June 29, 1937. W. R. BIXLER 2,085,412

REPEATING TOY PISTOL

Filed Feb. 19, 1934

Fig. 1.

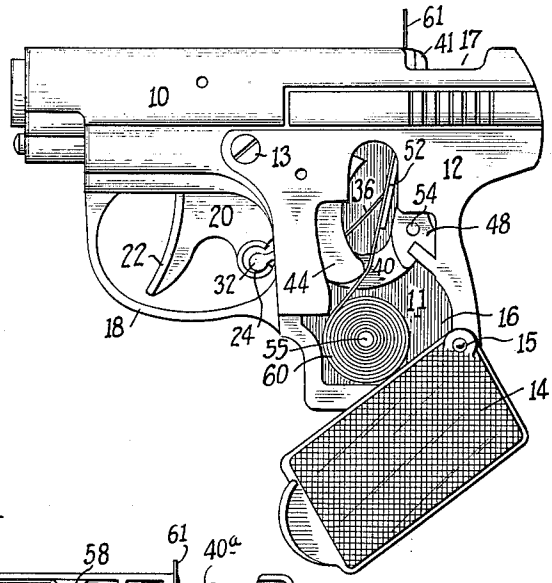


Fig. 6.

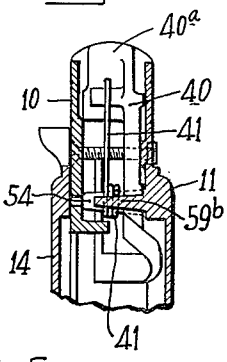


Fig. 2.

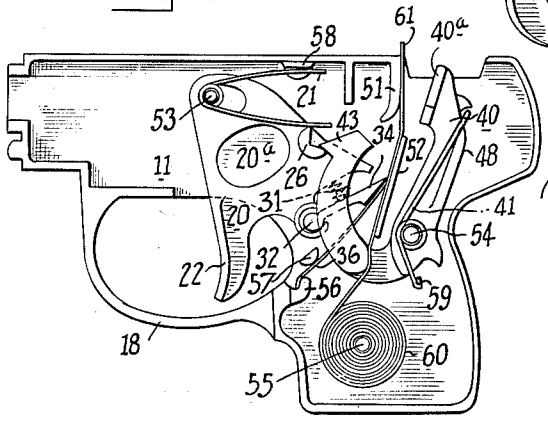


Fig. 5.

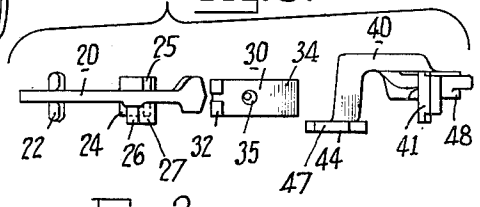


Fig. 3.

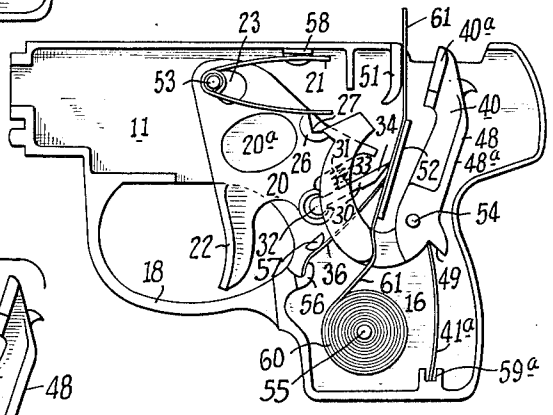
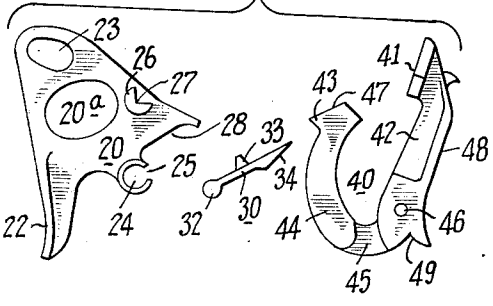


Fig 4.



INVENTOR

Willard R. Bixler

BY

Austin & Dix

ATTORNEY

Patented June 29, 1937 2,085,412

UNITED STATES PATENT OFFICE

2,085,412

REPEATING TOY PISTOL

Willard R. Bixler, Kenton, Ohio

Application February 19, 1934, Serial No. 711,828

3 Claims. (Cl. 42—57)

This invention relates to improvements in toy pistols, and more particularly to toy pistols of the automatic type wherein a strip or roll of caps are progressively fed and exploded by the simultaneous operation of the trigger and hammer.

Hitherto it has been proposed to use automatic toy pistols of the type in which the trigger mechanism and cooperating hammer mechanisms are adapted to rotate about a stud or pin in which an auxiliary operating member is interposed between the trigger and hammer mechanisms for transmitting the power to the hammer. With such devices it has been found that the manipulation of the trigger or so-called "trigger squeeze" to simulate the ordinary action of the automatic type pistol, has not been possible, due to the jerky action of the first-class lever trigger mechanism used, and also to the auxiliary operating members.

It is a feature of the present invention to provide an improved toy pistol-operating mechanism in which the trigger member forms a lever of the second class.

It is a further feature of this invention to provide such an improved toy pistol in which the hammer mechanism is directly connected to and actuated by the trigger mechanism.

It is also a further feature of this invention to provide improved automatic toy pistols adapted to use rolls of caps in which the caps are separately fed by a trigger-driven, actuating member in conjunction with a fixed plate member.

Another feature of the present invention is the provision of an improved trigger mechanism permitting an improved "trigger squeeze" in which the trigger is mounted as a lever of the second class.

These and other desirable features and advantages of the present invention will be described in the accompanying specification and illustrated in the drawing, certain preferred embodiments being shown by way of illustration only, for, since the underlying principles may be incorporated in other specific devices, it is not intended to be limited to the ones here shown except as such limitations are clearly indicated by the appended claims.

In the drawing like numerals refer to similar parts throughout the several views, of which

Fig. 1 is an elevation of a toy pistol with a magazine cover moved to one side to show the cap-feeding mechanism and hammer mechanism;

Fig. 2 is an elevation of a pistol with one side of the casing removed and showing the association of the several parts;

Fig. 3 is a view similar to Fig. 2 showing a modified form of spring for operating the hammer;

Fig. 4 is an exploded view of the trigger and hammer members with the cap-strip actuating member interposed therebetween;

Fig. 5 is a top plan view of the members shown in Fig. 4 showing the configuration and assembly thereof; and

Fig. 6 is a sectional view taken through the handle of the gun showing a modified torsion spring for controlling the hammer.

Referring now to the drawing, the improved toy pistol of the present invention comprises a casing **10** including mating sections **11**, **12**, secured together in any desired manner as by means of bolts or screws **13**. A cover **14** is formed on the section **12** and is adapted to be moved about a stud or a pin **15** whereby to serve as a closure or cover for a chamber or space **16** formed in the handle of the gun, in which space is mounted the operating mechanism of the gun. The mating sections **11** and **12** of the gun casing are apertured at the upper rear portion to provide a space **17** permitting the movement of the hammer **40***a* of the hammer mechanism or plate **40**.

The operative members of the pistol mechanism comprise a trigger member designated generally by the numeral **20**, a cap-strip actuating member designated generally by the numeral **30**, and a hammer piece designated generally by the numeral **40**. Associated with these three members are torsion spring **21**, compression spring **31** and torsion spring **41**, severally adapted to maintain the members **20**, **30** and **40** in operative, engaged position. A leaf spring **41***a* may be used in place of the torsion spring **41** for the hammer-urging spring, as shown more particularly in Fig. 3.

In the hammer mechanism shown in Fig. 6 the torsion spring **41** is mounted on member **54**, the hammer-engaging end being extended up against the hammer for an appreciable distance, while the shorter end is adapted to be urged against a post or stud member **59***b* as a stop.

The section **11** of the pistol casing is provided with an integral trigger guard **18**. In addition, the casing section **11** is provided with an integral anvil **51** at the forward end of the aperture **17**. In addition to the anvil there is provided a plate **52** adapted to cooperate with the strip-actuating member **30**. Pins **53**, **54**, are provided to serve as pivots for the trigger and hammer members,

respectively. A pin or stud 55 is provided at the bottom portion of the chamber 16 and is adapted to receive the roll of caps 60.

Considering the operating members in some detail, the trigger 20 comprises a generally triangular member which may have a central aperture 20a, a finger-engaging portion 22, and an elongated slot 23 adapted to rotate about pintle 53 as a fulcrum. The aperture 20a may serve to permit the trigger member 20 to rock freely about the bolt or screw 13 which joins the casing parts of the pistol together. A socket member 24 is provided at the bottom of the trigger, this socket comprising a generally circular member, apertured, as indicated at 25, and adapted to receive the ball or cylinder 32 of the cap-strip actuating member 30 whereby to form therewith an articulated joint. The member 20 is provided with a projection 26 extending from one side thereof which projection is in turn provided with an angular section 27, for the purpose to be described hereinafter. Rearwardly of the section 24 the trigger is provided preferably with a flat surface 28 adapted to serve as a bearing surface for the compression spring 31 mounted on the stud or pin 33 of the member 30.

The hammer piece 40 preferably comprises a generally U-shaped member having a striking-face or hammer 41 formed at the inner portion of the longer leg 42 and a tripping member or shoulder 43 formed at the upper end or shoulder of the shorter leg 44. The shorter leg 44 of this member is displaced with respect to the leg 42 and forms a well, depression or socket 45 through which the cap-strip 61 may be threaded from the roll of caps 60. The hammer piece is provided with an aperture 46 at the bottom of the leg 42, which aperture is adapted to engage the pivot or pin 54 formed on the casing member 11 and about which the hammer piece is adapted to be rotated. The shoulder 43 is provided with a face 47 over which the boss 26 of the trigger plate is adapted to slide when the trigger is returned to the off position, the elongated slot 23 permitting the trigger plate to ride over the fulcrum 53 a sufficient distance to allow the plate to clear the upper end of the arm 44 of the hammer piece.

The cap-strip-advancing member 30, as noted above, is not only provided with a ball or articulating member 32 adapted to engage the socket 24 of the trigger plate, but is provided with a stud 33 adapted to flexibly engage a spiral compression spring member 31, which in turn is maintained against the section 28 of the trigger plate 20. The compression spring 31 maintains a uniform pressure on member 30, as it rides on flat spring 36 and cap-plate 52. The flat spring 36 is held in position by the stud 57 and shoulder 56 formed in the member 11, and its free end engages the cap plate 52, permitting the cap-strip 61 to be threaded therebetween and slidably held in position. By this construction, the advancing member 30 engages the cap-string 61 and advances it in a resilient manner, which is made possible by the flexibility of compression spring member 31.

The trigger plate 20 is held in normal inoperative position by torsion spring 21. The boss 26 receives one leg of the torsion spring 21, while the other leg is held in engaged position by a boss 58 formed in the upper portion of the casing member 11.

The torsion spring 41, which maintains the hammer in position, may be provided with two legs, one of which is engaged with a pin or stud 59 formed on the casing member 11 while the other end of the spring may grip the rear portion or edge 48 of the hammer piece. Where a leaf spring 41a is used to urge the hammer piece into position, a shoulder or dog 49 may be formed at the bottom of the leg or arm 42 of the hammer member, a socket 59a being formed at the bottom of the chamber 16 formed in the bottom of the handle portion of member 11.

In operation, a roll of caps 60 is mounted on the pintle 55 in the chamber 16 formed in the handle of the toy pistol. The leading or free end of the cap-strip 61 is threaded through the leaf spring 36 past the gripping wedge-shaped end 34 of the cap-strip-advancing or actuating member 30 on and against the plate 52 until it is brought in firing position in front of and abutting the anvil 51.

The trigger 22 of the trigger plate when retracted rearwardly causes the notch or projection 27 of the boss 26 on the trigger plate to engage the shoulder or angle 43 of the hammer piece, forcing the latter back against the action of the hammer coil spring 41 or leaf spring 41a, as the case may be, causing the hammer piece to rotate about the pivot member 54. Simultaneously with this operation the articulation of member 30 with trigger plate 20 by means of the socket joint 24, causes the forward or pointed end 34 of the member 30 to be pushed into and advance the cap-strip material 61. The cap-strip is held in position against the plate 52 by the leaf spring 36. As the member 30 is pushed into the cap-strip, it is forced to ride up on the plate 52, thus pushing the cap-strip 61 upwardly in front of the anvil 51. When the hammer is pushed to its rearmost position the dog or shoulder 43 disengages from the boss 26 and the hammer coil spring 42a projects and forces the hammer forward, the hammer face 41 striking the anvil 51, causing the cap interposed therebetween to explode. In the forward movement of the hammer caused by the spring 41 or 41a, the face 47 of the leg 44 of the hammer piece pushes the underside of the boss 26 upwardly and forwardly, which causes a forward and return movement of the trigger piece as far as the length of the pivot slot 23 permits. When the face 47 of the hammer leg 44 has passed the boss 26 of the trigger plate, the coil spring 21 mounted on pintle 53 forces the trigger plate forward to normal, inoperative position.

With the trigger mechanism formed as a lever of the second class wherein the force supplied by the finger on the trigger surface 22 is intermediate the point of resistance 27 and the fulcrum 23, a distinct mechanical advantage is secured, as well as a smooth pull of the trigger. This smooth pull prevents a jerky operation of the gun as there is no rotation of the trigger plate about a central axis, as occurs in the average gun. This improved trigger pull is so marked that it is possible to practice "trigger squeeze" exercises with the improved toy pistol of the present invention which result has only been possible hitherto with real pistols.

The terms and expressions which have been employed are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described, or portions thereof, but it is rec-

ognized that various modifications are possible within the scope of the invention claimed.

What is claimed is:

1. An improved toy pistol comprising a two-part casing and having a trigger and a firing piece, including a hammer and a cap-strip advancing member mounted on the trigger, a cap-strip plate mounted on the casing, the said cap-strip advancing member being adapted to cooperate with the cap-strip plate to advance a cap-strip into firing position, the trigger piece being of generally triangular configuration and pivoted at one of the apexes, the lower apex portion serving as a finger section, the said trigger piece including a socket on the bottom edge for receiving and moving the cap-strip-advancing member, and including on the third side and above the said socket member, a pivot member; a hammer member of generally U shape having a forward upper dog for engaging the trigger member and being disposed over and around the cap-strip plate, the hammer being pivoted at the bottom of its rear leg and the two legs of the hammer or firing piece being bridged to form a groove to permit the cap-strip to be fed therethrough.

2. A toy pistol comprising a casing having mating portions, an operating mechanism pivotally mounted on one portion of the casing and comprising a generally triangular trigger member suspended from an apex to present a substantially perpendicular forward edge and a rearwardly directed body portion having hammer and cap-strip-engaging members therein and in substantially the same vertical plane with respect to each other, the said trigger member being mounted as a second-class lever, a hammer member directly operated and tripped by its actuating section on the trigger member, cap-strip feeding means directly articulated to the trigger member below the hammer engaging section and provided with means maintaining same in generally horizontal operating position and adapted to cooperate with the casing in a generally horizontal rearward motion upon movement of the trigger to firing position to simultaneously advance the cap-strip, the said trigger member and hammer member being separately spring-urged and the cap-strip-advancing member being provided with a compression spring, the said several moving parts being held on their respective pivots by the opposed mating section of the casing.

3. A toy pistol comprising a casing having mating portions, an operating mechanism pivotally mounted on one portion of the casing and comprising a torsion spring-urged trigger member of generally triangular shape and having a substantially vertical forward edge, including pivot means at the top thereof and a bottom finger portion, the said member being mounted as a second-class lever, a spring-urged hammer member pivotally mounted on the casing and adapted to be tripped by the trigger member in a substantially lateral movement, the said hammer member being so formed and arranged as to permit the passage of a cap-strip therethrough; a spring-urged cap-strip-advancing member articulated to the trigger member and adapted to work substantially horizontally against a fixed cap-strip member formed on the said casing; a stud formed on the casing and below the hammer member and adapted to receive a cap-strip; a leaf-spring member secured at one end to the casing and having its free end contacting with the said cap-strip plate, the said spring member being adapted to hold the cap-strip against the cap-strip plate and permitting the same to be gripped and advanced by the advancing cap-strip member, the said several moving parts and cap-strip being held on their respective pivots by the opposed mating section of the casing.

WILLARD R. BIXLER.