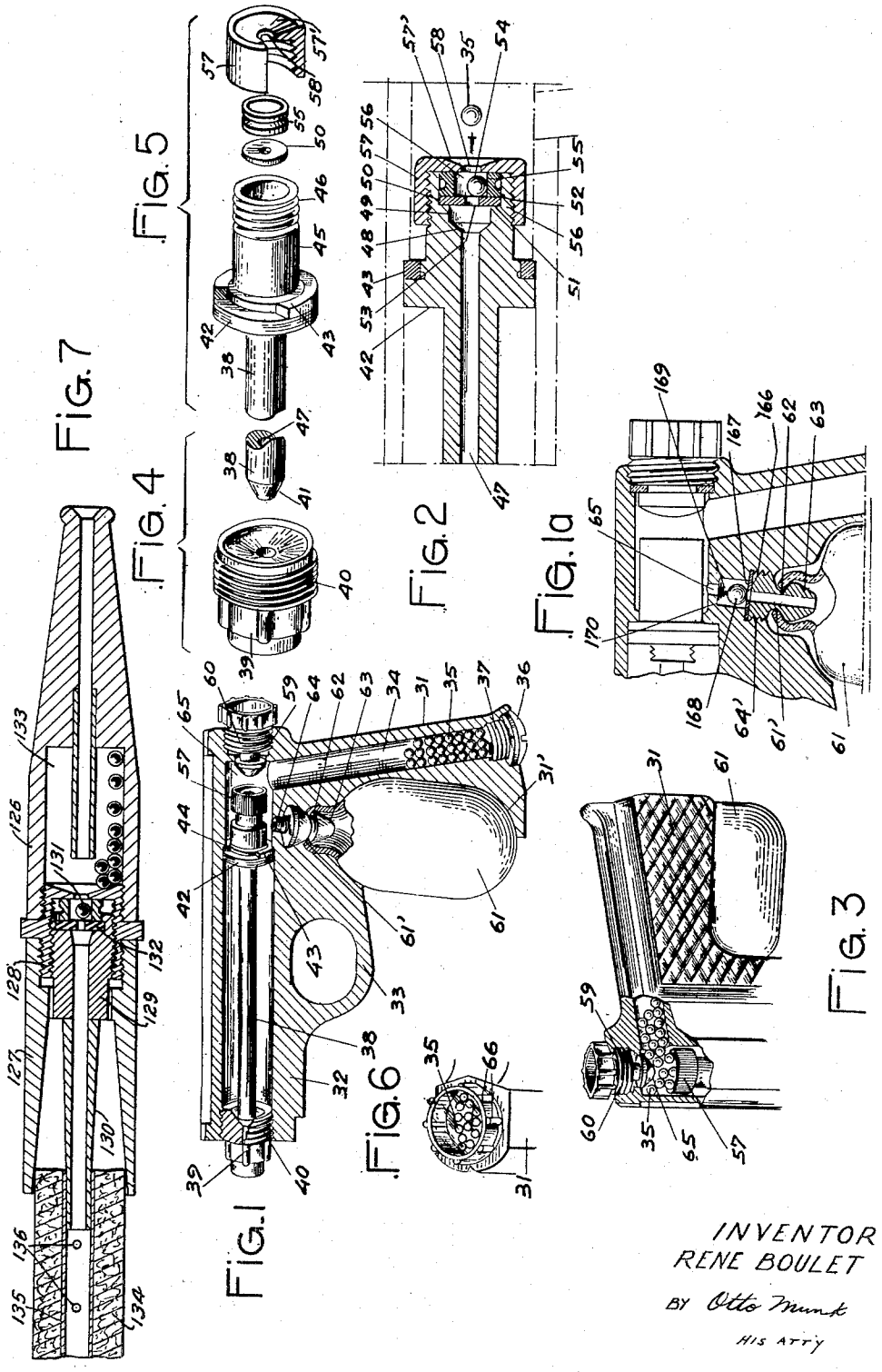
Jan. 22, 1952 R. BOULET 2,583,463

TOY COMPRESSED-AIR PISTOL

Filed Aug. 29, 1946 2 SHEETS—SHEET 1

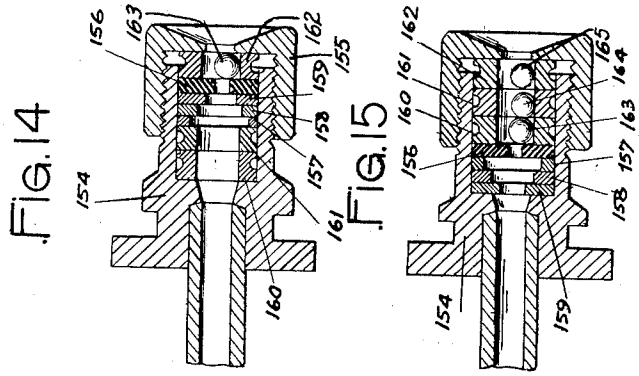


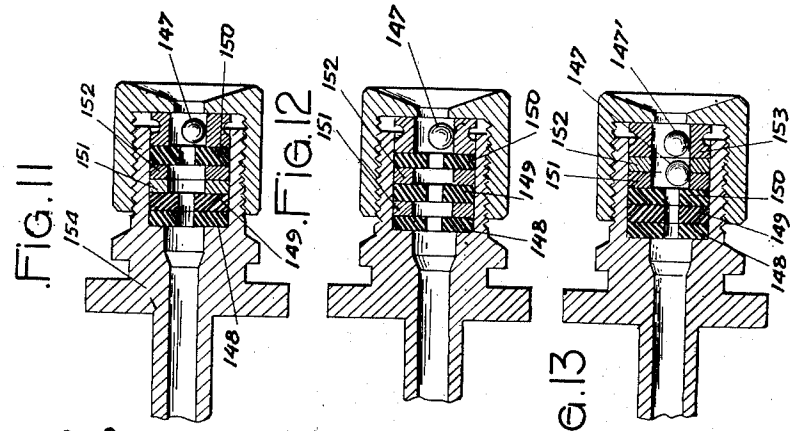
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BY Otto Munk
HIS ATTY

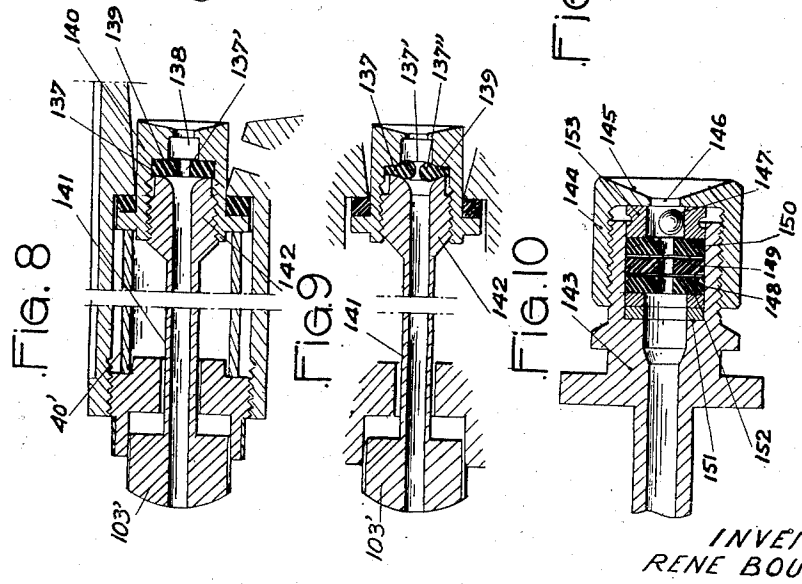
Jan. 22, 1952 R. BOULET 2,583,463

TOY COMPRESSED-AIR PISTOL

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TOY COMPRESSED-AIR PISTOL

René Boulet, Paris, France

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7 Claims. (Cl. 124—11)

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My invention has for its object to provide a new device which makes it possible to throw small projectiles, preferably round ones or of a form suitable to enable them to pass through a circular hole, by means of compressed air, which may be produced or delivered by any suitable means, such as bellows, rubber hand-ball, piston pump, storing flask or simply from the lungs through the medium of the mouth or by any other means.

This device for projecting small missiles through the action of a compressed gasiform fluid comprises, in combination with a barrel and an elastic throttling member for the missile holding same back until the pressure of the fluid allows the missile to pass through said throttling member, a breech enclosing a chamber adapted to receive at least one of the missiles to be projected and opening into the barrel through one or more elastic retaining washers forming the throttling member, while said chamber opens at its opposite end through a perforation of restricted cross-sectional area provided in a covering member and opening into a preliminary chamber communicating with a container for the provision of missiles to be projected and with the admission of the compressed aeriform fluid that is adapted to project the missiles out of their container into the first mentioned chamber through said restricted perforation and thence through the throttling member out of the barrel of the pistol or the like missile projecting device.

The projectiles used may be of very small dimensions, such as small shot; they may be stored in bulk and in a large quantity in the compressed air producing system, in order to obtain a protracted shooting.

The device may be realized under the form of various toys, such as pitsols, guns, cigarette-holders, etc. and also of sporting and offensive arms.

The invention provides also means by which it is possible to vary at will the throwing force.

Further features and advantages of the invention will be gathered from the following specification and from the drawings, in which the invention is illustrated by way of example:

Fig. 1 is a perspective view with a part sectional view of a compressed air pistol in the shooting position.

Fig. 1*a* shows a modification of Fig. 1.

Fig. 2 is an elevational sectional view of the breech on an enlarged scale.

Fig. 3 shows, partly in section, the rear part of the pistol in the charging position.

Fig. 4 is a perspective view showing the front end of the tube and the plug maintaining this end.

Fig. 5 is a perspective view showing the various parts forming the breech.

Fig. 6 is a perspective view showing a transparent breech plug making it possible to see the projectiles in the charging chamber.

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Fig. 7 is a longitudinal sectional view of a cigarette holder associated with a device according to my invention.

Figs. 8 to 15 are longitudinal sectional views of breeches showing various possibilities of adjustment and arrangement.

As shown in Figs. 1 to 5, the pistol comprises a moulded body made, for instance, of a light metal and comprising the butt **31**, a gun-casing **32** and a trigger-guard **33**. A bore **34** provided in the butt serves as a magazine containing the projectiles **35** of which a large number as, for instance, 500 small round shot pieces can be located therein. Said magazine is closed at its lower end by a plug **36** having external threads **37** screwed into corresponding internal threads of the body **31**.

The tube **38** is maintained in the casing **32** at its front end by a plug **39** having external threads **40** screwed into internal threads of the front end of the casing **32**. The front end of the tube **38** has a conical part **41** engaging a corresponding recess of the plug **39** for insuring its centering.

At its rear end the tube **38** is fast with a collar **42** bearing through the medium of a sealing washer **43** against a shoulder **44** formed in the casing **32**. Beyond said shoulder the tube **38** is provided with a sleeve **45** terminating in an externally threaded part **46**. The bore of the gun, which is designated by **47**, is flared in its rear part in the sleeve **42** in order to form a frusto-conical part **48** and an enlarged cylindrical part **49**. A flexible diaphragm **50** is placed against a shoulder **51** formed between the cylindrical part **49** and a cylindrical part **52** having a larger diameter.

The diaphragm **50** is provided with a central hole **53** the diameter of which is smaller than that of the small spherical shot **35** forming the projectiles. A ring **55** delimiting a charging chamber **56** is located in the cylindrical part **52**. Finally, the end of the breech **46** has external threads onto which a nut **57** is screwed, said nut being closed in its rear part by wall **57'** provided with a central opening the diameter of which is slightly larger than that of a shot piece **54**. The wall **57'** offers a certain concavity which facilitates the guiding of the shot towards the hole **58**. The nut **57** is advantageously knurled for facilitating its unscrewing.

The rear part of the body comprises an opening for the mounting and for charging the projectiles **35**; the cylindrical wall of said opening is internally threaded and a closing plug **60** having external threads **59** is screwed thereinto.

The butt **31** is provided with a recess **31'** having a suitable shape for receiving a hand-ball **61**, the open circular edge **61'** of which is introduced by a simple insertion into a groove **62** of a button with two cones **63** provided with an

axial passage and terminating in a screw 64 screwed into an internally threaded hole in the moulded body of the pistol, the end of said passage passing through the button 63 and opening into the compression chamber 65 in which the nut 57 is located and screwed onto the breech.

According to the modification of Fig. 1a the screw 64' formed on the button 63 has an appreciable width so as to form at the end of said button a plate 166 which can be covered with a sealing material 167 and forms a seat for a valve such as a ball 168 urged by a spring 169 resting on a shoulder 170 of the body.

The manufacture and the mounting of said pistol are particularly easy. If fact, it is sufficient to introduce the tube 38 provided with the unit shown in Fig. 2 into the bore of the moulded body until its collar 42 comes to rest through the medium of the joint 43 onto the shoulder 44. The plug 60 provided with a sealing washer is then screwed in place. For charging the arm with projectiles it is sufficient to unscrew one of the plugs 36 or 60 and after having introduced the projectiles into the bore 34 or 65 to replace in its position the plug which had been removed. Finally, the plug 63 of the hand-ball is set in position for instance by screwing it into the body which comprises an internally threaded hole for this purpose.

For graduating the force with which the projectile is thrown, diaphragms 50 of various flexibilities can be used. It is also possible selectively to place one or more diaphragms of a given flexibility in the charging chamber in order to graduate the resistance of said diaphragms and, consequently, the compressed air pressure generated behind it before the projectile can pass through said diaphragms, which has for its effect to adjust the force with which it is thrown.

For "arming" said pistol, i. e. for bringing a projectile into the charging chamber, it is sufficient to tilt it for bringing it to the position shown in Fig. 3 so that a shot piece 35 passes through the hole 58 provided in the middle of the wall 57' of the nut 57. When said shot is introduced into the charging chamber 56 the arm is held upright again. For shooting the fingers of the hand which holds the pistol are pressed into the ball 61 so that the air delivered by said ball generates a pressure of compressed air in the chamber 65, in the magazine 34 and in the chamber 56 while pushing the introduced shot 54 against the hole 53 of the diaphragm or diaphragms 50, which has a smaller diameter. When the air pressure is sufficient for overcoming the rsistance of said diaphragm the shot drives asunder the edges of the hole of the latter and passes through the same, the air stored behind it insuring its projection.

The plugs 39 and 60 can be made advantageously of a plastic material while the body 31, 38 is, for instance, moulded and made of a light metal.

According to a modification shown in Fig. 6 a plug 66 made of a transparent plastic material is substituted for the plug 60. It is thus possible to see the shots 35 inside the chamber 65 and to ascertain that the arm contains projectiles.

Fig. 7 shows the device according to my invention as mounted in a cigarette holder. The body is formed of two elements 126, 127 screwed onto a connecting piece 128 inside which the enlarged rear part 129 of a gun-tube is screwed. The loading chamber 131 which contains the resilient washer 132 is similar to that of the preceding forms of execution. A magazine 133 is provided in the portion 126 of the body.

With said cigarette-holder a cigarette 134 is used which is formed on a tube of light cardboard or other combustible material 135 threaded onto the end of the gun-tube 130. Holes 136 provided in the tube 135 make it also possible to breathe in the smoke and the gun-tube 130 always extends into a portion of the combustible tube 135, which renders possible a sure throwing of the projectiles, the tube 135 burning simultaneously with the cigarette.

Figs. 8 to 15 show various means making it possible to vary the throwing force in one and the same arm or other projectile throwing device by varying the resistance of the elastic diaphragms.

According to Fig. 8 a single resilient washer 137 is placed in the loading chamber 138 in which it rests against a shoulder 139 of the breech 140. A barrel 141 screwed into said breech with an enlarged part 142 makes it possible to compress the resilient washer 137 more or less. In the position of Fig. 8 in which said washer is practically not compressed the projectile in order to pass through the same has to overcome only its resilient resistance determined by its thickness, on the one hand, and by the ratio between the diameter of the hole 137' of the washer and the diameter of the projectile, on the other hand.

Contrary to this, according to Fig. 9, the washer 137 is strongly compressed by the part 142 of the tube against the shoulder 139 of the breech so that a bead 137'' forms which offers an increased resistance per se and which, furthermore, reduces the section of the hole 137', both said conditions having for their combined effect considerably to increase the resistance offered by the resilient washer to the passage of the projectile.

Thus, with a given resilient washer one can vary in a continuous manner between two limits, a maximum and a minimum, the resistance opposed to the passage of a projectile and, consequently, the force with which said projectile is thrown. It is obvious that it would be possible to provide two or more washers side by side instead of one and to exert on the whole of these washers the same graduated compression effect as that which has been described with reference to the single washer 137. By means of the button 103' which is formed at the end of the tube and which can be knurled it is possible to turn the tube from the outside and to screw the boss 142 more or less for adjusting the compression of the washer 137.

Figs. 10 to 13 show another mode of graduation of the resistance opposed to the passage of the projectile and, accordingly, of the force necessary for throwing the latter in one and the same breech. The loading chamber formed between the breech 143 and the cap 144 screwed thereon and comprising the funnel 145 with a hole 146 for the introduction of the projectile 147 contains a certain number of resilient washers 148, 149, 150, intercalary metallic washers 151, 152 and a metallic washer 153 intended for receiving a projectile.

In the position of Fig. 10 the three resilient washers 148, 149, 150 are placed side by side, thus forming a thick layer of resilient material through which the projectile 147 must pass right away.

In Fig. 11 only two resilient washers 148, 149 are joined side by side, then they are separated from the third resilient washer 150 through the

distance washers 151, 152 so that the projectile 147 must first pass through the washer 150 and then simultaneously through the washers 149, 148.

In the case of Fig. 12 the three resilient washers are separated by both intercalary washers so that the projectile 147 must overcome the resistance of a single washer three times successively.

In Fig. 13 the distance washers 151, 152 are placed beside the washer 153 which increases the capacity of the loading chamber which thus receives two projectiles 147, 147'. The three resilient washers are placed side by side.

Figs. 14 and 15 show another mode of graduation of the resistance offered by a resilient washer and of variation of the capacity of the loading chamber. In this case, the breech 154 with a cap 155 contains a resilient washer 156, three supporting washers 157, 158, 159 the holes of which have different diameters and three washers for the loading chambers 160, 161, 162.

In the position of Fig. 14 the resilient washer is placed behind the intercalary washer 159 the hole of which has the smallest diameter so that it is strongly maintained by the large surface of said washer and offers a strong resistance to the passage of the projectile 163. In Fig. 15, on the contrary, the washer 156 is placed behind the intercalary washer 157 the hole of which has the largest diameter so that it is maintained only on its periphery by the latter and offers, consequently, only its own resilient resistance to the passage of the projectile.

It would also be possible for obtaining an intermediary degree of resistance to place the middle washer 158 against the resilient washer 156.

Likewise, in the case of Fig. 14, a single loading chamber washer 162 is provided behind the resilient washer, thus providing a loading chamber which can receive only a single projectile 163. In the case of Fig. 15 the three washers 160, 161, 162 are placed side by side which renders possible the simultaneous introduction and projection of a plurality of projectiles such as 163, 164, 165. The loading chambers could as well be formed only of two washers 161, 162 for throwing two projectiles.

These are, moreover, non-limitative examples and it is possible without departing from the scope and spirit of the invention to provide any desired number of resilient washers, of intercalary rigid washers and of projectile-receiving washers in one and the same breech in order to intercalate them arbitrarily, on the one hand, for graduating the resistance offered to the projectiles, and, on the other hand, for determining at will the number of projectiles which are thrown simultaneously.

The invention makes it possible to obtain not only toy-arms but also true offensive or hunting arms by providing resilient washers of a sufficient force and a corresponding compressed air pressure. The same arm can be used for these various purposes simply by graduating the resistance of the resilient washers through one of the described means.

Moreover, various modifications can be brought to the described examples of execution without departing from the scope and spirit of the invention.

I claim:

1. In a toy pistol for projecting small spherical missiles through the operation of a compressed aeriform fluid, the combination of a projecting barrel, an elastic axially perforated throttling member associated with the inner rear end of said barrel, the perforation of said member being normally smaller than the diameter of the missile and adapted to open for allowing the passage of a missile urged against it by a sufficient fluid pressure, a loading chamber to the rear of said throttling member adapted to house a limited number of missiles and provided in its rear wall with a perforation registering with that in the throttling member and large enough to permit a missile to pass therethrough with slight clearance, a larger chamber on both sides of the throttling member surrounding laterally and rearwardly the first chamber, a receiver for loose missiles opening unrestrictedly to the rear of the first chamber into the part of the second chamber that is normally at the lower end of the latter, and hand operated means for feeding compressed aeriform fluid into said second chamber independently of the opening of the receiver into same.

2. In a toy pistol for projecting small spherical missiles through the operation of a compressed aeriform fluid, the combination of a projecting barrel, an elastic axially perforated throttling member including at least one flat washer cut out of a sheet of elastic material associated with the inner end of said barrel, and the perforation of said member being normally smaller than the diameter of the missile and adapted to open for allowing the passage of a missile urged against said member by a sufficient fluid pressure, a loading chamber to the rear of said throttling member, closed partially by the latter, adapted to house a limited number of missiles and provided in its rear wall with a perforation registering with that in the throttling member and large enough to permit a missile to pass therethrough with slight clearance, a larger chamber on both sides of the throttling member surrounding laterally and rearwardly the first chamber, a receiver for loose missiles opening unrestrictedly to the rear of the first chamber into the part of the second chamber that is normally at the lower end of the latter, and hand operated means for feeding compressed aeriform fluid into said second chamber independently of the opening of the receiver.

3. In a toy pistol for projecting small spherical missiles through the operation of a compressed aeriform fluid, the combination of a projecting barrel, an elastic axially perforated throttling member associated with the inner end of said barrel, the perforation of said member being normally smaller than the diameter of the missile and adapted to open for allowing the passage of a missile urged against said member by a sufficient fluid pressure, a loading chamber to the rear of said throttling member including an outwardly threaded tubular member rigid with the barrel in which the throttling member is fitted and a nut shaped member screwed over said tubular member and provided with an axially perforated outwardly concave partially closed end, allowing the passage of a missile with slight clearance and at least one rigid annular washer urged by the perforated end of the nut shaped member against the tubular member, a larger chamber on both sides of the throttling member surrounding laterally and rearwardly the first chamber, a receiver for loose missiles opening unrestrictedly to the rear of the first chamber into the part of the second chamber that is normally at the lower

end of the latter, and hand operated means for feeding compressed aeriform fluid into said second chamber independently of the opening of the receiver.

4. In a toy pistol for projecting small spherical missiles through the operation of a compressed aeriform fluid, the combination of a projecting barrel, an elastic axially perforated throttling member associated with the inner end of said barrel, the perforation of which is normally smaller than the diameter of the missile and is adapted to open for allowing the passage of a missile urged against it by a sufficient fluid pressure, a loading chamber to the rear of said throttling member including an outwardly threaded tubular member rigid with the barrel in which the throttling member is fitted and a nut shaped member screwed over said tubular member and provided with an axially perforated outwardly concave partially closed end, allowing the passage of a missile with slight clearance and a plurality of intermediary rigid spacing annular washers urged by the perforated end of the nut shaped member against the tubular member, a larger chamber on both sides of the throttling member surrounding laterally and rearwardly the first chamber, a receiver for loose missiles opening unrestrictedly to the rear of the first chamber into the part of the second chamber that is normally at the lower end of the latter, and hand operated means for feeding compressed aeriform fluid into said second chamber independently of the opening of the receiver.

5. In a toy pistol for projecting small spherical missiles through the operation of a compressed aeriform fluid, the combination of a projecting barrel, an elastic axially perforated throttling member including a plurality of adjacent annular washers of different diameters associated with the inner end of said barrel, the opening in at least one washer being normally smaller than the diameter of the missile and being adapted to open for allowing the passage of a missile urged against it by a sufficient fluid pressure, a loading chamber to the rear of said throttling member partially closed by the latter, adapted to house a limited number of missiles and provided in its rear wall with a perforation registering with that in the throttling member and large enough to permit a missile to pass therethrough with slight clearance, a larger chamber on both sides of the throttling member surrounding laterally and rearwardly the first chamber, a receiver for loose missiles opening unrestrictedly to the rear of the first chamber into the part of the second chamber that is normally at the lower end of the latter, and hand operated means for feeding compressed aeriform fluid into said second chamber independently of the opening of the receiver.

6. In a toy pistol for projecting small spherical missiles through the operation of a compressed aeriform fluid, the combination of a projecting barrel, an elastic axially perforated throttling member associated with the inner rear end of said barrel, the perforation of which is normally smaller than the diameter of the missile and is adapted to open for allowing the passage of a missile urged against it by a sufficient fluid pressure, a loading chamber to the rear of said throttling member partially closed by the latter, adapted to house a limited number of missiles and provided in its rear wall with a perforation registering with that in the throttling member and large enough to permit a missile to pass therethrough with slight clearance, a ring shaped stop member engaging the outer periphery of the rear end of the barrel for carrying same, a molded body provided with a bore adapted to house the barrel and the loading chamber and engaging fluid-tightly the stop member throughout its outer periphery, said molded body defining further a receiver for missiles opening unrestrictedly in the bore to the rear of the stop member and a further recess opening into the bore to the rear of the stop member, a compressible member adapted to be compressed by hand housed in said recess and adapted to produce compressed air and to deliver same unrestrictedly through the recess opening into the bore and thence into the loading chamber through last mentioned perforation therein, and a plug for closing the front outer end of the bore and carrying removably the outer end of the barrel.

7. In a toy pistol for projecting small spherical missiles through the operation of a compressed aeriform fluid, the combination of a projecting barrel, an elastic axially perforated throttling member associated with the inner rear end of said barrel, the perforation of which is normally smaller than the diameter of the missile and is adapted to open for allowing the passage of a missile against it by a sufficient fluid pressure, a loading chamber to the rear of said throttling member that closes partially the front of said chamber, said chamber adapted to house a limited number of missiles, being provided in its rear wall with a perforation registering with that in the throttling member and large enough to permit a missile to pass through said perforation with slight clearance, a ring shaped stop member engaging the outer periphery of the rear end of the barrel for holding same, a molded body provided with a bore adapted to house the barrel and the loading chamber and engaging fluid tightly the stop member throughout its outer periphery, said molded body defining further a receiver for missiles opening unrestrictedly in the bore to the rear of the stop member and a further recess opening into the bore to the rear of the stop member, a compressible member adapted to be compressed by hand housed in said recess and adapted to produce compressed air and to deliver same unrestrictedly through the recess opening into the bore and thence into the loading chamber through last mentioned perforation therein, a plug for closing the front outer end of the bore and holding removably the outer end of the barrel, the wall of the molded body being provided with a tapped opening registering with the rear end of the bore, and a threaded plug of transparent plastic material adapted to engage said opening.

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