D. HEYMAN & T. R. ARDEN.

TOY CANNON.

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1,209,160. Patented Dec. 19, 1916.

Fig. 1.

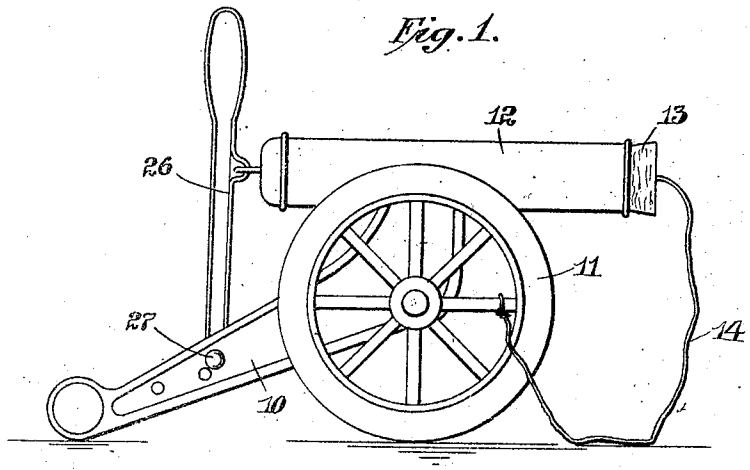


Fig. 2.

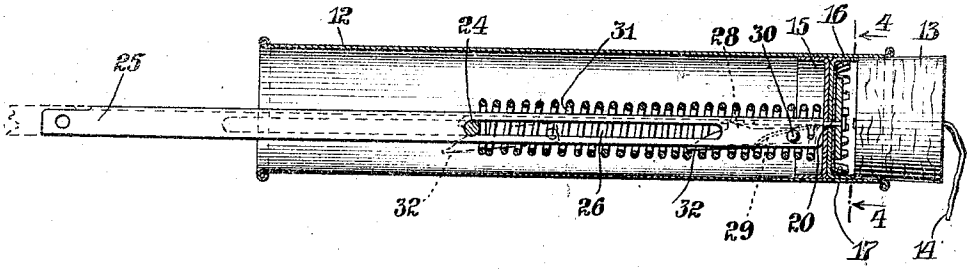


Fig. 3.

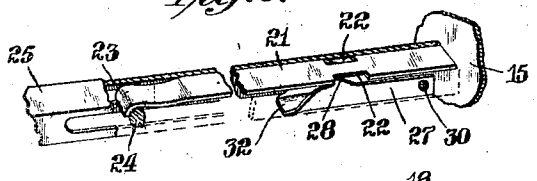
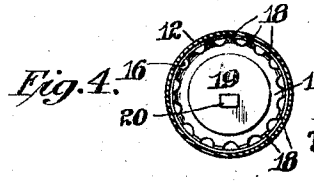


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TOY CANNON.

1,209,160. Specification of Letters Patent. Patented Dec. 19, 1916.

Application filed March 23, 1916. Serial No. 86,077.

To all whom it may concern:

Be it known that we, DAVID HEYMAN and THOMAS RAYMOND ARDEN, citizens of the United States of America, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Toy Cannon, of which the following is a specification.

Our invention relates to an improved toy cannon or gun, of the type in which a projectile, such as a cork, is expelled from the barrel mouth by the impact of a plunger against the projectile.

In the construction of toy guns or cannons with which we are familiar, the arrangement is such that when it is desired to discharge the projectile it is necessary to first cock a trigger or the like by one movement of an operating lever, and thereafter release the trigger by a second movement of the operating lever. Two distinct movements of an actuating element are thus required to discharge the projectile.

The principal object of our invention is to provide a construction of gun or cannon in which a single movement of the operating lever, in but one direction, is needed to effect a discharge of the projectile. This arrangement not only greatly simplifies the operation of the toy and eliminates likelihood of its being broken or damaged, but also tends to materially reduce the cost of production by reducing the number of parts, which is an important factor in articles of this kind.

We accomplish our object by the construction illustrated in the accompanying drawing, in which—

Figure 1 is a side elevational view of a cannon embodying our invention; Fig. 2 is a longitudinal sectional view through approximately the central part of the barrel; Fig. 3 is a detail perspective view, partly in section, of a portion of the operating bar, the plunger with its stem, and a pivoted pawl engageable with the stem; and Fig. 4 is a vertical sectional view on the line 4—4 of Fig. 2, and shows an elevational view of the form of plunger we prefer to employ.

Referring to the drawing by reference characters, 10 denotes the gun carriage which is preferably mounted on wheels 11, and supports the barrel 12. Any form of projectile may be employed, for example a cork 13, which may be held captive by a cord 14 tied to one of the wheels 11. Reciprocable within the barrel 12 is a plunger, which is preferably a composite structure embodying the cup shaped member 15 of rigid material such as metal, a flexible washer 16 which abuts the member 15 and is cupped in the opposite direction, a metal disk 17 having its edge serrated or provided with prongs 18, and a flat metal washer or wear piece 19 resting against the outer face of the disk 17. We find that a piston, constructed in the manner described, is strong and light, and operates with but little friction in the barrel. The serrated disk 17 holds the flexible washer 16 extended, but permits the latter to yield to any possible unevenness or irregularity in the gun barrel.

The several members of the composite plunger are held together in proper relation by a headed pin 20 formed at the forward end of the plunger stem 21, which is designed to extend rearwardly into the barrel 12. Intermediate its ends, the stem 21 is provided with diametrically opposite, lateral, notches 22, for a purpose to be presently described. The rear end of the stem is curved as at 23, to be capable of engaging a pin 24 which passes transversely through the barrel 12, somewhat forward of its rear end.

Extending longitudinally within the barrel 12 is an operating bar 25, having its rear end pivotally connected to the operating lever 26, which is pivoted to the carriage 10 at 27, or at any other suitable place. The bar 25 is channel shaped in cross section and is adapted to receive between its latera walls the stem 21 of the plunger. These lateral walls are longitudinally slotted at 26, and the cross pin 24 passes through the slotted walls 26. Pivotally carried by the bar 25 between its lateral walls, is a pawl or dog 27 having parallel spaced noses 28 which, under certain conditions, are de-

signed to enter the notches 22 in the stem 21. The pawl 27 is substantially channel shaped in cross section, and is normally pressed into the channeled operating bar 25 by a spring 29, which has its ends bearing against the pin 30 on which the pawl 27 is pivoted. Surrounding a part of the operating bar 25 is a coiled spring 31, one end of which bears against the inner face of the cup 15 of the plunger, and the opposite end of which bears against the pin 24 which passes transversely through the barrel 12.

The operation of the device is as follows:—When the lever 26 is vertical or substantially so, as shown in Fig. 1, the parts of the mechanism are in the positions shown in Fig. 2, *i. e.*, the plunger is at the forward end of the barrel 12, the noses 28 of the pawl 27 are in engagement with the notches 22 of the plunger stem 21, and the spring 31 is extended and not under substantial compression. If it be desired to discharge the cork 13 from the gun mouth it is merely necessary to move the lever 26 to the left (Fig. 1) about its pivot 27. As a result of this action, the operating bar 25 is retracted, and inasmuch as the pawl noses 28 engage the notches 22 of the stem 21, the plunger is also retracted, compressing the spring 31 between its cup 15 and the transverse pin 24. Compression of the spring and retraction of the plunger in the gun barrel 12 continue until the tail 32 of the pawl 27 encounters the pin 24, whereupon the pawl is rocked about its pivot 30 against the tension of spring 29, releasing the engagement between the pawl and the stem 21 of the plunger. When this occurs the coiled spring 31, which has been placed under considerable compression, extends and forcibly projects the plunger against the cork 13, expelling the latter from the mouth of the barrel. The expulsion of the cork is attended by a sharp report or "pop." To place the gun into condition for another discharge, the lever 26 is moved to the right, so that the operating bar 25 is moved forward in the barrel 12. It will be understood that the movement of the bar 25 in either direction in the gun barrel is limited by the ends of the slots 26 striking against the pin 24. When the bar 25 has moved forward a sufficient distance so that the pawl noses 28 are in line with the notches 22, the noses will engage these notches, thus locking the stem 21 and the bar 25 together, and placing the device into condition to be discharged.

From the foregoing description of the construction and operation of our improved gun or cannon, it will be apparent that but a single movement of the operating lever in one direction is required for a discharge, this single movement "cocking" the gun and also causing the expulsion of the projectile from the gun mouth. Movement of the lever in the opposite direction places the gun in condition for a succeeding discharge, but in this second movement the spring is not compressed, so that its life is materially lengthened.

It is not our purpose to limit our invention to the details of construction described or illustrated, as substantial modification thereof is possible without departing from the spirit of the invention as defined by the scope of the appended claims.

What we claim is:—

1. In a toy gun or cannon, the combination of a barrel, a plunger reciprocable therein, an operating bar movable in said barrel and adapted to be releasably connected to said plunger, compressible means for projecting said plunger in the barrel, means for retracting said operating bar in the barrel whereby said plunger is retracted and said compressible means is placed in condition to project said plunger in the barrel, and means for releasing the connection between said operating bar and said plunger whereby said compressible means projects the plunger in the barrel.

2. In a toy gun or cannon, the combination of a barrel, a plunger reciprocable therein, an operating bar movable in said barrel and adapted to be releasably connected to said plunger, a coiled spring surrounding said bar and adapted to project the plunger in the barrel, means for simultaneously retracting said bar and said plunger in the barrel whereby said spring is compressed to place it in condition to project the plunger in the barrel, and means for releasing the connection between the bar and plunger whereby said spring may extend and project the plunger in the barrel.

3. In a toy gun or cannon, the combination of a barrel, a plunger reciprocable therein, an operating bar movable in said barrel, means for releasably connecting the operating bar to the plunger, compressible means for projecting said plunger in the barrel, means for simultaneously retracting said bar and said plunger whereby said compressible means is placed in condition to project the plunger in the barrel, and means for actuating said first named means to release the connection between the bar and the plunger and render said compressible means operative to project the plunger in the barrel.

4. In a toy gun or cannon, the combination of a barrel, a plunger reciprocable therein, an operating bar movable in said barrel, means for releasably connecting the operating bar to the plunger, a coiled spring surrounding said bar and adapted to project the plunger in the barrel, means for simultaneously retracting said bar and said plunger whereby said spring is placed under

compression, and means acting on said first named means to release the connection between the bar and the plunger whereby said spring is free to extend and project the plunger in the barrel.

5. In a toy gun or cannon, the combination of a barrel, a plunger reciprocable therein, an operating bar movable in the barrel, a pivotally mounted member for releasably connecting the operating bar to the plunger, compressible means surrounding said bar and adapted to project the plunger in the barrel, means for simultaneously retracting said bar and plunger whereby said compressible means is placed in condition to project said plunger in the barrel, and means placed in the path of and adapted to rock said pivotally mounted member to release the connection between said bar and plunger whereby said compressible means is rendered operative to project the plunger in the barrel.

6. In a toy gun or cannon, the combination of a barrel, an operating bar movable therein, a plunger reciprocable in said barrel, a stem carried by said plunger and extending parallel to the bar, means for releasably connecting said bar and stem, compressible means adapted to project the plunger in the barrel, means for simultaneously retracting said bar and plunger to compress said compressible means, and means acting on said first named means to release the connection between said bar and said stem whereby said compressible means is free to extend and project the plunger in the barrel.

7. In a toy gun or cannon, the combination of a barrel, an operating bar movable therein, a plunger reciprocable in said barrel, a stem carried by said plunger and extending parallel to the bar, a pawl pivotally carried by said bar and adapted to releasably engage said stem, compressible means surrounding said bar and adapted to project the plunger in the barrel, means for simultaneously retracting said bar and plunger to compress said compressible means, and means in the path of and adapted to rock said pawl to release the connection between the bar and the stem, whereby said compressible means is free to extend and project the plunger in the barrel.

8. In a toy gun or cannon, the combination of a barrel, a channel-shaped operating bar movable therein, a plunger reciprocable in said barrel, a stem carried by said plunger and extending within said operating bar, a pawl pivotally carried by said bar and adapted to releasably engage said stem, compressible means surrounding said operating bar and adapted to project said plunger in the barrel, means for simultaneously retracting said bar and said plunger to compress said compressible means, and means for rocking said pawl to release the connection between the bar and the stem, whereby said compressible means is free to extend and project the plunger in the barrel.

9. In a toy gun or cannon, the combination of a barrel, an operating bar movable therein, a plunger reciprocable in said barrel, a pin traversing said barrel intermediate its ends, a coiled spring surrounding said bar and having one end engaging said plunger and its other end engaging said pin, means for releasably connecting said bar and said plunger, and means for simultaneously retracting said bar and plunger until said first named means strikes said pin to release the connection between the bar and plunger, whereby said spring is first compressed and is then rendered free to extend and project the plunger in the barrel.

10. In a toy gun or cannon, the combination of a barrel, an operating bar movable therein, a plunger reciprocable in said barrel, a pin traversing said barrel intermediate its ends, a coiled spring surrounding said bar and having one end engaging said plunger and its other end engaging said pin, a pawl pivoted to said bar and adapted to releasably connect the same to the plunger, and means for simultaneously retracting said bar and plunger until the pawl strikes said pin to release the connection between the bar and plunger, whereby said spring is first compressed and is then rendered free to extend and project the plunger in the barrel.

11. In a toy gun or cannon, the combination of a barrel, a channel shaped operating bar movable therein, a plunger reciprocable in said barrel, a stem carried by said plunger having notches formed therein, said stem extending in said bar, a pawl pivoted to said bar, said pawl having noses adapted to enter said notches and releasably connect said plunger to said bar, a pin traversing said barrel intermediate its ends, a coiled spring surrounding said bar and having one end engaging said plunger and its other end engaging said pin, and a lever for simultaneously retracting said bar and said plunger until the pawl strikes said pin and said noses are moved out of the notches in said stem, whereby the coiled spring is first compressed and is then rendered free to extend and project the plunger in the barrel.

12. In a toy gun or cannon, the combination of a barrel, a channel shaped operating bar movable therein, said bar having slotted side walls, a plunger reciprocable in said barrel, said plunger comprising a cup shaped member, an adjacent flexible washer and a metal washer having a serrated edge, a stem carried by said plunger, said stem extending in said operating bar, a pawl pivotally carried by the bar and adapted to releasably engage said stem, a pin traversing said barrel intermediate its ends and passing through

the slotted side walls of the operating bar, a coiled spring surrounding said bar and having one end engaging the cup shaped member of the plunger and the other end engaging said pin, and a pivotally mounted lever pivoted to said operating bar and adapted to retract the latter and the plunger in the barrel.

In testimony whereof we have affixed our signatures in presence of two witnesses.

DAVID HEYMAN.
THOMAS RAYMOND ARDEN.

Witnesses:
FRANK DOUSHKESS,
HANNAH LEVY.