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2,283,304

LATCH MECHANISM

Filed March 22, 1941

FIG. 1.

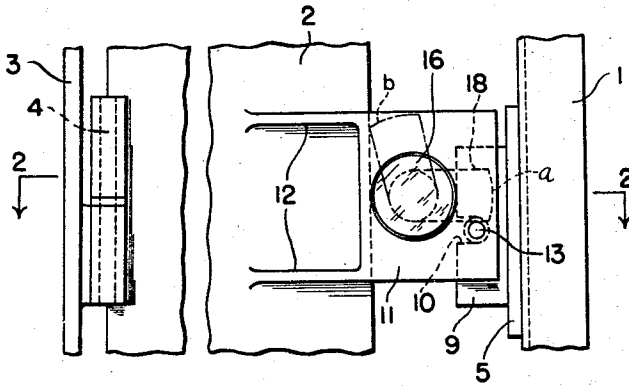


FIG. 2.

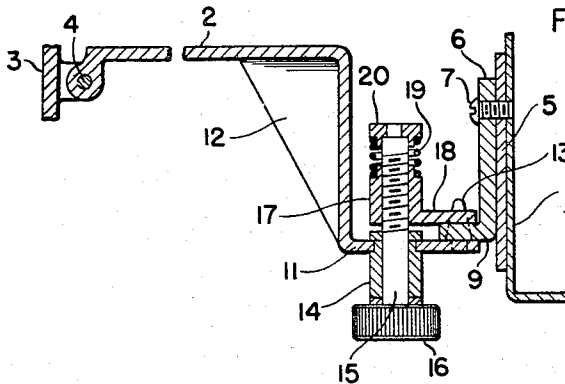


FIG. 3.

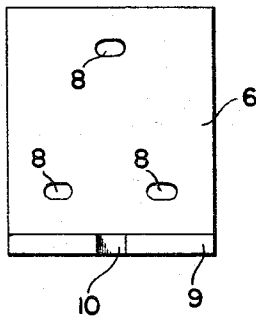
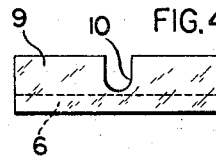


FIG. 4.



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LATCH MECHANISM

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2 Claims. (Cl. 292—212)

The present invention relates to latches and more particularly to a latch that may be quickly operated from its closed to its open position and one in which the movable member that is held in a locked position can be forcibly brought against the stationary member to which it is locked.

In some cases it is necessary to have a lock which will serve to hold, for example, a swinging member against a stationary member when the swinging member has considerable weight and may be pulled out of its proper position. For example, in a measuring instrument in which the measuring mechanism is to be swung in and out of a casing, it is desirable that this mechanism, which is usually mounted on a swinging plate, be held rigidly with respect to the casing when in its closed position but the mechanism should be able to swing outwardly for adjustment and repair if required. In such a case the lock mechanism that is used to hold the swinging member or instrument support must be able to exert considerable force to pull the swinging member into its proper relative position with respect to the stationary member or casing. In such a case also small movement of the latch itself is desirable to move it from its open to its closed position but the latch should also be able to hold the swinging plate, upon which the measuring mechanism is supported, rigidly in the casing in some particular position.

It is an object of my invention to provide a latch that satisfies the above desiderata in that it requires very little movement of the latch to lock and unlock it. The latch is also capable of tightly pulling the moving part against the stationary part while at the same time serving to line one part up with the other so that they will be properly positioned relative to each other. It is a further object of my invention to provide a latch mechanism which is easily and quickly operated to bring two parts together or to release one part from another.

The various features of novelty which characterize this invention are pointed out with particularity in the claims annexed to and forming part of this specification. For a better understanding of the invention, however, its advantages and specific objects obtained with its use, reference should be had to the accompanying drawing and descriptive matter in which is illustrated and described a preferred embodiment of the invention.

In the drawing:

Fig. 1 is a front view of the latch mechanism.

Fig. 2 is a section view taken on line 2—2 of Fig. 1, and

Figs. 3 and 4 are views of the latch plate.

Referring first to Figure 1, there is shown a stationary part 1 to which the swinging part 2 is adapted to be fastened by the latch of my invention. Needless to say the part 1 may be movable and the part 2 stationary, if desired, since the parts are shown herein as stationary and movable, respectively, as a matter of convenience. The swinging part 2 is in turn supported by another stationary part 3 and can swing back and forth relative thereto around the hinge pin 4, which forms part of a conventional hinge. A reinforcing plate 5 is attached to the part 1 and a latch plate 6 is attached to this reinforcing plate 5 by means of screws 7 that extend through elongated slots 8 formed in the plate. By means of the slots the latch plate can be shifted up and down, relative to the part 1, so that the plate can be properly positioned. This plate is bent as shown at 9, the bent part being provided with an opening or slot 10.

Extending forward from the part 2, and in the same direction, is a flange 11 which is formed as part of the part 2 and is rigidly held with respect thereto by means of a connecting portion that is reinforced by a flange 12, also formed as part of the structure. These elements are shown herein as being in a one piece cast structure, but it will be understood that these parts could be made of sheet metal and welded or fastened together in any suitable manner. A conically shaped pin 13 extends rearwardly from the flange 11 through the slot 10 of the latch plate 6. Because of the shape of this pin, as the part 2 is moved toward the part 1, the pin will serve to guide the part 2 to the right position relative thereto. Also attached to the flange 11 is a bushing 14 that receives a rotatable and threaded shaft 15, on the front end of which is formed a knurled knob 16. Received on the threaded portion of the shaft 15 is a sleeve 17 having a latch member 18 projecting therefrom, which latch is adapted to be moved from its position *a* to its position *b* in Figure 1, and back again. The rear end of the sleeve 17 is formed with a shoulder that receives one end of a spring 19, the other end of which is received by a similar shoulder on a collar 20, attached to the shaft 15.

My improved latch is shown in its latched position in Figure 2, and in Figure 1 when the part 18 is in position *a*. In order to unlatch the parts 1 and 2 so that they can be moved relative

to each other, the knurled knob 16 is first rotated in a counterclockwise direction in Figure 1. This causes the sleeve 17 to be moved rearwardly with respect to the shaft 15 until 18 is free of engagement with the bent portion 9 of the latch plate. 5
Thereafter, the sleeve 17 will rotate with the shaft 15 until the portion 18 engages the movable part 2.

Continued rotation of shaft 15 will thereafter move sleeve 17 further in rearwardly direction on the shaft 15. In order to close the latch the knob 16 is rotated in a clockwise direction in Figure 1. This will first move the latch 18 from its position b in Figure 1 to its position a in which the latch 18 engages the pin 13 as a stop. Thereafter continued rotation of the knob 16 will rotate the shaft 15 relative to the sleeve 17 and will cause 17 to move forwardly on 15 thus causing the flange 9 of the latch plate to be tightly gripped between latch 18 and flange 11. This serves to draw the parts 1 and 2 tightly together and to hold them in that position. The purpose of the spring 19 is to produce a slight amount of friction between the sleeve 17 and the shaft 15 so that initial movement of the shaft 15 will tend to move the latch with the shaft so that the latch will quickly be moved from its position a to its position b and vice versa. If it was not for the spring 19 the sleeve 17 would have to be moved full length of the threaded portion of shaft 17 before it was brought up against either the collar 20 or journal 15 and was rotated. Therefore, it will be seen that the addition of the spring 19 causes quick operation of the latch between its open and its closed positions.

From the above description it will be seen that I have provided a latch which is quickly moved from its open to its closed position and which also will serve to rigidly position a movable part relative to the stationary part. The pin 13 serves the dual purpose of guiding part 2 relative to part 1 so that they will be properly positioned with respect to each other and also serves to act as a stop to prevent continued movement of the latch 18 after it is in position a of Figure 1 before being moved forwardly toward flange 9. Thus, it will be seen that I have provided a quickly operated and efficient latch to hold one part in position relative to another part.

While in accordance with the provisions of the statutes, I have illustrated and described the best form of this invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of this invention as set forth in the appended claims, and that in some cases certain features of this invention may be used to advantage without a corresponding use of other features.

Having now described this invention, what I claim as new and desire to secure by Letters Patent is:

1. In a latch mechanism a latch plate provided with an opening therein, a member movable relative thereto and having a projection received by said opening in one relative position of said plate and member, a threaded shaft journaled on said member, a latch member threaded on said shaft whereby rotation of the shaft will rotate and produce axial movement of said latch member, the parts being so positioned relative to each other that rotation of said shaft will first move said latch member into engagement with said projection and further rotation of the shaft will then produce axial movement of the latch member to draw the latch member tightly against said latch plate.

2. In a latch mechanism a latch plate provided with an opening therein, a member movable relative thereto and provided with a pin received by said opening in one relative position of said plate and member, a threaded shaft journaled for rotation in said member with its threaded portion extending in the same direction as said pin, a latch member having a part projecting laterally therefrom and threaded on said shaft, stop means, said part projecting sufficiently to engage said pin or said stop means upon rotation of said shaft in one direction or the other, whereby as said shaft is rotated the projecting part will be rotated into engagement with either said stop means or said pin and then moved axially on said shaft to move said projecting part away from or toward said latch plate.

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