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TAKEDOWN DEVICE FOR FIREARMS

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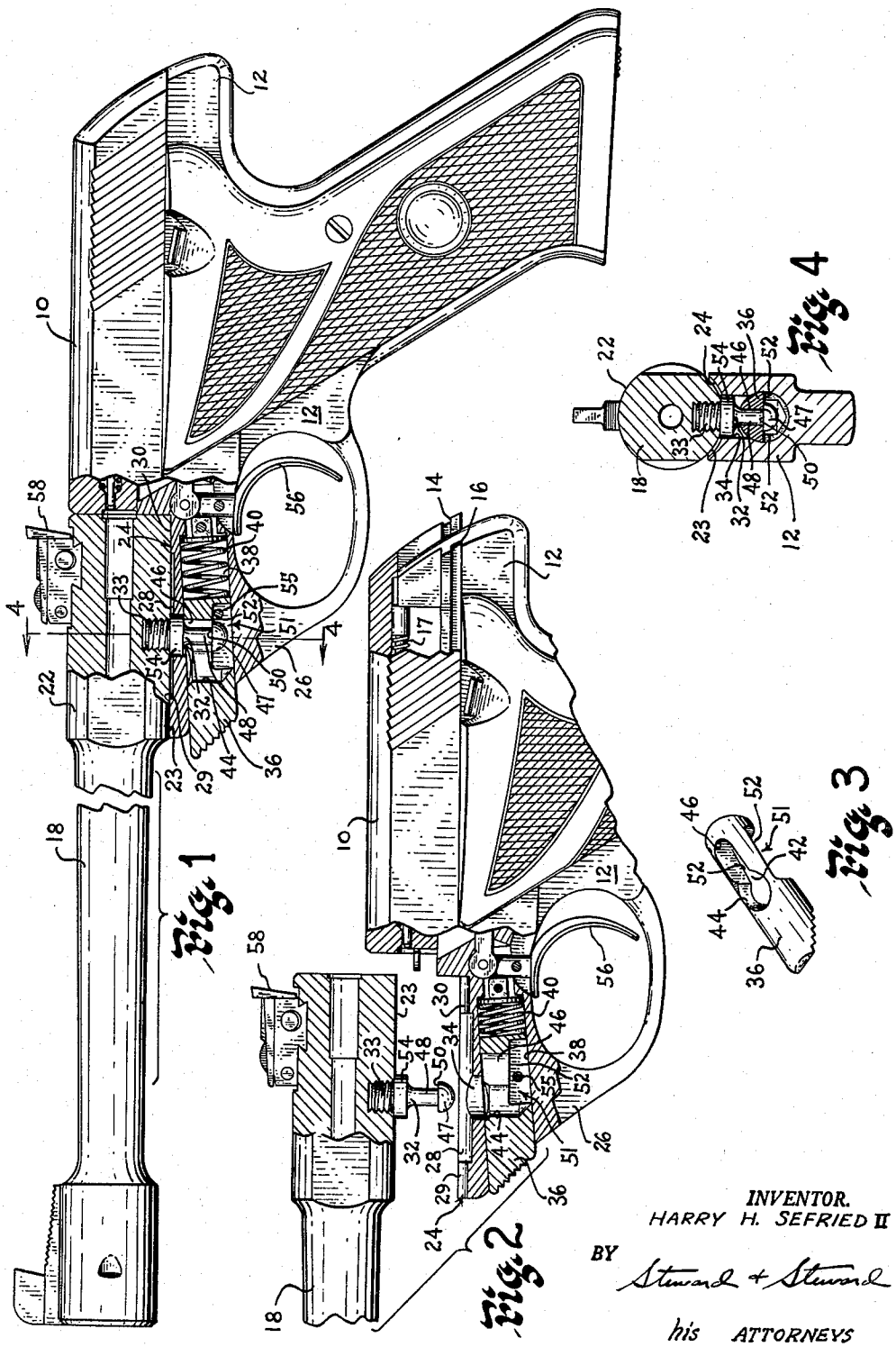


Fig. 1

Fig. 2

Fig. 4

Fig. 3

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TAKEDOWN DEVICE FOR FIREARMS

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This invention relates to barrel take-down devices for firearms, and it relates more particularly to take-downs for semiautomatic pistols.

The purpose of a take-down device is to fasten the barrel of the gun rigidly to, and accurately aligned with, the frame so that the barrel cannot move in any manner with respect thereto. The usual take-down device accomplishes this by means of a screw or bolt which fits through a hole in the frame and is threaded into a portion of the barrel so that the barrel and frame are compressed together as the screw is turned up tight. However, once the screw has been tightened sufficiently to secure the barrel on the frame, it is difficult to loosen the screw because of the pressure exerted on the threads. Various devices have been developed to provide a quick-acting take-down for gun barrels by using a spring-biased bolt which latches the barrel in place on the frame. One such device is shown for example in the patent to Altenburger 2,107,359. In such arrangements, either no pressure at all is exerted by the locking bolt on the barrel, as is the case in the device disclosed in the Altenburger patent, or else only a relatively light pressure is exerted by the locking bolt on the barrel under the direct urge of the spring on the bolt. In either case the spring must be weak enough so that it can be depressed with the fingers when the barrel is to be removed from the frame. Consequently, the locking bolt cannot exert enough force to rigidly clamp the barrel and frame together so that there is absolutely no play between them.

The difficulty previously encountered with such prior quick-acting take-down devices is rather ingeniously overcome by the device disclosed and broadly claimed in the patent to Liedke 2,817,174. In this arrangement the mechanical advantage afforded by the wedging action of an inclined surface provided on an actuator plunger movable transversely of a locking pin is employed in order to transmit a large force through the locking pin to the barrel by means of a relatively light spring acting on the plunger. This permits use of a fairly weak spring. Consequently, the plunger can be easily depressed with the fingers when it is desired to release the locking pin.

The present invention is a specific improvement over the take-down device disclosed in the above-identified Liedke patent. One of the objects of this invention is to reduce the manufacturing cost of a take-down of the kind shown in the Liedke patent. In the specific construction there shown, a dovetail tongue is provided on the barrel and a correspondingly shaped groove is formed in the frame, into which said tongue fits. Since the machining operations for forming the tongue and groove in said prior device are expensive, a specific object of the present invention is to do away with the need for such machining operations.

Another object of the present invention is to provide a quick-acting take-down arrangement of the type shown in the above-mentioned patent to Liedke, in which the barrel is removed by simply depressing the actuator plunger and lifting the barrel out of its bedding with a straight upward movement.

A further and general object of the invention is to provide a take-down device which will permit the barrel to be easily and rapidly mounted or removed from the frame and which at the same time will rigidly fix the barrel to the frame so that it is always properly aligned on the frame when the firearm is in use.

These and other objects of the invention, as well as novel features and advantages, will become further apparent from the description hereinafter.

A take-down device embodying the invention in its most advantageous form contemplates a barrel and frame having complementary non-coplanar mounting surfaces providing a bedding for said barrel in which it is immovably held on said frame, with a locking pin rigidly secured to said barrel and projecting from its mounting surface. A passage, which extends substantially perpendicular to the mounting surface, is provided in the frame in order to receive the locking pin so that it can interlock with a transversely disposed actuator plunger located in another passage in the frame. The actuator plunger is movable longitudinally of itself under the urge of a spring provided at the inner end of the passage in which said plunger is carried. On the opposite side of the plunger from the barrel is formed a wedging surface, which is engaged by an oppositely facing latching surface adjacent the end of the locking pin. On movement of the plunger in one direction under the urge of said spring, the locking pin is drawn axially inward of the frame causing said locking pin to draw the barrel into rigid immovable engagement with the frame.

An important advantage of the present invention is that it greatly reduces and simplifies the machining operations heretofore required in takedown devices of this general type and therefore reduces the over-all manufacturing cost. Another advantage of the invention is that the barrel can be mounted by setting it directly on its bedding on the frame, without having to slide a tongue and groove together.

In the accompanying drawings, which illustrate one particular embodiment of the invention,

Fig. 1 is a side elevational view, partly broken away and partly in cross-section, of a pistol incorporating the invention, in which the barrel is shown locked in position on the frame;

Fig. 2 is a view similar to Fig. 1, but showing the takedown actuator plunger compressed and the barrel lifted from the frame;

Fig. 3 is a perspective view of the actuator plunger; and

Fig. 4 is a vertical cross-section taken on the line 4—4 of Fig. 1.

With reference to the drawings, the pistol includes a slide **10** mounted for longitudinal reciprocation on a pistol frame **12**. Slide **10** is provided along both lower inner edges with a flange-and-groove **14**, which slidingly interengages with a corresponding flange-and-groove **16** extending longitudinally along the upper edges of frame **12** on both sides thereof. Such guide means **14**, **16** permit slide **10** to move back and forth longitudinally of frame **12** in the usual manner, with the return spring **17** urging it into battery position. The barrel **18** is mounted on frame **12** forwardly of slide **10** in the manner described hereinafter in accordance with the invention.

The enlarged rear end of barrel **18** is cylindrically shaped along both its upper (**22**) and lower (**23**) sides and, therefore, requires no expensive machining operations so far as these surfaces are concerned. A mount-

ing surface 24 on the upper side of the forward or trigger-plate portion 26 of frame 12 is correspondingly shaped to receive the lower side 23 or mounting surface of the rear end of barrel 18, so that said surfaces 23 and 24 may be brought into intimate engagement with each other in order to prevent the barrel from tilting, twisting, or moving sideways with respect to the frame.

A shallow recess 28 is provided in the central portion of the concave mounting surface 24, forming a pair of cylindrically shaped bands 29 and 30 at the front and rear ends, respectively, of surface 24. The area of contact between mounting surfaces 23 and 24 is therefore limited to the end portions of these surfaces, so that there will be no tendency for the barrel to rock longitudinally with respect to the frame. Mounting surfaces 23 and 24 may be of any corresponding non-coplanar configuration, such as mutually inclined or beveled flat surfaces for example, which will prevent the barrel from twisting or sliding sideways with respect to the frame when said mounting surfaces are pressed firmly together.

A locking pin 32 is secured, as by means of threaded portion 33, to the underside of the rear end of barrel 18 in the center of mounting surface 23 and extends downward perpendicular thereto. A passage 34 is provided in the center of, and perpendicular to, mounting surface 24 on frame 12, into which locking pin 32 is inserted, as shown in Fig. 1, so that it can be engaged with an actuator plunger 36 carried in another passage 38 in frame 12. Passage 38 extends generally longitudinally of the trigger-plate 26 but at a slight downward angle to the longitudinal axis of the gun toward the point where it opens onto the front edge of trigger-plate 26. Passage 34 intersects passage 38 substantially at its midpoint, thereby providing access for locking pin 32 to latch with actuator plunger 36, as will be described hereinafter.

When the barrel is locked in place on the frame, actuator plunger 36 extends outwardly somewhat beyond the front edge of trigger-plate 26, as shown in Fig. 1, so that it can be pressed rearwardly with the fingers against a coil spring 40 located at the inner end of passage 38 for the purpose of releasing the barrel. Plunger 36 is provided with a substantially key-hole shaped slot 42 (best shown in Fig. 3) which extends longitudinally of plunger 36 with an enlarged circular portion 44 at one end nearest the outer end of plunger 36 and a narrow portion 46 extending rearwardly toward the inner end of plunger 36. The circular portion 44 is slightly larger in diameter than a semi-spherically shaped head-portion 47 on the lower end of locking pin 32, such that head-portion 47 will fit through circular portion 44 of slot 42 when portion 44 is brought into alignment with passage 34 by moving plunger 36 inwardly. Locking pin 32 is provided with a reduced diameter shank 48 above head-portion 47, forming an annular latching shoulder 50 on the upper side of head-portion 47 adapted to engage with the actuator plunger 36. Shank 48 is smaller in diameter than the narrow portion 46 of slot 42 so that when locking pin 32 is in place on the frame, plunger 36 can be moved outwardly into locking relation with pin 32.

The underside of plunger 36 is cut away at 51 adjacent slot 42 to provide space for the head-portion 47 of pin 32 as may be seen in Fig. 1. When plunger 36 is moved outwardly, the upwardly facing latching shoulder 50 of locking pin 32 is engaged by the downwardly facing marginal surfaces 52 on either side of the narrow portion 46 of slot 42, in which the shank 48 of locking pin 32 is then located. This effectively locks the pin 32 and barrel 18 to the frame 12. It will also be noted that cutaway 51 is formed so that the surfaces 52 extend at an angle with respect to the longitudinal axis of plunger 36. Surfaces 52, therefore, act as a wedging surface forcing latching shoulder 50 downward as they slide laterally into locking position with pin 32. Consequently, when locking pin 32 is placed in latching relation with plunger 36 as just described, longitudinal movement of plunger 36 outwardly under the urge of spring 40 causes locking pin 32 to be moved inwardly (or downwardly as viewed in the drawings) of the frame, and this inturn causes the mounting surfaces 23 of the barrel 18 to be brought into immovable engagement with the mounting surfaces 24 of the frame 12.

In order that the force exerted by the actuator plunger 36 on locking pin 32 will be directed perpendicular to the mountign surfaces 23 and 24 of the barrel and frame, respectively, as is most desirable but not absolutely essential, the angle of the longitudinal axis of plunger 36 and its passage 38 with respect to the longitudinal axis of the gun is equal to the angle of wedging surfaces 52 with respect to the longitudinal axis of plunger 36. Consequently, as may be seen in the drawings, latching surface 50 and wedging surfaces 52 are both parallel to the mounting surfaces 23 and 24, and the force exerted by the wedging surface of plunger 36 is transmitted along, and by means of, locking pin 32 so that the entire multiplied force of the wedge is employed in rigidly holding the barrel in place on the frame.

In order to prevent movement of the barrel 18 longitudinally with respect to the frame 12, the locking pin 32 is provided with a cylindrical flange 54 between its threaded portion 33 and the shank 48, which flange 54 has a diameter equal to or slightly less than that of passage 34. Flange 54 therefore fits closely within passage 34 and prevents any appreciable amount of longitudinal movement of the barrel on the frame. Such movement is not critical in any event, since the forward movement of slide 10 under the urge of return spring 17 is limited by its abutment with the rear end of barrel extension 20 and, therefore, no difficulty arises even if the barrel moves slightly forward or back longitudinally, so long as it does not tilt or twist. The non-coplanar relationship of mounting surfaces 23 and 24, together with the great force exerted on locking pin 32 by actuator plunger 36, prevent any possibility of the barrel tilting or twisting.

The operation of the take-down device described hereinabove is believed to be clear from the disclosure and need not be further elaborated upon. It should be mentioned, however, that it is usually desirable to move the slide 10 to the rear and to latch it in that position before removing the barrel, as the pressure of the slide against the rear end of the barrel may interfere to some extent with the removal of the barrel. After the barrel is removed, the actuator plunger 36 is released and moves outwardly until the rear end of the cutaway 51 in its under side comes up against a stop pin 55 which extends through the trigger-plate 26 and passage 38. As will be noted in the drawings, pin 55 is located so that it does not interfere in any way with the normal operation of the plunger 36.

The pistol is of course provided with a trigger 56 and firing mechanism (not shown), but since these, as well as the rear sight 58, do not form any part of the present invention, they are not described herein.

What is claimed is:

1. In a firearm having a barrel member removably mounted on a frame member, such members having complementary non-coplanar and mutually engaging mounting surfaces for locating said barrel member on said frame member, the combination therewith comprising a locking pin rigidly secured to and projecting from the mounting surface of said barrel member into a first pasage in said frame member extending transversely of said mounting surfaces, an actuator plunger carried within a second pasage in said frame member which intersects said first passage, said plunger being movable longitudinally within said second passage at an angle to the longitudinal axis of said locking pin, said actuator plunger having a wedging surface facing generally away from said barrel member and inclined with respect to the longitudinal axis of said plunger, said locking pin having an enlarged head at its free end forming a latching surface facing gener-

ally toward said barrel member, said actuator plunger having a longitudinally elongated opening extending transversely through it and intersecting said wedging surface, said locking pin being interlockingly engageable with said actuator plunger and fitting through said opening with said latching surface in position for engagement with said wedging surface, at least a portion of said opening being narrower than the enlarged head of said locking pin, whereby said locking pin is drawn inward of said frame upon longitudinal movement of said plunger in one direction causing said locking pin to draw said barrel mounting surfaces into immovable engagement with the complementary mounting surfaces of said frame member, spring means mounted on said frame member for biasing said actuator plunger in said one direction, and

means for disengaging said locking pin from said actuator plunger.

2. The combination defined in claim 1, wherein said means for disengaging said locking pin comprises an enlarged portion of said opening in said actuator plunger located adjacent one end of said wedging surface such that the enlarged head of said locking pin will pass through it when said plunger is moved against the urge of said spring means to bring said enlarged portion into alignment with said locking pin.

References Cited in the file of this patent

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