

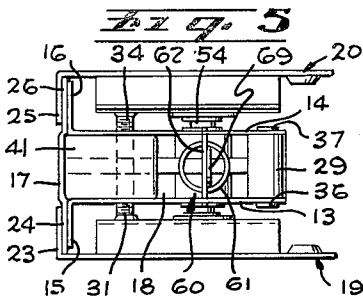
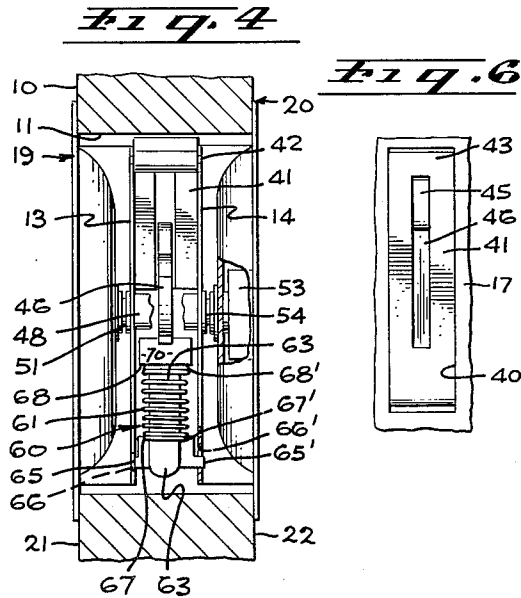
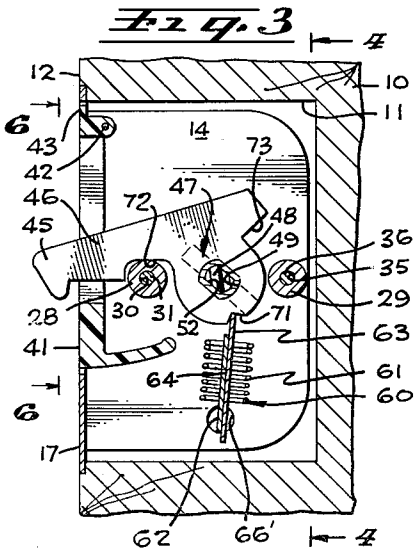
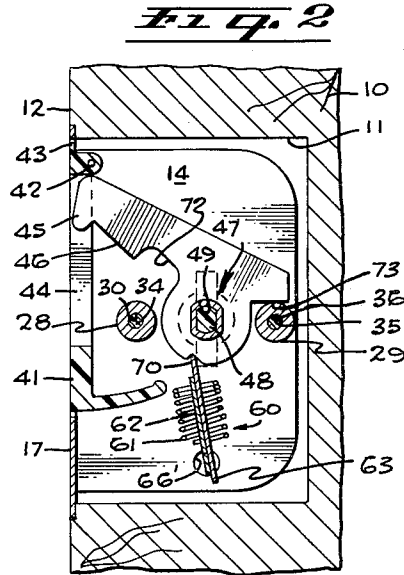
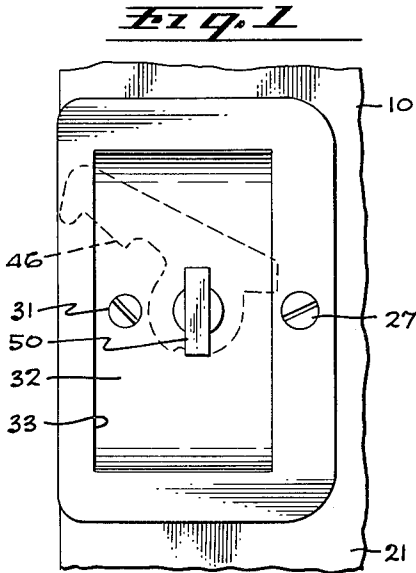
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SLIDING DOOR LATCH SPRING MEANS

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SLIDING DOOR LATCH SPRING MEANS

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1 Claim. (Cl. 292—101)

The invention relates to spring actions for door latches and particularly door latches of the type currently designated as sliding door latches.

Although sliding doors and latches for operating them are by no means new to the art, nevertheless, because of the current high cost of building space, and particularly residential building space, sliding doors have become increasingly popular. This increase in employment of sliding doors has correspondingly increased the use of sliding door hardware and particularly latches, which has prompted considerable redesign in the interest of improving the simplicity and compactness of door latches and locks of this particular type. Although the current popularity and demand for compact sliding door latches has resulted in an assortment of innovations, certain limitations have yet to be overcome in order to construct a sliding door latch comparable to the more conventional door latch as a positive, secure, and durable piece of hardware. Most sliding door latches require a spring to retain the latch hook in one position or another; but heretofore, springs and spring mechanisms which have been resorted to, although simple in some respects, have lacked an adequate degree of positive action and the ability to provide dependable service for long periods of time.

It is therefore, one of the objects of the invention to provide a new and improved spring action for a door latch, and in particular a sliding door latch which is appreciably more effective than those heretofore available.

Another object of the invention is to provide in a door latch, and especially a sliding door latch, a less expensive construction which, at the same time, provides a measurably improved degree of positive action and durability. Still another object of the invention is to provide a sliding door latch containing relatively few operative parts including a spring means more compact than spring means heretofore available, and capable of long periods of use because of the need for relatively little flexure of the spring means to accomplish its purpose.

Still another object of the invention is to provide a new and improved spring action mechanism for a sliding door latch which makes it possible to have the spring guides to serve also as mounts for the spring and an attachment of the spring to requisite portions of the latch. Still further among the objects of the invention is to provide a new and improved coil spring mechanism of relatively inexpensive, but of greatly improved positiveness of action especially suited to the manipulation of a latch hook in a sliding door latch.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claim and illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a side elevational view of a sliding door latch of the type in which the invention is incorporated.

FIGURE 2 is a longitudinal sectional view of the device showing a latch hook in withdrawn position.

FIGURE 3 is a longitudinal sectional view similar to FIGURE 2 showing the latch hook in extended position.

FIGURE 4 is a vertical sectional view taken on the line 4—4 of FIGURE 3.

FIGURE 5 is a bottom view of the device.

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FIGURE 6 is a fragmentary and elevational view of the device as it appears at the edge of the door on the line 6—6 of FIGURE 3.

In an embodiment of the invention chosen for the purpose of illustration, there is shown a fragment of a sliding door 10 in which the sliding door latch mechanism is mounted. The door 10 is provided with a relatively conventional cutout or recess 11 of ample size to accommodate the latch. The cutout is made by conventional means inwardly from an end edge 12 of the door.

In the chosen embodiment, the latch is provided with a casing consisting of opposite side plates 13 and 14 which are joined respectively at flanges 15 and 16 to a front plate 17, by some conventional expedient. A chamber 18 lies inwardly of the end plate 17 intermediate the side plates 13 and 14.

Escutcheon plates indicated generally by the reference characters 19 and 20 respectively are located on opposite sides of the casing and flush with opposite faces 21 and 22 of the door 10. On the escutcheon plate 19 is a vertical flange 23 which overlies an adjacent edge 24 of the end plate 17. Similarly a flange 25 of the escutcheon plate 20 overlies an opposite edge 26 of the end plate 17. Screws 27 on respectively opposite sides are employed to secure the escutcheon plates 19, 20 to the door 10.

In order to maintain the side plates 13 and 14 properly spaced from each other, spacing sleeves 28 and 29 are provided. In the chosen embodiment, the spacing sleeve 28 is provided with a threaded interior 30, and appropriate screws 31 may extend from a bottom 32 of a depression 33 of the escutcheon plate 19 through the bottom and an appropriate hole in the side plate 13 and thence into the threaded interior 30 of the spacing sleeve 28. If desired, a similar screw 34 may extend inwardly from the opposite side.

The spacing sleeve 29 may also be provided with a threaded interior 35 to accommodate a screw 36 extending from the outside of the side plate 13 into the threaded interior 35 of the spacing sleeve 29. Similarly, a screw 37 may extend from the outside of the side plate 14 through the side plate 14 into the threaded interior 35 of the spacing sleeve 29 and its opposite end.

The end plate 17 is provided with a rectangular opening 40 to accommodate a finger hook 41 which may, if desired, be formed of one of the currently commercially available synthetic plastic resinous materials. The finger hook 41 is pivotally mounted by means of a pivot pin 42 to the side plates 13 and 14, as shown in FIGURES 2, 3, and 4. An overhanging end 43 is preferably provided on the finger hook 41 to assist in starting its tilt outwardly when it is to be grasped for pulling the sliding door across its usual opening. Within the finger hook 41 is a slot 44 to accommodate an end hook 45 of a catch member 46, when the catch member 46 and the end hook 45 thereon is in the extended position of FIGURE 3.

To mount the catch member 46 in pivoting position, there is provided a hub assembly indicated generally by the reference character 47. In the chosen embodiment, the hub assembly 47 consists of a central hub element 48, noncircular in form as clearly shown in FIGURES 2 and 3, which is received in a complementary noncircular opening 49 in the catch member 46.

On the visible side of the device as shown in FIGURE 1, there is provided a handle 50 having a noncircular shank 51, which extends into a noncircular hole 52 in the hub element 48. A similar handle 53, on the opposite side, has a corresponding shank 54 extending into the noncircular hole 52 of the hub element 48. Constructed as described, the catch member 46 can be rotated from the position of FIGURE 2 to the position of FIGURE 3 and returned by manipulation either of the handle 50 or the handle 53.

It is of course, desirable to have the catch member 46 be releasably retained in one or other of the positions shown in FIGURES 2 and 3. This is accomplished by providing an over center spring mechanism indicated generally by the reference character 60. The spring mechanism 60 consists of a coiled spring 61 and two relatively flat plates 62 and 63, serving as spring guides. The flat plate 62 has a spring holding section 64 which lies within the coiled spring 61, and at its outer end is provided with projections 65, 65' which are pivotally retained in respective holes 66, 66' in the side plates 13 and 14 respectively. On the flat plate 62 are shoulders 67, 67' which bear against the endmost turn of the coiled spring 61 at one end.

The flat plate 63 is similarly provided with shoulders 68, 68' which bear against the endmost turn of the coiled spring 61 at its opposite end. The flat plate 63 has a spring holding section 69 which lies slidably within the coiled spring 61 and in face to face sliding relationship with spring holding section 64 of the flat plate 62. An upper portion 70 of the flat plate 63 and the portion which forms the shoulder 68, 68' is adapted by spring action to be pressed into a recess configuration 71 of the catch member 46.

In operation, let it be assumed that the catch member 46 is in the withdrawn position of FIGURES 2, which is also the broken line position as shown in FIGURE 1. In this position the spring mechanism 60 is positioned on the bias shown in FIGURE 2, and action of the coiled spring 61 bottomed upon the shoulders 67, 67' presses against the shoulders 68, 68' and thus forces the upper portion 70 of the spring holding section 69 into engagement with the recessed configuration 71. Because the recessed configuration 71 is off center with respect to the axis of pivot of the catch member 46, the action of the spring mechanism 60 will be to releasably retain the catch member 46 in the withdrawn position as shown, with surface 73 of catch member 46 bearing against spacing sleeve 29. To rotate the catch member 46 to the extended position shown in FIGURE 3, one or another of the handles 50 or 53 is rotated. Rotation of the respective handle through its shank and the hub element 48 causes the catch member 46 to rotate in a counter-clockwise direction as shown in FIGURES 2 and 3, until the bottom of a depression 72, on the catch member 46 engages the spacing sleeve 28 and stops further rotation of the catch member 46.

In the meantime, the flat plate 63 will be moved slightly against the coiled spring 61, depressing it for the necessary distance as the recessed configuration 71 passes from the position of FIGURE 2 to the position of FIGURE 3. During the movement, the pressure upon the flat plate 63 will be overcome and the action of the coiled spring 61 continues to extend it against the recessed configuration 71, but in an opposite direction, as shown in FIGURE 3, which results in the spring mechanism 60 tending to releasably retain the catch member 46 in its extended position, as shown in FIGURE 3. When the catch member 46 is to be again returned to the withdrawn position of FIGURE 2, the action is merely reversed as one or another of the handles 50 or 53 is employed to return the catch member 46, as desired.

Because the spring holding sections 64 and 69 of the respective flat plates 62 and 63 substantially fill the inside diameter of the coiled spring 61 leaving only a slight clearance, these flat plates 62 and 63 are held in face to face sliding relationship by the coiled spring 61. Further still, inasmuch as there is relatively little displacement of the bottom of the recessed configuration 71 endwise

with respect to the longitudinal axis of the coiled spring 61, there is relatively little depression of the coiled spring 61. This substantially minimum flexure of the coiled spring 61, creates only a very modest amount of tension and strain in the spring, and hence, even a relatively light spring mounted and constructed, as shown and described, provides an ample amount of spring tension which will continue to serve successfully for the life of the other mechanical portions of the latch. Moreover, the spring action, as described, is firm and positive because of the structural relationship, without at the same time being unnecessarily stiff, and hence, the mechanism provides a highly desirable spring action for a door latch, such as a sliding door latch, as herein disclosed.

While the invention has herein been shown and described in what is conceived to be a practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention which are not to be limited to the details disclosed herein but are to be accorded the full scope of the claim so as to embrace any and all equivalent devices.

Having described the invention, what is claimed as new in support of Letters Patent is:

In a latch for a sliding door, a casing, a hub element rotatably mounted in the casing, a catch member non-rotatably mounted on the hub element, and a turn member on the exterior of the casing having a portion thereof extending into the casing and being in nonrotatable engagement with said hub element, said hub element being adapted to rotatably mount said catch member in the casing, said catch member having an extended position projecting outwardly of the casing and a retracted position, a configuration on the catch member spaced from the axis of rotation of said catch member and having shoulders facing in opposite rotational directions, said configuration having one location when the catch member is in extended position and another location when the catch member is in retracted position, and a coiled spring assembly having one end in engagement with the casing and the other end in engagement with the configuration on said catch member in both locations of said configuration, said spring assembly comprising a coil spring and a pair of complementary relatively flat plates having a sliding relationship with respect to each other in face to face position, said plates being located within the interior of the coil of said spring, and elements including shoulders on said plates in engagement with respective opposite ends of the spring, said casing having openings adjacent one end of said spring assembly, one of said elements having a pivotal engagement in said openings of the casing and the other of said elements having a movable engagement with said configuration on the catch member alternatively at both locations thereof, whereby to releasably hold said catch member alternatively in extended and retracted positions.

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