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AIR GUN

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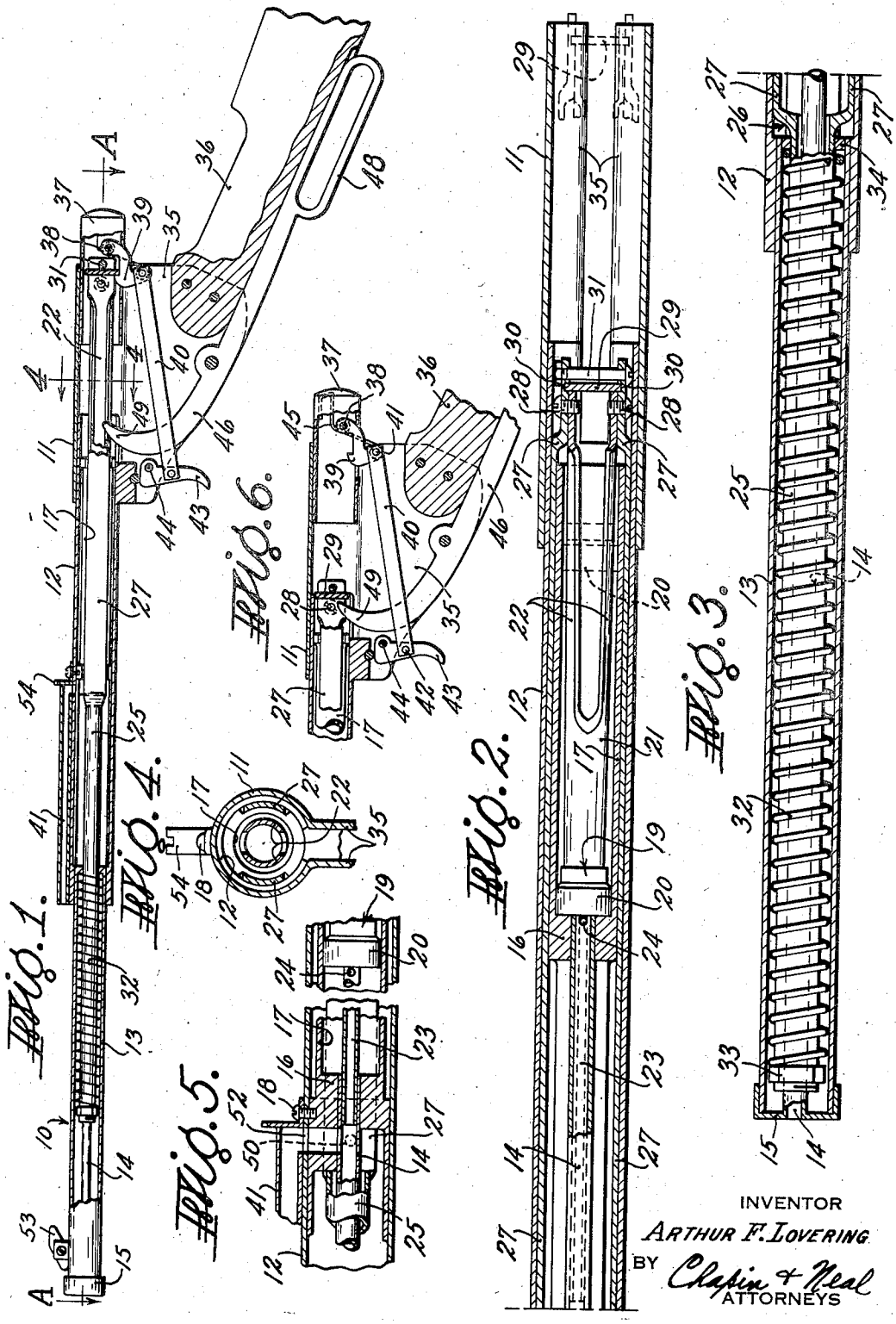


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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AIR GUN

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4 Claims. (Cl. 124—15)

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This invention relates to an improvement in air guns and more particularly to an improved spring arrangement for the actuation of the piston of the air compression cylinder.

The principal object of the invention is to secure a smoother more powerful and more accurate operation of the gun.

Other and further objects residing in the details of construction will be made apparent from the following specification and claims.

In the accompanying drawings which show one embodiment of the invention,

Fig. 1 is a side elevational view of a gun embodying the invention, parts being broken away, the firing mechanism being shown in cocked position;

Figs. 2 and 3 together form a sectional view substantially on line A—A of Fig. 1, on a larger scale, Fig. 2 showing the rear and Fig. 3 showing the forward portion of the barrel, the parts being shown in uncocked position;

Fig. 4 is a transverse section substantially on line 4—4 of Fig. 1;

Fig. 5 is a detail sectional view of the loading chamber; and

Fig. 6 is a detail sectional view showing the firing mechanism in uncocked position.

As shown, the barrel generally indicated at 10 comprises a rear or breech section 11, an intermediate section 12 and a forward section 13, these sections being welded or otherwise secured together to form an integral barrel.

Within the barrel 10 is provided a shooting tube 14 the forward end of which is welded or otherwise secured to a cap member 15 which closes the forward end of the space between the shooting tube and the barrel 10. The rear end of the shooting tube, as shown in Figs. 2 and 5 is supported in the head 16 of an air compression cylinder 17.

The compression cylinder 17 is held fixed within the barrel, adjacent the breech end thereof, in any suitable manner, as by a machine screw 18. Reciprocably mounted in compression cylinder 17 is a plunger, generally indicated at 19, comprising an air compressing head 20 and a rearwardly extending stem 21. The rear portion of stem 21 is bifurcated to form spaced arms 22. Extending from the forward face of the plunger head 20 is a hollow air tube 23 which telescopes into the rear end portion of the shooting tube 14 as shown in Figs. 2 and 5. The length of air tube 23 is slightly greater than the operating stroke of the plunger 19 so that when the plunger is drawn back in cocked position the

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forward end portion of the air tube is positioned within the cylinder head 16 (Fig. 5) with its end adjacent the forward face of the cylinder head.

The air tube is provided with one or more openings 24 adjacent the plunger head through which air from the cylinder is forced into the air tube upon forward movement of the plunger in the cylinder.

Surrounding the shooting tube and slidable thereover is a tubular member 25 the rear portion of which is split as indicated at 26 providing spaced yoke arms 27 which extend rearwardly along opposite sides of the compression cylinder between the latter and the gun barrel. To the rear of the compression cylinder the yoke arms 27 are respectively connected to the adjacent arms 22 of the plunger stem as by screws 28. A small vertical plate 29, set in grooves 30 formed in the end portions of yoke arms 27 bridges the space between said arms and is held in place by a bolt 31.

Surrounding the tubular member 25 is a coiled spring 32 one end of which engages a nut 33 threaded on the forward end of member 25, the other end being engaged by a flange 34 extending inwardly from the barrel.

The breech section 11 is formed with downwardly extending spaced plate portions 35 which are riveted or otherwise secured to the gun stock 36. The breech end of section 11 is closed by a closure member 37, welded or otherwise secured in place.

Pivoted to member 37 at 38 is a latch 39 to which one end of a link 40 is connected by a pivot 41. The other end of link 40 is pivoted at 42 to a trigger 43 which is pivoted at 44 between plates 35. Any suitable means such as spring 45 coiled around pivots 38 and 41 and having its free upper end engaging member 37 is provided to normally maintain latch 39 in the position shown in Figs. 6 and 1.

A cocking lever 46 is pivoted between plates 35, and is formed with a handle portion 48 and a hooked forward portion 49 adapted, when handle 48 is swung downwardly, to engage plate 29 as indicated in Fig. 6 and draw the latter, and the parts attached thereto, rearwardly until the bottom edge of the plate is engaged and held by latch 39 as shown in Fig. 1.

As will be apparent, when plate 29 is in engagement with latch 39 spring 32 is held under compression (Fig. 1) and plunger head 20 is positioned at the rear end of air compression cylinder 17, as indicated in dotted lines in Fig. 2. With the parts positioned as shown in Figs. 1

and 5, a shot may be positioned in front of air tube **23**, as shown in dotted lines at **50** in Fig. 5, through a loading tube **41** and opening **52** formed in the barrel. Loading tube **41** may be held in place by the screw **18** which secures the air compression cylinder **17** in place. Release of latch **39** by actuation of trigger **43** causes spring **32** to draw the plunger forwardly in cylinder **17** forcing the air under compression through openings **24** and tube **23** against the shot **50** projecting the latter through and from the shooting tube **14**.

The gun may be provided with the usual front and rear sights **53** and **54** respectively.

By my arrangement I am able to use a substantially longer spring than has heretofore been possible and without increasing the overall length of the barrel. By increasing the length of the spring a more powerful and smoother action of the air compression plunger may be obtained with a resulting greater range and accuracy. The relatively long space afforded at the forward end of the barrel permits the degree of compression imposed on the spring to be decreased preventing fatigue of the spring, and promoting longer life as well as smoother action.

What I claim is:

1. In an air gun, a barrel, an air compression cylinder secured within the barrel adjacent the breech end thereof, a shooting tube within the barrel, the forward end of said tube being fixed to the forward end of the barrel, said tube extending from the forward end of the barrel to the air compression cylinder and opening thereto, a plunger reciprocably mounted within the air compression cylinder, a spring surrounding the shooting tube between the forward end of the barrel and the compression cylinder, means movable longitudinally of the fixed shooting tube and engaging the forward end of the spring, said means having portions extending rearwardly of the compression cylinder, means connecting said portions to the breech end of said plunger, means to retract the plunger against the action of said spring, a latch releasably holding said plunger in retracted position, and trigger means for releasing said latch.

2. In an air gun, a barrel, an air compression cylinder secured within the barrel adjacent the breech end thereof, a shooting tube within the barrel, the forward end of said tube being fixed to the forward end of the barrel, said tube extending from the forward end of the barrel to the air compression cylinder and opening thereto, a plunger reciprocably mounted within the air compression cylinder, a spring surrounding the shooting tube between the forward end of the barrel and the compression cylinder, actuating means positioned between the spring and shooting tube and abutting the forward end of the spring, said means extending rearwardly of the compression cylinder, means connecting said actuating means to the breech end of said plunger rearwardly of the compression cylinder, means to retract the plunger against the action of said spring, a latch releasably holding said plunger in retracted position, and trigger means for releasing said latch.

3. In an air gun, a barrel, an air compression cylinder fixed within the barrel adjacent the breech end thereof, a shooting tube having its forward end supported by the forward end of the barrel and its rear end supported by the head of the air compression cylinder, a plunger reciprocably mounted in the compression cylinder, an actuating member including a tubular portion slidably mounted on the shooting tube, and two spaced arms extending rearwardly from the tubular portion along opposite sides of the air compression cylinder, a spring surrounding the tubular portion of the actuating member, a collar carried by the forward end of said tubular portion and abutting the forward end of the spring, a fixed abutment member engaging the rear end of the spring, means connecting said arms to the plunger rearwardly of the breech end of the air compression cylinder, means to retract the plunger to compress said spring between said collar and abutment, a latch releasably holding said plunger in retracted position, and trigger means for releasing said latch.

4. In an air gun, a barrel, an air compression cylinder fixed within the barrel adjacent the breech end thereof, a shooting tube having its forward end supported by the forward end of the barrel and its rear end supported by the head of the air compression cylinder, a plunger reciprocably mounted in the compression cylinder, an actuating member including a tubular portion slidably mounted on the shooting tube, and two spaced arms extending rearwardly from the tubular portion along opposite sides of the air compression cylinder, a spring surrounding the tubular portion of the actuating member, a collar carried by the forward end of said tubular portion and engaging the forward end of the spring, a fixed abutment member engaging the rear end of the spring, means connecting said arms to the plunger rearwardly of the breech end of the air compression cylinder, a plate member bridging the space between the ends of said arms, means movable to engage said plate to draw the actuating member and plunger rearwardly against the action of said spring, a latch engaging the plate member, when the actuating member reaches a predetermined point in its rearward movement, to releasably hold the actuating member and plunger in retracted position, and a trigger means for releasing said latch.

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The following references are of record in the file of this patent:

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