July 12, 1949. C. G. NITZ ET AL 2,476,212

TOY GUN

Filed March 22, 1946

FIG. 4.

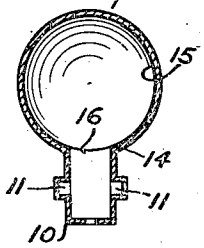
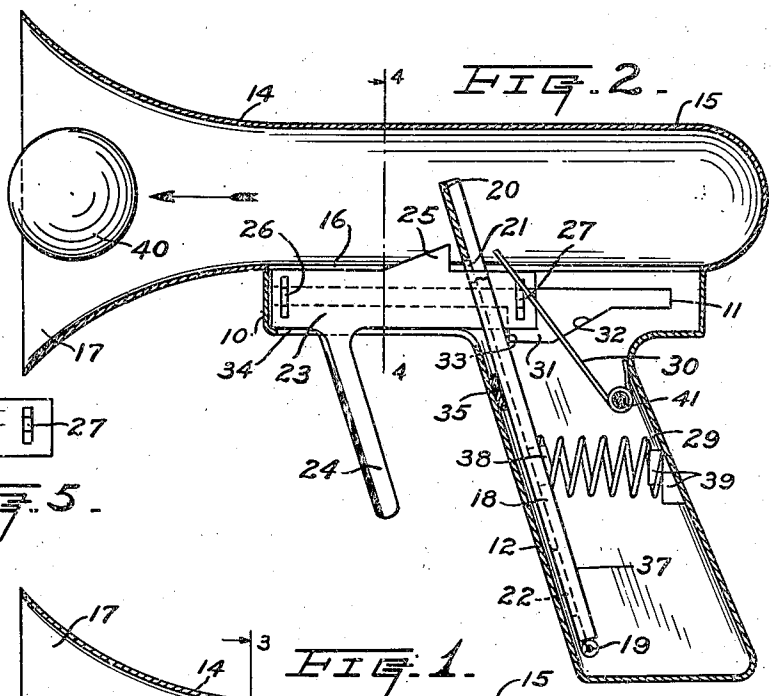


FIG. 2.



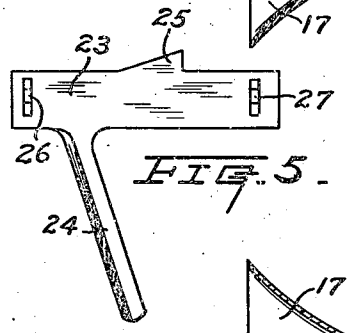
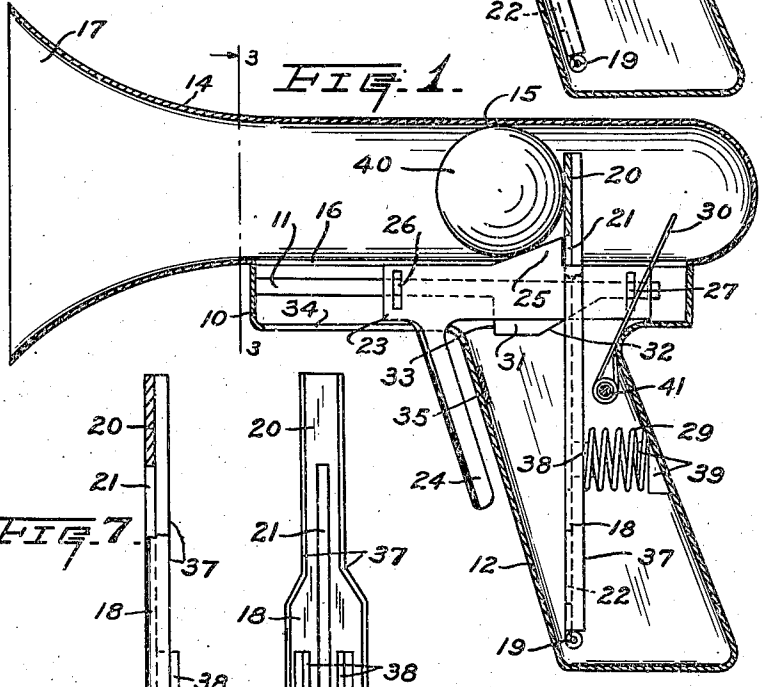


FIG. 5.

FIG. 1.



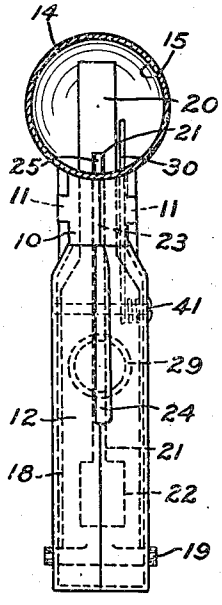


FIG. 3.

FIG. 7.

FIG. 8.

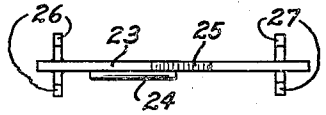


FIG. 6.

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TOY GUN

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5 Claims. (Cl. 124—27)

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Our invention relates in general to improvements in catapults or the like, and relates more specifically to improvements in the construction and operation of toy guns embodying catapult mechanism for delivering diverse kinds of projectiles therefrom.

The primary object of the present invention is to provide a simple and durable automatic gun adapted to forceably eject diverse types of bullets or projectiles in a rapid and most effective manner.

Some of the more important specific objects of our invention are as follows:

To provide an improved toy pistol or the like, which is adapted to be manufactured and sold at moderate cost, and which is also safely operable by children.

To provide an attractive and fascinating catapult which may be utilized to play games of skill, and which may also be used to shoot various kinds of projectiles such as rubber balls, objects with parachutes attached, feathered shuttlecocks, or the like.

To provide an improved mechanical pistol which is adapted to be readily operated so as to deliver the bullets with considerable force but without undue danger.

To provide a toy gun all parts of which may be conveniently constructed, assembled or dismantled, and wherein the movable parts with the exception of the trigger, are all enclosed and thoroughly protected.

To provide an improved spring operated pistol assemblage which is dependable and fascinating in action, and which may also be produced in quantity with simple equipment so that various parts of the mechanism are interchangeable.

To provide an exceedingly strong and compact catapult mechanism which is automatic in action, and which also is adapted to be utilized for diverse purposes.

These and other specific objects and advantages of our invention, will be apparent from the following detailed description.

A clear conception of the several features constituting the present improvement, and of the mode of constructing and of operating a toy gun embodying the invention, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

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Fig. 1 is a longitudinal section through a typical toy catapult pistol embodying the invention, showing the hammer or catapult arm about to be released in order to deliver a ball projectile;

Fig. 2 is a similar section through the same pistol, showing the hammer sprung and the projectile being delivered from the bell shaped discharge end of the barrel;

Fig. 3 is a transverse section through the pistol, taken along the line 3—3 of Fig. 1;

Fig. 4 is a transverse section through the barrel and the guide portion of the piston casing, taken along the line 4—4 of Fig. 2 but with other internal parts omitted;

Fig. 5 is a side view of the trigger and hammer retracting and release element of the pistol;

Fig. 6 is a top view of the same trigger and hammer retracting and release element;

Fig. 7 is a side view of the hammer or catapult lever arm, a portion thereof being shown in section; and

Fig. 8 is a rear view of the hammer arm.

While the invention has been shown and described herein as being especially applicable to toy pistols for projecting rubber balls or the like, it is not our desire or intent to unnecessarily limit the scope or the utility of the improved features by virtue of this restricted embodiment.

Referring to the drawing, the typical toy catapult pistol shown therein by way of illustration, comprises in general an elongated main guide casing 10 having longitudinal parallel guide recesses or grooves 11 in the opposite side walls thereof and being provided with an integral hollow grip or handle 12; a trumpet shaped elongated barrel 14 secured to the top of the casing 10 and having a rear hollow cylindrical portion 15 in open communication with the casing interior through a longitudinal opening 16, while its forward portion 17 is flared or bell shaped; an impact lever or hammer 18 having its lower extremity provided with pivots 19 journalled in the lower side walls of the handle 12 while its upper impact portion 20 is swingable within the rear barrel portion 15 through the elongated opening 16, and its medial portion is provided with a longitudinally extending slot 21 terminating in a lower enlarged hole 22; a combined trigger and

hammer retracting and release element 23 having an integral depending trigger 24, an integral upper hammer retracting tooth 25, and also being provided with front and rear oppositely extending guide projections 26, 27 respectively, which are engageable with the elongated casing recesses or grooves 11; and springs 29, 30 coacting respectively with the hammer 18 and with the rear side projections 27 of the trigger element 23.

The main casing 10 and handle 12 may be formed in separable sections and of any durable material such as sheet metal or plastic, and the barrel 14 may also be constructed of attractive and strong material such as sheet metal or plastic, and may be firmly secured to the casing in any suitable manner. While the barrel 14 shown in the drawing, has a trumpet shape, this formation is desirable only for certain uses, and the barrel may also be provided with a uniform cylindrical bore throughout its entire length. Each of the parallel elongated recesses 11 which are formed in the casing 10 beneath the barrel opening 16, is provided with an enlarged pocket 31 intermediate its ends, and each of these pockets 31 has an inclined rear wall 32 and an upright front wall 33 as clearly shown in Figs. 1 and 2. The main casing 10 is also provided with a lower slot 34 through which the trigger 24 extends and along which this trigger is movable, and the upper interior portion of the grip handle 12 is moreover provided with a buffer strip 35 which is cooperable with the hammer 18 so as to cushion and arrest its forward motion.

The impact lever or hammer 18 is preferably formed of a single blank of sturdy sheet metal with the aid of punches and dies, and is provided with reenforcing opposite side flanges 37 as illustrated in Figs. 7 and 8. These flanges 37 and the pivot 19 are formed integral with the same blank from which the hammer body is formed; and the medial portion of the hammer 18 with which the helical compression spring 29 coacts, is provided with spring retaining and centering lugs 38 which are also formed integral with the common blank. As previously indicated, the lower hammer pivots are mounted in the lower portion of the handle 12 while the upper impact portion 20 is swingable within the rear barrel portion 15 through the elongated opening 16, from an inclined position in contact with the buffer strip 35 as shown in Fig. 2, to a vertical position as illustrated in Fig. 1, and vice versa. The rear end of the compression spring 29 reacts against a retaining and centering abutment 39 formed integral with the handle 12, and the upper hammer impact portion 20 is adapted to directly engage and to eject a ball 40 or other suitable projectile confined within the barrel 14, in a manner to be subsequently explained.

The trigger and hammer retracting and release element 23 is also preferably formed of one or more pieces of strong sheet metal with the aid of punches and dies, and the trigger 24 is the only movable portion of the mechanism which is not housed within the casing 10, grip handle 12, or barrel 14. The hammer retracting tooth 25 of the element 23 is movable within the barrel portion 15 and along the opening 16 when the element is travelling parallel to the recesses 11 in the main casing 10, and when thus moved rearwardly, the tooth 25 is adapted to directly engage the hammer portion 20 and to thereby retract the hammer 18. The front projections 26 of the element 23 are slidable and swingable in the front portions only of the casing recesses or grooves 11, while the rear projections 27 are adapted to drop into the casing pockets 31 and are also slidable along the rear portions of the adjacent grooves 11 whenever the gun is being fired. The cantilever tension spring 30 engages the rear projections 27 on one side of the element 23, and winds around and is supported from a pivot screw 41 which may also be utilized to connect the casing and handle sections, and two springs 30 disposed on opposite sides of the element 23 may be utilized if desired. The trigger element 23 extends through the hammer slot 21, and the enlarged hole 22 at the lower end of this slot serves to permit convenient assembly of the hammer 18 and element 23.

When the various parts of the improved gun assemblage have been properly constructed as hereinabove described, the trigger element 23 may first be inserted within the hammer 20 by passing the rear projections 27 through the hammer hole 22 and by subsequently sliding the element 23 upwardly within the slot 21. The springs 29, 30 may then be caused to properly coact with the hammer 18 and projection 23 respectively, and all of these elements may thereafter be confined within the casing 10 and handle 12 by uniting the sections of the casing with the aid of the screw 41 or otherwise. The barrel 14 may then be attached to the casing 10 in any convenient manner so as to complete the assemblage, and various types of projectiles such as balls 40, objects with parachutes attached, feathered shuttlecocks, or the like should be provided.

After the gun has been properly assembled the trigger 24 will be the only exposed movable part of the mechanism, and this trigger 24 is adapted to either swing about the front projections 26 of the element 23, or it may be retracted along a straight path toward the handle 12 so as to cause the tooth 25 to move rearwardly within the rear barrel portion 15. If the trigger 24 is permitted to swing about the projections 26, the rear projections 27 will drop into the pockets 31 and the tooth 25 of the element 23 will not engage the upper hammer portion 20. However, if upward pressure is exerted against the trigger 24 when it is being retracted, the tooth 25 will engage the upper impact portion 20 of the hammer 18 and will retract the hammer from inclined position as shown in Fig. 2 to vertical position as shown in Fig. 1. During such retraction of the hammer 18 both of the springs 29, 30 will be tensioned, and as the hammer 18 reaches upright position as shown in Fig. 1, the tooth 25 of the element 23 will be withdrawn into the slot 21 and out of retracting engagement with the hammer portion 20 thereby permitting the stiff compression spring 29 to quickly impell the hammer forwardly and against the buffer strip 35 as shown in Fig. 2. If a ball 40 or other projectile has been previously positioned within the barrel portion 15 and against the upper hammer portion 20, the projectile will be ejected from the outlet end of the barrel 14 with considerable force, thus causing a shot or firing operation to be completed.

After the projectile or ball 40 has been thus forcibly ejected, the rearward pressure on the trigger 24 may be released, whereupon the tension spring or springs 30 will force the element 23 forwardly. During such forward motion of the trigger element 23, the upper inclined edge of the tooth 25 will engage the upper end of the slot 21 in the hammer 18, and the rear projections 27 will ride down the inclined walls 32 into

the pockets 31, thereby permitting the tooth 25 to pass forwardly beyond the inclined hammer 18. When the tooth 25 has thus passed the hammer while the element 23 is moving forwardly, the gun is re-cocked and ready for subsequent action, and all of these movements take place very quickly so that rapid successive firing is made possible. It is to be noted that when the trigger element 23 has been restored to a position wherein the tooth 25 thereof is in front of the hammer portion 20, the trigger 24 may be swung about the front projections 26 and during such swinging movement the rear projections 27 will oscillate within the adjacent pockets 31.

From the foregoing detailed description it will be apparent that our present invention provides an improved automatically functioning mechanical gun or pistol, which is adapted to be fired in rapid succession and which may be utilized to deliver various types of projectiles in any desired direction. The improved gun may be employed for diverse purposes, and when the projectiles are shot upwardly, the descending projectiles may be caught in the open end of the barrel 14. When thus utilized, it is preferable to provide the barrel with a bell-shaped projectile delivery and receiving end 17, thereby producing a game of skill which is exceedingly amusing as well. The gun assemblage may be made of any desired dimensions and the barrel 14 may be of any desired length, and the projectiles may be either hard or soft balls 40, miniature soldiers provided with parachutes for retarding rapid descent thereof, or shuttlecocks provided with feathers or other impact retarding structures.

It will also be apparent that the improved gun assemblage is of extremely simple, compact and durable construction and comprises relatively few simple parts which may be readily manufactured and conveniently assembled and dismantled. The casing 10, handle 12, and barrel 14 may be constructed of attractive sheet metal or plastic to produce a highly attractive assemblage and the element 23 and hammer 18 are preferably constructed of durable sheet metal in order to enhance the life of the unit. Since all of the rapidly moving elements of the assemblage are constantly concealed, danger of injury to the operators is minimized, and the trigger 24 may be manipulated in various ways to either retract the hammer 18 or to avoid doing so. The improved construction of the trigger element 23 permits this element to be automatically restored to proper position after each impact blow has been delivered by the hammer 18, by virtue of the specific construction of the recesses 11 and of the pockets 31 associated therewith. The trigger element 23 and the hammer 18 may be readily constructed of sheet metal with the aid of punches and dies at relatively low cost and in a manner whereby these elements will be interchangeable with other similar elements, and the improved gun has proven highly satisfactory and successful in actual use. The gun assemblage may be readily assembled and dismantled and may obviously be utilized for diverse purposes and need not necessarily be embodied in a toy such as shown, since the hammer actuating and release mechanism is well adapted for more general application.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of use, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

We claim:

1. In a mechanical catapult, a projectile conducting barrel having a manipulating handle and being provided with a recess extending along and located adjacent to the barrel, said recess having a continuous rectilinear guiding edge near the barrel and also having a locally pocketed opposite edge, a rigid hammer having one end pivotally mounted within said handle and its opposite end swingable within said barrel while its medial portion is provided with a slot, a trigger element extending through said slot and having a projection slidable along said recess and also having a rigid tooth engageable with said hammer adjacent to an end of said slot, said projection being engageable with said continuous recess edge to cause said tooth to travel along a rectilinear path throughout the entire retracting movement of the trigger and being swingable into the pocket of said opposite recess edge to cause said tooth to clear the hammer during return motion of the trigger, means for swinging said hammer forwardly whenever said tooth has completely entered said slot during retraction of the hammer, and means for swinging a portion of said trigger element away from said barrel during return movement of the trigger.

2. In a mechanical catapult, a projectile conducting barrel having a manipulating handle and being provided with a pair of spaced parallel recesses extending along and located adjacent to the barrel, said recesses having continuous rectilinear guiding edges near said barrel and also having locally pocketed opposite edges remote from the barrel, a rigid hammer having one end pivotally mounted within said handle and its opposite end swingable within said barrel while its medial portion is provided with a slot, said hammer being swingable between said recesses, a trigger element extending through said slot and having opposite side projections slidable along said recesses and also having a rigid tooth engageable with said hammer adjacent to an end of said slot, said projections being engageable with said continuous recess edges to cause said tooth to travel along a rectilinear path throughout the entire retracting movement of the trigger and some of said projections being swingable into the pockets of said opposite recess edges to cause said tooth to clear the hammer during return motion of the trigger, means for swinging said hammer forwardly whenever said tooth has completely entered said slot during retraction of the hammer, and means for swinging a portion of said trigger element away from said barrel during return movement of the trigger.

3. In a mechanical catapult, a projectile conducting barrel having a manipulating handle and being provided with a continuous rectilinear guiding edge extending along and located near the barrel, a rigid hammer having one end pivotally mounted within said handle and its opposite end swingable within said barrel while its medial portion is provided with a slot, a trigger element extending through said slot and having a projection slidable along said guiding edge and also having a rigid tooth engageable with said hammer adjacent to an end of said slot, said projection being constantly engageable with said continuous guiding edge to cause said tooth to travel along a rectilinear path throughout the entire retracting movement of the trigger and a portion of said element being swingable about said edge to cause said tooth to swing away from said barrel and clear the hammer during return motion of the trigger, means for swinging said hammer

forwardly whenever said tooth has completely entered said slot during retraction of the hammer, and means for swinging said trigger element away from said barrel during return movement of the trigger.

4. In a mechanical catapult, a projectile conducting barrel having a manipulating handle and being provided with a pair of spaced parallel rectilinear guiding edges extending along and located near the barrel, a rigid elongated hammer having one end pivotally mounted within said handle and its opposite end swingable within said barrel while its medial portion is provided with a slot, a trigger element extending through said slot and having opposite side projections slidable along said guiding edges and also having a rigid tooth engageable with said hammer adjacent to an end of said slot, said projections being constantly engageable with said continuous guiding edges to cause said tooth to travel along a rectilinear path throughout the entire retracting movement of the trigger and the rear portion of said element being swingable about said edges to cause said tooth to swing away from said barrel and clear the hammer during return motion of the trigger, a spring for swinging said hammer forwardly whenever said tooth has completely entered said slot during retraction of the hammer, and resilient means for swinging said trigger element about said projections during return movement of the trigger.

5. In a mechanical catapult, a projectile conducting barrel having a manipulating handle and

being provided with spaced parallel guiding recesses extending along and located near the barrel, a rigid elongated hammer having one end pivotally attached to said handle and its opposite end swingable within said barrel while its medial portion is provided with a slot terminating in an enlarged opening near the hammer pivot, and a flat rigid trigger element extending through said slot and having opposite side projections slidable along said recesses and also having a tooth engageable with said hammer to retract the same, said trigger element being formed for insertion within said hammer slot only through said enlarged opening and being thereafter confined within said slot by said recesses and by the pivotal mounting of the hammer.

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CARL F. HOFMEIER.

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