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GUN SPRING FIRE-CONTROL MECHANISM

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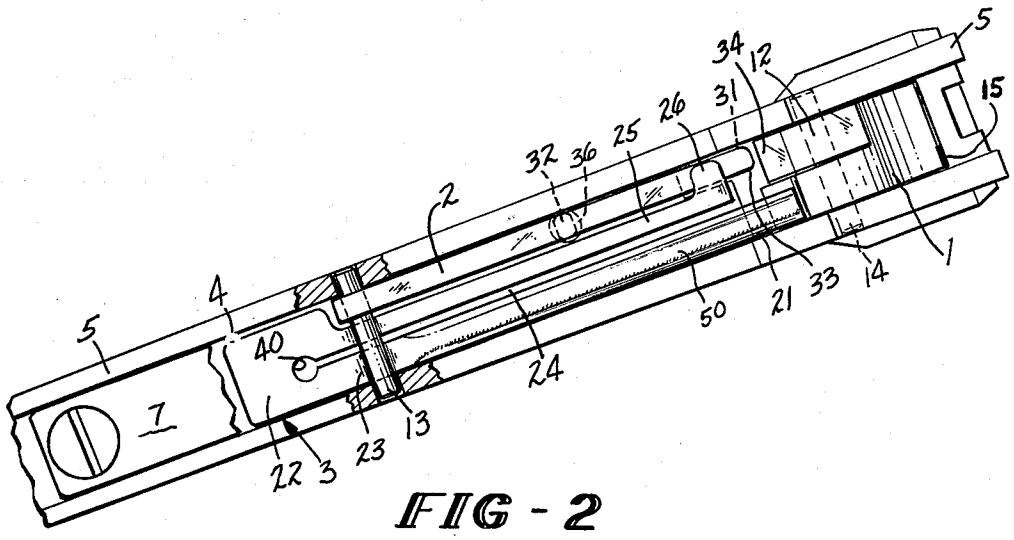


FIG - 2

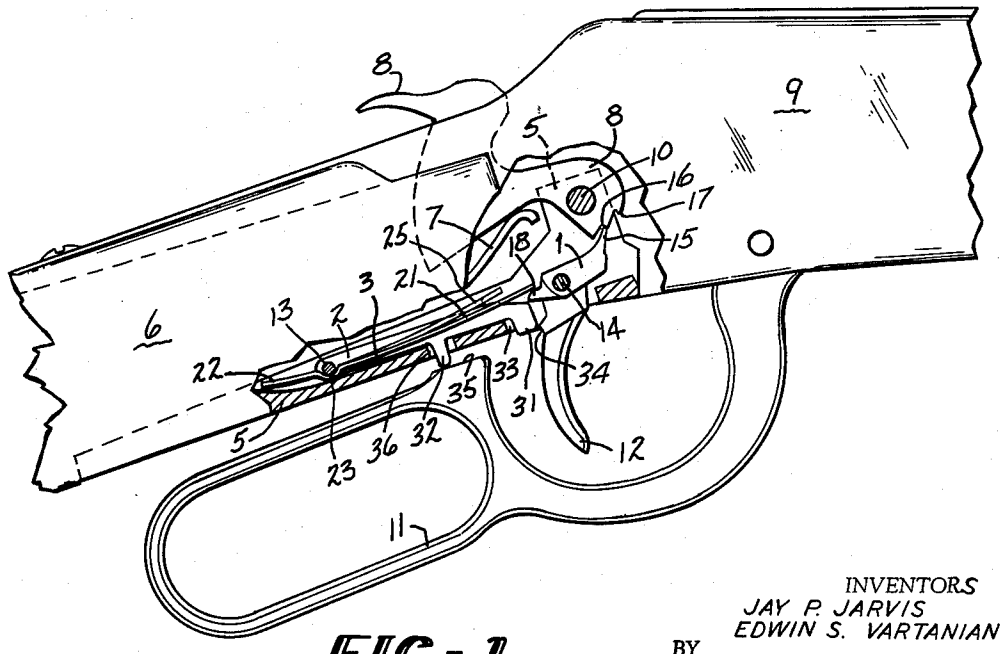


FIG - 1

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GUN SPRING FIRE-CONTROL MECHANISM

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This invention relates to firearms and particularly to an improvement in spring elements of the fire-control mechanism of a gun. The improvement relates more particularly to a spring structure and assembly useful in firearms of the type having an exposed hammer and a lever action as shown in U.S. Patent No. 524,702 to prevent unintentional discharge and insure a "right" feel in handling of the gun lever and trigger.

An object of the invention is to provide a novel spring structure in devices such as guns requiring the application of more than one bias in close proximity. Another object is to provide a fire-control mechanism, including a sear for the hammer and the safety catch for the lever together with a fire-control biasing means which is a simplified spring, easily mounted and fixed in place, resistant to distortion and misalignment, and having different but durable and dependable actions on the sear and catch.

In accordance with this invention firearms of this type are improved by provision of a single spring of sheet material bent and furcated to provide flat fingers acting with different bias on the sear and on the lever safety catch from the bend.

Other objects and advantages will appear from a description of specific embodiments illustrated by way of example in the accompanying drawing in which:

FIG. 1 is a side view of a portion of a gun with parts at the breech broken away to show one embodiment of the device of this invention in partial cross section; and

FIG. 2 is an enlarged plan view of a portion of the gun showing the fire-control spring installed according to FIG. 1 but with further modification to illustrate another embodiment.

In firearms of the type described where fire-control is obtained with the aid of biasing means acting on a sear 1 and also on a lever safety catch 2, heretofore the biasing means has taken the form of either a pair of separate springs or of a single wire spring. Such arrangements have been found either too costly to install and/or difficult to adjust and maintain in properly functioning relationship. As shown in FIG. 1, according to the present invention the biasing means takes the form of a single fire-control spring 3 fabricated of a suitable sheet material such as sheet steel slotted at one end to divide it into a plurality of fingers each performing a different biasing function. This spring is carried in a recess 4 in the topside of a trigger plate 5 closing the bottom of the hollow provided in the butt stock 6.

The spring is of uniformly thick sheeting, such as spring steel, not only longitudinally furcated but also transversely bent, folded, or otherwise grooved across the furcation for completion of the mounting and to assure independent flexing of the fingers substantially independently of each other from the bend.

The gun has a hammer 8 pivotally mounted in the hollow receiver 9 on a hammer pivot pin 10. For cocking and automatic loading from a magazine, not shown, the gun is also provided with a hand-operated lever 11 mounted by linkage in the receiver as shown in the aforementioned patent.

To prevent inadvertent firing by an unintentional pull on trigger 12, guns of this type have been provided with the aforementioned lever safety catch, pivotally mounted on a cross pin 13 carried in the trigger plate 5 which is fastened to both the stock 6 and the receiver 9.

In a manner well known in the art, hammer 8 is held back against the force of hammer spring 7 by means of the sear 1. For this purpose the sear is pivotally supported by transverse pin 14, which also pivotally supports trigger 12, and has ahead of pin 14 a lip 15 for projection either into the full-cock notch 16 of the hammer or into the half-cock notch 17 of the hammer. The sear and trigger have shoulders put into abutment when the trigger is pulled to rock the sear and release the hammer. For controlling the holding and release of the hammer with safety, the lip is held up in one or the other of these notches and against the hammer by the force of sear spring finger 21 acting back of pin 14 on sear tongue 18.

A lever-type spring 3 is carried, along with the lever safety catch in plate recess 4 with its finger-bridging and spring-mounting base 22 held there upwardly in abutment with the aid of spring cross pin 13 spanning the recess 4 and extending across it in a spring groove 23 provided as a corrugation transversely near base 22 at the rear end of the lever spring. The other end is bifurcated at 24 to provide finger 21 and finger 25 having a side tab 26 acting down on the top of the pivoted catch 2 having a depending trigger detent 31 and a depending sensing appendage 32. An alternative would be a side tab from the catch 2 under finger 25. Either way, under the resulting bias detent 31 extends through the plate at trigger slot 33 to normally interfere with trigger heel 34 and block the trigger against being pulled, unless gun lever 11 is grasped closed.

In close proximity but further out from the spring flexing point defined by the mounting cross pin 13 and with an entirely different biasing force, finger 21 presses down on tongue 18 formed at the rear end of the sear to keep sear lip 15 against the hammer at the notches. This is the normal condition unless the lip is released from the half-cock notch 17 and the trigger pulled, and further provided lever 11 is squeezed until its foot 35 pushes appendage 32 into plate slot 36, thereby lifting detent 31 out of blocking relationship.

In one embodiment the spring 3 is made of flat sheet stock of any suitable composition, thickness, width, and length to suit the purpose, is slotted as at 24 providing the spring fingers and terminating in a stress relieving fillet 40 at the base end 22, and is transversely corrugated at groove 23 at a suitable radius of curvature to take the mounting cross pin 13. Slot 24 divides the spring to provide fingers each of a width and length to provide desired lateral rigidity in each and also the variety of spring stiffness desired in the direction of thickness. The spring is thus adapted to be mounted fixed in proper alignment between an end abutment and an abutment with the single cross pin 13 also mounting the pivoted member 2 contacted distally by tab 26 of finger 25. It will be understood that according to this invention the stock material and thickness, the finger lengths and widths, and groove placement across the slot and fingers is selected to provide the stiffness desired in each finger.

In the embodiment of FIG. 1, finger 21 is wider than finger 25 to provide more stiffness despite the same thickness. The embodiment shown in FIG. 2 is like that of FIG. 1 with the difference that at least one of the fingers, namely 21, is also longitudinally corrugated as at 50 where still further stiffness is desired.

The narrowest finger is wider than the thickness of the stock. In finger 25, having for example a width of about 0.075 of an inch and a stock thickness such as about 0.036 or 0.047 of an inch, this provides resistance to torsional distortion and to lateral misalignment and also adapts the fingers for provision of proper thrust of any side tab such as 26 which otherwise would twist and put undesired stress on both the catch 3 and the finger

25 causing them to shift laterally into undesired interference.

Base 22 integral with fingers 21 and 25 in all embodiments is extended from the fingers so that by an abutment applied at one side to the end of the base and another abutment made with the pin 13 at groove 23 applied at the other side of the spring, the spring is not only mounted by these abutments applied in conjunction but is also adapted for flexing of the finger from the pin. The spring upon being so mounted flexes and develops a biasing leverage on the fingers as they are put into biasing contact with the sear and catch. This is predetermined by the degree of flexure-producing abutment.

It is to be further understood that those skilled in the art may make changes and modifications in the embodiment herein described and now believed preferred and that obviously a multi-fingered spring according to this invention may find uses in devices other than guns without departing from the spirit and scope of this invention as set forth in the appended claims.

What is claimed is:

1. In combination, a furcated lever spring of sheet material of uniform thickness having at least a pair of biasing fingers extending longitudinally to one end of the spring and having integral with said fingers at the opposite end a base portion extended for bridging said fingers at said opposite end, said base portion being adapted for mounting said spring against an abutment applied on one side of said spring at said opposite end, said spring having a transverse corrugation across said fingers adjacent said base and a pin member extending transversely of said fingers and being in engagement with said corrugation on the other side of said spring with finger biasing leverage being developed between said pin member and abutment whereby said fingers may be flexed, and one of said fingers having a longitudinally extending corrugation for rigidity.

2. The spring of claim 1 wherein said one finger is wider than the other.

3. In combination, a furcated lever spring of sheet material of uniform thickness having at least a pair of biasing fingers extending longitudinally to one end of the spring and having integral with said fingers at the opposite end a base portion extended for bridging said fingers at said opposite end, said base portion being adapted for mounting said spring against an abutment applied on one side of said spring at said opposite end, said spring having a transverse corrugation across said fingers adjacent said base portion, and a pin member extending transversely of said fingers and being in engagement with said corrugation on the other side of said spring with finger biasing leverage being developed between said pin member and abutment whereby said fingers may be flexed, one of said fingers including a side tab positioned adjacent the end opposite said base portion for applying a pivoted force about a member pivotally mounted on the pin adjacent the fingers.

4. In a fire-control apparatus for a firearm having a trigger member, the combination comprising a hand lever-operated safety catch for said trigger, a trigger-operated sear for holding and releasing a hammer, a transverse pin member pivotally mounting said catch, and a bifurcated spring member including a pair of fingers and a base portion, said base portion of said spring member having one side abutting a portion of the firearm, said pin member engaging said fingers of said spring member on the other side of said spring member at a point adjacent said base portion, one of said fingers biasing said safety catch into trigger-blocking safety relationship, and the other of said fingers biasing said sear into holding relationship with said hammer.

5. The combination of claim 4 wherein the catch is mounted on the pin member adjacent said one finger and said one finger has a side tab in contact with said catch at its end opposite the base portion of the spring.

6. The combination of claim 4 wherein said other finger is longitudinally corrugated for rigidity.

7. The combination of claim 4 wherein said other finger is wider than said one finger for rigidity.

8. In a fire control mechanism for a firearm having a trigger member, the combination comprising a hand lever-operated safety catch for said trigger, a trigger-operated sear for holding and releasing a hammer, a transverse pin member pivotally mounting said catch, a bifurcated spring member including a pair of fingers and a base portion, said base portion of said spring member having one side abutting a portion of the firearm, said fingers having a transversely extending groove adjacent said base portion in engagement with said pin member on the other side of said spring member, one of said fingers biasing said sear, the other of said fingers biasing said safety catch into trigger-blocking relationship, said other finger having a side tab contacting said catch, and said one finger being longitudinally corrugated and wider than said other finger.

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