

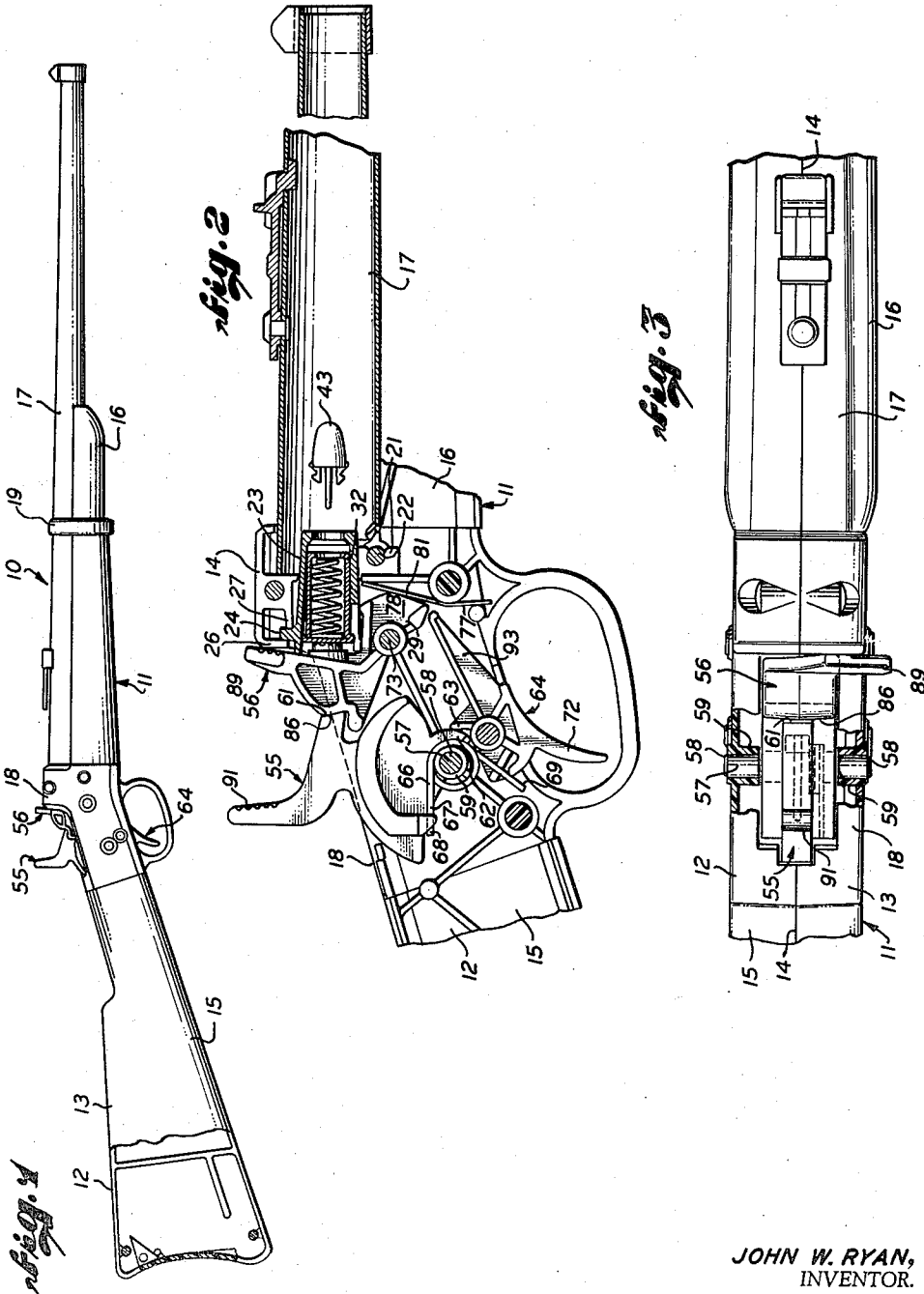
Nov. 29, 1960

J. W. RYAN
ROLLING-BLOCK RIFLE

2,962,016

Filed July 29, 1959

2 Sheets-Sheet 1



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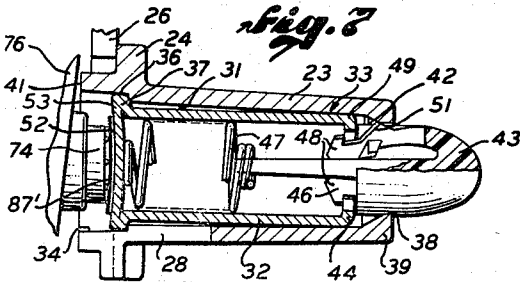
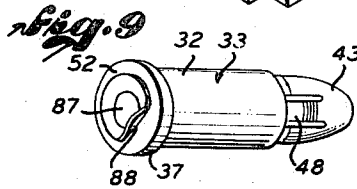
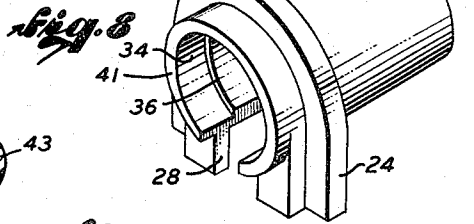
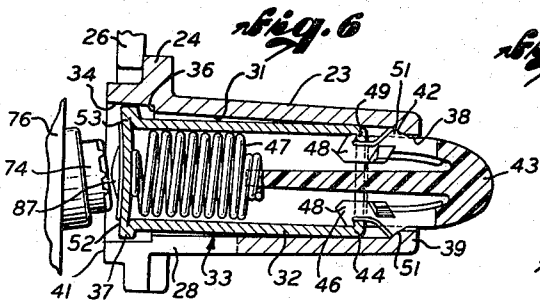
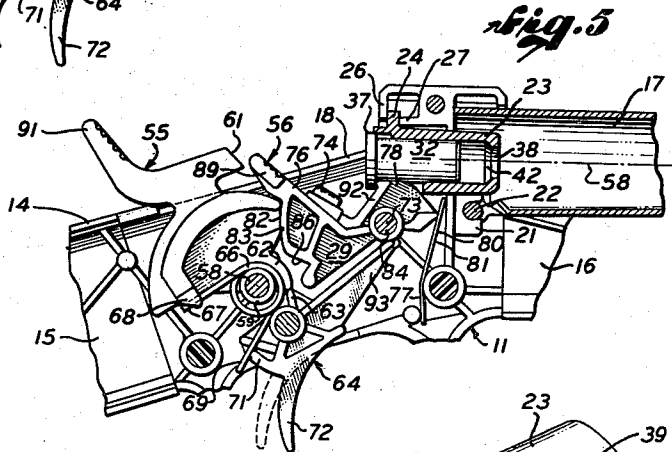
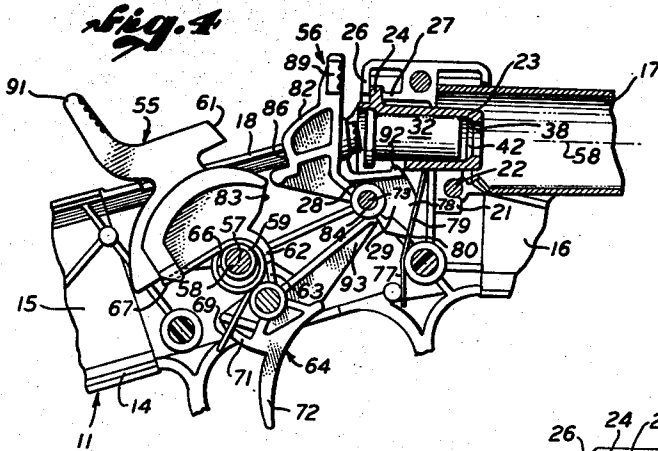
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1

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ROLLING-BLOCK RIFLE

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18 Claims. (Cl. 124—2)

This invention relates to a toy gun and more particularly to a rifle having a rolling block action simulating the action of the actual rolling block rifles used in early days.

In the early days of gun history, single shot rifles having a rolling block interposed between a hammer and a cartridge held within a chamber thereof were commonly used. Such a rifle had the unique advantage of preventing premature firing or actuation of the hammer, during unloading and reloading of the rifle, the rolling block being pivotally movable into a position adjacent to the cartridge wherein the impact of the hammer was transmitted to the cartridge, and a position adjacent the hammer when cocked in a rearward direction to prevent actuation of the hammer by the trigger means.

Due to childrens' increased awareness of authentic weapons of the early days of gun history, via cinematography and television, they are becoming more discriminating in their desire for toys which closely simulate such early weapons.

It is therefore an object of this invention to provide a new and improved toy rolling block rifle which closely simulates the appearance and action of the actual rolling block rifle commonly used in the early days of gun history.

It is another object of this invention to provide a new and improved toy rifle which is safe and harmless in use, incorporating a rolling block which prevents spattering of exploded fulminating material from the chamber when fired to protect the eyes and face of the user.

A further object of this invention is to provide a new and improved toy rifle which is economical to manufacture and capable of mass production.

Yet another object of this invention is to provide a new and improved toy rifle which includes means for propelling a bullet-simulating pellet through the barrel thereof in a realistic manner.

A further object of this invention is to provide a new and improved toy rifle in which assembly is greatly facilitated by the use of a minimum number of parts and including a minimum number of springs for biasing the parts in their proper relationship.

These and other objects of this invention will be more apparent from the herein detailed description, drawings and appended claims.

This invention provides a toy rifle having a housing closely simulating, in outer appearance, the actual counterpart thereof. The housing includes a barrel at one end thereof, a stock portion at the other end thereof, a breech portion intermediate of the ends and a chamber capable of receiving a simulated cartridge slidingly therein.

A trigger-actuated hammer is pivotally mounted within the breech portion of the housing for forward and rearward pivotal movement, into striking and cocking positions respectively. The hammer and the trigger are spring-biased into their relative positions by a common spring means. A rolling block is pivotally mounted within the breech, interposed between the hammer and the

2

chamber, and can be manually juxtaposed to the chamber whereby the hammer strikes a rolling block when actuated by the trigger, the striking force being translated through the rolling block to a rearwardly extending anvil face of the cartridge for firing a cap thereon and or ejecting a bullet-simulating pellet therefrom, through the barrel. The rolling block is further capable of being manually juxtaposed into a position adjacent to the hammer in its cocked position to prevent trigger actuation of the hammer during unloading and reloading. The rolling block means further includes an ejecting means for ejecting the cartridge outwardly of the chamber during its rearward pivotal movement to facilitate removal of the cartridge from the chamber.

In the drawings:

Figure 1 is a side view, in elevation, of a toy rifle designed and constructed in accordance with this invention, with parts broken away for greater clarity;

Figure 2 is an enlarged, fragmentary, vertical, cross-sectional view as taken along the longitudinal axis of the rifle illustrated in Figure 1;

Figure 3 is a plan view thereof, with parts broken away for greater clarity;

Figure 4 is a view similar to Figure 2 illustrating parts thereof in a changed position, more particularly, the hammer means thereof in a cocked position;

Figure 5 is a view similar to Figures 2 and 4, illustrating the rolling block means thereof in another position;

Figure 6 is an enlarged, vertical, cross-sectional view, as taken along the longitudinal axis of the chamber thereof;

Figure 7 is a vertical, cross-sectional view similar to Figure 6 illustrating an actuated position of parts shown in Figure 6.

Figure 8 is an enlarged, perspective view, in elevation, of the chamber; and

Figure 9 is a perspective view, in elevation, illustrating the cartridge means in greater detail.

Referring more particularly to the drawings, there is shown by way of illustration, but not of limitation, a toy rifle generally designated by the numeral 10, designed and constructed in accordance with this invention. The rifle 10 comprises a housing, generally designated by the numeral 11, preferably molded or otherwise formed of a plastic material which may be conveniently formed in halves 12 and 13 secured together as along their common parting line 14, the longitudinal axis of the housing. The housing 11 includes a stock portion 15 at one end thereof, a fore-end portion 16 for supporting a hollow barrel 17, and a breech portion 18 intermediate the ends.

The barrel 17 may be formed integrally with the housing 11 or separately therefrom, as illustrated, and secured to the housing as by an annular clamp 19 to secure the barrel 17 to the fore-end. Hooks 21 are provided on the barrel for engagement with inwardly extending pins 22 of each half section 12 and 13 to prevent axial movement of the barrel 17 relative to the housing 11. The barrel 17 is provided with a chamber 23 which is fixed at one end thereof adjacent the breech portion 18, the chamber 23 being tubular in form and having a radial flange 24 to facilitate securement within the housing 11 as between ribs 26 and 27 of the housing.

The flange 24 of the chamber 23 is preferably non-circular to prevent rotation thereof within the housing and to orientate a slot 28 thereof with an ejecting means 29 to be hereinafter described.

As best seen in Figure 6, the chamber 23 includes an internal bore 31 adapted to receive therein, in sliding relationship, a shell 32 of a cartridge generally designated by the numeral 33 and a counter bore 34 forming an inwardly facing shoulder 36 engageable with a rim 37 of a shell 32 to limit axial movement of the shell 32.

within the bore 31. The chamber 23 further includes a reduced bore 38 of a forward end wall 39, opposite the open end 41 having the counter bore 34, the bore 38 and 31 forming a conical shoulder 42 therebetween and adjacent the wall 39. The shoulder 42 forms a pellet-releasing means to be hereinafter described.

The cartridge 33 is adapted to slidingly fit coaxially within the bore 31 and includes, in addition to the shell 32, a pellet 43 releasably secured to the forward open end 44 of the shell 32, as by a releasable holding means 46, and a propelling means within the shell 32 in the form of a helical spring 47.

The cartridge 33, herein illustrated, is preferably designed and constructed in accordance with my copending patent application for a "Pellet Cartridge," Serial No. 798,290, filed March 9, 1959, in which a pellet may be propelled away from a shell of a pellet cartridge by a propelling means, in response to axial movement of the cartridge within a bore having a releasing means to release the pellet from the shell. The releasable holding means 46 comprises a pair of pliant, resilient hook members 48 integral with or secured to the pellet 43 and engageable with an inwardly extending flange 49 adjacent the open end 44 of the shell 32. As best seen in Figure 7, the pellet 43 may be released from the shell 32 by squeezing the hook members 48 inwardly to disengage the hook members from the flange 49 and thereby allow the spring 47 to expand and propel the pellet 43 away from the shell 32.

The releasing means 42, i.e., the conical shoulder 42, engages cam surfaces 51 of the hook members 48, when the cartridge 33 is moved in an axial direction towards the bore 38 of the chamber 23, to squeeze the hook members inwardly, as seen in Figure 7, to disengage the hooks from the flange 49 and subject the pellet to the expanding force of the spring 47.

The shell 32 of the cartridge 33 forms an anvil means by providing an anvil surface 52 formed on the outer surface of an end wall 53 of the shell 32 upon which an impact force may be applied to move the cartridge 33 in an axial direction. During the axial movement the cam surfaces 51 are brought into engagement with the conical shoulder 42 to squeeze the hook members 48 together and thereby release the pellet from the shell. The axial movement, as previously mentioned is limited by abutment of the rim 37 of the shell 32 with the shoulder 36 of the chamber 23.

The impact force applied to the anvil surface 52 is initiated by a hammer means 55 which applies a spring-biased force against a rolling block means 56. The rolling block 56 may be selectively interposed between the hammer 55 and the chamber 23 for translating impact force of a hammer 55 into an axial movement of the anvil means or cartridge 33.

The hammer means 55 is pivotally mounted in the breech portion 18 of the housing 11 for pivotal movement in forward and rearward directions around an axis 57 below the barrel axis 58 and transversely thereof. More specifically, the hammer 55 is pivotally mounted by means of transversely extending projections or pins 58 rotatably disposed in bearings 59 formed integrally with or secured to the housing halves 12 and 13. The hammer means 55 includes a striking face 61 and a downwardly facing shoulder 62. The shoulder 62 is engageable by a shoulder 63 of a trigger means 64, as best seen in Figures 4 and 5, to retain the hammer 55 in a cocked position, illustrated in these figures, resulting from a rearward, pivotal, manually-imparted movement of the hammer 55. The shoulder 63 of a trigger means 64 is retained in abutment with the shoulder 62 of the hammer 55 by a torque spring 66 having one end 67 thereof bearing against a spring keeper of the hammer 55, and another end 69 thereof bearing against a shoulder 71 of the trigger 64. The shoulder 63 is biased by the spring 66 beneath the shoulder 62 to prevent forward pivotal

movement of the hammer 55 until the shoulders are disengaged by manual actuation of a finger portion 72 of the trigger 64.

As the trigger piece 72 is manually drawn in a rearward direction, the shoulder 63 is removed from beneath the shoulder 62 to permit the spring 66 to bias the hammer 55 in a forward pivotal movement with an accelerated force. The spring 66 is preferably constructed of a comparatively heavy spring wire.

In accordance with this invention, means are provided in the housing 11 and operatively associated with the anvil means 33 and the hammer means 55 to translate the forward pivotal movement of the hammer under the spring force of the spring 66 into an impact force upon the anvil surface and an axial movement of the anvil means. The last-mentioned means comprises a rolling block 56 which is pivotally mounted in the housing 11 for pivotal movement about an axis 73 below the barrel axis 58 and transverse thereto. The rolling block includes a striking surface 74 extending outwardly of a forward face 76 thereof, the striking face 74 being appreciably smaller than the counter bore 34 of the chamber 31 to facilitate entry of the striking face 74 into the counter bore 34.

The rolling block is spring-biased as by a leaf spring 77 into one of two positions. The rolling block 56 includes a forwardly extending extension 78 having a pair of surfaces 79 and 80 which selectively bear against an upper end 81 of the spring 77 to retain the rolling block in either a forward or a rearward position. The forward position is shown in Figure 4 wherein the forward face 76 and striking face 74 is juxtaposed to the chamber 23, whereas the rearward position is illustrated in Figure 5 wherein the rolling block is adjacent the hammer 55, in its cocked position, thereby providing a shoulder 82 against which a forward shoulder 83 of the hammer 55 bears. The rolling block 56 is pivotally mounted as by a pair of laterally-extending pins 84 rotatably mounted in housing bearings like 59.

When the rolling block means 56 is in its forward position, illustrated in Figures 1 and 4, a rearwardly extending face 86 is exposed to the hammer 55, in line with the pivotal movement of the striking face 61. When the hammer 55 is released by the trigger 64 the face 61 is spring-biased against the face 86 with an impacting force, to drive the rolling block impact face 74 against the anvil surface 52, thereby to impart an axial movement to the cartridge or anvil means 33.

A sound-producing means, in the form of a percussive cap 87, see Figures 6, 7 and 9, may be removably secured to the anvil surface 52 for detonation by the striking face 74 of the rolling block 56 when the face 74 is driven against the anvil surface 52.

The percussive cap 87 is preferably designed and constructed in accordance with my copending application entitled "A Percussive Cap Structure," Serial No. 791,983, filed February 9, 1959, in which a percussive cap having a fulminating material contained therein is removably secured to an anvil surface as by a pressure-sensitive adhesive 88 secured on the outer face thereof. The cap 87 may be pressed against the anvil surface 52 to cause the adhesive 88 to secure the cap 87 thereon, whereafter the remnants indicated at 87' in Figure 7 may be peeled therefrom after detonation for replacement by a new cap 87 of the same character.

A finger piece 89 is preferably provided on the rolling block 56 to facilitate manual manipulation of the rolling block into its forward and rearward positions, whereas a finger piece 91 is preferably provided on a hammer 55 for manual actuation of the hammer in a rearward pivotal movement to cock the hammer, as previously described.

As best seen in Figures 2 and 5, the ejecting means 29 is secured on or integral with the extension 78 of the rolling block 56. The ejecting means comprises a hook 92 extending upwardly into the slot 28 of chamber 23

for engagement with the rim 37 of the shell 32 when the rolling block 56 is pivoted into its rearward position. As best seen in Figure 5, the hook engages the rim 37 during the rearward pivotal movement to withdraw the shell 32 outwardly of the chamber 23 to facilitate removal of the shell 32 for replacement of the cap and/or pellet 43 after discharge thereof.

The spring-biased rearward pivotal movement of the trigger means 64 to bring the shoulder 63 beneath and into engagement with the shoulder 62 is limited by a forward extension 93 of the trigger means 64, whereby as the shoulder 63 engages the shoulder 62, the extension 93 is brought into engagement with the hub of the pin 84.

While I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and methods.

What I claim as new and desire to secure by Letters Patent is:

1. A toy gun comprising: a housing having a tubular barrel at one end thereof, a stock portion at the other end thereof, and a breech portion intermediate said ends; a cartridge chamber adjacent said breech portion and coaxially aligned with said barrel; a cartridge adapted to slidably fit coaxially in said chamber and having an anvil surface at one end thereof adjacent said breech portion; a rolling block means pivotally mounted in said breech portion for pivotal movement into forward and rearward positions about an axis below the barrel axis; hammer means pivotally mounted in said breech portion for forward and rearward pivotal movement about an axis below the barrel axis; said hammer means being manually pivotable in said rearward movement for cocking thereof; a trigger means pivotally mounted adjacent said hammer means for actuating said hammer means; and a spring means for biasing said hammer means in said forward position so as to strike said rolling block means when said rolling block means is in its forward position and said hammer means is actuated by said trigger means, said rolling block means being interposed between said hammer means and said chamber in its forward position for transmitting the striking force of said hammer means to said anvil surface.

2. A toy gun, defined in claim 1, wherein said rolling block means is manually pivotable into said rearward position adjacent said hammer means when said hammer means is in said cocked position, so as to lock said hammer means against forward pivotal movement.

3. A toy gun, as defined in claim 2, wherein said trigger means is biased by said spring means.

4. A toy gun, as defined in claim 2, including ejecting means on said rolling block means and engageable with said cartridge, said ejecting means being responsive to rearward pivotal movement on said rolling block means for ejecting said cartridge from said chamber.

5. A toy gun, as defined in claim 2, including percussive sound-producing means removably secured on said anvil surface for detonation by said rolling block means when struck by said hammer means.

6. A toy gun, as defined in claim 2, wherein said cartridge includes a spring-biased pellet means on the other end of said cartridge, releasable holding means for releasably securing said pellet to said other end; and said chamber includes a pellet-releasing means coactive with said releasable holding means for releasing said pellet from said cartridge, said pellet-releasing means being responsive to impact transmitted by said rolling block means to actuate said releasable holding means for releasing said pellet from said cartridge.

7. A toy gun, as defined in claim 2, including means on said hammer means for preventing rearward pivotal move-

ment of said rolling block means when said hammer means is in said forward position.

8. A toy gun as defined in claim 2, including releasable holding means in said housing and coactive with said rolling block means for yieldingly holding said rolling block means in forward and rearward positions.

9. A toy gun comprising: a housing having a tubular barrel at one end thereof, a stock portion at the other end thereof and a breech portion intermediate said ends; an anvil means removably supported in said barrel adjacent said breech portion; a hammer means pivotally mounted in said breech portion for forward and rearward pivotal movement about an axis below the barrel axis; said hammer means being manually rearwardly pivotable for cocking thereof; a trigger means pivotally mounted in said housing for actuating said hammer means; spring means for biasing said hammer means into a forward pivotal movement in response to actuation by said trigger means; and means operatively associated with said hammer means and said anvil means for translating the forward pivotal movement of said hammer means into an impact force on said anvil surface.

10. A toy gun, as defined in claim 9, wherein said last-mentioned means is manually, rearwardly rotatable into juxtaposition to said hammer means when said hammer means is in a cocked position so as to lock said hammer means against forward pivotal movement.

11. A toy gun as defined in claim 10, including ejecting means on said last-mentioned means and engageable with said anvil means for ejecting said anvil means during said rearward pivotal movement.

12. A toy gun, as defined in claim 10, wherein said anvil means includes a shell having an anvil surface and an annular rim at one end thereof adjacent a said breech portion and said last-mentioned means of claim 9 includes an ejecting means engageable with said rim for ejecting said shell during said rearward pivotal movement.

13. A toy gun, as defined in claim 12, wherein said anvil means further includes a spring-biased pellet at the other end of said shell and releasable holding means for releasably securing said pellet to said other end of said shell; means for translating impact force of said last-mentioned means of claim 9 into an axial movement of said anvil means relative to said chamber; and pellet-releasing means in said chamber responsive to axial movement of said anvil means for releasing said releasing holding means, whereby said pellet is spring-urged outwardly of said chamber, through said barrel and outwardly of the gun.

14. A toy gun, as defined in claim 11, including percussive, sound-producing means removably secured on said anvil surface for detonation by said impact force of said last-mentioned means.

15. A toy gun, as defined in claim 9, wherein said trigger means is biased into engagement with said hammer means by said spring means.

16. A toy gun, as defined in claim 10, including a second spring means engageable with said last-mentioned means for retaining said last-mentioned means in selective forward and rearward positions, said forward position being in juxtaposition to said anvil means, said rearward position being in juxtaposition to said hammer means.

17. A toy gun, as defined in claim 13, including percussive, sound-producing means removably secured on said anvil means for detonation by said impact force of said last-mentioned means.

18. A toy gun, as defined in claim 13, including shoulder means in said chamber and engageable with said rim for limiting axial movement of said anvil means.

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