

April 28, 1931.

F. E. BESSLER

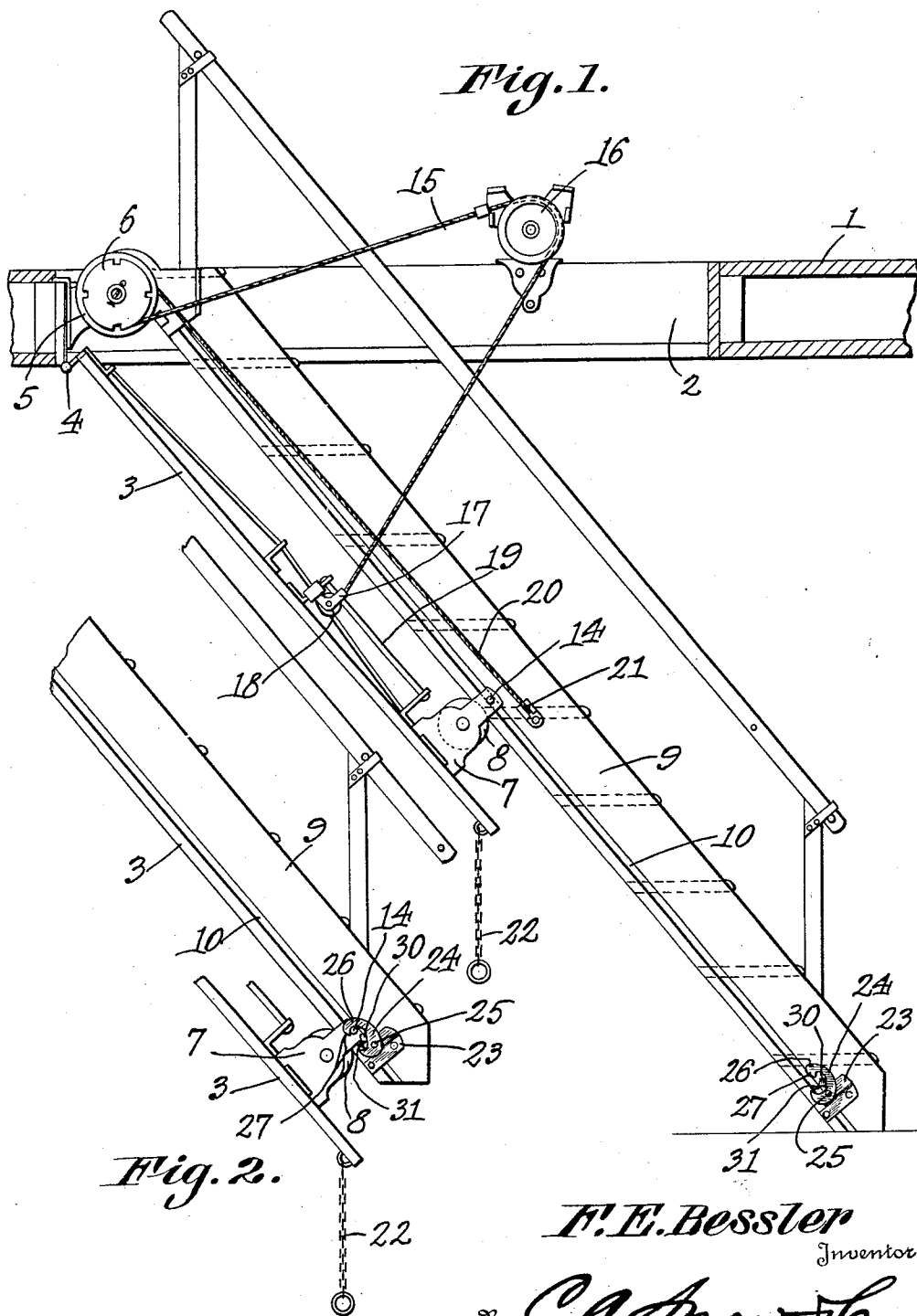
1,802,401

LATCH

Filed Aug. 4 1928

2 Sheets-Sheet 1

*Fig. 1.*



*Fig. 2.*

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2 Sheets-Sheet 2

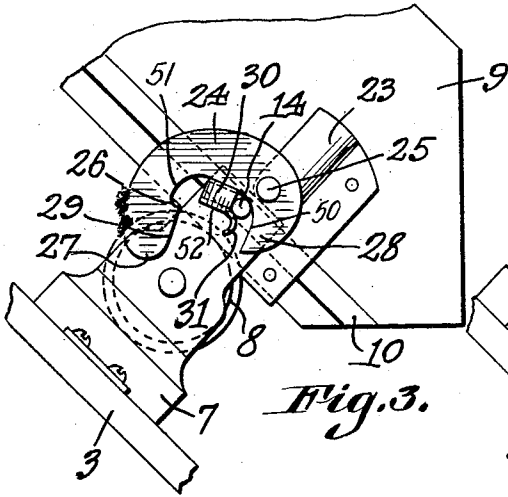


Fig. 3.

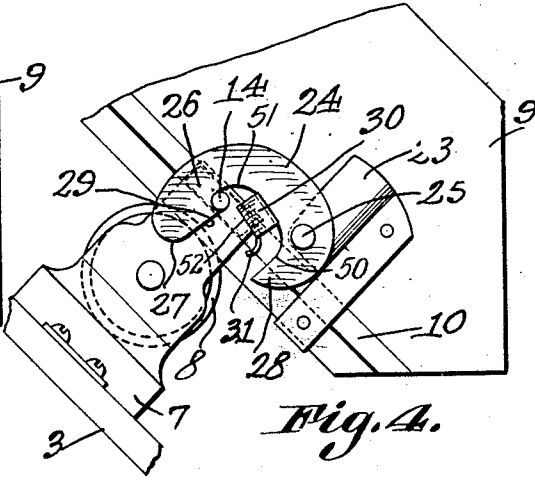


Fig. 4.

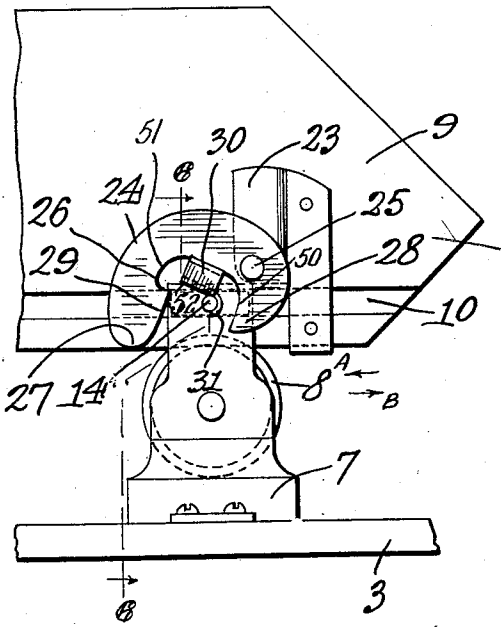


Fig. 5.

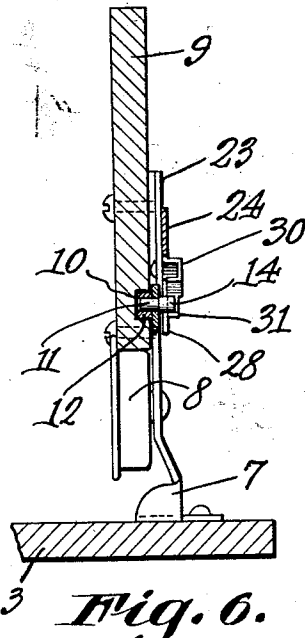


Fig. 6.

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# UNITED STATES PATENT OFFICE

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## LATCH

Application filed August 4, 1928. Serial No. 297,544.

The device forming the subject matter of this application is a latch, adapted to be used primarily in connection with a stairway which slides on a hingedly mounted panel, the latch being intended for the protection of the operator of the stairway in that it prevents the same from sliding back to the floor after it has once been started back to its inoperative position. The invention aims to provide a latch of the class described which will be partially automatic in its action, and require no attention on the part of the operator other than comes from sliding the stairway on the panel.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 shows in side elevation, a latch constructed in accordance with the invention, mounted on a stairway which has been lowered with respect to a panel;

Figure 2 is an elevation showing the parts as they will appear after the stairway has been shoved up on the panel, and before the panel has been raised;

Figure 3 is an elevation showing the parts as they will appear after the stairway has been shoved up on the panel by the operator and before the stairway has gravitated down a little to the position of Figure 2;

Figure 4 is an elevation showing the parts as they will appear after the stairway has gravitated down a little on the panel from the position of Figure 3;

Figure 5 is an elevation showing the parts as they will appear after the stairway and the panel have been completely raised;

Figure 6 is a transverse section on the line 6—6 of Figure 5.

In order that one application of the invention may be understood clearly, it is necessary to describe a part of the structure on which the latch forming the subject matter of this application has been mounted.

The numeral 1 marks a support, which may be the ceiling of a room, the support 1 having an opening 2. The numeral 3 designates a panel mounted to swing vertically, the panel 3 being hinged at one end to the support 1, as shown at 4. The panel 3 constitutes a closure for the opening 2. The panel may be swung downwardly into the position shown in Figure 1, by means of a chain 22 or the like, attached to the lower end of the panel. On the support 1 at one end of the opening 2 there is a hanger 5 on which a spring actuated drum 6 is journaled. On the lower end of the panel 3 there is a bracket 7 carrying a wheel 8. A stairway 9 is slidably supported at its upper end on the hanger 5, and at its lower end on the wheel 8. The stairway 9 has longitudinal guide grooves 10 in its sides. In the bracket 7 there is a rivet 11 which holds the block 12 that is received slidably in the guide groove 10 of the stairway 9. So far as the present invention is concerned, attention is directed only to the outer end of the rivet 11 which forms a projection 14. A flexible element 15 is connected to the spring actuated drum 6. The flexible element 15 passes a guide pulley 16 supported for rotation on the member 1 near to the opening 2. The lower end of the flexible element is connected to a frame 17 carrying the wheel 18 which has a limited sliding movement, lengthwise of the panel 3, on a track 19 which is secured to the panel. Because the wheel 18 can slide along the track 19, the flexible element 15 has an increased mechanical advantage in the way of an upward pull on the panel 3 as the panel swings upwardly toward closed position.

The numeral 20 marks a flexible element connected to the spring actuated drum 6 and adapted to be wound thereon. The flexible

element 20 extends lengthwise of the stairway 9 and is anchored at one end as shown at 21 to the stairway. The flexible element 20 is adapted to be put under tension by the spring actuated drum 6, and has a part in the operation of the latch which will be described hereinafter.

No novelty is claimed for the parts hereinbefore set forth, saving in so far as they may enter into combination with parts hereinafter specified. In operating the stairway, the panel 3 is swung down by means of the chain 22 and the stairway 9 slides or is drawn down to the position shown in Figure 1. When the operator desires to stow the stairway 9, he pushes it back on the panel 3, the flexible element 20 aiding in the backward movement of the stairway 9. When the stairway 9 has been pushed back far enough, a little upward shove will close the panel 3, especially in view of the fact that the flexible element 20 exerts an upward pull on the panel. With such a structure, or with an equivalent device, the latch forming the subject matter of this application is adapted to be used.

An anchor plate 23 is secured to the stairway 9 near to the lower end of the stairway. The numeral 24 marks a U-shaped latch which is pivotally mounted at 25, at a point near to one end of the latch, to swing on the anchor plate 23. The pivotal mounting of the latch 24 at 25 is of such nature that some force must be applied to the latch in order to move it. The latch does not swing freely on the pivot 25. At one end the latch 24 has a hook or seat 26. The latch 24 has an internal cam 51 leading to the seat 26. The end of the latch which is adjacent to the hook is rounded as shown at 27, and the latch has a straight edge 29 which extends from the rounded edge 27 to the bill of the hook 26. The edge 29 may be referred to as a first operating surface. That end of the latch which is opposite to the rounded end 27 has a lever arm 28. The lever arm 28 has a second operating surface 50. Intermediate its ends, the latch 24 has a laterally projecting trough shaped bracket 30 from which projects an arcuate detent 31. The lower portion of the bracket 30 constitutes an actuating surface 52.

Suppose that the panel 3 has been raised to a closed position, as shown in Figure 5, and that the spring actuated drum 6 is exerting a pull on the flexible element 20, so that the stairway 9 tends to move to the left in Figure 5, thereby engaging the detent 31 with the projection 14.

The panel 3 is swung down into the position shown in Figure 3, for instance. The first thing that occurs, as the stairway starts to move downwardly on the inclined panel 3 is that the edge 29 of the latch 24 comes into contact with the projection 14. This

tilts the latch 24 on its pivotal mounting 25, and the projection 14 passes along the edge 29 of the latch 24. The latch thus appears in Figure 1 of the drawings, wherein the stairway 9 has been pulled down as far as it will go.

When the operator shoves the stairway 9 upwardly on the panel 3, the projection 14 comes into contact with the inner edge 50 of the lever arm 28, the detent 31 passing above the projection 14, and the projection arriving in the position shown in Figure 3 of the drawings. The stairway 9 now gravitates down hill a little, and the projection 14 arrives in the hook 26 of the latch 24, the construction being such that the stairway 9 cannot slide back upon the operator during the upward movement of the stairway and the panel.

When the panel 3 arrives at a horizontal or closed position, as shown in Figure 5, the flexible element 20 exerts a pull on the stairway 9 and slides the stairway 9 to the left in Figure 5, until the projection 14 is engaged with the detent 31. The parts are now in position to repeat the cycle hereinbefore described.

Owing to the somewhat complicated operation of the latch 24, that operation possibly will be better understood if confined to the latch 24 and the projection 14, without regard to the specific mechanism employed for mounting and operating the stairway 9. It may therefore be stated that the projection 14 and the latch 24 are mounted for relative backward and forward movement, as shown by the arrows of Figure 5, the arrow A indicating a backward movement, and the arrow B indicating a forward movement. Referring to Figure 5, upon a first forward movement of the latch 24 in the direction of the arrow B, with respect to the projection 14, the projection will engage the first internal operating surface 29 and tilt the latch 24, to move the detent 31 upwardly and out of the path of the projection 14, the projection 14 engaging the second operating surface 50, upon a backward movement in the direction of the arrow A, to tilt the latch 24 and dispose the cam 51 in the path of the projection 14, as shown in Figure 3, the projection 14 coacting with the cam 51, upon a second forward movement in the direction of the arrow B, to tilt the latch 24 and engage the projection 14 in the seat 26, as shown in Figure 4, the projection 14 coacting with the actuating surface 52, upon a second backward movement in the direction of the arrow A, to direct the projection 14 into engagement with the detent 31, and to tilt the latch 24 and dispose the first operating surface 29 in the path of the projection 14, the parts thus being restored to the position of Figure 5.

What is claimed is:—

1. In a device of the class described, a U-shaped latch provided at one end with a hook shaped member, the latch having an end portion located outwardly of the hook shaped member, the latch being provided at its opposite extremity with a lever arm, an offset bracket on the inner edge of the latch, between the lever and the hook shaped member, and a detent projecting from the bracket in the same general direction as the lever.

2. A device of the class described, comprising a latch mounted for restrained pivotal movement and provided with a first internal operating surface and with a second internal operating surface located opposite to each other, the latch having an internal seat disposed inwardly of the first operating surface, the latch being provided with an internal cam leading to the seat, an internal detent mounted on the latch, the latch having an actuating surface leading to the detent, the detent and the actuating surface being located between the first and second operating surfaces; a projection, and means for mounting the projection and the latch for relative backward and forward movement, whereby upon a first forward movement of the latch with respect to the projection, the projection will engage the first internal operating surface and tilt the latch, to move the detent out of the path of the projection, the projection engaging the second operating surface, upon a backward movement, to tilt the latch and dispose the cam in the path of the projection, the projection coacting with the cam, upon a second forward movement, to tilt the latch and engage the projection in the seat, the projection coacting with the actuating surface, upon a second backward movement, to direct the projection into engagement with the detent, and to tilt the latch and dispose the first operating surface in the path of the projection.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

FRANK E. BESSLER.