No. 653,749. Patented July 17, 1900.

# W. R. MACKAY.

## TOY RAPID FIRE CANNON.

(Application filed Apr. 19, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

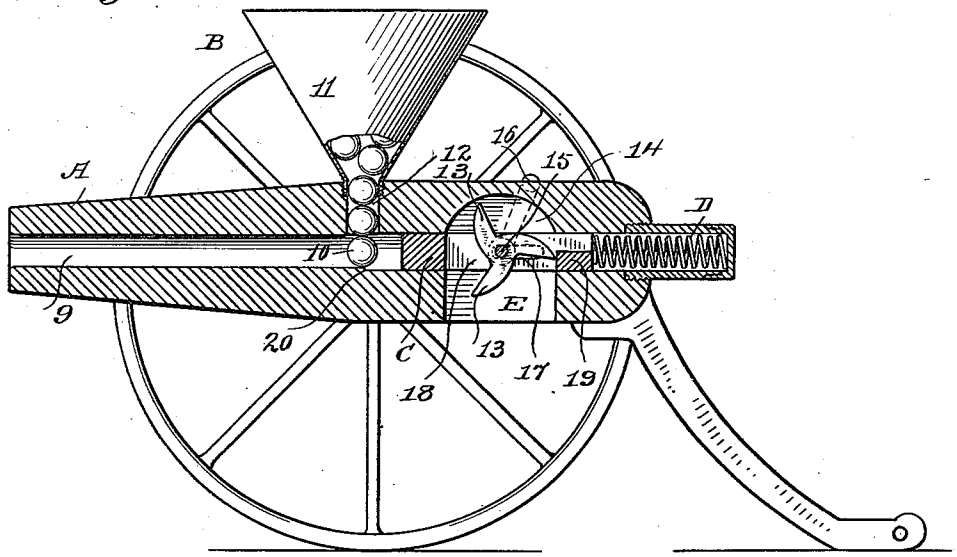
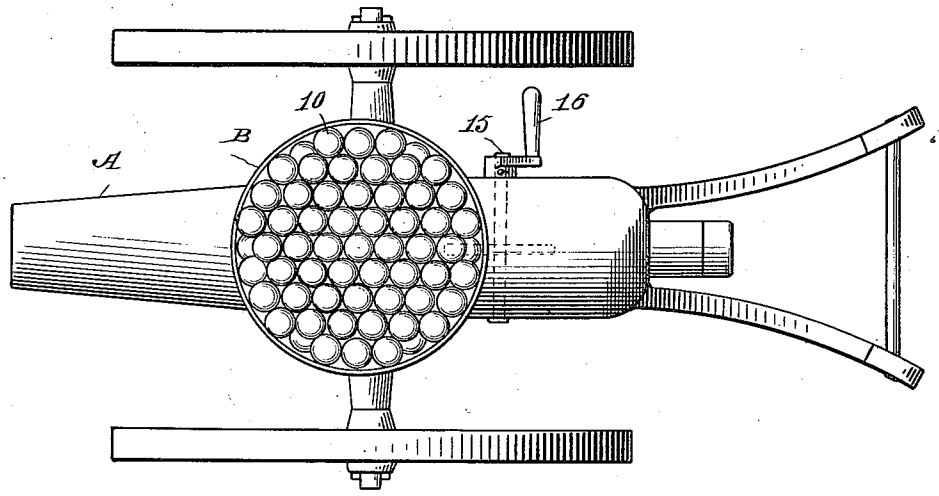



Fig. 2.




WITNESSES

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Fig. 3.

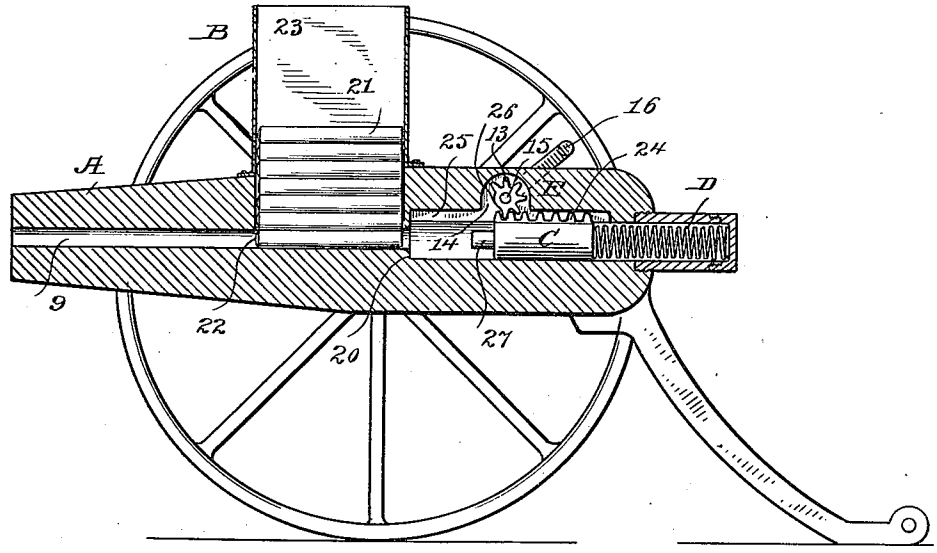
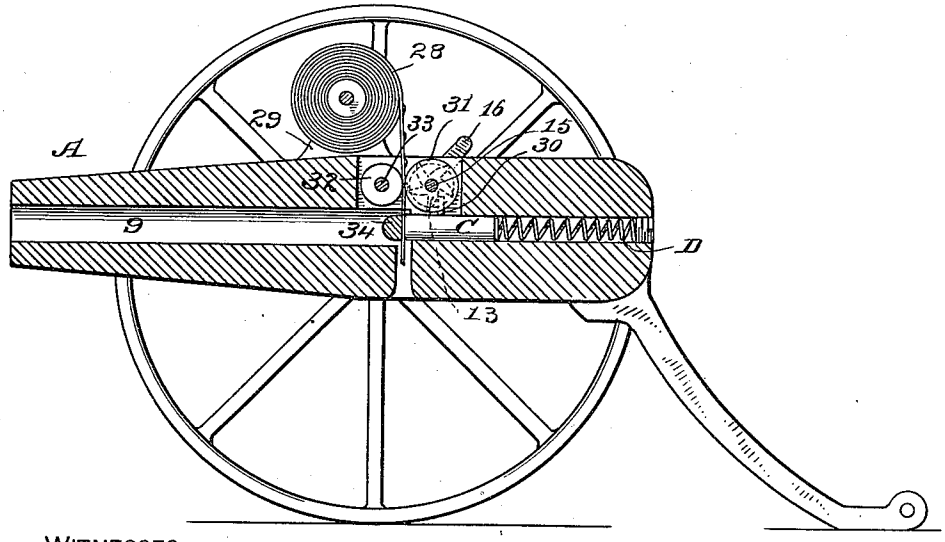



Fig. 4.




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# UNITED STATES PATENT OFFICE.

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## TOY RAPID-FIRE CANNON.

SPECIFICATION forming part of Letters Patent No. 653,749, dated July 17, 1900.

Application filed April 19, 1900. Serial No. 13,461. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. MACKAY, a citizen of the United States, residing at Meriden, county of New Haven, State of Connecticut, have invented a new and useful Toy Rapid-Fire Cannon, of which the following is a specification.

My invention has for its object to provide a toy rapid-fire cannon which shall have in diminutive and harmless form the essential peculiarities as regards appearance and mode of operation of military and naval rapid-fire cannon, the resemblance consisting in the fact that the feed is automatic and that all the operator is required to do to produce the mimic effect of a rapid-fire cannon in use is to turn a crank. With the end in view of providing an inexpensive, harmless, and exceedingly-attractive toy of this character I have devised the novel toy rapid-fire cannon which I will now describe, referring to the accompanying drawings, forming part of this specification, and using reference characters to designate the several parts.

Figures 1, 3, and 4 are longitudinal sections illustrating different modes in which I have carried my invention into effect, and Fig. 2 is a plan view corresponding with Fig. 1.

The essential features of my invention are a barrel A, feeding mechanism B, a plunger C, a strong spring D, by which the plunger is forced forward, and a retracting and releasing device which I have designated by E. Various styles of toy ammunition may be used.

In the form illustrated in Figs. 1 and 2 the cannon is designed to shoot balls 10 of any sort—for example, marbles—or a smaller size may shoot dried peas. The feeding mechanism of this form consists of a hopper which I have indicated specifically by 11. The balls are placed in the hopper, which communicates by a passage 12 with the bore 9 of the barrel. In use the balls feed by gravity. The retracting and releasing mechanism in all the forms consists of a wheel having arms or teeth 13, said wheel lying in a recess 14 in the barrel and being carried by a shaft 15, which is journaled in the barrel and is provided at one end with a crank 16 for convenience in operation. In the form illustrated in Fig. 1 the shaft passes through a transverse slot 17 in the plunger, and arms 13 lie in a vertical slot 18 in said plunger. Back of the slot 18 the plunger is provided with a suitable cross-piece or abutment 19, which is adapted to be engaged successively by the rounded operative faces of the arms to retract the plunger against the power of the spring. In the position shown in Fig. 1 it will be noted that the plunger is at its extreme retracted position. An instant later the arm which is at the instant illustrated holding back the plunger through engagement with the abutment will pass upward above the abutment and release it, the spring acting to propel the plunger forward with considerable force the instant it is released. In all the forms when the shaft is rotated in use the retracting and releasing device alternately retracts the plunger against the power of the spring and then releases it and permits the spring to propel it forward again. 20 denotes a shoulder or stop which may or may not be provided in the barrel to limit the extreme forward movement of the plunger and prevent the abutment from striking the hub of the retracting and releasing wheel.

It will be readily understood from Fig. 1 that when the plunger is propelled forward the full force of the blow is upon the ball that has dropped down by gravity from the hopper and which is thereby expelled from the barrel.

The form illustrated in Fig. 3 differs from the form above described in that instead of shooting balls it shoots short rods 21, each of which may be provided at its forward end with an explosive cap 22. These rods feed downward by gravity in a way 23. The plunger in this form is shown as provided with rack-teeth 24, which lie in a groove 25 in the barrel. The arms 13 of the retracting and releasing wheel act as teeth and engage the rack. One or more of the teeth, however, are broken away, leaving a recess 26. The plunger in this form strikes a shoulder 20 with full force and is provided with a forwardly-extending firing-pin 27, which strikes the rear end of a rod in the barrel and propels it forcibly forward and out of the barrel. It will be noted that in the form illustrated in Fig. 1 each rotation of the shaft will cause the cannon to fire three shots. In the form illustrated in

Fig. 3 a rotation of the shaft will cause the cannon to fire but one shot. In this form when the shaft is rotated the engagement of the arms or teeth 13 with the rack-teeth carry the plunger back until the recess 26 comes into alinement with the rack-teeth, when the latter are of course released and the plunger propelled forward by the spring.

In the form illustrated in Fig. 4 there is nothing expelled from the barrel of the cannon. In this form I use a roll 28 of percussion-tape, which is mounted to turn in brackets 29, one only being shown in the drawing. The retracting and releasing wheel in this form is shown as provided with five arms, which are adapted to engage a pin or lug 30, extending from the plunger. The shaft 15 in this form also carries a feed-wheel 31. 32 denotes another feed-wheel mounted on a shaft 33, which also extends across the recess 14. The percussion-tape used may be made in various ways; but ordinarily the fulminate in the form of separate pellets is placed between the layers of the tape. This, however, is not of the essence of my invention. In order to provide for the use of a percussion-tape having pellets of fulminate at intervals, the feed-wheel 31 may be provided with a groove (see dotted lines, Fig. 4) which will receive the pellets of fulminate without pressure and without danger of exploding them, the edges of feed-wheel 31—*i. e.*, the walls on opposite sides of the groove—acting to clamp the tape firmly between said feed-wheel and the feed-wheel 32. 34 denotes a strong abutment lying transversely to the bore of the barrel and in such position that the tape as it is fed downward by the feed-wheels when the shaft 15 is rotated will pass over the rear face thereof, where the pellets of fulminate will be exploded by the blows of the plunger. The action of the plunger is practically the same in this form as in Fig. 1, the retracting and releasing wheel having five arms instead of three, and said arms engaging a pin or lug extending from the plunger instead of lying in a recess in the plunger and engaging an abutment thereon.

Having thus described my invention, I claim—

1. In a toy cannon the combination with a barrel having a bore and a hopper for ammunition having a passage communicating with the bore, of a plunger having a slot 17 and an abutment 19, a shaft passing through said slot, a retracting and releasing wheel carried by said shaft and having arms adapted to engage the abutment and a spring acting to force the plunger forward.

2. In a toy cannon the combination with a barrel having a bore and a recess 14 and a hopper for ammunition having a passage communicating with the bore, of a plunger having slots 17 and 18 and an abutment 19, a shaft passing through slot 17, a retracting and releasing wheel carried by said shaft and lying in recess 14 and slot 18 and having arms adapted to engage the abutment and a spring acting to force the plunger forward.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM R. MACKAY.

Witnesses:
E. S. THOMPSON,
GEO. H. YEAMANS.