

**April 12, 1966**

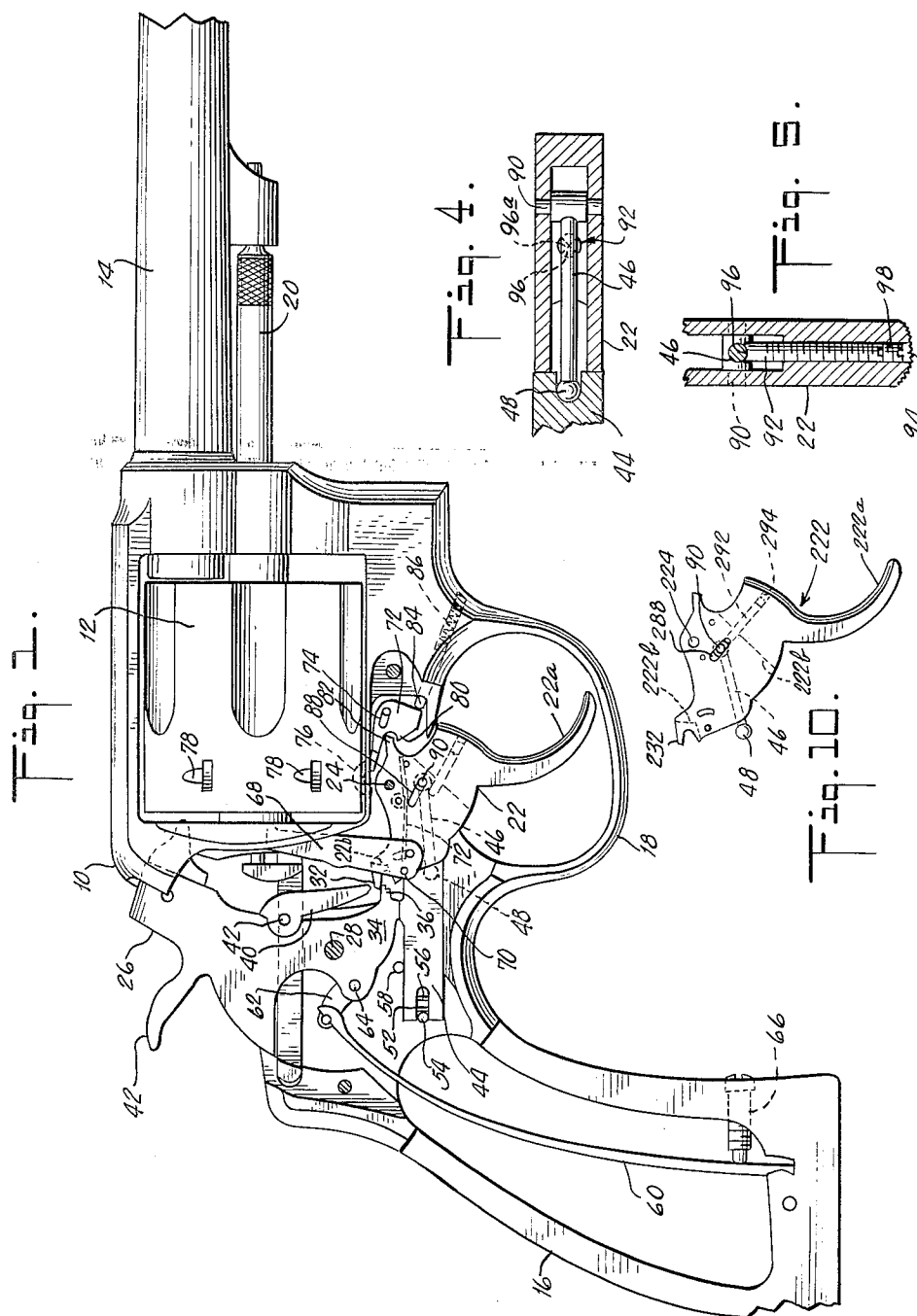
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**3,245,167**

# FIRING ACTION MECHANISM FOR FIREARMS

Filed March 4, 1965

4 Sheets-Sheet 1



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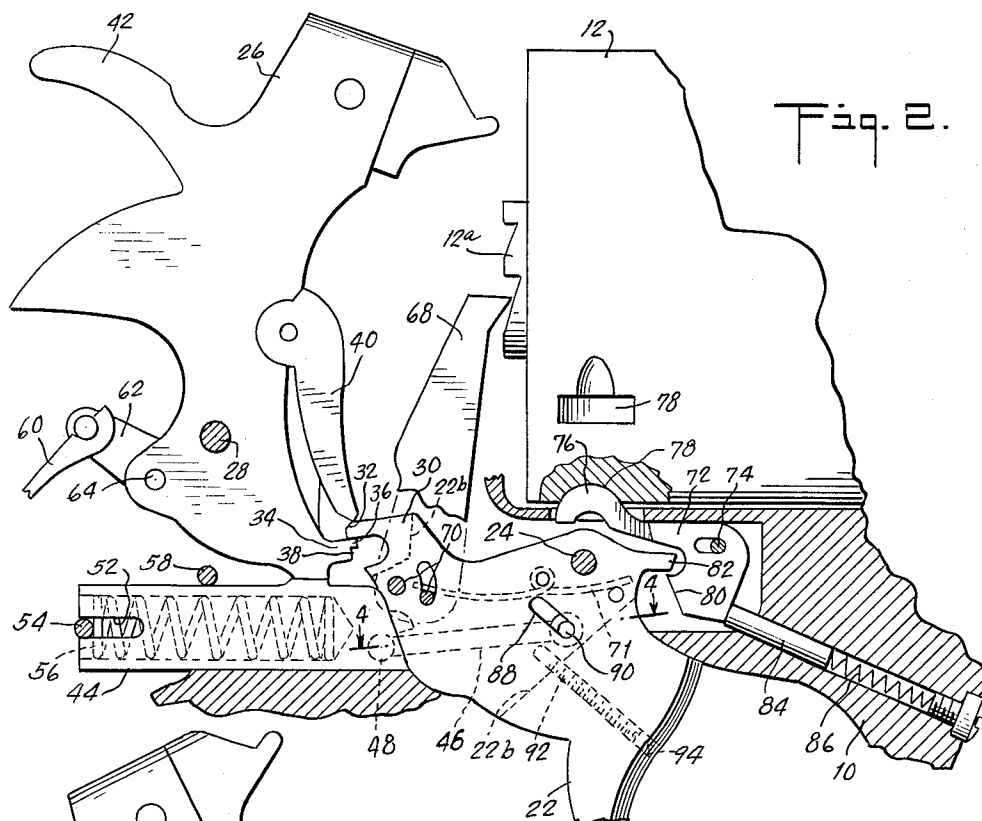
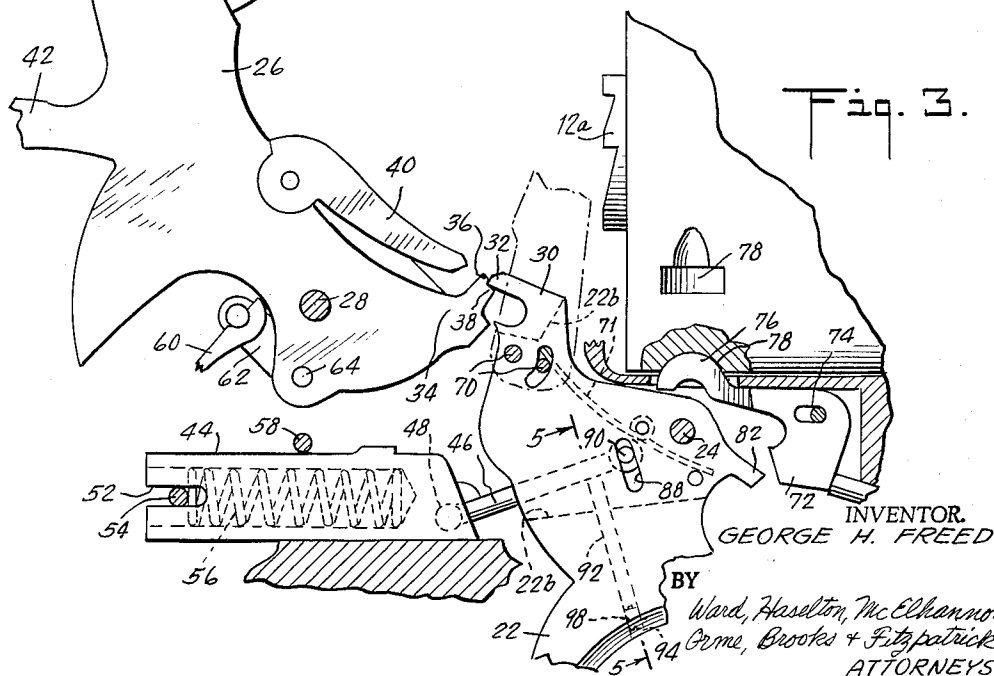
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FIRING ACTION MECHANISM FOR FIREARMS

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4 Sheets-Sheet 2



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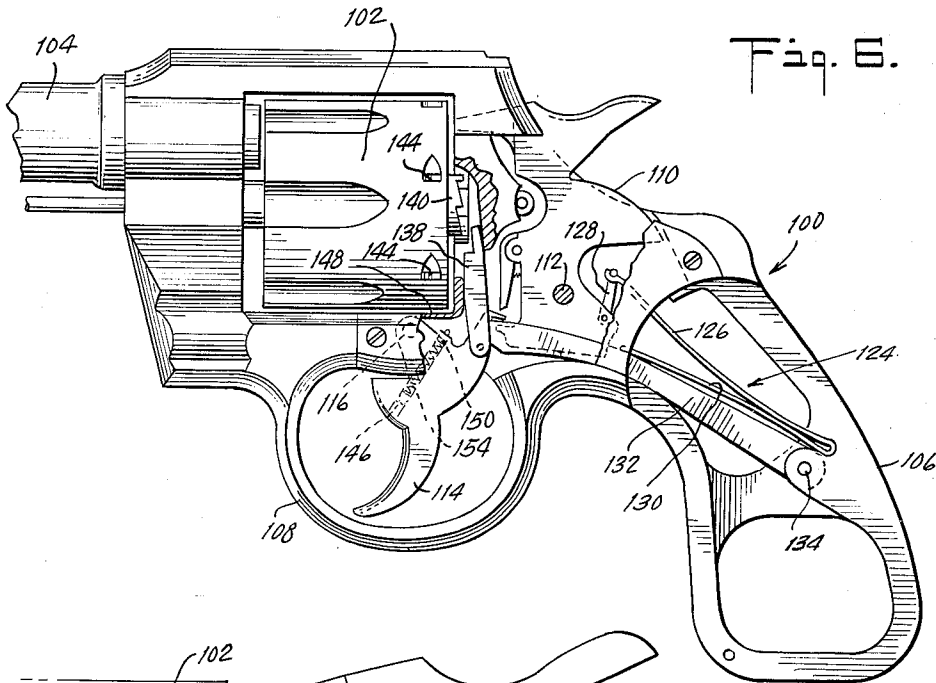
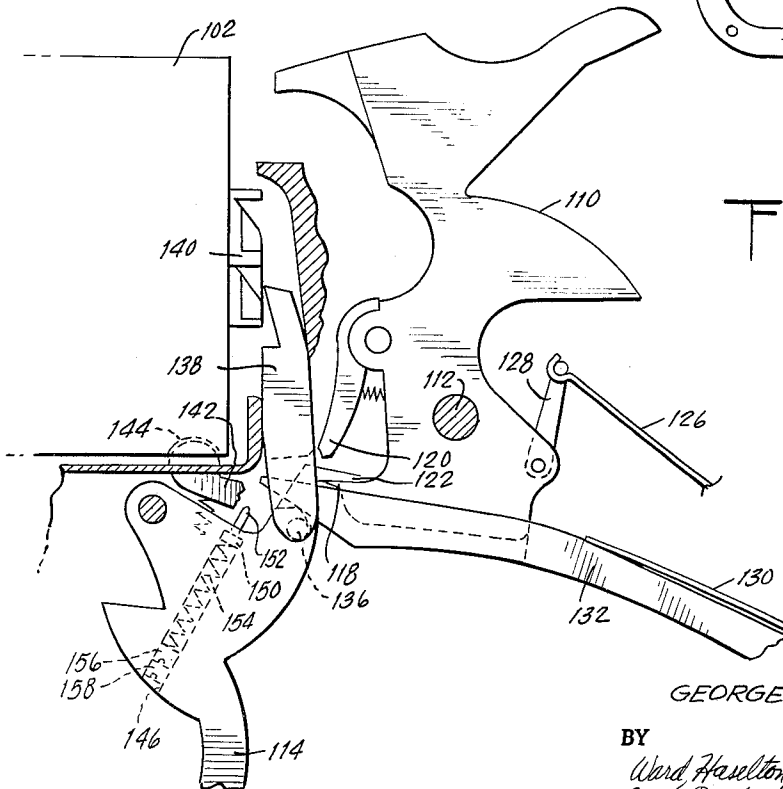
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FIRING ACTION MECHANISM FOR FIREARMS

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4 Sheets-Sheet 3



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FIRING ACTION MECHANISM FOR FIREARMS

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4 Sheets-Sheet 4

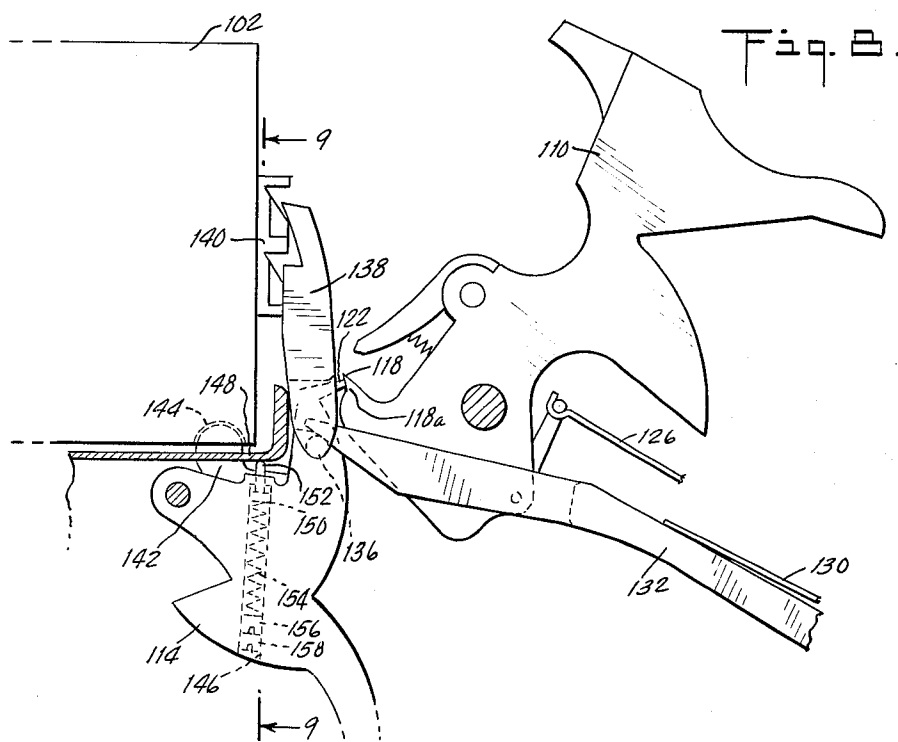
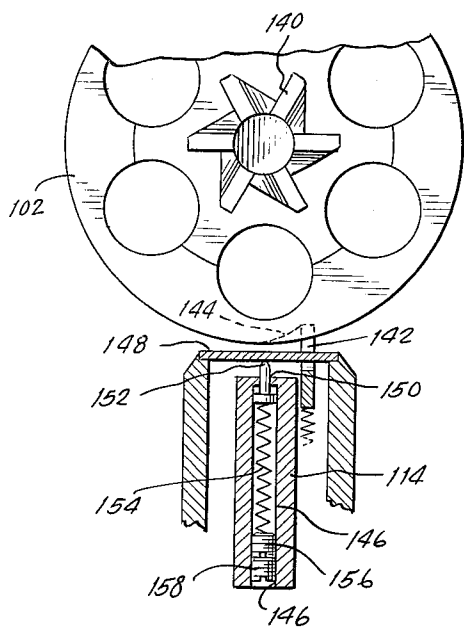


Fig. 9.

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1

3,245,167

**FIRING ACTION MECHANISM FOR FIREARMS**  
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32 Claims. (Cl. 42—65)

This invention relates to firing mechanisms for firearms, and more particularly to reducing the amount of trigger pull required to fire such devices.

Because the invention was made in connection with attempts to reduce and provide a range of variation of trigger pull in revolver type pistols, the invention will be described in connection with such use although it will be understood that the invention may have application in other types of firearms and cartridge firing devices.

Shooting accuracy when firing when small arms, such as revolver pistols, is greatly affected by the amount of finger force required to be exerted by the user in pulling the trigger of the firearm. Accuracy and control in shooting require that the weapon be capable of being fired using a minimum of pull on the trigger, and there exists a need for a safe and effective means for substantially reducing the amount of force required in pulling the trigger when discharging such firearms.

Further, and because such firearms are used under a variety of conditions and circumstances, there exists a need for a means whereby the amount of force required to pull the trigger may be effectively and conveniently adjusted in the same firearm within a range of predetermined amounts as may be desired by the shooter.

With reference to revolver pistols which incorporate a so-called "double action" movement of the lock mechanism, and as is well-known, the amount of finger force required to pull the trigger to fire the weapon using the double action movement depends upon the force required to be exerted by the trigger on the hammer element to cock the latter against the bias pressure of the pistol main spring and the additional amount of force required to overcome auxiliary return spring bias pressures of the mechanism, such as the trigger return spring, etc. When firing the pistol using the so-called "single action" movement of the mechanism, the amount of force required to pull the trigger after the weapon has been cocked depends upon the force required to be exerted by the trigger in disengaging the normal interlocking relationship of its sear element with the sear element of the hammer and the additional amount of force required to overcome the referred to auxiliary return spring pressures of the mechanism. For example, using a typical factory set lock mechanism, the finger must exert a force of from about 2½ to more than 3 pounds on the trigger to fire the weapon either from its manually cocked condition (single action) or from its uncocked condition (double action). Ordinarily, this substantial force required to pull the trigger cannot be reduced because of the equal amount of spring bias force inherently produced by the lock mechanism itself, acting in direction opposite to that of trigger pull, for the purpose of automatically returning the trigger, hand element, hammer, cylinder stop, and other parts to their normal uncocked positions after firing the weapon.

However, and with reference to single action shooting, it is known that pressure in the amount of only a few ounces is required to be developed by the mechanism to safely retain the engagement of the interlocking trigger and hammer sear elements when the pistol is in cocked condition. In view of this, and in attempting to obtain better shooting control and accuracy in conventional small-arms, nimrods succeed in reducing the required amount of trigger pull to some extent by filing and carefully honing the conventional sear elements to

2

either shorten the length of instep of the hammer sear, or to change the relative angle of engagement between the hammer and trigger sear elements, or to change both of these factors.

The filing and honing technique for modifying the interlocking sear arrangement is, however, a dangerous practice since it tends to introduce instabilities in the lock mechanism. That is, the reduction of force necessary to release the sears for firing as is accomplished using the honing techniques is, of course, accompanied by a corresponding reduction in the ability of the trigger to hold the hammer in its cocked position, and therefore the possibility that the weapon will fire prematurely is greatly increased. Such is undesirable both from the standpoint of firing accuracy and safety when using the weapon. Further, at the time of making the modification, there is the possibility that the sear elements may be inadvertently and irretrievably overhoned, whereupon one or both of the hammer and trigger elements is rendered useless and must be replaced since they are incapable of holding their interlocking engagement at all.

The present invention provides a firing action mechanism for firearms wherein the amount of trigger pull as is necessary to fire the weapon is substantially reduced. In addition, the mechanism is such that the amount of trigger pull which is required may be of a predetermined amount, far less than that heretofore considered attainable without incurring the hazard of instability as is produced by the conventional sear honing technique.

Further, the present invention provides a firing action mechanism in a firearm which imparts the very desirable characteristic that the mechanism is subject to adjustment of the amount of finger force which must be exerted on the trigger to fire the weapon, the adjustment capability being within a reasonably broad range from a few ounces to the standard pull of about 3 pounds or more.

It will also be noted that the present invention provides such reduced trigger pull and adjustment of trigger pull in a conventional firing action mechanism in a very economical manner. That is, the invention provides a modified form of trigger which may be simply and easily substituted for the conventional trigger as is included in such mechanisms, whereupon the features and advantages of the invention will be attained.

Moreover, the means for reducing trigger pull in accordance with the present invention does not require any reduction whatever of the ability of the usual trigger return mechanisms to perform their normal functions in such firearms so that, in the case of a revolver pistol, the cylinder rotating and alignment mechanisms operate as effectively as in standard weapons.

In general, the present invention involves the provision of a novel firing action mechanism wherein the net effect of return spring forces on the conventional interlocking sear arrangement is automatically altered and minimized at least at the time when the trigger has been moved to its position wherein the mechanism is cocked and ready for firing, yet the sears safely retain their interlocking relation. The invention will be described in connection with two principal embodiments thereof, in one of which these net effects are altered and minimized commensurate with the movement of the trigger when firing the weapon using its conventional double action characteristic, but in either of which the minimization occurs commensurate with cocking movement of the hammer for firing the weapon using the single action alternative.

In the first of the embodiments to be described, this is accomplished by providing means on the trigger which effect a change of the location of the normal pivotal con-

nection between the trigger and its return spring rod (conventionally called a "trigger lever") as the trigger is moved towards its firing position. After the weapon has been fired, the action of the conventional trigger return mechanism automatically induces a resumption of the normal location of such pivotal connection, whereupon full return action occurs in the weapon. Generally speaking, the inventive feature of the mechanism in either embodiment may be described as a trigger-associated cam arrangement which produces a change in the overall effective return spring forces which are acting on the trigger during the firing movement thereof. That is, whether the mechanism is cocked either using its single action or double action movement, the cam arrangement produces a leverage or moment arm reduction in the return mechanism linkage as the trigger moves towards and attains its position at which it releases the hammer of the mechanism to fire a cartridge, thus reducing the immediate effects on the trigger of both the trigger return spring and the pistol mainspring as the trigger achieves this position.

As incorporated in a Smith & Wesson revolver type pistol which includes provision for double action operation, the conventional trigger of the mechanism is modified to incorporate an elongated trigger pull adjustment slot within the plane of the trigger and extending across the normal transverse axis of pivotal attachment between the trigger and the conventional trigger lever or rod which connects the trigger to its return spring. The trigger pull adjustment slot is disposed at an angle with respect to the conventional location of pivotal attachment of the trigger to the pistol frame, thus permitting the desired camming action during trigger movement which effects a changing of the effective location of attachment between the trigger lever and the trigger. This change of the effective point of pivotal attachment between the trigger and the trigger lever is induced by the location of the end of a set screw of the trigger which, during the trigger movement, engages and lifts the trigger connected end of the trigger lever. By a simple adjustment of the positioning of the set screw, the timing of the cam arrangement during the firing movement of the trigger may be changed so that the amount of trigger pull required to fire the pistol in a given instance will be commensurately changed. In a modified form of this embodiment, the end of the set screw which engages the trigger lever may be slotted, either by a single diametral slot or by criss-cross diametral slotting as will be described, to provide a means for sensing the amount of change of the set-screw setting and, thus, the extent of trigger pull adjustment as has been made.

In another embodiment of the invention which is particularly adapted for adjusting the amount of trigger pull in a Colt revolver type pistol which incorporates a double action feature in its firing action mechanism, the trigger incorporates a similar set screw for adjusting the amount of trigger pull which will be required to fire the weapon. Inasmuch as the conventional Colt type revolver does not include either the aforementioned trigger lever connection to the trigger or a separate trigger return spring, the set screw is threaded into a bore which extends upwardly through the trigger along a line adjacent to but spaced from the location of normal pivotal movement of the trigger so that, at its upper end, the set-screw bore faces a frame element of the revolver. A spring extends within the bore from the set screw to a plunger which is slidably mounted in the bore and which projects outwardly from the trigger at the upper end of the bore for engaging the referred to frame element during firing movement of the trigger. The tension of the trigger spring is adjusted by adjusting the location of the set screw within the bore, such adjustment being determinative of the amount of trigger pull which will be necessary to fire the pistol, as will be seen. In this arrangement the sear element of either the trigger or the hammer, or both of these sear elements, preferably shortened and/or angu-

lated to an extent which, absent the spring biased plunger of the present invention, would be regarded as unsafe for the purpose of retaining the interlocking sear arrangement when the trigger has moved to its position in which the pistol is cocked prior to firing. Upon application of finger force to the trigger, the sear elements disengage in usual manner, and it will be noted that the amount of bias pressure exerted by the novel trigger spring in this embodiment is directly determinative of the finger force required to fire the pistol.

From the foregoing it will be apparent that a feature of the invention lies in the capability of the provided mechanism to be adjusted for fine control of the amount of trigger pull as will be necessary to fire the weapon. This is of particular advantage where the weapon is used by different persons whose personal requirements with respect to trigger "feel" may vary. Further, the adjustability of trigger pull as is afforded by the present invention provides an excellent means of compensating for the ordinary effects of wear of the firing action mechanism elements, or of extremes of temperature thereon.

These and other objects, features, and advantages of the present invention will be more fully apparent from the following detailed description of the invention, when taken together with the accompanying drawings in which:

FIGURE 1 is a side elevational view of a Smith & Wesson double action type revolver pistol which has been modified to incorporate the invention, the frame plate and handle grip plates being removed to better illustrate its details;

FIGURE 2 is an enlarged and fragmentary side elevational view illustrating the firing action mechanism of the revolver of FIGURE 1 with its components in normal or uncocked position;

FIGURE 3 is a view similar to FIGURE 2 but showing the same elements in their single action cocked position ready for firing;

FIGURE 4 is an enlarged fragmentary sectional view taken along lines 4—4 of FIGURE 2;

FIGURE 5 is a similarly enlarged and fragmentary sectional view taken along lines 5—5 of FIGURE 3;

FIGURE 6 is a fragmentary side elevational view of a Colt double action type revolver pistol which has been modified to incorporate the invention, the frame plate and handle grip plates being removed to illustrate details;

FIGURE 7 is an enlarged and fragmentary side elevational view illustrating the firing action mechanism of the revolver of FIGURE 6 with its components in their normal or uncocked position;

FIGURE 8 is a view similar to FIGURE 7 but showing the components in their single action cocked position ready for firing;

FIGURE 9 is a sectional view taken along lines 9—9 of FIGURE 8; and

FIGURE 10 is a side elevation of a modified form of trigger and trigger lever assembly as may be substituted in the mechanism of FIGURE 1.

Referring to FIGURE 1, one embodiment of a firing action mechanism incorporating the invention is shown in a Smith & Wesson pistol. The pistol has a frame 10, which houses and supports its operative elements including its firing action mechanism, a revolving cartridge chamber cylinder 12 and a barrel 14.

The frame 10 includes a hollow handle portion 16, a trigger guard 18, and a swingable mechanism (not shown) which permits the cylinder 12 to swing outwardly therefrom for ejection of spent cartridges and for the replacement of new ammunition. An extractor rod 20 is provided in the frame 10 ahead of the cylinder 12 to facilitate this operation.

The firing action mechanism of the pistol includes a trigger 22 which moves back and forth in the frame about a trigger pin 24, and a hammer 26, which also moves back and forth in the frame about a hammer pin 28. The trigger is provided with a finger squeeze

portion 22a which is constructed to accommodate the index finger of a person using a revolver such that upon application of normal rearward squeezing pressure, the trigger will pivot from its normal position to its cocking position.

The trigger 22 includes an upper extension 30 which terminates at a trigger sear 32. The hammer includes an extension 34 which terminates at a single action hammer sear 26. This single action hammer sear, as more clearly shown in FIGURES 2 and 3, includes a notch 38 so that when the hammer is moved to its cocked or retracted position (FIGURE 3), the notch 38 forms an interlock with the trigger sear 32 which prevents forward movement of either the hammer 26 or the trigger 22. The trigger, however, is not prevented by the interlock from further rearward movement and when such movement occurs the sears disengage to permit the hammer 26 to swing forward responsive to the urging of the pistol mainspring 60 and thereby fire a cartridge within the cylinder 12.

The hammer also includes a separately and independently operable double action sear 40, pivotally attached at one of its ends to the hammer at 26 and depending therefrom to a point above the single action hammer sear 36. The double action sear 40 is spring biased to an outer position as shown so that when the parts are in their normal uncocked positions, as in FIG. 2, the trigger sear 32 extends into the space between the single action and double action hammer sears 26 and 40.

In single action operation, the hammer 26 is pulled back manually, as by thumb pressure exerted at a thumb rest 42 on the back of the hammer. During this movement, single action hammer sear 36 rises and engages the underside of the trigger sear 32, thus urging the trigger 22 to move rearwardly. This movement continues until the hammer and trigger are in their cocked positions shown in FIGURE 3. At this point, the sears 36 and 32 interlock as previously described, and are retained in such interlocking relation by resilient biasing means, described more fully hereinafter. Thus, the trigger and hammer are maintained in their cocked positions until the trigger is pulled further back for sear disengagement and firing.

In double action operation, the trigger 22 itself is pulled back using finger force and its sear 32 engages the outwardly protruding double action hammer sear 40. Upon continued rearward movement of the trigger this sear engagement lifts and swings the hammer 26 in rearward direction, against the bias of the mainspring 60, to a cocked position beyond which the sears 32 and 40 come out of engagement and the hammer swings forward responsive to mainspring bias, whereupon the weapon is fired. The double action hammer sear 40 is pivotal against its spring bias in direction towards the hammer and thus permits the trigger sear 32 to return, after firing to its normal position between the single and double action hammer sears 36 and 40.

As previously indicated, the hammer 26 and trigger 22 are each biased against rearward pivotal movement about their respective mounting pins 24 and 28, and they therefore tend to assume their normal positions shown in FIGURES 1 and 2. The means which bias the trigger 22 in forward direction include a horizontally movable rebound slide 44 which acts, through a trigger push rod or trigger lever 46, to push the trigger 22 toward its forward position. The trigger lever 46 extends into a central channel formed in the plane of the trigger (as indicated by the channel upper and lower limits 22b) and is connected to the trigger by a slidable interconnection which forms a part of the camming mechanism to be described. The trigger lever 46 projects rearwardly from the trigger 22, and its rearward end is pivotally attached to the rebound slide 44 by a ball and socket type arrangement 48. The rebound slide 44 is provided with a slot 52 which extends longitudinally from its left end (as

viewed in FIGURES 1 and 2). The slide is partially guided in its horizontal travel by a stop pin 54 which extends through the slot 52. A coil compression spring 56 acts between the stop pin 54 and the rebound slide 44 to urge the slide and thus the trigger lever 46 and trigger 22 in a forward direction. A second guide pin 58 is attached in fixed position to the frame 10 and extends across the top of the rebound slide 44 to aid in guiding it along its horizontal path. This second guide pin serves to counteract certain reaction forces to which the rebound slide is subjected when operating in conjunction with the present invention.

The hammer 26 is biased towards its forward, or uncocked position by the leaf type mainspring 60 which is cantilevered from one of its ends at the bottom of the handle portion 16 of the frame 10, and connected at its opposite end through a stirrup 62 and stirrup pin 64 to the hammer 26. The stirrup pin 64 is located below the hammer pin 28 so that retraction of the hammer urges the mainspring forward, thus stressing it for firing. When the hammer is released, as in the aforescribed firing actuation, the mainspring 60 swings towards its unstressed position, thus rapidly swinging the hammer against a cartridge in the cylinder 12 to fire the same. A strain screw 66 is provided near the bottom of the frame and is movable against the mainspring to adjust its effective bias for controlling the force of the hammer blows in firing.

There has thus far been described the basic firing elements of the pistol, namely, the trigger 22, the hammer 26, their interacting sears 32, 36 and 40 and their return spring means, all of which cooperate to permit the hammer to be pulled back or cocked, and thereafter released or fired in a controlled manner.

In addition to these basic elements, there are certain other operative members which move in response to trigger and hammer movements and whose inherent friction and inertia complicates the problem of reducing trigger pull. One such element is a hand 68 which is pivotally pinned, as at 70, to the trigger 22 and which operates in response to trigger movements to rotate the cylinder 12 so as to bring a new cartridge into alignment with the hammer 26 and the barrel 14 each time the weapon is fired. The hand 68 is biased, by means of a coiled wire hand spring 71, against the conventional ratchet 12a formed on the rear surface of the cylinder 12, and the cylinder rotates a predetermined amount each time the trigger 22 is pulled. When the trigger returns to its normal position, it pulls the hand 68 downward over the ratchet of the cylinder 12 so that the hand is positioned below the succeeding tooth of the ratchet for the next actuation. There is a certain amount of friction involved in the hand action which has been described, and to overcome it the coil type compression spring 56, which supplies the trigger return force, must have commensurately higher bias pressure, such being achieved by greater spring stiffness than would otherwise be required to return the trigger alone.

Another operative member which moves in response to the trigger and hammer movements is a cylinder stop 72 which is pivoted on the frame 10 in a pin and slot mounting arrangement 74 immediately ahead of the trigger 22. The cylinder stop 72 includes an upward projecting lug 76, which, in the normal position shown in FIG. 2, protrudes up through the frame 10 and engages one of several alignment slots 78 in the cylinder 12 to hold the cylinder in properly aligned position between the hammer 26 and the barrel 14. At its underside, the cylinder stop 72 has a sear type protrusion 80 which is positioned with respect to a cooperating sear type protrusion 82 of the trigger such that initial trigger movement in the rearward direction causes the cylinder stop to pivot so as to withdraw its lug 76 from engagement with one of the alignment slots 78, thus allowing the upwardly moving hand 68 to rotate the cylinder 12 to a new position. In order

that the cylinder stop 72 may automatically secure the cylinder in position when a succeeding slot 78 is in alignment with the stop, there is provided a push rod 84 mounted on the pistol frame and biased by a spring 86 against the cylinder stop to urge its lug 76 against the cylinder immediately after the lug has been cleared from a previous slot 78. When the trigger 22 returns to its normal position after firing, its sear type protrusion 82 must force its way past the sear type protrusion 80 on the cylinder stop 72 so that the cylinder stop will be operated in the same manner the next time the weapon is fired. This is permitted by the pin and slot mounting arrangement 74 of the cylinder stop which allows the trigger protrusion 82 to push the cylinder stop back against its biasing spring 86 while the trigger protrusion 82 slips over the cylinder stop protrusion 80. Thus, here too a certain amount of extra force is required to be exerted by the trigger return spring to enable the trigger to return to its normal prefiring position such additional force being required to force the cylinder stop back, and this extra force is also provided by increasing the stiffness of the coil compression spring 56.

There are other operative elements, including a hammer block, which also are operated by the trigger and hammer movements, but which have been deleted from the drawings in order more clearly to illustrate the arrangement of the present invention. All of these other operative elements, like those above described, are dependent for at least a part of their movements upon the force supplied by the trigger return spring 56. As a consequence, this spring must be of a rather high stiffness, and the force in opposite direction required to pull the trigger is commensurately high.

The novel arrangement of the present invention, which is best shown in FIGURES 2 and 3, utilizes a slidable as well as pivotal interconnection between the forward end of the trigger lever 46 and the trigger 22. This interconnection is provided by a slot 88 of the trigger 22 and a transversely extending pin 90 at the forward end of the trigger lever 46 which slidably engages the trigger slot 88. The slot 88 is formed transversely through the trigger and, since it opens into the trigger channel 22b, the slot actually consists of two cofacing and coextensive slots at the respective sides of the channel, and the pin 90 takes the form of oppositely projecting pin portions engaging the respective slots. A cam arrangement for altering the position of the pin 90 along the length of the trigger slot 88 is provided by a set screw 92 which extends through and threadedly engages a longitudinal bore 94 in the trigger 22, the set screw 92 functioning as a cam rod to engage and lift the forward end of the trigger lever 46. The upper end of the set screw 92, which projects a predetermined distance into the trigger channel 22b, actually engages the trigger lever 46 at a location intermediate the ends of the latter, and it is seen that the threaded mounting of the set screw 92 renders it subject to adjustment of its projecting length. Because the referred to camming engagement occurs during the rearward movement of the trigger, it will be understood that the extent of projection of the set screw 92 into the trigger channel 22b will be determinative of the ultimate positioning of the trigger lever pin 90 along the length of the trigger slot 88 when the mechanism has achieved its cocked position. Thus, the amount of trigger pull required to fire the weapon is subject to variation within the range of such projection of the set screw 92.

The angulation and orientation requirements of the slot 88 and the cam rod 92 will be understood from the following description of the operation of the mechanism.

When the trigger 22 is in its normal position as shown in FIG. 2, the rebound slide 44 is in its forwardmost position. The pin 90 at the forward end of the trigger lever 46 is positioned at the lowermost end of the trigger slot 88 almost directly below the trigger pivot pin 24. The set screw or cam rod 92 is adjusted by threading the

same either farther into or out from the trigger bore 94 so that its projecting upper end just touches the trigger lever 46. The location of the bore 94 is such that the set screw 92 engages the lever 46 at a point therealong which is more radially displaced from the trigger pivot pin 24 than is the pin end 90 of the trigger lever 46. As the trigger 22 is pulled back, either by finger pressure thereon, as in double action operation, or by means of the single action hammer sear 36 acting thereon, as in the single action operation, the trigger urges the trigger lever 46 and the rebound slide 44 in rearward direction to compress the trigger return spring 56. During the course of this rearward movement, the end of the cam rod 92 pushes against the trigger lever 46 in an upward direction. Since the radial distance from the trigger pivot pin 24 to the upper end of the cam rod 92 is greater than the radial distance from the pivot pin 24 to the lower end of the trigger slot 88, the cam rod 92 moves with a more rapid upward linear velocity than does the lower end of the trigger slot. The cam rod thus pushes the forward end 90 of the trigger lever 46 upwardly within the trigger slot 88 so that, in the full cocked position of FIG. 3, the pin 90 is positioned nearly at the top of the slot 88.

The significance of this is that with the pin 90 in this position, the force of the trigger return spring 56, acting through the trigger lever 46, is now directed along a line which very nearly intersects the transverse pivotal axis of the trigger pivot pin 24. This reduces the effective torque arm through which the trigger lever 46 may act to rotate the trigger back toward its normal position, and thus considerably reduces the amount of return force which the spring 56, though fully stressed, can exert on the trigger. As a result, the trigger, once in the single action cocked or retracted position, may be pulled back the requisite slight additional distance for firing with a minimum of effort. It is also seen that trigger pull is reduced during a double action actuation of the mechanism, since the location of the pivotal connection 90 between the trigger lever 46 and the trigger 22 (at the slot 88) is changing in the same respect during the firing movement of the trigger.

After firing, when the trigger is released, its initial forward movement causes its cam rod 92 to commensurately move away from the underside of the trigger lever 46, thus allowing the forward end 90 of the trigger lever to move downwardly within the slot 88. This increases the torque arm through which the trigger return spring 56 may act on the trigger so that the restoring force on the trigger is being increased even while the spring 56 is becoming unstressed.

The above-described operation is, of course, effective in both the single and the double action operation of the revolver to reduce the amount of trigger pull required to fire the weapon. While FIG. 3 shows single action cocking, it will be observed that the trigger and trigger lever positions, and hence the trigger return forces will be substantially the same when the double action hammer sear is being engaged at the cocked position or firing point.

It will be appreciated from the above, that there are certain positional relationships which should be maintained between the trigger pivot pin 24, the trigger slot 88 and the cam rod 92.

Although other positional relationships of these elements may permit the desired variation in the effective torque arm between the connection end 90 of the trigger lever 46 and the trigger pivot pin 24, in the preferred form of the embodiment of the invention being described the trigger slot 88 is straight rather than curved, its lower end terminus being located virtually directly below and spaced from the location of the trigger aperture by which the trigger is pivotally mounted on the pivot pin 24, and its upper end being spaced a smaller distance away from the same aperture and facing substantially towards the trigger sear 32 at the rearward end of the trigger 22 when

the trigger is in its normal prefiring position as shown in FIGURE 2. That is, the lower end of the slot 88 is substantially at the conventional location of pivotal detachment between the trigger lever 46 and the trigger 22 in a standard firing action mechanism of the type, and the slot 88 extends rearwardly and upwardly with respect to the body of the trigger, the upper end terminus of the slot being closer to the location of pivotal connection of the trigger than is the lower end of the slot. The direction of the trigger bore 94, within which the set screw 92 is mounted, is substantially parallel to the slot 88 as shown in FIGURE 2, the bore 94 being spaced a distance away from the line of the slot 88 at that side of the slot which is opposite that of the referred to aperture by which the trigger is mounted on the pivot pin 24. Of course, the length or configuration or orienting of the trigger slot 88 may be varied depending upon the length of the trigger lever 46, the locus of intended movement of its forward end, the location of the trigger return spring 56, any variation of the location or orienting of the bore 94 insofar as the latter effects the point location of engagement of the cam rod 92 with the trigger lever 46, or other factors as will be understood.

For maximum reduction of trigger pull in the arrangement described, the extent of projection of the cam rod 92 within the trigger channel 22b is as aforesaid, i.e., that in which the upper end of the rod 92 engages the underside of the trigger lever 46 when the trigger is in its normal position as seen in FIGURE 2. The spacing of the bore 94 away from the slot 88 is such that, at the cocked position of the trigger as shown in FIGURE 3, the trigger lever 46 is lifted to a position just below a position in alignment with the trigger pivot pin 24. If a greater amount of trigger pull is desired, the extent of projection of the cam rod 92 is shortened by turning the rod in counterclockwise direction on its threaded connection within the bore 94. A screw head (not shown) is provided at the lower end of the rod 92 for the purpose, and the trigger guard 18 may be drilled through to provide convenient access of a screw driver. When its projection has been thus shortened, the rod 92 will not engage the trigger lever 46 until a later time during the rearward movement of the trigger, whereupon it will move the trigger lever end 90 only part way up the slot 88. Thus, the torque or moment arm between the lever end 90 and the trigger pivot point 24 will be longer, with consequent greater return spring forces acting upon the trigger. The force required to be exerted in opposite direction on the trigger to pull the same in firing the weapon is therefore commensurately greater. When the cam rod 92 is backed off to a location where it will not engage the trigger lever 46 at all during trigger movement, then the mechanism will act as a conventional mechanism, and require some 3 pounds or more of trigger pull to discharge the sear elements from their single action cocked position, or to fire the weapon using the double action movement.

In order to provide a more precise adjustment of the position of the cam rod 92, its upper end may be provided with a saddle shaped groove 96 as shown in FIG. 5. This gives a snap effect as the trigger lever 46 settles into the groove 96 each time the cam rod 92 is turned 180°. Alternatively, the grooving may be in a criss-cross arrangement imparting a snap effect upon each 90° of revolution of the cam rod 92. The additional groove is indicated by reference numeral 96a (FIGURE 4). By counting these snaps one may conveniently adjust the trigger mechanism to give any desired degree of trigger pull. This is especially advantageous where the weapon is to be used by different persons, or where because of wear or changing environmental conditions, it is desired to change the amount of trigger pull with a great deal of precision.

Also, as shown in FIG. 5, there may be provided a locking screw 98 which threads up against the lower end

of the rod 92 and maintains its adjustment against the vibratory shock effects encountered in firing.

FIGS. 6 through 9 illustrate the present invention as embodied in a Colt type revolver. The Colt revolver, like the Smith & Wesson, includes a metal frame 100 which houses and supports the various operative elements of the weapon including its firing action mechanism, a revolving cartridge chamber cylinder 102 and a barrel 104. Also, as in the Smith & Wesson revolver, the frame 100 of the Colt revolver includes a hollow handle portion 106, a trigger guard 108, and a swingable mechanism (not shown), which permits the cylinder 102 to swing outwardly for ejection of spent cartridges and for the replacement of new ammunition.

The firing action mechanism of the Colt revolver is similar to the above described Smith & Wesson mechanism to the extent that it includes a hammer 110 which is pivotable about a fixed hammer pin 112 and a trigger 114 pivotable about a fixed trigger pin 116, and in that the hammer includes single and double action sears 118 and 120, which cooperate with a trigger sear 122 to control the retraction and triggering of the hammer.

The hammer 110 and trigger 114 of the Colt revolver are spring biased to their respective forwardmost positions as shown in FIG. 6 by means of an integrally formed double leaf mainspring 124 housed in the hollow handle portion 106 of the frame 100. The mainspring includes an upper leaf 126 connected to a stirrup 128 which is pinned to the hammer 110 at a point below the hammer pin 112. The upper leaf 126 acts through the stirrup 128 to urge the hammer 110 toward its forward or firing position as shown in FIG. 6.

The mainspring 124 also includes a lower leaf 130 which exerts downward pressure upon a rebound lever 132. The rebound lever is pivotally mounted at one of its ends by means of a pivot pin 134 located in the handle portion of the frame. The other end of the rebound lever 132 bears down upon a hand axle 136 which projects laterally from the hand element 138 and which provides a pivotal mounting thereof on the trigger. The downward bias force of the lower leaf 130 of the mainspring acts upon the rebound lever 132 which in turn presses down on the hand axle 136 to urge the trigger toward its forward position as shown in FIG. 6.

It will be seen that rearward movement of the trigger 114 will cause the hammer 110 to pivot in rearward direction, and that this pivoting of both the hammer and the trigger will cause the upper and lower leaves 126 and 130 of the mainspring 124 to move closer to each other under stress. When the engaging sears 118 or 120 of the hammer and 122 of the trigger become disengaged, as in firing, the hammer is thrown forward by the action of the upper leaf 126 of the mainspring 124. When the trigger is thereafter released, the lower leaf 130 of the mainspring acts upon the rebound lever 132 which presses down on the hand axle to move the trigger back toward its forward position.

The hand element 138 operates a ratchet 140 at the rear surface of the cylinder 102 to turn the cylinder each time the trigger 114 is moved in rearward direction. This action is similar to that described above in connection with the Smith & Wesson revolver.

There is also provided a cylinder stop 142 which, as illustrated in FIGS. 8 and 9, projects up into one of several slots 144 located about the periphery of the cylinder 102 to align the cylinder such that a cartridge will be located in proper position with respect to the hammer and with respect to the barrel 104 for firing.

The cylinder stop 142 and the hand element 138 are both returned to their normal positions after firing by the force of the lower leaf 130 of the mainspring 124 acting to return the trigger to its forwardmost position. It will thus be appreciated that if these elements are to operate properly, the mainspring 124 must be made relatively stiff. This stiffness in turn causes an increase in

the trigger pull or amount of force necessary to pull back on the trigger when firing the weapon.

In this embodiment of the invention, and as shown in FIGS. 8 and 9, there is provided a bore 146 extending up through the trigger 114 at a location such that, at the firing position of the trigger (FIG. 8) the upper end of the bore faces a horizontal portion 148 of the frame 100. A plunger 150 is slidably mounted within the bore 146. The plunger 150 has a reduced diameter tip portion 152 which extends out through a correspondingly reduced diameter portion of the trigger bore 146 at its upper end, as indicated on the drawings. The reduced diameter of the plunger and trigger bore serve to permit the tip of the plunger to protrude out toward the horizontal portion 148 of the frame while preventing the plunger itself from coming out of the bore. A coil type trigger spring 154 extends within the bore 146 and urges the plunger 150 upwardly towards the horizontal portion 148 of the frame 100. The amount of outward force exerted by the spring 154 is controlled by means of an adjustment setscrew 156 which threadedly engages the lower end of the bore 146. As described in connection with the first embodiment, there may be provided an additional locking setscrew 158 to maintain a given setting of the adjustment setscrew 156.

As illustrated in FIG. 8, when the trigger 114 has moved to its retracted position whereat its sear 122 is in interlocking engagement with the single-action sear 118 of the hammer 110 (under the hammer sear instep 118a), the plunger 150 is in slightly depressed condition against the horizontal portion 148 of the frame 100. It will be seen that when the trigger is in this position the trigger 114 actually encounters increased resistance to further rearward movement because the plunger 150 now extends between the spring 154 and the frame element 148, the plunger being out of engagement with the narrowed upper end of the trigger bore 146. The amount of increased resistance is equal to the bias pressure of the spring 154.

FIG. 8 shows the single action hammer sear 118 in engagement with the trigger sear 122 at the cocked position of the weapon immediately prior to firing. In a preferred form of the invention in this embodiment, the interface between the sears 118 and 122 is disposed at an angle with respect to the line intersecting the hammer and trigger pivot pins 112 and 116 such that the hammer sear 118, pushing downwardly under the influence of the hammer spring bias, actually urges the trigger to move further in the rearward direction, thus tending to cause an overriding of the sears and a triggering of the weapon. That is, the sear arrangement tends to cooperate with the mainspring bias on the hammer to urge the trigger toward a firing position over the opposition of the return spring bias acting on the trigger via the rebound lever 132. This is the same effect as is produced when the sears in a conventional firing mechanism are severely overhoned. By itself it is a dangerous and wholly undesirable arrangement for obvious reasons. However, by reason of the action of the spring biased plunger 150 of the present invention, the above described sear and bias condition is actually turned to advantage.

In single action operation, the trigger 114 and hammer 110 are brought to their cocked positions as shown in FIGURE 8 by manual movement of the hammer in the rearward direction. Upon these elements reaching these positions, the plunger 150 on the trigger is in depressed condition against the horizontal portion 148 of the frame 100, as aforesaid. However, the bias of the trigger spring 154 is sufficient to urge the trigger toward its forward position in a manner augmenting the normal forward biasing of the trigger afforded by the lower leaf 130 of the mainspring 124.

The amount by which the trigger spring 154 overcomes the hammer sear override effect is dependent upon

the setting of the adjustment setscrew 156 since the tension of the trigger spring may be made greater or less by such adjustment. It will therefore be appreciated that the position of the adjustment screw may be varied to control very closely the amount of trigger pull necessary to fire the revolver. The natural tension of the spring 154 is selected such that when the setscrew 156 and lock screw 158 are in their most withdrawn positions within the trigger bore 146 the tension of the spring urges the trigger sear 122 against the hammer sear instep 118a with force just sufficient to prevent the aforementioned sear override. This is the condition of minimum trigger pull, and it will be noted that very slight finger pressure on the trigger is required to overcome this bias pressure of the spring 154 so as to further depress the plunger 150, permitting slight further rearward movement of the trigger to release the interlocking engagement of the sear elements and fire the weapon. Positioning the setscrew 156 farther inwardly along the length of the bore 146 increases the bias pressure of the spring 154, by compressing the same within the bore, whereupon the amount of trigger pull required to trigger the weapon will be commensurately increased. Such reduction and control of the requisite trigger pull to fire the weapon is substantially completely independent of the stiffness of the mainspring trigger return force exerted by the rebound lever so that the ability of the firing action mechanism to return its various elements to their normal positions is not affected by the arrangement.

Reverting to the FIGURE 1 embodiment of the invention, a modified form of trigger which may be substituted for the trigger 22 therein is shown by FIGURE 10. The trigger 222 of FIGURE 10 is in all respects the same as the trigger 22 of the FIGURE 1 showing, excepting for the location of the longitudinal bore 294 and setscrew 292 therein as compared with the location of the bore 94 and setscrew 92 on the trigger 22, as perhaps more clearly indicated by a comparison of FIGURES 10 and 2. That is, the trigger 222 includes a finger engagement portion 222a, an aperture 224 for its pivotal mounting on the revolver 10, a sear element 232, and a slot 288 within which the forward end 90 of the trigger lever 46 is mounted for pivotal and slidable movement. The trigger 222 also has a central channel through which the trigger lever 46 extends, the channel being indicated by its upper and lower extremities 222b. However, in this embodiment, the bore 294 extends upwardly through the trigger to the lower end terminus of the slot 288, as shown. Thus, the setscrew 292, which threadedly engages the bore 294 so that it may be adjusted therealong, projects at its upper end into the lower end region of the slot 288, and will therefore engage the forward end 90 of the trigger lever 46 during movement of the trigger towards its firing position when mounted in the pistol 10. It will be understood that such positioning of the adjustable setscrew 292 with respect to the trigger lever 46 directly determines the location of the forward end 90 of the trigger lever within the slot 288, and may therefore facilitate adjustment of the positioning of the trigger lever 46 with perhaps greater accuracy than the adjustment may be made in the trigger 22. Moreover, it will be noted that, when the trigger 222 is mounted in the pistol 10 and moved in rearward direction towards its firing position, its movement will not induce any substantial slidable movement of the trigger lever end 90 within its slot 288 since the trigger return spring 56 will bias the trigger lever end 90 against the upper end of the setscrew 292, and the camming action on the trigger lever 46, as would otherwise occur were the setscrew 292 displaced to the position of the setscrew 92 in the trigger 22, does not occur. The amount of finger pull on the trigger which is required to fire the weapon is therefore substantially constant throughout the range of trigger movement, and may be adjusted to a greater or lesser amount simply by a repositioning of the setscrew 292 within the bore 294.

What is claimed is:

1. In a cartridge firing device having a frame, a firing action mechanism comprising a trigger mounted for movement to a position thereof triggering the mechanism to fire a cartridge, bias means connected to said trigger for urging the trigger against its said movement, and means for altering the location of connection of said bias means on said trigger responsive to said movement of the trigger whereby resistance to said movement of the trigger is reduced.

2. In a cartridge firing device having a frame, a firing action mechanism according to claim 1 wherein the last said means comprises means defining a projecting portion of said trigger.

3. In a cartridge firing device having a frame, a firing action mechanism according to claim 1 wherein said bias means comprises spring means mounted on said frame and linkage means connecting said spring means and said trigger, said linkage means including a member mounted for slidable movement on said trigger, and said means for altering the location of connection of said bias means on said trigger comprises means for engaging said linkage means to induce slidable movement of its said slidable member during at least the terminal portion of said movement of the trigger whereby the effect of said urging of the bias means on said trigger is reduced.

4. In a cartridge firing device having a frame, a firing action mechanism according to claim 3 wherein said means for engaging said linkage means comprises means defining a projecting portion of said trigger.

5. In a cartridge firing device having a frame, a firing action mechanism according to claim 4 wherein the extent of projection of said projecting portion of the trigger is adjustable.

6. In a cartridge firing device having a frame, a firing action mechanism according to claim 4 wherein the extent of projection of said projecting portion of the trigger is such that it engages said linkage means during the entire time of said movement of the trigger to its said position.

7. In a cartridge firing device having a frame, a firing action mechanism comprising a trigger mounted for pivotal movement on said frame between a first position of the trigger and a second position thereof triggering the mechanism to fire a cartridge, spring means mounted on said frame, means including a trigger lever connecting said spring means and said trigger whereby said spring means urges said trigger towards its said first position, said trigger lever having an end slidably connected to said trigger for movement between a first connection location and a second connection location on the trigger, and means for urging said trigger lever end from its said first connection location towards its said second connection location responsive to pivotal movement of said trigger from its said first position to its said second position and for permitting return of said trigger lever end to its said first connection location responsive to pivotal movement of said trigger from its said second position to its said first position, said connection locations being disposed with respect to the axis of said pivotal movement of the trigger whereby the effective urging of said spring means on said trigger is decreased as said lever end moves from its said first connection location towards its said second connection location.

8. In a cartridge firing device having a frame, a firing action mechanism according to claim 7 wherein said second connection location on said trigger is closer to the axis of said pivotal movement of the trigger than is said first connection location.

9. In a revolver type pistol, a firing action mechanism comprising a trigger mounted for pivotal movement from a released position thereof towards a position thereof triggering the firing action mechanism to fire the pistol, said trigger having a trigger sear, a hammer element mounted for pivotal movement from a released position thereof in which the pistol is fired to a cocked position thereof spaced

away from said released position, said hammer element having a hammer sear engaging said trigger sear during said pivotal movements of said trigger and hammer element whereby pivotal movement imparted to one imparts pivotal movement to the other, spring means urging said trigger and hammer elements towards their said respective released positions, and means for reducing the bias effects of said spring means on said trigger responsive to, and at least during the terminal portion of, said movement of the trigger towards its said position thereof triggering the mechanism.

10. In a revolver type pistol, a firing action mechanism according to claim 9 wherein the last said means comprises spring bias means mounted on said trigger and depressible upon said trigger substantially attaining its said triggering position to urge said trigger towards its said released position whereby said engagement between said hammer sear and said trigger sear is retained, the relative configurations of said hammer sear and trigger sear with respect to each other being such that said engagement therebetween is not otherwise substantially retained when said trigger is in said position.

11. In a revolver type pistol, a firing action mechanism according to claim 10 wherein said spring bias means further comprises means defining a bore within said trigger, said bore being threaded along at least a portion of its length extending from one of its ends, means defining a narrow neck opening of the bore at the other of its ends, a plunger mounted for slidable movement within said bore adjacent said other end thereof and having a narrowed tip portion projecting outwardly of said trigger through said narrow neck opening of the bore, a setscrew in threaded engagement with said threads of the bore, and a depressible spring within said bore and extending between said plunger and said setscrew.

12. In a revolver type pistol, a firing action mechanism according to claim 9 wherein said spring means urging said trigger and hammer elements towards their said respective released positions comprises a separate hammer spring and a separate trigger return spring, said trigger return spring being mounted at a location below that of the axis of pivotal movement of said trigger and spaced away from said trigger at that end of the latter which corresponds to the direction of said pivotal movement of the trigger towards its said triggering position, and said means for reducing the bias effects of said spring means on said trigger comprises means defining an elongated slide on said trigger, a trigger lever having one end connected to said trigger slide for slidable movement with respect to said trigger and another end connected substantially to said trigger return spring, said trigger slide being spaced from and generally below the axis of pivotal movement of said trigger and extending generally in the direction of said movement of the trigger towards its said triggering position, and projecting means on said trigger disposed in spaced relation with respect to said slide and for engagement with said trigger lever during said movement of the trigger towards its said triggering position whereby said one end of the trigger lever is urged in its said slidable movement with respect to the trigger.

13. In a revolver type pistol, a firing action mechanism according to claim 12 wherein said slide has a lower end located a substantial distance below the axis of pivotal movement of said trigger when the trigger is in its said released position and an upper end which, when said trigger is in its said triggering position, is located substantially on but immediately below an imaginary line extending between said other end of the trigger lever and the axis of pivotal movement of the trigger, said one end of the trigger lever adjacent said lower end of the slide when said trigger is in its said released position.

14. In a revolver type pistol, a firing action mechanism according to claim 13 wherein said projecting means on said trigger engages said trigger lever when said trig-

ger is in its said released position whereby said one end of the trigger lever is urged to said upper end of the slide upon completion of said movement of the trigger towards its said triggering position.

15. In a revolver type pistol, a firing action mechanism according to claim 14 wherein said projecting means on said trigger is adjustable to a position thereof out of engagement with and below said trigger lever when said trigger is in its said released position, said projecting means engaging said trigger lever only after said movement of the trigger has been initiated whereby said one end of the trigger lever moves only a portion of the length of said slide away from said lower end of the latter during said trigger movement.

16. In a revolver type pistol having a frame, a firing action mechanism comprising a trigger mounted for pivotal movement from a released position thereof towards a position thereof triggering the firing action mechanism to fire the pistol, said trigger having an upper end surface, a rearward end surface facing generally in the direction of said pivotal movement of the trigger, means defining a central channel extending into the body of the trigger from its said rearward end surface, and means defining two cofacing and coextensive slots formed through said trigger at the respective sides of said channel and being located in spaced relation with respect to said trigger rearward end, each said trigger slot having length extending generally upwardly in direction towards said upper end surface and said rearward end surface of the trigger from a lower end terminus located a substantial distance below the axis of said pivotal movement of the trigger, spring means mounted on said frame, and means including a trigger lever connecting said spring means and said trigger whereby said spring means urges said trigger towards its said released position, said trigger lever extending within said trigger channel and having an end including means connecting the same for pivotal and slidable movement within said trigger slots, said trigger further including a projecting portion projecting into said trigger channel at a location between said slots and said rearward end surface of the trigger for engaging said trigger lever during said pivotal movement of the trigger.

17. A trigger for mounting in a cartridge firing device wherein a trigger lever moves to compress a trigger return spring in response to pivotal movement of the trigger, said trigger having an upper end surface, a rearward end surface, pivot means adjacent said upper end surface for pivotally mounting said trigger in said device, and slide means adapted to receive an end of said trigger lever in slidable connection with said trigger, said slide means having length extending in direction towards said upper end surface and said rearward end surface from an end terminus located a substantial distance below said pivot means to another end terminus located a lesser distance below said pivot means.

18. A trigger according to claim 17 wherein said slide means is substantially straight.

19. A trigger according to claim 17 wherein said slide means comprises means defining an elongated slot in said trigger.

20. A trigger for mounting in a cartridge firing device wherein a rearwardly extending trigger lever moves to compress a trigger return spring in response to pivotal movement of the trigger, said trigger having an upper end surface, a rearward end surface towards which said rearwardly extending trigger lever normally projects, pivot means adjacent said upper end surface for pivotally mounting said trigger in said device, slide means adapted to receive the forward end of said trigger lever in slidable connection with said trigger, said slide means having finite length and being located generally below said pivot means and in spaced relation with respect to said rearward end surface, and projecting means on said trigger positioned between said slide means and said rear-

ward end surface for engaging said rearwardly extending trigger lever during said pivotal movement of the trigger.

21. A trigger according to claim 20 wherein said trigger further comprises means defining a centrally located channel extending rearwardly from said slide means and opening at said rearward end surface for accommodating said trigger lever when so connected to said trigger, and said projecting means projects into said channel for engagement with the underside of said trigger lever.

22. A trigger according to claim 21 wherein said projecting means comprises means defining a bore extending upwardly through said trigger and opening into said channel, said bore being threaded along at least a portion of its length, and setscrew means threadedly engaging said bore and positionable therealong for adjusting the extent of its projection into said channel.

23. A trigger according to claim 22 wherein the end of said setscrew means which projects into said channel has transversely extending groove means for sensing its engagement with said trigger lever.

24. A trigger according to claim 23 wherein said groove means comprises a plurality of transversely extending grooves.

25. A trigger according to claim 22 wherein said slide means comprises means defining elongated and substantially straight slot means in said trigger having length extending in direction towards said upper end surface and said rearward end surface from an end terminus located a substantial distance below said pivot means to another end terminus located a lesser distance below said pivot means, said slot means being formed transversely through said trigger within the area defined by said channel, said upwardly extending bore being disposed substantially parallel to the length of said slot means.

26. In combination, a trigger for mounting in a revolver type pistol and a trigger lever having an end mounted for slidable movement on said trigger, said trigger having an upper end, a rearward end, pivot means adjacent said upper end for pivotally mounting said trigger in said device, means defining a central channel extending into the body of the trigger from its said rearward end, means defining two cofacing and coextensive slots formed through said trigger at the respective sides of said channel and being located in spaced relation with respect to said rearward end, each said slot having length extending in direction towards said upper end and said rearward end from an end terminus located a substantial distance below said pivot means to another end terminus located a lesser distance below said pivot means, and said end of the trigger lever comprising transversely extending and oppositely disposed projecting portions pivotally engaging and slidable within the respective of said slots, said trigger lever extending through said channel and having an opposite end normally projecting towards said rearward end of said trigger.

27. In a cartridge firing device having a frame, a firing action mechanism comprising a trigger mounted for pivotal movement on said frame between a released position and a firing position of the trigger, trigger return spring means mounted on said frame and including a trigger lever extending therefrom to connection at a location on said trigger which is spaced from the axis of said pivotal movement of the latter in direction whereby, when said trigger is substantially in its said released position, said trigger lever urges the trigger towards its said released position through a moment arm of predetermined length, and means for adjusting said connection location of the trigger lever on said trigger whereby, when said trigger is substantially in its said firing position, said trigger lever urges the trigger towards its said released position through a moment arm of shorter predetermined length.

28. In a cartridge firing device, a firing action mechanism according to claim 27 wherein said means for ad-

justing said connection location of the trigger lever on said trigger comprises slide means on said trigger, said trigger lever having an end in slidable engagement with said trigger slide means, and set screw means adjustably mounted on said trigger, said set screw means including an end which is positionable at a plurality of locations along the length of said trigger slide means upon adjustment of said set screw means, said set screw means being disposed whereby, at all of said location, its said end engages said trigger lever end.

29. In combination, a trigger and a trigger lever for mounting in a cartridge firing device, said trigger having an upper end surface, a rearward end surface, pivot means adjacent said upper end surface for pivotally mounting said trigger in said device, and slide means disposed in spaced relation with respect to and generally below said pivot means, and said trigger lever having an end slidably connected to said trigger slide means, said trigger lever being disposed to project generally towards said rearward end surface of the trigger, and said trigger further having means for adjusting the location of said trigger lever end along the length of said trigger slide means.

30. In combination, a trigger and a trigger lever according to claim 29 wherein said trigger slide means comprises means defining an elongated slot, and said means for adjusting the location of said trigger lever end along the length of said slide means comprises means defining a bore in said trigger, said bore extending generally in the direction of elongation of said trigger slot and having an open end in communicating relation with the end of said slot, and set screw means engaging and positionable along said bore for engaging said trigger lever end when the latter is so connected to said trigger.

31. In a revolver type pistol, a firing action mechanism according to claim 9 wherein the last said means comprises spring bias means depressible upon said trigger

substantially attaining its said triggering position to urge said trigger towards its said released position whereby said engagement between said hammer sear and said trigger sear is retained, the sear angle of engagement between said hammer sear and said trigger sear then being such with respect to an imaginary line extending between the respective axes of said pivotal movement of said hammer and trigger elements as to cause said hammer sear, responsive to the bias of said spring means urging the hammer towards its released position, to tend to urge said trigger further towards its said firing position.

32. In a cartridge firing device having a frame, a firing action mechanism comprising a trigger mounted for pivotal movement on said frame between a released position and a firing position of the trigger, trigger return spring means mounted on said frame and including a trigger lever extending towards said trigger, means connecting said trigger lever to said trigger whereby, when said trigger is substantially in its said released position, said trigger lever urges the trigger towards its said released position through a moment arm of predetermined length, and means for adjusting the position of said connecting means whereby, when said trigger is substantially in its said firing position, said trigger lever urges the trigger towards its said released position through a moment arm of shorter predetermined length.

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