March 16, 1943. J. E. CARLSON 2,313,803

CROSS BOW GUN

Filed April 30, 1941

Fig. 1.

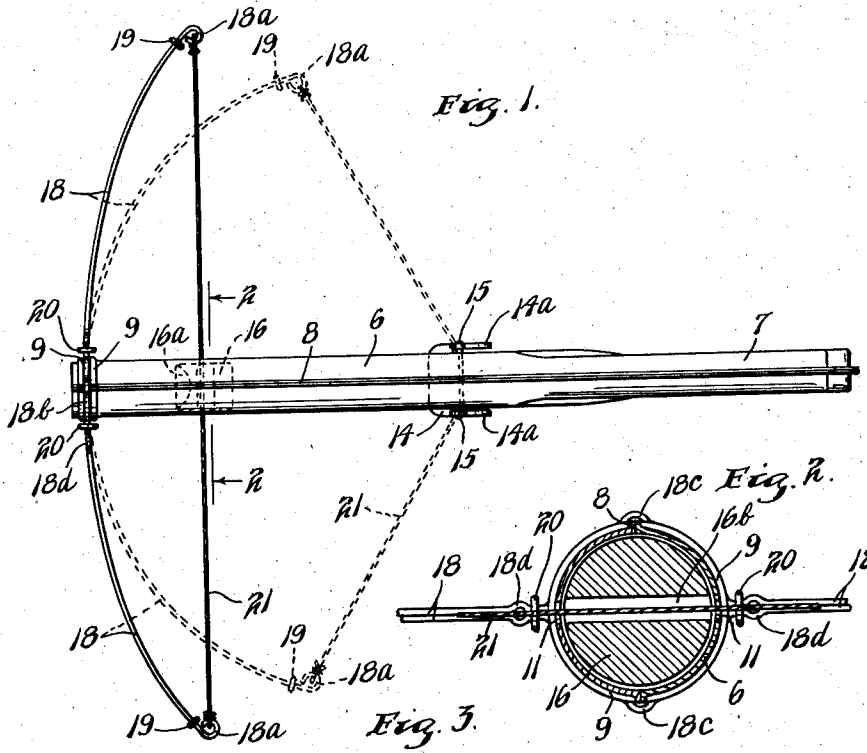


Fig. 2.

Fig. 3.

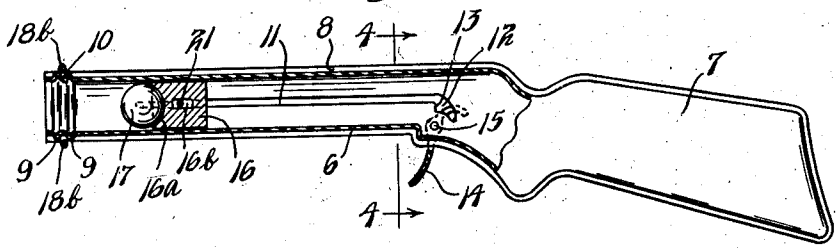


Fig. 4.

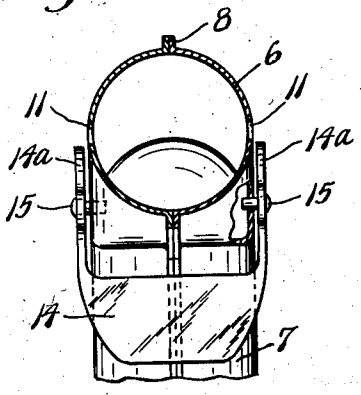
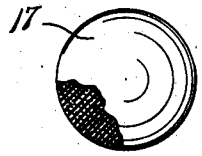


Fig. 5.



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CROSSBOW GUN

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Application April 30, 1941, Serial No. 391,027

7 Claims. (Cl. 124—25)

This invention relates to a toy gun.

It is one of the objects of the invention to provide a novel and improved toy gun of cheap and simple construction which is so constructed that it may shoot a soft ball such as a ball made from sponge rubber and which ball as projected from the gun may strike such delicate objects as glass, bric-a-brac, etc., without damaging the same.

Another object is to provide in a toy gun a barrel and a ball projecting plunger working therein so constructed that the plunger may force a soft rubber ball, such as a sponge rubber ball, through the barrel without causing such lateral expansion of the ball as will prevent it from freely working through the barrel.

A further object is to provide a novel and improved toy cross bow gun, the parts of which can be readily knocked down for shipment in small compass and the parts of which can be very easily assembled by the consignee.

Still another object is to provide a cross bow gun having a novel and improved mechanism of cheap and simple construction for retaining and releasing the bow string of the cross bow.

The objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawing wherein like reference characters refer to the same or similar parts throughout the various views and in which—

Fig. 1 is a plan view of a cross bow gun embodying the invention, certain of the parts being shown in the position they will assume after the gun has been fired in full lines and certain of the parts being shown in position ready for firing of the gun in dotted lines;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1 as indicated by the arrows;

Fig. 3 is a view in side elevation of the gun with certain of the parts broken away and shown in section to more clearly illustrate the construction thereof;

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 3; and

Fig. 5 illustrates a soft ball that may be used with the gun, part of the ball being broken away and shown in section.

In accordance with the invention a cross bow gun is provided having a cylindrical barrel 6 open at its forward end, the rear portion of the barrel joining a stock 7 having a shape corresponding to the stock of an ordinary gun. In the illustrated embodiment the barrel and stock 6 and 7 are shown as being formed of metal from two parts, i. e., right and left hand sections and the two parts are equipped with upper and lower projecting flanges 8 which are secured together as by spot welding. At the forward end of the barrel 6, two circular flanges 8 are provided which conjointly form a bow holding groove 10 which is interrupted only by the flanges 8 which extend across the groove. From points adjacent the forward end of the barrel 6 to points adjacent the rear part of the barrel opposed longitudinal slots 11 are cut in the sides of the barrel for the purpose of receiving a bow string. Apertures 12 are cut in the sides of the barrel 6 to join the rear ends of the slots 11 and conjointly form therewith bow string retaining shoulders 13 which are set preferably normal to the general direction of extension of the longitudinal slots 11.

A fork-like camming trigger 14 is provided and this trigger has a finger piece which extends downwardly below the barrel 6 adjacent the rear ends of the slots 11 and the trigger has upwardly extending arms carrying pivot pins 15 which are received within pin openings formed in the barrel 6. Above the pivots 15 the arms curve upwardly and rearwardly to form cams 14a for releasing the bow string when it is engaged and held by the shoulders 13.

Loosely working within the barrel 6 of the gun is a ball projector or plunger 16 of cylindrical shape. Used with the gun is a soft ball 17 preferably made of a highly resilient material such as sponge rubber. This ball 17 is of such size as to freely fit within the barrel 6 of the gun. To take the ball 17 and prevent lateral expansion of the soft material forming the ball as the ball is moved violently forwardly in the barrel 6 by the plunger 16, the plunger 16 at its forward end, as best shown in Fig. 3, is provided with a ball-receiving concave recess 16a curved to conform to a portion of the spherical surface of the ball 17. The plunger 16 is also provided with a transverse bow string receiving opening or slot 16b which is of considerably greater length fore and aft of the plunger than the diameter of the bow string which is adapted to be received through the said aperture.

The bow for the gun is preferably formed by two spring wires 18 which extend side by side throughout most of their lengths. These wires or bow members 18 have eyes 18a at their outer ends and they are secured together near their outer ends in side by side relation by small encircling bands 19. At their intermediate portions the two bow members 18 are concavely bent away from each other to form semi-circular barrel embracing portions 18b which are adapted to be

releasably fitted in to the groove 10 at the forward end of the barrel. To prevent turning movement of the bow members relative to the barrel each embracing portion 18b at its central part is equipped with an outwardly deformed part 18c to take the portions of the ribs 8 which extend across the groove 10. Adjacent the embracing portions 18b the two wires or cross bow members 18 are encircled by sliding rings 20 which are used for tightly drawing the embracing portions 18b into the groove 10 after the rings 20 have been slid over oppositely projecting deformations 13d formed on the wires 18 in closely spaced outward relation from the embracing portions 18b. A bow string 21 which may consist preferably of a wire cable or heavy cord is fastened at its two ends to the eyes 18a of the bow members 18 to extend across between such ends and distort the bow members into the well known bow shape under some spring tension.

The bow gun will preferably be shipped in knocked down condition with the bow members 18 detached from the barrel 6 of the gun and with the bow string 21 disconnected from the bow members and preferably with the bow members extending longitudinally of the barrel 6 of the gun. When thus assembled the parts of the gun can be boxed in small compass and inexpensively shipped to destination. In assembling the gun the two rings 20 will be slid toward the outer ends of the bow members whereupon the embracing portions 18b of the bow members will be slipped over the end of the barrel 6 of the gun to fit between the two flanges 9 within the groove 10. The two rings 20 will then be slid inwardly over the deformed portions 18d to tightly secure the bow in place on the barrel whereupon the portions 18c will prevent turning or twisting movement of the bow relative to the barrel 6. The bow string 21 is then passed through the bow string slots 11 and the bow string aperture 16b of the plunger 16 and the ends of the bow string are secured to the eyes 18a of the bow members. The gun is now assembled and ready for use.

In using the gun one of the soft balls 17 is placed within the barrel 6 of the gun through the open forward end of the same. The bow string 21 is then grasped and pulled rearwardly to the rear ends of the slots 11 into the apertures 12 and pressed downwardly slightly to cause the bow string to engage the shoulders 13. Of course, as the bow string is pulled back the plunger 16 moves to the rear of the barrel and as the gun will be held with its muzzle end elevated as it is cocked, the ball 17 will follow the plunger 16 to the rear part of the barrel of the gun. To shoot the gun the stock 7 is carried to the shoulder and the finger portion of the trigger 14 is pressed rearwardly. The cams 14a of the trigger as this occurs lift the central portion of the bow string 21 above the shoulders 13 into alignment with the longitudinal slots 11. The resiliency of the bow violently causes the bow string 21 to be moved forwardly through the barrel 6, and of course, the plunger 16, moves with the bow string and projects the ball 17 violently forwardly through the barrel to protect it therefrom in the aimed direction. After the string 21 reaches about the position shown in Figs. 1 and 2 of the drawings the plunger 16 can carry forwardly somewhat beyond this position to expel the ball from the recess 16a in the plunger whereupon the plunger is resiliently stopped in its forward travel by the bow string 21 itself. As the bow string slot or recess 16a in the plunger is of considerably greater width fore and aft the plunger than the diameter of the string 21 there is little danger of the cutting of the bow string by the portions of the sides of the barrel 6 which close the forward ends of the slots 11.

By reason of the fact that a large part of the surface of the ball 17 is contacted by the plunger 16 during forward movement of the ball and plunger, the ball although of soft material does not distort or spread laterally in the barrel as it is projected forwardly whereby the ball will move freely through the barrel. If the plunger 16 were not provided with the recess 16a the ball being made of soft material would expand laterally so as to frictionally engage the side walls of the barrel to such an extent as to choke the movement of the ball and plunger.

As the ball is made of soft material such as sponge rubber the gun may be aimed directly at light glass or other frangible objects and yet as the ball strikes such an object breakage will not occur. Accordingly the gun makes an ideal toy for use by children in the house or the like. Of course, the gun may also be used for shooting hard balls such as stones or the like if desired and it will carry a long distance in true flight.

It will be seen that an inexpensive and efficient toy gun has been provided which will carry out the objects set forth.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departure from the scope of the present invention which, generally stated, consists in the matter shown and described and set forth in the appended claims.

What is claimed is:

1. A toy gun comprising a barrel having a forward open end and a rear portion, a plunger working within said barrel, a cross bow mounted at the forward end of said barrel, a bow string running between the two ends of said bow, said barrel having facing longitudinal slots therein through which said bow string extends and said plunger having a cross slot of considerably greater width fore and aft the plunger than the diameter of said bow string and through which cross slot said bow string also extends.

2. A cross bow gun comprising a barrel having a forward open end and a rear portion, a plunger working within said barrel and having a forward end with a concave recess therein to take and carry a ball, a bow mounted at the forward end of said barrel, a bow string extending between and connecting the ends of said bow, said barrel having opposite longitudinal slots therein through which said bow string extends, said plunger having a cross slot therein of considerably greater width fore and aft the plunger than the diameter of said bow string and said bow string extending through said cross slot.

3. A cross bow gun comprising a barrel, a plunger working within said barrel, a pair of bow spring members, said bow spring members having central oppositely concaved embracing portions for releasable engagement with the forward part of the barrel, means for releasably clamping said bow spring members together to tightly engage the barrel, a bow string secured to and extending between the ends of said bow spring members, said barrel having longitudinal slots therein through which said bow string extends and said plunger having a cross opening through which said bow string extends.

4. The structure defined in claim 3, and means

preventing turning movement of said bow spring members relative to said barrel.

5. A cross bow gun comprising a barrel, a pair of cross bow members assembled along side of each other so that similar ends of said members project outwardly from the sides of said barrel, said cross bow members having central oppositely concaved portions embracing the forward part of the barrel, a pair of slip ring members encircling the two cross bow members at the two sides of said barrel, said cross bow members being slightly oppositely distorted outwardly from the normal positions of said ring members to releasably retain said ring members in position after being slid inwardly over the distorted portions and a bow string connected to and extending between the ends of said cross bow members.

6. A cross bow gun comprising a substantially cylindrical barrel having an open forward end and a rear portion, a pair of cross bow members assembled along side of each other so that similar ends of said members project outwardly from the sides of said barrel, said cross bow members having central oppositely concaved embracing portions for releasable engagement with the forward part of the barrel, means for releasably clamping said bow spring members together to tightly engage the barrel, a bow string secured to and extending between the ends of said bow string members, said barrel having longitudinal slots therein through which said bow string extends, a plunger working within said barrel, said plunger having a cross opening through which said bow string extends, said barrel having openings in its side at its rear portion communicating with the rear ends of said slots and cooperating with said slots to form bow string retaining shoulders at the rear ends of said slots and trigger means for releasing said bow string from said shoulders.

7. A cross bow gun comprising a barrel having a forward open end and a rear portion and having a circular external groove at its forward portion, a plunger working within said barrel, a bow having a central curved portion releasably received within said circular groove to connect the bow with said barrel, with portions of the bow projecting at either side of the barrel, the sides of said barrel having longitudinal slots therein and said plunger having a cross opening therein, a bow string connecting the two ends of said bow and passing through said slots and cross opening, and means for holding and releasing said plunger at the rear end of said barrel.

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