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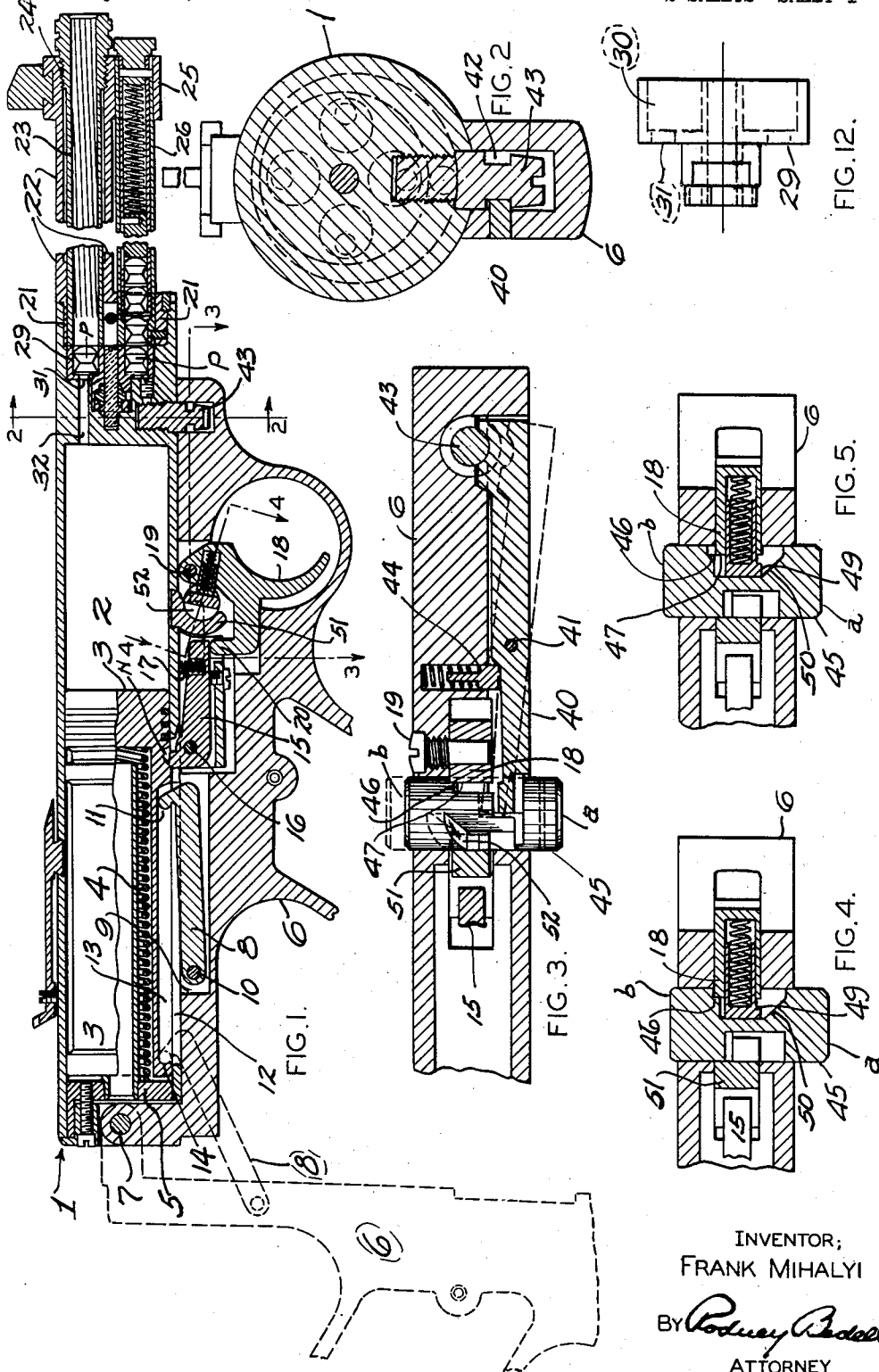
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2,572,176

AIR GUN AUTOMATIC SAFETY DEVICE

Filed April 18, 1945

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

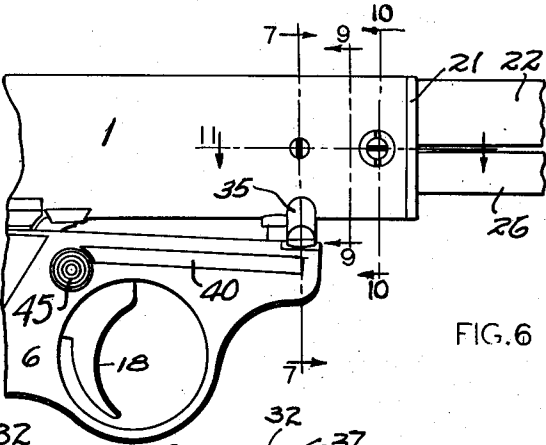


FIG. 6

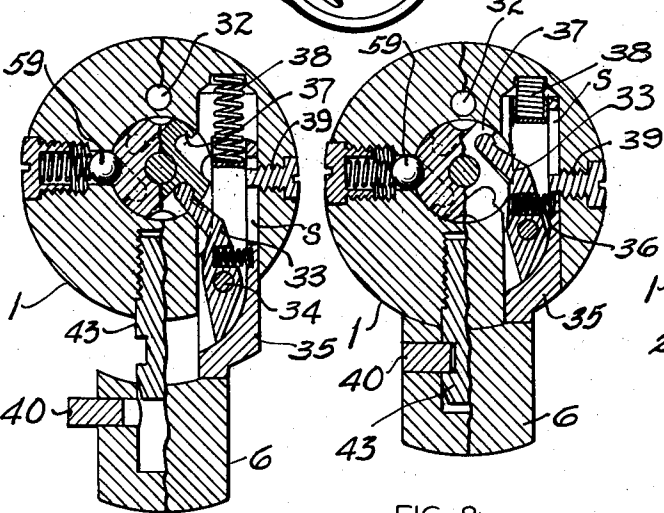


FIG. 7.

FIG. 8.

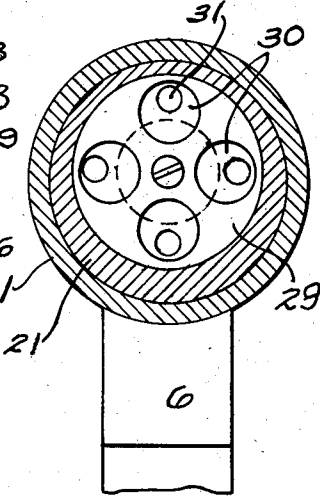


FIG. 9.

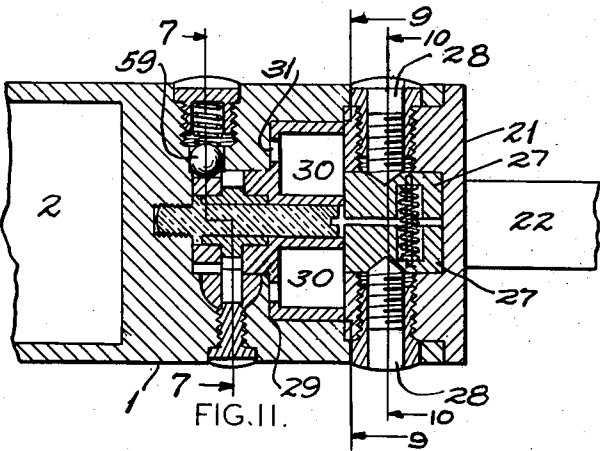


FIG. 11.

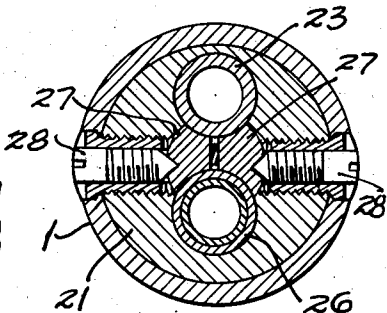


FIG. 10.

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AIR GUN AUTOMATIC SAFETY DEVICE

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5 Claims. (Cl. 124—15)

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The invention relates to fire arms and more particularly to fire arms in which pellets or other projectiles are discharged by air pressure. The invention consists in novel features facilitating the feeding and discharging of pellets and in safety devices associated with the cocking and discharging of the gun.

The gun is of the type in which a stock is pivoted on a barrel or head for cocking movement from a firing position to store up power for discharging a pellet when a trigger is pressed. One object of the invention is to provide for the automatic setting of a safety device whenever the gun is cocked.

Another object is to provide an automatic locking of the stock to the barrel or head following a cocking operation and before the gun can be discharged.

Another object is to control the trigger safety device and the stock and head locking device by the same element.

These and other detailed objects of the invention are attained by the structure illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section through a gun head and the stock and barrels assembled therewith, portions of the stock and barrels being broken away. The relative position of the stock when the gun is cocked is indicated in broken lines.

Figure 2 is a vertical transverse section on the line 2—2 of Figure 1.

Figure 3 is a horizontal section on the line 3—3 of Figure 1.

Figure 4 is a detail section inclined slightly from the horizontal and taken on the line 4—4 of Figure 1.

Figure 5 corresponds to Figure 4 but shows the parts in a different position.

Figure 6 is a side elevation of the forward end of the head and stock showing these parts in a position assumed during the return of these parts from a cocking operation and just prior to movement in which a pellet will be supplied to the firing chamber.

Figure 7 is a vertical transverse section taken on the line 7—7 of Figures 6 and 11.

Figure 8 is similar to Figure 7 but shows the parts in another position.

Figures 9 and 10 are vertical sections taken on the lines 9—9 and 10—10 respectively of Figures 6 and 11.

Figure 11 is a horizontal section taken on the line 11—11 of Figure 6.

Figure 12 is a side elevation of the transfer cylinder shown in vertical section in Figure 11.

The gun head 1 includes a cylinder 2 for compressing air and is fitted with a piston 3 and a strong coil spring 4 seated against the inner face of piston 3 and against the opposing rear end

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wall 5 of the cylinder. The gun stock 6 is pivoted to head 1 at 7. A link 8 is received in a slot 9 in the upper face of the stock and has one end pivoted at 10 to the stock. The other end of the link has a finger 11 which projects through a slot 12 in the lower portion of the cylinder and is slidable in a slot 13 in the lower portion of piston 3. When the gun is cocked, finger 11 engages the shoulder 14 at the rear end of slot 13 and moves the piston to the position shown in Figure 1, compressing spring 4. A sear 15 is pivoted at 16 to head 1, and a spring 17 thrusts the rear end of the sear into a notch N in the bottom of piston 3 when the latter is retracted to the position shown and retains the piston in retracted position until it is released from the sear by movement of trigger 18 pivoted at 19 to the stock. When the trigger is pressed, the upward projection 20 thereon will turn the sear on its pivot to release the piston and spring 4 will drive the piston forward, compressing the air in cylinder 2.

The head 1 has a cylindrical forward end into which is fitted a barrel mounting part, including a cylindrical base 21 with an integral, elongated sleeve 22 adapted to receive a detachable firing barrel 23. The outer ends of sleeve 22 and barrel 23 are threaded at 24 to maintain their assembly. A downward projection 25 on the forward end of sleeve 22 cooperates with base 21 to mount a detachable magazine barrel 26. Base 21 has vertically spaced, forwardly opening recesses for receiving the inner ends of barrels 23 and 26. Restricted portions of the barrel receiving recesses open towards each other and house wedge elements 27 (Figure 10) which are forced towards each other by set screws 28 to thrust barrel 23 upwardly and to thrust barrel 26 downwardly to firmly seat them against the top and bottom of their respective recesses.

With this arrangement, barrels 23 and 26 may be readily removed and replaced by loosening screws 28. If desired, barrels of different caliber may be interchanged, it being understood that the outer diameter of the interchanged barrels would remain the same so that the barrel centers would be maintained.

A cylinder 29 is rotatably mounted in head 1 at the inner ends of barrels 23, 26 and is provided with a plurality of chambers 30 adapted to be aligned successively with the two barrels as the cylinder is rotated about its axis. When one of the chambers 30 is in its lowermost position, it may receive a pellet P from magazine barrel 26, and when the chamber is in its uppermost position, it may present the pellet to the firing barrel. The inner end of each cylinder chamber 30 is apertured at 31 to provide for the passage therethrough of air compressed in

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cylinder 2 and discharged from the cylinder through a passage 32 when the gun is fired.

Cylinder 29 is yieldingly retained in a given position by a spring thrust ball 59 which engages a selected notch in the side of an extension on the cylinder. The cylinder is rotated automatically by a ratchet-like pawl 33 pivoted at 34 on a vertically movable slide 35 in head 1. A spring 36 thrusts the pawl to the left so that its toe engages the teeth-like elements 37 formed by lateral recesses in the cylinder extension. A spring 38 thrusts the slide downwardly to the extent permitted by a screw 39 in the head and having a point received in a slot S in the slide.

When the stock 6 is swung about its pivot 7 away from the head, slide 35 is moved downwardly to the extent permitted by pin 39 and pawl 33 rides over and below the next ratchet tooth to engage the same (Figure 7) so that when the stock is moved to the full line position shown in Figure 1 and slide 35 is moved upwardly, the pawl rotates cylinder 29 (Figure 8).

When the stock and head are moved to the relative position shown in full lines in Figure 1, they are automatically locked together by a lever 40 pivoted at 41 to swing horizontally in the stock and adapted, when in the full line position shown in Figure 3, to enter an annular recess 42 (Figure 2) in a stud 43 projecting downwardly from the head. A spring thrust plunger 44 yieldingly holds lever 40 in locking position. The lever may be moved from locking position to cock the gun by manually manipulating a pin 45 slidable transversely of the stock so as to project from one side of the stock, as shown in full lines in Figure 3, or to project from the other side of the stock, as shown in broken lines in Figure 3. Pin 45 is recessed to receive the left hand end of lever 40 and the recess is long enough to provide for some movement of pin 45 transversely of the stock without affecting lever 40, but when the pin is moved to the extreme position indicated by the broken lines in Figure 3, the lever is swung to the broken line position indicated, thus freeing the stock from stud 43 and permitting the cocking of the gun.

Pin 45 also constitutes part of a safety device best illustrated in Figures 4 and 5. The pin has a shoulder 46 which, when the pin is in the position shown in Figure 4, engages the rear edge 47 of the upper portion of trigger 18 and prevents retraction of the trigger. When the pin is moved to the position shown in Figure 5 (which is intermediate the full line and dotted line positions of the pin shown in Figure 3), shoulder 46 is disaligned from the trigger and the trigger may be retracted to swing sear 15 on its pivot and release piston 3 for discharge movement by its spring 4, thereby compressing the air in cylinder 2 and expelling the pellet P seated in chamber 30 at the rear of barrel 23.

The upper portion of the trigger is recessed to receive a spring thrust plunger 49 which bears against pin 45 and frictionally retains it in either position shown in Figures 4 and 5. The pin is readily moved from the position shown in Figure 4 to the position shown in Figure 5 by light pressure on one end a of the pin, thus releasing the safety stop, and if the gun is not fired, the pin may be returned to the position shown in Figure 4 by similar light pressure on the opposite end b, thus resetting the safety stop. To cock the gun, it is necessary to apply substantially heavier pressure to end a of the pin, forcing the plunger 49 to ride up the cam surface 50 in pin

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45, and as the pin moves to the broken line position shown in Figure 3, it engages the inner end of lever 40 and moves the outer end of the lever out of the groove in stud 43, permitting the stock to pivot on the head. If pressure on end a of pin 45 is removed at any time while plunger 49 is bearing against cam surface 50, the spring thrust plunger 44 will thrust the pin to the full line position shown in Figure 5.

When the stock and head are returned to the firing position, a projection 51 (Figure 1) on the head engages a cam face 52 (Figures 1 and 3) on pin 45 so as to move the pin to the broken line position shown in Figure 3 at which time plunger 49 rides to the top of cam surface 50 and when projection 51 passes the lower end of cam face 52 and releases pin 45, spring pressed plunger 49 thrusts pin 45 towards its original position so rapidly that a momentum results which snaps pin 45 to the position shown in Figure 4 so that pin shoulder 46 opposes trigger 18 and hence the lock is set each time the stock and head are returned from cocking position to firing position. At the same time, the outer end of lever 40 rides over the tapered lower portion of stud 43 and snaps into groove 42 to lock the stock and head together.

With this structure, a single element, pin 45, controls the lock for the stock and head and controls the safety stop for the firing trigger. The return of the stock and head from a cocking position to a firing position automatically presents a pellet to the firing barrel.

The structure show in the drawings and described herein is illustrative, and the details of the structure may be varied substantially without departing from the spirit of the invention and the exclusive use of those modifications coming within the scope of the claims is contemplated.

What is claimed is:

1. In a gun, a head part, including a discharge barrel and a retractable pressure actuated discharge element and a sear for holding said element in retracted position, a stock part, a trigger, pivoted thereto, a safety device slidable in the stock part transversely of the direction of the movement of the trigger, a portion of said device engaging said trigger to prevent its movement when the device is in one position in said stock part, said portion being spaced from the trigger when said device is in another position in said stock part, means frictionally retaining said safety device in either of said positions, a pivotal connection between said head part and stock part, about which said parts may be swung relative to each other, a link connecting said element to a portion of said stock part spaced from said connection to move said element and store energy therein when said parts are moved relative to each other about said connection and thereby cock the gun, said trigger and safety device being mounted on and movable with said stock part away from said sear when said head and stock parts are moved to cock the gun, and a projection on said head part, said device being in the path of movement of said projection when the parts are returned to firing position and moved thereby to trigger engaging position.

2. In a gun, a head part, including energy storing mechanism and a sear controlling the same, a stock part, including a trigger and a safety device checking the same, a link connecting a portion of said stock part to said mechanism, said stock part portion being movable away from said head part to gun cocking position to store

energy in said mechanism by movement thereof by said link, said stock part being movable towards said head part to firing position, said trigger being spaced from said sear when said parts are moved to gun cocking position and being brought into cooperative relation with said sear when the said parts are moved to firing position, said safety device being slidably mounted upon said stock part adjacent to said trigger and shiftable in said stock part from a position in which it engages said trigger to prevent trigger movement to a position in which it clears said trigger, there being an inclined cam face on said safety device, and an element on said head part moving against and then past said cam face when the head part and the stock part are returned to firing position to thrust said safety device in one direction to clear said trigger, said safety device having a surface inclined in the opposite direction from said cam face, and a spring plunger thrusting said safety device in the opposite direction to engage said trigger when said element moves past said cam face.

3. In a gun of the class described, a head part, including a discharge barrel and a pressure storing mechanism and a stock part having a pivotal connection to the head part about which the parts may be moved relative to each other, there being a mechanism actuating link connected to said mechanism and to said stock part at a point on the latter spaced from said pivotal connection, a lever pivoted on said stock part and disposed to engage said head part to lock said parts against relative movement, a sear on said head part normally holding said mechanism against discharge, a trigger pivoted on said stock part for moving said sear to release said mechanism, a device slidable on said stock part transversely of the direction of movement of said trigger with its ends accessible respectively from opposite sides of said stock part, said member movable in one direction by manual pressure to a position in which it engages said lever and moves it against said spring to disengage the head part, a spring plunger acting against said member when in said position to move it in the opposite direction, when manual pressure is released, to another position in which it opposes said trigger to hold the same against sear releasing movement, said member being movable manually in the last-mentioned direction to a third position out of opposition to said trigger.

4. In a gun of the class described, a stock part and a barrel part having a pivotal connection and movable relative about said connection to a firing position, in which said parts are alongside of each other, to a cocking position in which said parts are angularly disposed relative to each other, a member mounted on one of said parts and shiftable to a position engaging the other

part to lock the parts in firing position, discharge mechanism including a sear and a cooperating trigger, a pin slidable in one of said parts to three different positions, said pin in one position engaging a portion of the trigger to lock the same from the sear, in a second position disengaging said trigger, and in a third position moving said member to disengage same from one of said parts and unlock said parts from each other, and spring actuated means automatically returning said pin to the first-mentioned position when it is moved to said third position.

5. In a gun, a head part, including an energy storing mechanism and a sear normally holding the same against discharge of energy, and a stock part, including a trigger for releasing said mechanism from said sear, said parts being movable relative to each other to a cocking position and subsequently movable to a firing position, said energy storing mechanism being energized by the movement of said parts to the cocking position and the discharge trigger being brought into operating relation with said sear by movement of said parts to the firing position, a latch on one of said parts, a spring plunger thrusting the latch into a position engaging the other part and holding said parts together when they are in firing position, a member slidable manually on one of said parts to a position opposing the trigger to lock the same against release, and to another position to move the latch against the thrust of the spring plunger to disengage the latch from said other part, and spring means returning said member to said first-mentioned position whenever it is released from latch disengaging position.

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