

Aug. 28, 1951

A. D. MEYER
PUSH-PUSH LATCH

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2 Sheets-Sheet 1

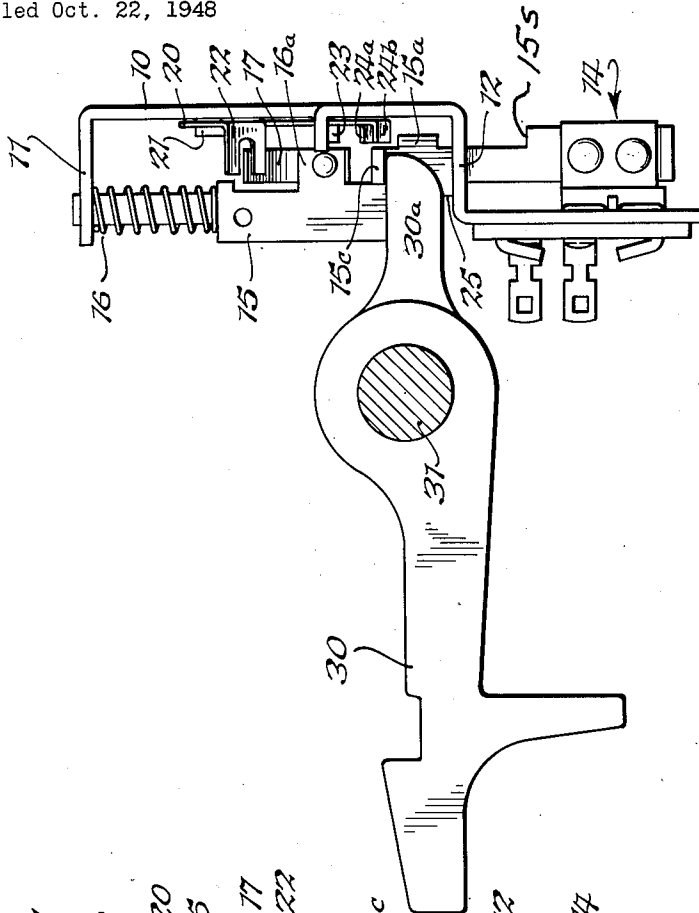


Fig. 2.

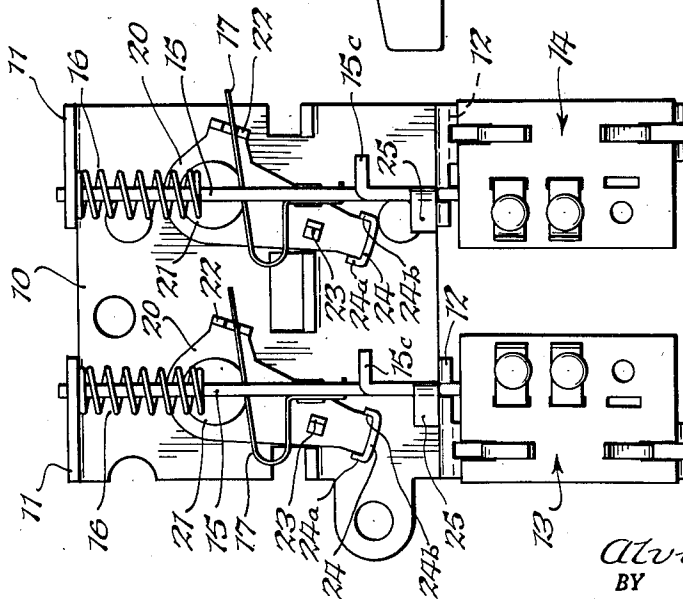


Fig. 1.

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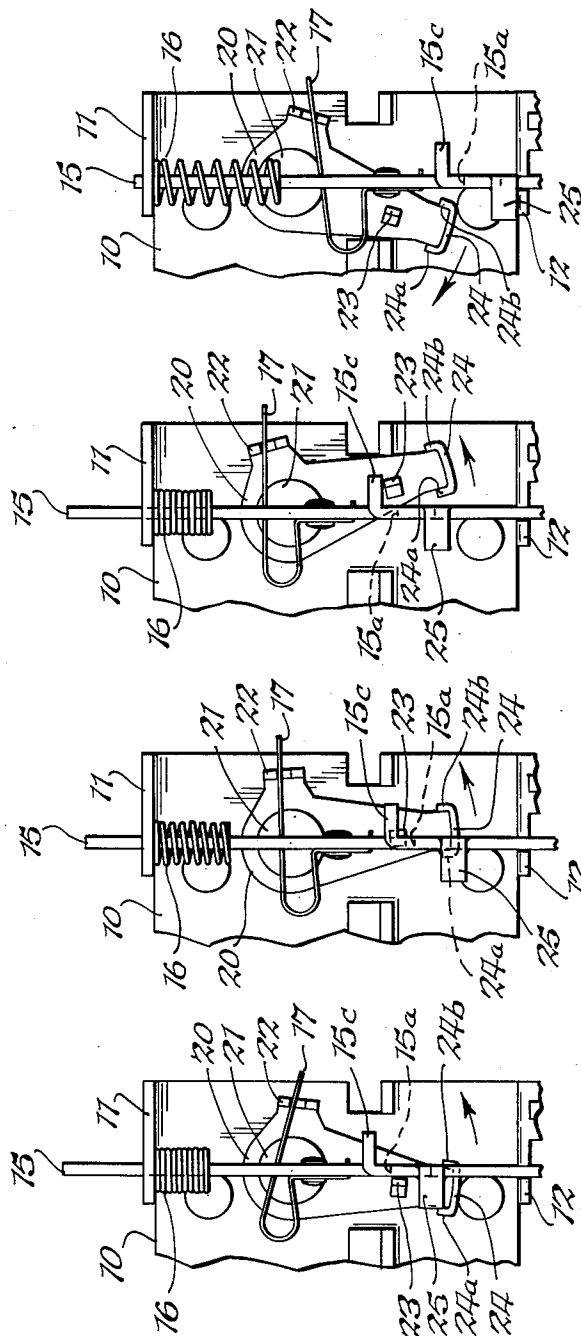


Fig. 6.

Fig. 5.

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE

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PUSH-PUSH LATCH

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5 Claims. (Cl. 74—503)

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This invention relates to a so-called "push-push" latch mechanism. This may be described as a mechanical arrangement wherein one of the elements can be moved for a given distance, by actuating an operating lever or push button, and the return stroke of the mechanism is limited when the operator releases the operating lever. The return stroke is accomplished by moving the operating lever or push button a second time, whereupon, upon release of the operating lever or push button, the mechanism returns to initial position and is ready for a new cycle of operations.

Mechanism of this type has many applications. One specifically described herein, is to control the push buttons of a radio receiver. Another is in trunk covers, door latches, and the like, wherein "star wheel" mechanism is employed.

It is an object of this invention to provide mechanism of the class described which is simple and reliable in its action, simple to construct and install, which requires a minimum of service, and which may be assembled from punch press parts, requiring no excessive tolerances.

Still other objects and advantages of my invention will be apparent from the specification. The features of novelty which I believe to be characteristic of my invention are set forth with particularity in the appended claims.

My invention itself, however, both as to its fundamental principles and as to its particular embodiments, will best be understood by reference to the specification and accompanying drawing, in which

Fig. 1 is a front elevation of mechanism in accordance with my invention, with various cover plates and other parts removed to show the construction of the elements,

Fig. 2 is a side elevation of the parts shown in Fig. 1, with some of the removed parts back in position, and Figs. 3, 4, 5 and 6 are fragmentary front elevations of the latch portion of the mechanism in successive positions in its operating cycle.

Referring now more particularly to Fig. 1, 10 designates the frame plate of the mechanism, in the embodiment of the invention about to be described, and which is for certain purposes and under certain conditions the preferred embodiment of the invention. The frame 10 has top ears 11 and bottom ears 12, provided with slots, in which are mounted for vertical movement sliders 15, operated by the operating levers or push buttons, and which in turn, in the embodiment of the invention described, operate tone control switches 13 and 14.

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The normal position of the sliders 15 is at the lower end of their travel, to which position they are biased by springs 16, the lower ends of which are secured to the sliders, and the upper ends about against ears 11. The sliders 15 carry a latching projection 15a, and a second projection 16a (Fig. 2), to the latter of which is secured a leaf spring 17, the free end of which passes between the bifurcations of a bifurcated ear 22 formed on rotary latch member 20, mounted on shaft 21.

Near the lower end of latch 20 there is formed a forwardly extending ear 23, and at the lower end of latch 20 there is provided a forwardly turned edge 24 and upwardly extending flanges 24a and 24b. Near the center of slider 15 there is a laterally extending finger 15c, and below this a second finger 25 extending in the opposite direction.

The bottom finger 25 serves as a stop to limit the downward movement of the slider by striking against ear 12, while ear 15c is engaged by the operating lever or push button which engages the slider, in this case key 30, mounted on shaft 31, and having a projecting portion 30a which fits under finger 15a and lifts slider 15 when the outer end of key 30 is depressed.

In this particular case key 30 is of the so-called piano-key type, but it will be understood that other types of key may be employed.

The operation of the mechanism will now be described.

When key 30 is depressed, slider 15 is lifted by the action of projection 30a and finger 15c. This lifts the bottom end of leaf spring 17 and applies pressure tending to rotate latch 20 counter-clockwise from the normal position of Fig. 1.

As latch 20 rotates counter-clockwise, and slider 15 rises, projection 15a on slider 15 moves in front of ear 23 on latch 20, and stops the rotation of latch 20 in the position of Fig. 3. Continued pressure on key 30 will produce no further movement, because the mechanism is now locked against further movement as long as pressure is applied. The slider 15 has reached the top limit of its travel, (upward movement is limited by step 15S on slider 15 engaging the underside of ear 12), and with the slider in that position, the latch 20 has reached the end of its counter-clockwise rotation. The operator now releases key 30.

When this occurs, vertical pressure on slider 15 is released, and spring 16 moves slider 15 downwardly. As the slider moves downwardly, projection 15a on slider 15 passes out of the path of ear 23 on latch 20, and spring 17 rotates latch 20 further counter-clockwise, to the position of Fig. 4, where the rotation of latch 20 is stopped,

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this time by the engagement of projection 15a and flange 24a at the lower left hand of the latch 20. This is the latched position of slider 15, in which it will remain until the key 30 is again depressed.

As the key 30 is depressed the second time, slider 15 is raised from the position of Fig. 4, clearing flange 23, and permitting latch 20 to rotate further counter-clockwise to the position of Fig. 5. At this point, if pressure on key 30 is released, the latch 20 is out of position to stop the return of slider 15 to the position of Fig. 1, and slider 15 moves downwardly to that position. As it does so, pressure in leaf spring 17 is built up tending to rotate latch 20 clockwise, and as soon as projection 15a has moved downwardly out of the path of flange 23, spring 17 restores latch 20 to starting position, as indicated in Fig. 6.

In the specification, I have explained the principles of my invention and the best mode in which I have contemplated applying those principles, so as to distinguish my invention from other inventions; and I have particularly pointed out and distinctly claimed the part, improvement or combination which I claim as my invention or discovery.

While I have shown and described certain preferred embodiments of my invention, it will be understood that modifications and changes may be made without departing from the spirit and scope thereof, as will be clear to those skilled in the art.

I claim:

1. In mechanism of the class described, in combination, a manual key, a slider mounted for longitudinal movement and actuated by said key, an oscillatory latch mounted for swinging movement into and out of the path of said slider, and a spring connection between said slider and said latch, said spring connection biasing said latch for rotation in opposite directions depending on the position of said slider, and said spring connection forming the sole means for moving said latch.

2. In mechanism of the class described, in combination, a frame, a slider mounted in said frame for translational movement, an oscillatory latch mounted on said frame for oscillation into and out of the path of said slider, said slider having a portion movable into and out of the path of said latch, and said latch having a portion mov-

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able into and out of the path of said slider, and said latch having a radially extending arm and a plurality of ears disposed substantially on a diameter of said latch and on the same side of the pivot point thereof projecting at right angles to the plane of said arm and extending toward said slider.

3. The combination claimed in claim 2 in which said ears are radially spaced from each other.

4. The combination claimed in claim 2 in which said latch has a radially extending arm and a plurality of ears extending at right angles to the plane of said arm and projecting toward said slider, said ears being radially spaced from each other, and said slider having a projection contacting one or the other of said ears depending on the position of said slider.

5. In mechanism of the class described, in combination, a frame, a slider mounted in said frame for translational movement, an oscillatory latch mounted for swinging movement into and out of the path of said slider, said slider having a portion movable into and out of the path of said latch, and said latch having a radially extending arm and a plurality of ears extending toward said slider, said ears being radially spaced from each other, and a spring connection between said slider and said latch, said spring connection biasing said latch for rotation in opposite directions depending on the position of said slider.

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