

No. 710,124.

Patented Sept. 30, 1902.

V. C. TASKER.
FIRING MECHANISM FOR GUNS.

(Application filed Mar. 8, 1902.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1

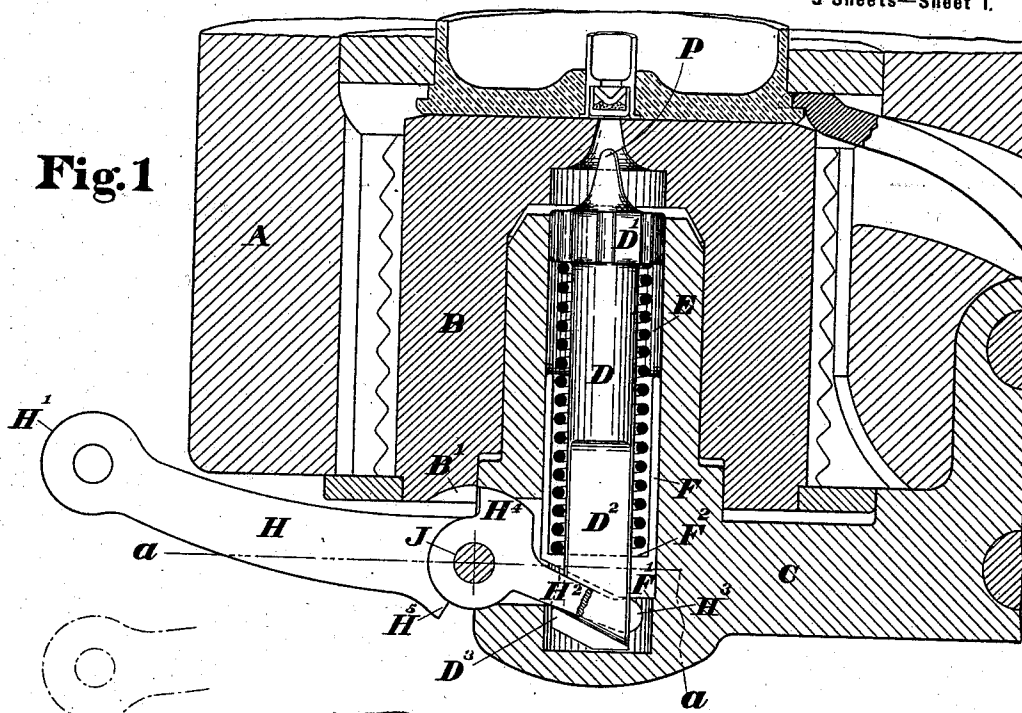
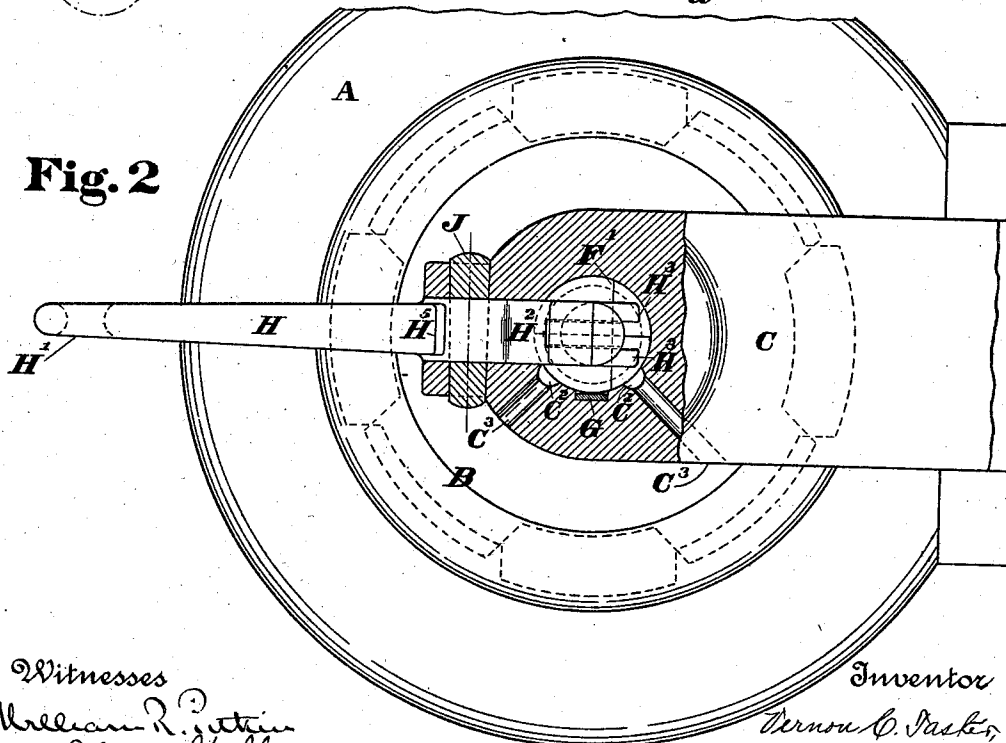


Fig. 2



Witnesses
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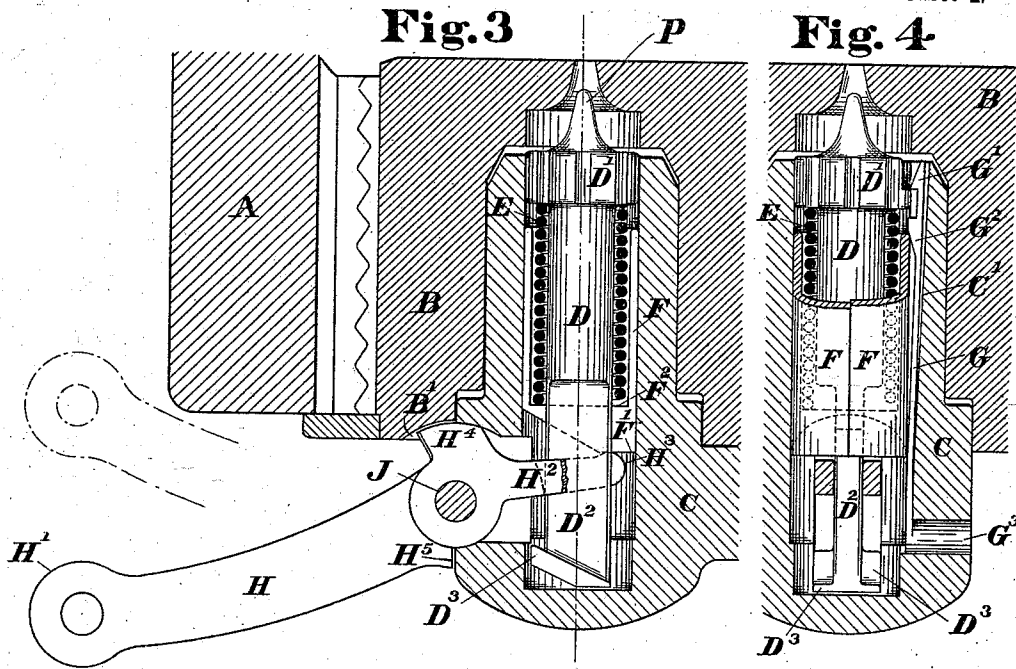
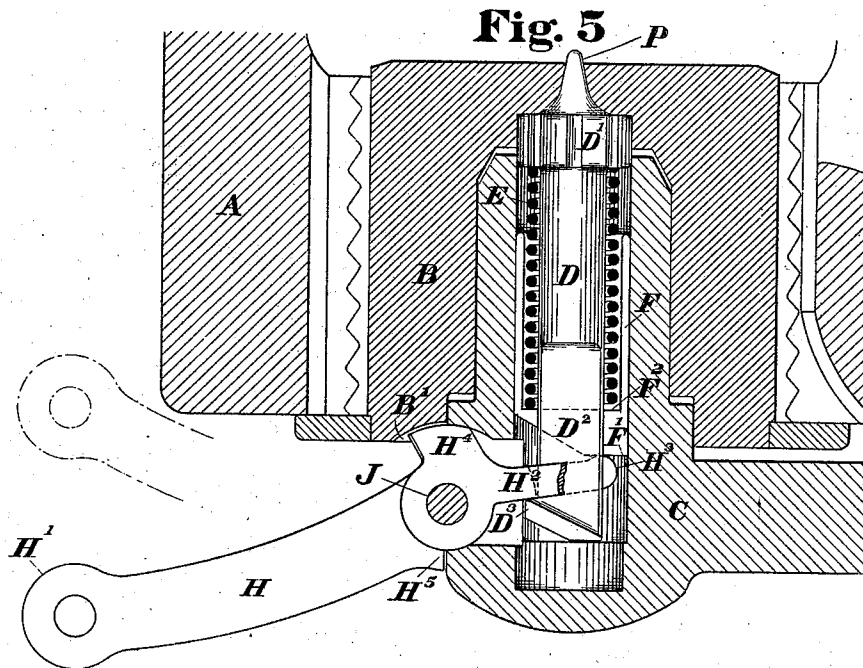
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5 Sheets—Sheet 2.

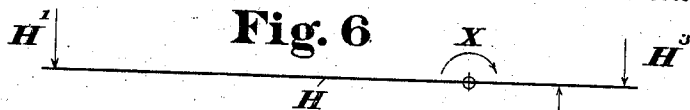
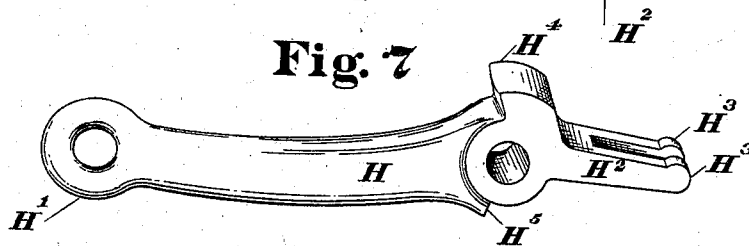
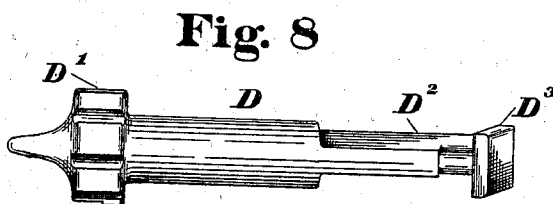
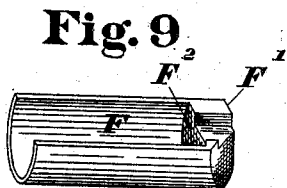
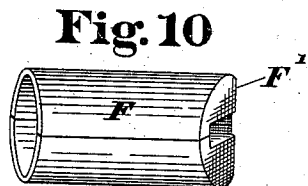
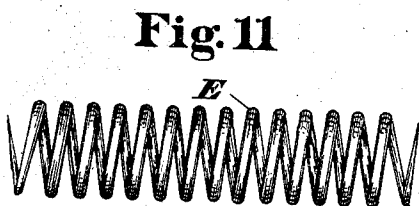
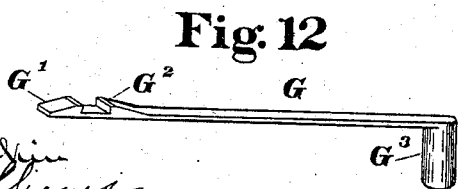


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5 Sheets—Sheet 3.



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Fig. 13

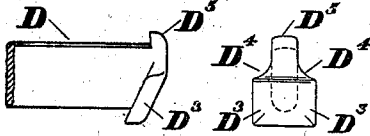


Fig. 14

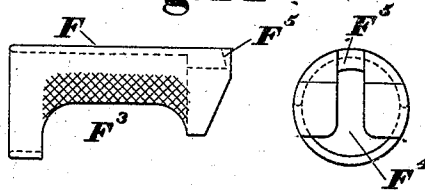


Fig. 15

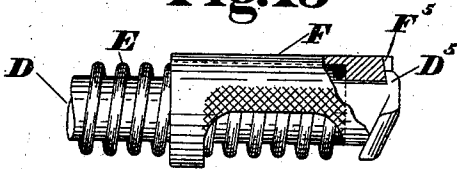


Fig. 16

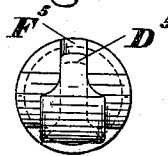
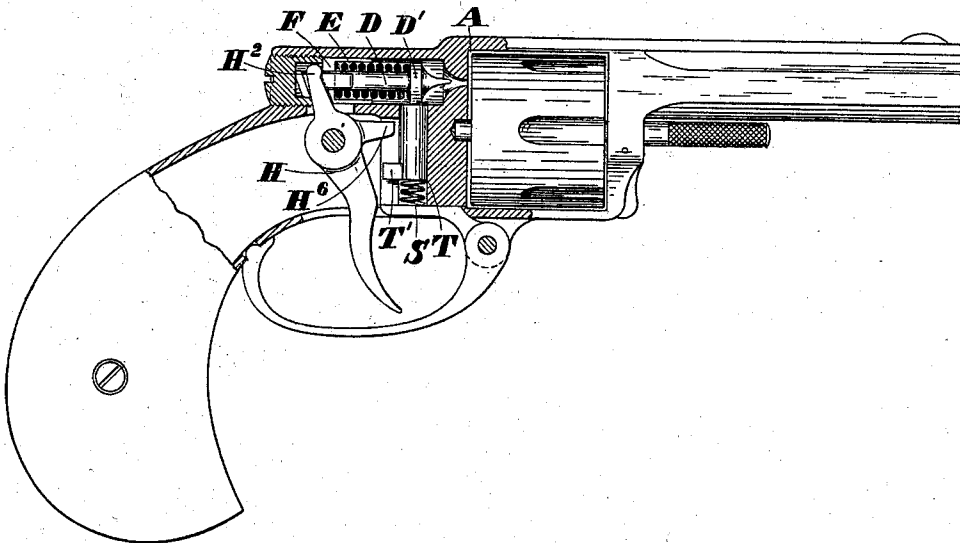


Fig. 17



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Fig.18

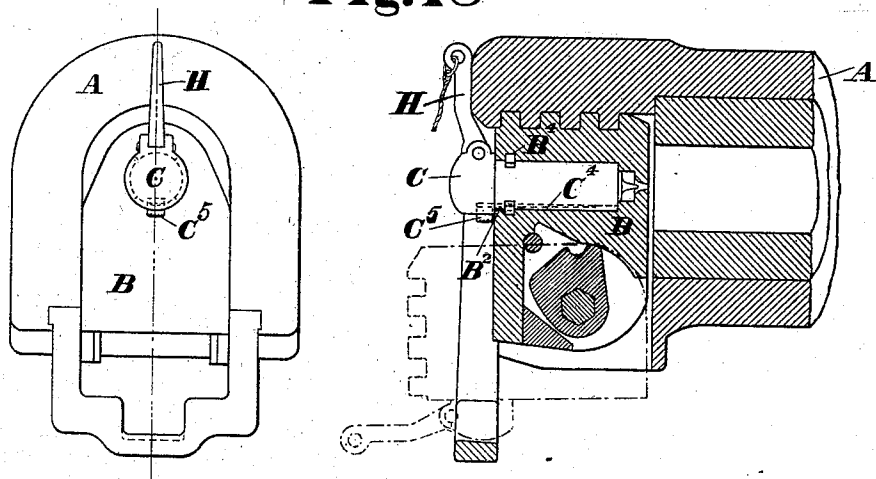
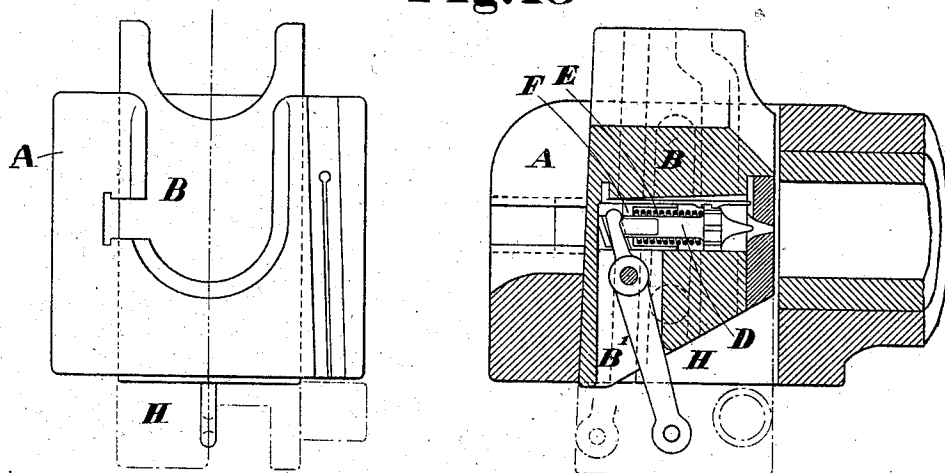


Fig.19



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UNITED STATES PATENT OFFICE.

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FIRING MECHANISM FOR GUNS.

SPECIFICATION forming part of Letters Patent No. 710,124, dated September 30, 1902.

Application filed March 8, 1902. Serial No. 97,310. (No model.)

To all whom it may concern:

Be it known that I, VERNON C. TASKER, of Bridgeport, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Firing Mechanism for Guns, of which the following is a full, clear, and exact description when taken in connection with the accompanying drawings, which form a part thereof, and in which—

Figure 1 represents a horizontal central section through the breech mechanism of a gun embodying my invention with the firing mechanism in its normal position; Fig. 2, a rear elevation of the same, a part being shown in section along the line *a a* of Fig. 1; Fig. 3, a horizontal section similar to Fig. 1, in which the parts are shown in a different position; Fig. 4, a vertical section of the firing mechanism, the parts being shown in the same position as in Fig. 3 and some shown in elevation and partly broken away; Fig. 5, a horizontal section similar to Fig. 1, the parts being shown in their position immediately after the striking of the primer; Fig. 6, a diagram illustrating the opposing forces of the spring applied in opposite directions to the lever-arm; Fig. 7, a detail perspective view of the lever-arm; Fig. 8, a similar view of the firing-pin; Fig. 9, a perspective view of one-half of the sleeve; Fig. 10, a similar view of both parts of the sleeve; Fig. 11, an elevation of the spring; Fig. 12, a perspective view of the sear; Fig. 13, a side and end view of the rear end of the firing-pin, showing a modified construction; Fig. 14, a side and end elevation of a modified form of the sleeve; Fig. 15, a side elevation of the rear end of the firing-pin, sleeve, and spring combined, the sleeve being partly broken away; Fig. 16, an end view of the same parts; Fig. 17, a side elevation, partly in section, showing a modified form of the invention applied to a revolver; Fig. 18, an end view and vertical central section showing the invention applied to a breech mechanism of a different type from that illustrated in Figs. 1 to 5, and Fig. 19 similar views of the invention as applied to a breech mechanism in sliding or wedge-block type.

In all figures similar letters of reference represent like parts.

My invention relates to mechanism for firing breech-loading guns or small-arms; and

it consists in the construction of and in the combinations of parts hereinafter described and claimed.

Referring to Figs. 1 to 12, inclusive, of the drawings, the part designated by the letter A represents a gun, B a cylindrical breech-block of the same, and C a swinging carrier in which the mechanism is shown assembled.

D is a firing-pin or plunger, which may be provided, as shown in the drawings, with a striker P (integral therewith or not, as desired) to strike the primer. The firing-pin moves in the axial cavity of the carrier C.

E is a spring, the force of which in one direction is transmitted to the firing-pin D by bearing against its head D'.

F is a spring-sleeve whose rear end forms a shoe or bearing between the spring E and arm H².

G is a sear, detent, or restraining member adapted to engage the firing-pin when in its retracted position. (Shown in Figs. 1, 3, and 4.) The sear G is shown in detail in Fig. 12 as a flat spring, which is seated, Fig. 4, in a recess C' in the carrier C and provided at its forward end with a catch G', adapted to engage the head D' of the firing-pin D, and a sloping surface G², adapted to be engaged by the sleeve F on its forward movement, which latter engagement depresses the sear G and releases the firing-pin from its engagement by the catch G'. A stem G³ at the rear end of the sear G secures it in place from longitudinal movement.

H is a lever, shown fulcrumed on the carrier by a pin J and having the extremity H' of one arm adapted to receive a lanyard for pulling it about the fulcrum and its other arm H² bifurcated to embrace the flattened rear portion D² of the firing-pin D, as shown more particularly in Figs. 1, 3, and 5, wherein one arm is shown broken away. The extremity H³ of the arm H² receives, through the medium of the end F' of the sleeve F, which bears on the arm, the force of the spring in one direction, (indicated by the arrow to the right and on the opposite upper side, Fig. 6,) while the force of the spring in the opposite direction is also transmitted to the arm H² through the medium of the firing-pin D and its lug D³, which bears on the other side of the arm H³ and with a different leverage, as

indicated by the arrow on the under side of the line, Fig. 6.

The lever H may have as a safety device a projection H⁴, which normally lies within the carrier C; but when the arm H' is pulled to the rear to fire the gun this projection enters a recess B' in the breech-block B. If the block should not be revolved to its completely-locked position, the recess will not register with the projection H⁴, and thus the gun cannot be fired. Another projection H⁵ on the lever H acts as a stop against the carrier C to limit the rearward motion of lever-arm H'.

The operation of firing is as follows: The parts being in their normal positions, (shown in Fig. 1,) the outer arm H' of the lever H is pulled to the rear by a lanyard. The extremities H³ of the forked inner arm H² move the spring-sleeve F forward, compressing the spring E, and the parts assume the positions shown in Figs. 3 and 4. Meanwhile the firing-pin D is held stationary by the sear G until the front of the sleeve F, depressing the surface G² of the sear, releases its catch G' from the firing-pin head D'. Upon such release the firing-pin flies forward under the influence of the compressed spring and the striker P strikes and explodes the primer, the parts being then in the positions shown in Fig. 5. When the pull on the lanyard is released, the spring through the sleeve F forces the arm H² of the lever to the rear, when it encounters the lugs D³ on the firing-pin. Since the spring exerts equal pressures in both directions—rearwardly against the arm H² and forwardly against the firing-pin—the rearward pressure of the spring against the extremities H³ of the arm is equal to the forward pressure of the firing-pin lugs D³ against the middle portion of said arm and they tend to move the lever in opposite directions; but as the point of application of the force at H³ is at a greater distance from the fulcrum J than that of the force at H² its leverage predominates and the arm, and with it the firing-pin, is returned to its normal position (shown in Fig. 1) and the cycle of operations is complete. This cycle may be repeated as often as required in case of "misfires" or "hang-fires" without endangering the gunner by opening the breech. It will be observed that by this arrangement a single spring may perform the three functions of firing the gun, retracting the firing-pin and striker, and returning the firing-lever to its normal position; also, that owing to the normally rearward tendency of the firing-pin there is no forward tension on the sear G and it does not come into play except during the operation of pulling the lever, when the breech-block is securely locked in position, so that a breakage of the sear would not be dangerous.

The differential action on the lever is clearly shown by the diagram, Fig. 6, in which the arrows at H³ and H² represent a mechanical couple, and it will be seen that the mechanical moment of the couple is the moment with

which the lever H will tend to turn about the fulcrum J in the direction of the arrow X.

Longitudinal vent-grooves C² (see Fig. 2) may be formed in the axial recess in the carrier C, terminating rearwardly in the vent-holes C³, communicating with the open air, and furnish a vent for the powder-gases, which may reach the interior of the mechanism in case of a "blow-back," preventing injury of the mechanism.

In Fig. 14 is shown an alternate form of spring-sleeve F, which in this application of the mechanism is more convenient to assemble. It is in a single piece, as shown, instead of in halves, and is cut away at F³ F⁴ F⁵ to permit of assembling the firing-pin with spring, the lugs D³ of firing-pin passing to rear of spring-sleeve F, the spring meanwhile prevented from following by its seat in the sleeve. Fig. 13 shows the corresponding form for the rear end of firing-pin D, the lugs D³ cut away at D⁴ D⁴, and a hook provided at D⁵.

Figs. 15 and 16 show the assembled firing-pin, spring, and sleeve, the hook D⁵ engaging with the notch F⁵ to hold the parts together for insertion into the carrier C.

In Fig. 18 the device is represented as inclosed in a case C and inserted entire from the rear into a breech-block B of another type, engaging with the same by a suitable bayonet-joint at B⁴ and locked against rotation by a flat spring C⁴, secured in the forward end of the case, entering a shallow depression at B² in the bayonet-joint and provided with a thumb-lug C⁵, by which it may be depressed and the case revolved a half-turn and removed from the block. The usual face-plate in such blocks may be dispensed with.

In Fig. 19 the invention is shown as applied to a breech mechanism of the sliding or wedge-block type. In such application many parts of the usual breech mechanism are dispensed with and the block shortened at its lower end. The customary form is shown in dotted lines. The entire mechanism is much lighter and simpler, the block at the same time being stronger by reason of the slot B' not extending all the way forward, as usual in this type.

Fig. 17 shows a possible application of the invention to a small-arm, in which T is the sear, guided vertically and pressed upward to engage the firing-pin by the spring S. T' is a lug on the sear, adapted to be depressed by the arm H⁶ on the lever after the main-spring has been sufficiently compressed. In other respects the construction and mode of operation is similar to that already shown and described.

While the invention has been described with particularity, so that one skilled in the art may make it, I do not intend to limit my invention to these details of construction, as they may obviously be varied without departing from the spirit of the invention.

I claim—

1. The combination with a plunger; of a fulcrumed arm adapted to retract said plun-

ger; and a spring actuating said arm to retract said plunger and reacting on said plunger, substantially as described.

2. The combination with a plunger; of a fulcrumed arm adapted to retract said plunger; and a spring actuating said arm to retract said plunger and reacting on said plunger, said arm energizing said spring on its reverse movement, substantially as described.

3. The combination with a plunger; of a fulcrumed arm adapted to retract said plunger; a spring actuating said arm to retract said plunger and reacting on said plunger, said arm energizing said spring on its reverse movement; a detent for engaging said plunger in a retracted position; and means for disengaging said detent, substantially as described.

4. The combination with a plunger; of a fulcrumed arm adapted to retract said plunger; a spring actuating said arm to retract said plunger and reacting on said plunger; and a detent for engaging said plunger in a retracted position, said arm energizing said spring on its reverse movement and adapted to disengage said detent, substantially as described.

5. The combination with a plunger; of a fulcrumed arm adapted to retract said plunger; a shoe acting on said arm; a spring urging said shoe to act on said arm to retract said plunger and reacting on said plunger; a detent for engaging said plunger in a retracted position, said arm energizing said spring on its reverse movement and adapted to disengage said detent through said shoe, substantially as described.

6. The combination with a plunger; of a fulcrumed arm adapted to retract said plunger; an energized spring actuating said arm to retract said plunger; and means for applying the reactive force of said spring to said arm, with a different leverage, substantially as described.

7. The combination with a plunger; of a fulcrumed arm adapted to retract said plunger; an energized spring actuating said arm to retract said plunger, and guided in a path different from that of the arm; and means for applying the opposing forces of the spring to said arm in opposite directions, and with unequal leverage, substantially as described.

8. The combination with a fulcrumed arm; of a plunger guided in a path different from that of the arm and adapted to be retracted by said arm; an energized spring tending to actuate the plunger; and means for applying the opposing forces of the spring to said arm in opposite directions with differential leverage, substantially as described.

9. The combination with a fulcrumed arm; of a plunger guided in a path different from that of the arm and adapted to be retracted by said arm; and an energized spring acting upon said arm, with a suitable leverage, through the plunger, and reacting on the arm

with a different leverage, substantially as described.

10. The combination with a fulcrumed arm; of a plunger guided in a path different from that of the arm, and bearing on said arm in one direction with a suitable leverage and adapted to be retracted thereby; and an energized spring urging said plunger to bear on said arm and reacting against said arm in the other direction with a greater leverage, substantially as described.

11. The combination with a fulcrumed arm; of an energized spring; a shoe transmitting the force of said spring to said arm at a suitable distance from its fulcrum; and a plunger normally transmitting the reactive force of said spring to said arm at a less distance from its fulcrum, substantially as described.

12. The combination with a fulcrumed arm; of an energized spring; a shoe transmitting the force of said spring to said arm at a suitable distance from its fulcrum; and a plunger normally transmitting the reactive force of said spring to said arm at a less distance from its fulcrum, said shoe and plunger being guided in a path divergent from that of said arm, substantially as described.

13. The combination with a fulcrumed arm; of a plunger having an engagement with said arm operative in one direction; a spring acting forwardly on said plunger and rearwardly on said arm and tending to maintain said engagement; a detent for detaining said plunger during the forward movement of said arm; means for releasing said plunger and means for retracting said plunger operated by said spring, substantially as described.

14. The combination with a firing-lever; of an independently-movable firing-pin; an engagement between said pin and lever acting forwardly on the lever with a suitable leverage; an energized mainspring acting rearwardly on said lever with a greater leverage, and acting forwardly on said firing-pin; a detent for detaining said firing-pin during the forward movement of the firing-lever; and means for releasing said firing-pin, substantially as described.

15. The combination with a firing-lever; of a firing-pin; an energized mainspring acting forwardly on the firing-pin and rearwardly on the lever; a detent for detaining the firing-pin when the lever is operated to compress the mainspring; means for releasing the firing-pin, and means for applying the unexpended energy of the mainspring to retract the firing-lever and firing-pin, substantially as described.

16. The combination with a firing-pin; of a firing-lever acting rearwardly on said pin at a suitable leverage to retract said pin; a mainspring acting rearwardly on said lever at a greater leverage and reacting forwardly on said pin, substantially as described.

17. The combination with a firing-pin; of a firing-lever; an engagement between said pin

and lever acting rearwardly on said pin at a suitable leverage; a mainspring acting rearwardly on said lever at a greater leverage, and reacting forwardly on said pin; a detent
5 for engaging said pin in a retracted position; and means operated by the forward movement of the lever for disengaging said detent, substantially as described.

18. The combination with an oscillatory firing-lever; of a firing-pin; an engagement between said lever and pin bearing forwardly on said lever at a suitable leverage; a shoe bearing rearwardly on said lever at a greater leverage; a mainspring acting forwardly on
15 said pin and reacting rearwardly on said shoe; and a detent engaging said firing-pin in a retracted position, and means for disengaging said detent on the forward movement of the shoe, substantially as described.

20 19. The combination with a firing-lever; of a firing-pin; an energized spring acting on the lever and reacting on the pin; and an engagement between the lever and pin for retracting the pin by means of said spring, substantially as described.

20. The combination with a plunger; of a spring for actuating said plunger; means for energizing said spring and means for retracting said plunger to its armed position operated by said spring, substantially as described.

21. The combination with a plunger; of a spring for actuating said plunger; a fulcrumed arm adapted to energize said spring on its movement in one direction, and to retract said plunger on its reverse movement operated by said spring, substantially as described.

22. The combination with a plunger; of a detent for engaging said plunger in a retracted position; a spring adapted to actuate said plunger; means for retracting said plunger to its armed position operated by said spring, substantially as described.

In witness whereof I have hereunto set my hand on the 28th day of February, 1902.

VERNON C. TASKER.

Witnesses:

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C. B. CURTIS.