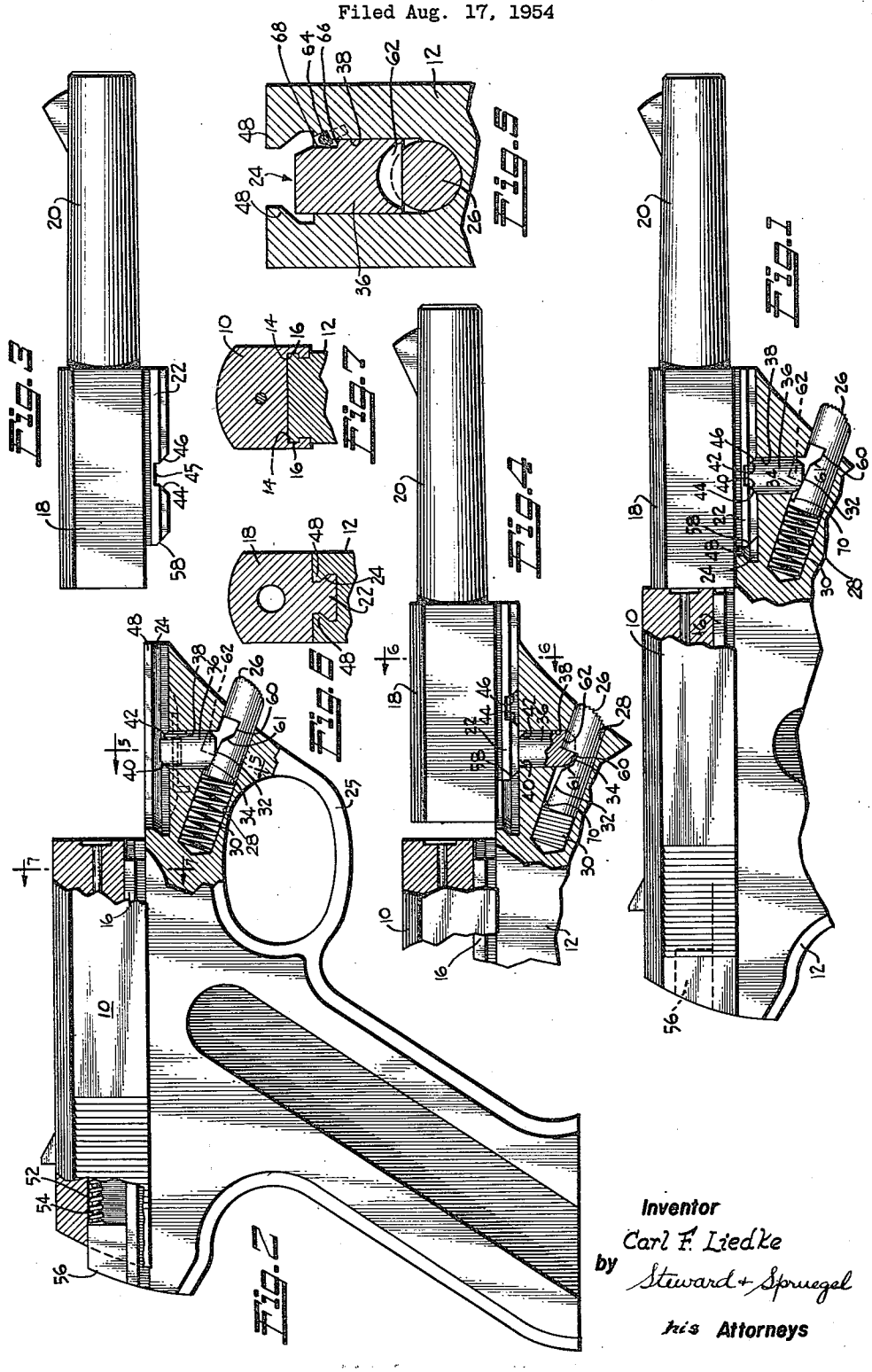
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TAKE-DOWN DEVICE FOR FIREARMS

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TAKE-DOWN DEVICE FOR FIREARMS

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This invention relates to latching devices, and more particularly to a quickly releasable latching or take-down device for firearms.

It is an object of this invention to provide a latching device which is simple in structure and easily releasable, and which has the advantage of increasing the latching force applied to the article to be held under conditions of severe vibrational stress.

It is a further object of this invention to provide means for rigidly fixing a firearm barrel to its frame so that the barrel is always properly aligned in the frame.

It is still another object of this invention to provide novel take-down means which permit a firearm barrel to be easily and rapidly removed from engagement with a firearm frame.

Heretofore, where spring means have been employed in take-down devices for securing the barrel of a firearm in place on the frame, the force holding these two members together did not exceed the pressure of the spring because the spring acted directly on the latching or locking element. Consequently, such spring-actuated take-downs have not been satisfactory, because if the spring were made stiff enough to hold the barrel and frame tightly together under the shock of firing the gun, then it would be difficult to overcome the pressure of the spring in order to release the barrel.

In a take-down arrangement according to the present invention, however, a relatively light spring may be used so that the barrel can be easily released under finger pressure only, but provides a much greater pressure to hold the barrel rigidly in place on the frame. This is accomplished by forcing a wedging or actuator plunger under the urge of a spring into engagement with a locking pin which rides on a wedge face of the plunger and exerts an increased force on the barrel pressing it tightly against seating or mounting surfaces on the frame. The mechanical advantage gained by this arrangement causes the locking pin to be pressed firmly toward locking position even though the biasing means may be relatively weak, and allows the withdrawal of the locking pin from locking position to be accomplished by manual pressure against the end of the actuator pin, to move the wedge face out of contact with the locking pin, without the application of undue force. It will also be appreciated that the locking pin cannot work loose when subjected to vibrational stresses, since any vibration will cause the wedge face to be forced more and more firmly against the end of the locking pin to hold it in locking position.

A particularly desirable embodiment of the invention comprises a locking pin which engages a transverse notch in a dovetail tongue member carried on a firearm barrel to prevent movement of the barrel with respect to the frame. The locking pin is pressed against the dovetail member by a wedge face on an actuator pin, which engages the bottom of the locking pin, and which is biased against the locking pin by a spring. The mechanical advantage gained by this arrangement causes

the locking pin to press with considerable force against the dovetail member to force it against the beveled sides of a mortise or channel in the firearm frame, with which it is engaged, to hold the barrel firmly in alignment on the frame, while avoiding the necessity of machining the dovetail member and mortise to close overall tolerances, it being necessary only to accurately align the bevel surfaces of the dovetail member and mortise with the center line of the barrel. A further advantage of the locking means of this invention is that it cannot work loose during jarring of the firearm during use, since any jarring action, such as that due to firing a shot, will only cause the wedge face, under urging of the spring to be forced more and more firmly against the bottom of the locking pin, to exert even greater pressure on the dovetail member. Tightening of the locking mechanism during use is particularly noticeable in firearms, since, in addition to the force exerted by the spring, the inertia of the actuator pin, during the rearward kick of the firearm during firing will tend to drive it forward relative to the barrel, to force the locking pin into firmer engagement with the dovetail member.

When it is desired to remove the barrel from the frame, the outer end of the actuator pin, which projects from the firearm frame, is manually pressed inwardly against the spring, removing the wedge face from contact with the locking pin, and allowing the latter to move or be moved downwardly into a notch provided in the actuator pin. In this position the upper end of the locking pin will offer no obstruction to axial movement of the barrel, and the latter may then be readily disengaged from the frame.

In order that those skilled in the art may more fully comprehend the nature of my invention and the means for carrying it out, it will be more particularly described in connection with the accompanying drawing in which:

Fig. 1 is a side elevational view, partly broken away, and partly in cross-section, of the upper portion of a pistol incorporating the invention, as it would appear with the barrel locked in position on the frame;

Fig. 2 is a side elevational view, partly in cross-section, of a pistol incorporating the invention, with the barrel removed, the slide being shown in place on the frame;

Fig. 3 is a side elevational view of the barrel and barrel extension;

Fig. 4 is a side elevational view, partly in cross-section and partly broken away of the pistol in process of assembly;

Fig. 5 is a cross-sectional view taken along the line 5—5 of Fig. 2;

Fig. 6 is a cross-sectional view taken along the line 6—6 of Fig. 4; and

Fig. 7 is a cross-sectional view taken along the line 7—7 of Fig. 2.

Referring to Fig. 1, which shows the upper portion of an assembled pistol, embodying the novel take-down means of the present invention as it would appear when it is in barrel-locking position, it will be observed that a slide **10** is joined to a pistol frame **12** by the engagement of channels **14** in the side walls of slide **10** with rails **16** on the upper portion of frame **10**, in a manner to permit reciprocatory motion of the slide **10** relative to the frame, the particular arrangement of the channels and rails being shown more clearly in Fig. 7. A barrel extension **18**, from which barrel **20** projects forwardly, is provided with a dovetail tongue **22**, which engages with a mortise or channel **24** cut into frame **12** at a point above and adjacent to the trigger guard **25**, as illustrated in Fig. 2.

The novel take-down means, shown in barrel-locking position in Fig. 1, comprises an actuator pin **26** carried in bore **28** in frame **12**, adjacent to and above trigger

guard 25, bore 28 lying in the same vertical plane as the axis of barrel 20, but being somewhat downwardly inclined from rear to front. Spring 30 is compressed between the end of bore 28 and the actuator pin 26, and serves to urge the wedge face 32 on the upper portion of actuator pin 26 into engagement with the base 34 of locking pin 36, which is carried in vertical bore 38, whereby to cam the latter upwardly to force its upper bevels 40 and 42 into contact with bevels 44 and 46, which form the sides of a transverse notch 45 cut into dovetail base member 22. It will be observed that wedge face 32 is cut at an angle to the axis of actuator pin 26, so that after base 34 has made contact with the front edge of wedge face 32, a further forward movement of actuator pin 26, under the influence of spring 30 will wedge locking pin 36 progressively further upward to make firm contact with bevels 44 and 46. In this position the barrel 20 is held firmly in position on frame 12, axial movement being inhibited by the contact of bevels 40 and 42 with bevels 44 and 46, respectively, while the camming action of wedge face 32, transmitted through locking pin 36, forces the sides of dovetail member 22 into firm engagement with the rails 48 of mortise 24, to prevent lateral movement of the barrel 20.

In assembling the pistol to form the assembly shown in Fig. 1, slide 10 is first placed in position on frame 12 by engaging channels 14 in the side walls of the slide with rails 16 in the upper portion of the frame. Slide 10 is then pushed back until the end of slide return spring rod 52, biased rearwardly by slide return spring 54, contacts post 56, as illustrated in Fig. 2. Dovetail member 22 of the barrel 20 is then engaged with mortise 24 and rails 48 of the frame, and the barrel 20 is moved rearwardly until the rear bevel 58 of dovetail member 22 contacts bevel 42 on locking pin 36. Actuating pin 26 is then manually forced rearwardly against spring 30 until wedge face 32 is moved out of contact with the base 34 of locking pin 36, allowing the latter to drop down, base 34 of locking pin 36 being received in notch 60 in actuator pin 26 so that bevel 42 no longer contacts bevel 58, and the barrel 20 may be moved further rearwardly to the position shown in Fig. 4, at which time pressure on actuator pin 26 may be released. In the event that there is any tendency for locking pin 36 to stick in bore 38, the camming action of bevel 58 against bevel 42 will force locking pin 36 to down position. It will be noted that notch 60 is provided with a sloping rear face 61, for a purpose which will be hereafter explained, and that locking pin 36 is arcuately cut away at 62 to permit it to drop down over the body of actuator pin 26. Further rearward movement of the barrel 20 will first cause its chamber end to contact the forward end of slide 10, and then to force slide 10 backward against the urging of spring 54 to the position shown in Fig. 1, at which point the notch 45 will be in a position over locking pin 36. As the barrel 20 moves into this position, the spring 30 will force rear face 61 of notch 60 against the base 34, forcing it rapidly upwardly to semi-locking position in which base 34 will contact the forward edge of wedge face 32, after which a further forward movement of actuator pin 26, under the urging of spring 30, will cause wedge face 32 to drive locking pin 36 into final locking position, a relatively great holding force being applied to pin 36 due to the mechanical advantage of wedge face 32.

In taking down the pistol, actuator pin 26 is manually forced rearwardly to permit the base 34 of locking pin 36 to ride down along the inclined surface of the wedge face 32 allowing the base of the locking pin to drop into notch 60, and removing the upper end thereof from the path of dovetail member 22. It will be noted that the slide return spring 54, urging the slide 10 forward against barrel extension 18, will cause a camming force to be exerted by bevel 44 against bevel 40, to force locking pin 36 downward, should there be any tendency for the latter to stick in bore 38, as will a manual forward pull on the barrel. To this end, bevel faces 40 and 44 are most desirably cut on about a 45° angle with respect to the axis of the barrel. Similarly, the bevel 58 on the rear edge of the dovetail portion or tongue 22 and the bevel 42 of the locking pin 36 are also cut at about a 45° angle. Bevel 46 of notch 45 will of course be cut at an angle corresponding to the bevel 42. With the locking pin thus moved out of the path of the dovetail portion 22, the barrel and barrel extension may then be moved forwardly to disengage dovetail member 22 from mortise 24, after which slide 10 may be moved forwardly to disengage rails 16 from channels 14, completing the take-down operation.

When the barrel extension has been disengaged from the frame, and when pressure on the actuator pin 26 has been released, it will be forced forwardly by spring 30, raising locking pin 36. This upward motion will be limited, however, as illustrated in Fig. 5, by retaining pin 64, carried by frame 12, and contacting shoulder 66 formed by cutting flat face 68 in the side of locking pin 36, whereby to retain the latter in vertical bore 38. Actuating pin 26 is held within bore 28 by retaining ear 70, which rises from the rear end of wedge face and which will contact base 34 of locking pin 36, when pin 36 is free to move upward to contact retaining pin 64.

While in the foregoing description of one specific embodiment of the invention, the tongue member 22 is dovetail shaped in cross-section in order to facilitate proper alignment of the barrel on the frame, it is of course possible though less desirable to make the member 22 T-shaped in cross-section as has been the usual practice heretofore. Moreover, if desired, the upper end of the locking pin and the notch 45 into which it fits could be made square or any other shape which would suit the purpose.

It will, therefore, be appreciated that the invention provides means for firmly locking a barrel assembly to a firearm frame, with the chamber end of the barrel in spring-pressed contact with the slide, which means are quickly and easily releasable to provide practically instantaneous take-down of the firearm. Moreover, any jarring of the pistol, such as during the firing thereof, will not loosen the locking means, but instead will drive the actuator pin further forward to increase the locking force applied by wedge face 32.

It will be further understood that any firearm embodying this invention will be provided with suitable firing, ejection, and loading means. Since these means do not form any part of this invention, they have not been illustrated or described.

It will be still further understood that while for the purposes of illustration, the novel take-down means has been described as being incorporated in a pistol, it is also well adapted to be incorporated in a rifle or other firearm.

What is claimed is:

1. A firearm including in combination a frame, a barrel removably mounted on said frame, said barrel having a dovetail base member and said frame having an open-end channel in which said base member is received, said dovetail base member and channel having corresponding mutually inclined surfaces extending longitudinally of said barrel, said base member being provided with a notch having mutually inclined front and rear faces, a locking pin carried by said frame for projection of one end of said pin into said channel, said pin being movable into and out of latching engagement with said notch, said one end of said pin having mutually inclined faces corresponding to said front and rear faces of said notch, and actuating means for forcing said locking pin into engagement with said notch whereby said corresponding inclined faces of said notch and locking pin become firmly engaged to rigidly position said barrel longitudinally on said frame and said corresponding inclined surfaces of said dovetail base member and channel

are forced into firm engagement thereby accurately positioning said barrel laterally on said frame.

2. The combination defined in claim 1 wherein said actuating means comprises an actuator pin carried by said frame for longitudinal movement at an angle to the direction of movement of said locking pin, said actuator pin having a wedging surface inclined with respect to the longitudinal axis of said actuator pin and engageable with said locking pin so as to force the latter into latching engagement with said notch upon longitudinal movement of said actuator pin in one direction, and means for biasing said actuator pin in said direction.

3. The combination defined in claim 2 wherein said locking pin is guided in a bore within said frame substantially perpendicular to said channel, said actuator pin being guided in an elongated bore which intersects the locking pin bore at the point where said actuator pin engages said locking pin, the bore in which said actuator pin is guided extending to an edge of said frame and said actuator pin projecting outwardly beyond the edge of said frame so that it can be manually moved against said biasing means to permit said locking pin to move out of latching position, the inner end of said actuator pin bore having an obstruction, and said biasing means comprising a coil spring compressed between said obstruction and the inner end of said actuator pin.

4. In a firearm having a barrel member removably mounted on a frame member, said members having complementary non-coplanar, mutually engaging, mounting surfaces for locating said barrel on said frame, the combination comprising a locking pin fitting within said frame in a first passage extending transversely of said surfaces, said locking pin being movable in said first passage and cooperating with said barrel to force the latter into rigid engagement with said frame upon application of a force on said locking pin longitudinally thereof toward a locking position, an actuator plunger carried within a second passage in said frame 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 inclined with respect to the longitudinal axis of said plunger and engageable with said locking pin so as to force the latter toward said locking position upon longitudinal movement of said plunger in one direction, and spring means mounted on said frame for biasing said actuator plunger in said direction.

5. In a firearm having a barrel removably attached to a frame by means of an interlocking tongue and channel connection, said tongue and channel being dovetail shaped to provide corresponding mutually inclined surfaces extending longitudinally of said barrel for accurately aligning said barrel laterally on said frame, a take-down device comprising in combination a locking pin carried by said frame for longitudinal movement into and out of

latching position, one end of said locking pin when in latching position engaging said barrel for rigidly locking the latter to said frame, said barrel being provided with a notch having mutually inclined front and rear faces with which said locking pin engages, said one end of said locking pin having correspondingly inclined faces whereby said barrel is rigidly positioned longitudinally with respect to said frame when said locking pin is forced against said barrel in latching position, an actuator pin carried by said frame for longitudinal movement at an angle to the direction of movement of said locking pin, said actuator pin having a wedging surface inclined with respect to the longitudinal axis of said actuator pin and engageable with said locking pin so as to force the latter into latching position against said barrel upon longitudinal movement of said actuator pin in one direction, and means for biasing said actuator pin in said direction.

6. In a firearm having a barrel removably attached to the upper side of a frame by means of an interlocking tongue and channel connection, a take-down device comprising in combination a locking pin guided in a substantially vertical bore within said frame for longitudinal movement into and out of latching position, the upper end of said locking pin when in latching position engaging said barrel for rigidly locking the latter to said frame, an actuator pin guided in an elongated bore within said frame at an angle to the longitudinal axis of said locking pin and intersecting the latter at its lower end, said actuator pin having a wedging surface inclined with respect to the longitudinal axis of said actuator pin and engageable with the lower end of said locking pin so as to force the latter into latching engagement with said barrel upon longitudinal movement of said actuator pin in one direction, said actuator pin bore extending in said one direction to an edge of said frame and being closed at its inner end, a coil spring compressed between the closed end of said actuator pin bore and the inner end of said actuator pin to urge said actuator pin outwardly, said actuator pin projecting outwardly beyond the edge of said frame so that it can be manually moved against said spring to permit said locking pin to move out of latching position, said actuator pin being further provided with a second surface adjacent to and outwardly of said wedging surface, said second surface being inclined at a greater angle to the longitudinal axis of said actuator pin to cause more rapid movement of said locking pin when said actuator pin is moved far enough inwardly to bring said second surface into engagement with said locking pin.

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