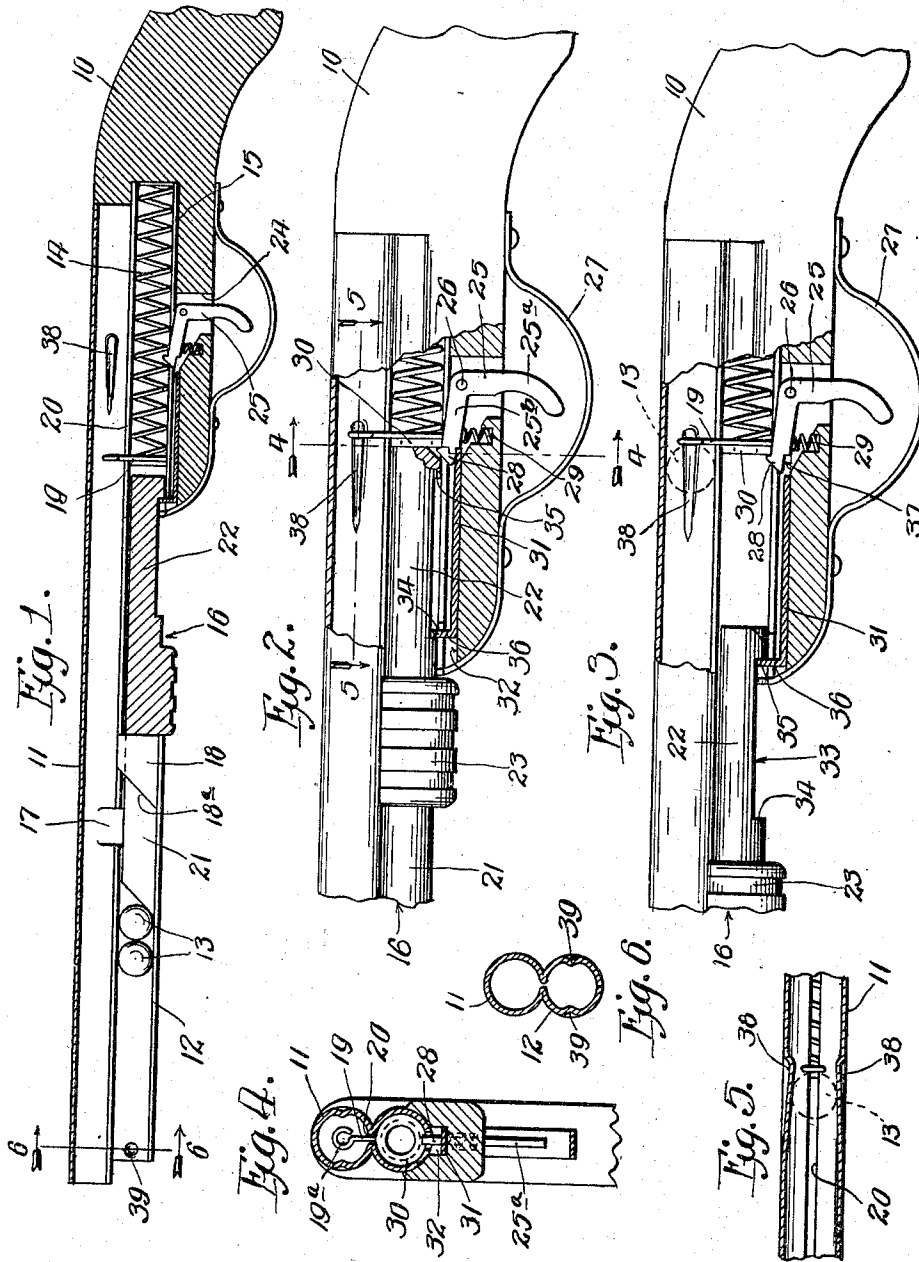


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TOY RIFLE.
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UNITED STATES PATENT OFFICE.

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TOY RIFLE.

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To all whom it may concern:

Be it known that I, JACOB R. SANDAGE, a citizen of the United States, and a resident of St. Joseph, in the county of Berrien and State of Michigan, have invented certain new and useful Improvements in Toy Rifles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the reference characters marked thereon, which form a part of this specification.

This invention relates to improvements in toy rifles, and more particularly to spring actuated toy rifles of the repeating type, having a projectile containing magazine and automatic reloading and spring setting devices, and resembling, in its general features of construction and operation, the so-called "pump" gun, known in the art of explosive firearms.

Among the objects of this invention is to provide, in connection with the reloading and trigger mechanism of the gun, a safety locking device designed to lock the trigger to prevent the discharging of the gun until the reloading and spring setting operations have been properly completed and the several parts restored to the proper positions.

A further object of the invention is to provide improved means for yieldingly retaining the projectiles within the magazine and the barrel, and to prevent the projectiles from being discharged therefrom by gravity.

The purposes and construction of the improved features mentioned will be clearly understood from the description which follows, taken in connection with the illustrations thereof, appearing in the accompanying drawings, in which—

Figure 1 is a view in longitudinal section taken through the rifle, a portion of the stock thereof being removed;

Fig. 2 is an enlarged detail view, partially in section, showing the parts of the trigger and reloading mechanism in locked position;

Fig. 3 is a view similar to Fig. 2, showing the same parts in position for discharging, the trigger locking device being shown in unlocked position;

Fig. 4 is a view in vertical section, taken on line 4—4 of Fig. 2;

Fig. 5 is a detail cross-sectional view, taken on line 5—5 of Fig. 2; and

Fig. 6 is a detail cross-sectional view, taken on line 6—6 of Fig. 1.

Referring to the general features of construction of the rifle, the same comprises a stock 10, a barrel 11, and a magazine 12 integral with and extending throughout the forward end of the barrel immediately below the same, said magazine being adapted to receive and contain a plurality of spherical projectiles or balls 13 of wood, cork, or like material. The remaining parts of the rifle consist of a projectile-impelling spring 14 mounted within a cylindric housing 15 immediately below the rear end portion of the barrel, a reloading and spring setting member 16 intermediate the magazine and the spring 14, a suitable trigger, and the trigger locking device, all of which will be hereinafter described in detail.

The barrel 11, magazine 12, and spring housing 15 are preferably integral with each other, being formed of sheet material bent to form cylindrical chambers arranged adjacent to each other, the margins of the sheet material preferably terminating in abutting relation along the lower surface of the magazine, as shown in Fig. 6. The magazine 12 and housing 15 are located at the forward and rear ends, respectively, of the barrel, and are separated by a space extending throughout the central portion of the barrel and wherein is located the reloading plunger, as hereinafter described. The stock is provided with a suitable depression to receive the housing and adjacent parts of the barrel. The barrel communicates with the magazine by means of a passage or opening 17 located intermediate the ends of the barrel and adjacent to the rear end of the magazine 12, said opening being provided to permit the projectiles to enter the barrel. At the extreme rear end of the magazine and immediately rearward of the opening 17 is provided an upright tongue 18, rigidly held in position intermediate the side walls of the magazine, said tongue being provided at its forward end with an inclined margin 18^a, said margin being inclined downwardly and toward the forward end of the magazine at an angle of substantially 45°, the lower end of the inclined margin being located immediately below the rearward end of the opening 17. At the rear of the barrel and immediately below the same is a cylindrical chamber or housing 15, formed in the same

manner as the magazine 12 and which is mounted within a cylindrical groove formed in the stock 10, the rear end of said housing projecting slightly beyond the barrel and embedded in the material of the stock. The housing 15 contains the projectile-impelling spring 14, as before mentioned, which bears at its rear end against the material of the stock 10 and when fully-expanded, as shown in Fig. 1, extends forwardly to a point spaced a short distance rearwardly from the forward end of said housing. The forward end of the spring is bent upwardly to provide a stem 19, which projects into the barrel 11 through a slot 20 (Fig. 4) extending throughout the length of the housing 15 and between said housing and the barrel 11. The stem 19 of the spring is preferably provided with a looped extremity 19^a, adapted to contact with the projectiles, when the same are placed in the barrel in position for being discharged therefrom, as shown in Fig. 3. Intermediate the housing 15 and the magazine 12 is mounted the reloading plunger or rod 16 arranged in axial alignment with the magazine 12 and spring 14 and adapted to be moved endwise with a reciprocating movement. The plunger extends into and is supported at its forward end within the rear portion of the magazine 12, the forward end 21 thereof being provided throughout its length with a vertical slot adapted to receive the tongue 18, which is thus straddled by said forward end portion of the plunger. The forward end portion 21 is further provided with an inclined or beveled end surface slightly concave in contour and arranged substantially parallel to the inclined edge of the tongue 18. The inclined surfaces or margins of the plunger 16 and tongue 18 cooperate to project the projectiles 13 upwardly through the opening 17 and into the barrel 11, in a manner hereinafter to be described. The rear end portion 22 of the reloading plunger 16 is mounted within the housing 15 and is adapted to engage the spring 14 at its forward end, to compress said spring, in the endwise movement of said plunger. Intermediate the end portions of the reloading plunger 16 is preferably provided a hand grip 23, the same having a grooved or otherwise roughened surface, said hand grip being adapted to be grasped by the user to manipulate the plunger and, further, acting as a stop to limit the movement of the plunger within the space separating the forward and rear ends of the housing and the magazine, respectively, in the act of reloading and cocking the rifle, in a manner hereinafter to be described.

Formed in the material of the stock and located below the housing 15 intermediate its ends is a vertical cavity 24 opening downwardly through the under surface of the

stock. Within this cavity is mounted the trigger 25 in the form of a bell crank lever, having a downwardly extending arm 25^a terminating in a trigger finger, which projects below the under surface of the stock, and a horizontal arm 25^b extending in a forward direction. The trigger is pivotally mounted within the cavity at the junction of the arms thereof, and preferably upon a pin 26 extending transversely through the stock. A trigger guard 27 extends about the trigger finger, and consists of a strip of metal which curves downwardly about the trigger finger and is secured to the under surface of the stock 10 in any suitable manner.

Referring now more in detail to the trigger mechanism and to its connection with the reloading mechanism and locking device, there is provided at the extremity of the horizontal arm 25^b a head 28, which forms a rearwardly facing shoulder or catch, said head being swung vertically in the movement of the trigger and upwardly through a slot extending along the lower surface of the housing 15, said head thus projecting into the path of movement of the spring 14 for the purpose of engaging the forward end of the spring, when it has been compressed or forced rearwardly by the reloading plunger to a position rearwardly of said head. A small coil spring 29 is mounted in vertical position beneath the horizontal arm 25^b of the trigger, and acts to force the arm and head upwardly into position to engage the forward end of the spring and to retain the same under compression after the reloading plunger has been removed. A washer 30 is preferably provided at the forward end of the spring for the purpose of securing more effective engagement between the head of the trigger and the forward end of the spring.

Before describing the details of construction of the locking device, it will be well at this time to set forth the manner of reloading and cocking the rifle and the manner in which the parts operate in accomplishing these functions. As shown in Fig. 1, the parts are in the position which they occupy immediately after the gun has been discharged. The plunger rod is in its forward or normal position with the grip 23 thereof in contact with the rear edge of the magazine, the forward end portion 21 of said plunger closing the opening 17 from the magazine of the barrel, and its rear end portion drawn forwardly out of the path of movement of the spring. In this position also the spring 14 is fully extended or expanded, its stem 19 being a considerable distance forward of the trigger 25 and adjacent to the rear end of the plunger. To reload and cock the rifle it is only necessary to move the plunger rearward with a quick movement to its fullest extent, namely, until the

grip 23 engages the forward end of the housing 15, as shown in Fig. 2, and in like manner move the plunger forward again to its original position. The rearward movement of the plunger forces the spring rearwardly, and compresses the same, the stem or forward portion of the spring being moved a slight distance rearwardly of the head 28 of the trigger, thus permitting the same to move upwardly and engage the washer 30, and to thereby effect the retention of said spring. The rearward movement of the reloading plunger also permits one of the projectiles 13 to roll rearwardly and into contact with the inclined edge of the tongue and to occupy a position immediately below the opening 17. Upon the forward movement of the reloading plunger, the beveled end thereof passes beneath the projectile, and the same is moved or forced upwardly through the opening 17 and into the barrel 11, whereupon it rolls or is impelled by gravity toward the rear end of the barrel until it engages the retaining means, hereinafter to be described, and held in position immediately forward of and in contact with the stem 19 of the spring 14, as shown in Fig. 3. It is desirable, for the reason that the projectiles are not positively actuated during the reloading operation, but are impelled by gravity, that the rifle be held, during the reloading operation, in a vertical or upwardly inclined position with the forward end or muzzle of the barrel elevated above the rear thereof. The inclination of the barrel is of further assistance in the reloading operation, in that the projectiles in coming into contact with the inclined edge of the tongue 18 have a tendency to roll upwardly along the same, thus permitting the beveled end of the plunger to pass beneath and propel the same through the opening 17.

Referring now to the locking device, the same comprises a locking member in the form of a flat strip of metal 31 substantially equal in length to the distance from the head 28 of the trigger to the forward end of the housing 15, said strip being mounted within a groove or slot 32 formed in the stock 10 and extending parallel to and immediately below that portion of the housing 15 intermediate the trigger and the forward end of said housing. The locking member 31 is adapted to be moved endwise through a short distance, the same being actuated by the reloading plunger 16 in the endwise movement thereof and through the medium of a connection between said members, which may be described as follows: The reloading plunger 16 is provided throughout the rear end portion 22, with a slot 33 extending transversely of the plunger and forming rearwardly and forwardly facing shoulders 34 and 35, said shoulders being spaced apart a distance slightly less than the

throw or path of movement of the plunger. The forward end of the locking member 31 is provided with an upwardly extending flange 36, which projects through a slot formed in the lower surface of the housing 15 and into the path of movement of said plunger, said flange or projection being positioned intermediate the shoulders 34 and 35 of the plunger 16 and adapted to be alternately engaged by said shoulders. Referring to Fig. 2, the projection 36 is shown in contact with the foremost shoulder 34 of the plunger 16, the locking member being in the position which it will occupy when said plunger is moved rearward to its fullest extent. In this position of the locking member the rear end thereof projects beneath the head 28 of the trigger and into a notch 37 (Fig. 3) preferably provided in the under surface of said head. It is apparent that the presence of the rear end of the locking member beneath the locking head prevents the downward movement of the arm 25^b of the trigger, and hence prevents the manipulation of the trigger to release the spring from retention by said head of the trigger. Upon moving the plunger to its forward or normal position the projection 36 of the locking member is engaged by the shoulder 35 adjacent to the rear end of the plunger 16, this engagement effecting the forward movement of the locking member a distance sufficient to remove the same from beneath the head of the trigger, thereby unlocking the trigger so that it may be pressed in the usual manner to release the spring and impel the projectile from the barrel. The purpose of the locking member will be seen from the following. Referring to Fig. 2, it is apparent that the plunger is held or allowed to remain at the position it occupies after it is moved rearward to set the spring, that is, directly in the path of movement of the spring, and hence, in the absence of any means for locking the trigger and upon the accidental or inadvertent releasing of the spring by the pressing of the trigger, the plunger would be thrown forward with great force under the action of the spring and against the rear end of the magazine. Therefore, unless locking means is provided to prevent the releasing of the spring under the conditions indicated, caution must be exercised to push the plunger rod forward to its normal position, thereby completing the operation of reloading the gun, before the same is "fired." The purpose of the locking member is, therefore, to lock the trigger, until the plunger has been moved forward to complete the reloading operation and entirely removed from the path of movement of the spring, so that no injury will arise by reason of the plunger being thrown forwardly by the spring. Inasmuch as devices of this kind are made for the use of chil-

dren, it is desirable to have a locking device which operates automatically to prevent the discharge of the gun when the same is not properly loaded or the parts not in proper positions. For this reason, a gun constructed in the manner described is safer and less liable to injure or be injured than are the guns of this type in which no safety device is employed.

The further improved feature of my invention resides in the projectile-retaining device, hereinbefore referred to. This device is utilized for two purposes, namely, to engage and retain the projectile within the barrel and in position for being propelled therefrom, and also to permit the introduction of the projectile into the magazine and at the same time prevent the same from rolling out of the magazine when the gun is inclined downwardly. Referring to the first form of projectile-retaining means, the same is formed by providing, at diametrically opposed points in the barrel 11, two elongated depressions 38, 38 in the outer surface and extending longitudinally thereof, adjacent to the rear end of the barrel and throughout the portion thereof occupied by a projectile when in position for being discharged. These depressions 38 (Fig. 5), being formed by pressing the metal of the barrel inwardly, form complementary projections on the inner surface of the barrel, which act to restrict the passage of the projectiles through that portion of the barrel. As shown in Fig. 5, the depressions and likewise the projections formed thereby are tapered or inclined inwardly toward the axis of the barrel and from the forward to the rear of the barrel. Thus, when a projectile 13 is introduced into the barrel and rolls rearwardly, as hereinbefore described, the same will come in contact with the projections formed by said depressions, and will be gradually brought to a stationary position by its contact with the inclined surfaces of said projections, and will be yieldingly held thereby. By forming the projections in the form of tapered, elongated surfaces, the projectiles are not only brought to rest gradually and yieldingly held, but it allows for slight discrepancies in the shape and size of the projectiles used, so that all projectiles will be retarded and retained in the same manner, although the position they may occupy at rest may vary a slight amount with respect to the space restricted by the projections.

The other form of projectile-retaining means is located at the forward end or opening of the magazine, the retaining means in this instance consisting of projections or points 39, 39 extending inwardly and formed by pressing the metal inwardly at diametrically opposed points, in the same manner as before described in connection with the re-

taining means of the barrel. The projections in this instance are not elongated, but are in the form of projecting points. These projections cooperate in the following manner to permit the introduction of the projectile and at the same time prevent the same from rolling outwardly from said opening. When a projectile is introduced into the opening, the same will come in contact with the projections 39, which tend to oppose the entrance of the same. The pressure of the projectile against the projections will tend to force the side walls of the magazine apart, and, in view of the fact that the metal is more or less flexible and that the walls of the magazine are not connected along the lower surface, the walls of the magazine will be forced apart a sufficient distance to allow the projectile to pass beyond the projections 39 and into the magazine. After the projectile has passed the projections, the end of the magazine will again assume its normal position, thus closing the entrance to the magazine, to the escape of the projectiles therefrom. The forms of projectile-retaining means herein described and illustrated require only the pressing of the metal of the barrel or magazine inwardly to provide the projections, an operation which is accomplished, in the forming of the barrel and magazine, by a slight change in the dies used in the form of the said barrel and magazine and without the use of additional parts or expenditure of time in the assembling of the rifle.

The several features of the device may obviously be modified as to details of construction, without departing from the spirit of the invention. Therefore I do not wish to be limited to the construction herein illustrated and described, except in so far as set forth in the appended claims.

I claim as my invention:

1. A toy rifle, comprising a barrel, a projectile-impelling spring associated with said barrel, a manually operable member, movable in one direction to set said spring and in the opposite direction to be moved beyond the path of movement of said spring, a trigger adapted to retain said spring in set position and to release the same, and a locking member actuated by said endwise movable member into and out of locking engagement with said trigger, in the movement of said movable member into and beyond the path of movement of said spring.

2. A toy rifle, comprising a barrel, a projectile-impelling spring, a plunger in axial alinement with said spring and movable endwise with a reciprocating movement to compress said spring and to be withdrawn beyond the path of movement thereof, a trigger adapted to engage and retain said spring in compressed position, and an endwise movable locking member located adja-

cent to the path of movement of said plunger and adapted to be actuated by said plunger through a relatively short distance into and out of locking engagement with said trigger.

3. A toy rifle, comprising a barrel, a projectile-impelling spring associated with said barrel, a trigger adapted to retain said spring in compressed position, a plunger in axial alinement with said spring and adapted to be moved endwise with a reciprocating movement into and beyond the path of movement of said spring to compress said spring, and a locking member arranged parallel to said plunger and adjacent to the path of movement thereof, said locking member and plunger being provided with coacting members adapted to move said locking member into locking engagement with said trigger during the compression of said spring and out of locking engagement with said trigger during the movement of said plunger beyond the path of movement of said spring.

4. A toy rifle, comprising a barrel, a projectile-impelling spring associated with said barrel, a trigger including a head movable transversely to said spring and adapted to retain the same in compressed position, a plunger in axial alinement with said spring, adapted to be moved in one direction to compress said spring and in the opposite direction beyond the path of movement of said spring, and a locking member comprising an endwise movable strip located adjacent the path of movement of said spring and provided at one end with a projection extending into the path of movement of said plunger, the latter being provided with shoulders spaced apart and adapted to engage said projection of the locking member to move the same into and out of locking engagement with said trigger.

5. A toy rifle, comprising a barrel, a pro-

jectile-impelling spring associated with said barrel, a trigger including a head movable transversely into and out of the path of movement of said spring to engage and release the same in compressed position, a plunger in axial alinement with said spring, adapted to be moved in one direction to compress said spring and in the opposite direction beyond the path of movement of said spring, and a locking member comprising an endwise movable strip located adjacent the path of movement of said spring and provided at one end with a projection extending into the path of movement of said plunger, the latter being provided with shoulders spaced apart, adapted to engage said projection of the locking member to move the same a relatively short distance into a position to engage the head of said trigger during the movement of said plunger in a direction to compress said spring, and to move said locking member out of engagement with said head in the movement of said plunger in the opposite direction.

6. A toy rifle, comprising a tubular metal barrel, a projectile-impelling spring associated with said barrel, and means for yieldingly retaining a projectile in position to be engaged by said spring, comprising projections extending longitudinally of said barrel and in the path of movement of said spring, said projections being inclined with respect to the barrel and formed by pressing the metal of the barrel inwardly from the exterior thereof.

In testimony that I claim the foregoing as my invention, I affix my signature in the presence of two witnesses, this 4th day of Apr., A. D. 1916.

JACOB R. SANDAGE.

Witnesses:

ALLIE WHITE,
L. C. UPTON.