

March 10, 1953

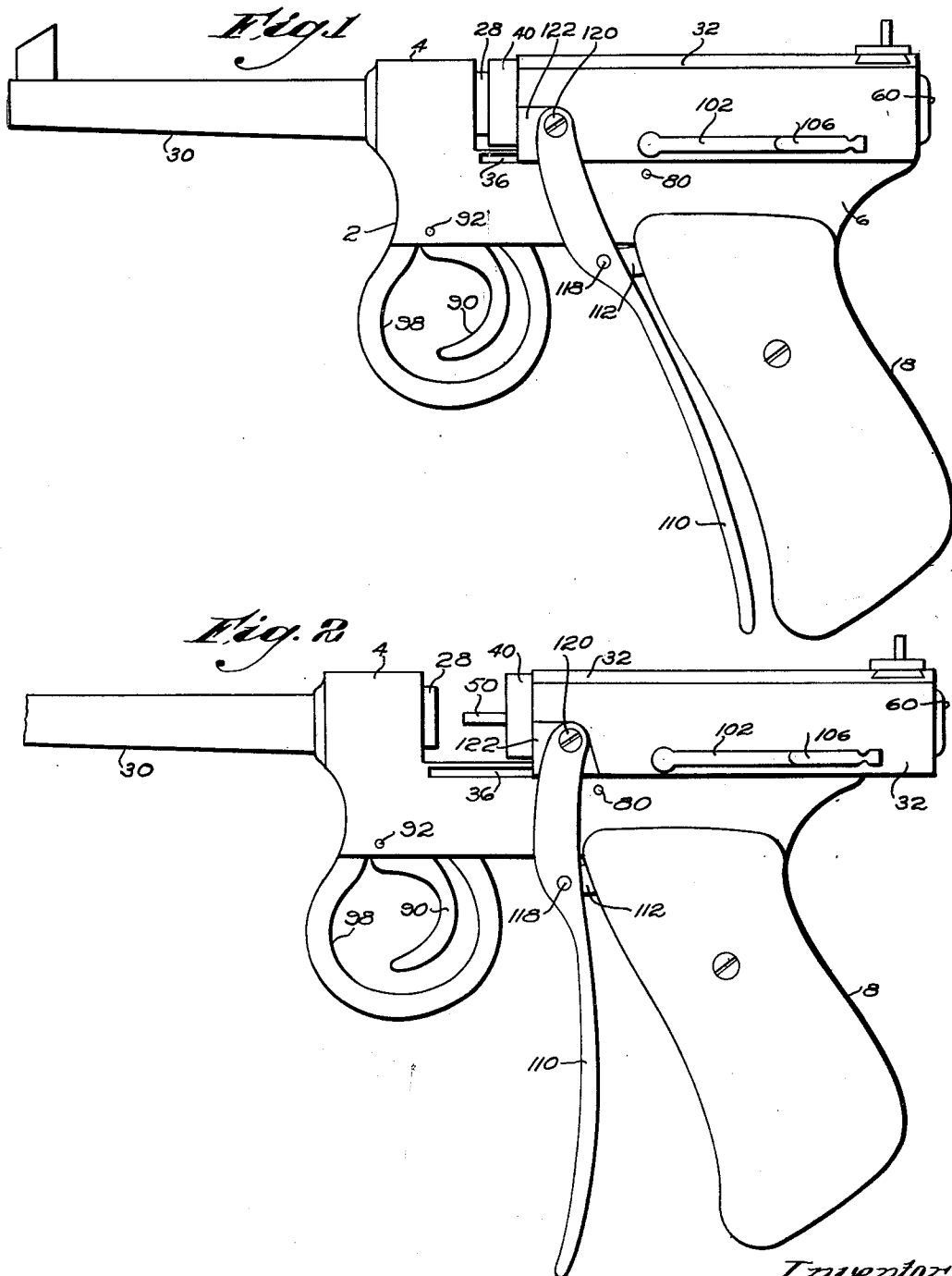
J. B. PETERS

2,630,795

AIR PISTOL

Filed Nov. 9, 1949

3 Sheets-Sheet 1



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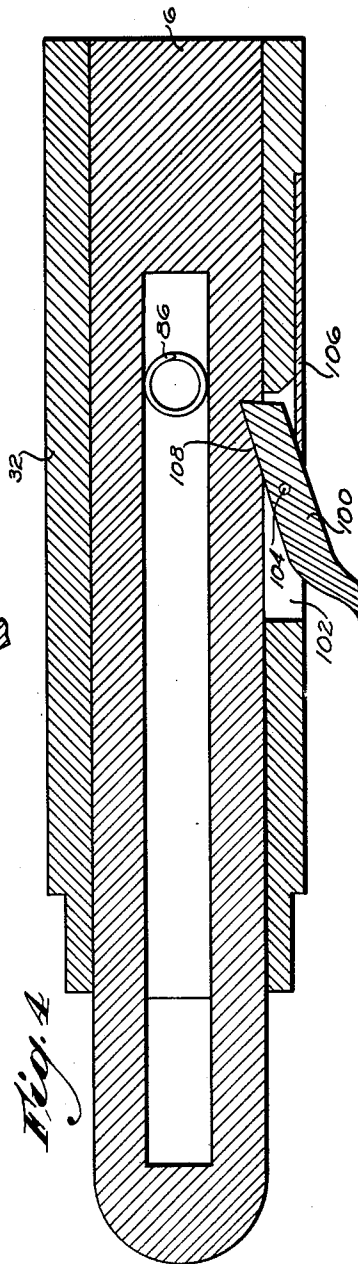
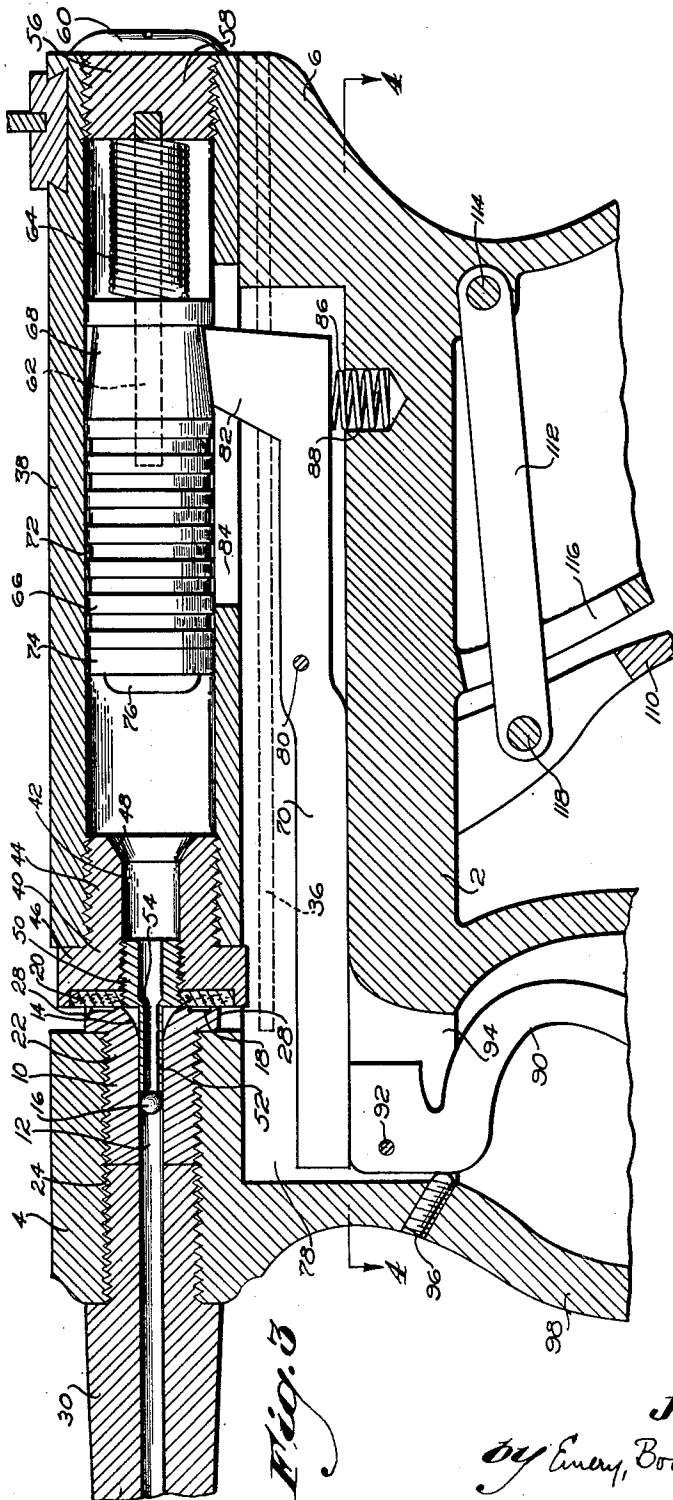
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3 Sheets-Sheet 2



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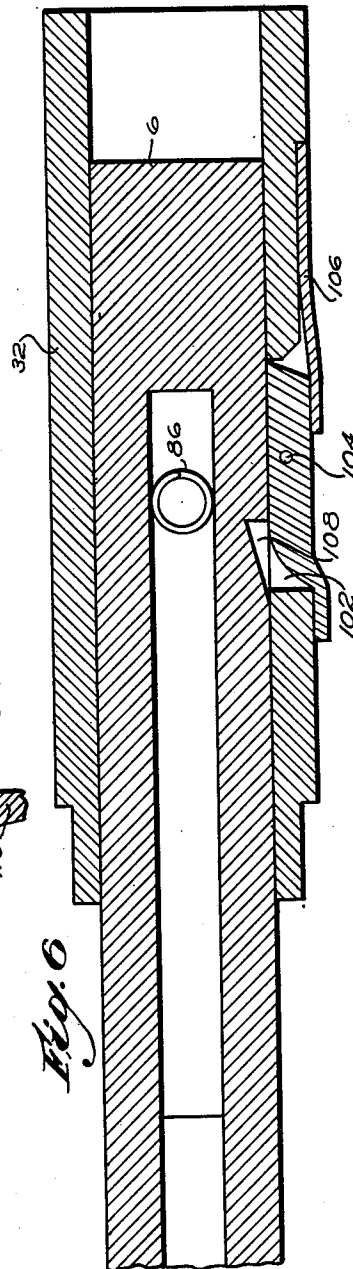
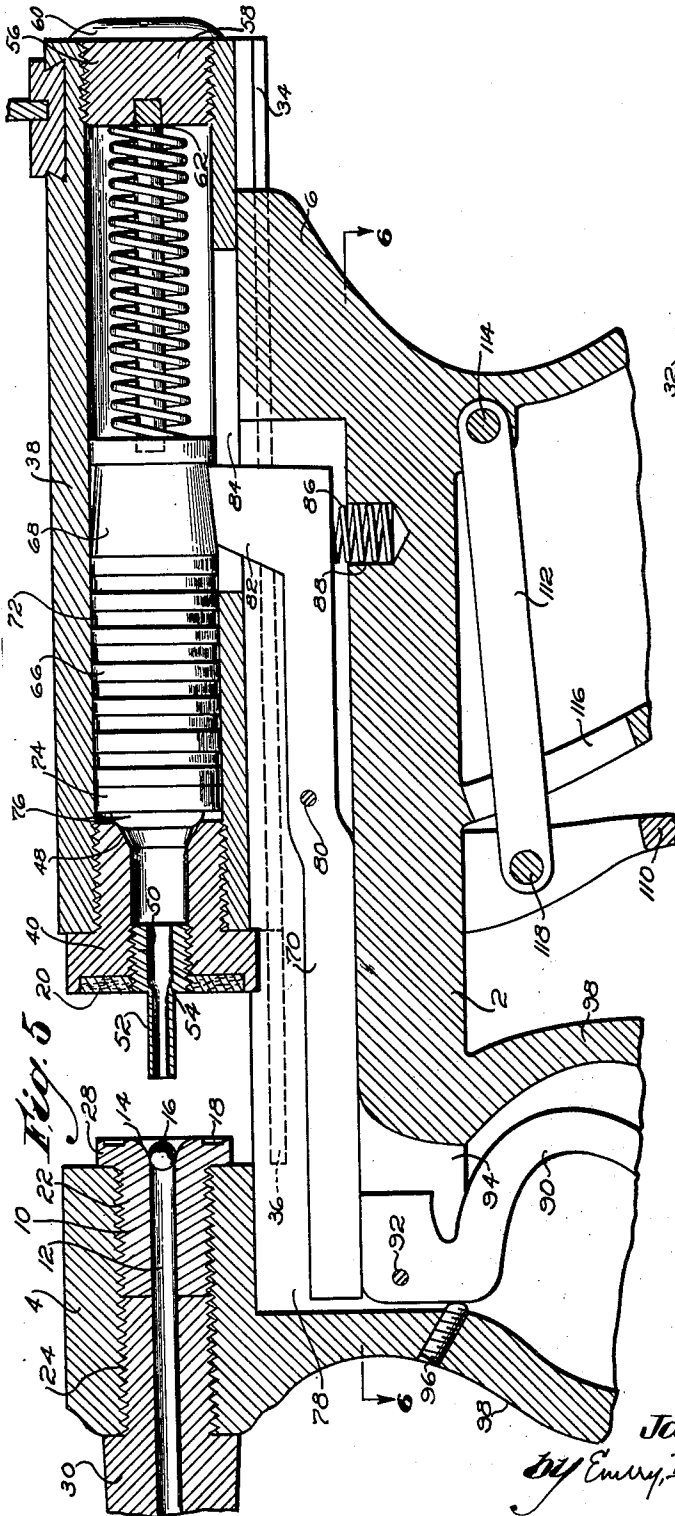
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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AIR PISTOL

James B. Peters, Lynn, Mass.

Application November 9, 1949, Serial No. 126,366

6 Claims. (Cl. 124—15)

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This invention relates to air guns of the class employing fluid pressure, such as air, in a self-contained spring-plunger actuated compression cylinder to discharge the projectile, and, more particularly, to the construction of a breech loading and firing mechanism for air guns. Since as a feature of the invention the "action" is largely independent of the barrel, stock, or grip, it is therefore adapted for use with rifles or pistols. The preferred application is, however, to a pistol, and it will be so described and disclosed hereinafter.

My invention has for its further object the provision of an air pistol which is extremely simple in construction and operation, inexpensive in manufacture, and durable in use. In size, proportioning and weight the air pistol of the invention may generally approximate that of standard pistols of various models, thus making it highly suitable for target practice without necessitating the expenditure of relatively costly powder-charged ammunition.

The invention will be more fully understood by reference to the following description taken in conjunction with the accompanying drawings, wherein like characters indicate like parts throughout the several views.

In the drawings:

Fig. 1 is a side elevation of the air pistol embodying the invention, with the slide in the forward or breech closing position;

Fig. 2 is a similar elevation of the gun, with the slide retracted as for loading;

Fig. 3 is a larger scale, vertical, longitudinal sectional view, with the slide forward and the piston cocked ready for firing;

Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view like that of Fig. 3, showing the slide in retracted position as in Fig. 2; and

Fig. 6 is a horizontal, sectional view on line 6—6 of Fig. 5.

The preferred embodiment of the invention comprises a main frame designated generally at 2 providing preferably integrally formed portions including a barrel-receiving chamber section 4, a slide supporting body 6 and a depending grip element 8. Removably fixed in the chamber section 4 is a breech piece 10 centrally and longitudinally apertured to form passage or bore 12 which has a tapering enlargement or throat 14 at its rear end, which throat receives a lead pellet 16, so dimensioned as to be deformed or sized when forced into bore 12. The end wall

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of the breech is provided with an annular groove 18 which cooperates with washer or gasket 20 of neoprene or other compressible material to seal the rear end of the breech 10. The latter as shown has a shank 22 which is threaded into a cylindrical recess 24 of the frame section 4 and is provided with an enlargement or head 28 abutting said frame section 4. The breech piece 10 may or may not be integral with the barrel 30 which is fixed on the frame with its bore in line with that of the breech piece.

An action slide 32 is mounted on the body 6 rearwardly of the breech by means of inwardly directed tongues 34 which engage in longitudinal grooves 36 formed in the upper side walls of the frame. The action slide 32 comprises a cylinder 38 which is provided at its forward end with a plug or head 40 constituting in effect a breech block. The head 40 has a configuration like that of the breech, being provided with an axial recess 42, an externally threaded shank 44, and an enlarged head portion 46. The bore 42 has a tapering enlargement 48 at its rear end and is threaded at its forward end to receive a tubular ram 50, the reduced elongated stem 52 of which is dimensioned to be slidably received in breech 10. The central passage in the ram 50 is stepped as at 54 and communicates with the cylinder 38 through the passage 42 in the cylinder head. The front end wall of plug 40 is annularly recessed to receive the above mentioned gasket 20, which surrounds ram 50.

Slidably received within the slide cylinder 38 is compression piston 66, which has near its rear face a rearwardly tapering annular cocking notch 68 for engagement by the sear 70, to be more fully described hereinafter. Annular grooves 72, located forward of notch 68, and resilient washer 74 fixed to the front end of the piston by means of a screw 76, serve to trap lubricant and seal the chamber forward of the piston against the escape of air past the piston. The screw 76 has an enlarged button head which is sized to fit wholly within enlargement 48 and permit washer 74 to seat on the rear face of the cylinder head and absorb much of the shock when the gun is fired.

The slide cylinder 38 is closed at its rear end by plug 56 which has a shank 58 which is threaded into the cylinder until its head 60 abuts the cylinder rear wall. Fixed to the forward face of the plug 56 is a guide post 62 on which is sleeved main spring 64 which engages the front face of plug 56 and the rear face of piston 66.

The above mentioned sear 70 lies in slot 78 in the frame and is pivoted on pin 80. It has a tapered nose 82 which is biased upwardly by spring 86, seated in recess 88, to project through slot 84 in slide 32 and engage in cocking notch 68. The front end of the sear overlies a trigger 90 which pivots on pin 92 in slot 94 in the frame. The upward pressure of spring 86 on the rear end of the sear rocks the trigger clockwise as viewed from the left, as in Fig. 3; this movement is adjustably limited for regulation of the degree of "squeeze" as by stop screw 96, threaded into the trigger guard 98 shown integral with the main frame. Action slide 32 carries a spring latch 100 mounted in a longitudinal slot 102, pivoted on a pin 104, and biased by leaf spring 106 to engage in notch 108 in the frame and prevent the rearward movement of the slide, as explained herein-after.

A cocking lever 110 is pivotally and movably mounted on the frame through link 112, which pivots on pin 114 through slot 116 and is secured to the lever by pivot pin 118. Lever 110 is pivotally connected to the slide by pins 120, the slide being recessed at 122 to receive the arms of the lever.

In operating the pistol, the compressible pellet is inserted by hand in the breech piece throat with the action slide in retracted, cocking position, as shown in Figs. 2 and 5, and then forced into the breech by ram 50 as the pistol is cocked. The cocking of the pistol is effected by manually compressing the cocking lever 110 against the pistol grip, which forces the slide 32 and ram 50 forward against the tension of spring 64, which is compressed between the rear plug 56, moving with the slide, and the piston 66, held fast by the sear 70. This ramming home of the pellet is an important feature of my invention, in that the compression of the pellet, which is initially somewhat larger than the pistol bore, serves to seal it in the breech. The improved seal of the pistol action involves, in addition to the deformation of the pellet, gasket 20 cooperating with groove 18, and piston 66. The parts are so proportioned that when the pistol is fully cocked the inner and outer annular ribs defined by groove 18 in the breech end wall are impressed on washer 20, effectively sealing the breech. It will be noted that the air pressure is built up only at the time of firing and the effect of the impact of the piston on the cylinder head will be to improve the seal.

When the forward movement of the slide has proceeded to the position illustrated in Fig. 3, with the breech fully sealed, and the pellet rammed home, its rearward movement, which is urged by spring 64, is prevented by the engagement of spring latch 100 with notch 108. The pistol is thus cocked and locked in firing position. Firing the pistol requires only such pressure on the trigger as will overcome the force of spring 86 and upset sear 70 from its engagement with the piston. The energy of main spring 64 is then released, and piston 66 is driven forward, compressing the air in cylinder 38 and forcing it through cylinder head 40 and ram 50, and producing a high velocity discharge of the ball. Spring latch 100 may now be released and the action slide retracted to loading position, as shown in Fig. 5, permitting the re-engagement of sear nose 82 in cocking notch 68 and the insertion of another shot in the breech.

It will be seen that I have provided an air gun of novel design requiring the minimum number

of parts, facilitating durable construction and simple operation, and wherein the novel sealing of the breech and barrel bore affords a discharge action of highest efficiency. While various features of the invention are applicable to air guns in general, it is particularly adapted to air pistols such as in the preferred embodiment illustrated. Further the invention makes possible the use of a relatively small bore, without resort to an air pumping action, and whereby a relatively small and correspondingly inexpensive pellet may be used. For example, in the form shown a preferred calibre is but .110 in., accommodating a No. 6 chilled shot as the appropriate pellet.

My invention is not limited to the particular embodiment thereof illustrated and described herein, and I set forth its scope in my following claims.

I claim:

1. In an air gun, in combination with a frame, a hollow cylindrical slide guided on the frame for movement between forward breech-closing and rearward open positions, an air compressor piston longitudinally movable in the slide cylinder, the latter having a closed rear wall, a compression spring bearing between the piston and said rear wall, a cocking lever pivoted on the frame below said slide and extending downwardly from said frame and engaging the slide to force it to forward position against compression of the spring, a latch on the slide engageable with the frame to hold it forward, a sear on the frame and engageable with the piston to hold it from forward movement with the slide and thereby to subject it to the force of the compressed spring, and a trigger arranged to trip the sear to permit the spring to drive the piston forward for compressing air ahead of it in the cylinder.

2. In an air gun, a frame, a slide longitudinally movably mounted on the frame and comprising a compressor cylinder, a wall member closing the rear end of the cylinder, an elongated piston slidably guided within the cylinder and having at its rear portion an axial recess and a spring-seating abutment, a coil spring bearing between the cylinder rear wall and said piston abutment, an axial guide post in and extending forwardly from the rear wall of the cylinder for guiding entrance at the piston recess and having the spring sleeved on it, a cocking notch in the piston for holding engagement by a sear tooth, the piston having a plurality of annular circumferential grooves adapted to retain a sealing and lubricating fluid and providing piston-guiding lands between them, a resilient buffer-like and circumferentially sealing washer at the front end of the piston, and a centrally apertured plug fixed in the forward end of the cylinder, the rear face of said plug formed with a buffing and sealing seat for the piston washer at the forwardmost point of the piston travel, whereby on spring-actuated forward movement of the piston air is compressed in the cylinder ahead of it and expelled through the apertured plug.

3. An air pistol having in combination a frame with a pendant hand grip and supporting a barrel and a breech piece and in line therewith an action slide, the latter comprising a hollow cylindrical body defining a piston chamber closed at the rear and having a head cooperative with the breech piece as a closure therefor, the breech piece having a loading throat tapering to the barrel bore for compressive reception of an over-size compressible pellet, a tubular ram projecting centrally from the slide head for entering the

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throat to ram a pellet therein into sealing conformity with the barrel bore, the ram and head having a longitudinal passage for compressed air from the piston chamber, a compressor piston reciprocable in said chamber, an action spring bearing between the piston and the rear wall of the chamber, means including a cocking lever pivoted on the frame for manual grasping and movement toward the pistol grip by the operator's hand clamping the latter whereby to advance the slide and ram so as to thrust home the pellet and to seal the breech, a latch to hold the slide in such forward breech-sealing position, and a trigger-releasable sear to hold back and cock the piston against compression of the action spring as the slide is advanced.

4. In an air gun, a frame, a slide longitudinally movable on the frame and comprising a compressor cylinder, a wall closing the rear end of the cylinder, an elongated piston slidably guided within the cylinder and having at its rear portion an axial recess and a spring seating abutment, a coil spring bearing between the cylinder rear wall and said piston abutment, an axial guide post in and extending forwardly from the rear wall of the cylinder for guiding entrance at the piston recess and having the spring sleeved on it, a link pivotally mounted at one end to said frame, having its other end located below said slide, a cocking lever pivotally mounted below said slide to the other end of said link, engaging the slide at its upper end and extending downwardly from said link and frame for forcing the slide from a rear to a forward position against the spring compression, a latch pivoted on the slide and biased to engage a notch in the frame to lock said slide in a forward position, a sear pivoted in the frame and having a tooth extending through a recess in the slide to engage and hold back the piston under forward spring-compressing movement of the slide by the cocking lever, and a trigger pivotally mounted on the frame and arranged to trip the sear.

5. In an air gun in combination with a frame, a hollow cylindrical slide having a rear wall guided on the frame for movement between forward

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breech-closing and rearward open positions, an air compressor piston longitudinally movable in the slide cylinder, a compression spring bearing between the piston and said rear wall, a cocking lever pivoted on the frame below said slide and extending downwardly from said frame and engaging the slide to force it forward against compression of the spring, a latch to hold the slide in such forward breech-closing position, and a trigger-releasable sear to hold back and cock the piston against the compression of the spring as the slide is advanced.

6. In an air gun, a frame, a slide longitudinally movable on the frame and comprising a compressor cylinder having a rear wall, an elongated piston slidably guided within the cylinder and having at its rear portion an axial recess and a spring seating abutment, a coil spring bearing between the cylinder rear wall and said piston abutment, an axial guide post in and extending forwardly from the rear wall of the cylinder for guiding entrance at the piston recess and having the spring sleeved on it, a cocking lever pivoted on the frame below said slide and extending downwardly from said frame and engaging the slide to force it forward against compression of the spring, a latch to hold the slide in forward position, and a trigger-releasable sear to hold back and cock the piston against compression of the spring as the slide is advanced.

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