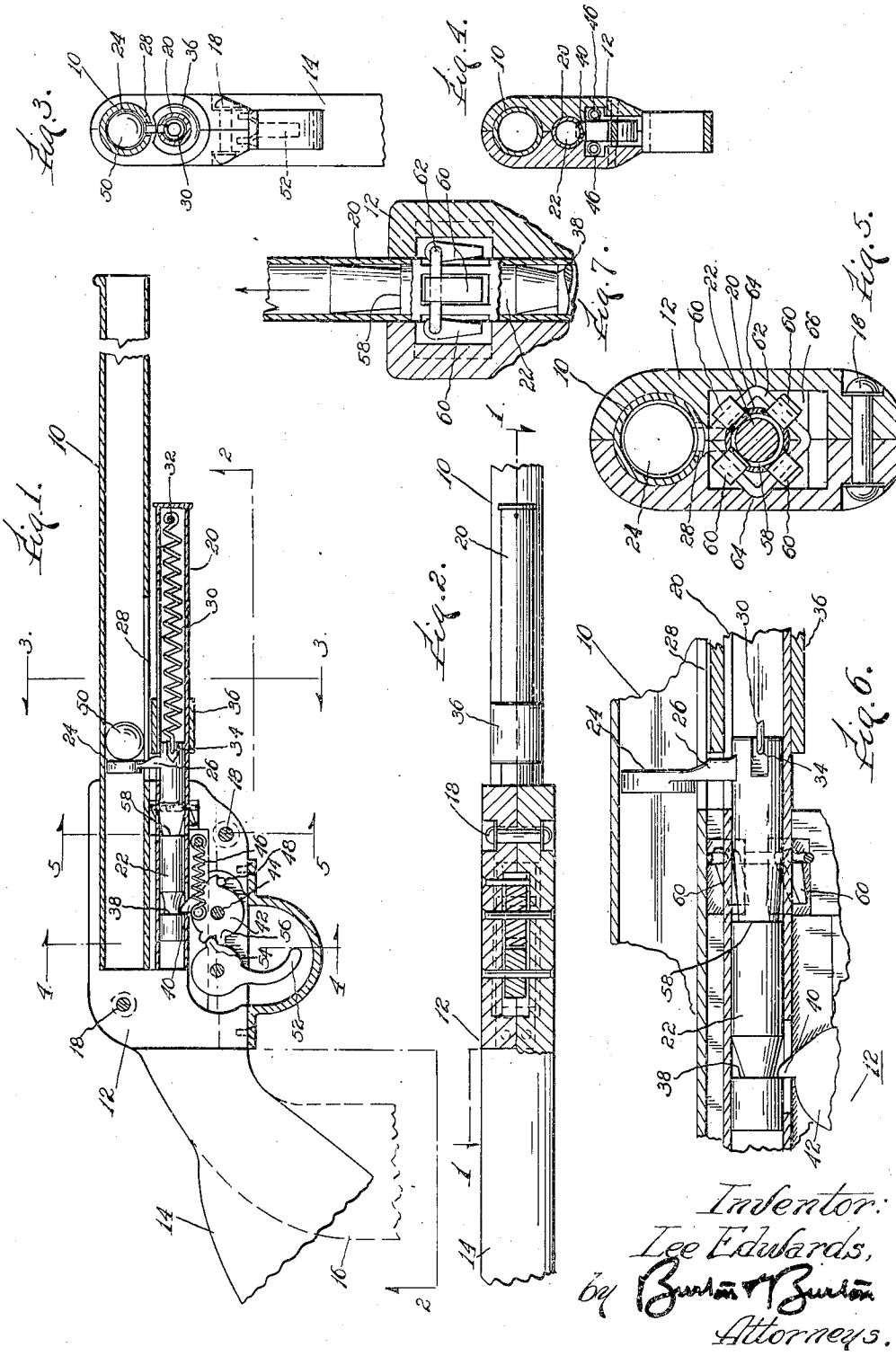
July 12, 1949. L. EDWARDS 2,476,138

TOY GUN

Filed June 18, 1945



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Patented July 12, 1949

2,476,138

UNITED STATES PATENT OFFICE

2,476,138

TOY GUN

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Application June 18, 1945, Serial No. 600,063

5 Claims. (Cl. 124—27)

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This invention relates to toy guns of the type which are mechanically actuated as distinguished from those employing explosives.

One object of the invention is to provide a toy gun having means for expelling a missile but equipped with means which prevents the expelling mechanism from operating except when the gun in pointed substantially in a vertical direction.

It is also an object of the invention to provide a mechanically operated gun having means which renders it incapable of shooting in a horizontal direction.

More specifically, the invention includes a gun having a barrel with a driving member operable therein to expel a missile from the barrel, together with spring means which is tensioned for actuating the driver and pivotally suspended latch means which normally falls into a position to obstruct the movement of the driver except when the barrel is held substantially in a vertical position, said latch means being then swung by gravity into a pendant position so that the driver mechanism will clear it and operate to expel a missile when released by the trigger. Other objects and advantages of the invention will appear from the following description taken in connection with the drawings, in which:

Fig. 1 is a longitudinal sectional view of a mechanically operated gun embodying this invention, a fragment of the stock or handle being shown in elevation and a portion of the barrel being broken out to condense the view;

Fig. 2 is a fragmentary bottom plan view partly in section, as indicated at line 2—2 on Fig. 1;

Fig. 3 is a transverse vertical section taken as indicated at line 3—3 on Fig. 1;

Fig. 4 is a vertical section at line 4—4 on Fig. 1;

Fig. 5 is a detail section on an enlarged scale being taken substantially at line 5—5 on Fig. 1;

Fig. 6 is a detail vertical section on an enlarged scale of a part of the operating mechanism;

Fig. 7 is a detail section with parts omitted illustrating the position of the detents when the barrel is pointed in a vertical direction.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and rearrangements of the features of the toy gun shown herein may be made without departing from the spirit and scope of the invention and that the same is not limited to the particular form herein disclosed except in so far as indicated by the appended claims.

A common type of toy gun is shaped to simulate a firearm, but the barrel is provided with a

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driver mechanism, usually spring operated for expelling a missile such as a light wooden ball or bullet in simulation of the action of a gun which employs explosive cartridges. Although the force with which the toy missile is expelled is not exceedingly great, there is the possibility of serious accident to the playmates of the user when the gun is operated at close range; it also is capable of breaking windows and doing other damage when improperly used. The present invention aims to provide a gun of this general character but to include in its mechanism a catch or detent device which prevents the gun from operating in a horizontal direction or in any direction except when the barrel is pointed upwardly. This permits the missile to be shot into the air, affording the user the satisfaction of "firing" the gun but without serious probability of injury to anyone. A gun of this type also may be employed for launching toy parachutes which may be variously constructed so that they may be collapsed and placed in the barrel of the gun for such launching.

As shown in the drawings, the gun includes a hollow tubular barrel 10 secured at its rear end in a breech portion 12 which may continue in a butt portion 14 shaped to resemble that of a rifle or similar firearm, or which may be formed as indicated in dotted outline at 16 to simulate the handle of a pistol or other small sidearm. The length of the barrel 10 will of course be proportionate to the style of the stock. The breech may be understood as composed of two halves joined at a vertical plane and secured together by rivets 18, 18 with the end of the barrel 10 clamped between them.

Extending from the breech section just below the barrel and parallel therewith there is provided a guide tube 20 having a plunger 22 slidably mounted therein. Said plunger carries a driver 24 connected to the plunger by a narrow arm 26 which extends through a longitudinal slot 28 in the lower side of the barrel 10 so that the driver 24 may move lengthwise in the barrel when the plunger 22 slides in the guide tube 20. A tension spring 30 has one end anchored to a crosspin 32 in the outer end of the guide tube 20, while the other end of the spring is connected to the plunger 22 at 34. By means of a ring 36 slidable upon the guide tube 20 and engaging the arm 26, the spring 30 may be tensioned by forcing the plunger 22 toward the rear end of the tube 20 until the shoulder 38 in the plunger rides over the tooth 40 of a catch or holding member 42 which is pivoted in the breech at 44. The spring

46 yieldingly holds the part 42 with its tooth 40 in upstanding position and said part 42 positively stopped by a pin 48 which checks the rotation of the member 42 at this position.

When the gun has been "cocked" by retracting the plunger 22 into engagement with the latch tooth 40 and thus placing the spring 30 under tension, a ball 50, or any other suitable missile, is placed in the barrel 10, being entered from the outer end or muzzle thereof and allowed to rest against the driver 24 in its retracted position at the rear end of the slot 28. Then, to fire the gun, the trigger 52, which includes a tooth 54 engaging the tooth 56 of the latch member 42, is rocked to rotate the latch member 42 through a sufficient arc to disengage its holding tooth 40 from the shoulder 38 of the plunger 22. If the gun is pointed upward, this will permit the spring 30 to contract suddenly, drawing with it the plunger 22 and the driver 24 and expelling the missile 50 from the barrel.

To prevent this operation when the barrel is directed otherwise than upwardly, I provide the plunger 22 with a second shoulder 58 and mount within the breech 12 a set of pivoted detents or catch dogs 60. As shown in Fig. 5, there may be four of these dogs 60, each pivoted on an axis at 45° to the mid-plane of the stock 12 so that when the gun is held in normal horizontal position the two upper dogs 60 will swing downwardly against the reduced portion of the plunger 22 in position to engage the shoulder 58 and obstruct the movement of the plunger if the trigger should be operated. Similarly, if the gun is held on its side in a generally horizontal position, one of the upper dogs 60 and one of the lower dogs 60 will fall into obstructing position with respect to the shoulder 58; and if the gun is held upside down, but in a generally horizontal position, the two lower dogs 60 will swing into obstructing position in relation to the shoulder 58.

The dogs 60 may be supported upon any suitable pivot means; Fig. 5 shows a wire 62 bent in the form of a square to provide pivot bearings for all four of the dogs and this square pivotal supporting frame is lodged between the two halves of the breech 12 with its corners fitted into notches 64 therein. These portions of the breech are hollowed out to provide a chamber 66 in which the dogs 60 may swing freely through a limited range, and this range is sufficient so that when the gun is held with its barrel 10 in a substantially vertical position, all four dogs 60 will hang pendant from the pivot wire 62 as shown in Fig. 7, so that if the trigger is pulled to release the plunger 22 from the holding tooth 40, the shoulder 58 will move past the dogs 60 without obstruction and the driver 24 will be permitted to expel the ball 50 upwardly from the barrel 10. It may be understood that the ring or sleeve 36 employed for cocking the gun may be attached permanently to the plunger 22 so as to move with it if desired; but preferably, the sleeve will not be connected to the plunger, but will be employed merely to slide it back into latched position. The sleeve will then be returned to the outer end of the guide tube 20, engaging the tube with sufficient friction to remain in that position while the gun is fired.

Thus it will be seen that I have provided a mechanism suitable for use in a toy gun and adapted to render the gun safe and harmless in the hands of children or those of immature judgment while at the same time permitting it to be employed in an entertaining fashion and to serve the purposes of a toy without the danger customarily associated with a device of this character.

I claim:

1. In a gun, the combination of a barrel, a driver movable therein to expel a missile from the barrel, a plunger associated with said driver, a spring to actuate said plunger and driver, trigger means to hold the plunger in retracted position with the spring under tension, said plunger having a shoulder, detent means pivoted adjacent the plunger and disposed normally in position to engage the shoulder when the trigger is released unless the gun is held with the barrel extending in vertical position the center of gravity of the detent means being so related to the pivot thereof that in all positions of the gun except when the gun is aimed vertically, gravity causes rotation of the detent means to force it into engagement with the shoulder.

2. In a gun, the combination of a barrel, a driver movable therein to expel a missile from the barrel, a plunger connected to said driver, a guideway for the plunger in which it is slidable, a spring which is tensioned by sliding the plunger in one direction, holding mechanism for the plunger, a trigger for releasing said plunger from the holding means at will, said plunger having a shoulder, and a plurality of pivoted detent dogs extending from their pivots rearwardly in the gun, with at least one of said dogs normally disposed in obstructing relation to said shoulder of the plunger, all said dogs hanging vertically from their pivots in positions clear of said shoulder when the barrel of the gun is pointed in a substantially vertical direction said dogs being arranged in spaced position about the plunger and so positioned that when the barrel is horizontal at least one of the dogs is at all times above a horizontal plane passing through the longitudinal axis of the plunger, the center of gravity of each dog being spaced rearwardly from the pivot axis.

3. In a gun, the combination of a tubular barrel, a tubular guide extending parallel to said barrel, a stock having a breech portion from which said barrel and guide extend, a plunger slidable in said guide, a driving spring for the plunger, a driver carried by the plunger and movable thereby in the barrel for expelling a missile therefrom, holding and release mechanism for the plunger housed in the breech with a trigger projecting therefrom, said plunger having a shoulder, and detent means also housed in said breech and normally positioned to engage said shoulder when the trigger is actuated, but automatically moved from the path of the plunger when the barrel is pointed in a substantially vertical direction the detent means including a member pivoted at a point removed from the center of gravity thereof, the center of gravity being between the pivot line and the breech portion of the gun whereby gravity exerting its force rotates the detent into inoperative position when the barrel is aimed vertically.

4. In a gun, the combination of a barrel, a driver movable therein to expel a missile from the barrel, a plunger associated with said driver, a spring to actuate said plunger and driver, said plunger having a shoulder, a toothed holding member engageable with said shoulder to hold the plunger in retracted position with the spring under tension, a trigger for releasing said holding member at will, said plunger having a second shoulder, detent means pivoted adjacent the

plunger and disposed normally in obstructing relation to said second shoulder but out of contact therewith, ready to engage the shoulder when the trigger is actuated, said detent means being held clear of said second shoulder by gravity when the gun is held with the barrel extending in substantially vertical direction the center of gravity of the detent means being located to the rear of the pivot thereof whereby at all times except when the barrel is vertical, gravity forces rotation of the detent means into the shoulder engaging position.

5. In a gun, the combination of a barrel, a driver movable therein to expel a missile from the barrel, a plunger connected to said driver, a guideway for the plunger in which it is slidable, a spring which is tensioned by sliding the plunger in one direction, holding mechanism for the plunger, a trigger for releasing said plunger from the holding means at will, said plunger being formed with abutment means, and at least three pivoted detent dogs mounted adjacent the plunger, each at a

different side thereof, in positions to engage said abutment means for obstructing movement of the plunger if released by the trigger, all said dogs hanging vertically from their pivots in positions clear of the plunger when the barrel of the gun is pointed in a substantially vertical direction the center of gravity of each of the detent dogs being located to the rear of the pivot thereof whereby at all times except when the barrel is vertical, gravity forces rotation of some of the detent dogs into the shoulder engaging position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
285,368	Trieller	Sept. 18, 1883
1,196,235	Heyman et al.	Aug. 29, 1916