July 19, 1955 S. ABAGOFF 2,713,338

TOY SUB-MACHINE GUN

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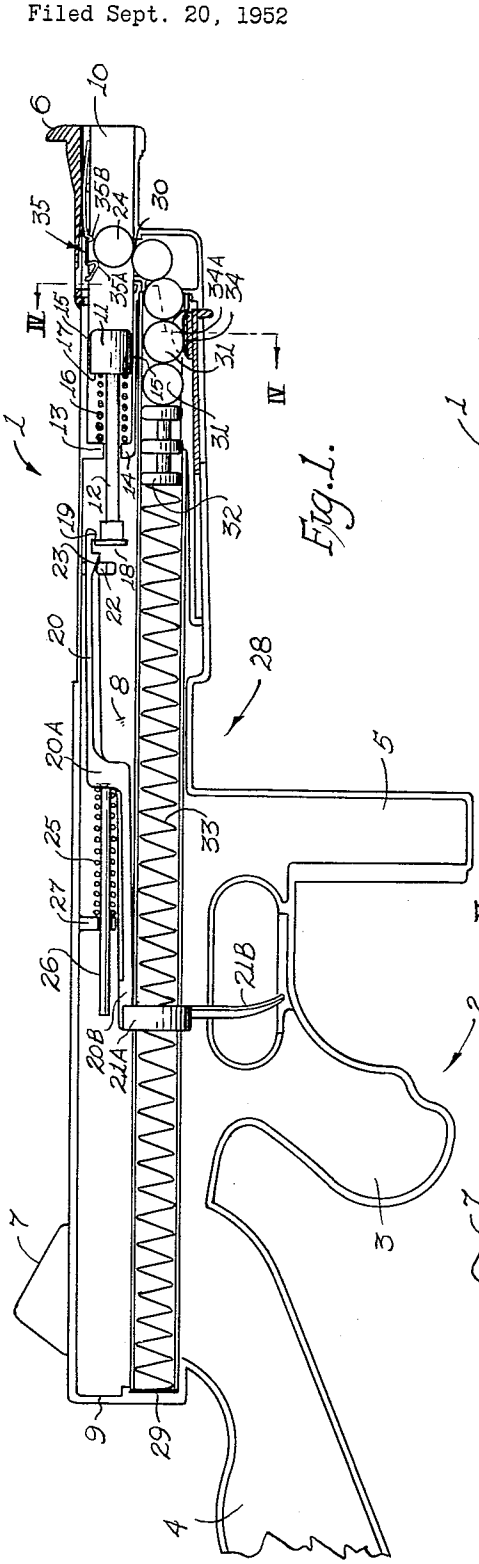


Fig. 1.

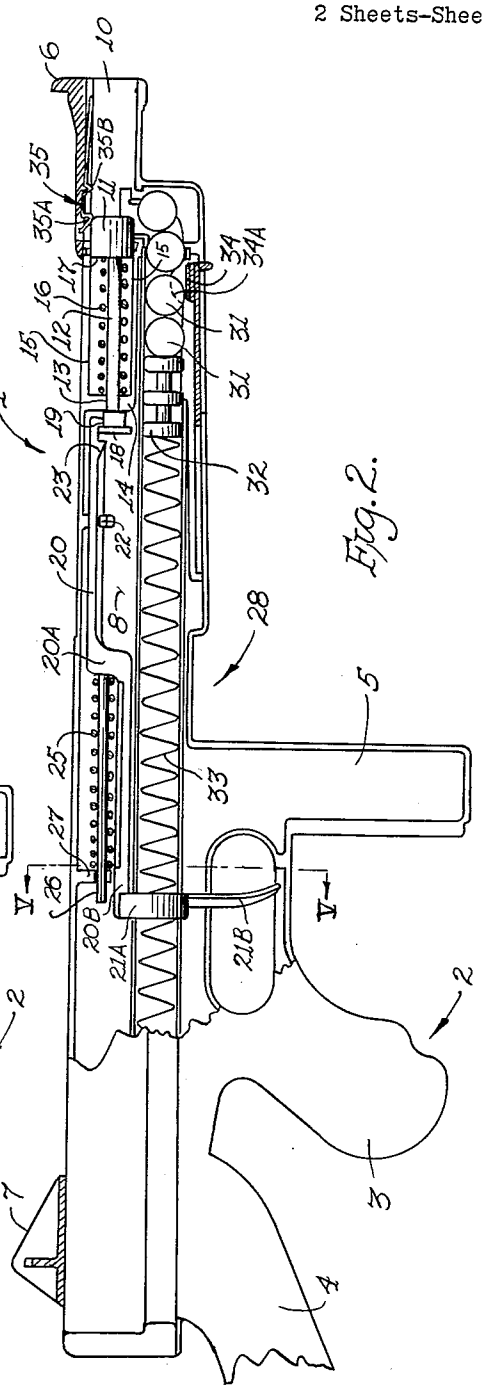


Fig. 2.

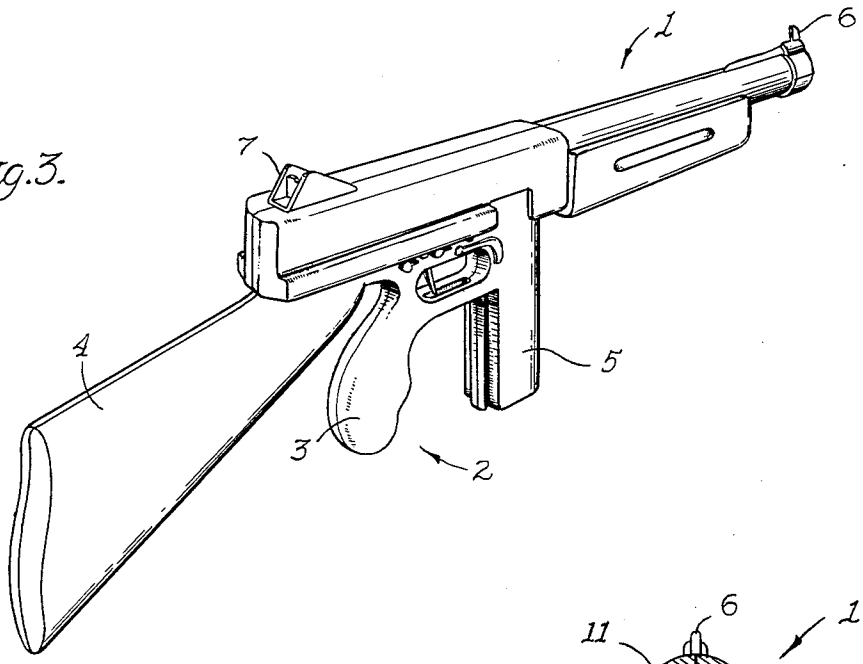
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Fig. 3.



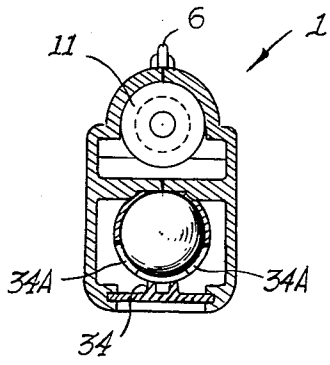


Fig. 4.

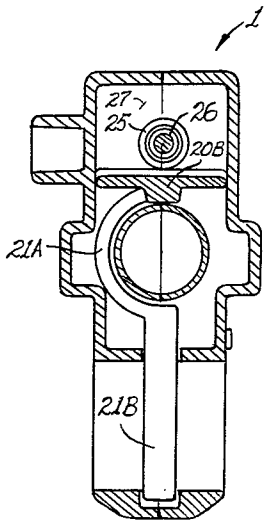


Fig. 5.

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TOY SUB-MACHINE GUN

Serge Abagoff, Burbank, Calif.

Application September 20, 1952, Serial No. 310,672

1 Claim. (Cl. 124—27)

Generally speaking, the present invention relates to toy guns and, more particularly, to an improved toy gun of the repeater or sub-machine gun type, of exceedingly simple, cheap, fool-proof construction, and which is adapted to controllably, sequentially shoot one or more projectiles, such as ping pong balls or the like, for example, with considerable force and accuracy.

I am aware of the fact that a considerable number of prior art toy guns intended to shoot one or more projectiles, such as ping pong balls or the like, have been invented and developed heretofore. However, all of such guns known to me, have been of relatively complex and/or costly construction and are usually prone to become inoperative after a short period of use. Furthermore, there have been very few such prior art guns which are capable of operating as a repeater or sub-machine gun type of multiple firing gun, and in those few cases where they have been capable of such use, they have usually been of a costly pneumatic type or of an exceedingly complex mechanical type. Therefore, such devices have never been commercially successful.

In most prior art toy guns, the trigger operated means adapted to cock the gun into firing position, usually consisted of some sort of lip, shoulder, catch or pawl means, temporarily cooperating with similar means and usually arranged for sliding engagement and disengagement with respect thereto. Usually the contact arm of such cooperative means was relatively small and wear rapidly rendered the gun inoperable by making proper engagement of said cooperative means impossible. Another disadvantage of such prior art toy guns was that they were difficult and, therefore, usually costly to assemble.

Generally speaking, the present invention consists of a hollow longitudinal barrel having longitudinally movable means positioned therein for longitudinal movement with respect thereto. Also included is a first resilient biasing means normally biasing said longitudinally movable means into a forward projectile striking position. Said longitudinally movable means carries lip means in effective association therewith. Also included is lip engaging means arranged for cooperation with the lip means. Also included is trigger means effectively connected to the lip engaging means and slidably positioned for convenient digital access from the exterior of the gun. Also included is a second resilient biasing means normally effectively biasing the trigger means and the lip engaging means into a forward extremum position within the barrel. Also included is means (preferably, through not necessarily, cam means) arranged to effectively disengage the lip engaging means from the lip means in response to rearward movement of the lip engaging means and the trigger means beyond a predetermind point, whereby the longitudinally moveable means will be released and forcibly impelled forwardly by the first resilient biasing means and will strike a projectile carried in and adjacent to the forward end of the barrel and will forcibly catapult the projectile therefrom, and whereby upon manual release of the rearwardly positioned trigger means

the lip engaging means and the trigger means will be forcibly impelled forwardly by the second resilient biasing means and said lip engaging means will be moved into engagement with the lip means ready for a subsequent rearward actuation thereof.

A preferred general form of the present invention also includes hollow magazine means adapted to carry a plurality of projectiles therein and port means communicating the magazine means and the interior of the barrel means at a predetermined striking position in front of the unfired longitudinally movable means. This form of the present invention may also include resilient means in the hollow magazine means for biasing the plurailty of projectiles toward the port means.

From the above general description of the basic form and one preferred generic form of the present invention, it will be apparent to those skilled in the art that virtually all of the hereinabove mentioned disadvantages of prior art toy gun constructions are virtually entirely eliminated and overcome in and through the use of the present invention.

For example, it is apparent that the gun of the present invention is of exceedingly simple, cheap, fool-proof construction and will operate for a long period of time without getting out of order.

With the above points in mind, it is an object of the present invention to provide a new and improved toy gun, which may take the form of a repeater or sub-machine gun or a single shot gun, and which is adapted to catapult one or more projectiles (such as ping pong balls or the like) in a controllable and accurate manner.

Other and allied objects will be apparent to those skilled in the art after a careful perusal, examination and study of the accompanying illustrations, the present specification and the appended claim.

To facilitate understanding, reference will be made to the hereinbelow described drawings, in which:

Fig. 1 is a fragmentary, elevational view of the left half of one illustrative embodiment of the present invention as seen from the center thereof, and shows the gun in the position its trigger mechanism assumes just prior to firing.

Fig. 2 is a fragmentary view, similar in aspect to Fig. 1, but showing the trigger mechanism in the position it assumes after firing a projectile and before again retracting the trigger for firing a subsequent shot.

Fig. 3 is a perspective view of the fully assembled gun illustrated in Figs. 1 and 2.

Fig. 4 is a vertical sectional view taken in the direction of the arrows IV—IV in Fig. 1.

Fig. 5 is a vertical sectional view taken in the direction of the arrows V—V in Fig. 2.

Generally speaking, the present invention includes a hollow longitudinal barrel (preferably, though not necessarily, provided with suitable handle and/or stock means).

In the specific example illustrated, the hollow longitudinal barrel is indicated generally at **1** and is effectively fixedly fastened in operative position with respect to handle means indicated generally at **2** and comprising a pistol grip **3**, a shoulder engageable stock **4** and a manually graspable aiming and support member **5**. In the specific example illustrated, the barrel **1** is provided with front sight means **6** and rear sight means **7** to facilitate aiming the gun. In the specific example illustrated, the barrel **1** is provided with a hollow longitudinal interior chamber **8** having a closed rear end **9** and an open front end **10**.

Also generally speaking, the hollow longitudinal barrel of the present invention carries therein a longitudinally movable means slidably mounted for relative longitudinal movement with respect thereto.

In the specific example illustrated, the longitudinal mov-

able means comprises a projectile striking plunger having an enlarged head 11 and a rearwardly directed shaft 12. It will be noted that a portion of the plunger (the shaft 12) is in sliding engagement with an aperture 13 in a member 14 positioned across the hollow chamber 8 and fixed with respect to the barrel 1, and that another portion of the plunger (the head 11) is in sliding engagement with respect to the larger concentric aligned aperture defined by the walls 15 of the barrel 1, whereby to effectively position and guide the direction of movement of the plunger striking head 11.

Also generally speaking, a first resilient biasing means is arranged to normally bias the longitudinally movable means into a forward projectile striking position.

In the specific example illustrated, this first resilient biasing means comprises a first coil compression spring 16 axially carried by the plunger shaft 12 between a shoulder 17 at the rear side of the plunger head 11 and the fixed portion 14 carried by the barrel 1. The arrangement is such that the plunger head 11 is biased toward the right as viewed in Fig. 1 and Fig. 2 and, in absence of constraint, tends to assume the position shown in Fig. 2.

Also generally speaking, lip means is operatively connected to the longitudinally movable means and is arranged for cooperation with respect to slidable lip engaging means effectively connected to slidable trigger means.

In the specific example illustrated, the lip means is indicated at 18, carried at the rear end of the plunger shaft 12. In the specific example illustrated, the lip engaging means comprises a tooth 19 carried by the right end of a slidably mounted connecting rod 20, the other end of which is provided with a downwardly directed portion 20A, which is provided with a rearwardly directed portion 20B fixedly fastened to a trigger connecting link portion 21A, which is connected to a trigger 21B. It will be noted that the trigger 21B and the connecting rod 20 carrying the lip engaging means 19 are slidably moveable with respect to the barrel 1 whereby rearward movement of the trigger 21B into the position shown in Fig. 1 will cause the lip means 18 engaged by the lip engaging means 19 to be moved rearwardly (or toward the left as viewed in Fig. 1) and will thus correspondingly move the plunger head 11 rearwardly (or toward the left as viewed in Fig. 1) against the action of the first biasing spring 16.

Also included is means for effectively disengaging the lip engaging means with respect to the lip means in response to rearward movement of the lip engaging means and the trigger means beyond a certain point.

In the specific example illustrated, this takes the form of cam means comprising a member 22 fixed with respect to the interior of the barrel 1 and an inclined surface 23 carried by the underside of the right hand end of the connecting rod 20. The arrangement is such that when the trigger 21B is moved into the rearward or leftward position shown in Fig. 1, a slight additional movement will cause engagement of the members 22 and 23 and will effectively disengage the lip engaging means 19 from the lip means 18, thus allowing the first biasing spring 16 to forcibly move the lip means 18, the plunger shaft 12 and the plunger head 11 forwardly or toward the right, as viewed in Fig. 1, whereby it will strike a projectile 24 in a striking position in a forward portion of the barrel 1 and it will forcibly catapult said projectile therefrom.

Also generally speaking, the present invention includes a second resilient biasing means normally effectively biasing the trigger means and the lip engaging means into a forward extremum position within the barrel.

In the specific example illustrated, said second resilient biasing means comprises a second coil compression spring 25 axially carried by a rearwardly extended portion 26 of the connecting rod 20 between the shoulder portion 20A thereon and an apertured projecting portion 27 fixedly carried within the barrel 1. This arrangement also comprises means for slidably mounting the movable trigger assembly and lip engaging means. The arrangement is such that the lip engaging means 19 is normally biased into a forward or right hand extremum position as shown in Fig. 2 whereby, following the disengagement of the lip engaging means 19 and the lip means 18 after movement of the trigger 21B into a position slightly more to the left than shown in Fig. 1, the trigger 21B can be released and allowed to move forwardly under the action of the second coil compression spring 25 into the position shown in Fig. 2, where the lip engaging means 19 will re-engage the lip means 18 and place the device in condition for subsequent rearward actuation of the trigger 21B, the connecting rod 20, the lip engaging means 19, the lip means 18, the plunger shaft 12, and the plunger head 11 into a position immediately before firing takes place, such as shown in Fig. 1.

Also generally speaking, the present invention may include hollow magazine means adapted to carry a plurality of projectiles therein and provided with port means communicating the magazine means and the interior of the barrel means at a predetermined striking position in front of the unfired longitudinally movable means. This may also be provided with resilient biasing means effectively biasing the plurality of projectiles toward the port means.

In the specific example illustrated, the hollow magazine means is of longitudinal tubular form and is positioned immediately under the barrel means, as indicated generally at 28, and is provided with a closed rear end 29 and a laterally ported front end 30 communicating with the interior of the barrel 1 at a predetermined striking position. In the specific example illustrated, the tubular magazine 28 is adapted to carry a plurality of spherical projectiles, such as are indicated at 31, positioned ahead of a slide member 32, the rear of which abuts a coil compression spring 33, which comprises the above mentioned resilient biasing means. The arrangement is such that the spring 33 effectively forwardly impels the slide member 32, which correspondingly forwardly impels the plurality of projectiles 31 so as to force the end projectile into a predetermined striking position in the barrel 1 when the plunger head 11 is out of alignment with respect to the port means 30, as shown in Fig. 1. It should also be noted that the magazine 28 is provided with a slidably movable cover 34 adapted for manual sliding movement to open and close loading port 34A to facilitate the gun reloading operation. It should also be noted that the trigger linkage member 21A is of semi-annular form and extends around approximately half of the exterior periphery of the wall of the magazine 28. This arrangement provides effective linkage between the trigger actuating portion 21B and the rear portion 20B of the connecting rod 20 (through slot means) without in any way interfering with the operation of the magazine 28.

Also generally speaking, projectile positioning means may be positioned in the barrel at a predetermined striking position and arranged to effectively receive from the port means a projectile to be fired, and to temporarily position said projectile in said striking position until it is forcibly catapulted therefrom by the impact of the fired longitudinally movable means.

In the specific example illustrated, the projectile positioning means comprises resilient means indicated generally at 35 insertable into and engageable with respect to the interior of the end of the barrel and provided with spaced projections 35A and 35B positioned so as to be effectively capable of positioning cooperation with respect to the top of a projectile 24, as best shown in Fig. 1.

It should be noted that the major portions of the gun are constructed of two molded plastic half sections adapted to be joined together in a generally vertical

plane or plurality of such planes, and that the various internal moving parts may, therefore, be easily and conveniently assembled in operating position within the gun, thus making it possible to produce a gun of cheap simple construction.

Numerous modifications and variations of the present invention will occur to those skilled in the art after a careful study hereof. All such properly within the spirit and scope of the present invention are intended to be included and comprehended as fully as if specifically described, illustrated and claimed herein. For example, it should be noted that while the preferred form of the present invention contemplates that the fixed portions of the invention will be made of molded plastic construction and the biasing means and/or the projectile positioning means may be made of metallic construction, the present invention is not limited to this arrangement but may be made in other suitable forms and of other suitable materials.

It should also be noted that while I have described the projectiles to be fired in the gun of the present invention as of a type similar to ping pong balls, the invention is not so limited. Various other types of projectiles may be fired. It should also be noted that the gun of the present invention is not limited to a multiple firing arrangement of a repeater or machine gun type but may comprise any type of gun, whether multiple firing or single firing. In the event that it is single firing, the magazine may be eliminated.

In certain forms of the present invention the projectile positioning means may be modified substantially or may be eliminated entirely. This is also true of the slidable member carried in the magazine means. The exact construction of the two biasing means, lip engaging means, lip means, cam releasing means, and associated components may be modified considerably within the spirit hereof. The magazine means may be modified substantially.

The exact constructions, configurations, compositions, relative positionings, and cooperative relationships of the various component parts of the present invention are not critical and can be modified substantially within the spirit and the basic teachings hereof.

The embodiments of the present invention specifically described, illustrated and claimed herein are exemplary only and are not intended to limit the scope of the present invention, which is to be interpreted in the light of the prior art and the appended claim only, with due consideration for the doctrine of equivalents.

I claim:

An improved toy sub-machine gun adapted to controllably sequentially catapult a plurality of projectiles therefrom, comprising: a hollow longitudinal barrel; a longitudinally movable plunger within the barrel slidably mounted for longitudinal movement with respect thereto, said plunger being provided with guiding portions in sliding engagement with longitudinally concentrically aligned apertures at opposite ends of a selected forward region of the barrel which position and guide the direction of movement of the plunger, said plunger being provided with a shoulder, a first resilient biasing coil compression spring means axially carried by the plunger between said shoulder and the rear end of said forward region of the barrel and adapted to normally bias the plunger into a forward projectile striking position; lip means carried by the rear of the plunger; handle means depending from the barrel adjacent the rear thereof; lip engaging means arranged for cooperation with the lip means; trigger means effectively connected to the lip engaging means and positioned in front of the handle means for convenient digital access from the exterior of the gun; means slidably mounting said lip engaging means and said trigger means for relative longitudinal movement with respect to the barrel; a second resilient biasing means normally effectively biasing said trigger means and said lip engaging means into a forward extreme position within the barrel; means effectively cooperable with respect to the lip engaging means to effectively disengage said lip engaging means from the lip means in response to rearward movement of the lip engaging means and the trigger means beyond a predetermined point, whereby the plunger will be released and forcibly impelled forwardly by the first resilient coil compression spring means and will strike a projectile carried in and adjacent to the forward end of the barrel and will forcibly catapult the projectile therefrom, and whereby upon manual release of the rearwardly positioned trigger means, the lip engaging means and the trigger means will be forcibly impelled forwardly by the second resilient biasing means and said lip engaging means will be moved into engagement with the lip means ready for a subsequent rearward actuation thereof for re-cocking the gun; said lip engaging means including tooth means carried by the front end of a slidably mounted longitudinal rearwardly directed connecting rod, which is provided adjacent its rear end with the downwardly directed slidably mounted trigger means positioned immediately in front of the handle means, the rear end of said connecting rod being also provided with a shoulder and a rearwardly extended portion slidably cooperable with respect to a fixed projection carried within the rear portion of the barrel means; said second resilient biasing means comprising a second coil compression spring axially carried by the rearwardly extended portion of the connecting rod between the shoulder thereon and the projecting portion of the barrel, whereby said lip engaging means is normally biased into a forward extreme position; said means adapted to effectively disengage the lip engaging means from the lip means including cam means arranged to vertically move the tooth means out of engagement with respect to the lip means at a predetermined point in the path of rearward travel of said lip engaging means, allowing the first coil compression spring to forcibly return the plunger to its normal forward position; and hollow longitudinal tubular magazine means adapted to carry a plurality of projectiles therein positioned immediately under the barrel means and provided with port means adjacent the forward end of said magazine means communicating the upper forward end of the hollow magazine means with the interior of the barrel means at a predetermined striking position in front of the plunger; said downwardly directed trigger means including an arcuate portion closely slidably partially encircling the exterior of the hollow tubular magazine and a lower downwardly directed finger-engageable portion positioned immediately in front of the handle means.

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