

March 7, 1933.

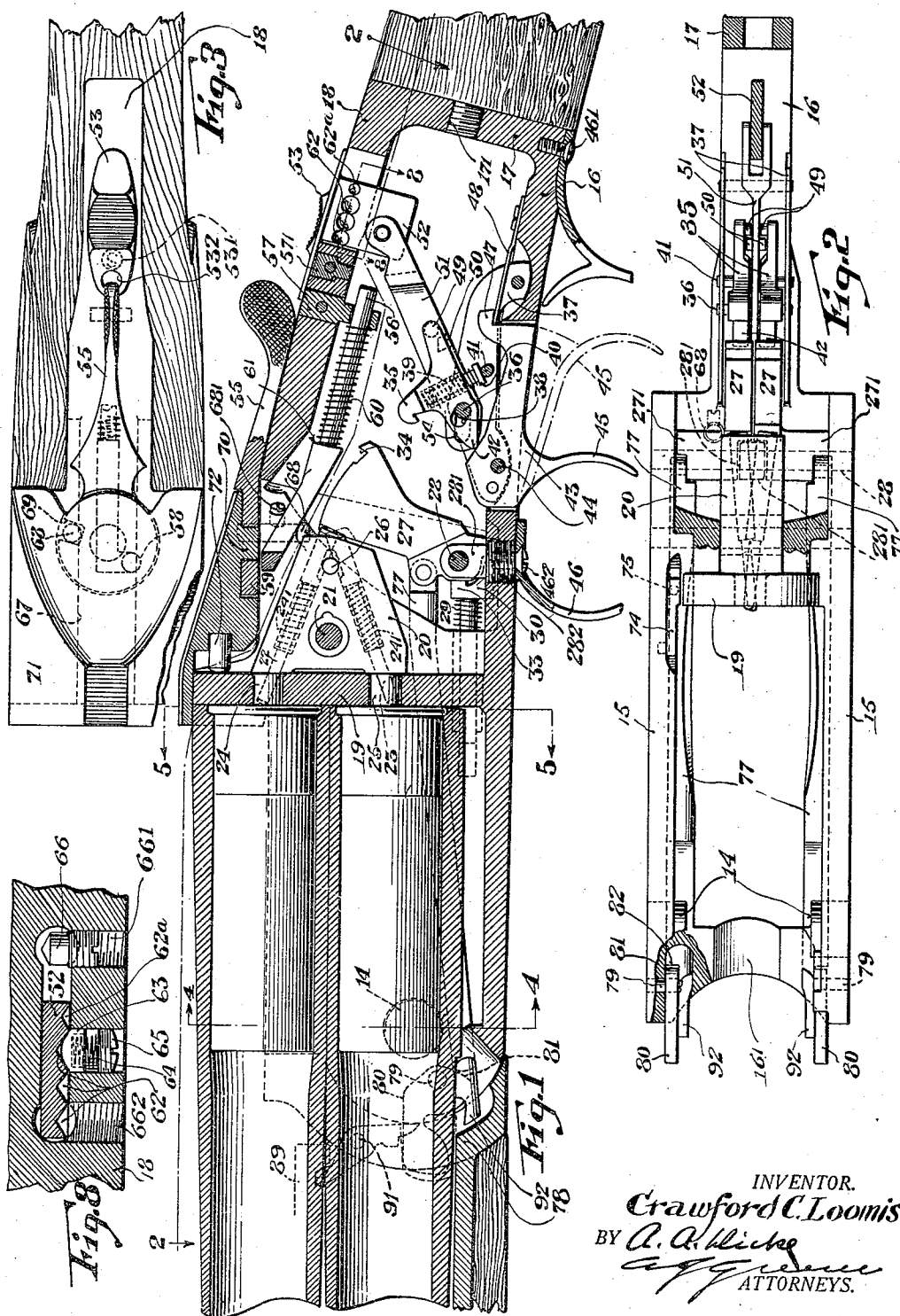
C. C. LOOMIS

1,900,184

FIREARM

Filed Jan. 26, 1931

2 Sheets-Sheet 1



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FIREARM

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Fig. 6

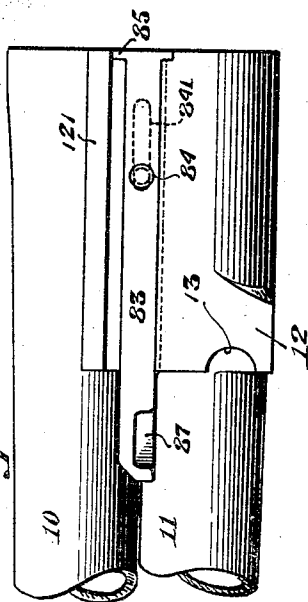


Fig. 5

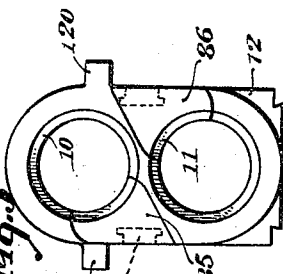
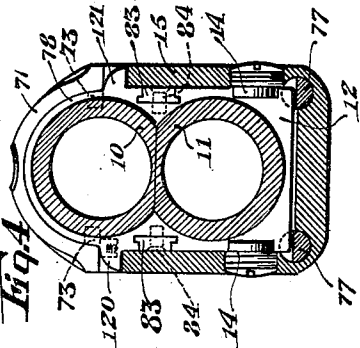


Fig. 4



# UNITED STATES PATENT OFFICE

CRAWFORD C. LOOMIS, OF ILION, NEW YORK, ASSIGNOR TO REMINGTON ARMS COMPANY, INC., A CORPORATION OF DELAWARE

## FIREARM

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This invention relates to firearms, and particularly to firearms of the double barrel type in which the barrels are arranged one above the other, such guns being commonly known as "over-and-under" guns, as distinguished from the somewhat more common type of double guns in which the barrels are arranged side-by-side. Certain features of the invention, however, are of general applicability and as to such features the invention is not limited to any particular type of firearm.

The object of the invention, generally stated, is to construct a simple, rugged and efficient firearm. With this object in view, the invention contemplates improvements in the barrel assembly pivoting, the breach closing mechanism, the construction and operation of sears, an improved safety, an improved firing pin mounting, improved hammer cocking and shell ejecting devices, and an improved fore-end construction, together with the novel functioning of the various parts in conjunction with each other, all as more fully hereinafter described.

In the drawings:

Fig. 1 is a fragmentary, longitudinal, sectional elevation of a firearm illustrating one embodiment of the present invention.

Fig. 2 is a plan view, partly in section, upon the broken line 2—2 of Fig. 1.

Fig. 3 is a fragmentary plan view of the frame or receiver section of the firearm.

Fig. 4 is a vertical section substantially on the line 4—4 of Fig. 1.

Fig. 5 is a rear elevation of the barrel assembly; note the line 5—5 on Fig. 1.

Fig. 6 is a fragmentary side elevation of the barrel assembly.

Fig. 7 is a fragmentary side elevation, partly in section, showing particularly the fore-end construction and the shell ejecting mechanism.

Fig. 8 is a sectional detail of the safety finger piece, the section being substantially on the line 8—8 of Fig. 1.

Fig. 9 is a fragmentary front elevation of the frame and breech locking bolt or cover.

Fig. 10 is a rear elevation of the fore-end.

Fig. 11 is a fragmentary side elevation of a ventilated fore-end piece which may be used

upon the firearm of the present invention.

The upper barrel 10 and the lower barrel 11 are rigidly secured at their rear ends in a breech piece 12, provided with the lateral projections forming downwardly facing shoulders or flanges 120 and 121. The forward ends of the barrels are preferably joined so as to permit relative movement, thereby preventing distortion of the barrels due to unequal heating when one barrel is fired more frequently than the other. The joining means for this purpose may be of any suitable type, such as that shown in the patent to Brennan & Loomis, Number 1,662,025, issued March 6th, 1928.

In the forward edges of the breech piece 12 are provided forwardly facing half journals 13 adapted to receive pivot studs 14 projecting inwardly from the sides 15 of the main frame. Referring particularly to Fig. 1, it will be seen that the centers of the barrel pivot studs 14 are somewhat above the bottom of the assembly, and that the lower part of the rear face of the barrel assembly is suitably curved to permit it to swing upwardly with respect to the frame. The relatively high location of the barrel pivot exposes the mouth of the lower barrel chamber after a minimum of angular movement of the barrel assembly relative to the frame.

The pivot studs 14 are screwed into the side flanges 15 of the frame, being preferably provided with threads of a pitch differing slightly from the pitch of the cooperating threads in the frame openings thereby more positively securing the studs in place. Further, opposite sides of the studs may be ground to different radii, as seen in Figs. 1 and 7, the shorter radius curvature of the rearwardly facing portion of the studs conforming to the curvature of the half journals 13 on the breech piece. If a journal becomes worn, due to improper lubrication, a stud 14 may readily be replaced by another having a journal engaging face of a greater radius. The forward or long radius portion of each stud 14 bears against the arcuate face of a lug 88, preferably integral with the adjacent flange 15 of the frame.

The fire control mechanism is all support-

ed upon a unitary and preferably integral main frame, which comprises the aforementioned side plates or flanges 15 projecting upwardly from the forward section of a bottom plate 16. The rearward portion of the frame is in the form of an open rectangle, comprising the bottom plate 16, a post or column 17, a top plate member 18, and a breech closing block or partition wall 19, all preferably integral, and suitably formed to receive and support the mechanism to be described. The post 17 comprises an aperture 171, threaded to receive the stock holding screw. The partition wall 19 is suitably apertured to receive the firing pin, hammer cocking rods, and hammer spring plungers, and the forward end of the top plate 18 is widened and curved to receive the sliding breech cover, all to be hereinafter described.

The firing pins are supported and partially housed in a firing pin supporting block 20 secured in place by a transverse pin 21 extending through the breech closing member 19 which is suitably slotted to receive the block 20. The rearward ends of the firing pins lie side-by-side in the same horizontal plane (Figs. 1 and 2); from its rear end the firing pin 22 for the upper barrel extends diagonally inward, forward and upward, and the firing pin 23 for the lower barrel extends diagonally inward, forward and downward, the points of the pins passing respectively through apertures 24 and 25 in the wall 19 into position to engage the primers of shells or cartridges in the chambers of the two barrels. The block 20 is suitably apertured and counterbored to receive the two firing pins with their retracting springs 241 (Fig. 1); and a common cross pin 26 retains the firing pins in place in the block 20. After their firing movement the cartridge engaging ends of the firing pins are retracted into the breech closing wall 19 by springs 241, as seen in Figs. 1 and 2, the firing hammers being slightly retracted as presently explained.

The fire control mechanisms for the two barrels are counterparts, each comprising similar elements arranged side by side; hence, a description of one fire control mechanism is applicable to both. Each fire control mechanism comprises a firing hammer 27 pivoted on the cross pin 28. The ends of cross pin 28 are supported in the frame flanges 15 and a centrally located bearing member 281, said bearing member comprising at its lower end a threaded enlargement 282 which is screwed into an aperture in the frame plate 16 as shown at 282, Fig. 1.

The upper or firing pin and sear engaging portion of each hammer 27 is offset relative to its lower or hammer spring pilot engaging portion, the upper parts of the two hammers lying adjacent to each other (Fig. 2) while the lower parts comprise hubs 271 which extend outwardly to the side flanges

15. Each hammer is actuated by a hammer spring 29 arranged in a suitable well in the bottom plate 16 and acting through a pilot head 30 upon parts of the associated hammer adjacent its pivot, see particularly Fig. 7. Each pilot head 30 comprises an extension 31 which contacts with a downward projection 32 on the associated hammer when the hammer is cocked. When the hammer is in its forward or uncocked position a surface 33 of the pilot head engages a suitably shaped surface upon the hammer substantially in alignment with or slightly above the hammer pivot 28. Thus, after a hammer has been moved to actuate the associated firing pin, it may rebound or be retracted slightly by the action of the firing pin retracting spring 241.

Each hammer comprises a notch 34 upon its outer periphery for engagement with the nose of a sear 35 pivoted at 36 in a pair of flange plates 37 projecting upwardly from the bottom frame plate 16. The pivot receiving opening in each sear 35 is an elongated slot 38 (Fig. 1) for the purpose of permitting the momentary displacement of the sear when the associated hammer is cocked with the safety mechanism in "safe" position, as hereinafter more fully described. Each sear is urged into the position with respect to its pivot illustrated in Fig. 1 by a spring 39 partially housed in a suitable well in the sear and guided by a spring pilot 40 bearing at its lower end upon a transverse rod 41 secured in the flange plates 37. Each sear comprises a forwardly extending toe 42 adapted to engage a trigger 43 pivoted at 44 in the plate 16. The triggers are provided with the usual finger pieces 45, shielded by a trigger guard 46 attached to the base plate 16 in any suitable manner, such as a screw 461 threaded into the plate, and a screw 462, received in a threaded aperture in the shank 282 of bearing member 281. Each trigger includes a rearwardly extending nose 47 overlying a suitable spring 48 by which each trigger is held in contact with the toe 42 of the associated sear.

Each of the sears 35 is provided with a laterally extending pin or lug 49 adapted for cooperation with a lug 50 upon a safety bar 51. Said safety bar is pivoted at its rearward end to a sliding plate 52 associated with a safety operating finger piece 53. The safety bar 51 extends forwardly and downwardly from the plate 52, passing between and acting as a separator for the sears, and at its lower end comprises a slot 54 which receives the sear pivot 36. It will be understood that there is but one safety bar 51 and that said bar is provided on opposite sides with lugs 50 for cooperation with the lugs 49 of the two sears. When the finger piece 53 is in its forward (Fig. 1) position, the lugs 50 upon the safety bar 51 stand in front of the

sear lugs 49 and the sears can be operated to disengage their respective hammers. When the finger piece is retracted so that the lugs 50 stand beneath the lugs 49 the sears cannot move and, by reason of the engagement of the toes 42 of the sears with the triggers, the triggers cannot be moved. The entire firing mechanism is thus securely locked against operation. When the safety operating finger piece has been moved forwardly (Fig. 1) to permit firing, it will be restored to "safe" position by the movement of the top lever 55 necessary for opening the breech. This operation is performed through a safety operating plunger 56 supported at its rear end in an apertured depending post 57 and pivoted at 58 (Fig. 3) to the hub 59 of the top lever. A spring 60 is interposed between the post 57 and a suitable shoulder 61 upon the plunger, thereby not only holding the plunger in its forward position but likewise holding the top lever 55 in its normal position.

Means are provided for adjusting the safety mechanism, first, so that it will not be automatically moved to "safe" position upon the movement of the top lever but may be manually operated; and second, so that the gun is in ready to fire condition at all times. These features are desirable, for example, for trap shooting, in which there is no necessity for rendering the gun safe every time it is opened for reloading, and such functioning is a positive inconvenience. The present invention provides a third position for the safety bar 51, plate 52, and finger piece 53, in which the lugs 50 stand in the rear of the sear lugs 49, and the plate 52 entirely out of the path of movement of plunger 56. Adjustable means are also provided for optionally preventing movement of the safety mechanism to this rearmost position or preventing its movement to its forward or automatically operated position. To this end plate 52 is provided with a series of V shaped grooves or notches 62 adapted to receive the rounded end of a short plunger 63 pressed inwardly by spring 64 held in place by a short screw 65; threaded into a transverse aperture in the frame 18. The plate and associated parts are thus yieldingly held in the position to which they may be moved, and are prevented from stopping in an intermediate position. Fig. 8 shows parts of the safety mechanism in the normal firing position, that is, with the finger piece 53 moved forwardly. The slot in the frame 18 which receives the plate 52 is of sufficient length to permit the movement of said plate to the rearward or "manually safe" position aforementioned, but movement of the plate 52 to such position is normally blocked by means of a screw 66 threaded into a transverse aperture 661 in the frame 18. By retracting said screw, plate 52 and associated parts may be moved to the manual safe posi-

tion and will remain there until manually restored to one of the forward positions, the spring plungers 63 occupying the foremost one of the notches 62, and if it is desired to positively prevent accidental restoration to an "automatic safe" condition the stop screw 66 may be inserted in front of plate 52 thru the threaded opening 662. Moreover, the parts being in "manual safe" position, they may be set to prevent movement to "safe" position by advancing the screw 66 thru opening 661 until its conical point enters the supplemental notch 62<sup>a</sup> in plate 52. In this "continuous fire" condition the gun cannot be rendered "safe", but is at all times in a ready-to-fire condition. To provide for plainly indicating whether the firearm is in "safe" or "ready-to-fire" condition, whether it is made ready to fire by moving the finger piece forward or backward from its "safe" position, a suitable legend, such as the letter "S" is inscribed on the top of plate 18, or on an insert 531 therein, in position to be visible thru a window 532 in finger piece 53 when the mechanism is in "safe" position, and to be obscured by the parts of the finger piece forwardly and rearwardly of said window when the mechanism is in either "ready-to-fire" position.

The forward end of frame plate 18 comprises a rectangular slot 67 through which the firing pin mounting block 20 is inserted in assembling the firing mechanism. The top lever 55 is pivoted upon a pin or stud 68, projecting from a journal opening in the frame plate 18, and engaging a notch 69 in the hub 59 of the top lever. In assembly the stud or roller 68 is inserted from beneath and may be held in place by a screw 681 (Fig. 2), crossing its lower end and threaded into the frame.

The hub 59 comprises a central aperture adapted to receive a projection 70 of the main locking bolt or breech cover 71; said locking bolt having formed therein an annular recess which receives the hub 59, as clearly shown in Fig. 1. When said locking bolt is in its forward position (Fig. 1) it projects over the rear end of the barrel assembly, thereby locking the breech. The top lever is moved to its normal central position by spring 60, as aforesaid; the locking bolt being thereby carried to its forward or breech locking position; its forward movement by spring 60 is limited by a suitable stud 72 which engages the partition wall 19 of the frame. Movement of the top lever to the left from its normal (Fig. 3) position will retract the locking bolt to permit the opening of the breech by reason of the eccentric mounting of the top lever on the frame 18 and its central connection with the top lever. For accurately guiding its movement, the locking bolt is provided with inwardly extending flanges 73 (Fig. 9) received in suitable grooves in the frame.

Means are provided for holding the breech

cover retracted until the breech is closed comprising a short lever 74 (Fig. 7) pivoted in one of the side plates 15 and urged upwardly by a spring 75 to engage a shoulder 76 on the breech cover. When the breech is closed said lever is depressed out of engagement with shoulder 76 through its engagement by the ledge 120 on the breech piece 12.

Means are provided for cocking the firing hammers 27 and for loosening and subsequently ejecting fired shells while permitting unfired shells to remain in the chambers, all upon the opening movement of the breech. These devices may be constructed as follows:

Pivoted to each of the firing hammers is a link or thrust rod 77 which extends through a suitable aperture in the frame wall 19, forward adjacent to one of the frame flanges 15, through an aperture in the transversely curved and forwardly inclined joint check 161 formed at the forward end of the frame plate 16. The ends of the flanges 15 are curved concentric with the barrel pivots 14 and receive the correspondingly curved end of the fore-end iron 78. Pivoted at 79 near the curved end of each flange 15 is a lever 80 provided with a cam surface 81 engaging a shoulder 82 on the associated cocking rod 77. The forward end of each lever 80 extends into a recess 801 in the fore end, and in the breech opening movement each lever is turned about its pivot 79 through its engagement with the top wall of its recess. In this movement of each lever 80 its cam 81 engages shoulder 82 and thrusts its cocking rods 77 rearwardly thereby cocking the associated firing hammer. If the sear 35 is locked by engagement with the lugs 50 of the safety mechanism its forward end will move rearwardly and downwardly by reason of its slot connection with pivot 36, heretofore mentioned, enabling the hammer shoulder 34 to pass the sear nose.

The shell extracting and ejecting mechanism comprises extractor bars 83 (Fig. 6) mounted for sliding movement in opposite sides of the breech piece 12, such movement being limited by the engagement of a stud 84 on each bar 83 in a slot 841 in the breech piece. The extractor bars are provided at their rearward ends with enlarged heads 85 and 86 respectively, (Fig. 5) which are received in recesses in the face of the breech piece 12 and the barrels 10 and 11, respectively, and are provided with rabbeted edges forming a continuation of the shell rim receiving recesses provided in the barrels. Each extractor bar 83 is provided near its forward end with a shouldered recess 87 (Fig. 7) adapted to be engaged in the breech opening movement by an abutment piece 88 upon the adjacent frame flange 15. Thus, upon the breech opening movement, each extractor bar is positively thrust rearwardly a short distance for the purpose of loosening shells which fit tightly in the chamber and permit-

ting their subsequent ejection by the ejector mechanism.

The ejector hammers and sears are mounted in a novel fore-end iron, best illustrated in Figs. 7 and 10. The rearward portion of said iron has the form of a yoke, (Fig. 10) with side arms or plates 761 extending upwardly along and beyond the lower barrel. Each side plate 761 comprises a longitudinal groove adapted to contain an ejector hammer 89. Space transversely of the plate 761 being limited, each ejector hammer is propelled by a plurality, in the present illustration two, of coil springs 90 of relatively small diameter, arranged one above the other. Each ejector hammer 89 is controlled by a pivoted ejector sear lever 91, the downwardly and rearwardly extending portion of which lies adjacent to the arcuate end of a main frame flange in position to be engaged by the nose 92 of the associated cocking rod 77, which nose is projected forwardly from the frame into position to thus engage the ejector sear lever 91 when the associated firing hammer moves to its forward position. The sear notch 93 in each ejector hammer 89 is of such depth that a substantial movement of the sear, carrying its depending arm within the flange 15, is necessary to disengage the ejector sear from its hammer. This construction is necessary in order to provide that the breech shall be fully opened, the chamber of the lower barrel clearing the top of the frame, before the ejectors are operated, and to provide that the ejector sears shall remain in engagement with the cocking rod projections 92 as the cocking rods are retracted in the breech opening movement, in the manner heretofore described. The side pieces 761 of the fore-end iron are apertured, as shown at 762 and 763 (Fig. 7) to facilitate assembly and to render the parts easily visible and accessible for inspection and adjustment after final assembly.

The fore-end may be secured in place upon the barrel assembly in any desired manner. One construction for this purpose comprises a lug 94 secured to the lower barrel and provided with a notch adapted for engagement by a latch 95 pivoted at 96 to a reinforced section 764 of a forward extension of the lower part of the fore-end iron. Said latch occupies a suitable aperture in the wood fore-end cover 97, which is secured to the fore-end iron by suitable means such as screws and nuts 971. Latch 95 is moved to lug engaging position by a suitable spring, such as 98, preferably secured to the upper surface of the fore-end iron, passing through an aperture therein and engaging a recess in the back of the hook. The hook is also provided with a forwardly extending finger piece 99 lying substantially flush with the under-surface of the wood cover 97, and corrugated to facilitate heat radiation. Movement of the latch 95 by finger piece 99 is limited by the engage-

ment of the back of said latch with an abutment in the fore-end iron, excessive straining of spring 98 being thus prevented. When the fore-end is thus released, it may be removed from the gun by a forward and downward movement. The barrel assembly may thereupon be removed from the frame by retracting the locking bolt or cover 71, opening the breech, and moving the barrel assembly upwardly and rearwardly relative to the frame.

Fig. 11 illustrates a novel fore-end wood particularly adapted for an over and under firearm in which the barrels are spaced apart through the greater part of the section thereof covered by the fore-end. The wood 97 is provided with a suitable arrangement of ventilating apertures or slots 972, enabling a free circulation of air around and between the barrels, thus facilitating their cooling.

The particular construction herein described is to be understood as merely a representative embodiment of an invention which may assume many other forms, all falling within a broad construction of the appended claims.

What is claimed is:

1. In a firearm comprising a plurality of firing chambers located one above another, a fire control mechanism supporting frame, a firing pin supporting block secured on said frame, firing pins held in and diagonally traversing said block the rearward ends of said firing pins being side-by-side in substantially the same horizontal plane and the front ends of said pins being spaced vertically and in substantially the same vertical plane, each of said firing pins being provided with a retracting spring.

2. In a multiple chamber firearm, a pair of similar firing hammers pivoted on a common pivot shaft and a supporting bearing for said pivot shaft located between said hammers.

3. In a firearm, a plurality of firing hammers, a mechanism supporting frame comprising a bottom plate and side flanges, a pivot shaft for said firing hammers having end bearings in said side flanges and an intermediate bearing in a member projecting from said bottom plate.

4. In a firearm, a mechanism supporting frame comprising a bottom plate and side flanges, a pivot shaft having end bearings in said side flanges and an intermediate bearing in a member threaded into an aperture in said bottom plate.

5. In a firearm, a frame plate, a member projecting outwardly from and adapted to be attached to said plate, a supporting member extending inwardly from said plate and secured in an aperture therein, and means for attaching a part of said outwardly projecting member to said supporting member.

6. In a firearm, a frame plate, a bearing member secured in an aperture in said frame plate and projecting inwardly therefrom, a

trigger guard, means for attaching said trigger guard to the portion of said bearing member received in said aperture.

7. In a firearm, a frame plate, a bearing member secured in an aperture in said plate and extending inwardly therefrom, a trigger guard, and means for attaching said trigger guard comprising a threaded opening in said bearing member.

8. In a firearm, a frame comprising side flanges, a pair of firing hammers having closely adjacent hammer heads substantially midway between said side flanges, hubs extending laterally from the bases of said hammer heads, and hammer springs engaging surfaces near the outer ends of said hubs.

9. In a firearm, a frame plate, a pair of supporting flanges secured to said plate, a pivot stud supported in said flanges, a pair of sears pivoted on said pivot stud, and a safety bar mounted for sliding movement on said pivot stud between said sears and acting as a spacer therefor.

10. In a firearm, a pivot stud, supporting means therefor, a pair of sears mounted on said stud for rotational movement about said stud and translational movement relative thereto, and a safety bar mounted for translational movement on said stud, between said sears, and separating said sears.

11. In a firearm, a pair of sears, provided with projections, a safety bar extending between and separating said sears, means on said safety bar adapted in one position of said safety bar to engage said projections and block movement of said sears, and means whereby said safety bar may be shifted both forwardly and rearwardly.

12. In a firearm, a safety mechanism having an intermediate "safe" position and "firing" positions on either side of said "safe" position, and means adjustable to lock said safety mechanism in one of said firing positions.

13. In a firearm, a safety mechanism having a "safe" position and a "firing" position, and means for setting said safety mechanism in firing position and preventing its movement therefrom.

14. In a firearm, a safety mechanism having a "safe" position and a "firing" position, means for automatically restoring said safety mechanism from said firing position to said safe position, and means for preventing movement of said safety mechanism to said firing position while permitting its movement to a second firing position.

15. In a firearm, a breech locking bolt, a bolt retracting device, a safety mechanism, having a "safe" position and a "firing" position from which it is restored to safe position by the movement of said bolt retracting device, said safety mechanism being movable to a second firing position in which it is not affected by said bolt retracting device,

and means adjustable to prevent movement of said safety mechanism to the first said firing position.

16. In a firearm, a breech locking bolt, a bolt retracting device, a safety mechanism having a "safe" position and a "firing" position from which it is restored to safe position by the movement of said bolt retracting device, said safety mechanism being movable to a second firing position in which it is not affected by said bolt retracting device, and means adjustable to lock said safety mechanism in said second firing position.

17. In a firearm comprising a plurality of barrels arranged one above another, a fore-end iron comprising a yoke extending upward along the sides of the barrel assembly, ejector sears and hammers mounted in the walls of said yoke, said walls being apertured opposite the engaging surfaces of the sears and hammers to facilitate relative adjustment thereof.

18. In a firearm comprising a plurality of barrels arranged one above another, a fore-end iron comprising a yoke partially encircling the barrel assembly, an ejector hammer mounted in the wall of said yoke, and a plurality of springs for propelling said ejector hammers arranged one above another in said wall.

19. In a multiple chamber firearm, a pair of similar firing hammers arranged side by side and having firing pin engaging portions and pivotal supporting portions, the pivotal portions of the hammers being offset with respect to the firing pin engaging portions, and a supporting bearing received between said pivotal portions.

CRAWFORD C. LOOMIS.