United States Patent [19]

Seecamp

[11] **3,722,358**

[45] **Mar. 27, 1973**

[54] **COMBINED SINGLE AND DOUBLE ACTION FIRING MECHANISMS FOR PISTOLS AND KITS FOR CONVERTING SINGLE-ACTION PISTOLS**

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[52] **U.S. Cl.** **89/147**
[51] **Int. Cl.** **F41c 19/14**
[58] **Field of Search** ..... 42/65, 69 B; 89/147

[56] **References Cited**

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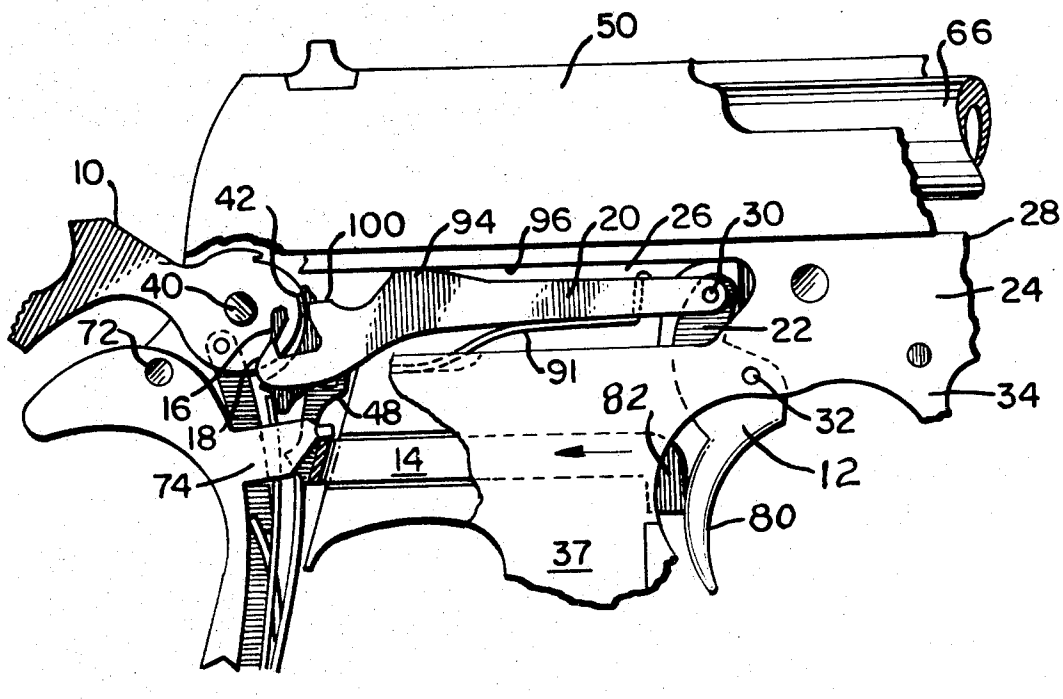
2,464,427 3/1949 Wilson 89/147

Primary Examiner—Stephen C. Bentley
Attorney—Steward & Steward, Merrill F. Steward and Donald T. Steward

[57] **ABSTRACT**

A double-action trigger mechanism for automatic pistols in which the firing mechanism of the original single-action design of pistols, such as the Government Model 1911, is retained and continues to function in the same way as before. Conversion of existing pistols is made feasible by providing a cocking link between the trigger and the hammer which is completely separate from the single-action sear mechanism, thereby retaining the same operation in firing the gun in single-action while adding double-action, that is, the capability of cocking and firing the gun by means of the trigger.

5 Claims, 7 Drawing Figures



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SHEET 1 OF 2

FIG. 1

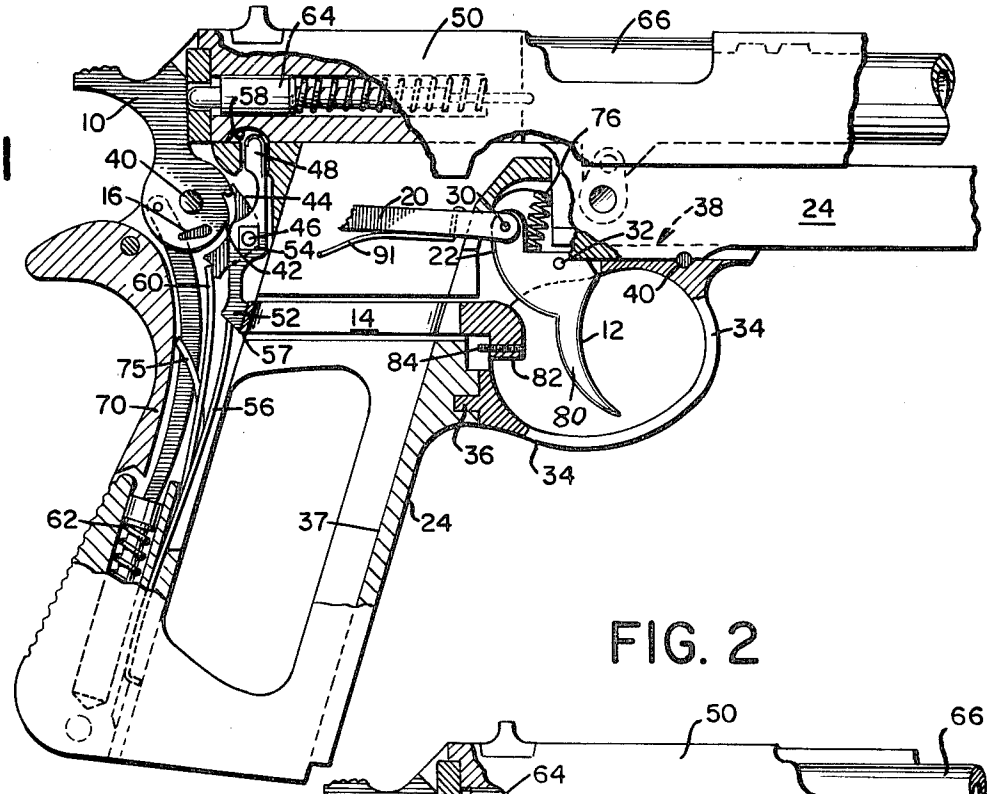


FIG. 2

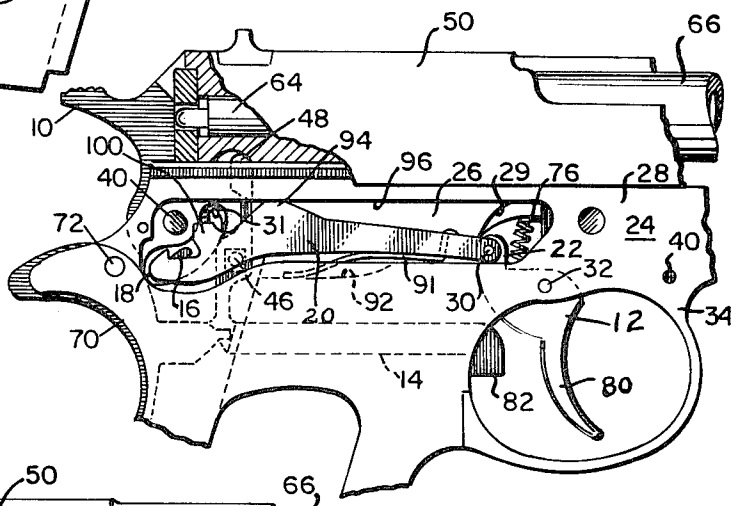
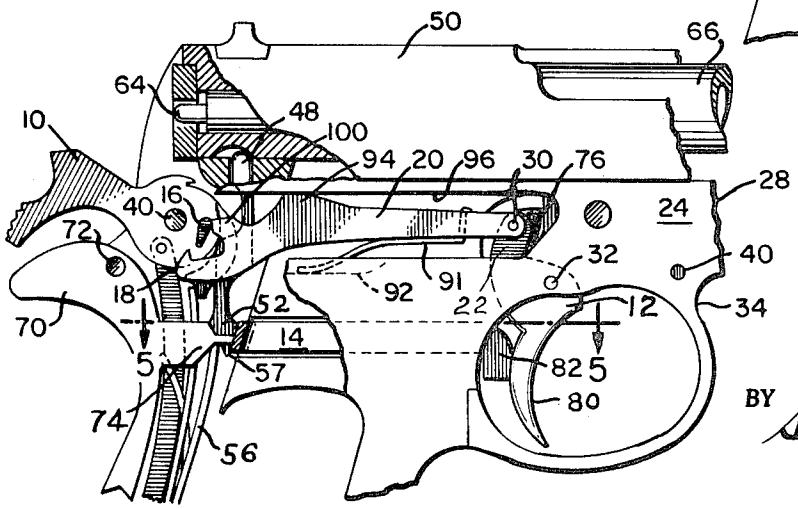


FIG. 3



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FIG. 4

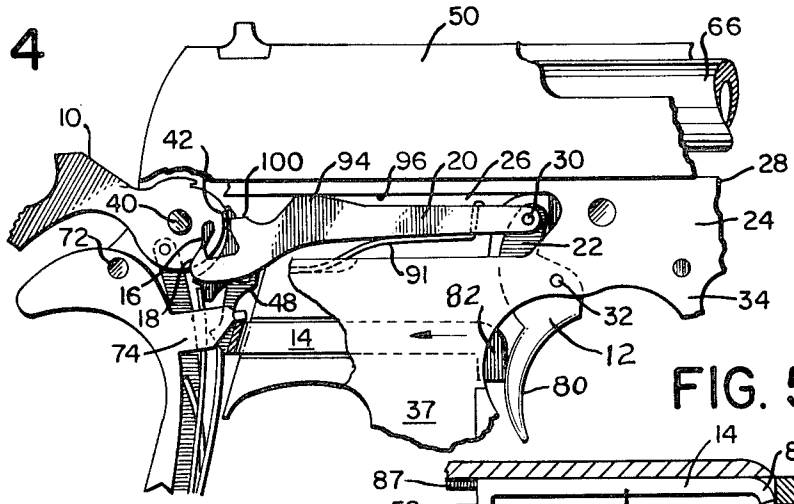


FIG. 5

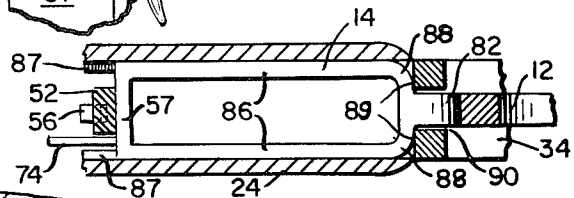


FIG. 6

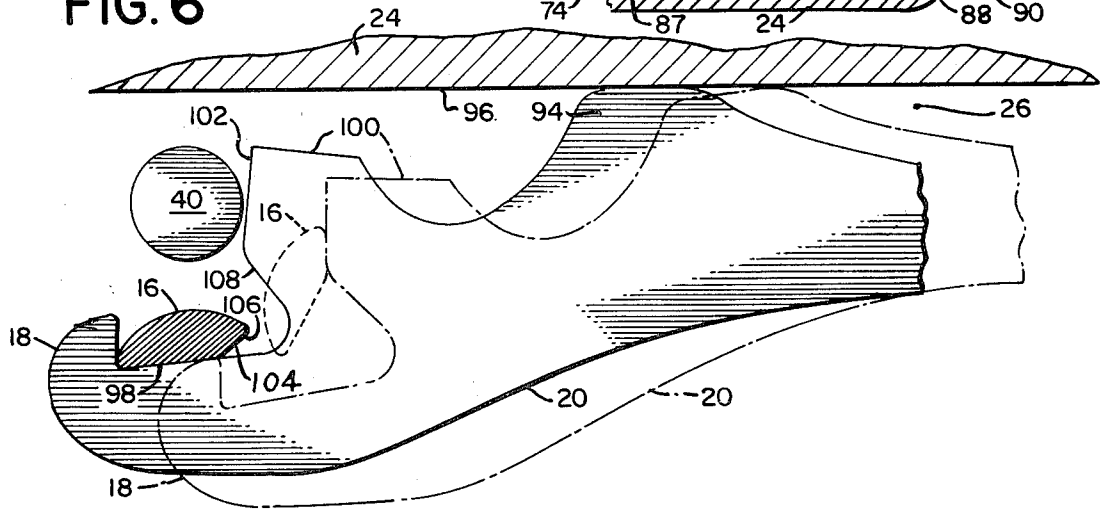
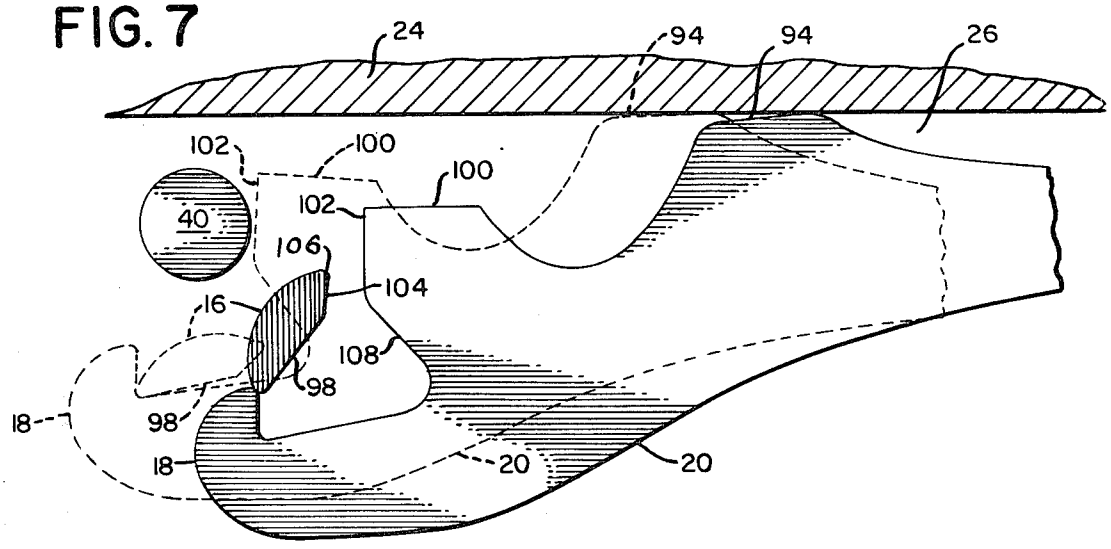


FIG. 7



COMBINED SINGLE AND DOUBLE ACTION FIRING MECHANISMS FOR PISTOLS AND KITS FOR CONVERTING SINGLE-ACTION PISTOLS

BACKGROUND OF THE INVENTION

This invention relates to firearms and more particularly to an improved firing mechanism for semi-automatic, slide-action pistols of the 1911 Government type, originally manufactured by Colt's Patent Firearms Company. The basic design for this famous pistol is shown in the U.S. Pat. to J. M. Browning, No. 580,924 dated Apr. 20, 1897 and No. 984,519 dated Feb. 14, 1911. While pistols of this design are available in various calibers, the most common and best known is usually referred to as a Colt .45, one military model of which is designated M1911A1. and is accordingly referred to hereinafter simply as a Colt .45 or as a Government Model 1911.

In order to fire the first round in a Colt .45, it is necessary before pulling the trigger to cock the hammer manually by means of the exposed thumbpiece on the hammer or by retracting the slide. This type of trigger action is referred to as single-action, as opposed to a double-action, in which the gun may be cocked and fired in one continuous pull of the trigger. It is an object of the present invention to provide a double-action Colt .45, which can still be fired using single-action in the same manner that this well-known weapon has been fired for some 60 years or more. Furthermore, it is contemplated that the invention will usually be employed in modifying existing weapons already owned and used by sportsmen and gun collectors, rather than in the manufacture of new guns.

It will be appreciated, however, that the development of an inexpensive and reliable way of converting existing guns poses rather difficult problems, both in design and economy, which are not involved in the development and production of a new gun. In fact, many times it is much more difficult to modify an existing design, while retaining its original operation and as many of its original parts as possible and at the same time improving upon it, than it is to design an entirely new gun having the same features. Such is the case in developing a practical design for converting existing Government Model 1911 pistols and the like for double-action. Unless the conversion can be made simply and inexpensively, it would be more practical to make and sell an entirely new gun than to convert existing ones. The present invention makes this conversion so easy that it is possible to furnish inexpensive kits, with which the owner of any Colt .45 or automatic pistol of similar design can himself convert his gun for double-action without altering its original single-action. to linked

Handguns, including revolvers as well as pistols, have been provided heretofore with firing mechanisms for both single-action and double-action firing. However, such guns are basically double-acting and become single-acting when the hammer is cocked either by pulling it back manually or automatically on recoil of the slide in the case of a slide-action pistol. For example, the pistol shown in U.S Pat. No. 3,152,418 to Charron is a double-acting arrangement with a screw adjustment for converting to single-action exclusively. The firing mechanism of the Charron patent is similar to that disclosed earlier in U.S. Pat. No. 2,846,925 to Norman,

which provides a drawbar for cocking the hammer when the trigger is retracted. However, this arrangement requires the intervention of a separate sear that is operated by the drawbar during double-action firing when the trigger is retracted beyond the point required for cocking the hammer.

Another double-action firing mechanism is shown in U.S. Pat. to Walther Nos. 2,135,992 and 2,259,404, both of which show a cocking piece which is distinct from the drawbar for cocking and subsequently serving as a sear. Still another such mechanism is the drawbar arrangement of an earlier U.S. Pat. to Walther, No. 1,712,411, which requires an intervening rocking plate and rotatable catch on the hammer. A double-action trigger mechanism is also shown in U.S. Pat. No. 2,464,427 to Wilson, in which a trigger-hammer link has the dual function of actuating the single-action sear by direct engagement therewith, as well as of cocking the hammer during double-action operation, the link being depressed by a cam which releases it from the cocked hammer, while preventing engagement of the sear with the hammer.

Although these prior patents show double-action mechanisms capable of single-action firing, none discloses or suggests the provision of a cocking link which is completely separate from the single-action sear and has no effect on it.

SUMMARY OF THE INVENTION

The present invention achieves the addition of double-action operation to single-action pistols which have a pivoted hammer by providing a cocking link from the trigger to the hammer for engagement with a cocking lug on the hammer. In order to retain the original single-action firing of the pistol the cocking link must be completely separate from the single-action sear means, which in the case of the Government Model 1911 includes the pivoted sear and disconnector. In addition, the trigger must be separate from the sear-actuator so that it can be swung through an additional amount of travel before it engages the sear-actuator, thereby making it possible for the trigger to cock the hammer as it is retracted through this additional travel. An essential aspect of the present invention resides in the provision on the cocking link of a trigger-positioning surface which is engaged by the hammer as it is being cocked manually or on recoil, so that the trigger is retracted by the hammer from its extreme forward, or double-action position, to a single-action position intermediate such double-action position and a hammer-release position adjacent its opposite limit of travel when fully retracted. The single-action position of the trigger should be located such that the distance through which the trigger moves upon being retracted to its hammer-release position is the same as the trigger travel of the original gun, thereby retaining the same trigger action and feel of the original as if the conversion to include double-action had not been made.

DESCRIPTION OF THE PREFERRED EMBODIMENT

One embodiment of the invention is shown in the accompanying drawings, in which

FIG. 1 is a fragmentary side elevational view of the rear portion of a Government Model 1911 modified in

accordance with the present invention, portions being removed or broken away and shown partly in cross-section;

FIG. 2 is a fragmentary view similar to FIG. 1, but showing all the parts required for conversion to double-action in accordance with the invention, with the hammer uncocked and the trigger released;

FIG. 3 is a view similar to FIG. 2, but showing the positions of the parts when the hammer is cocked on single-action;

FIG. 4 is another view similar to FIG. 2, but showing the positions of the parts during double-action with the hammer pivoted to a cocked position at the moment of incipient release;

FIG. 5 is a detail view of the trigger bar taken in horizontal cross-section on the line 5—5 in FIG. 3; and

FIGS. 6 and 7 are detail views on a greatly enlarged scale showing the interaction of the hammer cocking lug and the cocking link during single-action firing and double-action firing, respectively.

As mentioned hereinbefore, the basic design and operation of the Colt .45 automatic pistol is not changed by the addition of a double-action trigger mechanism in accordance with the present invention. However, in order to provide the action required for cocking the hammer **10**, a pivoted trigger **12** is employed in place of the sliding trigger of the original gun. In addition, the trigger bar **14**, which is separate from trigger **12**, is used in place of the sear-actuator that is an integral part of the trigger in the Colt .45. This permits the trigger to swing through an additional amount of travel before it engages trigger bar **16** so that the trigger can cock the hammer while being retracted through this additional travel. A cocking lug **16** is also provided on the lower portion of hammer **10** for engagement by a hook **18** (FIG. 2) on the rear end of a horizontally disposed cocking link **20** pivoted at its other end to an upwardly extending cocking-portion **22** of trigger **12**. The cocking link **20** and cocking lug **16** are of course not parts of the original gun and must be furnished separately, as for example in a conversion kit.

The frame **24** of the original gun may be modified to receive the pivoted trigger **12** and cocking link **20** by machining a horizontally elongated recess **26**, best shown in FIG. 2, in its right-hand side **28**, in order to provide space within which to receive cocking link **20**. In addition, access space is provided above the trigger for its cocking-portion **22**, and an opening **29** is cut laterally therefrom into recess **26**, through which a pivot pin **30** on cocking link **20** extends into pivotal engagement with the trigger. An arcuately shaped access opening **31** is also cut from the rear portion of recess **26**, so that cocking lug **16** may extend laterally into recess **26** from hammer **10** for engagement by the hooked end **18** of cocking link **20**. Since a longer trigger travel is required for cocking the hammer by means of a double-action trigger than is required where a single-action trigger is employed, the original trigger guard must be replaced by one that will accommodate the double-action trigger.

The trigger **12** is mounted on a pivot pin **32** in the substitute trigger guard **34**, which is provided on a lower rear portion with a tongue **36** (FIG. 1) that fits snugly within a groove machined in the mating surface of the handle portion **37** of frame **24**, from which the original trigger guard was removed. The upper portion of the new trigger guard **34** may be provided with horizontally extending dovetail surfaces which fit within a mating dovetail groove, indicated generally at **38** (FIG. 1), cut in the under surface of the upper portion of frame **24**, from which the original trigger guard was also removed. The trigger guard **34** may then be permanently staked in place, as for example, by a pin **40**.

Under present-day circumstances, it is more desirable to provide a new frame **24**, including the modified trigger guard **34** and cocking link-receiving recess **26** as part of the conversion kit, thereby eliminating the necessity of machining the old frame. This alternative is entirely practical, not only because in many cases replacement of the frame is needed in guns which have seen hard service in the military and elsewhere, but also because all of the parts of the original gun except for the frame, hammer and trigger may be re-assembled in the replacement frame. Accordingly, the cost of modifying the original frame under present conditions in the United States at least, is actually greater than the cost of a new frame. Despite this, the conversion to double-action, including the new frame, can still be done by the owner of the original pistol for only about half the cost of a new Colt .45. Moreover, a new Colt automatic that has not been modified would of course have the disadvantage of the usual single-action trigger only.

Referring now in greater detail to the drawings, it will be seen how the double-action trigger mechanism is incorporated while still retaining the single-action and feel of the original gun. Thus, except for the addition of the cocking lug **16**, the hammer **10** is identical with that of the original and is pivoted on a hammer pin **40**. The usual sear notch **42** is also provided in the underside of the hammer. The sear **44** is pivotally mounted on a sear pin **46** for movement of its sear nose into and out of engagement with sear notch **42**. The disconnector **48** extends vertically along both sides of sear **44** for engagement at its upper end by the underside of the slide **50** and at its lower end **52** by the trigger bar **14**. Disconnector **48** has an enlarged opening **54**, through which sear pin **46** extends thereby permitting limited vertical and lateral movement of the disconnector with respect to sear **44**. The upper end of a leaf-spring **56** engages the inclined surface on the back of the lower end **52** of disconnector **48**, urging it forward against the cross piece **57** of trigger bar **14**. Leaf-spring **56** also urges disconnector **48** upward so that its upper end projects into a recess **58** in the under surface of slide **50**. When disconnector **48** is at its upper limit of travel as shown in FIGS. 1 and 2, its lower end **52** is disposed between the lower end of sear **44** and trigger bar **14** so that when the trigger **12** is fully retracted to its hammer-release position, the sear **44** is pivoted clockwise in order to disengage the nose of the sear from the sear notch **42** of the cocked hammer.

However, when the slide **50** is retracted either manually or on recoil, the recess **58** is moved out of alignment with the upper end of disconnector **48** so that the disconnector is moved down by the underside of slide **50**. This moves the lower end **52** of disconnector **48** to a position where it no longer operatively engages sear **44**, thereby disconnecting trigger bar **14** from the sear. Then, regardless of whether trigger bar

14 is retracted or not, sear 44 is free to be pivoted in a counterclockwise direction (as viewed in FIG. 1 by the sear spring 60 into its hammer-cocking position. If the trigger is held back after a shot is fired, the disconnector 48 becomes blocked by the lower end of sear 44 against movement upward again into recess 58 upon return of slide 50 to battery position, thereby disconnecting the sear from the trigger bar. Consequently, it is necessary to release the trigger 12 after each shot in order to re-connect the sear with the trigger bar through disconnector 48 for the next shot, thus preventing the firing of more than one shot for each pull of the trigger.

Hammer 10 may be pivoted into a cocked position by its exposed thumb-piece or by retraction of slide 50 manually, or on recoil, the hammer spring 62 being compressed on cocking so that the hammer will fall on being released from its cocked position to strike the firing pin 64 in slide 50 in order to fire a cartridge in the chamber of barrel 66. Recoil on firing drives the slide rearward, ejecting the empty case, recocking hammer 10, and reloading the chamber with a fresh cartridge from the magazine (not shown) in the handle portion 37 of the frame 24, all in precisely the same way that the original pistol functions.

The Colt .45 also has a safety device in the handle which must be depressed in order to release sear 44 from cocking engagement with hammer 10. The grip safety comprises a pivoted safety member 70 in the upper back portion of the handle 37 below hammer 10. As best seen in FIGS. 3 and 4, safety member 70 is pivoted on a pin 72 and has a finger 74 which projects forward into abutting relation with trigger bar 14 to one side of disconnector 48, thereby preventing actuation of the trigger bar. The action of a leaf-spring 75 resiliently holds safety 70 in the safe position. If the pistol is held the proper way in one hand, safety member 70 is pivoted forward (counterclockwise as viewed in the drawings) as the hand of the shooter grips the handle 37. Such forward movement of safety member 70 lifts the end of its finger 74 out of abutting relation with trigger bar 14, so that the latter can be retracted far enough to pivot the sear 44 out of cocking engagement with the hammer. It will be noted that the sear 44, disconnector 48, sear spring 60, disconnector spring 56, hammer spring 62 and grip safety 70, as well as all other parts of the gun including those not shown, are identical with and interchangeable with, the corresponding parts of the original pistol and, therefore, do not need to be furnished with the double-action conversion kit of the present invention. In fact, except for the frame that can be either modified or replaced, the only parts of the original gun which are not used are the hammer and trigger.

The pivoted trigger 12 is urged in a counterclockwise direction as viewed in FIG. 1, by a trigger spring 76, one end of which seats in a recess in the upper part of the trigger and presses downward to pivot the trigger while the other end of spring 76 engages a fixed portion of the frame 24 within the access space provided for the trigger. The rear side of the finger portion 80 of the trigger is desirably rounded and convex in shape for engagement with a downwardly disposed abutment 82 at the front end of the trigger bar 14. An adjusting screw 84 (FIG. 1) may be provided in the depending portion of abutment 82 for adjusting the amount of movement or over-travel of trigger 12 following release of the hammer by sear 44 when the pistol is fired by single-action trigger actuation.

Referring more particularly to FIG. 5, trigger bar 14 is a rectangular member which is identical in shape to the corresponding portion of the original trigger except that it is separate from the trigger and has the down-turned abutment 82 for engagement by the trigger. The longitudinal side portions 86, 86 of trigger bar 14 are guided in grooves 87, 87 on each side of the handle portion 37 of the frame, so that the cartridge magazine (not shown) can be inserted between them. The cross piece 57 at the rear of trigger bar 14 joins the two longitudinal side portions 86, 86 and is engaged by the front side of the lower end 52 of disconnector 48, which in turn is continuously pressed forward against trigger bar 14 by the leaf-spring 56. The forward travel of trigger bar 14 is limited by engagement of its shoulders 88 on opposite sides of abuttment 82 with corresponding stop surfaces 89, 89 on trigger guard 34, through an opening 90 in which abutment 82 projects for engagement by trigger 12.

It will be apparent therefore that when hammer 10 is cocked as shown in FIG. 3 and the trigger pulled to fire the gun, the rear surface of trigger 12 engages abutment 82 on trigger bar 14 forcing it rearwardly against the action of spring 56. Such rearward travel of trigger bar 14 to its hammer-release position, which is identical with the action of the trigger of a Colt .45, pivots sear 44 out of the cocking notch 42 of hammer 10 for firing the gun. When the shooter releases trigger 12, trigger bar 14 is moved forward again by leaf-spring 56.

Cocking link 20 is constantly biased upward, or in a clockwise direction as viewed in FIGS. 1–4, about its pivot pin 30 by means of a cantilever spring 91, which is fastened at one end to the cocking link near pin 30, with its other end resting in a retaining track 92 (FIGS. 2 and 3) in the lower side of the recess 26 of frame 24. Cocking link 20 has room within recess 26 for limited movement both horizontally and vertically. When the hammer is uncocked and the trigger released as shown in FIG. 2, the hook 18 on cocking link 20 is moved upward by the action of spring 91 into operative engagement with the cocking lug 16 of hammer 10, thereby limiting pivotal movement of link 20 in this direction. Pivotal movement of cocking link 20 about pivot pin 30 in a clockwise direction is also limited by engagement of a pivot-hump 94 on the top edge of cocking link 20 with the upperside or track 96 of recess 26. It will be noted that when the hammer and trigger are in the positions shown in FIG. 2, the hump 94 is in engagement with track 96, but that when the cocking link 20 is returned to this position following firing of the last round, its hook-end 18 can move down as it engages the front, lower side of cocking lug 16.

As trigger 12 is retracted from its normal position for double-action shown in FIGS. 1 and 2, the forward end of cocking link 20 is lifted upward and forward, causing the cocking link to rotate about its pivot-hump 94 at the same time that it is advanced forward. Thus, when the pistol is fired in double-action, the cocking hook 18 draws the lug 16 on hammer 10 to the position shown in FIG. 4 for cocking the hammer. At the same time, due to its rotational movement about hump 94, the

hook-end of cocking link **20** is forced downward, withdrawing hook **18** from engagement with cocking lug **16**. In the meantime, pivotal movement of hammer **10**, as it is being cocked, causes cocking lug **16** to move upwardly until only the tip of cocking hook **18** and rear end-portion of cocking lug **16** remain engaged with each other at the point of insipient release of hammer **10**.

The double-action of trigger **12** is clearly illustrated in FIG. **7**, which is a greatly enlarged diagrammatic view of the rear portion of cocking link **20**, cocking lug **16** and pivot pin **40** for hammer **10**, together with a portion of the upperside of recess **26** that forms the track **96**, along which the hump **94** of cocking link **20** slides as the hammer is being cocked. The full-line positions of cocking link **20** and cocking lug **16** shown in FIG. **7** are the same as in FIG. **4**, with cocking lug **16** just on the point of being released by the cocking hook **18**. It should be noted how downward movement of hook **18** from its initial position (broken-line showing) of full engagement with lug **16** and simultaneous upward movement of lug **16** as the hammer is cocked combine to provide a smooth, positive cocking and releasing action of trigger **12**. During the very last increment of the trigger travel, which occurs suddenly and almost instantaneously with the release of cocking lug **16** by hook **18**, cocking link **20** moves slightly forward of its full-line position shown in FIG. **7** and is permitted to pivot downward slightly when the rounded tip of its hook **18** is engaged by the underside **98** of cocking lug **16** as the hammer falls under the action of hammer spring **62**.

If a cartridge is in the chamber of barrel **66** and the magazine is not empty, the recoil on firing the cartridge in the chamber extracts and ejects the empty case, recocks hammer **10** and chambers a fresh cartridge. During this automatic reloading cycle, cocking lug **16** moves forward as hammer **10** is cocked on being pivoted back by the recoiling slide **50**, this time slightly beyond its full-line position shown in FIGS. **4** and **7**, where it is held upon engagement of sear **44** in sear notch **42** of the hammer, as shown in FIG. **3**.

When the trigger is used in double-action both to cock and release the hammer, it is pivoted into engagement with the abutment **82** on trigger bar **14**, so that during the balance of the travel of trigger **12**, trigger bar **14** is also actuated, as if to release the hammer from the position in which it is located when cocked by sear **44**. This position is herein referred to as the sear-cocked position in order to differentiate from the position referred to as the cocked position, to which the hammer is momentarily cocked during double-action trigger actuation. It will be appreciated, however, that depending on how the parts are designed, the sear-cocked position on single-action and the cocked position on double-action may coincide.

In the construction shown for illustrative purposes in the drawings, the sear **44** is moved by trigger bar **14** out of engagement with hammer **10** during double-action substantially simultaneously with the release of cocking lug **16** by the hook **18** on cocking link **20**. However, this situation is not critical, because even if the sear is not actuated by trigger bar **14** until after the hammer has been released by cocking bar **20** during double-action firing, the force on the trigger **12** required for cocking the hammer is necessarily great enough to ensure immediate, if not instantaneous retraction of the trigger through its final, short, sear-actuating movement as soon as the hammer escapes cocking hook **18**. Similarly, the present arrangement permits release of the hammer by cocking hook **18** on double-action slightly before the hammer is pivoted far enough for the nose of sear **44** to engage in sear notch **42**. But here again such a situation is not critical for the reasons here indicated. It will be apparent therefore that no great care is required to ensure positive release of hammer **10** from its cocked position on conversion of the pistol to a double-action trigger in accordance with the present invention. Consequently the cocked position of the hammer when fired in double-action may be said to coincide only approximately with its sear-cocked position.

Cocking link **20** is provided on its upper edge between hook **18** and pivot-hump **94** with a trigger-positioning projection **100**, which has a flat surface **102** (FIGS. **6** and **7**) disposed at a predetermined distance from the pivot pin **30**, by which link **20** is connected to trigger **12**. On release of the trigger after the gun has been fired and automatically reloaded and cocked, the trigger **12** does not return to its forward-most or double-action position of FIGS. **1** and **2**, but remains instead in engagement with abutment **82** on trigger bar **14** at what is referred to hereinafter as its single-action position, which is shown in FIG. **3**. This is due to the fact that the hammer is cocked immediately upon recoil of the slide **50**, thereby positioning cocking lug **16** in the path of projection **100** on cocking link **20** so that on release of the trigger the cocking link moves rearward under the action of trigger spring **76** but is blocked from returning to its initial position shown in FIG. **2** (full-line position in FIG. **6**). Such blocking of the cocking link is caused by engagement of the surface **102** on projection **100** with cocking lug **16**, as illustrated in FIG. **3** and in broken-lines in FIG. **6**. This short return-movement of cocking link **20** permits trigger **12** to pivot far enough forward for trigger bar **14** to move to a point at which the disconnector **48** is allowed to move upward into operative relation with sear **44** for actuating the sear on the next pull of trigger **12**. Trigger **12**, however, remains engaged with the trigger bar **14**.

By properly selecting the distance between the positioning surface **102** and the pivot pin **30**, as well as the length of trigger bar **14**, the trigger **12** can be located in exactly the same position for single-action as the trigger in the original pistol when it is at ready position in its forwardmost limit of travel. Consequently, on firing the modified gun of the present invention after the hammer has been cocked, the action of the firing mechanism is the same as that of the original and the trigger travel is the same. The only difference in the trigger action is in the pivotal movement of the modified trigger as compared with the straight, sliding action of the trigger in the original. This difference is so slight that it is scarcely noticeable.

In order to retain the original trigger travel on firing single-action, it is necessary that the positioning surface **102** on cocking link **20** be reasonably accurately disposed relative to cocking lug **16** and that the position of abutment **82** on trigger bar **14** be determined to

ensure proper engagement of trigger **12** with trigger bar **14** when positioning surface **102** engages cocking lug **16**. This relationship must be established both to ensure that there is no gap between the trigger and the trigger bar when the trigger is in its single-action position and also to avoid disturbing the operation of the sear, as for example, if trigger **12** were prevented from returning far enough to release the disconnector. In order to better determine this relationship, a flat surface **104** is formed adjacent the forward end **106** (FIG. **6**) of cocking lug **16** at an angle with its under surface **98**, such that when the lug **16** and cocking link **20** are in the positions shown in broken-lines in FIG. **6**, their respective surfaces **104** and **102** meet in full engagement with each other.

When the hammer is uncocked and it is desired to fire the gun in the conventional manner by first cocking the hammer manually—that is, by retracting the thumb-piece on the hammer or, in order to chamber a cartridge following reloading with a fresh magazine, by retracting the slide **50** by hand —the act of first manually cocking the hammer results in moving the trigger from its double-action position to its single-action position. The pistol can then be fired in single-action by pulling the trigger through the balance of its travel. When the hammer is cocked manually, movement of the trigger from its double-action position to its single-action position is effected by engagement of cocking lug **16** with an upwardly inclined surface **108** on the rear side of positioning projection **100**. This action is apparent from FIG. **6**, in which the lug **16** and cocking link **20** are shown in full lines when the hammer is uncocked and the trigger is in its double-action position as in FIG. **2**. Thus, cocking lug **16** is swung from the position shown in full lines to the position shown in broken lines where hammer **10** becomes cocked by engagement of sear **44** in sear notch **42**, (FIG. **3**). During the course of this movement, the tip **106** of lug **16** engages the inclined surface **108** on cocking link **20**, moving it to the right as viewed in the drawings until the positioning surfaces **102** and **104** on the cocking link **20** and lug **16**, respectively, engage as illustrated in broken lines in FIG. **6**. Movement of cocking link **20** to this position pivots the finger portion **80** of trigger **12** into engagement with trigger bar **14** without disengaging sear **44** from the hammer. The gun is then in the same condition which it assumes following automatic reloading under recoil.

What is claimed is:

1. In a semi-automatic pistol, a firing mechanism for firing the pistol in both single and double action comprising in combination

a pivoted hammer having provision for being manually cocked and for movement between a cocked position and a fired position,

a trigger pivotally mounted for movement about a fixed pivot,

single-action sear means for releasably retaining said hammer in a sear-cocked position including a sear movably mounted for cocked engagement with said hammer upon pivotal movement of said hammer into a sear-cocked position, and also including a sear-actuator separate from said trigger but mounted for engagement thereby,

said trigger having limited travel between a double-action position adjacent one of its extremities of travel, a hammer-release position adjacent its other and an intermediate single-action position at which it engages said sear-actuator and is poised for release of said sear from cocking engagement with said hammer, said trigger having a finger portion and a cocking portion disposed on the opposite side of its pivot from said finger portion,

a cocking link pivotally connected to said cocking portion of said trigger for movement completely separate from said sear for pivoting said hammer to a cocked position approximately coinciding with its said sear-cocked position upon retraction of said trigger from its double-action position,

a cocking lug rigidly mounted on and forming part of said hammer for operative engagement by said cocking link,

said cocking link having a cocking surface disposed for engagement with said cocking lug when said hammer is uncocked for pivoting said hammer toward its cocked position upon movement of said cocking link in one direction during such retraction of said trigger and for releasing said hammer when it reaches said cocked position,

said cocking link also having a trigger-positioning surface for engagement by said hammer as it is cocked other than by means of said trigger in order to move said cocking link in said one direction and to locate said trigger in its said single-action position.

2. A firing mechanism as defined in claim **1**, wherein said sear-actuator comprises a trigger bar separate from said trigger and mounted for limited movement sufficient to pivot said sear out of cocking engagement with said hammer, said trigger being out of engagement with said trigger bar when in its said double-action position and being retractible into engagement with said trigger bar when in its said single-action position, spring means for resiliently moving said trigger towards said double-action position, said trigger-positioning surface on said cocking link being engageable by said cocking lug on said hammer for moving said cocking link against the action of said spring means as said trigger is moved by said cocking link into its single-action position.

3. A firing mechanism as defined in claim **2**, wherein said cocking link is also mounted for pivotal movement about said cocking portion of said trigger and said cocking surface on said cocking link is disposed on a hook portion of said cocking link for operative engagement with said cocking lug on said hammer on pivotal movement of said cocking link in one direction of rotation, a cocking-link spring urging said cocking link in said one direction of rotation, and means for limiting the movement of said cocking link in said one direction of rotation in order to effect release of said cocking lug when said hammer is pivoted to its cocked position by retraction of said trigger.

4. A firing mechanism defined in claim **2**, wherein said sear is moved out of cocking engagement with said hammer substantially simultaneously with release of said cocking lug by said cocking link during double-action actuation of said firing mechanism.

5. A double-action conversion kit for a semi-automatic pistol having a firing mechanism originally designed with a single-action trigger only and having a frame for mounting a pivoted hammer, single-action sear means including a sear normally urged into cocked engagement with the hammer and a sear actuator on the trigger for releasing said sear, the frame having guide means on which the sear actuator is supported, said kit comprising

a replacement trigger having a depending finger portion, a hammer-cocking portion and means located between said portions for pivotal mounting in the pistol,

a replacement hammer identical in all respects to the original hammer but having a cocking lug rigidly mounted thereon,

a replacement frame formed in all respects identical to the original frame for holding and assembling all the original parts of the pistol expect the hammer and trigger, but having means for pivotally mounting said replacement trigger and an elongated recess in one side between the trigger and hammer including access thereto, said replacement frame having a guide-way for a sear actuator similar to the guide means in the original frame,

said replacement trigger being pivotally movable on said replacement frame between a double-action position at one of its limits of travel, a hammer-release position at its other and an intermediate single-action position at which it is poised for release of said sear,

a trigger spring fitting within a portion of said recess in said replacement frame adjacent said trigger for continuously urging said trigger toward its double-action position,

a trigger bar similar to the sear actuator of the original pistol but separate from said replacement trigger and movable within said guide-way in said replacement frame between said replacement trigger and said sear, said trigger bar being adapted for engagement by said replacement trigger when the latter is in its single-action position such that upon retraction of said replacement trigger from said single-action position to its sear-release position said sear is disengaged from said hammer, said trigger being movable independently of said trigger bar between its double-action and single-action positions,

a cocking link pivotally connected to said cocking portion of said replacement trigger for both pivotal and longitudinal movement within said recess in said replacement frame, said cocking link being completely separate from said single-action sear and having a cocking surface disposed for engagement with said cocking lug on said replacement hammer when said hammer is uncocked and for pivoting said hammer toward its cocked position upon movement of said cocking link in one direction during retraction of said trigger from its double-action position and for releasing said hammer when it reaches said cocked position,

said cocking link also having a trigger-positioning surface for engagement by said replacement hammer as it is cocked other than by means of said replacement trigger in order to move said cocking link in said one direction and to locate said replacement trigger in its said single-action position.

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