

April 15, 1958

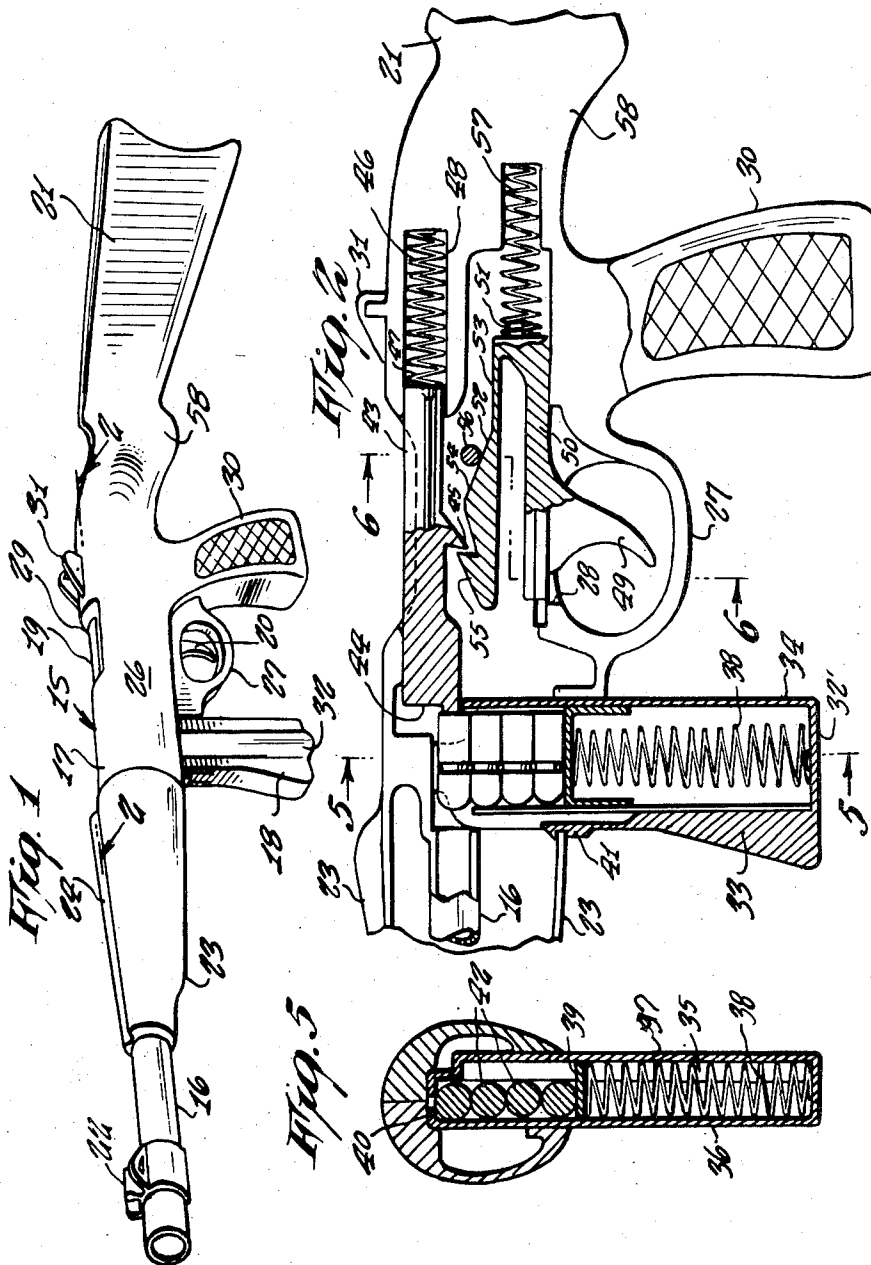
H. HOROWITZ ET AL

2,830,570

TOY MACHINE-GUN MAGAZINE

Original Filed May 11, 1953

3 Sheets-Sheet 1



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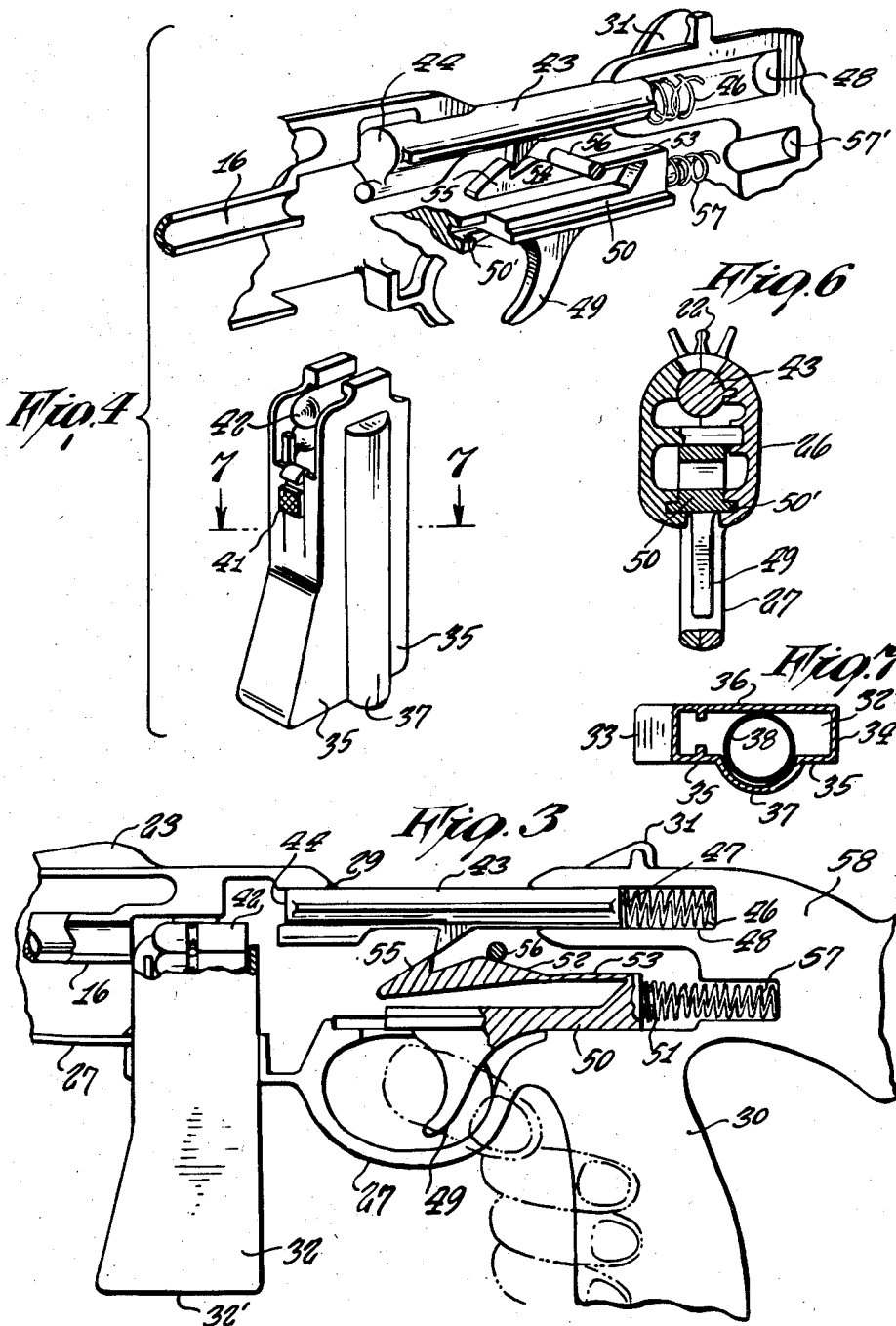
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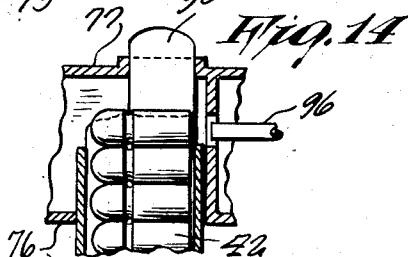
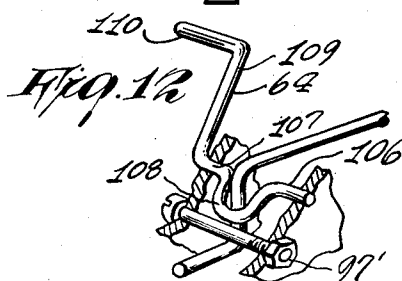
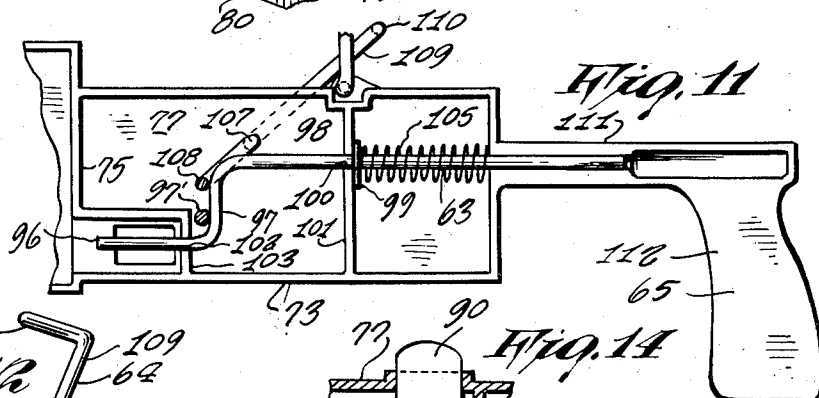
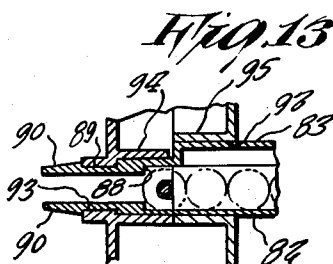
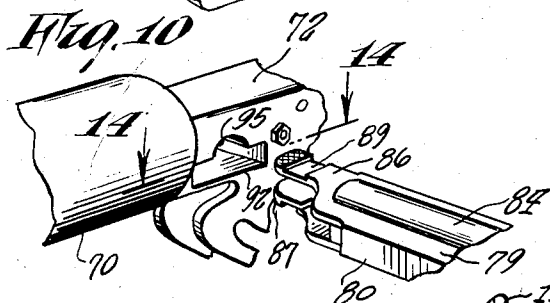
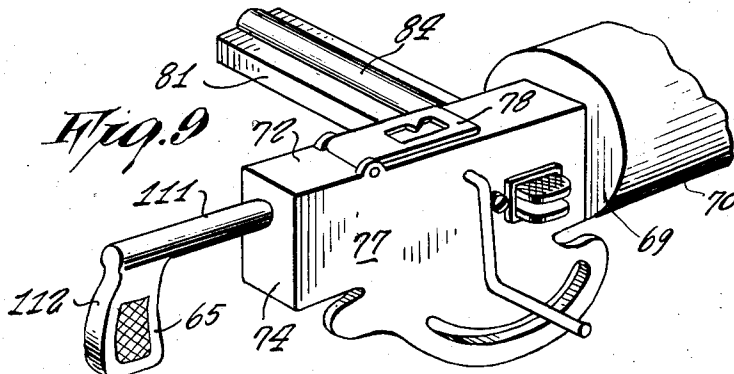
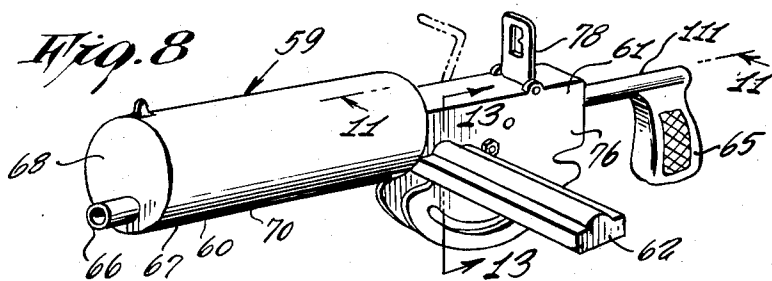
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TOY MACHINE-GUN MAGAZINE

Harry Horowitz, Brooklyn, and Abraham Schneiderman, Westbury, N. Y.

Original application May 11, 1953, Serial No. 354,158, now Patent No. 2,737,942, dated March 13, 1956. Divided and this application January 12, 1956, Serial No. 559,087

1 Claim. (Cl. 124—52)

This application is a division of our copending application Serial No. 354,158, filed May 11, 1953, now Patent No. 2,737,942, granted March 13, 1956.

This invention relates generally to the field of toys, and more particularly to an improved toy gun structure of a type adapted to expel a series of small harmless pellets in rapid succession.

It is among the principal objects of the present invention to provide toy gun structure in which the external appearance thereof may closely resemble that of firearms in present use by the Armed Forces of this country.

Another object of the invention lies in the provision of toy gun structure in which the handling, function, and operative cycle may as closely as possible resemble that of the actual firearms which it resembles.

Still another object of the invention lies in the provision of toy gun structure of the class described in which the cost of fabrication may be of a relatively low order, with consequent wide sale, distribution and use.

A further object of the invention lies in the provision of a novel breech mechanism which is adapted to propel pellets in a realistic manner, but with a force insufficient to injure a youthful user, even if the same should strike vulnerable organs.

A feature of the invention lies in the fact that the child using the toy weapon may observe the functioning of the operative parts as the pellets are discharged in a manner which appears to be very realistic.

Another feature of the invention lies in the provision of novel clip magazine structure which may be manually loaded in exactly the same manner employed in loading actual clips with live ammunition, which clips may be fabricated from materials and components available to other than firearms manufacturers.

Still another feature of the invention lies in the provision of an improved rapid fire bolt mechanism which is practically indestructible in the hands of young children, and which has a relatively long useful life.

A further feature of the invention lies in the fact that substantially all parts may be formed from molding and casting with suitable synthetic resinous materials.

These objects and features, as well as other incidental ends and advantages, will become more clearly apparent during the course of the following disclosure, and be pointed out in the appended claim.

On the drawing, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

Figure 1 is a view in perspective showing a first embodiment of the invention.

Figure 2 is a fragmentary enlarged vertical longitudinal sectional view as seen from the plane 2—2 on Figure 1.

Figure 3 is a fragmentary enlarged vertical longitudinal sectional view, corresponding in most respects to Figure 2, but showing the operative parts in another position thereof.

Figure 4 is a fragmentary sectional view in perspective

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showing the operative parts in the relative position shown on Figure 2, and showing the magazine structure in a detached condition.

Figure 5 is a vertical transverse sectional view as seen from the plane 5—5 on Figure 2.

Figure 6 is a vertical transverse offset sectional view as seen from the plane 6—6 on Figure 2.

Figure 7 is a horizontal transverse sectional view of the magazine structure as seen from the plane 7—7 on Figure 4.

Figure 8 is a view in perspective showing a second embodiment of the invention.

Figure 9 is a fragmentary view in perspective of the second embodiment showing the reverse side of the structure shown on Figure 8.

Figure 10 is a fragmentary view in perspective showing the engagement of the magazine with the breech structure.

Figure 11 is an enlarged fragmentary vertical longitudinal sectional view as seen from the plane 11—11 on Figure 8.

Figure 12 is a fragmentary view in perspective showing the bolt actuating means which comprises a part of the second embodiment.

Figure 13 is a vertical transverse sectional view as seen from the plane 13—13 on Figure 8.

Figure 14 is a fragmentary enlarged vertical longitudinal sectional view corresponding to that seen from the plane 14—14 on Figure 10, but showing the magazine in a fully engaged position.

In accordance with the first embodiment of the invention, the device, generally indicated by reference character 15, comprises broadly; a barrel element 16, a casing element 17, a clip or magazine element 18, a bolt element 19, a trigger element 20, and a stock element 21. As has been mentioned, the device is preferably constructed almost entirely from moldings from suitable synthetic resins of a type having the desired qualities of durability, elasticity, and resistance to breakage. We have found such compositions as polystyrene, and cellulose acetate to be very suitable.

The barrel element 16 may be formed integrally with the remaining parts of the device, or may be formed from plastic tubing of suitable diameter. It is of generally conventional design, and may include a front sight 22 and a barrel cover 23, the same having a sighting groove 24 therein.

The casing element 17 encloses the breech and trigger elements 19 and 20, and includes an outer casing 26, an integral trigger guard 27, a trigger guard opening 28, a top port 29, a pistol grip 30, and a rear sight 31. The port 29, as will become more clearly apparent at a point later in the disclosure, is not of a sufficient size to allow the bolt element 19 to clear the same, so that while a child may observe the bolt element traveling back and forth, he cannot wedge his fingers between the bolt face and the edges defining the port to injure the same.

The magazine element 18, is adapted to use a circular, coil-type spring which is commercially available, rather than the special springs having a rectangular cross section which are normally employed in the firearms art, thus making it possible to fabricate the same at a much lower cost.

Since the spring employed does not correspond to the inner confines of the magazine, it is necessary that the shape of the outer shell 32 of the magazine element 18 be so formed as to maintain the spring in position, and simultaneously maintain the stacked pellets in aligned relationship for successive positioning before the bolt element 19. The element 18 includes a forward wall 33, a rearward wall 34, a left side wall 35, a right side wall 36, and a bottom wall 37. The left side wall 35 includes a circular portion 37 within which the magazine spring

38 is maintained (see Figure 7). The lower end of the spring 38 bears against the bottom wall 32' while the upper terminal presses against the lower surface of a follower plate 39 which pushes the lowermost of the pellets 42 in an upwardly direction, thereby elevating the entire stack, in a well-known manner. The latch member 41 which forms means for engaging the entire magazine element 18 with the casing element 17, is formed integrally with the forward wall 33, thereby eliminating the necessity of separate structure. As the synthetic resinous material from which the entire magazine is fabricated possesses a substantial degree of resilience, the latch member 41 may be moved through small angular distances with respect to the forward wall 33 without damage.

The bolt element 19 is also preferably formed from a single casting or molding, and includes a body member 43 having a forward face 44, and a trigger engaging projection 45. The main operating spring 46 bears against the rear face 47 of the body member 43 and is maintained in position by being disposed within a spring and body member recess 48 formed in the casing 26.

The trigger element 20 includes a trigger member 49, a trigger link member 50, which is mounted for slidable rearward and forward motion in a groove 50' in the casing element 17, a spring engaging stud 51, and a resilient member 52. The member 52 includes a flexible portion 53, a cam portion 54 and a bolt engaging portion 55. Extending across the space between the walls forming the casing 26 is a cam pusher 56, which engages the face of the cam portion 54 as the trigger member is moved. The trigger element 20 is normally maintained in the forwardmost position by a spring 57 which is maintained within a bore 57'.

The stock element 21 is preferably formed integrally with the casing element 17, and may, if desired, include an offset portion 58.

The operation of the device will be best understood from a consideration of Figures 2 and 3. After the magazine element 18 is loaded in a conventional manner, the same is engaged with the casing element 17 as shown on Figure 2 the magazine latch 41 engaging a portion thereof. As the trigger 49 is pulled rearwardly as shown on Figure 3, the cam 53 is depressed by the cam pusher 54 so that the entire resilient member 52 flexes about the flexible portion 53. Since at the beginning of this motion, the bolt engagement portion 55 is engaged with the trigger engaging projection 45 on the bolt member 43, both bolt element 19 and trigger element 20 travel rearwardly at the same time. As the cam pusher 56 depresses the cam 52, the portion 55 become disengaged with the member 45, so that the spring 46 pushes the bolt element 19 in a leftward direction as seen on Figure 3 to result in the bolt face 44 engaging the uppermost pellet 42. As the body member 43 is travelling at a considerable speed when the bolt face 44 strikes the pellet 42, sufficient inertia is imparted to the pellet to permit the same to pass through the barrel element 16 and outwardly out of the device 15. When the bolt element 19 has come to a halt, the trigger 49 may be released to allow the entire trigger element 20 to return to its leftwardmost position as shown on Figure 2, wherein the portion 55 re-engages the projection 45, and the cycle may be repeated as long as there are pellets 42 remaining in the magazine element 18. When the magazine element 18 has been emptied, it may be removed in a well-known manner to be replaced with a fresh magazine, or the same magazine may be reloaded.

As may be seen on Figure 3, at the point of release wherein the trigger element is disconnected from the bolt element, the bolt face 44 is still disposed beneath the casing element, so there is no opportunity for dirt, children's fingers, or other objects to be placed within the breech mechanism.

Turning now to the second embodiment of the inven-

tion, the device, generally indicated by reference character 59, includes a barrel element 60, a casing element 61, a magazine element 62, a bolt element 63, trigger means 64, and a stock element 65.

The second embodiment of the device differs from the first embodiment in that the structure of the first embodiment simulates a semi-automatic carbine, while the second embodiment resembles in appearance and operation a water cooled machine gun.

The barrel element 60 includes a barrel 66 which is surrounded by a simulated water jacket 67, preferably incorporating a sight on the forward wall 68. The rearward wall 69 is formed integrally with the casing element 64.

The casing element 61 is generally rectangular in configuration, and includes a top wall 72, a bottom wall 73, a rear wall 74, and a front wall 75. A folding rear sight is preferably mounted upon the rear wall 74, as shown on Figures 8 and 9.

The magazine element 62 includes an outer casing 79, the casing having a front or forward wall 80, a rear wall 81, a bottom wall 82, and a top wall 83, including a curved portion 84. Extending from the open end of the magazine element are a pair of engagement members 86 and 87, which are preferably formed integrally with the bottom and top walls 82 and 83, respectively. Each engagement member includes a pellet seat recess 88 against which the pellet 42 which is about to be discharged, is abutted so as to be positioned for engagement with the bolt element 63. On the opposite side of each engagement member 86 and 87, is a casing engagement recess 89, which maintains the clip in connection with the other parts of the device. The members 86 and 87 also include tapered finger engaging portions 90, which project through the casing element 61, as may be seen on Figures 9 and 13.

Referring to Figures 9, 10 and 13, it will be observed that the left side wall 76 is provided with a relatively large opening 92 for the insertion of the magazine element, while the right side wall 77 is provided with a smaller opening 93 which is large enough to admit the engagement members 86 and 87. The casing element structure includes a first positioning wall 94 and a second positioning wall 95 which conform to the contour of the magazine element to assure a snug fit when engaged. It is thus apparent that when the magazine element is inserted, the tapered surfaces 90 permit the members 86 and 87 to be moved toward each other until the engagement recesses 89 engage the smaller opening 93, at which point they expand to unstressed condition to securely maintain the magazine in position.

The bolt element 63 is preferably formed from a single length of steel wire, and includes a lower horizontally disposed segment 96, a vertically disposed elongated segment 97, and a second horizontally disposed upper segment 98. An opening 100 in a wall 101 provides a guide means for the segment 98. A second opening 102 in a vertically disposed wall 103 provides second guide means to assure that the bolt element will travel only in a horizontal direction, to the left and right as seen on Figure 11. Surrounding the upper segment 98 and disposed between the walls 74 and 101, is the coil spring 105 which normally urges the bolt element to the left as seen on Figure 11, the leftwardmost limit of the path of travel being determined by the engagement of the vertical member 97 with the screw 97'. The force of the spring 105 is transmitted by a washer 99.

The trigger means 64 is also formed from a single length of steel wire, and includes first and second support segments 106 and 107 which are engageable respectively with the walls 76 and 77 of the casing element 61. The members 106 and 107 are joined by a U-shaped segment 108 intermittently engageable with the vertically disposed member 97 (see Figure 12). A crank segment 109 extends outwardly of the casing element, the same

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including a finger engaging portion 110, which provides means for rotating the entire trigger means 64. From a consideration of Figures 11 and 12, it will be apparent that as the crank segment 109 is rotated in a counter-clockwise direction, the U-shaped segment 108 will engage the vertically disposed segment 97 and force the same rearwardly as the crank rotates through approximately 120°. As soon as the segment 108 has passed the segment 97, the spring 105 which has been compressed, forces the bolt element to the left, as seen on Figure 11 wherein the end of the member 96 engages the uppermost pellet in the magazine then being positioned by the recesses 88 and drives the same through the barrel 66. Each time the crank is rotated as the bolt element is withdrawn, the rightward movement of segment 96 permits a succeeding pellet to be moved to the discharge position, and the crank may be rotated to expel the pellets as long as there are pellets remaining in the magazine element.

When the magazine element has been emptied, it is removed from engagement with the casing element by squeezing the surfaces 90 toward each other with the fingers of one hand while withdrawing the magazine to the left as seen on Figure 9, with the other hand. As is the case in the first embodiment, the magazine may be then reloaded or a fresh magazine may be inserted.

It may thus be seen that we have invented novel and highly useful improvements in toy gun construction, in which there are provided toy guns having a similarity both in appearance and function which very closely resembles that of actual firearms, which are simple in operation and which may be fabricated at a reasonably low cost. The devices may be formed substantially entirely from suitable synthetic resins using injection molding techniques and many of the parts may be formed

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integrally, thereby eliminating any unnecessary machining or joining operations.

We wish it to be understood that we do not consider the invention limited to the exact details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the present invention pertains.

We claim:

A magazine for use in conjunction with a plurality of pellets and engageable with a portion of a toy gun comprising: a casing, resilient means within said casing for urging pellets disposed therein toward one end of said magazine; a pair of engagement members associated with said casing at said end of said magazine for engaging said magazine with said gun; said members each having inner and outer surfaces; each of said members having an engagement notch on said outer surfaces thereof; said members being movable toward each other for clearing corresponding structure on said gun whereby upon release of said members the same may resiliently move away from each other to engage said engagement notches with said gun; said inner surfaces of said engagement members having rabbeted portions forming a pellet seat, whereby each of said pellets within said magazine may be positioned thereupon for successive ejection from said magazine and said gun.

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