C. A. YOUNG.

FIREARM.

APPLICATION FILED JAN. 18, 1909.

955,490.

Patented Apr. 19, 1910.

6 SHEETS—SHEET 1.

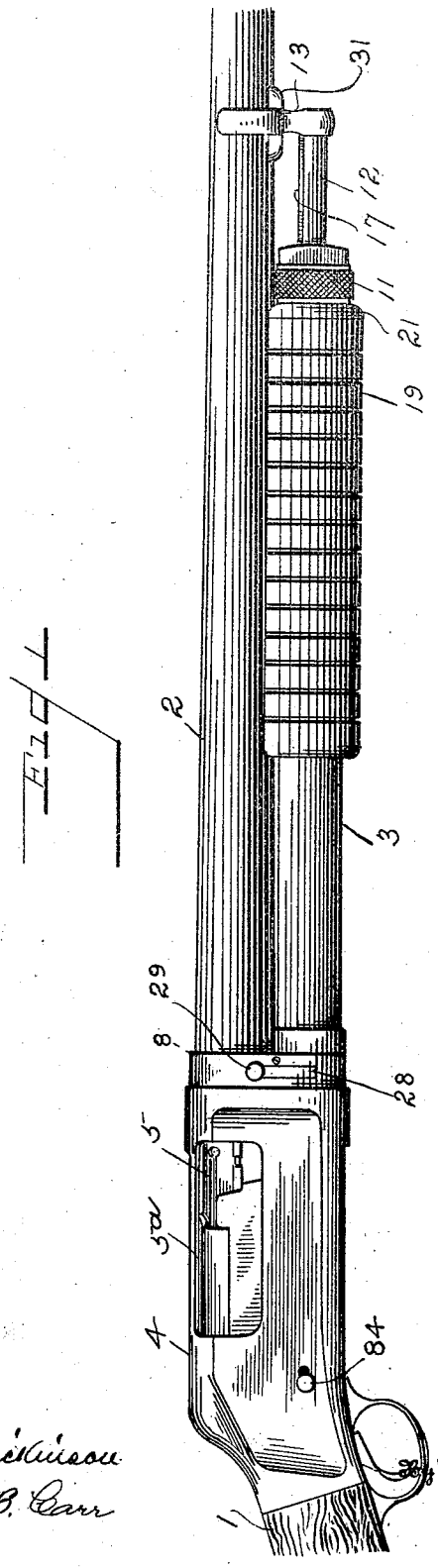

Fig. 1.

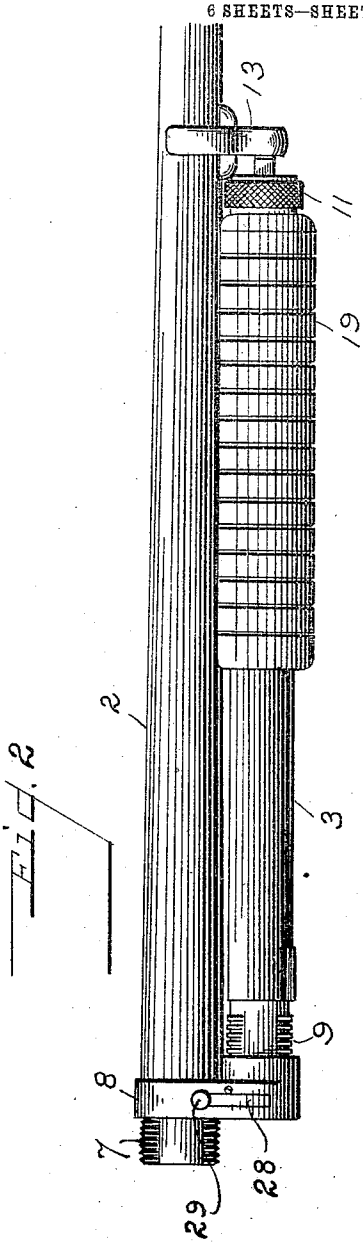

Fig. 2.

Witnesses

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6 SHEETS—SHEET 2.

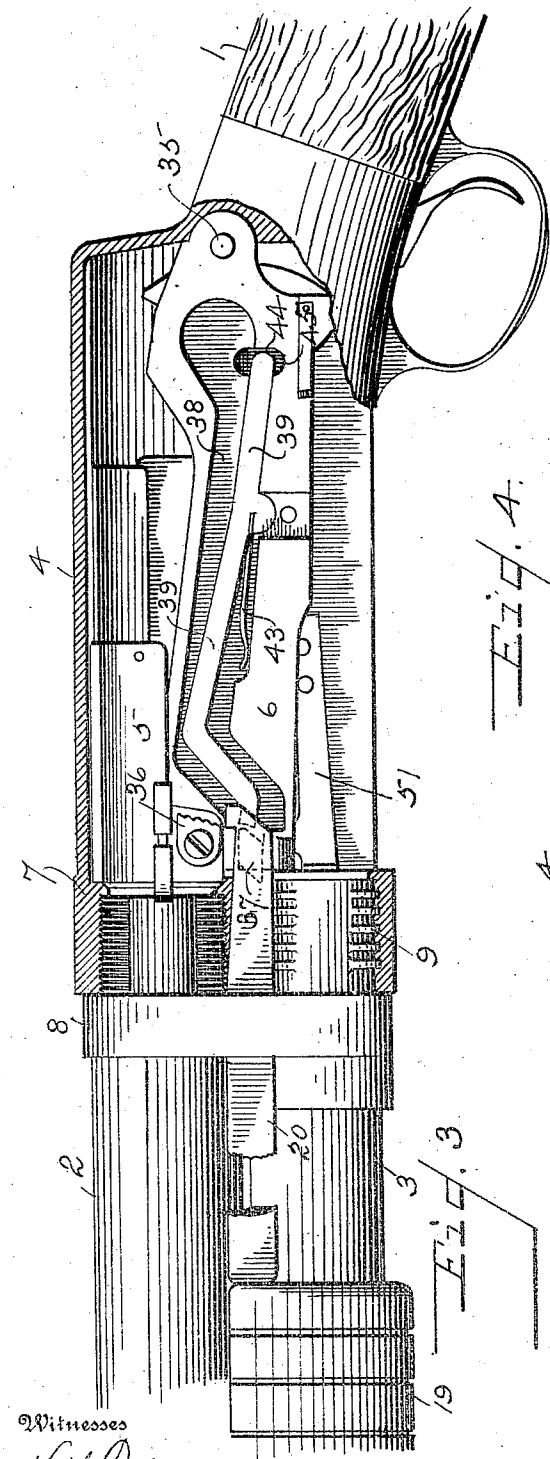

Fig. 3.

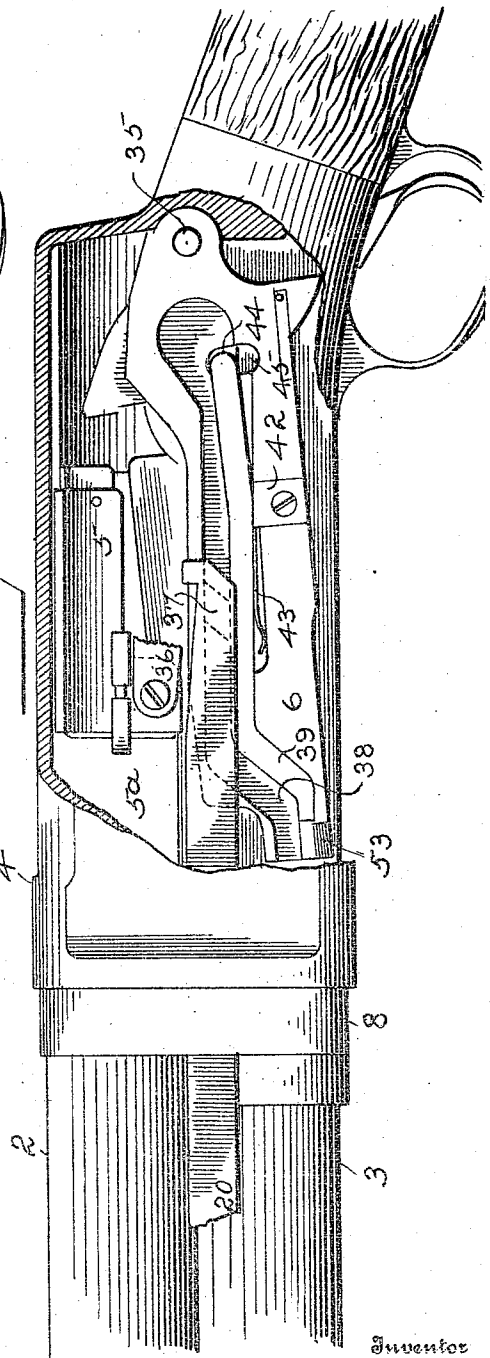

Fig. 4.

Witnesses

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6 SHEETS—SHEET 3.

Fig. 5

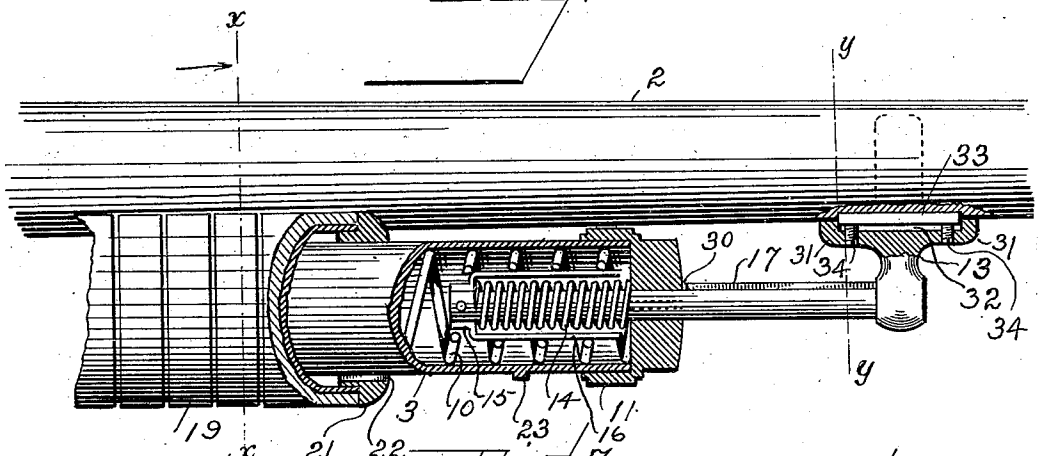


Fig. 6

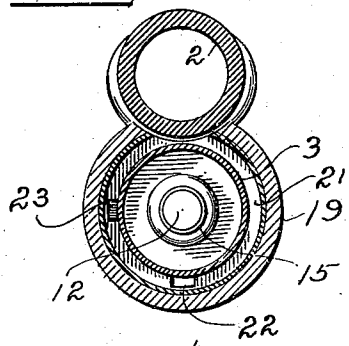


Fig. 7

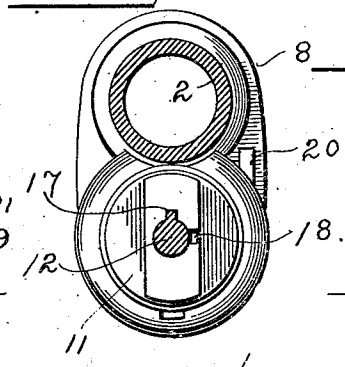


Fig. 8.

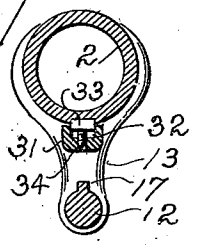


Fig. 9.

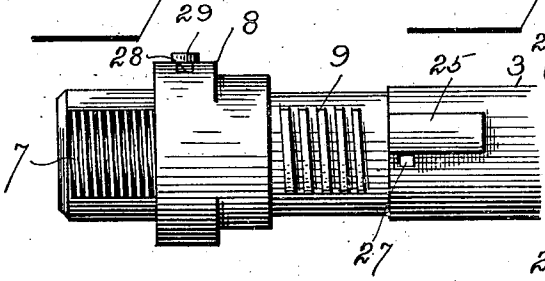


Fig. 10

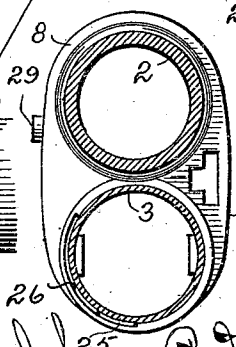
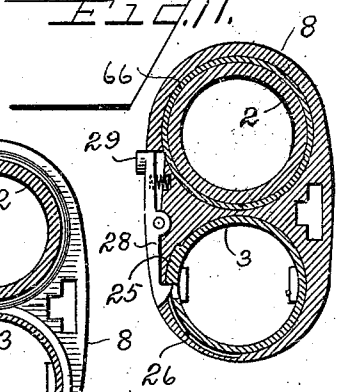


Fig. 11.



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6 SHEETS—SHEET 4.

Fig. 12

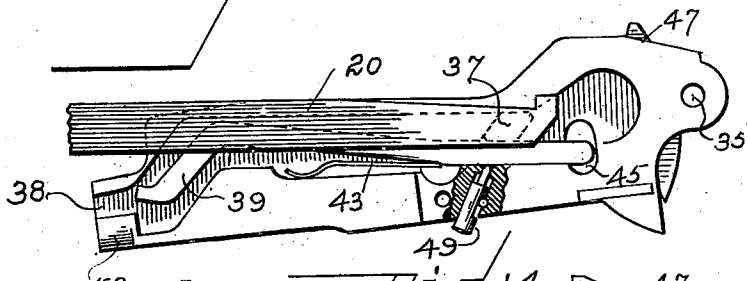


Fig. 13

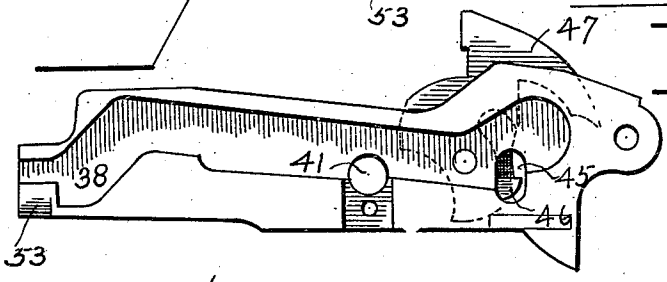


Fig. 14.

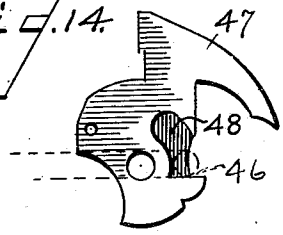
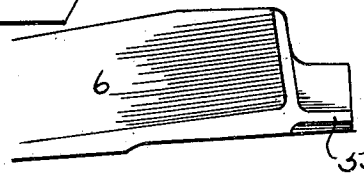


Fig. 17.



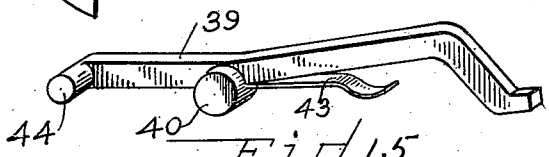
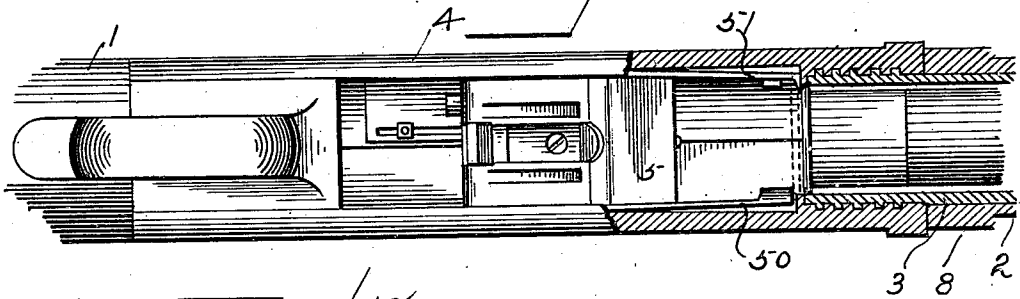


Fig. 15.

Fig. 16



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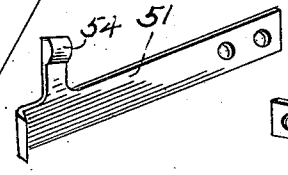
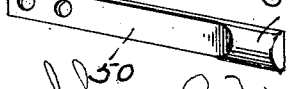


Fig. 19.



Witnesses

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FIREARM.

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955,490. Patented Apr. 19, 1910.

6 SHEETS—SHEET 5.

Fig. 20

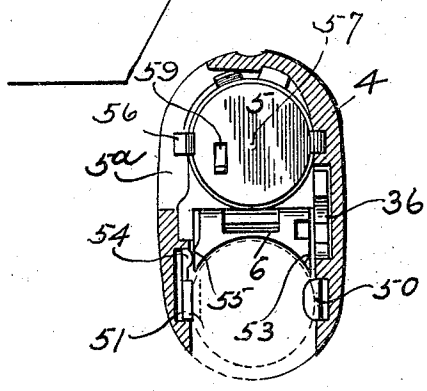
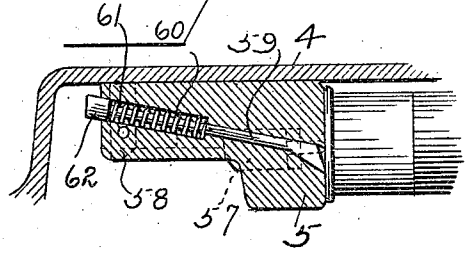


Fig. 23



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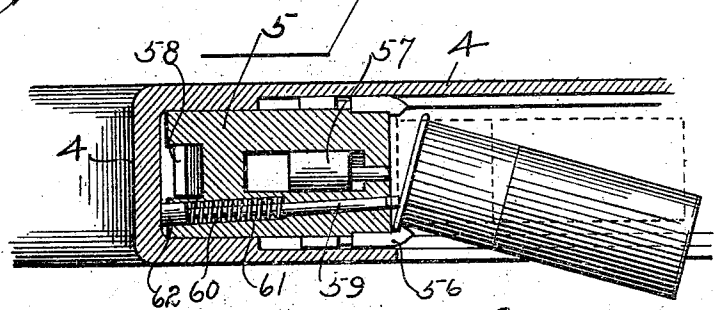


Fig. 21

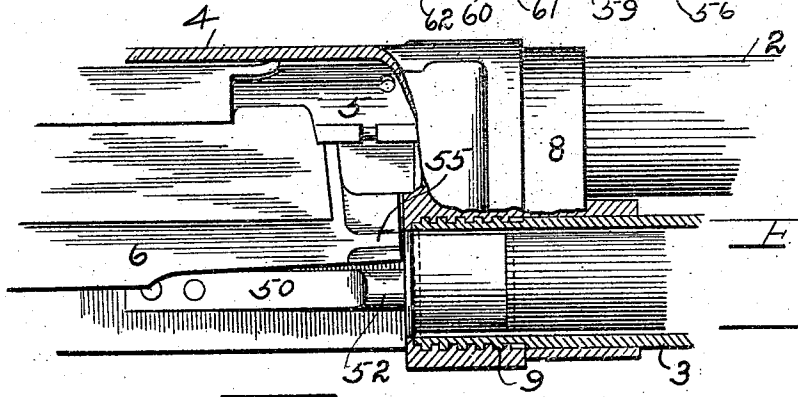
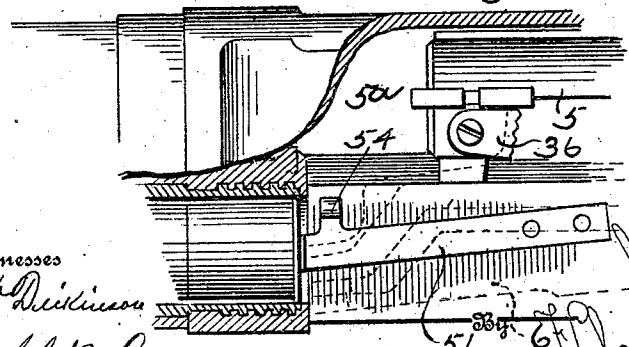


Fig. 22



Witnesses

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6 SHEETS—SHEET 6.

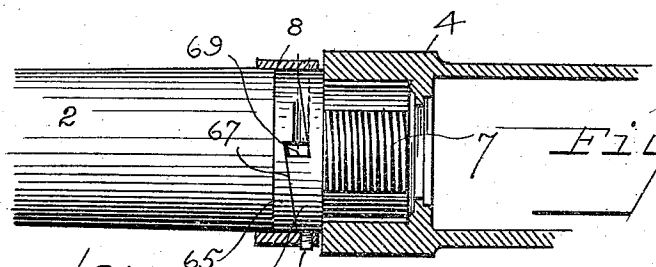


Fig. 25

Fig. 26

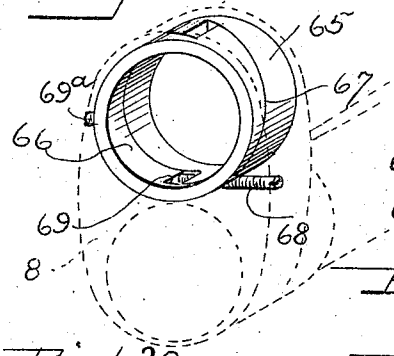


Fig. 27

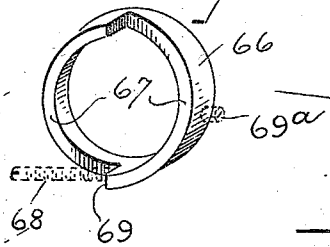


Fig. 28

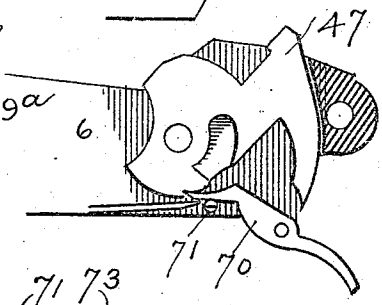


Fig. 29

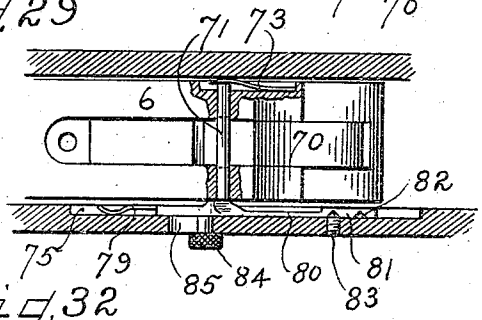


Fig. 30

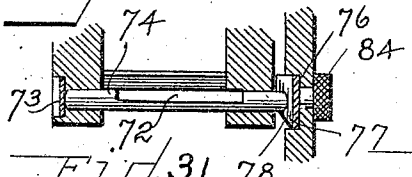


Fig. 31

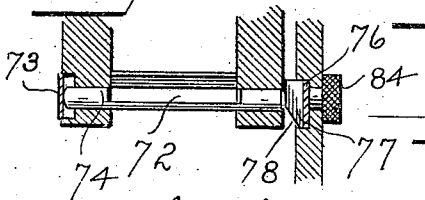


Fig. 32

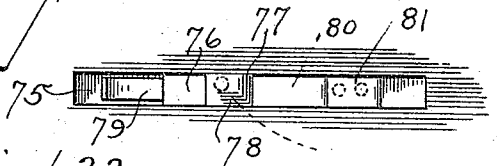


Fig. 33

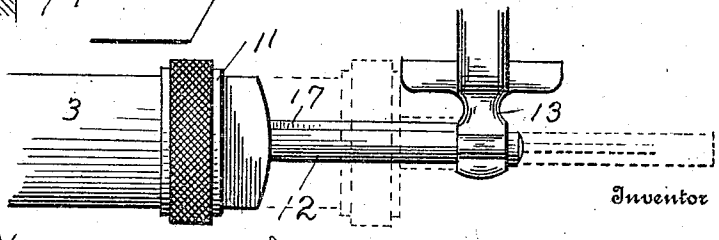
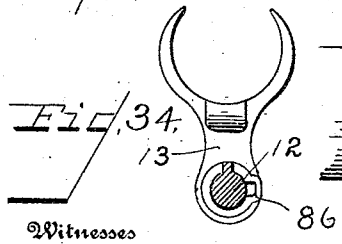


Fig. 34.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES A. YOUNG, OF NEAR ENON, OHIO.

FIREARM.

955,490. Specification of Letters Patent. **Patented Apr. 19, 1910.**

Application filed January 18, 1909. Serial No. 472,976.

To all whom it may concern:

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

My invention relates to fire arms, and particularly to repeating or magazine guns.

The invention relates more especially to improvements in that class of magazine guns in which the breech block is arranged to move longitudinally rearward and forward in opening and closing the breech, in which the carrier is located below the breech block and adapted to swing in a vertical plane to receive the cartridge from the magazine and present it forward of the breech block in such position that the forward movement of the breech block will force the cartridge from the carrier into the barrel, the parts being actuated by a reciprocating fore-arm grip or handle located forward of the frame of the gun and reciprocated in a line substantially parallel with the axis of the gun barrel.

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

A further object is to provide in such an arm an improved form of take-down by which the barrel and stock may be readily separated and when separated may be easily and quickly connected. And further, to provide means for locking the sliding grip or handle in its forward position when the barrel and magazine are disconnected from the stock in order that the action bar may not protrude beyond the end of the magazine and become bent or otherwise damaged.

A further object is to provide an improved means of securing the forward end of the magazine to the barrel of the gun.

A further object is to provide means for locking the magazine in its adjusted position when the barrel and stock are connected.

A further object is to provide a safety lock to prevent the opening of the gun after the hammer has been cocked and the parts in condition for firing until after the falling of the hammer, thereby preventing the user from prematurely opening the gun by exercising an untimely rearward draft upon the sliding handle and to provide a manually operated device whereby said safety lock may be disengaged at will.

A further object is to provide improved means for ejecting the exploded shell from the arm upon the withdrawal of the breech block.

A further object of the invention is to provide improved form of detents controlling the escape of the cartridge from the magazine and means for operating said detents by the operation of the carrier.

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

Referring to the drawings, Figure 1 is a side elevation of the arm, the forward portion of the barrel, and the rear portion of the stock being broken away. Fig. 2 is a side elevation of the barrel and magazine disconnected from the stock. Fig. 3 is a longitudinal sectional view showing the parts in condition for firing. Fig. 4 is a similar view showing the parts partially operated to reloading position. Fig. 5 is a detail view partly in section of the forward end of the magazine showing the connection of the magazine with the barrel of the arm. Fig. 6 is a transverse sectional view on line *x x* of Fig. 5 looking forward or to the right. Fig. 7 is a transverse sectional view on line *y y* of Fig. 5 looking rearward. Fig. 8 is a similar view on the same line looking forward. Fig. 9 is a bottom view of the rear portion of the magazine and barrel disconnected from the stock. Fig. 10 is a transverse sectional view of the barrel and magazine forward of the connecting yoke. Fig. 11 is a transverse sectional view of the barrel and magazine through the connecting yoke showing the magazine latch. Fig. 12 is a side elevation of the swinging carrier removed from the housing with the action bar operated almost to the limit of its stroke. Fig. 13 is a side elevation of the swinging carrier with the locking lever removed.

Fig. 14 is a side elevation of the hammer removed from the carrier. Fig. 15 is a perspective view of the locking lever removed from the carrier. Fig. 16 is a bottom view partly in section of the gun, showing the interior of the housing with the carrier removed. Fig. 17 is a side elevation of the forward end of the carrier illustrating one of the operating cam faces. Figs. 18 and 19 are the two cartridge controlling detents. Fig. 20 is a sectional view through the housing showing the forward face of the breech block and the forward end of the swinging carrier and the cartridge detents. Figs. 21 and 22 are detail sectional views illustrating the respective cartridge detents. Fig. 23 is a vertical sectional view through the housing and breech block illustrating the ejector. Fig. 24 is a horizontal sectional view through the housing and breech block showing the ejector in operated position. Figs. 25, 26, and 27 are detail views of an adjustable take-up device to compensate for wear upon the inter-engaging threads of the barrel and the housing. Fig. 28 is a sectional view through the rear portion of the carrier showing the relation of the hammer and the sear and an automatic locking device for securing the sear and the hammer in an engaged position. Fig. 29 is a bottom plan view partly in section illustrating the sear locking device. Figs. 30 and 31 are transverse sectional views showing the sear locking device in operative and inoperative positions respectively. Fig. 32 is a detail view of the interior side wall of the housing showing the cam slide operating the sear locking device. Figs. 33 and 34 are detail views of a modified form of supporting and locking device for the magazine.

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

General description.—In the drawings 1 is the stock, 2 is the barrel immediately below which and extending parallel therewith is the magazine 3. The barrel 2 and magazine 3 open at their rear ends into a housing 4 connecting said parts with the stock 1. Within the housing 4 is located a reciprocating breech block 5 immediately below which is a swinging carrier 6. In the side of the housing 4 is the opening 5^a through which the exploded shell is ejected or the cartridge if it be not exploded. This opening 5^a is normally closed by a suitable closure cooperating with the breech block and carrier, but which forms no part of the present invention.

The take-down.—The take-down or means for connecting and disconnecting the barrel and magazine with the stock is an important feature of the invention and is constructed as follows: The rear end of the barrel 2 is provided with mutilated screw threads 7 which engage corresponding internal threads in the forward portion of the housing in the usual manner. At the rear end of the barrel and magazine the parts are connected by a yoke 8 secured upon the barrel and through which the magazine is adapted to freely reciprocate. The rear extremity of the magazine is also provided with mutilated threads 9 engaging corresponding threads in the forward portion of the housing. The magazine 3 comprises a tubular member within which is the helical spring 10 which tends to force the cartridges toward the rear or mouth of the magazine where they are controlled by certain detents hereinafter described. At its forward end, the magazine is provided with a head 11 preferably knurled or provided with projections by which the magazine may be readily rotated. Extending through said head 11 and within the magazine is a longitudinal shaft 12 supported in a clamp 13 engaging the barrel 2. Surrounding the shaft 12 and within the magazine is a helical spring 14 operating at one end on the magazine head 11 and at the opposite end against a collar or nut 15 secured on the shaft 12.

In the drawings, the spring 14 is shown as inclosed within a sleeve 16 formed integrally with the collar 15. This is the preferable construction to prevent the entanglement or interengagement of the magazine spring 10 and the spring 14, although said sleeve 16 is not essential to the successful working of the parts. The shaft 12 is provided with a feather or spline 17 and the head 11 is provided with a corresponding groove or way 18 so located in the head 11 as to register with the feather 17 when the barrel and magazine are disconnected from the stock, but when the arm is connected or in normal condition the groove or way 18 will occupy a position at right angles to the feather 17, the connecting operation of the magazine including a quarter turn thereof which moves the groove 18 out of registry with the feather 17. Slidingly mounted on the magazine 3 is the fore grip or handle 19 rearwardly from which extends the action bar 20 by which the breech block and carrier are actuated. At its forward end the grip 19 is provided with a runner or sliding collar 21 having therein a notch or groove 22 in such position that it will register with the lug 23 on the exterior of the magazine 3 adjacent to the head 11 when the magazine is connected with the stock. The relation of the notch 22 and lug 23 is such that when the arm is set up or connected the sliding handle 19 will over-ride the lug, the lug 23 registering with the notch 22, thereby permitting the free movement of the grip. However, when the magazine is dis-

connected the quarter revolution of the magazine during the take-down operation as hereinafter described will turn the lug 23 out of registry with the notch 22 and providing the grip has first been moved to its extreme forward position, the rotation of the magazine and movement of the lug out of registry with the notch 22 will serve to lock the grip 19 in its forward position by the engagement of the lug with the rear of the runner or collar 21 as shown more particularly in Fig. 6. By this means the grip will be secured and the action bar 20 will be prevented from protruding beyond the end of the barrel and magazine when disconnected from the stock. It has been found that the end of the action bar if permitted to protrude is very liable to become bent or battered so as to interfere with its successful operation, and furthermore, the protruding end soon wears a hole through the gun case in which the parts are carried. Adjacent to the rear end of the magazine 3 is a lug or spline 25. The yoke 8 through which the extremity of the magazine is freely movable as before described is recessed throughout substantially one-fourth of its inner periphery, as at 26, within which recess the lug 25 engages when the arm is set up or the parts connected. The relative proportion of the lug 25 and the recess 26 is sufficient to permit the rotation of the magazine throughout substantially an arc of 90°, the rotation in either direction being limited by the engagement of the lug 25 with the opposite ends of the recess 26. Adjacent to the lug 25 in the wall of the magazine is a notch or recess 27 engaged by a spring actuated latch 28 in the yoke 8 when the magazine is connected with the stock. When the arm is set up or connected as shown in Fig. 1 and it is desired to disconnect the barrel and magazine from the stock, the latch 28 is released by depressing the button 29, which disengages the latch from the notch 27 in the magazine. The grip 19 having first been moved to its extreme forward position, the magazine 3 is rotated by means of the knurled head 11 throughout an arc of 90°, its revoluble movement being limited by the engagement of the lug 25 with the end of the recess 26 in the yoke 8. By this revoluble movement the mutilated screw threads 9 are disconnected from the corresponding threads in the stock, and, at the same time, the notch or groove 18 in the head 11 is brought into registry with the feather 17 of the shaft 12. The expansion of the helical spring 14 will move the magazine longitudinally on the shaft 12, withdrawing it from the connection with the stock and carrying with it the sliding grip or handle 19, which, by the revoluble movement of the magazine, has been locked or secured thereto by the engagement of the lug 23 behind the runner or collar 21 to where it passed through the groove 22 prior to the revoluble movement of the magazine.

In practice it is desirable, although not essential, to have a slight clearance at the point 30 between the end of the feather 17 and the head 11 of the magazine when the arm is set up or in connected condition, in order that upon the depression of the button 29 thereby releasing the latch 28, the magazine may make an initial step or jump longitudinally to move the recess 27 slightly out of registry with the latch 28, thereby preventing the latch reëngaging the magazine upon the release of the button 29 before the magazine can be rotated. The engagement of the magazine head 11 with the feather 17 of the shaft 12 maintains the magazine in proper position to be readily engaged with the stock; that is, with the mutilated screw threads 9 of the magazine out of registry with the corresponding threads of the housing so that the magazine may be reciprocated against the tension of the spring 14 to bring the magazine to such position that the respective mutilated threads of the respective parts will interengage upon the quarter rotation of the magazine. When it is desired to set up or connect the arm as shown in Fig. 1, the magazine parts will be found to be in the position illustrated in Fig. 2; that is, with the magazine held in its extreme forward position by the spring 14 and the sliding handle or grip 19 in place upon the magazine. In order to connect the parts, the extremity of the barrel is inserted into the corresponding opening in the housing with the yoke 8 extending at right angles to the housing after which the barrel and magazine are given a quarter turn to interengage the mutilated threads 7 of the barrel with the corresponding threads in the interior of the housing and to bring the magazine into registry with the corresponding opening in the forward end of the housing. The magazine is then pressed rearward against the tension of the spring 14 and it will be found that on account of the magazine being maintained in proper position by its engagement with the feather 17 of the shaft 12 the rear end of the magazine will enter the opening in the housing without interfering with the mutilated threads therein, and upon giving the magazine a quarter turn after it has been pressed rearward, the threads 9 of the magazine will be interengaged with the threads within the housing. The rotation of the magazine will be limited by the engagement of the lug 25 within the recess 26 and when it has been rotated to the limit of its movement, the spring latch 28 will engage the recess 27 and

lock the magazine in its adjusted position. It will then be found that the rotation of the magazine has brought the lug 23 at the forward end of the magazine into registry with the groove 22 in the runner 21 of the sliding handle, and the handle will be free to reciprocate upon the magazine.

Magazine clamp.—The clamp 13 in which the shaft 12 is supported comprises a Y shaped member the arms of which partially inclose the barrel 2. Immediately below the barrel the member is extended in opposite directions from the arms as at 31, and on the inner portion adjacent to the barrel is recessed as at 32. The barrel is provided with a corresponding recess which registers with the recess 32 of the clamp. Within said recess is located a coupling plate 33 of such thickness that it may be contained wholly within the recess 32 of the clamp while the clamp is being adjusted to the gun barrel. Adjusting screws 34 are provided in the extended portions 31 which operate on the said coupling plate 33 and wrest said plate partially out of the recess 32 into the corresponding recess in the gun barrel which is of less depth than the thickness of the plate. The construction is such that when the clamp is in place and the coupling plate 33 adjusted by the screws 34 the plate will extend into both the recess in the gun barrel and the recess 32 in the clamp as clearly shown in Fig. 5 and thereby prevent a longitudinal movement of the clamp upon the barrel. If it is desired to remove the clamp the adjusting screws 34 are withdrawn which permits the coupling plate to return wholly to the recess 32 and out of engagement with the recess in the barrel after which the clamp may be withdrawn in the usual manner. It is not unusual to have a member or a key in the clamp which engages a notch or recess in the gun barrel, but heretofore this has usually been a transverse screw or bolt and it has been found in practice that after long usage the imprint of such transverse connection shows within the gun barrel by a slight constriction of the bore at that point. With the present coupling device the bore extends over considerable surface with its greatest length in line with the bore of the barrel and on account of the extended operating surface will obviate the difficult experience with the transverse connections having small operating surface which eventually affect the interior of the bore of the barrel.

The safety lock mechanism.—The safety lock mechanism is adapted to secure the gun against opening after it has been once closed until the hammer has fallen, thus preventing "juggling" whereby two cartridges might be released from the magazine and jammed in the carrier at the same time. It also prevents the premature opening before the cartridge has exploded by pulling the trigger and pulling rearward on the operating grip or handle at the same time. The carrier 6 is of well known construction pivoted within the housing at 35 and adapted to swing in a vertical plane. In its upper or closed position the carrier 6 engages with a shoulder on the breech block and prevents the rearward movement of the breech block 5. The breech block 5 is reciprocated within the housing by means of a dog 36 partially broken away in Figs. 3 and 4, which is engaged by the extremity of the action bar 20. At the same time that the breech block 5 is reciprocated, the swinging carrier is oscillated within the housing by the engagement of a lug 37 upon the action bar 20 which engages a cam groove 38 in the side of the carrier 6. Pivoted in the side of the carrier 6 in such position as to form a false or movable side for the cam groove 38 is a locking lever 39. This lever 39 may be pivoted in any suitable manner but is preferably provided with a cylindrical lug as shown at 40, Fig. 15 which engages a corresponding opening 41 in the side of the carrier (see Fig. 13). The lever is preferably held in place by a removable plate 42 secured to the carrier and projecting over the pivotal point of the locking lever. A spring 43 tends to move the locking lever 39 about its pivotal connection whereby the forward end of said lever will obstruct the cam groove 38 and will be engaged by the lug 37 of the action bar 20 as shown in Fig. 3. The rear end of the locking lever 39 is provided with an inward projecting finger 44 which extends through an opening 45 in the side of the carrier and into the path of a shoulder 46 formed on the hammer 47 which is pivoted in the carrier 6. The hammer is recessed at 48 to provide clearance for the inward projecting finger 44. When the arm is in its closed position and the hammer 47 cocked, the spring 43 will have raised the forward end of the locking lever 39 into the path of the lug 37 of the action bar 20 and will prevent the rearward movement of the action bar. However, upon the falling of the hammer 47 just prior to the limit of its movement, the shoulder 46 will engage the finger 44 and lift the rear end of the locking lever 39, thus depressing the forward end thereof and clearing the lug 37, permitting said lug to enter the cam groove 38 of the carrier as shown in Fig. 4. The locking lever 39 is unalined, and the respective arms thereof, on opposite sides of the pivotal point, are slightly angular in relation to each other. This is a preferable form although not essential, as the locking lever might be made straight and leave a sufficient clearance in the side of the carrier to permit the oscillation of the forward end of the locking lever to its operative position as shown in Fig. 3. However,

as shown in the drawings, the action bar 20, as it approaches the rear limit of its stroke, will oscillate the locking lever 39 as shown in Fig. 12. Before the locking lever has reached the position shown in Fig. 12, the hammer 47 has been again wrested or cocked by means of the reciprocating breech block 5 which engages the hammer upon its rearward movement. A manually operated depressible plunger 49 is provided at one side of the pivotal point of the locking lever 39, which plunger when depressed is adapted to operate upon said lever and turn the locking lever on its pivotal connection. By the depression of the plunger 49 shown in Fig. 12, the locking lever may be withdrawn from the path of the lug 37 of the action bar 20 at the will of the operator, independent of the action of the hammer 47. After the various parts have been operated by the reciprocatory movement of the action bar 20, the locking lever 39 will be elevated to obstruct the cam way 38 by the action of the spring 43 immediately upon the withdrawal of the lug 37 from said cam way. The said lug 37 cannot return to the cam way until the hammer has fallen and by the engagement of the shoulder 46 with the finger 44 move the locking lever from the path of the lug or until the plunger 49 has been depressed and the same result accomplished. The parts are therefore securely locked in closed position, thereby preventing any "juggling" of the gun which might result in premature discharge. This safety device is an important feature, for, if the shell will not readily enter the chamber of the barrel the shooter will probably try to throw the cartridge out of the gun and if he fails to give the gun a full stroke with the guns in ordinary use, he will frequently release the second shell from the magazine and so have two cartridges in the receiver at the same time, which would result in blocking the gun and possibly in a premature explosion. As a further protection against such accidents, there is provided means for controlling the escape of the cartridges from the magazine by the movement of the carrier.

Magazine detents.—Located within the housing 4 on opposite sides thereof and adjacent to the mouth of the magazine are cartridge detents 50 and 51 which engage the rearmost cartridge and limit its movement as it is forced rearward by the magazine spring 10. Each of the detents are spring pressed into the path of the cartridge and are preferably although not necessarily in the form of spring plates as shown in Figs. 18 and 19, attached at the rear ends to the interior of the housing, the forward or operating ends tending to move inward or toward each other. The detent 51 extends slightly in advance of the detent 50 and will be termed the primary detent, while the detent 50 will be hereinafter termed the secondary detent and engages the cartridge when it is released by the primary detent 51. The cartridge, in its escape from the magazine, makes a two step movement. Its rearward movement, due to the magazine spring, is first arrested by the primary detent and upon the withdrawal of the primary detent the cartridge moves a short distance to engagement with the secondary detent while the primary detent returns to normal position in advance of the rim of the cartridge and in position to engage the next cartridge when the first one has been released by the secondary detent and passed into the carrier. The secondary detent 50 is provided with a cam face 52 engaged by a corresponding cam face 53 on the forward extremity of the carrier 6, as the carrier moves from closed to open position. The primary detent 51 is provided with a cam face 54 which is engaged by a corresponding cam surface 55 at the forward portion of the carrier 6 and opposite the cam surface 53. As illustrated in Fig. 20, the cam faces 54 and 52 of the respective detents 51 and 50 are in different horizontal planes and are so located that when the carrier 6 is in its uppermost or closed position the cam surface 55 thereon will have engaged the cam face 54 of the primary detent 51 and thereby will have depressed the detent 51 withdrawing it from the path of the cartridge. Upon initial movement of the carrier 6 from its closed position it will disengage and release the primary detent 51, permitting the detent to return to the path of the cartridge and as the carrier continues its movement it will engage the cam face 52, thereby depressing the secondary detent 50 withdrawing it from the path of the cartridge and permitting the cartridge held thereby to escape into the carrier. During the time the arm is open and the cartridge being carried from the magazine to the barrel chamber, the remaining cartridges in the magazine are held by the primary detent 51. Upon the closure of the arm as the carrier 6 reaches its normal closed position, the cam face 54 of the primary detent is engaged and the primary detent 51 is withdrawn and the cartridge within the magazine is engaged by the secondary detent. It will thus be seen that both detents are operated and the cartridge within the magazine controlled, wholly by the movement of the carrier, and that while the carrier is in closed position the primary detent is withdrawn or inoperative and the secondary detent is in engagement with the cartridge and that upon opening the arm the relation of the detents is reversed, and the primary detent is released and becomes operative while the secondary is depressed to inoperative position, the respective detents being thus alternately operated. The action

and relative position of the controlling detents are best illustrated in Figs. 16–22 inclusive.

Ejector mechanism.—In order that the exploded cartridge or the cartridge if it should have failed to discharge will be ejected from the arm upon the opening thereof, means is provided as follows: Referring particularly to Figs. 23 and 24, the reciprocating breech block 5 which is moved longitudinally within the housing 4 at each opening or closing operation is provided with the usual extractor hook 56 which engages the rim of the cartridge as shown in Fig. 24 and withdraws the cartridge from the chamber of the barrel upon the rearward movement of the breech block 5. In addition to the usual firing pin 57 carried within the breech block 5 and the pivoted dog 58 by which the hammer is raised at each operation, there is also located within the breech block a longitudinally movable plunger 59 actuated by a helical spring 60 located within a bore 61 within the breech block. At its rear end the plunger 59 is provided with a collar or head 62. The spring 61 bears at one end against the inner end of the bore 61 and at its opposite extremity against the head or collar 62 and tends to move the plunger 59 rearward so that its forward end will extend flush with the face of the breech block. The head 62 of the plunger 59 projects beyond the rear extremity of the breech block, and upon the rearward movement of the block the head 62 is adapted to contact the rear of the housing 4. Upon the engagement of the head 62 with the housing 4 the movement of the plunger 59 in unison with the breech block 5 will be arrested, and the breech block 5, being given a slight additional movement independent of the plunger 59 and against the tension of the spring 60, will cause the forward end of the plunger 59 to protrude beyond the face of the breech block as shown in Fig. 24. The protruding end of the plunger 59 will engage the butt of the cartridge and will tend to swing the cartridge laterally as shown in Fig. 24, the cartridge tending to swing about the point of engagement of its rim with the extractor hook 56 as about a pivot. Referring to Figs. 20 and 23 it will be seen that the operating point of the plunger 59 is not only located at one side of the center of the cartridges, but also below the center which will tend to swing the cartridge upward as well as outward. It is immaterial in what relative location in the face of the breech block the operating point of the plunger is located. However, when located as shown in the drawing, between the extractor hook 56 and the firing pin 57 and somewhat below the level of the firing pin it is obvious that less relative movement of the plunger 59 and the breech block 5 will be necessary to successfully eject the shell than if the plunger was located at the opposite side of the firing pin. The relative size of the operating end of the plunger is also immaterial.

Take-up sleeve. (Figs. 25, 26, and 27.)—It has been found in practice that after long usage the thread 7 on the barrel 2 becomes worn so that the barrel becomes loose within its connection in the housing 4 and it has been found desirable to provide means for conpensating for the wear on the said connecting threads. Heretofore, such means has usually been an adjustable sleeve screw threaded within the housing and in which the barrel is in turn screw threaded or such screw threaded sleeve has been mounted on the extremity of the barrel. With such construction, however, each adjustment of the sleeve lessens the engaging surface or overlapping length of the threads of the barrel and those of the said sleeve on account of the interrupted condition of the threads. In the present instance, means is provided for compensating for wear while still permitting the full length of the thread section to be utilized for holding the barrel. There is provided within the yoke 8 and about the barrel 2 two engaging rings or collars, a stationary collar 65 and a corresponding adjustable collar 66. The adjacent faces of said collars are inclined or spiral as shown at 67. A set screw 68 in the side of the yoke 8 engages a shoulder 69 of the revoluble collar 66, and by its adjustment tends to turn said collar 66 within the yoke and upon the barrel. The inclined or spiral surface 67 of the revoluble collar 66 engaging with the corresponding surface of the stationary collar 65 causes the collar 66 to move outward upon the rotation thereof so that the said collar 66 will project slightly beyond the yoke 8, and abut on the forward end of the housing 4. A set screw 69ª on the opposite side of the yoke 8 secures the revoluble collar 66 in its adjusted position. In adjusting the barrel and the housing, the barrel is first connected in the usual manner and if it is found that there is play or undue looseness in the connecting threads, the adjusting screw 68 is operated to rotate the adjustable collar 66 until the barrel has been tightened within the housing by said collar being moved into contact with the forward end of said housing. It is obvious that in place of the stationary collar 65 the barrel might be formed with a shoulder, the rear face of which is inclined or spiral, corresponding to the spiral 67 of the collar 66, or in lieu of this construction, the collar 65 might be formed integral with the yoke 8, the operation of the parts would remain exactly the same, and the parts would be similar to those illustrated. A further advantage resulting from the location of the take-up or

compensating sleeve on the gun barrel instead of on the housing is that it will require less frequent adjustment. Many shooters employ several interchangeable barrels with the same stock and lock mechanism. By locking the compensating sleeve or take-up on the barrel, each barrel will be individually adjusted to the housing, and the adjustment maintained, whereas if the take-up sleeve is located in the housing where obviously it might be, the take-up sleeve must necessarily be readjusted each time the barrel is changed as it is not probable that two barrels would require the same degree of adjustment.

Sear locking mechanism. (Figs. 28–32.)—The usual means for providing safety locks for fire arms of the present character have been to lock the trigger against operation, which under ordinary circumstances is successful, in case of accident such as the gun being dropped while the hammer is cocked or being otherwise subjected to severe shock, the sear is very liable to be disengaged from the hammer by the jar, even though the trigger may be locked against movement. Furthermore, in repeating guns of the present character it might be possible that a piece of dirt or other foreign matter be introduced within the housing, and falling within the path of the sear as the carrier 6 is moved to closed position might cause the disengagement of the sear from the hammer even though the trigger remained locked. To obviate such possibilities there is herein provided a lock for positively preventing disengagement of the sear from the hammer until disengaged by the shooter.

There is provided in the carrier 6 immediately below the sear 70, which engages and holds the hammer 47 in its elevated position, a transversely movable pin 71 having therein a recess 72 of length substantially equal to the width of the sear 70. Located in one side of the carrier 6 is a spring 73 operating on one end of the movable pin 71 and tending to move said pin within the carrier to such position that the shoulder 74 adjacent to the recess 72 will extend under the sear 70 and prevent the operation thereof, as is shown in Figs. 28 and 30. Located at the opposite side of the carrier 6 in the side of the housing 4 is a guide-way 75 in which is mounted a sliding member 76 having two inclined surfaces 77 and 78; extending from the member 76 is a spring finger 79 bearing on the bottom of the guide-way 75 and thereby affording a yielding resistance to the movement of the member 76. Extending in the opposite direction from the member 76 is a flexible extension 80 carrying a head 81 in which are two depressions 82 adapted to alternately engage a pin or set screw 83 in the side of the housing and thereby retain the member 76 in a predetermined position. The member 76 is adapted to be held in place in the guide-way 75 and reciprocated therein at the will of the operator by means of a shouldered stud 84 extending through a slot 85 in the side of said housing and engaging the member 76.

The normal position of the locking pin 71 is shown in Fig. 30 in which the sear 70 is prevented from moving downward by the shoulder 74 extending thereunder. When it is desired to discharge the gun the sliding member 76 is reciprocated within the guide-way 75, causing the cam surface 77 to engage the end of the pin 71, moving said pin longitudinally against the tension of the spring 73 until the recess 72 in said pin is brought into registry with the sear 70 as particularly shown in Fig. 31, when the sear will be permitted to move in the usual manner. It is not necessary that the sliding member 76 be operated at each operation of the gun. When the slide 76 has been moved to unlocked position the pin 71 will engage the cam surface 78 of the member 76 as the carrier 6 approaches the closed position at each operation thereafter, which engagement of the pin 71 with the cam surface 78 will reciprocate the pin 71 in the manner before described, to release the sear 70. The path described by the pin 71 at each movement of the carrier is indicated by dotted lines in Fig. 32. It will be obvious that at all times when the carrier is moved from its closed position the sear will be locked in engagement with the hammer 47 and will not be disengaged therefrom until the carrier has again been returned completely to closed position, thus positively preventing the accidental falling of the hammer during the operation of the arm. And it is further obvious that the sear may be locked against movement when the arm is closed by reciprocating the member 76 to disengage the cam surface thereof from the pin 71 thereby permitting the shoulder 74 of said pin to be moved under the sear 70 by the action of the springs 73.

Modification of the magazine support. (Fig. 33.)—It is obvious that instead of the construction illustrated in Figs. 5, 7, and 8, a construction such as illustrated in Fig. 33 may be employed for supporting the forward end of the magazine. In this construction, the shaft 12 would be rigidly supported on or form an integral part of the head 11 of the magazine, and the shaft 12 would be adapted to slide through the supporting clamp 13, the clamp 13 being provided with a suitable opening and the guide-way 86 to be engaged by the feather 17 of the shaft 12. The guide-way 86 being located in the member 13 in a position at right angles to the feather 17, when the magazine is engaged with the housing and engaged by the said

feather 17 upon the quarter rotation of the magazine necessary to disengage it from the housing as before described. In this construction, the spring 14 and casing 16 might be omitted. It is obvious that the mutilated threads 9 on the extremity of the magazine and the corresponding threads within the housing might be dispensed with and the engagement of the head 11 of the magazine with the end of the feather 17 of the shaft 12, or the engagement of the feather with the clamp 13 in the modified construction, might be relied upon to lock the magazine in its innermost position or in engagement with the stock, the rotation of the magazine moving the groove 18 out of registry with the feather 17 prevents the longitudinal or return movement of the magazine until the magazine has been again rotated to its former position.

It will be seen that there is thus produced a gun which will be safe against accidental discharge, or premature discharge before the gun is fully closed, and in which the barrel and magazine may be easily and quickly connected with and disconnected from the stock, and in which the shell will be positively ejected from the gun as the gun is moved to its open position, and in which it will be impossible to so juggle the gun as to get two shells in the carrier at the same time, and which possesses the other features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, detail construction, and arrangement of parts, without departing from the principle involved, or sacrificing any of its advantages.

Having thus described my invention I claim:

1. In a fire arm as described, the combination with a stock, a barrel, a lock action, a reciprocating action bar and a swinging carrier having a cam groove therein engaged by the action bar, of means for contracting the cam groove to prevent the entrance therein of the action bar when the arm is in condition for firing, and means to automatically return the cam groove to normal upon the falling of the hammer.

2. In a fire arm as described, the combination with a stock, a barrel, a lock action including a hammer, a reciprocating action bar and a swinging carrier having a cam groove therein engaged by the action bar, of a pivoted locking lever carried in the swinging carrier and oscillating in a vertical plane, said locking lever being adapted when oscillated to intersect the cam groove and prevent the entrance therein of the reciprocating action bar, said locking lever being controlled by the hammer whereby the falling of the hammer will withdraw the locking lever from the cam groove to permit the operation of the action bar.

3. In a fire arm as described, a stock, a barrel, a lock action including a hammer, a movable member, means to actuate said movable member including a cam groove in said member, a movable side in said cam groove and means for moving said movable side to obstruct the cam groove when the hammer is raised, and to clear said groove when the hammer falls, substantially as specified.

4. In a fire arm as described, a stock, a barrel, a lock action including a hammer, a movable carrier having a cam groove therein, a reciprocating action bar engaging said cam groove, a pivotal lever forming a false side of said cam groove, said lever being adapted to extend into the path of the action bar when the hammer is cocked and means for oscillating said lever from said path upon the falling of the hammer, substantially as specified.

5. In a fire arm as described, a stock, a barrel, a lock action including a hammer, a swinging carrier having a cam groove therein, a reciprocating action bar engaging said groove, a pivoted lever forming a false side of said cam groove, a spring tending to oscillate said lever to obstruct the cam groove, a finger on said lever, a shoulder on the hammer into the path of which the said finger projects adapted to engage the finger at the falling of the hammer to oscillate the lever against the tension of the spring to clear said cam groove, substantially as specified.

6. In a take-down magazine fire arm, a stock, a barrel, a longitudinally movable magazine, a support therefor adapted to permit the longitudinal movement of the magazine, a spring adapted to yieldingly hold the magazine in its forward position when disengaged from the stock to prevent undue longitudinal movement thereof, and an abutment for said spring.

7. In a fire arm as described, the combination with a stock, a barrel, a lock action including a hammer, a reciprocating action bar and a swinging carrier, of a pivoted stop lever rigid throughout, adapted by its oscillation to be moved into and out of the path of the action bar, a lateral projecting finger on one arm of said stop lever, a shoulder formed on the hammer and adapted, as the hammer moves to its down position, to engage the lateral finger and elevate the corresponding arm of the stop lever to depress the forward or operating end of the stop lever out of the path of the action bar.

8. In a fire arm as described, a stock, a barrel, a lock action including a hammer, a reciprocating action bar, a movable carrier having a cam groove engaged by the action bar, means for blocking said action bar to prevent the operation thereof, means for automatically clearing the action bar at the falling of the hammer, and means for

manually clearing the action bar independent of the hammer action, substantially as specified.

9. In a fire arm as described, a stock, a barrel, a lock action including a hammer, a movable carrier having a cam groove therein, a reciprocating action bar engaging the cam groove, a stop member adapted to extend into the path of the action bar when the arm is in condition for firing, means for automatically withdrawing said stop member from the path of the action bar when the hammer falls, and a manually operated depressible plunger adapted to cause the withdrawal of the stop member independent of the automatic controlling means, substantially as specified.

10. In a fire arm as described, the combination with a housing, a barrel and a lock action, of a magazine, a movable carrier, two detents supported on the housing and controlling the escape of cartridges from the magazine, both detents normally tending to move into the path of the cartridges, and adapted to be moved from said path by the action of the carrier, said carrier being adapted to withhold one of the detents and permit the engagement of the other when in its closed position, and to reverse the arrangement of the detents by releasing the withdrawn detent, and withdrawing the engaged detent when the carrier is moved to open position, substantially as specified.

11. In a fire arm as described, the combination with a housing, a barrel and a lock action, of a magazine, a movable carrier, two detents supported on the housing controlling the escape of cartridges from the magazine, comprising a primary detent adapted to be first engaged by the cartridge and a secondary detent located to the rear of the primary detent to engage the cartridge when released by the primary detent, means for controlling said detent by the movement of the carrier whereby the primary detent will be withdrawn and the secondary detent becomes operative when the arm is closed and said secondary detent will be withdrawn and the primary detent becomes operative when the arm is open, substantially as specified.

12. In a fire arm as described, the combination with a stock, a barrel and a lock action, of a magazine, a movable carrier, two detents controlling the escape of cartridges from the magazine, comprising a primary detent adapted to be first engaged by the cartridge and a secondary detent located to the rear of the primary detent adapted to engage the cartridges when released by the primary detent, said detents tending normally to move into the path of the cartridges, cam faces on each of said detents, the cam faces of the respective detents being located in different planes, and adapted to be alternately engaged by the movable carrier upon its movement from closed to open position and vice versa, substantially as specified.

13. In a fire arm as described, the combination with a stock, a barrel and a lock action, of a magazine, a movable carrier, two detents controlling the escape of cartridges from the magazine, comprising a primary detent adapted to be first engaged by the cartridge and a secondary detent located to the rear of the primary detent adapted to engage the cartridge when released by the primary detent, both said detents being spring pressed into the path of the cartridge, interengaging surfaces on the movable carrier and respective detents arranged to be brought into operative engagement at different points in the path of travel of said movable carrier whereby each of said detents will be withdrawn at different times from the path of the cartridge, substantially as specified.

14. In a fire arm as described, a stock, a barrel, a housing connecting said parts, a lock action within said housing, a movable carrier, a magazine, two spring blade detents attached to the opposite inner walls of the housing, and normally overhanging the mouth of said magazine, cam surfaces on each of said detents, corresponding cam surfaces on the carrier, the relation of the operating surfaces for the respective detents being such that one of the detents will be depressed when the carrier is in closed position and the other will be depressed as the carrier is moved to open position, substantially as specified.

15. In a take down magazine fire arm, a stock, a barrel, a longitudinally movable magazine, a spring tending to reciprocate said magazine upon its disengagement from said stock, to move the magazine out of engagement with the stock, substantially as specified.

16. In a take down magazine fire arm, a stock, a barrel, a longitudinally movable magazine, a stationary shaft projecting through the head of the magazine and on which the magazine is slidingly mounted, a spring within the magazine about said shaft engaging the head of the magazine and adapted to reciprocate the magazine on said shaft, substantially as specified.

17. In a take down magazine fire arm, a stock, a barrel, a longitudinally movable magazine, a bracket carried on the barrel, a shaft carried by said bracket, and on which the magazine is movably supported, and a spring adapted to reciprocate the magazine when disengaged from the stock, substantially as specified.

18. In a take down magazine fire arm, a stock, a barrel, a magazine both longitudinally and revolubly movable, a shaft on

which said magazine is slidingly mounted, a feather on said shaft, a corresponding groove in the head of the magazine registering with said feather when the magazine is disengaged from the stock, but out of registry therewith when the magazine is engaged, substantially as specified.

19. In a take down magazine fire arm, a stock, a barrel, a longitudinally movable magazine, means for connecting said magazine with said stock necessitating the interengagement of said parts in predetermined relation, a shaft, a feather on said shaft adapted to maintain the magazine in position to engage said stock when disconnected therefrom while permitting the longitudinal movement, substantially as specified.

20. In a take down magazine fire arm, a stock, a barrel, a longitudinally movable revoluble magazine, a shaft on which said magazine is slidingly mounted, a feather in said shaft engaging said magazine and preventing the rotation thereof until it has reached a predetermined position in its reciprocatory movement and upon rotation of the magazine adapted to lock the magazine against return reciprocatory movement, substantially as specified.

21. In a take down magazine fire arm, a stock, a barrel, a magazine, a yoke connecting said barrel and magazine and in which the magazine is revolubly mounted, a spring actuated latch in said yoke adapted to engage the magazine and automatically lock it against rotation when the magazine has been rotated to a predetermined position, substantially as specified.

22. In a take down magazine fire arm, a stock, a barrel, a revoluble magazine, a yoke connecting said barrel and magazine, a spring actuated latch in said yoke adapted to automatically engage the magazine and lock it in its operated position against return rotation, substantially as specified.

23. In a take down magazine fire arm, a stock, a barrel, a magazine both longitudinally and revolubly movable, a yoke supported on the barrel and forming a bearing for said magazine, a spring actuated latch adapted to engage and automatically lock the magazine against movement when the magazine has been moved to a predetermined position, substantially as specified.

24. In a take down magazine fire arm, a stock, a barrel, a revoluble magazine, a yoke connecting said barrel and magazine, a recess in said yoke, a lug on the exterior of said magazine adapted to engage in the recess and limit the revoluble movement of the magazine by engagement with the opposite ends of said recess, substantially as specified.

25. In a take down magazine fire arm, a stock, a barrel, a magazine, mutilated threads on the magazine adapted to engage similar threads within said stock, a yoke in which the magazine is revolubly mounted, a recess in the interior of said yoke, a projection on the exterior of the magazine engaging in said recess to limit the rotation of said magazine, said parts being so relatively located that at one limit of movement of the magazine as determined by the said projection and recess, the mutilated threads of the magazine and stock will be in position to be disengaged and at the opposite limit of movement will be engaged, substantially as specified.

26. In a take down magazine fire arm, a stock, a barrel, a magazine, a reciprocating grip slidingly mounted on said magazine, interengaging separable connections between the stock and magazine, means for locking said grip against movement by the operation necessary to release the magazine from the stock, substantially as specified.

27. In a take down magazine fire arm, a stock, a barrel, a magazine, a reciprocating grip, means for interengaging the magazine with the stock, means for locking the grip in predetermined position simultaneous with the disengagement of the magazine from the stock, substantially as specified.

28. In a take down magazine fire arm, a stock, a barrel, a magazine, a grip slidingly mounted on the magazine, means for securing the grip against movement when the magazine is disconnected from the stock and adapted to release the grip and permit the movement thereof upon the interengagement of the magazine and stock, substantially as specified.

29. In a take down magazine fire arm, a stock, a barrel, a revoluble magazine, a reciprocating grip slidingly mounted on the magazine, a lug on said magazine over which the grip normally rides freely, means on the grip engaged by the lug upon the rotation of the magazine whereby the grip will be secured against movement, substantially as specified.

30. In a take down magazine fire arm, a stock, a barrel, a magazine, a reciprocating grip slidingly mounted on the magazine, a movable lug, a flange on said grip having therein a recess whereby the grip and flange will normally pass over the lug without interference, means for moving said lug out of registry with the recess of said flange whereby the reciprocatory movement of the grip may be checked, substantially as specified.

31. In a take down magazine fire arm, a stock, a barrel, a revoluble magazine, a sliding grip, a flange on said grip having a recess therein, a lug on said revoluble magazine so located as to normally register with said recess whereby the grip will normally pass over the lug without hindrance, said

lug being adapted to be moved out of registry with the recess by the rotation of the magazine, whereby the flange will be engaged by said lug to prevent reciprocatory movement of the grip independent of the magazine, substantially as specified.

32. In a take down magazine fire arm, a stock, a barrel, a magazine, a supporting bracket for the forward end of the magazine including oppositely disposed arms encircling the barrel, said bracket having a recess therein, the barrel being provided with a corresponding recess registering with that of the bracket, a coupling member capable of being wholly contained in the recess of the bracket, means to project the coupling member beyond the recess of the bracket into that of the barrel, substantially as specified.

33. In a magazine fire arm as described, a stock, a barrel, a magazine, a bracket supporting the magazine and carried upon the barrel, means to prevent lateral displacement of the bracket comprising a coupling member normally projecting simultaneously into a recess in the barrel and in a corresponding recess in the bracket, means whereby the coupling member may be permitted to withdraw from the engagement with the barrel and be contained wholly within the bracket, thereby permitting the removal of the bracket, substantially as specified.

34. In a magazine fire arm as described, a stock, a barrel, a magazine, a supporting bracket for the forward end of the magazine, said barrel and magazine having corresponding recesses therein, a plate adapted to simultaneously engage in the recesses of each of said parts to prevent the lateral displacement of the bracket, substantially as specified.

35. In a magazine fire arm as described, a stock, a barrel, a magazine, a supporting bracket for the forward end of the magazine comprising a Y shaped member the arms of which inclose the barrel, oppositely disposed lugs on said member, a recess in said lugs and member, a plate located in said recess and adapted when projected beyond the recess to engage a corresponding recess in the barrel, substantially as specified.

36. In a magazine fire arm as described, a stock, a barrel, a magazine, a supporting bracket for the magazine carried on the barrel, a recess in said bracket, a plate located in said recess, and adapted when projected beyond the recess to engage a corresponding recess in the barrel, adjusting screws in said bracket engaging the plate and adapted to move the plate within said recesses, whereby the bracket will be secured upon the barrel, substantially as specified.

37. In a fire arm, a stock, a barrel, a hammer, a sear engaging said hammer, a stop adapted to lock said sear against disengagement from said hammer and means including a movable cam member to automatically move said stop from the path of the sear, said cam member being movable to and from the path of the stop, thereby permitting the sear to be disengaged from the hammer and means for maintaining said cam member in operative position, substantially as specified.

38. In a fire arm, a stock, a barrel, a sear engaging a hammer, a transversely movable member having a recess therein, means for maintaining said member in such position that the recess is normally out of registry with the sear and the sear blocked against movement by said member and means to move said member at the will of the operator whereby the recess will be caused to register with the sear and said sear permitted to move within the recess and be thereby disengaged from the hammer, substantially as specified.

39. In a fire arm, a stock, a barrel, a swinging carrier, a hammer, a sear, a locking member adapted to automatically lock said sear in engagement with the hammer when the carrier is moved from its closed position, and to automatically release said sear when the carrier is returned to closed position, substantially as specified.

40. In a fire arm, a stock, a barrel, a swinging carrier, a hammer, a sear, a locking member adapted when moved to a predeterment with the hammer, a movable control member adapted when moved to a predetermined position to cause the disengagement of said locking member, substantially as specified.

41. In a fire arm, a stock, a barrel, a housing, a swinging carrier, a hammer, a sear, a longitudinally movable locking pin, a spring normally pressing said movable pin into the path of the sear and preventing the movement thereof, a cam member slidingly mounted in the side of said housing and movable into and out of the path of said locking pin as the swinging carrier is moved to its closed position, the engagement of said pin and cam member being adapted to cause the disengagement of said pin and sear, substantially as specified.

42. In a fire arm, a stock, a barrel, a swinging carrier, a hammer and a sear carried in said swinging carrier, means for locking said sear in engagement with the hammer when the carrier is moved from normal position, substantially as specified.

43. In a fire arm, a stock, a barrel, a swinging carrier, a hammer and a sear engaging said hammer both carried in said swinging carrier, and means for locking said sear in engagement with the hammer at all times when the carrier is moved from nor-

mal position, and means for releasing said sear whereby it may be disengaged from the hammer at the will of the operator, when the carrier is in its normal or closed position, substantially as specified.

44. In a fire arm, a stock, a detachable barrel, interengaging means between said barrel and stock, an adjustable take-up sleeve comprising a revoluble collar having an angular face, a stationary angular face with which said collar engages, and a screw adapted to engage and to rotate said collar whereby the interengagement of the angular faces will cause a longitudinal movement of the collar, substantially as specified.

45. In a fire arm, a stock, a detachable bearer, interengaging means between said barrel and stock, an adjustable take-up sleeve to compensate for variation of the interengaging devices comprising a revoluble collar having an inclined face, a corresponding stationary face with which said collar engages, a shoulder on said collar, an adjusting screw engaging said shoulder and by its adjustment adapted to rotate the collar whereby the interengagement of said inclined faces will produce a lateral movement of the collar, substantially as specified.

46. In a fire arm, a detachable barrel, a screw threaded connection between the barrel and stock, a revoluble annular collar mounted on said barrel and adjacent to the said connection, said collar having a smooth exterior and interior, an inclined surface on the face of said collar, a corresponding surface engaged thereby, a screw member adapted to rotate said collar whereby the collar will be shifted to and from said screw threaded connection, substantially as specified.

In testimony whereof, I have hereunto set my hand this 13th day of January A. D. 1909.

CHARLES A. YOUNG.

Witnesses:
MABEL B. CARR,
F. L. WALKER.

Corrections in Letters Patent No. 955,490.

It is hereby certified that in Letters Patent No. 955,490, granted April 19, 1910, upon the application of Charles A. Young, of near Enon, Ohio, for an improvement in "Firearms," errors appear in the printed specification requiring correction as follows: Page 11, line 98, the words and syllables "when moved to a predeter-" should be stricken out and the words and syllables *to lock said sear in engage-* inserted instead, and page 12, line 18, the word "bearer" should read *barrel;* and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of June, A. D., 1910.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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