March 16, 1948. E. L. DRUMHELLER 2,437,728

ROTARY MAGAZINE FOR TOY GUNS

Filed June 4, 1946

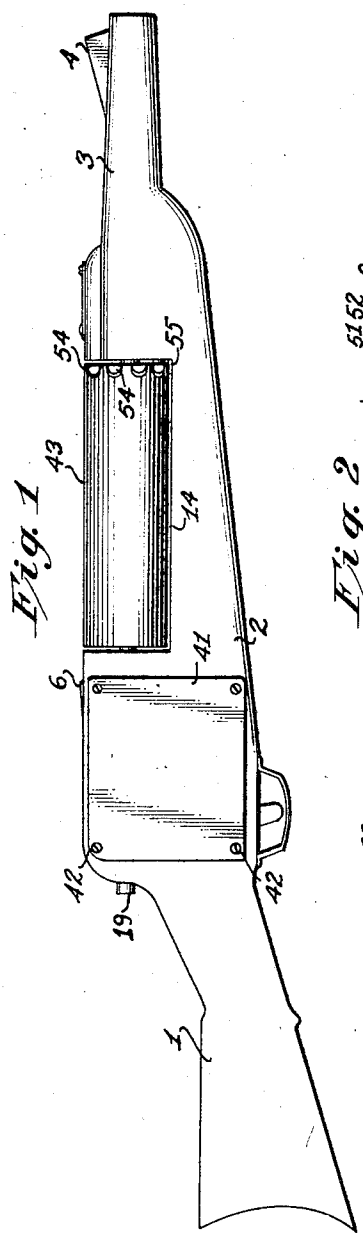


Fig. 1

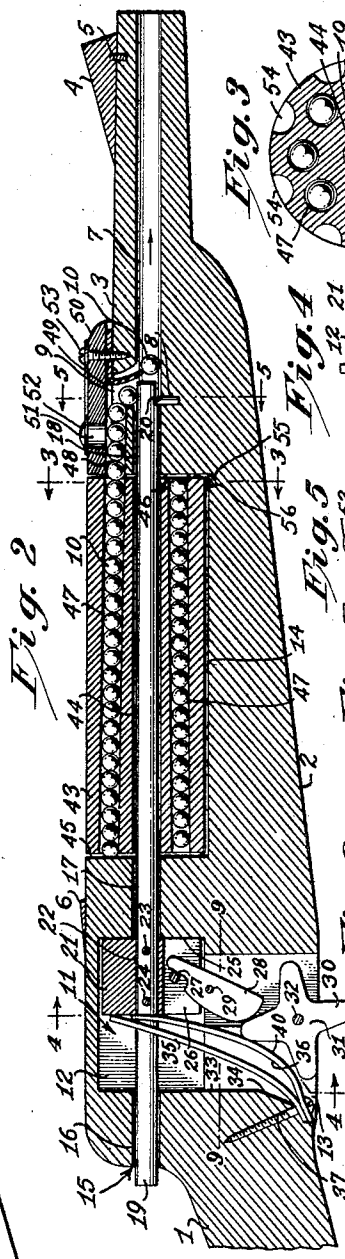


Fig. 2

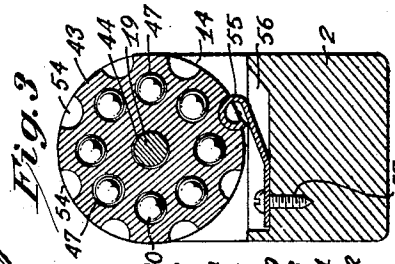


Fig. 3

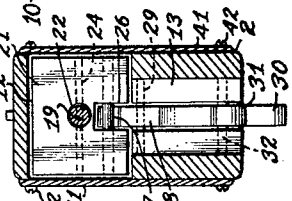


Fig. 4

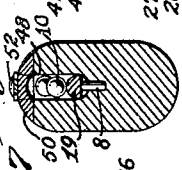


Fig. 5

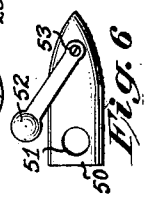


Fig. 6

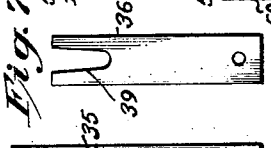


Fig. 7

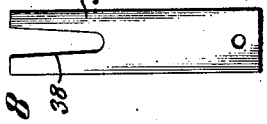


Fig. 8

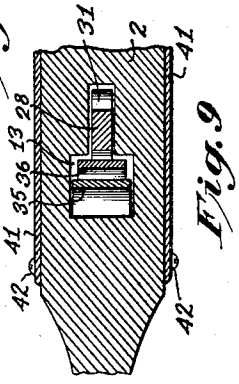


Fig. 9

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ROTARY MAGAZINE FOR TOY GUNS

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4 Claims. (Cl. 124—48)

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This invention relates to a toy gun and more particularly to those guns in which a projectile such as a small ball is projected out of the barrel of the gun toward a mark by the impact of a spring-impelled strike-pin or plunger rod.

It is an object of the invention to provide a repeater type of toy gun of the aforementioned type with an elongated, rotary magazine having a plurality of passages therein for feeding projectiles into the barrel of the gun.

It is a further object of the invention to provide a repeater type of toy gun of the aforementioned type which is simple in construction, cheap to manufacture, and which can shoot many more times without reloading, than the usual repeater type gun which is provided with a stationary, single passage or chamber magazine.

Other objects and advantages of the invention will become apparent as the description proceeds, reference being made to the accompanying drawings, wherein:

Fig. 1 is a side elevational view of a rifle type toy gun constructed in accordance with my invention,

Fig. 2 is an enlarged vertical sectional view of Fig. 1, parts being broken away,

Fig. 3 is an enlarged sectional view taken along the line 3—3 of Fig. 2 looking in the direction of the arrows,

Fig. 4 is a sectional view taken along the irregular line 4—4 of Fig. 2 looking in the direction of the arrows,

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 2 looking in the direction of the arrows,

Fig. 6 is a plan view of a detail,

Fig. 7 is a plan view of an impelling spring,

Fig. 8 is a plan view of another impelling spring, and

Fig. 9 is a sectional view taken along the line 9—9 of Fig. 2 looking downwardly.

Referring to the drawing, the toy gun constructed in accordance with my invention therein illustrated is a rifle type gun and comprises a stock 1, a main body portion 2, and a barrel 3, preferably, but not necessarily, of integral construction.

A sight 4 is secured to the forward end of the barrel by means of a dowel pin 5 and glue. A cooperating sight 6 may be suitably secured adjacent the rear of the body portion 2.

The bore 7 of the barrel is provided adjacent its rearward end with a pin 8 projecting therein to to prevent the balls or other projectiles from rolling rearwardly out of the barrel proper. The

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upper portion of the rearward end of the barrel 3 is provided with an opening 9 through which the projectiles such as the balls 10 may be fed into the barrel.

The rearward portion of the body portion 2 is provided with a recess generally indicated by the numeral 11. The recess 11 comprises an upper portion 12 extending entirely across the body portion 2. Below the portion 12 the recess assumes substantially a T-shape (Fig. 9) and this portion of the recess is designated by the numeral 13. The rearward portion of the T-shaped recess 13 is the wider portion.

A second recess 14 is provided in the body portion 2 forwardly of the recess 11. A preferably circular passage designated generally by the numeral 15 is provided in the body portion 2 substantially in alignment with the bore 7 of the barrel 3. The recesses 11 and 14 divide the circular passage 15 into three longitudinally spaced passages 16, 17 and 18.

A strike-pin or plunger rod 19 is mounted for reciprocation in the passages 16, 17 and 18. The forward end of the plunger rod 19 is suitably recessed as indicated at 20 to permit the rod 19 to pass over the pin 8.

A block 21 provided with a passage 22 for receiving the plunger rod 19, is suitably connected to the plunger rod adjacent the rearward portion thereof by means of pins 23 and 24. The block 21 is located in the upper portion 12 of the recess 11 and reciprocates with the plunger rod 19. The forward wall 25 of the portion 12 of the recess 11 functions as a stop to limit the forward movement of the block 21 and rod 19.

The bottom of the block 21 is provided with a recess 26 through which a pin 27 extends transversely. The pin 27 is engaged by one end of a cam 28 which is pivotally mounted on a pin 29 in the portion 13 of the recess 11. The other end of the cam 28 is engaged by the fingers 30 of a star-shaped trigger 31 which is also pivotally mounted by means of pin 32 in the portion 13 of recess 11 below the cam 28.

The lower portion of the rearward wall 33 of the recess 11 is curved rearwardly as indicated at 34. Flat leaf power springs 35 and 36 are secured to the portion 34 of the wall 33 by means of a screw 37. The spring means 35 and 36 extend upwardly in the recess 11 and preferably freely engage the rearward end of the block 21. The spring 35 is provided with an elongated opening or slot 38 and the spring 36 is provided with a similar slot 39 to receive the rod 19. The elongated openings 38 and 39 permit the springs 35

and 36 to move transversely relative to the rod 19.

The spring 36 is positioned forwardly of the spring 35 and is convexly curved as indicated at 40. The portion 40 thereof extends into the space between two adjacent fingers 30 of the star trigger 31. These two fingers are, the one which will next actuate the cam 28, and the second one in line for the actuation for the cam 28. Thus the spring 36 performs a dual function. It not only assists the spring 35 in driving the plunger rod 19 forwardly, but also, the curved portion 40 acts as a stop means to prevent reverse rotation of the trigger 37.

Also, the force required to compress the springs 35 and 36 is distributed over the two fingers of the star trigger 31 that the curved portion 40 of the spring 36 lies between. One part of this compressive force is transmitted to and carried by the actuating finger 30 of the trigger 31 by the block 21 and cam 28. The other part is transmitted directly to and carried by the next actuating finger 30 by the curved portion 40 of the spring 36. Obviously, any force tending to compress the spring 36 must also necessarily tend to compress the spring 35 located rearwardly thereof, and thus the force required to compress both springs is distributed over two fingers 30 of the star trigger 31.

The open sides of the portion 12 of the recess 11 may be closed by plates 41 suitably secured to the body portion 2 as by means of screws 42. Preferably, as illustrated, the plates 41 extend from adjacent the top to adjacent the bottom of the body portion 2.

A substantially cylindrical, elongated magazine 43 provided with a circular axial passage 44 is mounted for rotation upon the plunger rod 19 in the recess 14. The end walls 45 and 46 of the recess 14 act as stops to prevent any substantial longitudinal movement of the magazine 43 as the plunger rod 19 is reciprocated.

The magazine 43 is provided with a plurality of elongated passages or chambers 47. The elongated passages 47 are forwardly and inwardly inclined and the axes of the passages 47, at any transverse plane through the magazine 47, are equally spaced from the longitudinal axis of the said magazine. Thus, at any transverse plane through the magazine 43, the axes of the passages 47 are peripherally spaced along the circumference of a circle having as its center the longitudinal axis of the magazine 43.

A forwardly and downwardly inclined open-top passage or well 48 leads from the wall 46 of the recess 14 forwardly and communicates the uppermost chamber 47 with the opening 9 leading into the bore 7 of the barrel 3.

A curved spring 49 extends down into the bore 7 of the barrel 3 a short distance, adjacent the forward end of the recess 9. The spring 49 prevents the ball 10 from rolling forwardly out of the barrel until impelled by the impelling means.

A member 50 overlies the open top of the passage 48. The member 50 is provided with an opening 51 for loading the magazine, and the opening 51 is provided with a pivoted closure 52. A screw 53 extends through the forward ends of the closure 52 and the member 50, and also through the spring 49, to secure these elements to the barrel 3. Additional means, such as glue, is used to secure the rearward end of the member 50 to the body portion 2.

The periphery of the magazine 43 is provided with a series of aligned spaced grooves or notches 54, one for each chamber or passage 47. A curved

spring holding means 55 releasably engages the notches 54, one at a time, to hold or maintain a passage 47 in alignment with the passage 48, feeding projectiles into the barrel. As one passage or chamber 47 becomes empty, the magazine 43 may be indexed in either direction to bring a filled chamber 47 into alignment with the passage 48.

The bottom wall of the recess 14 is recessed as indicated at 56 to receive the spring 55 and the said spring is secured to the body portion 2 by means of a screw 57.

The magazine 43 illustrated holds 21 one-fourth inch balls in each of its 8 chambers or passages 47, and is approximately 5¼ inches long. The passage 48 holds 5 balls and hence, the gun illustrated may be fired 173 times without reloading. Obviously, the length of the magazine 43 may be varied to make it longer or shorter, and, for pistol type guns is preferably somewhat shorter than 5¼ inches.

In assembling, the cam 28 is pivotally mounted in the recess 11 by the means 29. Next, the springs 35 and 36 are secured to the lower portion 34 of the wall 33 by means of the screw 37. The springs 35 and 36 are then held rearwardly and the block 21 is placed in the portion 12 of the recess 11 with the pin 27 engaging the rearward side of the cam 28. The magazine 43 is then placed in the recess 14 and the plunger rod is inserted in the passage 15 forwardly through the slots 38 and 39 of the springs 35 and 36, the passage 22 in the block 21, and the passage 44 in the magazine 43, to a position such that it blocks the feeding of the balls 10 into the barrel 3 through the opening 9 when the block 21 is in its forwardmost position as shown in Fig. 2. The block 21 is then secured to the rod 19 by means of the pins 23 and 24. The star trigger 31 may next be pivotally mounted in the recess 11 by means of the pin 32.

In operation, the magazine 43 is loaded with projectiles 10 through the opening 51, the said magazine being indexed each time one chamber 47 thereof becomes filled to bring an empty chamber 47 thereof into alignment with the passage 48, until all 8 chambers have been filled. Also, the passage 48 is loaded with the 5 balls it holds.

On firing the gun, when the trigger 31 is actuated in a clockwise direction, the cam 28 engaged thereby is actuated in a counter-clockwise direction and by means of the pin 27 the block 21 and the rod 19 connected thereto are actuated rearwardly against the force of the spring means 35 and 36. In its rearward movement, the forward end of the rod 19 passes beyond the opening 9 and a ball 10 drops down into the barrel from the passage 48. The pin 8 prevents rearward rolling movement of this ball 10 and the spring 49 prevents forward rolling movement thereof. In its rearward-most position, the forward end of the rod 19 is preferably spaced from the ball 10 positioned between the pin 8 and the spring 49.

As soon as the trigger finger 30 disengages the cam 28, the spring means 35 and 36 impel the block 21 and the plunger rod 19 forwardly. In its forward movement the rod 23 engages the ball 10 in the barrel and impels it or projects it therefrom.

The ball 10 dropping down into the barrel from the passage 48 is immediately replaced by one from the inclined passage or chamber 47, and as soon as one chamber 47 is emptied, the maga-

zine 43 may be indexed to bring a filled chamber 47 into alignment with the passage 48.

With the exception of the spring means, which are preferably made of metal, any suitable material such as wood, plastic or metal may be used in the construction of my toy gun.

The specific projectile type impelling means herein described, is disclosed and claimed per se in my copending application, Serial No. 674,168, filed of even date herewith.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and have herein described in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

I claim:

1. In a toy gun comprising a body portion, a barrel connected to said body portion, and a plunger rod mounted for reciprocation in said body portion in alignment with said barrel, a magazine rotatably mounted on said rod, said magazine having a plurality of forwardly and inwardly inclined projectile receiving passages therein, and a passage leading into said barrel from said magazine.

2. In a toy gun comprising a body portion, a barrel connected to said body portion, and a plunger rod mounted for reciprocation in said body portion in alignment with said barrel, a magazine rotatably mounted on said rod, said magazine having a plurality of projectile receiving passages therein, and a passage leading into said barrel from said magazine.

3. In a toy gun comprising a body portion, a barrel connected to said body portion, and a plunger rod mounted for reciprocation in said body portion in alignment with said barrel, a magazine rotatably mounted on said rod, said magazine having at least one projectile receiving passage therein, and passage means communicating said passage with said barrel.

4. In a toy gun comprising a body portion and a barrel, a recess in said body portion, a magazine rotatably mounted in said recess, said magazine having a plurality of forwardly and inwardly inclined projectile receiving passages therein, and a passage leading into said barrel from said magazine.

EDWARD L. DRUMHELLER.

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