Sept. 8, 1925. 1,552,460

C. A. YOUNG

REPEATING FIREARM

Filed April 19, 1921 5 Sheets-Sheet 1

Fig. 1

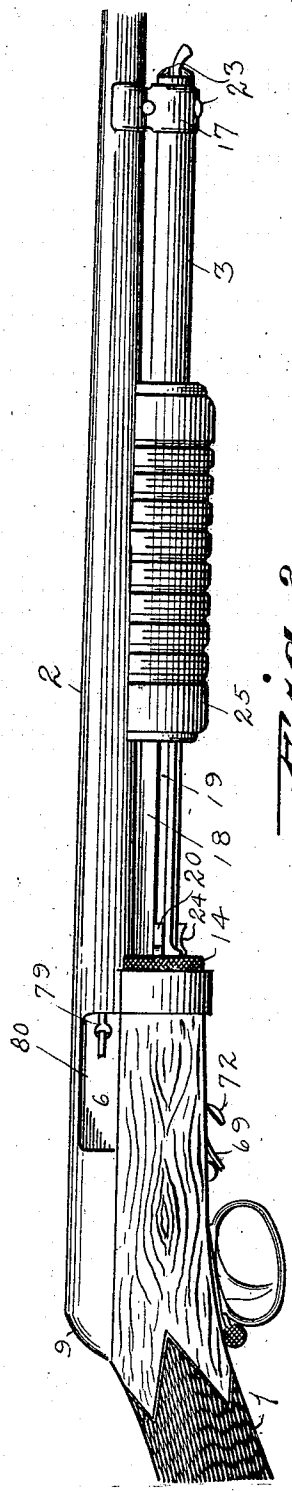
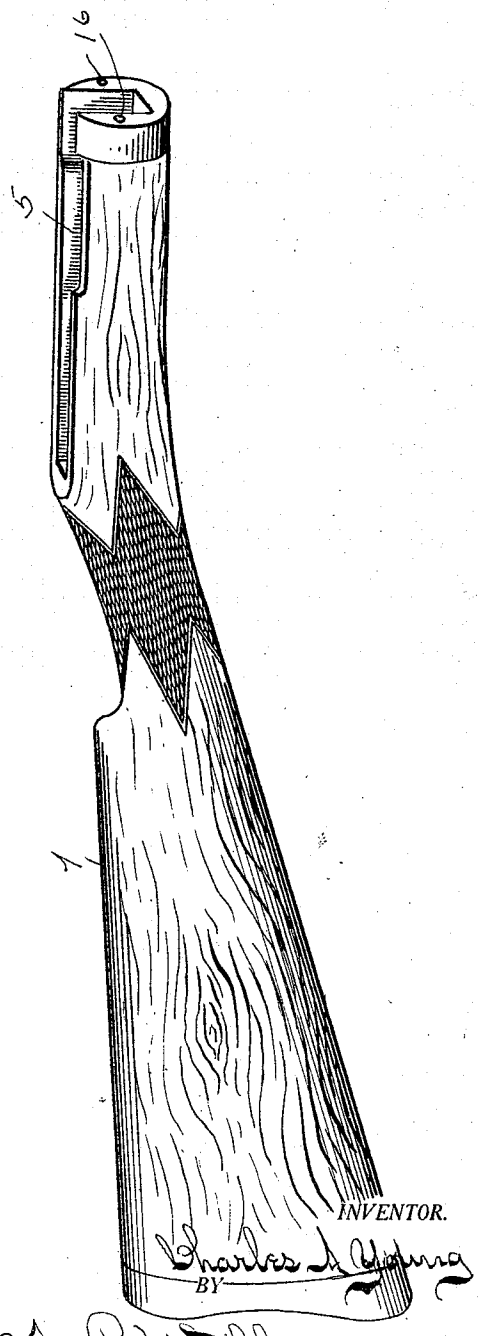


Fig. 2



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Sept. 8, 1925.

1,552,460

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REPEATING FIREARM

Filed April 19, 1921

5 Sheets-Sheet 2

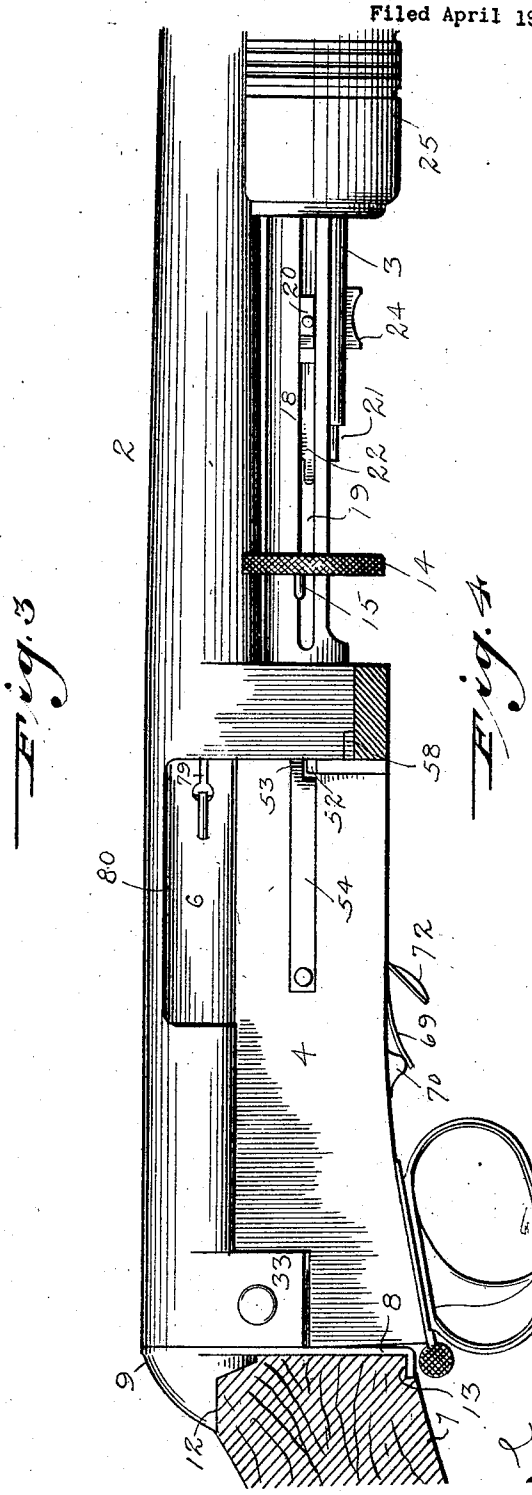


Fig. 3

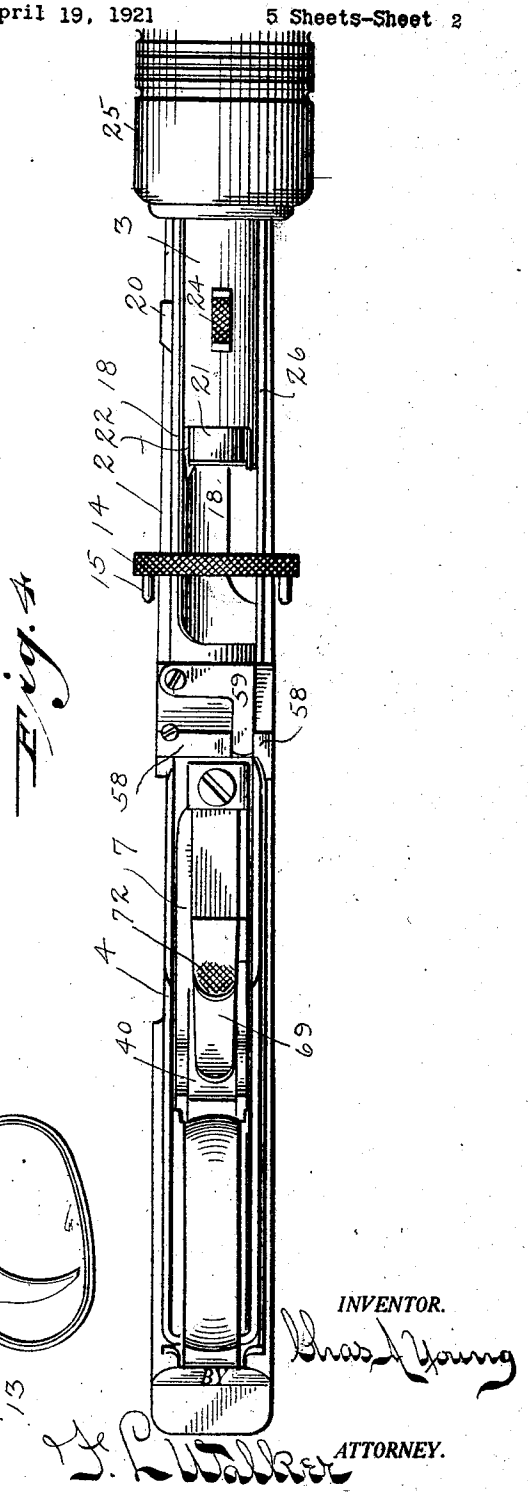


Fig. 4

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Sept. 8, 1925. 1,552,460

C. A. YOUNG

REPEATING FIREARM

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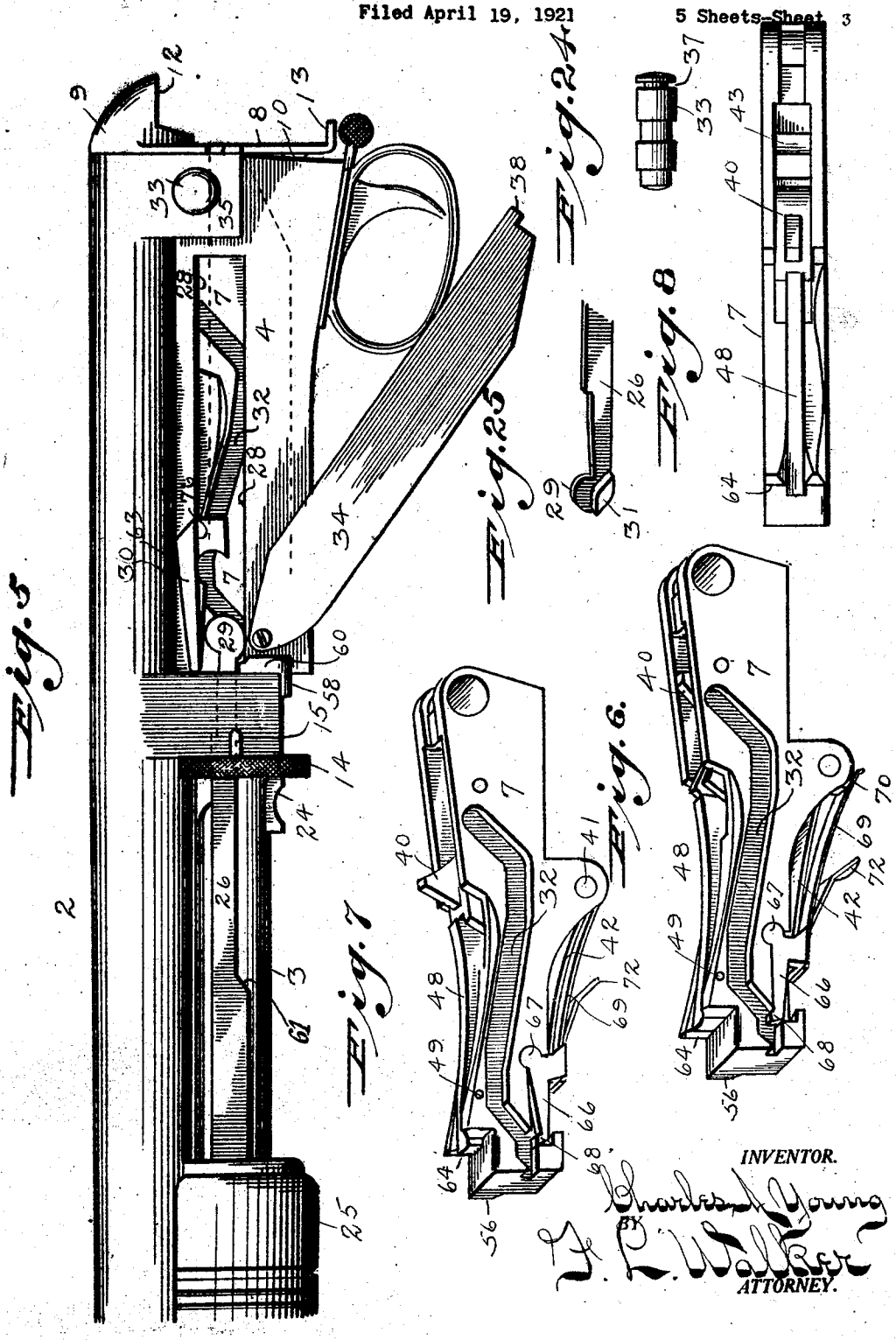


Fig. 5

Fig. 24

Fig. 23

Fig. 8

Fig. 7

Fig. 6.

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BY

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Sept. 8, 1925. 1,552,460

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REPEATING FIREARM

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Fig. 9

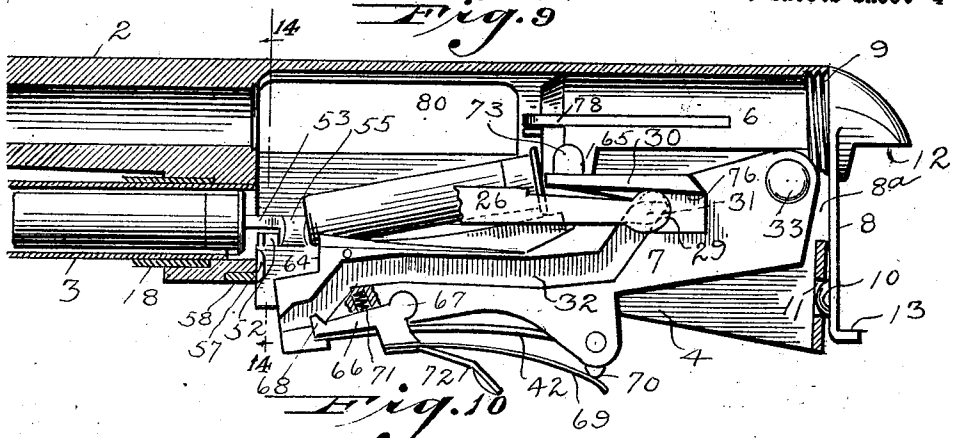


Fig. 10

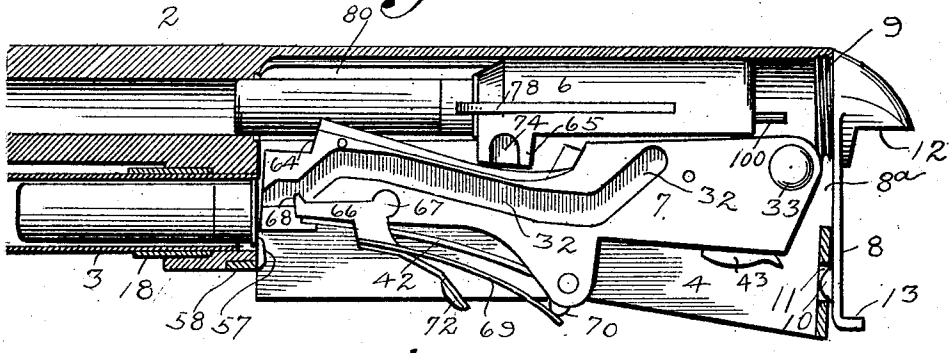


Fig. 11.

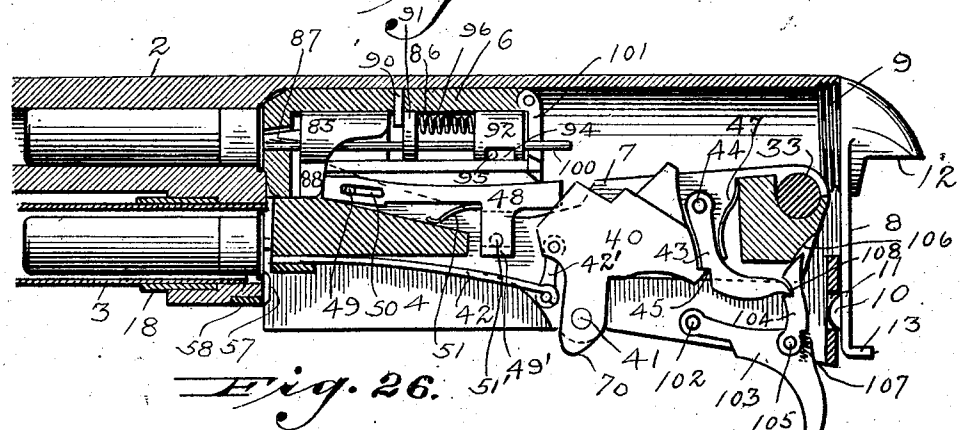
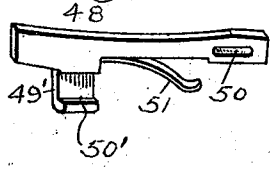


Fig. 26.



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1,552,460

REPEATING FIREARM

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Fig. 12

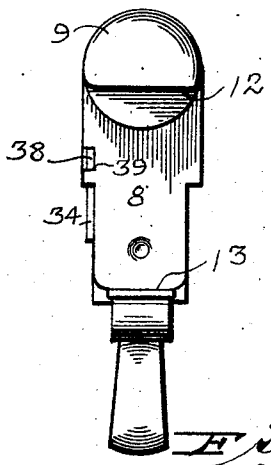


Fig. 13

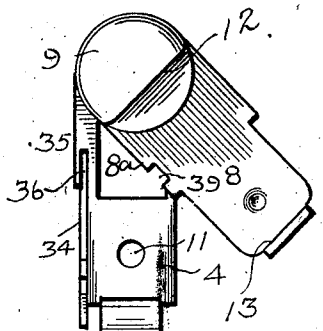


Fig. 14

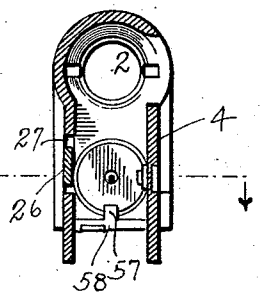


Fig. 16

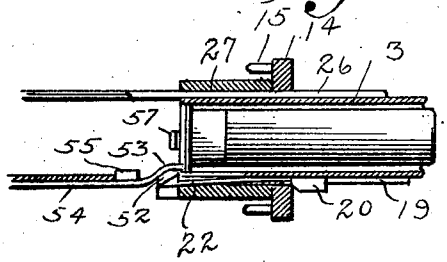


Fig. 15

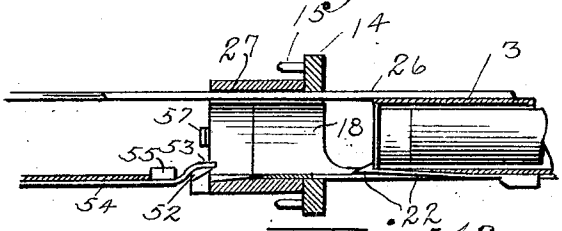


Fig. 18.

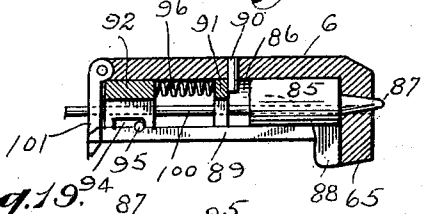


Fig. 17

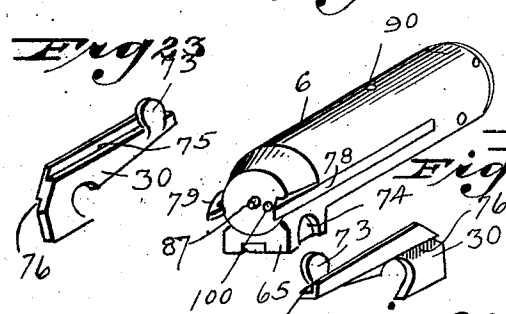


Fig. 23

Fig. 22

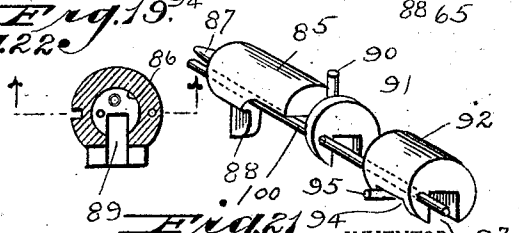


Fig. 19.

Fig. 20.

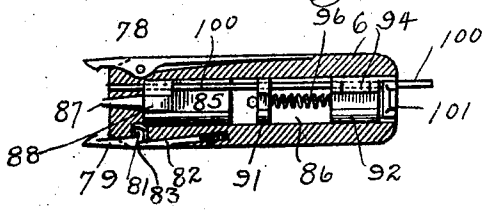


Fig. 21.

INVENTOR.

BY

ATTORNEY.

Patented Sept. 8, 1925. 1,552,460

UNITED STATES PATENT OFFICE.

CHARLES A. YOUNG, OF SPRINGFIELD, OHIO.

REPEATING FIREARM.

Application filed April 19, 1921. Serial No. 462,484.

To all whom it may concern:

Be it known that I, CHARLES A. YOUNG, a citizen of the United States, residing at Springfield, in the county of Clarke and State of Ohio, have invented certain new and useful Improvements in Repeating Firearms, of which the following is a specification.

My invention relates to fire arms and more particularly to guns of the repeating or magazine type, wherein the breech block is reciprocated to and fro in synchronism with the oscillation of the swinging carrier located beneath the breech block, and swinging in a vertical plane to receive the cartridge from the magazine and present it forward of the breech block in position to be advanced into the barrel by the forward movement of the breech block, the parts being actuated by the reciprocatory movement of an action bar actuated by the to and fro movement of a forearm grip, or handle, located forward of the frame or stock and moving parallel with the axis of the barrel.

The object of the invention is to simplify the structure as well as the means and mode of operation of such firearms, whereby they will not only be cheapened in construction, but will be more efficient in operation, positive in action, safe and unlikely to get out of repair.

A further object of the invention is to provide in a fire arm of this character, take down features by which the stock and barrel may be readily and quickly disconnected and connected the receiver and operating parts carried thereby being permanently connected with the barrel, thereby obviating the difficulties due to wear and looseness of the joints or connections between the barrel and receiver of the usual take-down type of gun.

A further object of the invention is to provide a structure wherein the various operating parts are readily accessible and the mechanism capable of being readily and quickly assembled and disassembled without the use of hand tools.

A further object of the invention is to provide safety means whereby a gun may not be accidentally or prematurely discharged by holding the trigger retracted during the operative movement of the action.

A further object of the invention is to provide a magazine capable of being loaded without the necessity of passing the cartridges thru the receiver.

A further object of the invention is to provide an improved system of cartridge detents, for automatically controlling the escape of cartridges from the magazine.

A further object of the invention is to provide an improved form of divided firing pins, brought into operative position only at the final movement of the action mechanism, and to further provide means for accurately guiding and adjusting the cartridge in axial alinement, with the barrel, preparatory to its being advanced thereinto by the movement of the breech block.

A further object of the invention is to provide improved means for mounting the extractor hooks and for guiding and controlling the ejector means.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation or their equivalents as hereinafter described and set forth in the claims.

Referring to the drawings, Fig. 1 is a side elevation of the operative portion of the firearm forming the subject matter hereof, illustrating the parts in their assembled relation with the gun closed preparatory to discharge. Fig. 2 is a perspective view of the gun stock from which the barrel and receiver have been disengaged, illustrating the form of mortise for the reception of the receiver. Fig. 3 is a side elevation of the receiver and adjacent portion of the action mechanism a portion of the stock being shown in section and showing the magazine disengaged from the receiver. Fig. 4 is a bottom plan view illustrating the receiver and magazine in the same relation as shown in Fig. 3. Fig. 5 is a side elevation of the receiver and adjacent parts of the action mechanism, viewed from the left side or that opposite Fig. 3. Figs. 6 and 7 are detail perspective views of the carrier removed from the receiver, showing the lock action in cocked and discharged positions respectively. Fig. 8 is a top plan view of the carrier with the lock mechanism in discharged position. Fig. 9 is a longitudinal sectional view of the receiver and adjacent portions of the barrel and magazine, showing the carrier in

its depressed position, receiving a cartridge or shell from the magazine preparatory to elevating it into alinement with the barrel. Fig. 10 is a similar longitudinal sectional view of the receiver and adjacent portions of the barrel and magazine, showing the carrier in its elevated position, supporting the cartridge in axial alinement with the barrel, and the breech block beginning its forward movement. Fig. 11 is a similar longitudinal sectional view of the receiver and adjacent portions of the barrel and magazine, illustrating the carrier also in section to disclose the details of the lock mechanism with the various parts in final positions of adjustment, preparatory to discharge. Figs. 12 and 13 are rear end elevations of the receiver, illustrating the receiver closed and partially open respectively, to afford access. Fig. 14 is a transverse sectional view of the receiver looking forwardly. Fig. 15 is a longitudinal sectional plan view of the forward portion of the receiver on line 15—15 of Fig. 14, with the magazine in disconnected relation. Fig. 16 is a similar view showing the magazine in operative engagement with the receiver. Fig. 17 is a perspective view of the reciprocatory breech block. Fig. 18 is a vertical sectional view thereof. Fig. 19 is a transverse sectional view of the breech block. Fig. 20 is a horizontal sectional view, viewed from the bottom, the section being taken on line 20—20 of Fig. 19. Fig. 21 is a detail perspective view of the operative internal parts of the breech block removed therefrom. Figs. 22 and 23 are perspective views of the breech block hook, viewed from opposite sides. Fig. 24 is a detail view of the trunnion pin for the carrier. Fig. 25 is a detail view of the inner side of the action bar head. Fig. 26 is a detail perspective view of the primary portion of the divided firing pin and shell support.

Like parts are indicated by similar characters of reference thruout the several views.

While the features of invention herein shown and described may be embodied in either a repeating rifle or shot gun of either large or small caliber it has been particularly designed as a small bore shot gun, and has been embodied in a gun of thirty-six gage, which is equivalent in size to a forty-four caliber rifle. There is at present a growing demand for small gauge shot guns for the use of women, and for men with highly developed sporting instinct and a willingness to give the game a greater chance by employing a reduced quantity of shot covering a smaller pattern or field.

It is to be understood, however, that the invention is not limited to small gage shot guns, but is equally applicable to shot guns of larger gage, and also to rifle constructions.

In the preferred form of embodiment, as illustrated in the drawings, the gun embodies the essentials as the stock 1, the barrel 2, beneath which and parallel therewith is located the magazine 3, the barrel and magazine both opening rearwardly into the receiver 4.

It has been customary in take-down firearms to disconnect the barrel and with it the magazine from the receiver or housing leaving the latter with its contained action mechanism permanently mounted upon the stock. The repeated connection and disconnection of the barrel from the receiver induces wear of the connecting parts, and results in looseness of the joint, and more or less play or lack of rigidity between the barrel and stock and necessitates some form of take up device. Such construction, however, has heretofore been proven unsatisfactory and undesirable. In the present instance, the barrel 2 and receiver 4 are permanently and integrally united one with the other. The receiver is detachably connected with the stock 1, whereby upon dismounting the gun the receiver and entire action mechanism remains upon the barrel and are entirely removed from the stock. To permit such engagement and removal of the receiver, the stock 1 is provided with a mortise or recess 5, as shown in Fig. 2 within which the receiver is detachably engaged. The receiver contains in the upper portion thereof a substantially cylindrical chamber for the reception of the reciprocatory breech block 6, beneath which is a rectangular elongated chamber containing the vertically swinging carrier 7. The receiver 4 is open at its rearward end as indicated at 8^a in Fig. 13, and the breech block 6 is inserted within the upper portion of the receiver thru this open inner end. The breech block is of a general cylindrical form agreeing with the contour of the breech block chamber, within which it is free to slide to and fro. The rear end of the receiver 4 is provided with a closure plate 8, having a screw threaded head 9, engaging in and forming a closure for the rear end of the breech block chamber. The closure plate 8 is slightly resilient and has a circular depression in the outer face thereof forming on the inner side of the plate 8 a boss 10, engageable in a hole or socket 11 in the rear wall of the receiver 4, when the plate and head 9 are adjusted to their final position. By rotating the closure plate 8 the head 9 is screwed into or out of the orifice of the breech block chamber, and upon the final turn in the feeding operation the plate 8 is under such tension that the boss 10 will be projected into the hole or socket 11 by the resiliency of the plate to lock the parts in their final adjusted position. It will be obvious that this closure plate may be removed or replaced by manual effort without the ne-

cessity of tools. The head 9 of the closure plate is formed with a rearwardly extending shoulder 12 which overhangs the grip of the stock 1 at the rear of the mortise 5 while the lower end of the closure plate 8 is offset or out-turned at 13 to underhang the grip of the stock at the inner end of the mortise thus securely interlocking the receiver and stock against vertical displacement. The connection is made by inserting the receiver within the mortise 5 from the top and rear end foremost, and then turning the barrel downward into alinement, thus bringing the entire receiver within the mortise 5. At the forward end of the receiver and slidingly adjustable upon the magazine cage hereafter referred to is a locking collar 14, having therein two rearwardly projecting pins or studs 15, which when the barrel and receiver have been adjusted to proper relation with the stud are insertable in holes 16 in the forward end of the stock 1. The locking collar 14 which is slidable to and from locking engagement with the stock is in turn held against disengagement by the magazine as hereinafter described.

The magazine 3 is of tubular form and is slidingly mounted for reciprocatory movement immediately beneath the barrel 2. At its forward end the magazine 3 has sliding engagement in a clip or supporting yoke 17 dependent from the barrel 1, and surrounding the magazine 3. At its rearward end the magazine 3 is slidingly engaged in a cage 18 of substantially semi-tubular form, fixedly mounted in the forward end of the receiver, beneath the barrel and extending forwardly therefrom and enclosing the rearward portion of the magazine. This cage 18 has a longitudinal slot in one side thereof, in which engages a guide lug 20 carried by the magazine 3. The cage 18 is stationary in relation with the chamber, while the magazine reciprocates to and from the receiver being guided by the lug 20 in the guide slot 19, and the engagement of the magazine in the supporting clip 17. The magazine is provided with the usual spring actuated ejecting plunger which has not been shown in the drawing. At its rearward or inner end it is cut away on one side as shown at 21 in Figs. 3 and 4 and is provided with a longitudinally disposed spring detent 22, which overhangs the butt of the rearmost cartridge within the magazine, and prevents its escape under the influence of the spring actuated plunger. It is difficult to introduce cartridges of small gage or rifle cartridges into a magazine thru the receiver in the usual manner because of lack of space for the operator's fingers. In the present instance, provision is made for loading the magazine by withdrawing it from the receiver longitudinally outwardly permitting one or more cartridges to be laid loosely within the magazine cage 18, whereupon the subsequent rearward movement of the magazine, the latter will be thrust around and over the deposited cartridges, which are held by the stop or detent hereinafter mentioned, from pressing rearwardly and thereby the magazine plunger is depressed as the magazine passes around each succeeding cartridge. The spring detent 22 serves to retain these cartridges in the magazine, when the latter is disengaged from the receiver, However, upon the rearward movement of the magazine to its normal position, the detent 22 is disengaged and the cartridges within the magazine are under the control of detents operated in synchronism with the operation of the action. The magazine is held in its inward or normal position by a spring latch 23 at its forward end, which engages in the supporting clip 17. At the same time a lug 24 carried on the under side of the magazine 3 engages with a locking collar 14 shown in Figs. 1 and 5 to maintain the locking collar in engagement with the gun stock.

Slidingly mounted upon the magazine 3 for reciprocatory movement to and fro is forearm grip or handle 25 from which extends rearwardly the reciprocatory action bar 26. The action bar 26 by its reciprocatory movement actuates both the reciprocatory breech block and the swinging carrier in proper time with each other. The action bar extends thru a suitable orifice 27 (Figs. 14–16) in the head of the receiver 4 and thence thru a longitudinal slot 28 in the side wall of the receiver as shown in Fig. 5. The action bar 26 is provided with a circular head 29 which engages with the breech block hook 30 by which it is coupled to the breech block 6. On the inner face of the circular head 29, the action bar carries a lug or boss 31, which operatively engages in a sinuous groove 32 in the side of the swinging carrier 7. By the interengagement of the action bar lug 31 in the cam groove 32 during the reciprocatory movement of the bar, the swinging carrier is given an oscillatory movement in a vertical plane about its pivotal stud 33. The action bar head 29 automatically disengages from the breech block hook 30 as it approaches the forward limit of its stroke, and automatically reengages the breech block hook as it starts rearwardly. The lug 31, however, maintains its engagement in the cam groove 32 of the carrier at all times, and is held in such engaging positions by a cover plate 34, pivoted to one side of the receiver 4, and normally overlapping the slot 28 and overhanging the action bar in its reciprocatory movement therein. This cover plate 34 not only retains the action bar in engagement with the carrier but it also serves to lock the trunnion pin 33 of the carrier against disengagement and is in turn locked

in its engaging position by the closure plate 8 at the rear end of the receiver. The receiver 4 is provided adjacent to its rear end with a laterally projecting face 35 in which is located the trunnion stud 33 of the swinging carrier. This laterally projecting face 35 is undercut or slotted in its lower edge as at 36, Fig. 13. The trunnion stud 33 is provided with a peripheral groove 37, which registers with this undercut slot 36, when the pin is in its normal position. The cover plate 34 is of such thickness as to project within the slot 36 and into the groove 37 of the pin 33, overlying the action bar and slot 28 as shown by dotted lines in Fig. 5. The cover plate is provided at its extremity with a projecting tongue or finger 38, which engages in a corresponding notch 39, in the lateral edge of the closure plate 8 on the end of the receiver 4, when the latter is in its closed position. The locking engagement of the closure plate 8 and the cover plate 34 will be obvious from Figs. 5, 12 and 13.

The carrier 7 is recessed or mortised and contains therein the oscillatory spring actuated hammer 40, pivoted at 41 and actuated by the main spring 42 secured to the underside of the carrier 7 and connected to the hammer 40 by a stirrup 42′. The spring 42 normally tends to forcibly project the hammer 40 forwardly about its pivotal connection 41. It is temporarily held against such movement by the L-shaped sear 43 pivoted at 44 within the recess of the carrier and having a shoulder 45 engaging a corresponding shoulder upon the hammer 40, into engagement with which it is moved by a comparatively light spring 47. The mortise of the carrier 7 also contains the primary portion 48 of the divided firing pin, the secondary portion of which is carried by the breech block 6. The primary firing pin 48 is mounted for both longitudinal movement and depression within the carrier 7. It has a sliding pivotal engagement upon a transverse pin 49, which passes thru a slot 50 in the primary firing pin 48, and is normally held in elevated position by a spring finger 51, beneath the firing pin 48, which tends to oscillate the firing pin 48 upwardly about its pivotal pin 49. At the same time the primary firing pin 48 is free to move longitudinally under the impact of the hammer 40. The upward movement of the firing pin 48 is limited by the engagement of a shoulder or lip 50′ on a dependent tongue 49′ with a stud or pin 51′ projecting from the inner side of the carrier. The firing pin 48 is depressible against the tension of the spring 51 to accomodate the carrier to the position of the breech block 6 during the closing movement of the parts.

As heretofore described the cartridges are temporarily retained in the magazine 3 by the spring detent finger 22 so long as the magazine is disconnected from the receiver. However, upon the inward thrust of the magazine, the beveled nose of the detent finger 22 engages with a cam projection 52, located at one side of the receiver as shown in Figs. 3, 15 and 16. This engagement of the detent finger 22 with the cam projection 52 flexes the detent finger outwardly out of the path of the cartridges, which are then under the control of two stops 53 and 57. The stop 53 is a temporary stop or detent and is controlled by the movement of the carrier. It comprises a spring blade or finger 54 inturned at its foward end into the path of the cartridges, as at 53, and carries adjacent thereto a cam surface 55, which is engaged by the nose 56 of the carrier upon its upward movement to yieldingly press the spring finger 54 and stop 53 outwardly out of engagement with the cartridge which upon its release by the stop 53 is after a slight rearward movement reengaged by the stop 57. This stop nose 57 is carried upon a transversely arranged depressible stop arm 58, arranged transversely beneath the forward end of the receiver 4. The stop arm is normally pressed upwardly to project the stop nose 57 in the path of the cartridges by means of a flat spring 59. See Fig. 4. At its free end the transverse stop lever 58 has an upwardly extending finger 60, (see Fig. 5) which projects into the path of travel of a cam shoulder 61 upon the action bar 26. It is to be understood that the temporary stop 53 is moved to disengaging or outwardly flexed position by the swinging carrier 7 only as the carrier is moved to its upper or closed position. The main stop 57 is at sometime in engaging position, and intercepts the rearmost cartridge in the magazine upon its release by the temporary stop 53. Upon the rearward movement of the action bar, the cam engagement of the lug 31 in the cam groove 32 depresses the carrier 7 thereby releasing the temporary stop 53 which moves inwardly under the tension of the spring finger 54. As before stated and as shown in Figs. 15 and 16 the temporary stop 53 extends beyond the stop 57, so that the cartridge when released from the temporary stop 53 is permitted a very short rearward movement before being again arrested by the main stop 57. This movement brings the flange of the cartridge butt beyond the end of the temporary stop 53. Upon the release of the temporary stop 53, by the depression of the carrier, (the cartridge being then held by the main stop 57), the temporary stop 53 will be moved inward beyond the flange of the first cartridge and in position to stop the second cartridge of the series, but will have no influence or control over the first cartridge, which will be released by the depression of the main stop 57. The temporary stop being thus in posi-

tion to arrest the second cartridge of the series, the action bar in its continued movement brings the cam shoulder 61 thereof into engagement with the upturned finger 60 of the stop arm 58 depressing such stop arm against the tension of its spring 59, and withdrawing the stop nose 57, thus releasing the first cartridge of the series in the magazine. At this time it will be understood that the action bar has reached the rearward limit of its movement as the carrier is in its lowermost position as shown in Fig. 9. The cartridge is propelled rearwardly by the spring plunger within the magazine into the receiver and on top of the carrier. At the same time the temporary stop 53 arrests the next succeeding cartridge within the magazine as shown in Fig. 9.

During the rearward movement of the action bar necessary to depress the carrier and operate the stops to release the cartridge, the breech block 6 has been carried rearwardly by means of the coupling hook 30. This rearward movement of the breech block has served to extract and eject the preceding exploded shell as will be hereafter described.

With guns of large gage, the bore is of sufficient size that the shell will readily enter the barrel and automatically adjust itself to a limited extent into the necessary axial alinement. However, a relative small diameter of the shell and the bore as compared with the length of the shell necessitates more accurate positioning of the shell in axial alinement with the bore to insure its easy entrance without jamming. To this end the cam groove 32 in the side of the swinging carrier is so shaped and arranged that upon the extreme return movement of the action bar, the carrier will be caused to overthrow or be elevated to a position substantially beyond its normally closed position and into the path of travel of the reciprocatory breech block as has been shown in Fig. 10. In this position the carrier supports and guides the shell while the advance of the breech block 6 pushes the shell into the chamber of the barrel. This overthrow of the carrier and extreme adjustment thereof in relation with the breech block is permitted by the depression of the primary firing pin 48. As the carrier 7 is swung upwardly beyond its normal position, the firing pin 48 engages with the forward portion of the breech block 6 and as the carrier continues to move the firing pin yields downwardly against the tension of its supporting spring 51. As the action bar continues its forward movement, the carrier is retracted downwardly out of the path of the breech block as the breech block advances, pushing the shell ahead of it into the chamber of the barrel. As the breech block reaches the forward limit of its travel, the coupling hook 30 comes to rest in registry with the notch 63 in the top of slot 28, which permits the hook 30 to oscillate upward under further movement of the action bar, thereby disengaging the head 29 of the action bar from the circular notch in the coupling hook. The further and final movement of the action bar in the cam groove 32 of the carrier serve to swing the carrier again upwardly to its final and normal position wherein the shoulder 64 upon the carrier is elevated behind the dependent portion 65 of the breech block 6. This serves to lock the breech block 6 in its advanced or closed position. In this final position of adjustment the action bar 26 is also locked against return movement in the cam groove 32 until the discharge of the gun. This is effected by a spring actuated catch finger 66 pivoted at 67 to a side of the carrier and having a locking nose 68 which is projected into the cam groove 32 in the path of the lug 31 upon the action bar 26. The locking nose 68 is beveled to permit the lug 31 to pass in one direction by the retraction of the lock finger against the tension of its spring 69. The spring 69, however, immediately returns the locking nose into the cam groove 32 to prevent the return of the action bar. The spring 69 extends rearwardly from the pivoted locking finger and bears at its rear end upon cam like projections 70, upon the lower end of the hammer 40. The tension of the spring 69 and position of the cam surface 70 on the hammer 40 are such that when the hammer 40 is in its cocked position the spring 69 is under tension and thereby tends to keep the locking finger 66 elevated. However, upon the discharge of the fire arm the forward oscillation of the hammer 40 actuates the cam surface 70 to relieve its pressure upon the spring 69, thereby permitting the locking finger 66 to drop out of the path of the lug 31. In this movement it is preferably assisted by a small helical spring 71 seated in the body of the carrier.

In order to enable the gun to be opened and the unexploded shells removed, means is provided for manually withdrawing the locking nose 68 of the catch finger 66 against the tension of its spring 69. To this end there is provided a finger lever 72 secured to the catch finger 66 which by upward pressure of the finger thereon will serve to oscillate the catch finger 66 against the tension of its spring 69 to withdraw the locking nose 68 and thereby permit the rearward movement of the action bar.

The coupling hook 30 is detachably connected with the breech block 6 by means of an upturned semi-circular ear 73 which engages a corresponding depression or recess 74 in the side of the dependent portion 65 of the breech block. This construction

affords a simple, detachable pivotal connection between the hook and breech block, which may be engaged and disengaged without the use of tools. It is merely necessary to insert the ear 73 loosely within the recess 74 thru the slot 28 in the side of the receiver. The wall of the receiver above the slot 28 overhangs the ear and recess thereby preventing lateral disengagement. The hook 30 is rabbetted at 75 upon its upper inner side to ride upon the upper edge of the slot 28 in the receiver wall. This hook is also rabbetted at 76 on its outer face to agree with and ride upon the upper edge of the cover plate 34, when the latter is in closed position. Thus the hook is guided and held between the edge of the cover plate 34 and the edge of the slot 28 against disengagement from the breech block, during its reciprocatory movement.

The breech block 6 is of a general cylindrical form, corresponding in diameter to the upper chambered portion of the receiver and somewhat tapered at its forward end, the face of the truncated conical portion agreeing substantially in diameter with the butt of the cartridge. At its forward end it is provided with the dependent lug 65. It is provided on diametrically opposite sides with extractor hooks 78 and 79. The receiver 3 is provided with an opening 80 in one side thereof, normally closed by the breech block 6, when the latter is in its forward or operative position, and opened by the retraction of the breech block for the extraction of the exploded shell. The shell is drawn from the chamber of the barrel by the extractor hooks 78 and 79, which engage the rim of the shell at diametrically opposite points. The extractor hooks are yieldingly mounted in order that they may release the shell at the proper moment. The extractor hook 78 on the side of the breech block 6 opposite the exit opening 80 is pivoted in a suitable slot in the side of the breech block and is provided with a beveled head capable of a slight yielding movement outwardly against the tension of a rearwardly extending tail, which bears against the body of the breech block within an extension of the receiving slot for the hook. The engaging jaw or shoulder on the operative head of the extractor hook 78 is beveled slightly backward to afford a cam like yielding engagement. The hook 79 at the opposite side of the breech block to the contrary has an abrupt engaging shoulder affording a firm and positive engagement with the rim of the shell. This hook 79 is of somewhat different character. It is of much shorter length, and at its rear end is provided with an inwardly beveled lug 81, which engages in a corresponding pocket or hole in the side of the breech block in lieu of a pivotal connection. This beveled lug 81 permits a rocking movement of the hook 79 against the side of the socket or hole. This movement is effected outwardly against the influence of a spring actuated plunger pin 82, seated in a suitable bore in the wall of the breech block and engaging at its forward end a shoulder 83, adjacent the rear end of the extractor hook 79.

The breech block 6 is longitudinally bored thruout the greater portion of its length and provided on its under side with a slot intersecting such bore to provide a bearing space or chamber for the effective or secondary portion of the divided firing pin, the primary portion of which is located in the carrier. The secondary portion of the divided firing pin comprises a substantially cylindrical body 85, cut away at its lower rearward portion and having a diameter substantially fitting the longitudinal bore 86 extending forwardly from the rear end of the breech block 6. This firing pin is provided with an extended tapered nose 87 projecting thru a reduced opening in the forward extremity or face of the breech block. It is further provided with a dependent finger 88, which extends downwardly thru the bottom slot 89 of the breech block, and into the path of the primary firing pin section, 48. Projecting into the longitudinal bore 86 of the breech block is a stop pin 90, which limits the rearward movement of the secondary firing pin and also forms a rest for a spring abutment member and guide 91. This guide and abutment member 91 comprises a disc like member, having a diameter corresponding to that of the bore 86, and notched or recessed at its lowest point, agreeing with the slot 89. Located to the rear of this abutment and guide 91, and in spaced relation therewith, is a second reciprocatory cylindrical guide member 92, also fitted within the bore 86 and provided with a groove or notch 93 registering with the slot 89. This support and guide member is also provided with a transverse notch in its lower end as at 94, within which engages a transverse pin 95, limiting the reciprocatory movement of the guide and bearing member 92. Interposed between the members 91 and 92 is a spring 96, which tends to move the guide member 92 rearwardly until arrested by the stop pin 95.

Fixedly secured to the guide member 92 and having a loose sliding bearing in both the guide disc 91 and the firing pin section 85, is an ejector pin or rod 100, which extends thru a hole in the face of the breech block 6, eccentrically positioned toward the inner side of the housing or that side opposite the exit opening 80. This ejector rod 100 preferably terminates substantially flush with the face of the breech block at its forward end, but at its rearward end extends

somewhat beyond the bearing member and support 92, and beyond the rear end of the breech block. As the breech block approaches the rearward limit of its stroke, the end of the ejector rod 100, engages the head of the receiver while permitting the breech block a limited further movement against the tension of the spring 96. This further movement of the breech block causes the ejector arm 100 to be extended beyond the face of the breech block against the butt of the cartridge then engaged by the extractor hooks. The ejector rod 100 is located adjacent to the extractor hook 78 on the side of the breech block away from the exit opening. As before stated, this extractor hook has a yielding engagement with the rim of the shell or one more easily disengaged than the opposite extractor hook 79. The pressure of the ejector rod 100 upon the butt of the shell as the breech block recedes causes the inner side of the shell rim to be disengaged from the extractor hook 78; while the outer hook 79 retains its engagement with the rim of the shell, thereby causing the shell to be suddenly and forcibly rotated about its point of engagement with the extractor hook 79 as a center. This causes the shell to be forcibly ejected laterally thru the exit opening 80. Pivotally mounted at the rear end of the breech block 6 is a dependent swinging cocking finger, 101, capable of swinging freely in an outward or rearward direction, but limited by its engagement with the breech block in its forward movement. This cocking finger 101 projects downwardly to a position to engage the hammer 40 upon the rearward reciprocation of the breech block whereby the hammer is carried backward in unison with the movement of the breech block against the tension of the main spring, until engaged by the sear 43. Upon the return or forward movement of the breech block the cocking finger 101 will ride freely over the hammer, due to its free rearwardly swinging movement.

To prevent the accidental or automatic discharge of the gun in the event that the trigger is held retracted, while the fore arm grip is manipulated to operate the reloading mechanism, there is provided a special yielding trip finger, between the trigger and the sear. Pivoted at 102 in the lower portion of the receiver is the usual trigger 103. (See Fig. 11.) Projecting upwardly from the trigger 103 is a grip finger 104, pivoted to the trigger at 105, and engaging at its upper end a cam face 106 formed upon the lower rearward portion of the carrier 7. This trip finger is spring actuated forwardly and hence into engagement with the cam surface 106, by a spring 107, seated in the trigger 103, and engaging a shoulder upon the trip finger. The trip finger is provided with a notch 108, in which the rear edge of the sear 43 engages when the trigger 103 is in its lowermost position. It is obvious from Fig. 11 that the retraction of the trigger elevates the trip finger and with it the rear end of the sear to disengage the latter from the hammer. In its upward movement, the trip finger by its engagement with the cam surface 106 is oscillated rearwardly against its spring thereby disengaging the finger from the sear 43 allowing the latter to return to position to again engage the hammer upon the cocking of the same by the retraction of the breech block. However, so long as the trigger is held in this retracted position, and the trip finger elevated, the sear will not again be disengaged. However, if the trigger be released and allowed to descend the trip finger descending with the trigger will bring the notch 108 into registry with the rear end of the sear, which it will engage under the influence of the trip finger spring. By thus providing for the automatic disengagement of the trigger and sear, after the operative movement of the latter, successive independent operations of the trigger are compelled. It is thus impossible to either hold the sear out of engagement with the hammer, so that the hammer would not be maintained in a cocked position or to cause the disengagement of the sear from the hammer by the operation of the reloading mechanism, by merely holding the trigger continuously in a retracted position. This feature is of importance in overcoming the cause of numerous accidents and difficulties arising from the failure of the hammer to be engaged upon its cocking movement.

The depressible feature of the firing pin 48 pertains to its function as a shell guide in directing and supporting the shell after its release from the magazine rather than to its function as a firing pin. This yielding member 48 is slightly curved on its upper edge and in reality constitutes the top surface of the carrier. It is this firing pin which the shell rests upon, when it escapes from the magazine, and by which the rear end of the shell is guided rearwardly and upwardly to a position in front of the face of the breech block. The breech block and the carrier move in intersecting paths of travel. The nose of the carrier is elevated above its normal position to support the shell. At the same time the breech block is moving forwardly, there would be interference between the carrier and the breech block. This interference is avoided by the depression of the firing pin 48 which as stated also constitutes a shell guide. It is obvious that this member might be utilized as a shell guide only, and other firing means, as for instance the reciprocatory hammer shown in my prior patent No. 1029037 dated June 11, 1912 might be positioned beneath the member 48 or in lieu thereof the recipro-

catory stem of such prior patented construction might be employed as the firing pin in association with the present form of oscillatory hammer. If a separate firing pin is provided, the depressible member 48 would continue to perform its function of a shell guide.

The various operating parts of the fire arm constructed as heretofore described are easily and readily accessible. By oscillating the rear receiver head 8 slightly to one side, the side plate 34 is disengaged. By allowing the side plate 34 to drop slightly, it in turn disengages the trunnion pin of the carrier. By then pressing upon one end of the pin, the pin may be projected in the opposite direction sufficiently beyond the wall of the receiver to afford an easy grasp and enable it to be withdrawn merely by the operator's finger and without the use of a special tool. The trunnion pin having been removed the carrier is readily removable thru the lower open side of the receiver. Before doing this, however, the action bar is sprung slightly outward to lift the lug 31 out of the cam groove 32. This return movement of the action bar from the carrier is prevented by the side plate 34. The carrier being removed from the receiver, the parts mounted therein are readily accessible thru the open bottom or top of the carrier. The primary firing pin 48 is easily disengaged by removing the transverse pin 49 after which the shoulder 50′ on the dependent tongue 49′ may be unhooked from beneath the pin or stop 51′. By unscrewing the head plate 8 from the end of the receiver 3, the breech block 6 is readily removed therefrom after first disengaging the coupling hook 30. The latter is easily disengaged after the lowering of the side plate 34, by withdrawing or unhooking the upstanding ear of the hook 30 from the recess in the side of the breech block. The various parts are thus capable of easy access for inspection, repairs or cleaning. This is quite important particularly when the shooter is in the field or in some sparsely settled district where gun smiths and tools are not to be had.

It is necessary that the extractor hook 79 be yieldingly mounted to enable it to pass over the rim of the shell upon the forward movement of the breech block when advancing the shell into the chamber of the barrel in order that it may have a firm engagement therewith to withdraw the shell after the discharge. However, it is equally desirable that the extractor hook 79 shall not yield but shall be firmly held against such movement at the moment of ejection of the shell when the breech block reaches the rearward limit of its stroke. To this end, as shown in the drawings, the breech block is given a limit of travel to a point beyond the ejection opening 80. In this rearward position of the breech block the extractor hook 79 bears against the wall of the receiver, which forms an abutment or stop against lateral yielding movement and holds the hook stationary in relation with the breech block while the shell is being rotated about its point of engagement by the ejector rod 100.

A fire arm constructed as described is further economical in manufacture, inasmuch as no inside milling cuts or other operations difficult to perform in the limited space are necessary. Every part of the arm may be machined from the outside, and is readily accessible for various manufacturing operations.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific details shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. In a fire arm, the combination with a stock, barrel and lock action including a hammer, and a sear, a swinging carrier in which the hammer and sear are mounted, of a trigger, and a yielding trip finger carried thereby capable of yielding movement to compensate for movement of the carrier engageable with the sear when the trigger is in normal position and disengageable from the sear after effecting the disengagement of the sear from the hammer upon the retraction of the trigger.

2. In a fire arm, the combination with a stock, barrel and lock action including a hammer and a sear and a swinging carrier in which the hammer and sear are mounted, of a trigger, and a coupling member for temporarily effecting operative engagement between the trigger and sear to release the hammer, and means upon the swinging carrier to effect the disengagement of the coupling member and the sear, after having released the hammer.

3. In a fire arm, the combination with a stock barrel and lock action including a hammer and sear, and a swinging carrier in

which the hammer and sear are mounted, of a trigger, means for operatively engaging the sear and trigger during the initial movement of the latter to release the hammer and disengaging the sear and trigger upon further movement of the latter.

4. In a fire arm, the combination with a stock, barrel and lock action including a hammer and sear and a swinging carrier in which the hammer and sear are mounted, of a trigger, a trip finger pivoted to the trigger and spring actuated into engagement with the sear by which the sear is actuated upon movement of the trigger and a cam face upon the swinging carrier engaged by the trip finger upon further movement of the trigger by which the finger is disengaged from the sear.

5. In a fire arm, the combination with a stock, barrel and lock action including a hammer and sear and a swinging carrier in which the hammer and sear are mounted, of a trigger adapted by its initial movement to disengage the sear from the hammer regardless of the position of the carrier and upon further movement to release the sear from the trigger.

6. In a fire arm, the combination with a stock, barrel and lock action including a hammer and sear, of a swinging carrier in which the lock action is mounted, a trigger, a yielding trip finger carried thereby and retaining its engagement with the sear during the swinging movement of the carrier providing the trigger is unretracted, said trip finger serving to disengage the sear from the hammer upon retraction of the trigger in any position of the swinging carrier to release the hammer at will without necessity of exploding a cartridge.

7. In a fire arm, the combination with a stock and a barrel, of firing mechanism including a reciprocatory breech block, a swinging carrier, an oscillatory hammer in said carrier, a two part reciprocatory firing pin one part of which is provided with a sliding pivotal connection in the carrier and receives the impact of the hammer, the free portion of which is yieldingly spring pressed upwardly to afford a cartridge guide, the other part of which is located in the breech block and engages the shell, said parts being brought into operative relation one with the other by the relative movements of the carrier and breech block to closed positions.

8. In a fire arm, the combination with a stock, and a barrel, of firing mechanism including a swinging carrier, a hammer mounted therein, and a firing pin and an actuating member for such firing pin located in the carrier capable of both longitudinal and oscillatory movements in relation with the carrier.

9. In a fire arm, the combination with a stock and a barrel, of firing mechanism including a firing pin a swinging carrier, a hammer mounted therein, and a vertically depressible actuating member for the firing pin located in the carrier capable of longitudinal movement under the influence of the hammer.

10. In a fire arm, the combination with a stock and a barrel, of firing mechanism including a swinging carrier, a hammer mounted therein, a firing pin and an actuating member therefor yieldingly depressible within said carrier.

11. In a fire arm, the combination with a stock and a barrel of a swinging carrier and a reciprocatory breech block moving in intersecting paths of travel, and a yielding portion in said carrier serving to guide the cartridge to the barrel, during reloading operation and adapted upon further adjustment of the parts to effect the explosion of the cartridge, and means for shifting said portion from its cartridge guiding to its cartridge exploding relation, upon relative movement of the carrier and block.

12. In a fire arm, the combination with a stock and a barrel, a swinging carrier and a reciprocatory breech block moving in intersecting paths of travel, a hammer a firing pin and a depressible actuating member for the firing pin located in the carrier, the latter yielding upon engagement with the breech block.

13. In a fire arm, the combination with a stock, a barrel and firing mechanism, of a swinging carrier and a yielding shell guide, pivoted at its forward end in the carrier and extending rearwardly with its rear end in elevated relation when the carrier is depressed to guide the rear end of the cartridge to a position in advance of the breech block.

14. In a repeating fire arm, the combination with a stock, a barrel and firing mechanism, of a reciprocatory magazine, a depository for cartridges positioned in alinement with the magazine, cartridges being entered singly into the magazine by repeated reciprocation of the magazine by which it is thrust over successive cartridges placed within the depository.

15. In a take down fire arm, a stock section, a barrel and a housing interconnected with each other and detachable as a unit from the stock section, and a yielding take up between the housing and stock for maintaining the detachable sections against lost motion when interconnected.

16. In a fire arm, the combination with a stock, a barrel and firing mechanism, of a swinging carrier a reciprocatory breech block, and a reciprocatory action bar for actuating said breech block, to and from closed position and depressing the carrier to receive a cartridge as the breech block is retracted, said carrier being elevated when the

block is advanced, of an operative connection between the carrier and action bar for temporarily elevating the carrier above its normal closed position as the breech block initiates its advance under influence of the bar to support the carried cartridge in position to enter the barrel, the carrier moving from such extreme position to its normal elevated position as the breech block progresses forwardly.

17, In a fire arm, the combination with a stock, a barrel and firing mechanism, of a swinging carrier, a longitudinally disposed bar pivoted in the top of said carrier, a spring tending to elevate the bar, a dependent tongue on the bar and a stop engageable with said dependent tongue to limit the oscillatory movement of the bar.

18. In a fire arm, the combination with a stock, a barrel and firing mechanism, of a swinging carrier, a longitudinally disposed slotted bar located in the top of said carrier, a pivotal stud extending thru the slot in said bar in relation with which the bar is capable of both oscillatory and longitudinal shifting movement.

19. In a firearm, the combination with a stock, a barrel and firing mechanism, of a swinging carrier, a reciprocatory breech block, means for actuating the breech block and carrier by which the carrier is moved to elevated position when the breech block is closed and depressed upon the opening of the block, said carrier being caused to overthrow above its normal elevated position into the path of travel of the breech block upon the initial forward movement of the latter, to temporarily support the shell in line with the barrel.

20. In a take down fire arm, a stock section, a barrel, and a housing interconnected with each other and detachable as a unit from the stock section, and a yielding butt plate for the housing bearing upon the stock section when the detachable sections are interconnected.

21. In a fire arm, the combination with a stock, a barrel and firing mechanism, of a swinging carrier assuming an elevated position when the arm is closed and in condition for firing, and a depressed position to receive a shell when the arm is open for reloading and a reciprocatory action bar therefor adapted to cause said carrier to overthrow upon the upward swinging movement of the carrier to temporarily support the shell substantially in alinement with the barrel, said carrier being retracted from such overthrow position to its normal elevated closed position by further movement of the action bar.

22. In a fire arm, the combination with a stock, a barrel and firing mechanism, of a swinging carrier, which assumes an elevated position when the arm is closed ready for firing and a depressed position to receive a shell when the arm is opened preparatory to reloading, said swinging carrier being capable of being elevated to a position above its normal closed position and actuating means to initially actuate the carrier beyond its normal closed position to temporarily support the shell in substantial alinement with the barrel and upon further movement to retract the carrier from such extreme position to its normal intermediate position.

23. In a fire arm, the combination with a stock, a barrel and a firing mechanism, of a swinging carrier, a reciprocatory action bar and an operative engagement between the action bar and swinging carrier whereby during the forward movement of the action bar the carrier will be initially oscillated upward to an extreme position beyond its normal position of rest and thereafter retracted and returned to an intermediate position of rest.

24. In a fire arm, the combination with a stock, a barrel, a receiver and a swinging carrier within the receiver of a freely removable trunnion stud for the carrier, said stud having a peripheral groove adjacent to one end thereof and a movable locking plate on the receiver engageable within said peripheral groove to lock the pin against removal.

25. In a fire arm, the combination with a stock, a barrel and firing mechanism, of a receiver having a lateral opening therein a reciprocatory breech block, mounted within said receiver a reciprocatory action bar, and a coupling hook having detachable interlocking engagement with the breech block and the action bar respectively said coupling hook being insertable into and removable from operative position, through the lateral openings of said receiver

26. In a fire arm, the combination with a stock, a barrel and firing mechanism, of a receiver having a lateral access opening therein a reciprocatory breech block, mounted within said receiver a reciprocatory action bar, a coupling hook having a projection thereon loosely engaging in a recess in the breech block and removable therefrom through said lateral access opening of the receiver.

27. In a fire arm, the combination with a stock, a barrel and firing mechanism, of a reciprocatory breech block, a receiver in which said breech block is slidingly mounted, a coupling member, a reciprocatory action bar, connected with the breech block by said coupling member, the coupling member being disengageable from the breech block without necessitating removal of the breech block from the receiver, said coupling member and action bar being located at the opposite side of the receiver from the ejector opening.

28. In a fire arm, the combination with a

stock, a barrel, a receiver having a lateral opening, firing mechanism, of a reciprocatory breech block, a reciprocatory action bar, and a coupling member insertable thru the lateral opening in the receiver into engagement with the breech block and engageable with the action bar for operatively connecting the same with the breech block.

29. In a fire arm, the combination with a stock, a barrel, and firing mechanism, of a receiver having a longitudinal slot in one wall thereof, a reciprocatory breech block, a reciprocatory action bar, a coupling member operatively connecting the action bar and breech block, said coupling member being rabbeted for sliding engagement with the receiver slot and insertable therethru into detachable engagement with the breech block.

30. In a take down repeating fire arm, a recessed stock, a receiver having a bifurcated head adapted to be inserted within the recess of the stock with its bifurcated head straddling the stock at the end of the recess, means for detachably locking the receiver within the recess, and a barrel fixedly united with the receiver.

31. In a repeating fire arm, a stock, a barrel, a receiver to which the barrel is fixedly united, said receiver having an access opening in its rear end, for the insertion and removal of a reciprocatory breech block, a reciprocatory breech block therein, means for actuating the same and a rotary closure for said opening and a spring arm connected to said rotary closure and extending radially in relation therewith, substantially as specified.

32. In a repeating fire arm, the combination with a stock, a barrel, a housing containing reloading and firing mechanism and a reciprocatory action bar having a hand grip for controlling the reloading operations, of a magazine detachably connected with the housing, and capable of reciprocatory movement when detached therefrom, and a depository for cartridges located intermediate the housing and hand grip, the magazine being thrust over cartridges placed therein in its movement toward the housing whereby such cartridges are caused to enter the magazine.

33. In a repeating fire arm, the combination with a stock, a barrel, a housing containing reloading and firing mechanism, of a magazine detachably connected with the housing and capable of reciprocatory movement when detached therefrom, a cartridge retaining detent carried by the magazine retaining therein cartridges entered within the magazine, and depository for cartridges intermediate the end of the magazine when detached and the housing, the magazine being thrust over cartridges deposited therein by its reciprocatory movement toward the housing, such cartridges being retained within the magazine by detent during repeated movements of the magazine.

34. In a take down fire arm, a stock section, a barrel, and a housing interconnected with each other and detachable as a unit from the stock section, and a spring hook arm detachably engaging the separable housing with the stock section.

35. In a take down fire arm, a stock section, a unitary barrel and housing section detachable as a unit from the stock, a sliding magazine carried by the barrel and housing section, and a detent interengaging the separable units and in turn locked against disengagement by the adjustment of the magazine.

36. In a take down fire arm, a stock section, a unitary barrel and a housing section detachable as a unit from the stock, a sliding magazine carried by the barrel and housing section, and means for interlocking the separable units against disengagment by the adjustment of the magazine.

37. In a take down fire arm, a stock section, a unitary barrel and housing section detachable as a unit from the stock by relative movement in a vertical plane and means for interlocking the separable units against relative movement.

38. In a take down fire arm, a stock section, a unitary barrel and housing section detachable as a unit from the stock by relative movement in a direction substantially perpendicular to the axis of the barrel, and means for detachably interlocking the separable units against such relative movement.

39. In a take down fire arm, a stock section, a unitary barrel, and housing section detachable as a unit from the stock, the barrel and housing unit being engageable with the stock when turned to an abnormal angularly disposed relation from which position the units are relatively oscillated into their normal alined relation and means for detachably interengaging the units to prevent return oscillation.

40. In a fire arm, the combination with a stock, a barrel, barrel opening and closing means, and a lock action including a sear and a hammer free for action when released from the sear, of means for disengaging the sear from the hammer at will regardless of the condition of the barrel opening and closing means, including a trigger, and a trip member operated by the trigger, maintaining its operative engagement with the sear in all stages of operation of the barrel opening and closing means.

In testimony whereof, I have hereunto set my hand this 13th day of April A. D. 1921.

CHARLES A. YOUNG.