United States Patent [19]

Martial

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[54] **COCKING AND EJECTION MECHANISM FOR FIREARMS**

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[52] **U.S. Cl.** **42/48**

[51] **Int. Cl.** **F41c 15/06**

[58] **Field of Search** 42/48, 47, 43

[56] **References Cited**

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Assistant Examiner—C. T. Jordan
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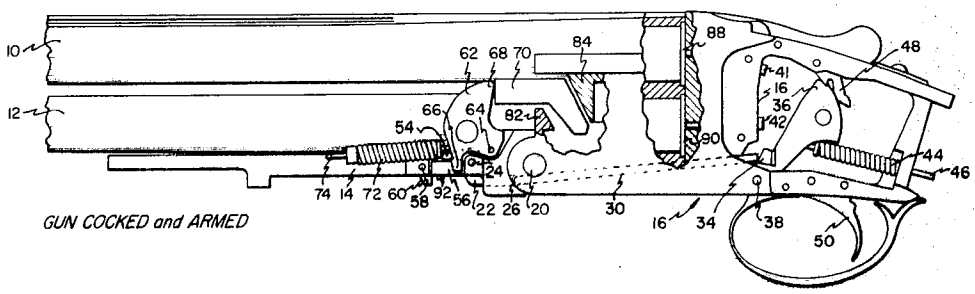
[57] **ABSTRACT**

A cocking and ejection mechanism for use on multi-barreled shotguns wherein the forearm bracket and the receiver are pivotally joined. The mechanism includes a spring-loaded percussion hammer held in a cocked position by a sear, both of which are pivotally mounted to the receiver. A spring biased cocking-ejecting rod capable of slidable axial movement is carried transversely within the receiver. One end of the rod is in pressured contact with the percussion hammer and the other end is contoured for mating with one end of a cocking lever that is pivotally mounted to the forearm bracket. A spring-loaded ejection hammer and a sear for holding this hammer in a cocked position are pivotally mounted to the forearm bracket. As the ejection hammer sear is displaced by the cocking lever through the slidable action of the cocking-ejecting rod, the ejection hammer is released striking a lug mounted to a mechanism for ejecting spent shells. With the above cocking and ejection mechanism, fewer precision parts and adjustments are required during its manufacture and assembly.

11 Claims, 4 Drawing Figures



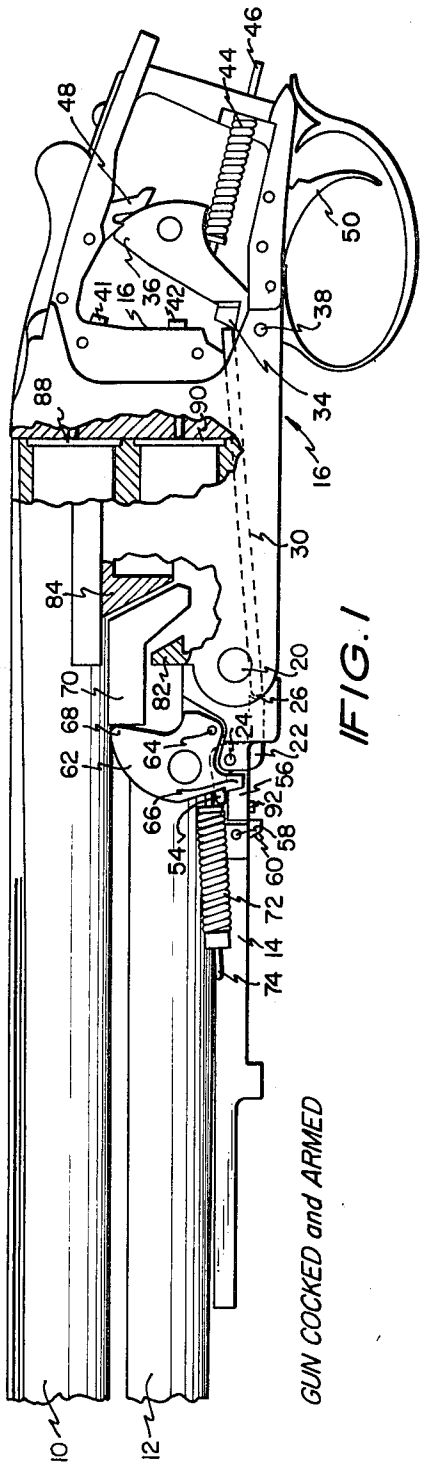


FIG. 1

GUN COCKED and ARMED

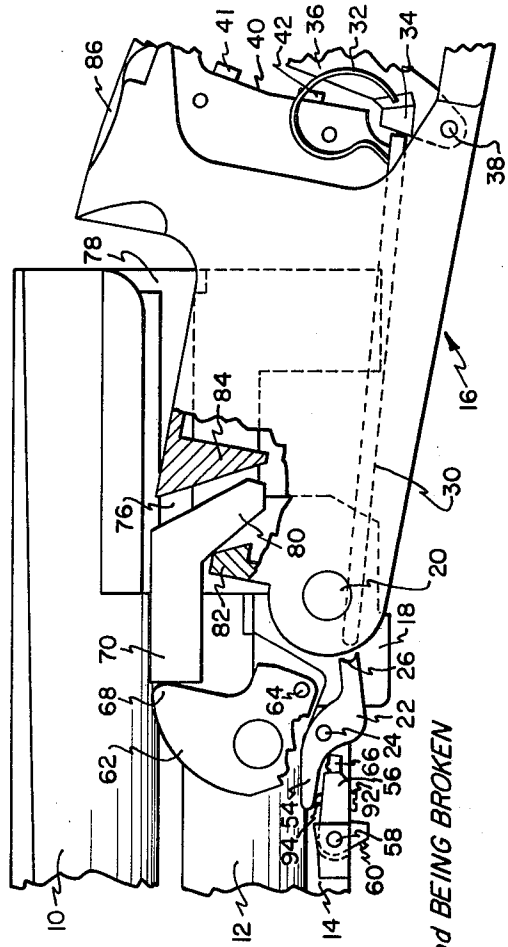
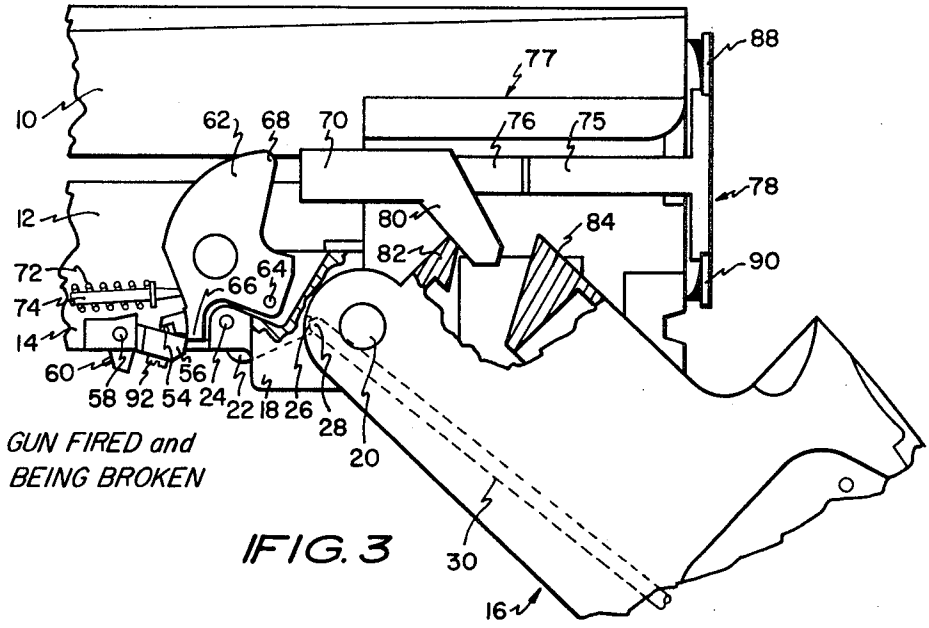


FIG. 2

GUN ARMED and BEING BROKEN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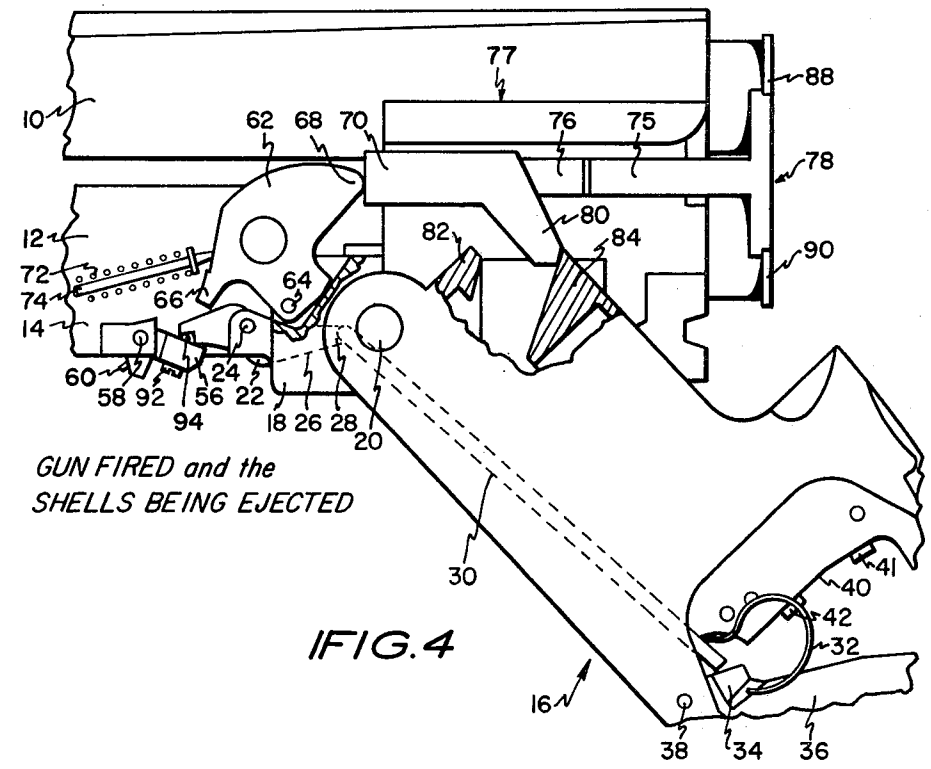
GUN FIRED and
BEING BROKEN

FIG. 3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GUN FIRED and the
SHELLS BEING EJECTED

FIG. 4

COCKING AND EJECTION MECHANISM FOR FIREARMS

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

This invention is directed to firearms and particularly to an improved cocking and ejection mechanism for use on firearms having pivotally joined receiver and barrel sections.

2. STATE OF THE ART

Multibarreled shotguns capable of being broken for the purpose of ejecting spent shells from its chamber and concomitantly arming or cocking the firearm are well known.

Traditionally, guns of this type required that most of the parts be precisely manufactured and after assembly required several precise adjustments to insure that the cocking and ejecting systems functioned cooperatively. With the relatively high number of precision parts and manual adjustments required, the cost for manufacture and assembly necessarily increased.

To assist in remedying this problem, the cocking and ejection mechanisms were redesigned so that the number of precision parts required during manufacture could be reduced and thereby reduce the number of precise adjustments during assembly to only one.

SUMMARY OF THE INVENTION

This invention in its broadest aspect is directed to a cocking and ejection mechanism for use on firearms which are pivoted at a point between the forearm bracket and the receiver. As the gun is broken, the ejection and cocking mechanisms, hereinafter described, are actuated.

The inventive mechanism comprises a percussion hammer pivotally mounted to the receiver and a cocking lever pivotally mounted to the forearm bracket. A cocking-ejecting rod traverses the receiver and is capable of slidable, axial movement therein. One of the ends of the cocking-ejecting rod is in continuous contact with said percussion hammer while the other end is contoured for mating with one end of said cocking lever. An ejection hammer held by an ejection hammer sear is pivotally mounted to said forearm bracket in a manner such that this sear is capable of being displaced by said cocking lever through the slidable action of said cocking-ejecting rod. This action releases the previously cocked ejection hammer which in turn strikes a shell ejection system positioned in the trajectory of said ejection hammer. Upon impact, the shell ejection system is actuated and the spent shells are expelled.

After the shells have been fired, the gun is broken and the spent shells ejected. Simultaneously therewith, the percussion hammer is recocked and, upon closing, is in condition for immediate firing.

If the gun is broken prior to firing, the above sequence is modified wherein the ejection hammer is not released but instead an arm extending downward from said ejection system engages a lug extending upward from the receiver and slidably moves a member of the ejection system towards the butt end of the gun permitting the shells to be exposed and manually withdrawn.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a partial cutaway side view of a firearm in an armed condition and ready for firing;

FIG. **2** is a partial cutaway side view showing the initial stage of breaking an armed firearm;

FIG. **3** is a partial cutaway side view showing a firearm which has been fired and in the process of being broken; and

FIG. **4** is a continuation of FIG. **3** wherein the firearm has been fully broken and the shells are being expelled.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The armed gun represented by FIGS. **1** and **2** comprises a pivotal type shotgun having two superposed barrels, an upper barrel **10** and a lower barrel **12.** A forearm bracket **14** is positioned under the barrel **12** and pivotally joined to a receiver **16** by a laterally traversing pivotal pin **20.** The receiver has extending side walls which overrides the side bearing surface **18** of the forearm bracket to facilitate breaking of the firearm.

It should be noted that the gun shown in the figures is of the double-barrel type and that individual firing mechanisms, ejection systems, cocking mechanisms, etc. are provided for each barrel. Since each of the systems is essentially identical in construction, only one of the systems will be referred to in the description to follow.

The cocking and ejection mechanism for each barrel comprises a unique cocking lever **22** pivotally mounted on the posterior end of the forearm bracket **14** by pin **24.** The rearward end **26** of cocking lever **22** is contoured to receive a rounded end **28** of a longitudinally positioned cocking-ejecting rod **30** which transverses the receiver **16.** The other end of the cocking-ejecting rod **30** is continuously urged by a spring **32** against a lug **34** of percussion hammer **36.** The lower end of the percussion hammer **36** is pivotally mounted to the receiver **16** by a pin **38** and held in a cocked position by an overhead pivotally mounted sear **48.** A coiled spring **44** and its spring guide **46** continually urges the percussion hammer **36** towards the receiver surface **40** for contact with one of the firing pins **41** or **42** upon release. The percussion hammer is released from its cocked position by movement of the sear **48** which is actuated by a trigger **50** through a conventional trigger mechanism located in the receiver.

The forward end **54** of the cocking lever **22** is in contact with the top section of an ejector hammer sear **56** which is pivotally mounted to the forearm bracket **14** by a pin **58.** The ejector hammer sear **56** is continuously urged against the cocking lever **22** by a torsion coil spring **60.**

An ejection hammer **62** is pivotally mounted on the forearm bracket by a pin **64** positioned slightly above the cocking lever **22.** The ejection hammer possesses a lower lug **66** which is capable of engaging the ejection hammer sear **56** on cocking. The upper end or nose portion **68** of ejection hammer **62** is spring loaded by means of a compression spring **72** and a spring guide **74** and is in trajectory alignment with the shell ejection system shown generally by numeral **78.** The shell ejection system includes a lug **70** which is an integral part of a slidable ejector extension **76.** Linked to the ejector extension **76** is an ejector member **75** both of which are slidably carried in a groove (not shown) formed in the barrels assembly **77** of receiver **16.** The barrels assembly is generally identified as the upper rear section of the joined breech sections of barrels **10** and **12.** The lug

70 possesses a downwardly and rearwardly extending arm 80 which is capable of engaging a forward projection 82 when the gun is broken and rearward projection 84 when the ejection hammer 62 has been released. The above two projections 82 and 84 are part of and extend out from the receiver 16.

When the gun is broken (after firing both barrels), as is shown in FIGS. 3 and 4, the ejection system 78 is moved slightly rearwardly by movement of arm 80 against forward projection 82. Concomitantly the cock-ing lever 22 depresses the ejection hammer sear 56 until the ejection hammer 62 is released and strikes lug 70 sharply. This impact forces the ejection system rearwardly ejecting shells 88 and 90 together or individually from their chambers depending on whether one or both shells had been fired.

If the gun is broken prior to firing, as is shown in FIGS. 1 and 2, the cocked ejection hammer cannot be released. This occurs because the cocking-ejecting rod 30 is held back in contact with lug 34 of percussion hammer 36 by the loop spring 32. In this instance the end 28 of the cocking-ejecting rod 30 is not engaged in the contoured end 26 of the cocking lever 22 and thus prevents actuation of the ejection hammer sear 56. In this case the ejection system (see FIG. 2) is moved rearwardly (as the gun is broken) by action of the forward projection 82 against the extending inclined arm 80. By such action the shells are exposed for removal but are not expelled from the chamber as occurs when the ejection hammer 62 is released.

When the gun is in the armed position as is shown in FIGS. 1 and 2, the percussion hammer 36 is retained in a cocked position by the sear 48. The rearward urging action of spring 32 coupled with rearward position of the percussion hammer 36 prevents the forward end 28 of the cocking-ejecting rod 30 from engaging the rearward contoured end 26 of the cocking lever 22.

After the percussion hammer 36 is released by actuating the trigger mechanism 52, the forward end 28 of the cocking-ejecting rod 30 is moved slidably forward and into engagement with the contoured end 26 of cocking lever 22.

In operation the angular rotating movement of the forearm bracket 14 and the receiver 16 sets in motion a series of interrelated actions which ejects the spent shells and rearms the gun. As the gun is being broken, the cocking-ejecting rod 30 is forced forward and engages the contoured end 26 of the cocking lever 22. Concomitantly, the percussion hammer 36 is pushed rearwardly to engage sear 48 by means of the force transmitted by the cocking lever 22 through cocking-ejecting rod 30. As the cocking-ejecting rod 30 engages the cocking lever 22, the pivoted cocking lever is forced downward so that the end 54 of the cocking lever engages and forces sear 56 downward against the counteraction of spring 60. Concurrent with the above actions, the arm 80 of the lug 70 is slidably moved rearwardly by action of projection 82 of the receiver 16. This starts the initial extraction of shells 88 and 90 from chambers which are in communication with barrels 10 and 12, respectively. Finally, the end 54 of cocking lever 22 continues downward until the sear 56 releases the ejection hammer 64. The latter, under the influence of spring 72 and spring guide 74, is forced rearwardly allowing the nose 68 of the ejection hammer 64 to strike sharply lug 70. The impact is transmitted to the ejection system 78 through the ejector extension 76 and ejector 75 whereby the shells from the cartridge chamber are ejected. The longitudinal displacement of the ejection system is limited by contact of the arm 80 with the projection 84 which extends upward from the receiver 16.

When the gun is closed the projection 84 is moved upward and forward towards the barrels retracting the ejection system 78 by forcing the arm 80 of the lug 70 slidably forward. This action pushes the ejection hammer 62 forward about pivot pin 64 to its initial cocked position. Spring 60 assures that sear 56 is returned to a position for accepting lug 66 of ejection hammer 62 as well as returning the cocking lever to its original position. Spring 32 also withdraws cocking-ejecting rod 30 from the contoured end of cocking lever 22 permitting the cocking lever to return to its original position.

To insure that the moment of ejection does not occur prematurely that is before the breech has cleared the line of projection of the spent shells and to permit for simultaneous shell ejection, a pair of individually adjustable adjusting screws 92 are provided for each ejection system. Each adjusting screw traverses the ejector sear 56 exposing its end 94 to contact with end 54 of the cocking lever. Thus, the amount of protrusion of the adjusting screw 92 will position the cocking lever 22 at the desired pivotal angle so that the release of the ejection hammer can be adjustably timed.

While the invention has been described with reference to specific embodiments, it should be understood that certain changes in construction may be made by one skilled in the art and would not thereby depart from the spirit and scope of this invention which is limited only by the claims appended hereto.

I claim:

1. A cocking and ejection mechanism for use on a firearm which is pivoted between a forearm bracket and a receiver to permit actuation of said mechanism when the firearm is broken comprising:

a. a spring-loaded percussion hammer pivotally mounted to said receiver;

b. a sear pivotally mounted to said receiver and in communication with said percussion hammer to permit the release of said percussion hammer upon actuation thereof;

c. a cocking lever pivotally held to said forearm bracket;

d. a cocking-ejecting rod transversing said receiver wherein one end of said cocking-ejecting rod is in contact with said percussion hammer and the other end is contoured for mating with said cocking lever;

e. an ejection hammer and ejection hammer sear pivotally mounted to said forearm bracket wherein said ejection hammer sear is displaceable by said cocking lever for operatively controlling the release of said ejection hammer; and

f. a shell ejection system positioned in the trajectory of said ejection hammer.

2. The mechanism of claim 1 wherein the cocking-ejecting rod is continuously held against said percussion hammer by an urging means.

3. The mechanism of claim 2 wherein the urging means comprises a looped spring, one end of which is attached to said percussion hammer and the other end is attached to said cocking-ejecting rod.

4. The mechanism of claim 2 wherein said cocking-ejecting rod is adapted for slidable movement within said receiver and wherein one end of said cocking-ejection rod is adapted for mating with said cocking lever.

5. The mechanism of claim 4 wherein said ejection hammer sear is continuously urged by a biasing means to contact said cocking lever.

6. The mechanism of claim 5 including an adjusting means traversing said ejection hammer sear wherein one end of said adjusting means is in contact with one end of said cocking lever.

7. The mechanism of claim 6 wherein the adjusting means is an adjusting screw.

8. The mechanism of claim 6 wherein said shell ejection system is slidably carried in a groove in a barrels assembly of said receiver and comprises an ejector member having one end lipped for engaging a rim of a shell and a lug fixed to the other end of said ejector member for receiving an impact from said ejection hammer.

9. The mechanism of claim 8 wherein said ejection system includes an ejector extension member intermediate said lug and said ejector member and wherein said ejector extension is integral with said lug.

10. The mechanism of claim 9 wherein said lug includes an arm extending down and away from said lug.

11. The mechanism of claim 10 wherein said receiver includes two spaced-apart projections and wherein said arm of said lug extends therebetween.

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