March 3, 1936. G. H. GARRISON 2,032,929

FIREARM

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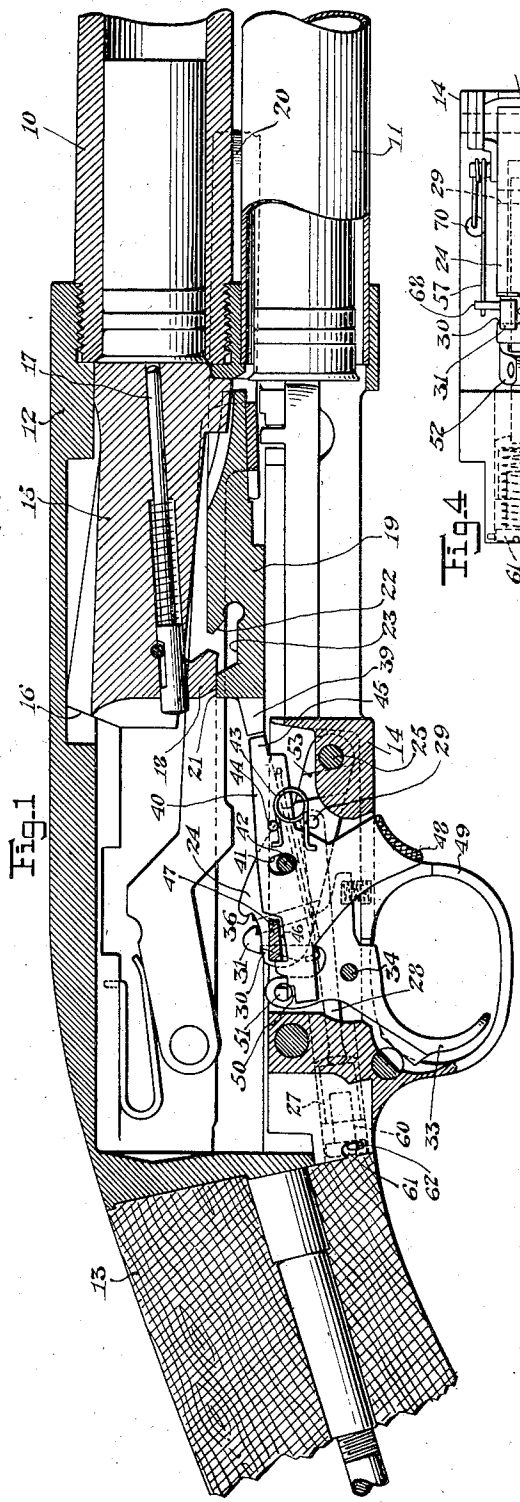


Fig. 1

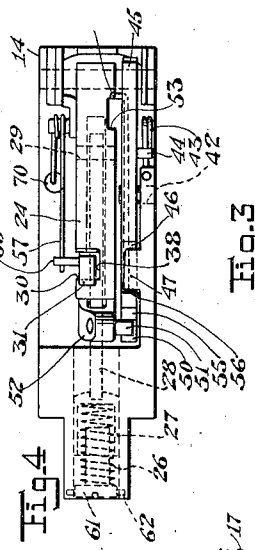


Fig. 4

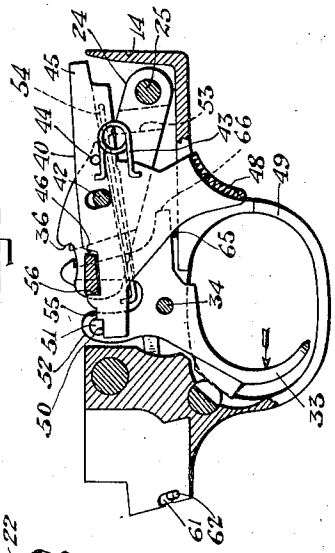


Fig. 3

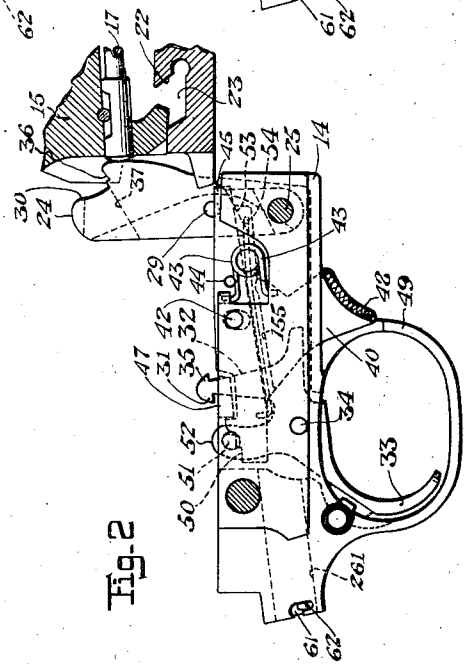


Fig. 2

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Fig. 5

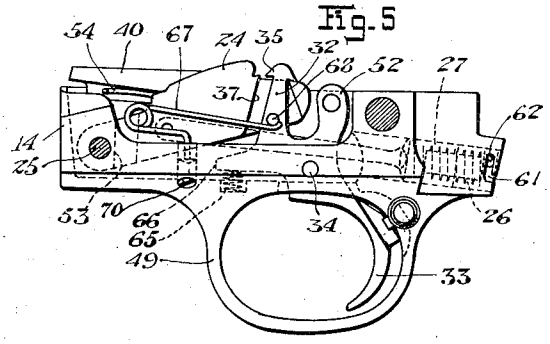


Fig. 6

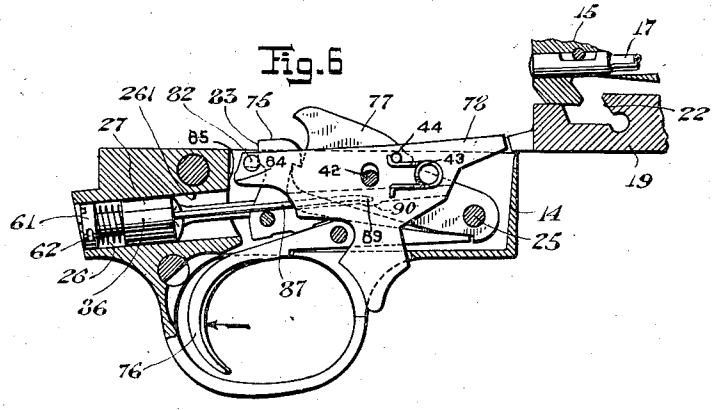


Fig. 8

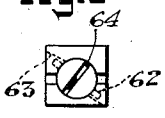


Fig. 7

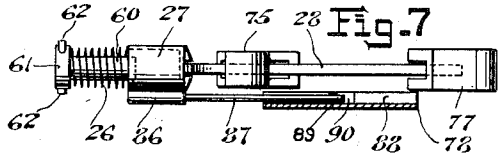
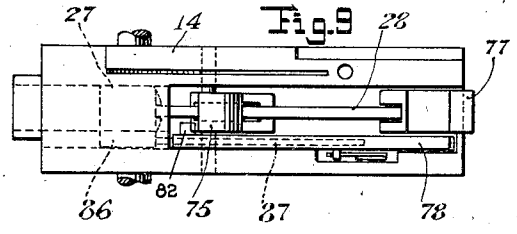


Fig. 9



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UNITED STATES PATENT OFFICE

2,032,929

FIREARM

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Application May 13, 1932, Serial No. 611,075

7 Claims. (Cl. 42—69)

This invention relates to firearms, and certain of its aspects are particularly adapted to firearms of the "repeating" type; such firearms comprising a single chambered barrel, a breech and fire control mechanism co-operating therewith, and a magazine adapted to contain a number of cartridges or shells which are to be transferred one at a time to the chamber of said barrel.

One object of the invention is to provide for a firearm of the repeating type an improved method of controlling a member which normally prevents unlocking of the breech block when the fire control mechanism is in cocked position.

A further object of the invention is to cause such a breech block locking device to co-operate with a trigger or sear in such a manner as to lock said trigger or sear in engagement with the firing hammer at all times when the breech mechanism is unlocked.

A further object of the invention is to provide a breech block locking device and trigger or sear co-operating in such a manner that a pull on the trigger during the closing movement of the breech mechanism will condition the breech block locking device to move instantly to effective position when the breech is fully closed, thereby locking the breech block.

A further object of the invention is to provide an improved form of readily removable hammer spring abutment.

A further object of the invention is to provide a simple and readily adjustable means for varying the amount of force required to effect disengagement of the trigger or sear from the hammer.

As a modification of the mechanism for controlling the breech locking device, the invention contemplates an improved means for controlling said device from the hammer spring pilot, instead of from the hammer.

With these and other incidental objects in view the invention consists in certain novel mechanisms and arrangements thereof, representative embodiments of which are illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary sectional side elevation of a firearm having the preferred forms of the inventions applied thereto, showing the breech closed and locked and the fire control mechanism in cocked position.

Fig. 2 is a side elevation, partly in section, of the fire control mechanism shown in Fig. 1, the hammer being fired and the trigger being locked by the novel trigger lock constituting a part of the present invention.

Fig. 3 is a side elevation, partly in section of the trigger plate, showing the parts in the positions they assume when an attempt is made to pull the trigger before the breech block is fully locked.

Fig. 4 is a plan view of the trigger plate and mechanism mounted thereon.

Fig. 5 is a left side elevation of said trigger plate, showing the control of the action slide lock by the hammer and the adjustable trigger pull mechanism.

Fig. 6 is a sectional side elevation of a construction embodying certain modifications of the mechanisms illustrated in Figs. 1 to 5. In this figure the sear is separate from the trigger and the action slide lock is controlled from the hammer spring pilot instead of from the hammer.

Fig. 7 is a plan view of the fire control mechanism of Fig. 6, the trigger plate being omitted.

Fig. 8 is a fragmentary rear elevation of the trigger plate, showing the improved form of hammer spring abutment.

Fig. 9 is a plan view of the trigger plate shown in Fig. 6.

The firearm comprises a barrel 10 and a magazine tube 11 suitably secured to the forward end of a receiver or frame 12 having a stock 13 secured at its rear end by any suitable means. Preferably the sides, top and rear end of the receiver are integral. The bottom of said receiver, however, is open and is adapted to support in its rearward portion a trigger plate 14 carrying certain of the mechanisms involved in the present invention, which will be hereinafter more fully described.

The receiver contains a chamber closing breech block 15 adapted to be locked in breech closing position by an abutment 16 in the receiver and housing the usual firing pin 17. Said breech block comprises a heel 18 adapted for co-operation with an action slide 19 suitably connected to a forwardly extending action bar 20 designed to be manipulated by a fore-end piece, not shown since it is not involved in the present invention.

When the action slide is in its forward position the bottom of the heel 18 of the breech block rests on the upper surface 21 of the rear end of the action slide 19, as shown in Fig. 1. As the action slide is moved to the rear the forward portion of said heel engages the inclined surface 22 in front of a notch 23 in the action slide, and in the continued rearward movement of said action slide the heel enters the notch 23, drawing the rear end of the breech block downward until it clears the abutment 16, after which the breech block and action slide travel to the rear together.

The mechanisms by which extraction of a fired shell from the chamber, its ejection from the receiver, and the transfer of a fresh shell from the magazine 11 to the chamber, are effected, may be of the form disclosed in the patent to Loomis, No. 1,834,410, December 1, 1931.

The fire control mechanism is mounted in the trigger plate 14, and may be constructed as follows: A hammer 24 pivoted in the trigger plate at 25 is urged forwardly and upwardly by a hammer spring 26 partially housed in a pilot member 27 which is engaged by a hammer link 28 having a pivotal connection with the hammer at 29. Said hammer comprises a forwardly facing shoulder 30 adapted for engagement by a rearwardly facing spur or sear 31 on an upstanding arm 32 of a trigger 33 pivoted at 34. Said arm 32 likewise comprises a forwardly facing spur 35 adapted to co-operate with a notch 36 in the hammer 24 and particularly to be engaged by a rearwardly facing shoulder 37 on the hammer, to insure movement of the trigger to normal position as the hammer is cocked, in the event that an attempt is made to hold the trigger depressed at this time. When the hammer is cocked, the trigger arm 32 occupies a notch 38 in the left side of the hammer, as clearly shown in Fig. 4. The cocking of the hammer is effected through its engagement by the action slide 19 as said slide is moved to the rear.

Means are provided for locking the breech mechanism when the firing hammer is cocked, and for releasing the breech mechanism for its unlocking and breech opening movements as soon as the hammer reaches fired position. Said means is mounted in the trigger plate and operates on the breech block through a tail 39 on the action slide. It performs the further functions of locking the trigger at all times when the breech mechanism is unlocked, and is also arranged to be moved by the trigger to lock the breech mechanism if the trigger is held depressed during the breech closing movement of said breech mechanism. Said means comprises a member 40 which, for convenience, will be called an "action slide lock". Said action slide lock comprises an elongated pivot opening 41 which receives a pivot pin 42 secured in the trigger plate, and is urged upwardly by suitable means such as a spring 43 having one end in engagement with the trigger plate and the opposite end in engagement with the action slide lock or means thereon such as stud 44. Said action slide lock comprises a nose 45 for co-operation with the tail 39 of the action slide and, with the hammer cocked and the mechanism in normal position, spring 43 is effective to hold said nose elevated and behind the tail 39, as shown in Fig. 1; thus locking the action slide and, through said slide, the breech block. The action slide lock is recessed at 46 to receive an abutment 47 on the trigger plate for a purpose to be presently described.

The lower portion of the action slide lock comprises a finger piece 48 preferably projecting below the trigger plate immediately in front of a trigger guard 49, to enable the unlocking of the breech when desired. The rearward portion of the action slide lock comprises a notch 50 adapted for co-operation with a lug 51 on an arm 52 of the trigger. Normally, the action slide lock is elevated with respect to its pivot 42, and when it is rocked clockwise (Fig. 1) about said pivot to unlock the slide, trigger lug 51 is engaged in the notch 50; thus locking the trigger against hammer releasing movement. Such rocking of the action slide lock is preferably effected as an incident to the movement of the hammer to fired position (Fig. 2). The mechanism for this purpose may be as follows:

The hammer 24 is provided near its pivot with a cam notch 53 adapted when the hammer moves to fired position to operate upon a suitable device associated with the action slide lock 40. This device may take various forms, the one which has been selected for purpose of illustration comprises a stiff wire spring 54, partially housed in a suitable longitudinal recess 155 in the action slide lock and secured at its rear end to said lock. The forward end of said spring or connector is bent transversely inward to engage the upper marginal surfaces of cam notch 53 as the hammer is moved to fired position, as clearly shown in Fig. 2. Such engagement and depression of the forward end of spring connector 54 tensions the same sufficiently to rock the action slide lock and release the slide therefrom as shown in Fig. 2.

Fig. 2 likewise shows the trigger depressed, lug 51 out of the notch 50 and overlying a shoulder 55 adjacent said notch, thereby holding the rear end of the action slide lock depressed. The tension in spring connector 54 is sufficient to compress the action slide lock spring 43, lowering the action slide lock upon its pivot 42. When, in the breech opening movement, the hammer approaches cocked position and spur 35 is engaged by a shoulder 37 the trigger will be forcibly moved to normal position even though an attempt be made to hold it depressed, lug 51 will clear the shoulder 55 and enter the notch 50 permitting the rear end of the action slide lock to rise. The parts are now in the position shown in Fig. 3. The nose 45 of the action slide lock remains depressed due to its engagement by the tail 39 of the action slide until the breech is fully closed and locked. Now, if the trigger be forcibly pressed during breech locking movement trigger lug 51 engages the margin of notch 50 at a point which is necessarily above the action slide lock pivot 42 and tends to prevent the elevation of the nose of the action slide lock into the path of movement of the tail 39 when said tail clears the nose 45. Means are provided, however, whereby such a pressure on the trigger actually throws the nose 45 of the action slide lock upward as soon as said nose is clear of the tail 39, as follows:

As heretofore stated, the action slide lock comprises a recess 46 which receives a fixed abutment 47. When the trigger is pressed prior to the locking of the breech the margin 56 of said recess 46 engages the rearward face of abutment 47 at a point somewhat above the point of engagement of the face of lug 51 with the margin of notch 50. Thus, pressure upon the trigger, acting through lug 51 and the margin of notch 50, actually rocks the action slide lock 40 counterclockwise about the point of engagement of the surface 56 with the abutment 47, elevating the nose 45 into breech locking position as soon as said nose is permitted to rise. This condition of the mechanism is illustrated in Fig. 3 in which the arrow indicates the application of pressure to the trigger. The action slide is locked, the hammer is engaged by the spur 31 of the trigger and cannot be released therefrom until the trigger has been released, permitting the action slide lock to rock to its normal Fig. 1 position. It is thus insured that the action slide cannot be operated repeatedly merely by exerting a constant pressure upon the trigger. It should be further

noted that, if in attempting to open the breech by pressure upon the action slide lock finger piece 48 a careless or inexperienced user inadvertently presses upon the trigger 33 as well as finger piece 48, said trigger will become locked against hammer releasing movement before the nose 45 is depressed below the tail 39 of the action slide; thus positively preventing accidental discharge of the gun through pressure upon the trigger when the breech mechanism is unlocked.

The operation of the mechanism thus far described may be summarized as follows:

When the gun is cocked and ready to fire the various parts of the fire and breech control mechanisms are in the position illustrated in Fig. 1. The breech is locked due to the position of the nose 45 of the action slide lock 40 immediately behind tail 39 of the action slide, and the rear end of the action slide lock is depressed so that notch 50 is below trigger lock 51. The inturned end of spring connector 54 stands above and slightly in front of the hammer cam notch 53 in position to engage in said notch as the hammer swings forward. The action slide lock is held in the position described and elevated with respect to its pivot 42 by spring 43. If the trigger is now pulled the hammer is disengaged from trigger spur 31. The hammer is impelled forward by hammer spring 26 acting through the hammer link 28 and as it moves forward the inturned end of spring connector 54 is engaged by the cam surface of notch 53, rocking the action slide lock to the Fig. 2 position. Normally the trigger will be released following the pull thereof which releases the hammer and, as the hammer is cocked by the rearward movement of the action slide, the parts again assume the Fig. 1 position, spring 43 elevating the nose of the action slide lock to locking position. If, however, the trigger is forcibly pressed during breech closing movement the engagement of trigger lug 51 with the margin of notch 50 exerts a force which tends to rock the action slide lock counter-clockwise about the point of engagement of surface 56 of said action slide lock with the fixed abutment 47, said point of engagement being above the point of engagement of lug 51 with the margin of notch 50. In this condition, the action slide lock will be so rocked as soon as the tail 39 clears the nose 45 and thereafter the trigger must be released, to permit the notch 50 to drop clear of trigger lug 51, before the trigger can be pulled to again release the hammer 24.

The invention further contemplates an improved and readily removable hammer spring abutment, one form of which is illustrated in Figs. 6 to 8. The hammer spring 26 is housed in an aperture 261 opening at the rear end of the trigger plate, and prior practice has contemplated only such spring abutments for closing the rear end of aperture 261 as a flat plate or disk held by a transverse pin extending into the adjacent walls of the trigger plate, as shown in the patent to Loomis, above mentioned. The present invention contemplates a short interior pilot 60 provided with a head 61 having projecting laterally therefrom lug 62 adapted to be received in bayonet slots 63 in the trigger plate. Said head 61 may comprise a transverse slot 64 similar to an ordinary screw head slot. Thus, by the application of a screw driver to said slot the hammer spring is very readily removed and replaced.

The invention further contemplates means for readily effecting the adjustment of the trigger pull from a minimum of say two pounds to any desired maximum. A light spring 65 (Fig. 5) may be placed in the trigger plate beneath a forwardly extending portion 66 of the trigger to provide a minimum pull, or said spring 65 may be omitted altogether. A supplemental adjustable spring 67 is placed upon the trigger plate adjacent the hammer and trigger and has one end thereof in engagement with a pin 68 upon a suitable part of the trigger, such as the arm 32 thereof. An abutment 69 is provided on the trigger plate for the loop of the spring 67, and its lower end is turned downwardly into a threaded aperture in the trigger plate. Said aperture receives a screw 70 which is accessible on the under side of the trigger plate preferably at a point near the front portion of the trigger guard 49. By adjustment of said screw 70 in and out, the tension on spring 67 may be varied between wide limits, thus providing a trigger pull susceptible of ready adjustment to meet the requirements or idiosyncrasies of individual shooters.

Figs. 6, 7 and 9, illustrate a modification of the action slide and trigger lock devices heretofore described, adapting them first to a construction in which the sear is separate from the trigger, and second to a control of the action slide lock from the hammer spring pilot or housing 27 instead of from the hammer hub. The sear 75, trigger 76 and hammer 77, are substantially of the form illustrated and described in the aforementioned patent to Loomis. The action slide lock 78 is similar in some respects to the action slide lock 40 heretofore described. The rearward upper portion of the action slide lock comprises a transversely extending lug 82 adapted to engage behind the rear face 83 of sear 75 and lock said sear in hammer engaging position. It should be noted that the upper portion of said sear must move to the rear to release the hammer; whereas, in the form illustrated in Figs. 1 to 5, the trigger spur 31 must be moved forward in order to release the hammer. A tail 84 at the rear end of the action slide lock is adapted to engage the face 85 of the trigger plate at a point below the point of engagement of lug 82 with the sear, thereby providing that when the trigger is pulled prior to the locking of the breech, the action slide lock will rock about the point of engagement of lug 82 and surface 83, moving said lock into effective position in the same manner as the lock 40 heretofore described is moved to effective position under similar conditions.

As above stated, the action slide lock is controlled on the fall of the hammer, by means associated with the hammer spring pilot or housing 27. Said means comprises a transverse extension 86 of housing 27, apertured to receive and rigidly support a stiff spring member 87 extending forward therefrom and engaging an upwardly facing surface 88 on the action slide lock 78. When the hammer is cocked the point of engagement of spring member 87 with surface 88 of the action slide lock is substantially in vertical alignment with the action slide lock pivot 42, thus its opposition to the elevation of the nose of the action slide lock by spring 43 is reduced to a minimum. If desired, the construction may be such that at this time the action slide lock is substantially or entirely freed from spring 87. One means for this purpose comprises a slightly downturned end 89 on spring 87 (Fig. 6), which downturned end forms the point of contact of said spring with the action slide lock, and a recess 90 in the action slide lock into which the end 89 drops as the hammer reaches cocked po-

sition. As the housing 27 is impelled forwardly in the fall of the hammer, the point of engagement of member 87 with the action slide lock shifts to a position forward from pivot 42, and the tension of said member 87 tends to rock the action slide lock to ineffective position. The aperture 261 which receives the hammer spring and its housing 27 comprises a suitable transverse enlargement to receive the extension 86 of housing 27, as clearly illustrated in Fig. 8.

It is to be understood that the specific embodiments of the inventions herein described are typical and illustrative only, the invention being susceptible to embodiment in a variety of other forms, all falling within the scope of the appended claims, which claims are to be broadly construed.

What is claimed is:

1. The combination with a firearm mechanism comprising a breech block, a firing pin in said breech block, a firing hammer adapted for co-operation with said firing pin, and a hammer controlling trigger and sear; of a unitary locking device for said hammer and trigger, controlling means for said unitary locking device associated with said hammer and adapted when said hammer is moved to fired position to move said unitary locking device to release said breech block, said locking device comprising a pivot received in an elongated pivot opening and being depressed on said pivot when so moved under the control of said hammer.

2. In a firearm comprising a breech closing mechanism, a firing hammer, a hammer spring, and means connecting said spring to said hammer comprising a movable spring housing; in combination, a breech mechanism lock, an apertured lateral projection on said hammer spring housing, a breech mechanism lock controlling device secured in said projection and extending forwardly therefrom into engagement with said breech mechanism lock.

3. The combination with a firearm mechanism comprising a breech block having opening and closing movements, a firing pin in said breech block, a firing hammer adapted for co-operation with said firing pin, and a hammer controlling trigger and sear; of a unitary locking device for said breech block and said trigger adapted in one position to lock said breech block and in another position to lock said trigger, and means whereby pressure on said trigger during the closing movement of said breech block tends to move said locking device to breech block locking position.

4. The combination with a firearm mechanism comprising a breech block having opening and closing movements, a firing pin in said breech block, a firing hammer adapted for co-operation with said firing pin, and a hammer controlling trigger and sear; of a unitary locking device for said breech block and said trigger adapted in one position to lock said breech block and in another position to lock said trigger, and means whereby pressure on said trigger during the closing movement of said breech block tends to move said locking device to breech block locking position, said means comprising a fixed abutment, and a surface on said locking device adapted for engagement with said abutment.

5. The combination with a firearm mechanism comprising a breech block having opening and closing movements, a firing pin in said breech block, a firing hammer adapted for co-operation with said firing pin, and a hammer controlling trigger and sear; of a unitary locking device for said breech block and said trigger adapted in one position to lock said breech block and in another position to lock said trigger, and means whereby continued pressure on said trigger during the closing movement of said breech block effects the locking of said breech block when closed.

6. The combination with a firearm mechanism comprising a breech block having opening and closing movements, a firing pin in said breech block, a firing hammer adapted for co-operation with said firing pin, and a hammer controlling trigger and sear; of a unitary locking device for said breech block and said trigger adapted in one position to lock said breech block and in another position to lock said trigger, and means whereby continued pressure on said trigger during the closing movement of said breech block effects the locking of said breech block when closed and blocks said trigger against hammer releasing movement until pressure thereon is relaxed.

7. The combination with a firearm mechanism comprising a breech block having opening and closing movements, and a firing pin in said breech block; of a trigger plate, a firing hammer and a hammer controlling trigger and sear pivoted in said trigger plate, a unitary locking device for said breech block and said trigger pivoted in said trigger plate and adapted in one position to lock said breech block and in another position to lock said trigger, and means comprising an abutment on said trigger plate and a co-operating shoulder on said locking device whereby pressure on said trigger during the closing movement of said breech block effects the locking of said breech block when closed.

GEORGE HENRY GARRISON.