

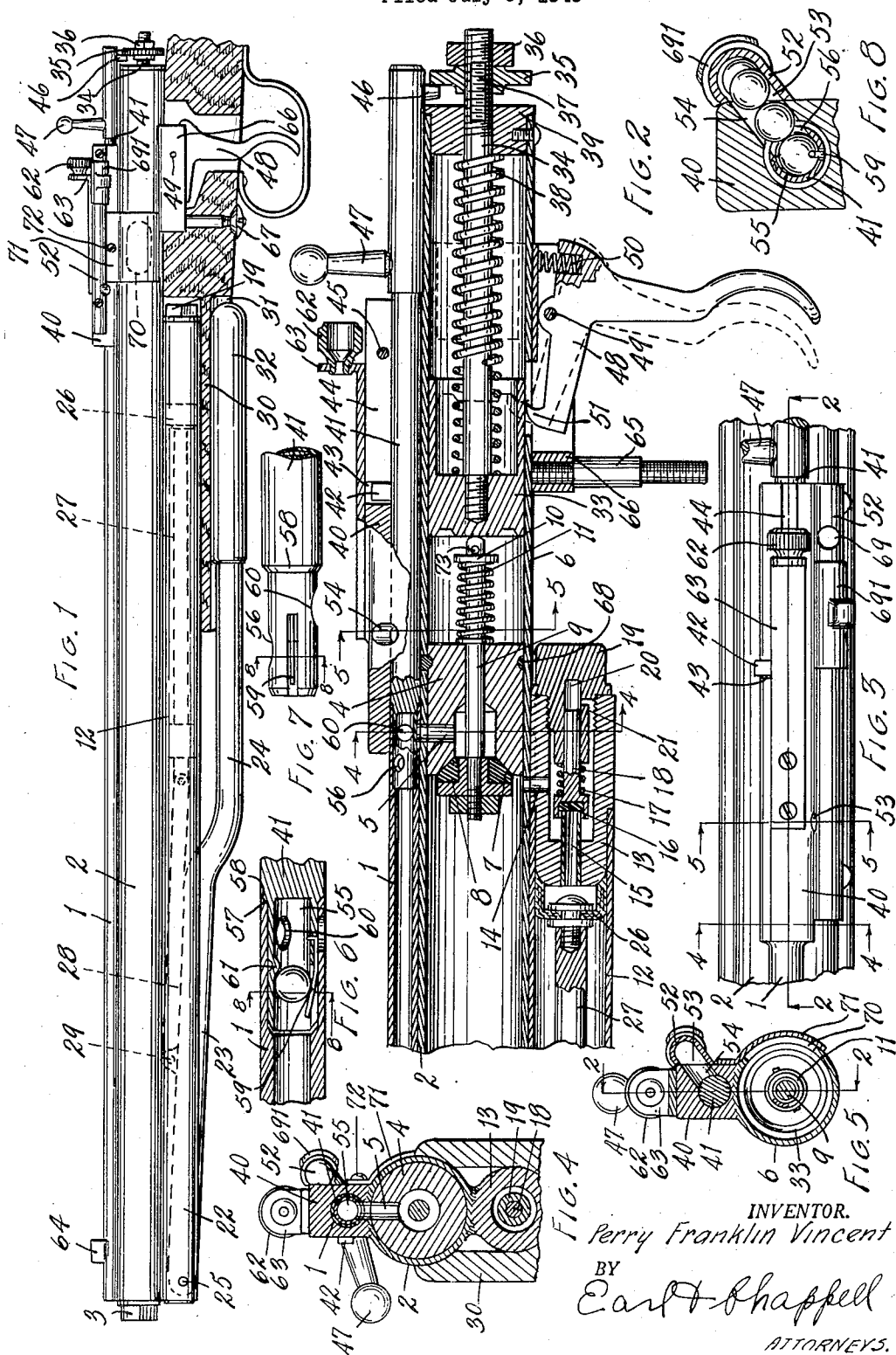
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AIR GUN

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AIR GUN

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The main objects of this invention are:

First, to provide a repeating air gun which is compact in structure, is easily operated, and may be fired several times with one charge of the air reservoir.

Second, to provide an air gun which has a reservoir of large capacity and one which at the same time is well balanced.

Third, to provide an air gun which is loaded and cocked by a single actuation of the loading bolt.

Fourth, to provide an air gun in which the firing charge may be substantially varied.

Fifth, to provide an air gun having these several advantages which is made up of relatively few parts, and one in which the parts are accessible for repair or replacement as may be required.

Objects relating to details and economies of the invention will definitely appear from the description to follow. The invention is defined in the claims.

An air gun which embodies the features of the invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevation of an air gun embodying my invention, the stock being shown in longitudinal section.

Fig. 2 is an enlarged fragmentary view mainly in section on line 2—2 of Figs. 3 and 5.

Fig. 3 is a fragmentary plan view.

Fig. 4 is an enlarged cross sectional view on line 4—4 of Figs. 2 and 3.

Fig. 5 is a transverse section on line 5—5 of Figs. 2 and 3.

Fig. 6 is a fragmentary longitudinal section of the rear end of the barrel showing the relation of the loading bolt and barrel when the bolt is in its advanced position prior to being rotated to locked position or firing position.

Fig. 7 is an enlarged fragmentary view of the bolt.

Fig. 8 is a fragmentary cross section on line 8—8 of Figs. 6 and 7 illustrating the relation of the bullet magazine to the bullet chamber of the bolt.

In the embodiment of the invention illustrated in the accompanying drawing the barrel 1 is mounted on the upper side of the elongated air pressure reservoir 2 which is closed at its front end by means of a closure plug 3 and is provided at its rear end with a plug-like valve casing 4 having a lateral port 5 opening to the barrel through the wall of the barrel and through the wall of the reservoir tube, this providing a continuous port. The valve casing 4 is fixed within

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the reservoir in spaced relation to its rear end, the rear end of the reservoir constituting a hammer housing 6.

The valve casing 4 is provided with a forwardly facing valve seat 7 with which the valve 8 coacts, this valve being provided with a stem 9 projecting through the valve casing and provided with a thrust collar 10 for the valve biasing or seating spring 11. This stem projects into the hammer housing.

The pump cylinder 12 is secured on the under side of the reservoir 2 in parallel relation thereto. At the rear end of the pump cylinder 12 I provide a valve casing 13 having a lateral port 14 opening through the wall of the reservoir to the rear end of the reservoir but in advance of the valve casing 4. The valve casing is provided with a longitudinally extending tube 15, the rear end of which constitutes a seat for the valve 16 which is seated by means of the spring 17 on its stem 18. The closure member 19 of the valve casing is provided with a bore 20 which constitutes a guide for the stem 18. A passage 21 opening to the bore 20 at the rear of the stem is provided so that the air pressure on the valve is equalized.

The cylinder 12 has a forward extension 22 which preferably extends to the end of the reservoir. This extension is slotted on its under side to receive the upwardly offset portion 23 of the pump handle 24 which is pivoted at 25 within the slot. The plunger 26 is preferably of the cupped leather type provided with a plunger rod 27 connected by the connecting rod 28 to the upwardly offset portion of the handle at 29. The stock 30 is secured to the reservoir and is provided with a longitudinal recess 31 adapted to partially receive the handle grip 32 when the handle is collapsed. With this arrangement the parts are very compact and the structure is attractive in appearance.

The hammer 33 is slidably or reciprocatingly mounted in the housing 6 and is provided with a stem 34 threaded at its rear end to receive the adjustable tappet 35. A lock nut 36 is provided for securing the tappet in adjusted position. This stem 34 is provided with graduations 37. The hammer is actuated by the coiled spring 38 arranged on the stem, the rear end of the housing being provided with a plug 39 supporting the spring. This spring is of a tension sufficient to momentarily unseat the firing valve under the impact of the hammer but not sufficient to hold it in unseated position against the tension of the

spring 11 and the air pressure within the reservoir which acts to seat the valve.

The bolt housing 40 is secured to the hammer housing portion of the air reservoir and is adapted to support the charging bolt 41 for sliding and rotatable movement, this movement being substantially that of a bolt action gun. The bolt is provided with a lug 42 adapted to swing into the recess 43 in the housing when the bolt is in its advanced position, thereby locking the bolt in that position and supporting it to receive the firing impact. The housing has a longitudinal slot 44 adapted to receive the lug when it is rotated to retracting position, the stop 45 limiting the retracting movement. The bolt is provided with a lug 46 coacting with the adjustable tappet 35 on the hammer stem. The bolt is provided with the usual handpiece 47.

As the bolt is retracted the hammer is drawn back to cocked position, in which position it is engaged by the trigger 48 pivoted at 49 and urged to engaging position by the spring 50, the detent 51 of the trigger engaging the front end of the hammer. The tappet 35 coacting with the lug 46 on the bolt performs two functions, namely, that of cocking the hammer and also limiting the stroke of the hammer. As stated, the tappet is adjustable on the hammer stem. The firing valve is opened by the impact of the hammer; the firing stroke of the hammer, being regulated by this adjustment, regulates the opening of the firing valve and thus the firing charge.

The bullet magazine 52 is secured to the side of the bolt housing and is provided with a discharge opening 53 registering with the lateral passage 54 in the bolt housing to deliver to the bullet chamber 55 in the forward end of the bolt through the opening 56 therein. The bolt and the barrel have a ground beveled abutting joint at 57, 58 forming a tight joint between the bolt and the barrel when the bolt is in firing position. The bullet chamber is provided with a tongue-like spring 59 which projects in advance of the bullet receiving opening 56 so that the bullet is yieldingly retained in the firing chamber.

When the bolt is rotated to firing position the opening 60 thereof is brought into register with the port of the firing valve so that when the trigger is pulled the firing charge of compressed air is delivered into the barrel or into the bullet chamber at the rear of the bullet and the bullet is expelled. The tongue 59 is of such tension as to restrain the bullet so that it will not roll out of the barrel. The bullet is discharged from the magazine against this spring tongue and is supported against rearward movement by the lug 61 struck inwardly from the wall of the chamber, see Fig. 6. As the bullet is carried forward by the forward movement of the bolt the tongue is sprung slightly downwardly as the bullet moves out of alignment with the passage 54. In the event the gun is not fired or the bullet is not discharged by the firing of the gun, and the bolt is again retracted to charging position, the bullet within the bolt prevents the entrance of another bullet to the bullet chamber of the bolt as shown in Fig. 8 so it is impossible for more than one bullet to enter the bullet chamber of the bolt at one time.

The magazine charging opening 69 is provided with a slidable closure 691. To facilitate the removal of the firing valve the rearward extension of the reservoir is provided with a side opening 70 which is normally covered by the cover 71 secured by the screw 72. By removing this cover

access may be had to the retaining pin 73 for the thrust collar 10 on the valve stem 9. By removing this pin the valve is released and may be removed through the reservoir closure 3. This permits removal of the valve seat as occasion may require.

A sight 62 is mounted on a suitable bracket 63 on the bolt housing. A coaxing barrel sight 64 is provided. The stock 30 is detachably mounted by means of the bolt 65 threaded into the trigger support 66 and threaded to receive the retaining nut 67. The firing valve casing 4 is fixedly retained by a ring of solder 68 (Fig. 2).

With the parts thus arranged I provide a structure which is well balanced and compact and attractive in appearance. The air reservoir is of relatively large capacity and the pump enables the charging of the reservoir to quite a high degree of pressure. While it is obvious that each successive firing charge reduces this pressure, the gun may be discharged a number of times without recharging the reservoir. The firing may be substantially varied by adjustment of the tappet 35. The gun is cocked by the manipulation of the loading bolt; in other words, the bolt is a combined loading bolt and trigger setting bolt, and is effective throughout the very considerable range of possible adjustment.

I have illustrated and described the invention in a very practical embodiment. It is believed this disclosure will enable those skilled in the art to embody or adapt the invention as may be desired.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In an air gun, the combination of a barrel, an air reservoir, a spring seated firing valve, the pressure within said reservoir also acting to seat said valve, a hammer slidably supported to coact with said firing valve, said hammer having a stem provided with a tappet, a hammer actuating spring, the tension of said hammer spring being only sufficient to move said firing valve from its seat momentarily under the impact of the hammer, a bullet magazine, a slidably mounted bolt provided with a bullet chamber at its forward end projecting into said barrel when the bolt is in advanced position, said bullet chamber having a bullet receiving opening adapted to receive a bullet from said magazine when the bolt is in retracted position and a port registering with the firing valve port when the bolt is in its firing position, said bolt being provided with a yielding bullet retainer projecting into said bullet chamber in advance of a bullet therein, a lug at the rear thereof limiting the rearward movement of a bullet in said chamber, and a trigger coacting with said hammer, said bolt having a lug coacting with said tappet on said hammer whereby the hammer is cocked on the retraction of said bolt.

2. In an air gun, the combination of a barrel, an air reservoir, a firing valve casing provided with a barrel port and with a forwardly facing valve seat, a firing valve coacting with said seat and provided with a stem projecting rearwardly through the valve casing, a spring on said valve stem acting to seat said firing valve, the pressure within said reservoir also acting to seat said valve, a hammer slidably supported to coact with said firing valve stem, said hammer having a stem provided with an adjustable tappet arranged to limit the stroke of said hammer, a hammer actuating spring, the tension of said hammer spring

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being only sufficient to move said firing valve from its seat momentarily under the impact of the hammer, a slidably mounted loading bolt, and a trigger coacting with said hammer, said bolt having a lug coacting with said tappet on said hammer whereby the hammer is cocked on the retraction of said bolt.

3. In an air gun, the combination of a barrel, an air reservoir, a spring seated firing valve, a spring actuated hammer coacting with said firing valve and provided with an adjustable tappet arranged to abut a fixed portion of the gun, and a loading bolt operatively engageable with said adjustable tappet whereby the hammer is cocked on the retraction of the bolt and the stroke of the hammer may be varied by the adjustment of the tappet.

4. In an air gun, the combination of a barrel, an elongated air reservoir, a valve housing positioned within said reservoir and spaced forwardly of the rear thereof, a spring seated firing valve in said valve housing, a spring actuated impact hammer positioned in the rear of said reservoir coacting with said firing valve and provided with externally adjustable stroke regulating means, and a loading bolt operatively associated with said means and acting to cock the hammer on the retraction of the bolt.

5. In an air gun, the combination of a barrel, an elongated air reservoir, a valve housing positioned within said reservoir and spaced forwardly of the rear thereof, a spring seated firing valve in said valve housing, the pressure within the reservoir also acting to seat said valve, a spring actuated hammer positioned in the rear of said reservoir coacting with said firing valve and provided with an adjustable tappet positioned externally of said reservoir and engageable with a fixed portion of said reservoir, the tension of said hammer spring being only sufficient to move said firing valve open momentarily under the impact of the hammer, and a loading bolt cooperative with said barrel and operatively associated with said tappet whereby the hammer is cocked by the manipulation of the loading bolt, said tappet being adjustable longitudinally of said hammer to control the opening of said firing valve.

6. In an air gun, the combination of a barrel, a tube secured to said barrel parallel thereto and extending to the rear thereof, said tube defining a reservoir in the forward end thereof and a hammer housing in the rear thereof, a valve housing fitting within said tube between said reservoir and said hammer housing and defining a firing port between said reservoir and said barrel, a forwardly facing valve seat around said port, a firing valve spring biased to port closing position and having a stem extending into said hammer housing, a hammer reciprocable in said hammer housing and slidably engaging the walls thereof, a stem on said hammer extending to the rear of said hammer housing, a guide for said hammer stem secured to said hammer housing, a tappet on said hammer stem engageable with said guide to limit the forward movement of said hammer, said tappet being threadedly adjustable axially of said hammer stem to vary the stroke of said hammer, and a spring urging said hammer toward said valve stem, said hammer spring being weaker than the spring biasing said firing valve.

7. A multiple shot air gun comprising, a continuous tubular member, a valve casing secured within said member toward the rear end thereof and dividing said member into a forward reservoir and a rear hammer housing, front and rear clo-

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sures for the ends of said tubular member, a barrel integrally secured along the top of said member and terminating at the rear over said valve casing, said valve casing having a radial port opening to the rear of said barrel and a forwardly facing firing port in communication with said radial port opening to said reservoir, a pump secured along the bottom of said member and adapted to charge said reservoir, a firing valve positioned to close said firing port and having a stem projecting rearwardly through said valve casing into said hammer housing, a firing valve spring cooperative with said stem to urge said firing valve to closed position, air pressure in said reservoir further acting to seat said firing valve, a hammer slidably supported in said hammer housing and having a stem projecting rearwardly through said rear closure, a hammer spring positioned in said hammer housing to urge said hammer against said firing valve stem, said hammer spring having less compressive strength than said spring on said firing valve stem whereby said hammer and hammer spring are effective to open said firing valve only momentarily by impact and are ineffective to hold said firing valve open against the combined force of said firing valve spring and the pressure in said reservoir, a tappet threadingly adjustably mounted on the rear of said hammer stem and cooperative with said rear closure to variably limit the forward motion of said hammer and thereby variably control the opening of said firing valve, a bolt housing secured to said tubular member above said hammer housing and coaxial with said barrel, a bolt slidably and rotatably mounted in said bolt housing and having a laterally projecting operating handle, a lug on the rear of said bolt engageable with said tappet to cock said hammer when said bolt is retracted, the forward end of said bolt having a bullet receiving chamber formed therein to project into said barrel when said bolt is advanced, the walls of said bullet chamber forming a port registering with said radial port from said valve casing in the advanced position of said bolt and a bullet receiving port forwardly and angularly displaced from the other port in said bolt, an inwardly projecting bullet retaining lug positioned between said ports within said bullet chamber, an inwardly projecting bullet retaining spring secured to the inside of said bullet chamber to yieldably retain a bullet against said lug, a magazine secured to said bolt housing and adapted to receive a plurality of bullets, said magazine and bolt housing having registering ports opening to the bullet receiving port in said bolt in the retracted position of said bolt, and a trigger pivotally carried by said member and cooperative with said hammer to hold and release said hammer.

8. A multiple shot air gun comprising, a continuous tubular member, a valve casing secured within said member toward the rear end thereof and dividing said member into a forward reservoir and a rear hammer housing, a closure for the front of said tubular member, a barrel secured along the top of said member and terminating at the rear over said valve casing, said valve casing having a radial port opening to the rear of said barrel and a forwardly facing firing port in communication with said radial port opening to said reservoir, means for charging said reservoir, a firing valve positioned to close said firing port and having a stem projecting rearwardly through said valve casing into said hammer housing, a spring cooperative with said stem to urge said firing valve to closed position, air pressure in said

reservoir further acting to seat said firing valve, a hammer slidable in said hammer housing and having a stem projecting rearwardly from said hammer housing, a hammer spring positioned in said hammer housing to urge said hammer against said firing valve stem, said hammer spring having less compressive strength than said spring on said firing valve stem whereby said hammer and hammer spring are effective to open said firing valve only momentarily by impact and are ineffective to hold said firing valve open against the combined force of said firing valve spring and the pressure in said reservoir, a tappet axially adjustably mounted on the rear of said hammer stem exteriorly of said member and cooperative with the rear of said member to variably limit the forward motion of said hammer and thereby variably control the opening of said firing valve, a trigger pivotally mounted on the underside of said tubular member and cooperative with said hammer, a bolt slidably mounted on said hammer housing and having an operating handle, a lug on the rear of said bolt engageable with said tappet to cock said hammer when said bolt is retracted, the forward end of said bolt having a bullet receiving chamber formed therein to project into said barrel when said bolt is advanced, the walls of said bullet chamber forming a port registering with said radial port from said valve casing in the advanced position of said bolt and a bullet receiving port forwardly displaced from the other port in said bolt, an inwardly projecting bullet retaining lug positioned between said ports within said bullet chamber, an inwardly projecting bullet retaining spring secured to the inside of said bullet chamber to yieldably retain a bullet against said lug, and a magazine secured to said bullet housing and adapted to receive a plurality of bullets, said magazine having a loading port opening to the bullet receiving port in said bolt in the retracted position of said bolt.

9. A multiple shot air gun comprising, a continuous tubular member, a valve casing secured within said member toward the rear end thereof and dividing said member into a forward reservoir and a rear hammer housing, a barrel secured along the top of said member and terminating at the rear over said valve casing, said valve casing having a radial port opening to the rear of said barrel and a forwardly facing firing port in communication with said radial port opening to said reservoir, means for charging said reservoir, a firing valve positioned to close said firing port and having a stem projecting rearwardly through said valve casing into said hammer housing, a spring cooperative with said stem to

urge said firing valve to closed position, air pressure in said reservoir further acting to seat said firing valve, a hammer slidable in said hammer housing and having a stem projecting rearwardly from said reservoir, a hammer spring positioned in said hammer housing to urge said hammer against said firing valve stem, said hammer spring having less compressive strength than said spring on said firing valve stem whereby said hammer and hammer spring are effective to open said firing valve only momentarily by impact and are ineffective to hold said firing valve open against the combined force of said firing valve spring and the pressure in said reservoir, a tappet mounted on the rear of said hammer stem and cooperative with the rear of said hammer housing to limit the forward motion of said hammer, a trigger pivotally mounted on the underside of said tubular member and cooperative with said hammer, and coaxial with said barrel, a bolt slidably mounted on said hammer housing and having an operating handle, and a lug on the rear of said bolt engageable with said tappet to cock said hammer when said bolt is retracted, the forward end of said bolt having a bullet receiving chamber formed therein to project into said barrel when said bolt is advanced, the walls of said bullet chamber forming a port registering with said radial port from said valve casing in the advanced position of said bolt and a bullet receiving port forwardly displaced from the other port in said bolt.

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