

[54] **ADJUSTABLE HESITATION BLOW BACK OPERATED GUN LEVER MECHANISM**

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[52] U.S. Cl. **89/180, 89/187, 89/197, 89/199**

[51] Int. Cl. **F41d 11/06**

[58] Field of Search **89/180, 181, 184, 187 CB, 89/188, 189, 190, 194, 197, 198, 199**

[56] **References Cited**

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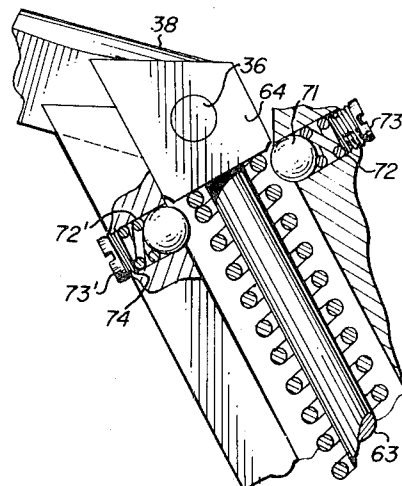
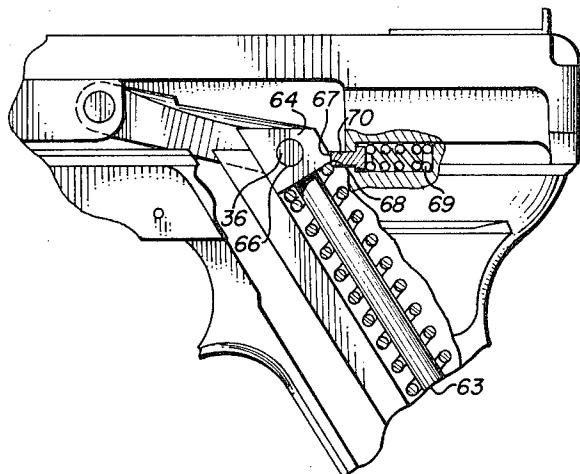
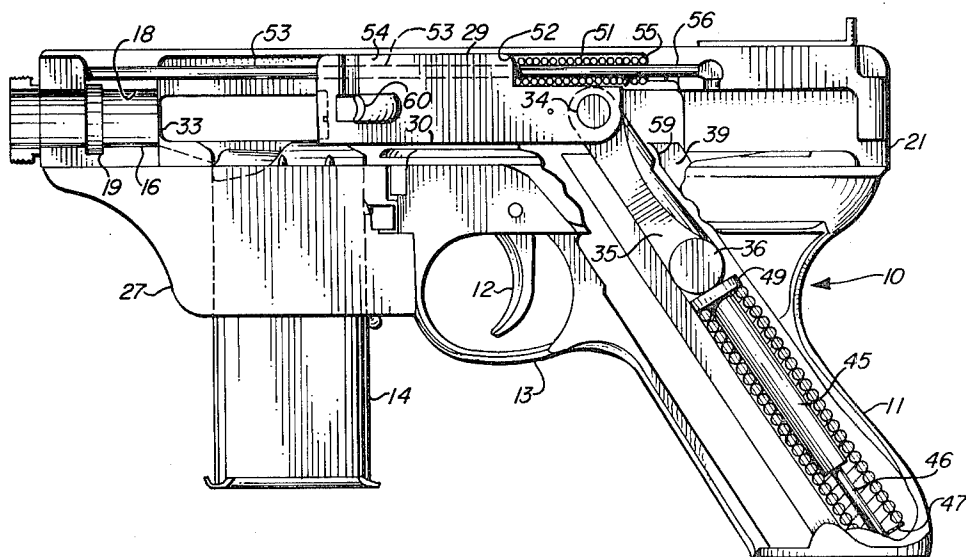
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[57] **ABSTRACT**

A bolt action pistol in which an associated lever provides a given hesitation before being tripped to recede into the handle of the pistol by the effects of gas pressure generated at the time of firing.

3 Claims, 11 Drawing Figures



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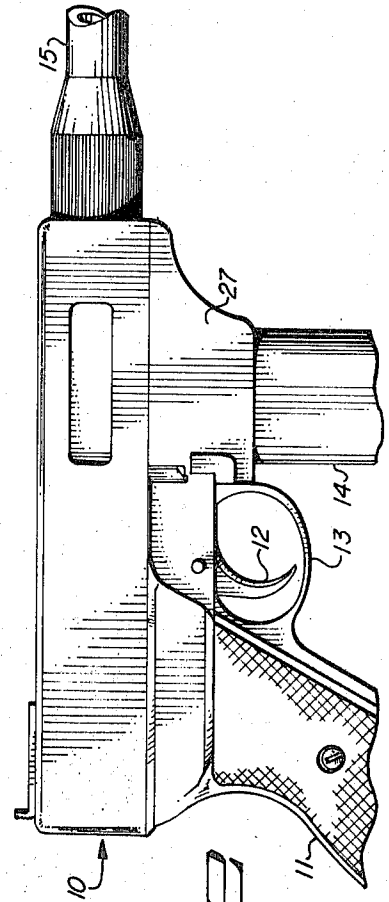
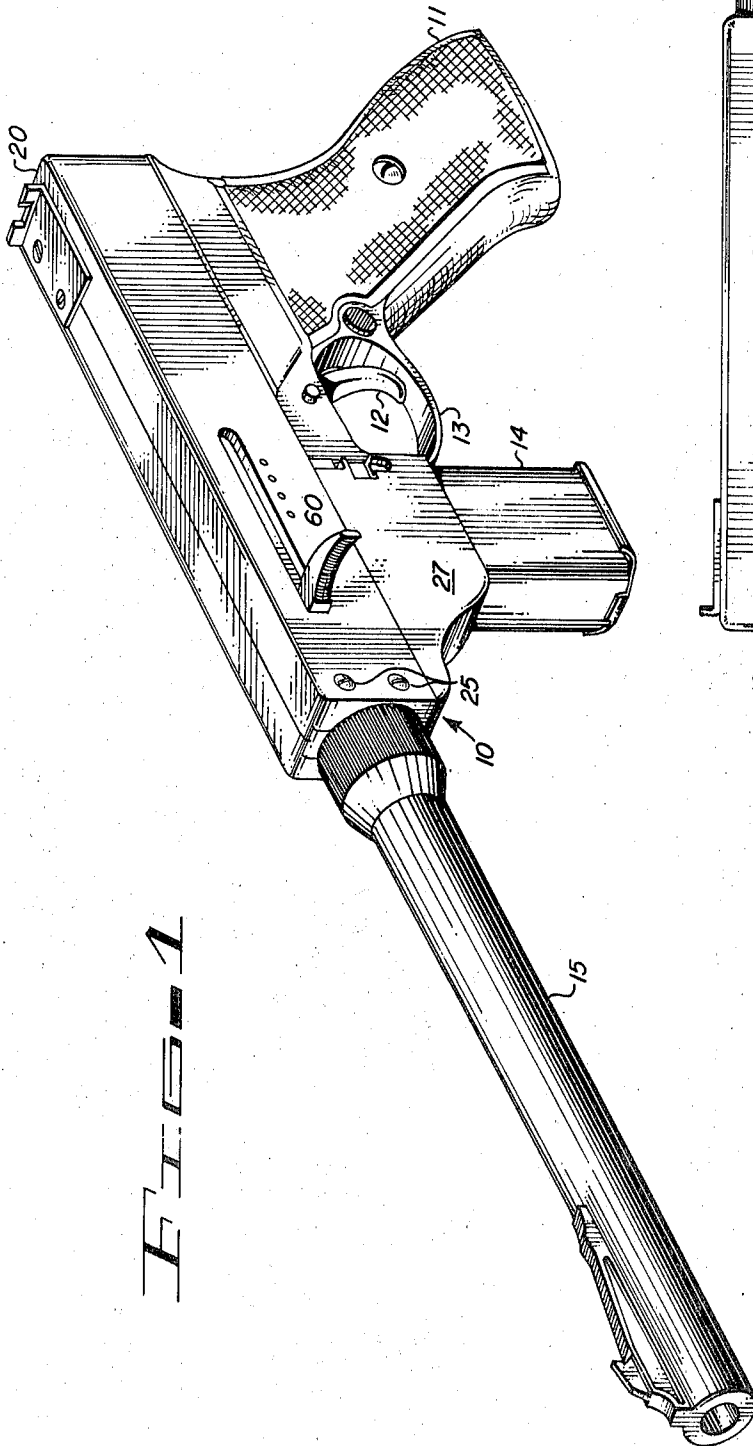


Fig. 1

Fig. 2

FIG. 3

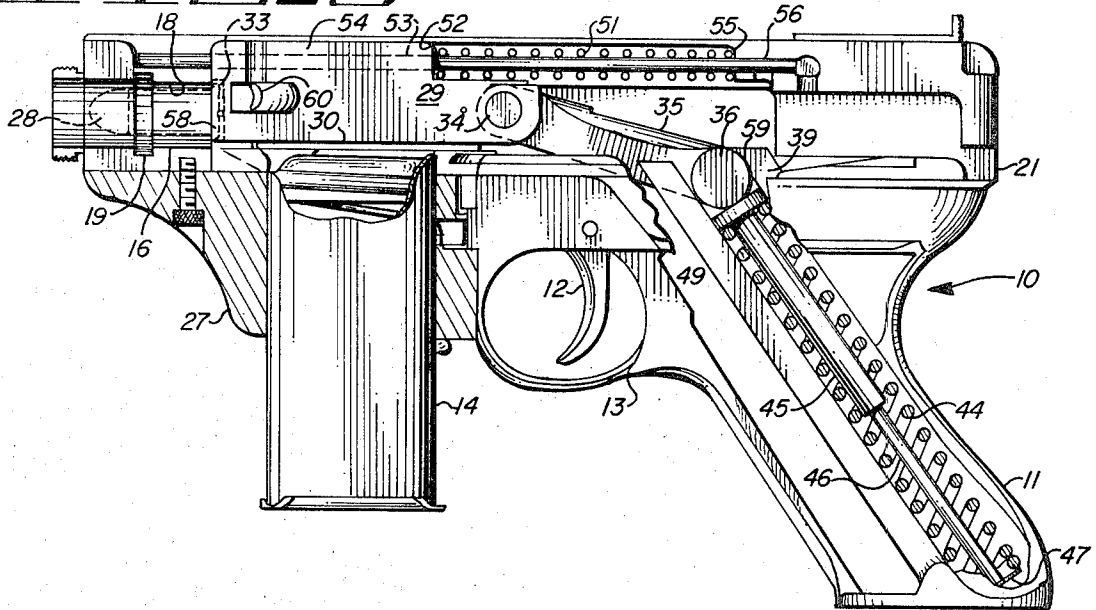


FIG. 4

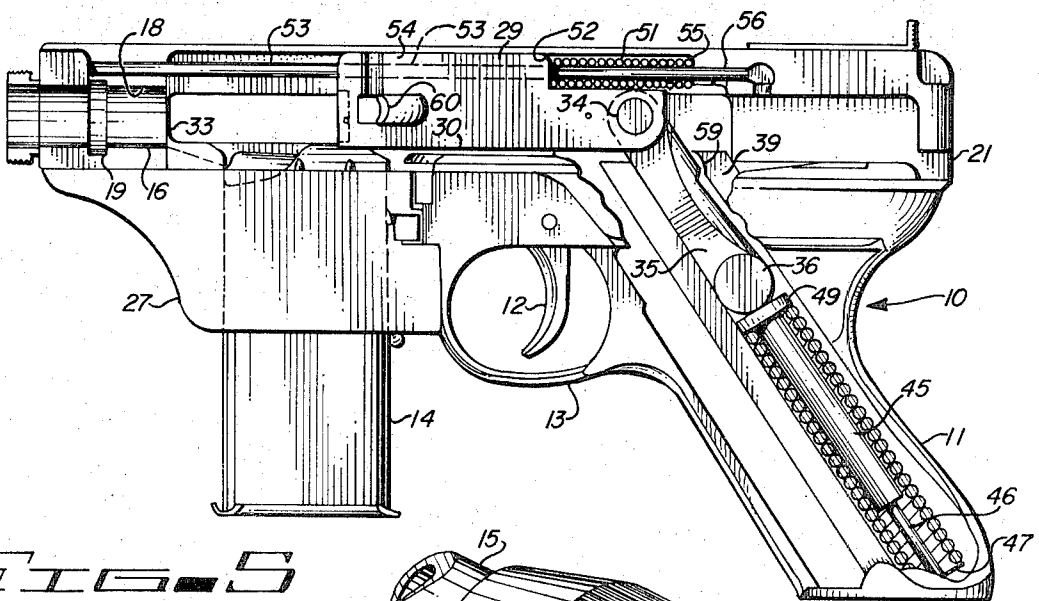


FIG. 5

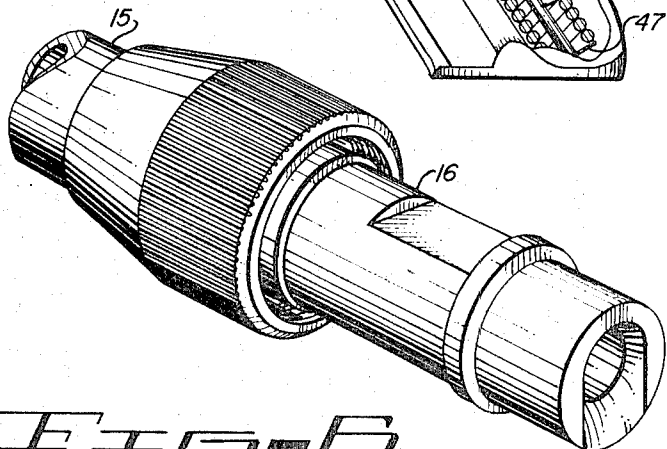
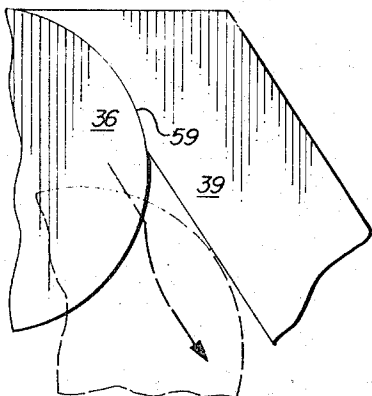


FIG. 6

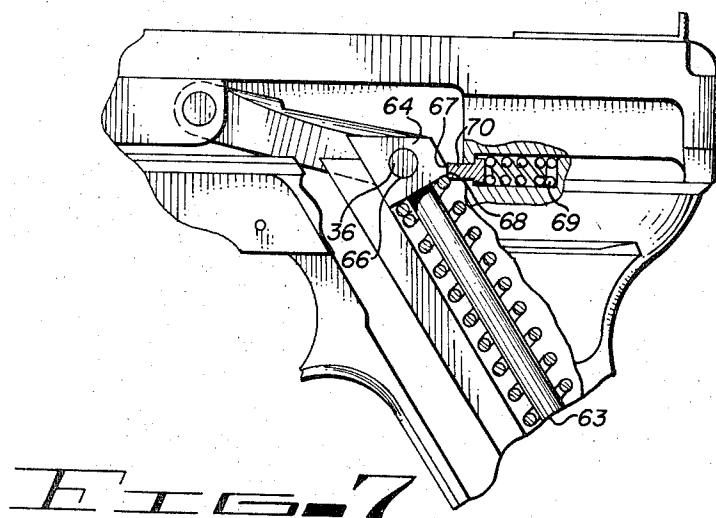


FIG. 7

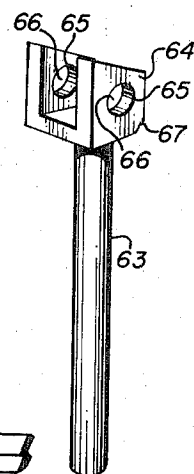


FIG. 8

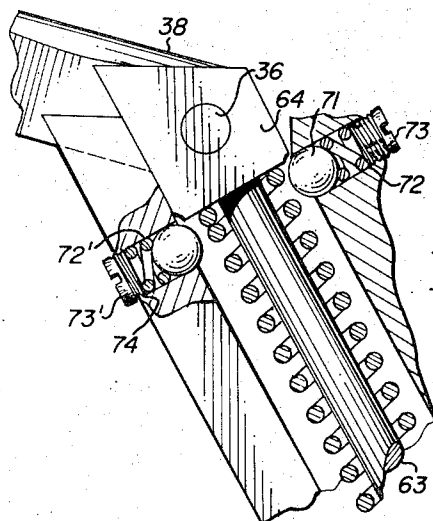


FIG. 9

FIG. 10

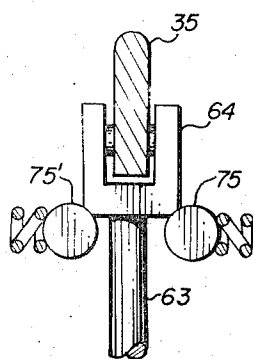
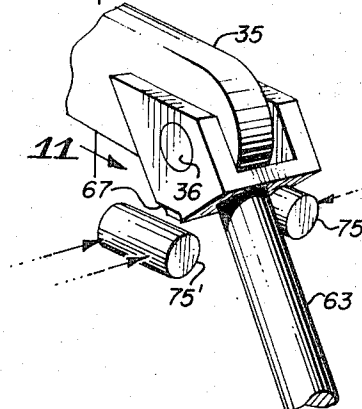


FIG. 11

ADJUSTABLE HESITATION BLOW BACK OPERATED GUN LEVER MECHANISM

BACKGROUND OF THE INVENTION

This invention pertains to bolt action weapons and is particularly directed to means for causing the bolt to hesitate before an associated lever or link is caused to recede into the handle of the pistol by gas pressure generated at the time of firing.

FIELD OF THE INVENTION

This invention is particularly directed to bolt action weapons such as pistols which heretofore were held by numerous techniques in a closed position until such time as the chamber gas pressure dropped to a safe level for opening the breech of the gun.

DESCRIPTION OF THE PRIOR ART

Heretofore the majority of all bolt action weapons of this class have been recoil operated and were limited to the use of small, low energy pistol ammunition.

In accordance with the invention claimed, a new and improved bolt action weapon is provided which utilizes the gun barrel pressure directly to drive a lever holding the bolt in its locked position to a tripped position within the handle of the weapon. At the time this happens the bullet has left the barrel of the weapon and the residual pressure in the weapon after a predetermined hesitation caused the lever to move to its fully retracted position in the handle of the weapon. Recoil springs in the gun return the lever and bolt to a locked position.

SUMMARY OF THE INVENTION

It is, therefore, one object of this invention to provide an improved weapon in which gas pressure generated in a gun barrel is utilized directly to actuate a lever holding the bolt of the weapon in a locked position to a released, retracted position.

Another object of this invention is to provide an improved weapon having a predetermined hesitation before the bolt controlling lever is caused to recede to a retracted position.

A further object of this invention is to provide a weapon with a bolt lever design such that there is only one point of contact in the moving parts going rearward and one point of contact in the moving parts returning to their original position so as to make the operation of the gun completely silent.

A still further object of this invention is to provide a lever for controlling the movement of a bolt in a weapon that employs a predetermined hesitation before being tripped from a locked position that is dynamically balanced so as to accomplish a smooth, consistent, and continuous pressure throughout the movement of the bolt after tripping, in which the line of force from the moving parts is directed to the palm of the hand, thereby virtually eliminating all noticeable recoil.

Further objects and advantages of the invention will become apparent as the following description proceeds and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

BRIEF DESCRIPTION OF THE DRAWING

The present invention may be more readily described by reference to the accompanying drawings, in which:

FIG. 1 is a left hand side elevational view of a gas operated bolt action weapon incorporating the features of this invention;

FIG. 2 is a partial right side view of FIG. 1;

FIG. 3 is an enlarged fragmentary vertical sectional view of FIG. 1 showing the lever controlling the bolt in a partially retracted position;

FIG. 4 is a view similar to FIG. 3 of the weapon shown in FIG. 1 with the lever in a fully retracted position;

FIG. 5 is an enlarged fragmentary view of the right end of the lever shown in FIG. 3 and illustrating in dash lines a further position of that end of the lever;

FIG. 6 is an enlarged fragmentary perspective view of the interlocking gun barrel and frame mechanism;

FIG. 7 is an enlarged fragmentary view of a modification of the connection of the lever to the spring biasing means for said lever mounted in the handle of the weapon and one embodiment of a hesitation means;

FIG. 8 is a perspective view of the push rod of the spring biasing means shown in FIG. 7;

FIG. 9 is an enlarged fragmentary cross-sectional view of a modification of the hesitation means for the bolt shown in FIG. 7;

FIG. 10 is an enlarged fragmentary perspective view of a further modification of the hesitation means for the bolt shown in FIGS. 7 and 9; and

FIG. 11 is a cross-sectional view of FIG. 10 taken on the line 11—11.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1-6 illustrate an example of one embodiment of this invention. For more details of the general configuration of the gun, reference is made to U.S. Pats. No. 3,630,119 and No. 3,709,091 by the same inventor of this application. More particularly, FIGS. 1-4 illustrate a pistol having a frame 10, a handle 11, a trigger 12 with trigger guard 13, and a bullet magazine 14. A demountable, adjustably positioned barrel 15 has a rear end diameter portion 16 which is received in the semi-circular bore 18 and groove 19 in the front end of the frame 10. An elongated clamp 20 is pivotally mounted on a suitable hinge 21 secured in the frame 10 so that clamp 20 can swing away from the frame as shown in more detail in the above patents. The outer end of clamp 20 is provided with a mating semi-circular bore and groove to match bore 18 and groove 19 to grip the diameter portion 16 to secure the gun barrel 15 in firing position on frame 10. The clamp is secured in closed position by suitable screws 25 in frame 10.

The bullet magazine 14 is demountably secured by the usual releasable latch in guide sleeve 27 of the frame 10 to feed the bullets 28 into insertion and firing position by the usual bolt 29 which moves on the guide keys 30 in appropriate guide slots in frame 10 and clamp 20 longitudinally of breech opening 33 of the rear end of the barrel 15, as more clearly shown in the above patents. The rear end of bolt 29 is pivotally connected by a pivot pin 34 carried in the front end of link or lever 35, the rear end of which is pivotally mounted on a push rod 45.

Normally, when bullet 28 has been loaded in the barrel in firing position, lever 35 with a roller 36 pivotally mounted at one end thereof is positioned up against an abutment means 39 mounted in frame 10. At this time the axis of pin 36 is positioned below the longitudinal axis of bolt 29. A compression spring 44 is carried on push rod 45 and is slidingly supported on a support rod 46 in handle 11. The compression spring 44 operates between a baffle 47 at one end of the handle, as shown, and a flange 49 of the push rod 45 to normally yieldingly hold lever 35 against adjustment means 39 in firing position of the gun.

Lever 35 is tripped from bolt locked position shown in FIG. 1 to fully retracted position in handle 11 by gas pressure from the gun barrel when the gun is fired.

As shown in the drawings, a compression spring 51 is arranged between a shoulder 52 formed around a bore 53 defined in a protruding lug 54 of bolt 29 and a ridge 55 formed around a bore 56 defined by frame 10 and clamp 20. Lug 54 is shown as being integral with bolt 29.

At the time bullet 28 is fired and leaves the barrel 15 and is on its way to its target, residual pressure existing in chamber 58 will drive bolt 29 backward with sufficient force to complete the travel of lever 35 sufficiently to move the pivot pin 36 and lever 35 to force them to complete their downward travel along an arcuate path 59 formed on the abutment means 39 to their lowest point down inside the handle 11 of the gun against the bias of compressing spring 44.

The inertia of bolt 29 continues rearwardly, compressing the recoil compression spring 51. Bolt 29 and lever 35 are returned to their original positions by the stored-up energy in the two springs 44 and 51. This completes the firing cycle and prepares the gun for the second firing, having picked up an additional bullet 28 from the clip magazine and placed it in the chamber when the bolt returned to its original position by well known conventional mechanism.

In order to force lever 35 into the handle of the gun to load the first bullet into the gun, a manual lever 60 is provided on the gun which, when moved longitudinally of the axis of the gun by the operator against the action of spring 51, causes lever 35 to move into the handle of the gun far enough to allow the operator to move bolt 29 back sufficiently to allow a bullet 28 from the clip magazine 14 to enter the chamber of the gun for the first firing action.

In accordance with the invention claimed, an adjustment locating means is provided for lever 35 which makes it possible to hold the lever 35 in a given position and to hold that position until gas pressure from the firing of the gun of a predetermined value causes the lever to recede into the handle of the gun. In order to provide a desired hesitation in the receding of the lever into the handle of the gun the abutment means 39 and more particularly its arcuate path 59 is provided. The friction of the roller 36 of lever 35 rolling under pressure laterally of and along the arcuate path 59 delays and retards the initial movement of lever 35 into handle 11. When the lever is returning to its position shown in FIG. 3 from its broken position in handle 11, the biasing of spring 44 will be enough to overcome the resistance of the abutment means 39. It should be noted from FIG. 5 that the arcuate path 59 forms a pocket for holding roller 36 of lever 35 when in bolt extended position, and that the extra force needed to move out of the

pocket over that merely necessary to roll over and along arcuate path 39 provides the necessary hesitation of the bolt and lever during a gun firing operation.

As shown in FIGS. 7-11 of the drawings, the end of the push rod 45 and the abutment means 39 of the gun frame 10 may be modified for variations in manufacture. In FIGS. 7 and 8, the piston rod 63 is shown as comprising a clevis 64 at one end which is provided with bearing surfaces 65 in apertures 66 in the legs of its U-shaped end. The apertures are adapted to receive in a pivotal manner pin 36 mounted at the end of lever 35.

The edge of the U-shaped end of clevis 64 may be formed to provide a concave surface or pocket 67 which is adapted to receive the end 68 of an abutment means 69. Abutment means 69, as shown in FIG. 7, comprises a spring biased plunger 70, the end of which is biased into the pocket 67 for providing a delaying force to the initial movement of lever 35 into the handle of the gun during a gun firing operation.

As shown in FIG. 9, the plunger 70 may be replaced by a spring biased ball 71 which cooperates with a similar abutment means directly opposite thereto on the other side of the clevis to aid in retarding the movement of lever 35 into the handle of the gun. As shown, the tension on the springs 72, 72' biasing balls 71, 71' may be adjusted by set screws 73, 73' threadedly mounted to move into or out of bores 74, 74' in frame 11 housing springs 72, 72'.

FIGS. 10 and 11 illustrate a further modification of the lever retarding means shown in FIGS. 7-9 wherein the plunger 70 of FIG. 7 and the balls 71, 71' of FIG. 9 are replaced with rollers 75, 75' spring biased into the pockets 67 formed in the clevis of piston rod 63.

Although but a few embodiments of the present invention have been shown and claimed, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

What is claimed is:

1. A bolt action weapon comprising:

- a frame,
- a handle on said frame,
- a hollow barrel having a firing chamber,
- a bolt movable in said frame axially to and from the firing chamber of said barrel,
- a link connected at one end to said bolt,
- a compression element provided within said handle and interconnected between said frame and the other end of said link to normally yieldingly urge said link to upward bolt locked position,
- and guiding means for directing said other end of said link into said handle during a firing of said weapon, said other end of said link comprising an arcuate surface,
- said guiding means comprising an arcuate surface for engaging said arcuate surface of said other end of said link only when said bolt is in the firing chamber of said bore,
- one of the arcuate surfaces of said link and said guiding means being rotatably mounted,
- said other end of said link comprises a roller for moving over said arcuate surface of said guiding means during the initial movement only of the link into the handle of the weapon.

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2. The bolt action weapon set forth in claim 1 wherein:

said compression element comprises a piston rod slidably mounted in said handle, and a spring for biasing said rod into engagement with said link, said rod being pivotally connected to the other end of said link.

3. The bolt action weapon set forth in claim 1 in fur-

ther combination with:

spring means connected to said guiding means for controlling the pressure of its arcuate surface against the arcuate surface of the other end of said link for controlling the hesitation of the movement of said link into the handle of said weapon.

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