric with the axis of the gun. In the construction of the present application the breech-block is fitted to the gun-breech concentric with the gun, and the core is disposed eccentrically in the block and the pin-guide eccentric in the core. Hence in this construction the mass of the core when shifted in the block by the block's rotative movement, as hereinafter described, occupies the normal path of longitudinal movement of the pin-point and prevents its performing its designed function except when the associated parts of the mechanism are in readiness for the firing of the gun, and therefore constitutes a functional barrier for said element.

In the drawings forming part of this specification, Figure 1 is a central vertical longitudinal section of the breech of a gun with the breech-block fitted with my improvement. Fig. 2 is a similar horizontal section. Fig. 3 is a vertical cross-section on line *xx* of Fig. 1, the parts being shown in the positions assumed when the breech-block is in closed position, the firing-pin standing concentric with the axis of the gun. Fig. 4 is a similar sectional view with the parts in the positions assumed when the breech-block is in release position ready to be withdrawn from the gun, the firing-pin standing offset or eccentric relative to the axis of the gun. Fig. 5 is a detail cross-section of the firing-pin sleeve on line *yy* of Fig. 1. Fig. 6 diagrammatically illustrates the arc of movement of the firing-pin as the breech-block is rotated. Fig. 7 is a detail rear end view of the firing-pin shown without the cocking-lever, and Fig. 8 is a side elevation and partial section of the same.

In the drawings, 2 represents the breech of the gun; 3, the breech-block; 4, the carrier-ring upon which the block is supported and carried, and 5 the breech-block cap. The construction of the parts is of the type shown in my previous patents, particularly No. 585,517, issued June 29, 1897, and upon which this invention is an improvement. The breech-block is of the interrupted-screw-thread construction, having two threaded

segments and two cut-away segments, requiring rotation through an angle of ninety degrees from closed to full-release position. A is the firing-pin core, which is fitted eccentrically and longitudinally in the breech-block, being secured therein by segmental circumferential tenons 6, engaging corresponding grooves in the block, although a continuous-thread connection may be employed, if preferred. The firing-pin B is arranged equally and oppositely eccentrically in the core and so positioned that when the block is in closed position the firing-pin stands concentric with the block, while at all other relative positions of the core and block the pin will stand offset from the center of the block and the axis of the gun. The pin B is provided with a pair of longitudinally-arranged ribs 7, which serve as abutments for the firing-spring 8 and also as stops limiting the rearward movement of the pin by engaging the shoulder 9 on the interior of the core A. The ribs abut against the forward end of the socket in the sleeve when the point 10 of the firing-pin is protruded the maximum amount to detonate the cartridge. The circumferential shoulder 9 of the core is provided with grooves 11, through which the ribs 7 of the firing-pin can be passed when the pin is inserted into the core, after which the pin is rotated through a slight angle, so as to prevent the ribs from reëntering the grooves.

12 is the cocking-lever, having a rounded fulcrum head or end resting in a socket 13 in the carrier-ring, the power being intermediately applied by means of the segmental cam 14, the resistance end of the lever being bifurcated and fitted over the firing-pin and serving as a seat for the firing-spring 8. The opposite side of the lever is adapted to bear against a shoulder 15 upon the firing-pin, whereby the lever in the rotating of the breech-block to release position automatically retracts or cocks the firing-pin, it being held in retracted position by means of the sear 16, the point of which engages a notch 17 in the firing-pin. This position of the firing-pin is maintained after the block has been rotated into closed position until released by the pull of the lanyard-strap in the ordinary way to disengage the sear therefrom in the operation of firing. The pin can also be directly retracted or cocked by means engaging the eye 18 in its projecting end.

19 represents the shell-extractor, which engages the rim 20 of the shell 21, as illustrated in Fig. 1.

The operation or working of the device is as follows: The firing-pin core is arranged in the breech-block in such position that the axis of the core is in a vertical plane with the axis of the block when the block is in closed or locked position in the gun. The parts having been assembled as shown in the draw-

ings, the breech-block is swung into the gun, at which time the positions of the various parts are as indicated in Fig. 4, with the firing-pin standing eccentric or out of alinement with the axis of the gun. The block being then rotated through an arc of ninety degrees to closed position carries the parts into the positions shown in Fig. 3, the core A and the firing-pin B being held from rotating with the block by the lever 12. The firing-pin is thus brought into position concentric with the bore of the gun and in line with the cartridge-primer, whereas in Fig. 4 it stands eccentric, so as to present its point 10 to the rim or flange of the primer. The arc through which the point 10 passes is shown in Fig. 4 at 22 and also illustrated diagrammatically in Fig. 6, the circles representing the core A. In other types of breech mechanism where the cocking of the firing-pin is accomplished by different means the core may be held from rotating in the breech by means of a rigid arm 23, the rounded head or end 24 of which will rest in the socket in the carrier-ring. It will thus be seen that only when the breech-block is in closed or locked position can the firing-pin point, if actuated, make contact with the primer. When the breech-block stands in unlocked or release position, the pin-point is held by its guide eccentric with the axis of the gun, so that if it be accidentally actuated or protruded it cannot make contact with the primer, and thereby explode the cartridge.

I claim—

1. In combination, the gun, the block rotatable therein, the non-rotating core in the block eccentric with the axis of the gun, and the firing-pin disposed eccentrically in said core.

2. The combination of the rotatable block, the firing element, and the core eccentric with the gun's axis, said block and core having relative movement.

3. The breech mechanism comprising in combination with the gun, an interrupted-thread block, a non-rotating core eccentric with the gun's axis upon which the block rotates, and a firing-pin eccentrically disposed in said core.

4. In a breech-loading gun, in combination, a rotatable breech-block, a firing element, a support for said element upon which said block rotates, and means actuated by the rotation of the block for preventing the pin if actuated from making contact with the cartridge-primer except when the block is closed.

5. In a breech-loading gun, in combination, a rotatable breech-block, a non-rotating core disposed in said block eccentrically to the gun's axis, a firing-pin and a guide for the pin-point automatically shiftable into and out of alinement with the axis of the gun.

6. In a breech-loading gun, the combina-

tion with its breech-block, of a firing-pin having longitudinal support therein, and means for moving it longitudinally and laterally in said block.

5 7. In a breech-loading gun, the combination with its breech-block, of a firing element, a non-rotating support for said element disposed longitudinally in said block, a guide for the point of said element, and means for
10 automatically moving said guide laterally with relation to the gun's axis.

8. In a breech-loading gun, the combination with its breech-block, of a primer detonating element and means longitudinally disposed in said block for automatically shifting
15 said element laterally therein.

9. In a breech-loading gun, the combination with its breech-block, of a firing-pin, a non-rotating firing-pin guide longitudinally
20 disposed in said block, means for reciprocating the pin, and means for shifting its point laterally as the block is rotated.

10. In a breech-loading gun, the combination with its breech-block, of a firing-pin having a guide-support longitudinally disposed in
25 said block, the firing-pin point being in alignment with the axis of the gun when the block is in closed position, means for moving said support to shift the firing-pin laterally in the
30 block when the latter is turned from closed position, and means for reciprocating said pin.

11. In a breech-loading gun having a concentric, rotatable breech-block, a firing-pin
35 working in said block, and a guide for said pin longitudinally disposed in said block adapted to hold its point out of alignment with the axis of the gun except when the block is in closed position.

40 12. In a breech-loading gun, in combination with a concentric-arranged, rotatable breech-block, a firing-pin, and means disposed longitudinally of said block and actuated by its rotation, for shifting the firing-
45 pin point from concentric position in said block.

13. In a breech-loading gun, the combination with the rotatable breech-block and its firing-pin, of the non-rotating firing-pin support arranged eccentrically in said block, and
50 adapted to center said pin in said block when the latter is in firing position, and to shift said pin to eccentric position therein when the block is turned from firing position.

55 14. In a breech-loading gun, the combination with its breech-block, of a firing-pin having a support longitudinally disposed in said block, the firing-pin being concentric with

the bore of the gun when the block is in firing position, and means for moving said support
60 to shift the firing-pin transversely of the axis of said block when the latter is turned from firing position.

15. In a breech-loading gun having a concentric, rotatable breech-block, a firing-pin
65 carried by said block, and means supporting said firing-pin, longitudinally disposed in said block, and adapted to hold said pin eccentric with the bore of the gun except when the block is in closed or firing position. 70

16. In a breech-loading gun having a concentric-arranged, rotatable breech-block, the combination of a firing-pin working in
75 said block and means actuated by the rotation of the block and longitudinally disposed in the same for automatically moving said firing-pin from concentric to eccentric position in said block.

17. In a breech-loading gun having a breech-block with interrupted thread, a firing-pin and firing-pin sleeve or support carried by said block, the sleeve being arranged
80 eccentric in said block and the pin equally and oppositely eccentric in the sleeve.

18. In a breech-loading gun, having a concentric, rotatable breech-block, a firing-pin
85 and means fitted longitudinally in said block capable of automatically moving the pin with respect to said block from eccentric to concentric position. 90

19. In a breech-loading gun, in combination with its rotatable breech-block, a firing-pin, a pin-support arranged longitudinally in the block, and means capable of automatically moving the pin with respect to the breech-
95 block from eccentric to concentric position.

20. In a gun of the class described, in combination, an interrupted-thread breech-block, a firing mechanism, a longitudinal support for said mechanism arranged in said block,
100 one being movable relatively to the other, and means constituting a functional barrier to said mechanism.

21. In a gun of the class described, in combination, an interrupted-thread breech-block,
105 a firing-pin, a pin-support mounted longitudinally in the block, one being movable relatively to the other, and means constituting a functional barrier shiftable into the normal path of the pin-point. 110

Signed at New York city this 20th day of January, 1903.

GREGORY GERDOM.

Witnesses:

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