

(No Model.)

2 Sheets—Sheet 1.

E. E. BAILEY & T. A. MONK.
AIR GUN.

No. 603,549.

Patented May 3, 1898.

Fig. 1.

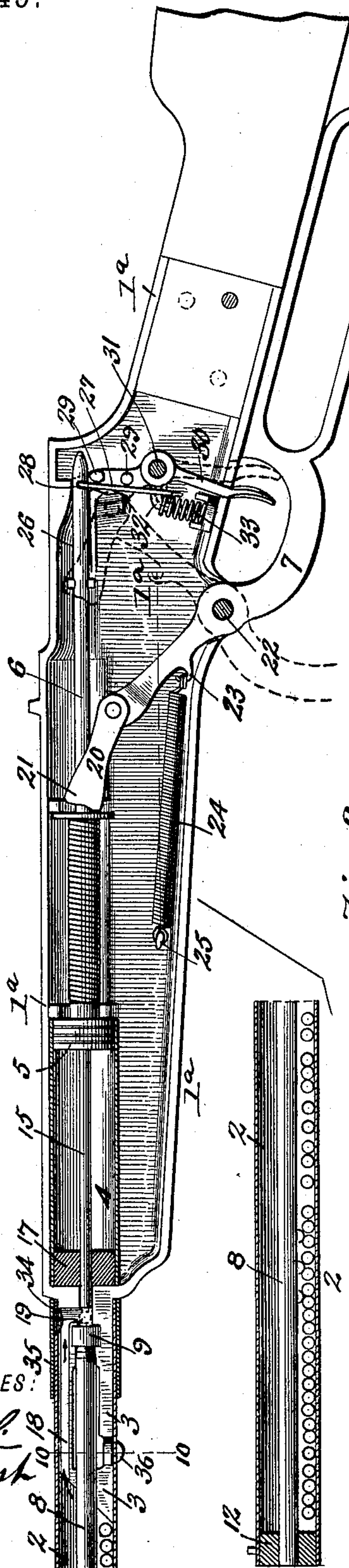
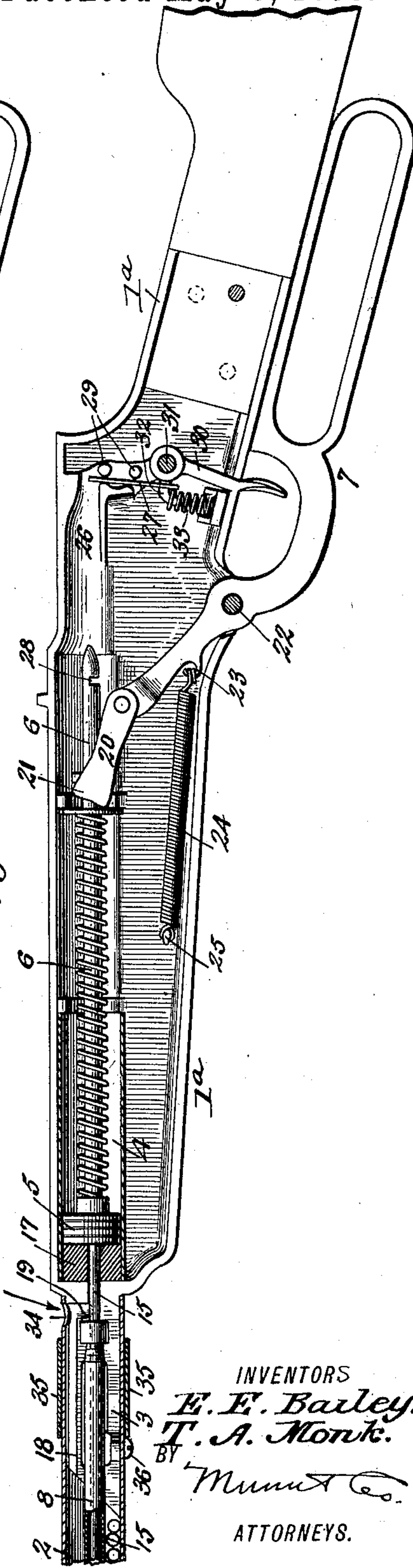


Fig. 2.



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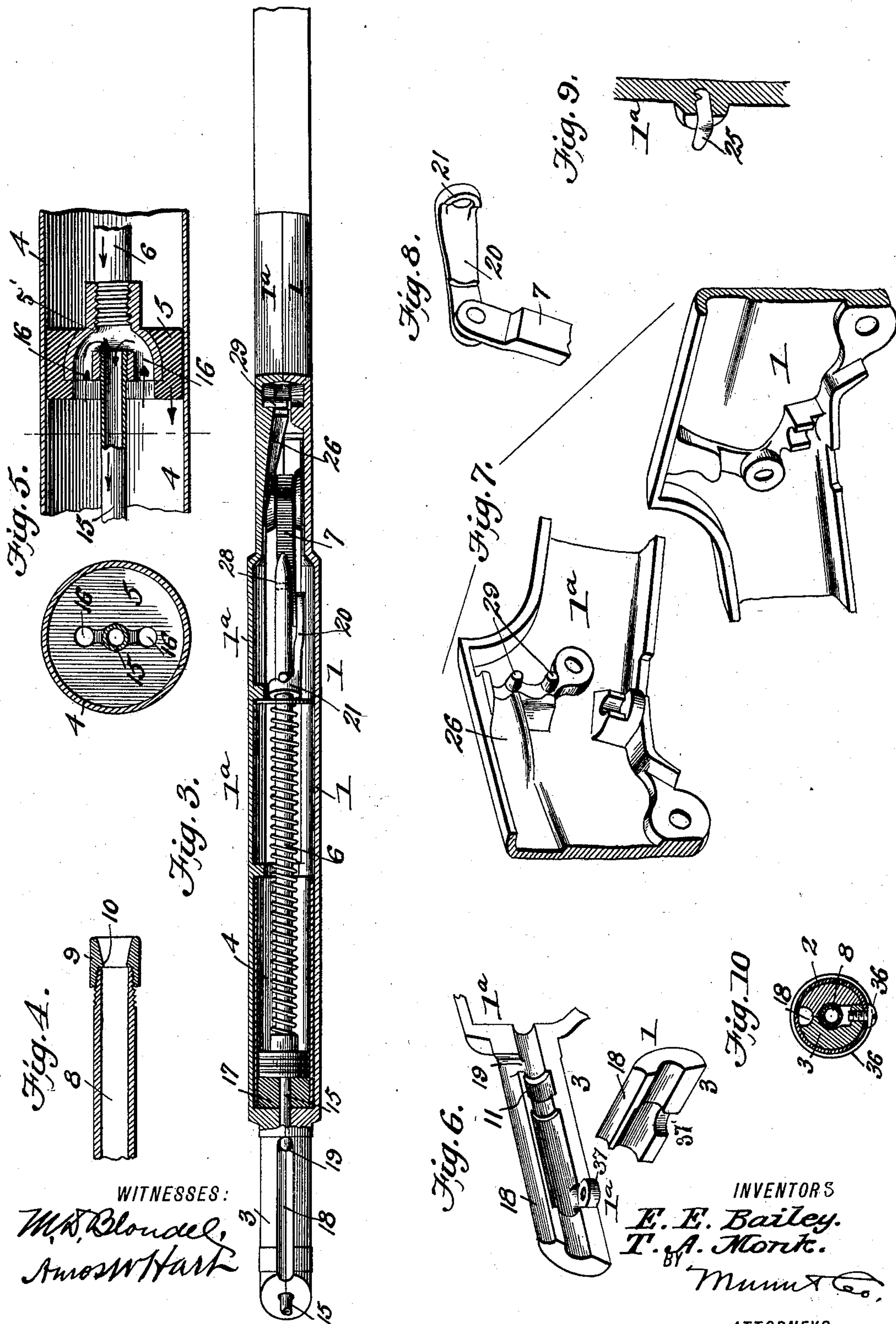
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WITNESSES:
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UNITED STATES PATENT OFFICE.

ELMER E. BAILEY AND THOMAS A. MONK, OF PHILADELPHIA,
PENNSYLVANIA.

AIR-GUN.

SPECIFICATION forming part of Letters Patent No. 603,549, dated May 3, 1898.

Application filed June 29, 1897. Serial No. 642,887. (No model.)

To all whom it may concern:

Be it known that we, ELMER E. BAILEY and THOMAS A. MONK, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Air-Guns, of which the following is a specification.

Our invention is an improvement upon the repeating air gun or rifle for which Letters Patent No. 507,470 were granted to Elmer E. Bailey, aforesaid, October 24, 1893. The results attained by the several features constituting the improvement are reduction in the number, friction, and weight of parts and cost of manufacture of the gun as a whole, greater facility of repair, and increased durability, accuracy, and efficiency.

The construction, arrangement, and operation of the gun parts are as hereinafter described, and shown in the accompanying drawings, two sheets, in which—

Figure 1 is a central longitudinal section of our improved air-gun, showing the piston retracted and other movable parts of the discharge mechanism in position for firing. Fig. 2 is a view similar to Fig. 1, save that the movable parts of the discharge mechanism are shown in the normal position as when discharged and the charging-hole in the magazine uncovered. Fig. 3, Sheet 2, is a horizontal section of a portion of the lock-frame. Fig. 4 is an enlarged longitudinal section of the rear end of the firing-tube or shot-barrel proper. Fig. 5 includes an enlarged longitudinal and cross section of the piston air-jet tube and piston-cylinder. Fig. 6 is a perspective view of parts composing the cylindrical extension of the lock-frame. Fig. 7 includes perspective interior views of the rear portion of the lock-frame. Fig. 8 is a detail perspective of the piston-rod link connected with the guard-lever. Fig. 9 is a detail perspective section showing the manner of securing one of the pins to which the guard-lever spring is attached. Fig. 10 is a cross-section on line 10 10 of Fig. 1.

As in Bailey's former invention above referred to, the lock-frame is made in two parts or longitudinal halves 1 1^a, Figs. 1, 2, and 3, which are in most respects duplicates, and

the magazine 2 is fitted on and secured to the reduced front extension 3 of such frame. An air-compression cylinder 4, piston 5, and piston-rod 6 are arranged in the chambered frame 1 1^a, and such piston and rod are operated by a pivoted guard-lever 7, as before. A small firing-tube 8 also extends through the said magazine 2 and is secured at its rear end in the lock-frame. In all these and other connected parts we have devised the following important changes and improvements.

The brass firing-tube 8, Figs. 1 and 4, is provided at its rear end with an enlarged tubular head 9—i. e., a short hardened or steel tube which is threaded on the firing-tube and serves to reduce the lead balls or "B B" shot used in the gun to a uniform size as they are forced through it, so that they may properly fit the firing-tube 8. The entrance or mouth of such head 9 is made slightly flaring and then contracted interiorly at a point adjacent to the end of the firing-tube 8. In other words, the head 9 is provided with an interior circumferential rib or shoulder 10, which is of slightly less diameter than abutting firing-tube 8. Such attachment or head allows easy entrance of the shot and shaves or reduces them to uniform size without perceptible wear, so that it outlasts the other parts, whereas in the former invention the firing-tube was liable to become enlarged or flared at the rear end and thus fail to reduce and shape the shot properly, so that choking of the tube was the result, thus disabling the gun. It is to be also noted that the enlarged head 9 serves further as a means for securing the firing-tube 8 in the lock-frame 1 1^a, since it fits, Fig. 1, in a socket 11, Fig. 6, in the extension 3 of the lock-frame. The muzzle of the tube 8 fits in the central bore of a plug 12, secured in the front end of the magazine 2; but it does not require to be permanently fastened therein, so that the tube may be readily removed by taking the parts 1 1^a of the lock-frame apart.

In the former invention the guard-lever was connected by a link or arm with the air-compression cylinder, which was adapted to reciprocate as a necessity or result of the functions of other parts.

In the present invention the cylinder 4 is held stationary in the frame, besides requiring to be made of but about half the length of the former one, whereby cost, weight, and friction are obviously reduced.

A soft-metal piston 5 is cast in the hard-metal tubular head 5', Fig. 5, and with said head 5' is connected the tube 15, which performs the double function of pushing shot through the reducing-head 9 into the firing-tube 8 and of conducting an air jet or blast into the latter from the cylinder 4, wherein it is compressed by the piston 5. The said tube 15 is screwed into a threaded bore or socket in the enlarged head 5', and the piston-rod 6 screws into a larger, aligned, and threaded bore or socket in the rear end of said head. The latter has air-passages 16 leading inward from its front end to the air-jet tube 15. In casting the piston proper on such head 5' the metal is prevented from flowing into or closing such passages by plugs of suitable construction.

It will be seen that if the piston 5 be retracted the vacuum that would be otherwise formed in the cylinder 4 is supplied by air entering the front end of the jet-tube 15 and passing thence through the side passages 16 in the head 5', as shown by arrows in Fig. 5. The tube 15 fits closely in and slides through the plug 17, forming the front end of the cylinder 4, which is open at the rear end. Hence, as will be seen, when the piston 5 is pushed forward the air drawn into the cylinder 4, as before described, is forced back through the passages 16 in the head 5' and into the tube 15 and is discharged as a jet or blast from the front end of the latter. At the moment such forward movement of the piston 5 begins the front end of the tube 15 comes in contact with a shot, which upon elevating the gun had passed from the magazine 2 back along the groove 18 in the lock-frame extension 3 and lodged in the pocket 19 just in rear of the flaring mouth or entrance of the head 9 of the firing-tube 8. Then, the forward movement of the piston 5 continuing, the air-jet tube 15 forces such shot through the head 9 into the firing-tube proper, and a strong air jet or blast being simultaneously delivered from the tube 15 the shot is ejected from the firing-tube 8 with the desired velocity. While the shot is being thus pushed into and through the head 9, the contracted portion of the latter reduces it, if too large or irregular in shape, to the uniform diameter required to enable it to properly fit the firing-tube.

Another improvement consists in the connection between the guard-lever 7 and piston-rod 6. In the former invention a stirrup-like device was employed for this purpose and it was screwed onto the piston-rod, which construction and connection were for several reasons objectionable. We employ a link 20, Fig. 8, which is a single plate or bar having a lateral apertured head 21 to receive the piston-rod 6 and admit of vertical oscillation as

the guard-lever 7 is operated. This device is held in place on the piston-rod 6 by means of a headed pin that passes through the rod and is upset at the point. The rear end of the link 20 is apertured to receive a lug on the guard-lever 7, which lug is upset or riveted down and serves as a pivot-pin. The link 20 has thus a secure attachment to the piston-rod 6 and is also adapted to be cast in a mold, so that it may be produced at minimum cost.

The guard-lever 7 is pivoted on one of the screws 22, which hold the two parts 1^a of the lock-frame together, and is cast with a hook or curved lug 23 to provide for easy attachment of a spiral or helical retracting-spring 24. The front end of said spring is similarly attached to a wrought-metal or other flexible pin 25, which is suitably placed in the mold in the process of casting the lock-frame and subsequently bent as required. It will be noted, Fig. 9, that the said pin 25 has a notched head to enable it to be held firmly in the thin lock-frame, which has a boss at the point of attachment of the pin to afford due support for the latter.

The solid and conical rear end of the piston-rod 6 is guided in a tapered passage 26, formed of longitudinal projections of one side of the lock-frame (see Figs. 1 and 7)—that is to say, one of the two parts of the frame is cast interiorly with a thickened portion which is suitably grooved to form such tapered passage 26. It may be remarked that it is unnecessary to groove the opposite portion of the lock-frame, since the guard-lever 7 holds the piston-rod 6 pressed laterally into the passage 26. The conical end of the piston-rod first enters the flared end of such passage 26 and is guided thereby to the narrower rear portion and into sure engagement with the sear 27. This construction is advantageous in respect to an improved operation of parts as well as greater economy in manufacture.

It will be noted that a simple cross slot or notch 28 in the piston-rod 6 provides for engagement with the sear 27, which slides freely in contact with the lugs 29, cast on the lock-frame part 1^a. The trigger 30 is now pivoted on one of the screws 31, that holds the lock-frame parts 1^a together instead of on a separate screw, as before, and it is also constructed with but one hooked lug 32 instead of two. Said lug 32 enters and bears upon the spiral spring 33, which holds the trigger 30 in normal position, and the sear 27 is also loosely attached to the same lug 32.

We have likewise simplified and otherwise improved the construction and reduced the cost of the gun as respects supplying the magazine 2 with shot and confining the latter therein; also, in feeding them to the firing-tube 8. We employ no lugs in the groove or passage 18 in the lock-frame extension 3, but it is unobstructed, and the hole 34 in the magazine 2, through which shot are fed forward

into the latter or directly to the pocket 19 at the entrance of the firing-tube 8, is closed by a longitudinally-slidable sleeve 35 instead of a rotatable one; also, its movement is limited by the screw 36, that secures the magazine 2 to the lock-frame extension 3. The same hole 34 serves also for discharge of the lead shavings or parings removed from the shot in passing through the reducing head or crimper 9.

It will be seen, Fig. 6, that the part 1^a has a lateral perforated lug 37, that fits in a corresponding notch or socket 37' in part 1. The screw 36 is inserted in this lug 37, and the latter aids in preventing longitudinal movement of one part of the lock-frame on the other.

What we claim is—

1. In an air-gun, the combination with the magazine, having an apertured disk at its front end, and the lock-frame having a socket in its front extension, of the firing-tube having its front end held in said disk and provided with an enlarged head which fits in said socket, substantially as shown and described, for the purpose specified.

2. In an air-gun, the firing-tube having a head made of suitably-hardened material and constructed with a circumferential interior shoulder, or rib, which is of less diameter than the firing-tube, substantially as and for the purpose specified.

3. In an air-gun, the firing-tube having a hardened or steel head whose longitudinal passage is tapered as shown, there being an angular shoulder formed at the inner end of such passage, which shoulder abuts the firing-tube and is of less diameter than the latter, as and for the purpose specified.

4. In an air-gun, the combination with the magazine and firing-tube, having a head provided with a tapered passage as specified, of the air-jet tube, the piston attached to the latter, piston-rod, air-cylinder, and means for reciprocating the piston, as shown and described.

5. In an air-gun, the combination, with the air-jet tube and piston-rod, each threaded as specified, of the head for such tube, having aligned and threaded bores, and air-passages opening at the front as shown and described.

6. In an air-gun, the air-jet having an enlarged head provided with lateral passages opening on the front side and the soft-metal

piston proper cast on and around said head, as shown and described.

7. In an air-gun, the combination with the lock-frame, having the flexible hook as specified, the fixed air-compression cylinder, the piston sliding therein, the piston-rod, and link, of the pivoted guard-lever having a hook on its shorter arm, and the spiral spring attached to the hooks, as shown and described for the purpose specified.

8. In an air-gun, the combination with the lock-frame having a tapered guide-passage formed by opposing longitudinal projections on one side of said frame as specified, of the piston-rod having its rear end tapered, or conical, to adapt it to enter and be guided in said passage, as shown and described.

9. In an air-gun, the combination, with the piston-rod and sear, of the pivoted trigger having a curved lug or arm, which passes through said sear, and the spiral spring engaging said lug, as shown and described.

10. In an air-gun, the combination with the lock-frame made in two longitudinal parts, the piston-rod and sear, of the trigger, connected with said sear, and a screw which passes through the trigger and lock-frame and thus serves to pivot the one and secure the parts of the other together, as shown and described.

11. In an air-gun, the lock-frame formed of two longitudinal parts, one having a lateral apertured lug on its front extension, and the other extension having a corresponding recess to receive said lug, the magazine fitting on the cylindrical extension, and a screw passing through the magazine and lug, for securing the parts together, as shown and described.

12. In an air-gun, the combination with the lock-frame having a front extension, and apertured lug, the magazine fitting on said extension and having a shot-hole, a slidable sleeve on said magazine, and a round-headed screw passing through one of the holes in the magazine and entering the lug on the lock-frame, whereby it serves to unite the magazine and frame and also as a stop for the sleeve, as shown and described.

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THOMAS A. MONK.

Witnesses:

AMOS W. HART,
M. D. BLONDEL.