

Dec. 7, 1937.

W. C. ROBINSON

2,101,198

AIR GUN

Filed June 12, 1936

2 Sheets-Sheet 1

FIG. 2

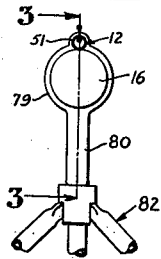


FIG. 1

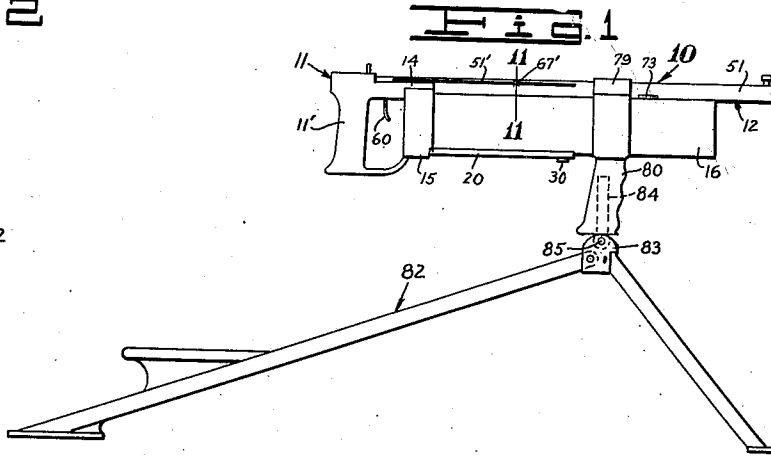


FIG. 8

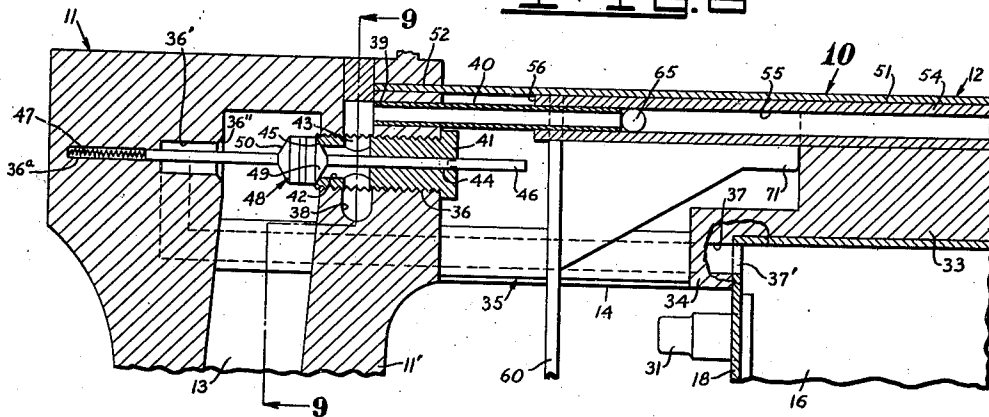


FIG. 9

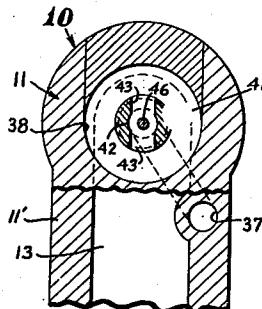


FIG. 10

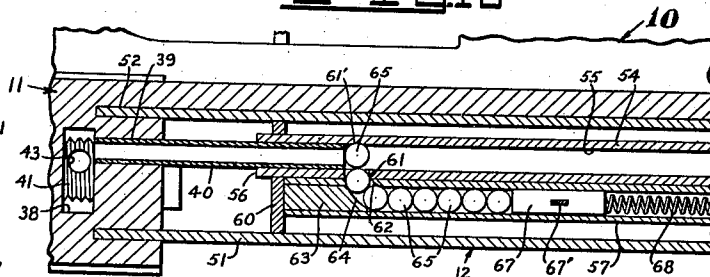
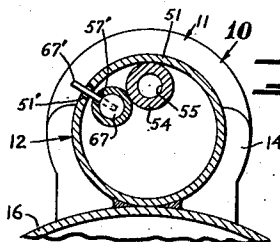


FIG. 11



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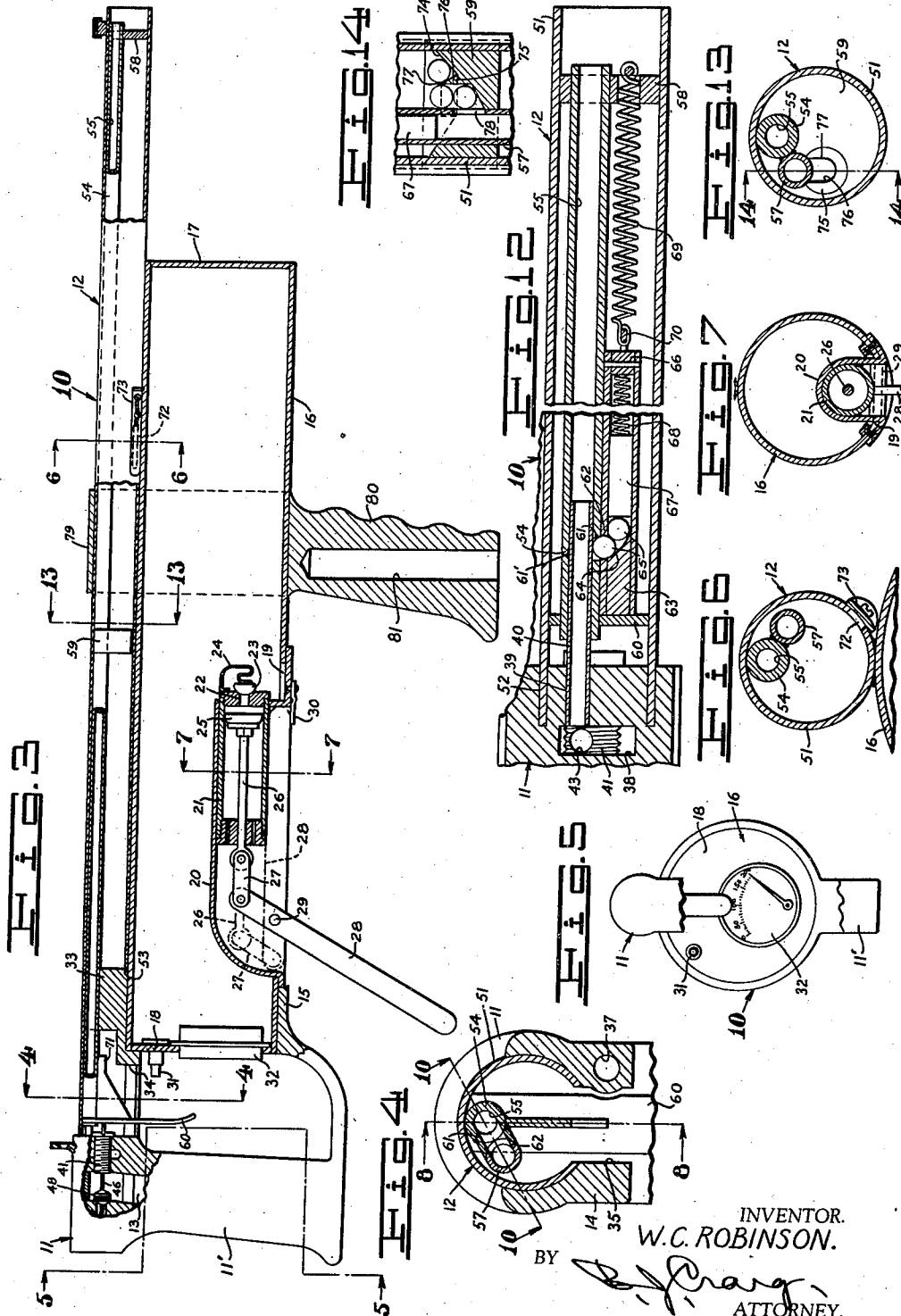
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UNITED STATES PATENT OFFICE

2,101,198

AIR GUN

William C. Robinson, Bell, Calif.

Application June 12, 1936, Serial No. 84,855

12 Claims. (Cl. 124—15)

This invention relates to air guns.

The general object of the invention is to provide an improved air gun which is capable of shooting hard and accurately and which is of such a nature that it will not get out of order readily.

Another object of the invention is to provide a novel shot magazine and delivery device for an air gun.

Another object of the invention is to provide an air gun having novel means for advancing a bullet to discharge position.

A further object of the invention is to provide a novel trigger release for an air gun.

Another object of the invention is to provide a novel pump means for the storage reservoir of a repeating air gun.

Another object of the invention is to provide an improved air gun wherein a plurality of pellets can be expelled therefrom merely pulling and releasing the firing trigger.

Another object of the invention is to provide an air gun including means whereby the action of pulling and releasing the firing trigger expels a pellet from the firing barrel and reloads.

Other objects and the advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a side elevation of an air rifle embodying the features of my invention showing the rifle mounted on a tripod;

Fig. 2 is a front elevation of the air rifle;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is a section taken on line 4—4 of Fig. 3;

Fig. 5 is a section taken on line 5—5 of Fig. 3;

Fig. 6 is a section taken on line 6—6 of Fig. 3;

Fig. 7 is a section taken on line 7—7 of Fig. 3;

Fig. 8 is a section taken on line 8—8 of Fig. 4;

Fig. 9 is a section taken on line 9—9 of Fig. 4;

Fig. 10 is a section taken on line 10—10 of Fig. 4;

Fig. 11 is a section taken on line 11—11 of Fig. 1;

Fig. 12 is a view similar to Fig. 10 showing the parts in a "fired" position;

Fig. 13 is a section taken on line 13—13 of Fig. 3; and

Fig. 14 is a fragmentary section taken on line 14—14 of Fig. 13.

Referring to the drawings by reference character I have shown my invention as embodied in an air gun which is indicated generally at 10. As shown the air gun includes a stock 11 and a barrel 12. The stock includes a grip portion 11'

which is shown as of the pistol grip type and has a central chamber 13 and upper and lower forwardly projecting portions 14 and 15.

The portion 15 is mounted upon the under side of an air reservoir 16 which is connected to the barrel 12 as by soldering and is preferably cylindrical and includes a front wall 17, a rear wall 18 and which has a lower aperture 19 therein in which I mount a closure 20.

The closure 20 is cup-shaped in cross section and has a cylinder 21 fitted therein which communicates through an aperture 22 with the interior of the reservoir 16. The aperture 22 is normally closed by a valve 23 which is urged to its seat by a spring 24. Within the cylinder 21 I show a piston 25 which has a piston rod 26 secured thereto and which is connected by a link 27 with an operating member 28 which is pivoted as at 29 to the side wall of the closure 20. The construction is such that when the lever 28 is moved back and forth the pump will operate to charge the reservoir 16. When not in use the lever 28 is moved within the lower portion of the closure 20 and is secured in place as by a clip 30, as clearly shown by the broken lines in Fig. 3.

The rear end 18 of the reservoir is provided with an inflating valve 31 which may be a tire valve and with a gauge 32 which indicates the pressure within the reservoir.

The upper portion 14 of the stock includes a part 33 which engages the top of the reservoir and includes a depending portion 34 which engages the rear member 18 of the reservoir. Between the portion 34 and the grip 11' the stock includes a cut away portion 35. Adjacent the top thereof the stock 11 has a threaded aperture 36 therein (see Fig. 8) one end of which opens into the cut away portion 35 and the opposite end into the chamber 13. At the opposite side of the chamber 13 the stock has a recess 36' therein which opens into the chamber 13 and includes a valve seat portion 36''. Opening into the recess 36' the stock has a reduced recess 36'' therein.

Furthermore, adjacent the top the stock 11 has a conduit 37 therein, one end of which opens into the recess 36' and the opposite end communicates with the interior of the reservoir 16 through an aperture 37' in the rear wall 18 of the reservoir.

Adjacent the upper end of the chamber 13 and forward thereof and coaxial with the threaded aperture 36 the stock has a chamber 38 therein. Above the threaded aperture 36 the stock has an aperture 39 therein one end of

which opens into the cut away portion 35 and the opposite end into the chamber 38. Fixed in the aperture 39 and suitably secured to the stock I provide a tube 40 which extends into the cut away portion 35 a predetermined distance. Positioned in the threaded aperture 36 I provide a threaded valve plug 41 which has a recess 42 therein which opens into the chamber 13 and has a plurality of radial apertures 43 therein which at one end open into the recess 42 and at the opposite end open into the chamber 38. Furthermore, the plug 41 has a reduced aperture 44 therein which is concentric with the recess 42.

The inner end of the plug is concave to form a valve seat 45. Positioned in the aperture 44 of the plug 41 I provide a stem 46 which at one end extends a predetermined distance into the cut away 35 and the opposite end is positioned in the aperture 36^a. Positioned in the aperture 36^a between the end thereof and the end of the stem 46 I provide a coiled spring 47. Intermediate the length thereof the stem 46 has a valve member 48 thereon which includes opposed frusto-conical valve faces 49 and 50. Normally the spring 47 retains the valve face 49 in engagement with the valve seat 45 of the plug 41 to restrict passageway from the chamber 13 into the plug recess 42.

The barrel 12 includes an outer cylindrical member 51 which projects beyond the front 17 of the reservoir and the top portion of which projects beyond the rear portion 18 of the reservoir and is fitted within an arcuate groove 52 in the stock 11 as shown in Fig. 8. The lower portion of the barrel 12 terminates at 53 (see Fig. 3) abutting the stock portion 33. Within the barrel 12 I mount a rifle barrel 54 having a bore 55 therein. The outer end of the barrel 54 terminates a short distance from the outer end of the barrel 51 and the inner end terminates at 56 at a location spaced from the stock 11.

Secured to the rifle barrel 54 I provide a magazine tube 57. Adjacent the forward end of the barrel 51 the rifle barrel 54 and the magazine tube 57 are slidably supported in a bearing plug 58 in the barrel 51 and adjacent the opposite end are similarly supported in the portion 33 of the stock 11. Intermediate the stock portion 33 and the plug 58 the rifle barrel 54 and the magazine tube 57 are slidably supported in a plug member 59.

Adjacent the rear end 56 the rifle barrel 54 has a depending trigger member 60 secured thereto. Forward of the rear end 56 the rifle barrel 54 has an aperture 61 (Figs. 10 and 12) therein and the magazine tube 57 has a similarly aligned aperture 62 therein. Opposite the aperture 61 a slight depression 61' is provided in the surface of the bore 55 to hold the pellet 65 in the bore 55 in position until the gun is fired. The rear end of the magazine tube 57 is closed by a plug 63 having an arcuate front face 64 which curves towards the rear side of the aperture 62 to guide pellets 65 through the apertures 61 and 62. The forward end of the magazine tube 57 is closed by a plug 66 (see Fig. 12) and positioned in the magazine tube I provide a follower 67.

In the magazine tube 57 between the plug 66 and the follower 67 I provide a coiled spring 68 which urges the follower 67 rearward to force the pellets 65 towards and through the apertures 61 and 62. The follower 67 has a finger portion 67' thereon which projects out of the magazine tube 57 through a slot 57' and through the barrel 51 through a slot 51' (see Figs. 1 and 11).

Suitably anchored to the plug 58 I provide a coiled spring 69 which at the opposite end is secured as at 70 to the magazine tube plug 66. The spring 69 normally urges the rifle barrel 54 and the magazine tube 57 forward until a stop portion 71 on the trigger member 60 engages the rear of the stock portion 33.

The tube 40 is positioned in the bore 55 of the rifle barrel 54 and when the rifle barrel 54 is fully forward the forward end of the tube 40 is positioned in line with the rear of the barrel aperture 61 as clearly shown in Fig. 10.

The space in the barrel 51 between the plug 58 and the plug 59 is adapted to be used to store a quantity of the pellets 65. To insert the pellets into the barrel 51 the barrel 51 has an elongated slot 72 therein which is closed by a slice member 73 (see Figs. 3 and 6).

The forward face of the plug 59 has a conical recess 74 therein (see Fig. 14) which adjacent the magazine tube 57 has a reduced forwardly projecting boss 75 therein. The boss 75 has a recess 76 therein the size of a pellet 65 and the outer end of the boss is knife-edged coincident with the side walls of the recess 76. Adjacent the bottom of the recess 76 the magazine tube 57 has an aperture 78 therein through which the pellets 65 are adapted to pass into the interior thereof.

Between the forward end of the reservoir 16 and the pump I provide a collar member 79 which encompasses the reservoir 16 and the barrel 51 and has a depending grip portion 80 thereon which has a recess 81 therein.

As shown in Figs. 1 and 2 a tripod 82 including a hub portion 83 having an upstanding reduced spindle 84 thereon may be provided to support the gun 10 when desired. The spindle 84 may be pivotally secured to the hub 83 as indicated at 85. The spindle 84 is positioned in the aperture 81 of the gun grip 80 and when the gun is thus supported it may be swung about the spindle 84 and may be tilted on the spindle pivot 85.

In operation the slide member 73 is moved to expose the slot 72 in the barrel 51 and a quantity of the pellets 65 are put into the barrel 51 through the slot 72 and thereafter the slide member 73 is moved to close the slot 72. The gun 10 is then held vertical with the front end up and the follower 67 is moved against the action of the spring 68 by the finger 67' to a position wherein it is above the aperture 78 of the magazine tube 57 as shown in Fig. 14. When the gun is held in this position the pellets 65 roll into the conical recess 74 of the plug 59 and into the recess 76 and thence through the aperture 78 of the magazine tube into the interior of the magazine tube.

The knife edge 77 of the boss 75 separates the pellets 65 and allows only one at a time to enter the recess 76 thereby preventing jamming. After a quantity of pellets 65 are in the magazine tube the follower 67 is released whereupon the spring 68 urges the follower and the pellets 65 in the magazine tube 57 towards the apertures 61 and 62 and forces one of the pellets through the apertures 61 and 62 into the bore 55 of the rifle barrel 54 as shown in Fig. 10. The clip 30 is then released and the operator actuates the pump handle 28 to charge the reservoir 16 with compressed air.

When the compressed air in the reservoir is at a suitable pressure the operator swings the pump handle into the casing 20 and moves the clip 30 to retain it therein. Instead of pumping air into the reservoir 16 compressed air may be in-

roduced through the tire valve 31 from a suitable source of compressed air. When the reservoir 16 is charged compressed air flows therefrom through the aperture 37', the conduit 37, and the recess 36' into the chamber 13. The gun 10 is now ready to be fired.

To fire the gun 10 the trigger is quickly pulled rearwardly. When the trigger 60 is pulled rearwardly the rifle barrel 54 moves with it. By the time the trigger 60 engages the end of the stem 46 the rifle barrel 57 has moved a sufficient distance so that the tube 40 closes the aperture 61 in the magazine barrel and as the trigger continues to move rearwardly it moves the stem 46 rearwardly. As the stem 46 is moved rearwardly the valve member 48 moves therewith moving the valve face 49 out of engagement with the valve seat 45 of the valve plug 44 and upon continued rearward movement of the stem 46 the valve face 50 engages the valve seat portion 36'' surrounding the recess 36' thereby restricting the passage of compressed air into the chamber 13 through the recess 36'. As the valve face 49 moves out of engagement with the valve seat 45 the compressed air in the chamber 13 passes therefrom through the valve plug recess 42 and apertures 43 into the chamber 38 and thence through the tube 40 and forces the pellet 65 forward in the rifle barrel bore 55 and expels it from the barrel.

When the trigger 60 is released the spring 69 moves the rifle barrel 54 forward to its normal position and the spring 68 forces another of the pellets through the apertures 61 and 62 into the bore 55 of the rifle barrel 54. Furthermore, when the trigger is released the spring 36^a forces the stem 46 forward thereby moving the valve face 50 out of engagement with the valve seat 36'' and the valve face 49 into engagement with the valve seat 45. When the valve face 50 moves out of engagement with the valve seat 36'' compressed air again flows from the reservoir 16 through the aperture 37', the conduit 37, and the recess 36' into the chamber 13.

Thus it will be seen that when a sufficient quantity of compressed air is in the reservoir 16 all the pellets 65 in the magazine tube 57 may be fired one after the other by the one operation of repeatedly pulling and releasing the trigger 60.

From the foregoing description it will be apparent that I have invented a novel air gun which may be economically manufactured and which is highly efficient in use.

Having thus described my invention I claim:

1. An air gun including a stock, an air reservoir and an outer barrel secured to said stock, said stock having a chamber therein, means to admit a charge of air into the chamber, means to discharge a charge of air from the chamber, a tube member mounted on said stock and projecting forwardly therefrom, said stock having conduit means therein at one end communicating with said tube and at the opposite end communicating with said chamber, a rifle barrel slidably mounted on said tube member, a magazine tube in said rifle barrel, said rifle barrel having a loading aperture communicating with said magazine tube.

2. An air gun including a stock, an air reservoir secured to said stock, an outer barrel portion mounted on and secured to said reservoir and said stock, means on said reservoir to force air thereinto under pressure, said stock having a chamber therein, said stock having a recess opening therefrom, valve means to control passage of air into and out of said chamber, valve

operating means mounted on said stock, a tube member mounted on said stock, said stock having conduit means therein at one end communicating with said tube, and at the opposite end communicating with said chamber, a rifle barrel slidably mounted in said outer barrel, said tube member being disposed in said rifle barrel.

3. An air gun including a stock, an air reservoir secured to said stock, an outer barrel portion mounted on and secured to said reservoir and said stock, means on said reservoir to force air thereinto under pressure, said stock having a chamber therein, said stock having a pair of opposed recesses opening into said chamber, a valve seat surrounding each recess, said stock having conduit means therein communicating at one end with the interior of said reservoir and at the opposite end opening into the rear one of said recesses, a stem member slidably mounted in said stock coaxial with said recesses, a valve member on said stem adapted to control passage through each of said recesses, said stem projecting forwardly of said stock, a tube member mounted on said stock and projecting forwardly, said stock having conduit means therein at one end communicating with said tube and at the opposite end opening into said front recess, a rifle barrel slidably mounted in said outer barrel, a magazine tube positioned in said outer barrel, said rifle barrel and said magazine tube being secured together, said rifle barrel having a loading aperture communicating with said magazine tube, said tube member being disposed in said rifle barrel.

4. An air gun including a stock, an air reservoir secured and an outer barrel secured to said stock, said stock having a chamber therein, said stock having a pair of opposed recesses opening into said chamber, a valve seat surrounding said recesses, said stock having conduit means therein communicating at one end with the interior of said reservoir and at the opposite end opening into the rear one of said recesses, said stock having an open bottomed cut away portion therein between said grip portion and said reservoir, a stem member slidably mounted in said stock coaxial with said recesses, a valve member on said stem and disposed in said chamber, said valve member including a front valve face adapted to engage said valve seat of said front recess and a rear valve face adapted to engage said valve seat of said rear recess, said stem projecting out of said stock into said cut away portion, a tube member mounted on said stock and projecting into said cut away portion, said stock having conduit means therein at one end communicating with said tube and at the opposite end opening into said front recess, a rifle barrel slidably mounted in said outer barrel, a magazine tube in said rifle barrel, said rifle barrel having a loading aperture communicating with said magazine tube.

5. An air gun including a stock, an air reservoir secured to said stock, an outer barrel portion mounted on and secured to said reservoir and said stock, means on said reservoir to force air thereinto under pressure, said stock having a chamber therein, said stock having a pair of opposed recesses opening into said chamber, a valve seat surrounding each recess, said stock having conduit means therein communicating at one end with the interior of said reservoir and at the opposite end opening into the rear one of said recesses, said stock having an open bottomed cut away portion therein between said

grip portion and said reservoir, a stem member slidably mounted in said stock coaxial with said recesses, a valve member on said stem and disposed in said chamber, said valve member including a front valve face adapted to engage said valve seat of said front recess and a rear valve face adapted to engage said valve seat of said rear recess, said stem projecting out of said stock into said cut away portion, a tube member mounted on said stock and projecting into said cut away portion, said stock having conduit means therein at one end communicating with said tube and at the opposite end opening into said front recess, a rifle barrel slidably mounted in said outer barrel, a magazine tube positioned in said outer barrel, said rifle barrel and said magazine tube being secured together, said rifle barrel having a loading aperture communicating with said magazine tube, said tube member being disposed in said rifle barrel.

6. An air gun including a stock, an air reservoir secured to said stock, an outer barrel portion mounted on and secured to said reservoir and said stock, means on said reservoir to force air therein under pressure, said stock having a chamber therein, said stock having a pair of opposed recesses opening into said chamber, a valve seat surrounding each of said recesses, said stock having conduit means therein communicating at one end with the interior of said reservoir and at the opposite end opening into the rear one of said recesses, said stock having an open bottomed cut away portion therein between said grip portion and said reservoir, a stem member slidably mounted in said stock and coaxial with said recesses, a valve member on said stem and disposed in said chamber, said valve member including a front valve face adapted to engage the valve seat of said front recess and a rear valve face adapted to engage the valve seat of said rear recess, resilient means normally urging said front valve face into engagement with its associated valve seat, said stem projecting out of said stock into said cut away portion, a tube member mounted on said stock and projecting into said cut away portion, said stock having conduit means therein at one end communicating with said tube and at the opposite end opening into said front recess, a rifle barrel slidably mounted in said outer barrel, a magazine tube positioned in said outer barrel, said rifle barrel and said magazine tube being secured together, said rifle barrel having a loading aperture communicating with said magazine tube, said tube being disposed in said rifle barrel and said loading aperture being exposed when the barrel is in its forward position.

7. An air gun, said air gun including an outer barrel, a tube at the rear end of said outer barrel, means to supply compressed air to said tube, a trigger for controlling said means, a rifle barrel positioned in said outer barrel, a magazine tube positioned in said outer barrel, said rifle barrel and said magazine tube being slidably mounted and secured together, said rifle barrel having an aperture adjacent the rear thereof and an aligning aperture in said magazine tube, a follower member in said magazine tube, the ends of said magazine tube being closed, said rear closure of said magazine tube being shaped to direct pellets through said rifle barrel and tube apertures, said first tube being positioned in said rifle barrel with the forward end thereof aligned with the rear edge of said aperture in said rifle barrel, a plug in said outer barrel having a conical recess in its

forward face and said magazine barrel having an aperture therein adjacent the bottom of said conical recess and a boss extending from the surface of said conical recess, said boss having a recess therein into which said second magazine tube aperture opens.

8. An air gun, said air gun including an outer barrel, a tube at the rear end of said outer barrel, means to supply compressed air to said tube, a trigger for controlling said means, a rifle barrel positioned in said outer barrel, a magazine tube positioned in said outer barrel, said rifle barrel and said magazine tube being slidably mounted and secured together, said rifle barrel having an aperture adjacent the rear thereof and an aligning aperture in said magazine tube, a follower member in said magazine tube, the ends of said magazine tube being closed, said rear closure of said magazine tube being shaped to direct pellets through said rifle barrel and tube apertures, said first tube being positioned in said rifle barrel with the forward end thereof aligned with the rear edge of said aperture in said rifle barrel, a plug in said outer barrel having a conical recess in the forward face thereof and said magazine barrel having an aperture therein adjacent the bottom of said conical recess, a boss extending from the surface of said conical recess, said boss having a recess therein into which said second magazine tube aperture opens, the outer side walls of said boss being tapered to form a knife edge coincident with the surface of said boss recess.

9. An air gun including an outer barrel, a tube at the rear end of said outer barrel, means to supply compressed air to said tube, a trigger for controlling said means, a rifle barrel positioned in said outer barrel, a magazine tube positioned in said outer barrel, said rifle barrel and said magazine tube being secured together, a closure member in said outer barrel adjacent the forward end thereof and a plug in said outer barrel intermediate the length thereof, said rifle barrel being slidably mounted in said closure member and said rifle barrel and said magazine tube being slidably mounted in said plug, said rifle barrel having an aperture adjacent the rear thereof and an aligning aperture in said magazine tube, a follower member in said magazine tube, the ends of said magazine tube being closed, said rear closure of said magazine tube being shaped to direct pellets through said rifle barrel and tube apertures, means normally urging said follower towards said rifle barrel and magazine apertures, means normally urging said rifle barrel and said magazine tube forward, said first tube being positioned in said rifle barrel with the forward end thereof aligned with the rear edge of said aperture in said rifle barrel, said plug member having a conical recess in the forward face thereof and said magazine barrel having an aperture therein adjacent the bottom of said conical recess, a boss extending from the surface of said conical recess, said boss having a recess therein into which said second magazine tube aperture opens, the outer side walls of said boss being tapered to form a knife edge coincident with the surface of said boss recess.

10. An air gun including a stock, an air reservoir secured to said stock, said stock having a chamber therein, said stock having a pair of opposed recesses opening into said chamber, a valve seat surrounding said recesses, said stock having conduit means therein communicating at one end with the interior of said reservoir and at the opposite end opening

into the rear one of said recesses, said stock having an open bottomed cut away portion therein between said grip portion and said reservoir, a stem member slidably mounted in said stock coaxial with said recesses, a valve member on said stem and disposed in said chamber, said valve member including a front valve face adapted to engage said valve seat of said front recess and a rear valve face adapted to engage said valve seat of said rear recess, said stem projecting out of said stock into said cut away portion, a tube member mounted on said stock and projecting into said cut away portion, said stock having conduit means therein at one end communicating with said tube and at the opposite end opening into said front recess, a rifle barrel slidably mounted in said outer barrel, a magazine tube movable in said rifle barrel, said rifle barrel having a loading aperture communicating with said magazine tube, said rifle barrel having an aperture adjacent the rear thereof and an aligning aperture in said magazine tube, a follower member in said magazine tube, means to direct pellets through said rifle barrel and tube apertures, said first tube being positioned in said rifle barrel with the forward end thereof aligned with the rear edge of said aperture in said rifle barrel, said magazine barrel having an aperture therein and means to direct pellets into said last mentioned aperture.

11. An air gun including a stock, an air reservoir and an outer barrel secured to said stock, said stock having a chamber and having a pair of opposed recesses opening into the chamber, a valve seat surrounding each recess, said stock having conduit means therein communicating at one end with the interior of said reservoir and at the opposite end opening into the rear recess, said stock having an open bottomed cut away portion therein between said grip portion and said reservoir, a stem member slidably mounted in said stock coaxial with said recesses, a valve member on said stem and disposed in said chamber, said valve member including a front and a

rear valve face adapted to engage said front valve seat and said rear valve seat, said stem projecting out of said stock into said cut away portion, a tube member mounted on said stock and projecting into said cut away portion, said stock having conduit means therein at one end communicating with said tube and at the opposite end opening into said front recess, a rifle barrel slidably mounted in said outer barrel, a magazine tube movable in said rifle barrel, said rifle barrel having a loading aperture communicating with said magazine tube, said rifle barrel having an aperture adjacent the rear thereof and an aligning aperture in said magazine tube, a follower member in said magazine tube, the rear of said magazine tube having a closure, said closure being shaped to direct pellets through said rifle barrel and tube apertures, said first tube being positioned in said rifle barrel with the forward end thereof aligned with the rear edge of said aperture in said rifle barrel, a plug in said outer barrel having a recess in the forward face thereof and said magazine barrel having an aperture therein adjacent the bottom of said conical recess and a boss extending from the surface of said conical recess, said boss having a recess therein into which said second magazine tube aperture opens.

12. In an air gun including a stock and a firing barrel, a magazine tube containing a plurality of pellets and communicating with the barrel, a member fixed on said stock and projecting into said barrel and normally preventing communication between the magazine and barrel, means to move said barrel relative to the member to open communication between the barrel and the magazine, a source of compressed air, a movable firing trigger, means operative each time said trigger is pulled to cause a pellet to be expelled from said firing barrel and means operable each time the trigger is released to cause another pellet to be moved from the magazine tube into said firing barrel.

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