March 27, 1951 A. M. BOWZER 2,546,149

LATCH

Filed Sept. 19, 1945

Fig. 1

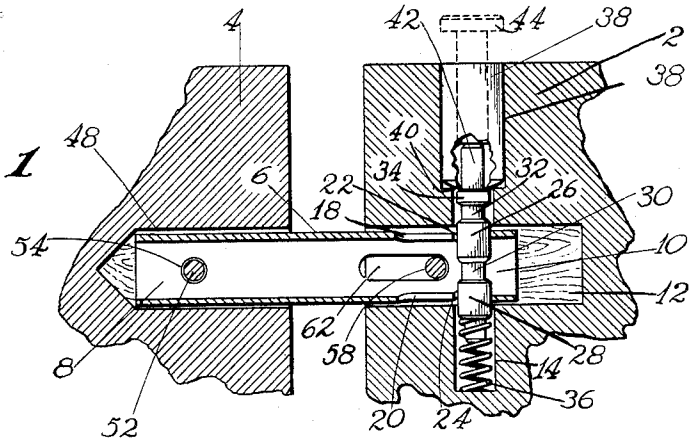


Fig. 2

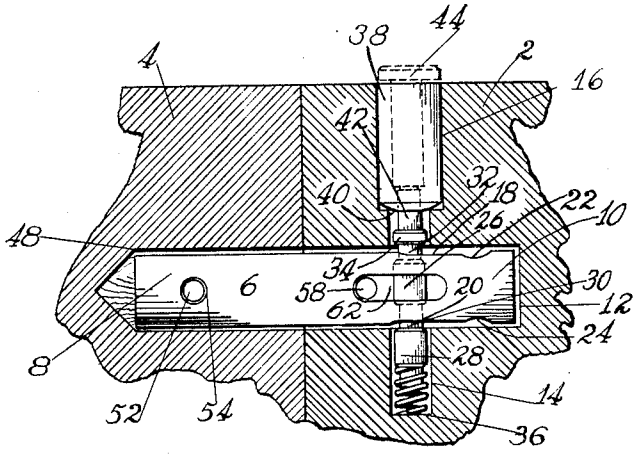


Fig. 3

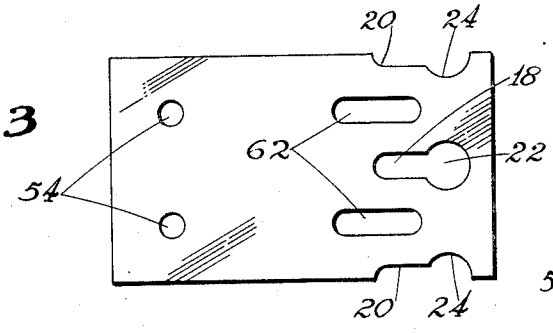
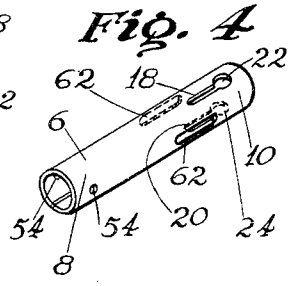


Fig. 4



INVENTOR.

Augustus M. Bowzer

BY

David Rines

ATTORNEY.

Patented Mar. 27, 1951 2,546,149

UNITED STATES PATENT OFFICE

2,546,149

LATCH

Augustus M. Bowzer, Lynn, Mass., assignor of one-half to Daniel Warren Lewis, Nahant, Mass.

Application September 19, 1945, Serial No. 617,266

2 Claims. (Cl. 16—1)

1

The present invention relates to latches or locks and more particularly to devices of this character for at will holding relatively slidable parts against relative slidable movement.

Among the objects of the invention are to improve upon the sturdiness, the ruggedness and the rigidity, as well as the durability, of latches or locks of the above-described character, though simplifying their construction and reducing their cost of manufacture.

Another object is to provide a device of the above-described character the slidable members of which may be readily assembled, yet that shall not be separable, thus preventing loss.

Other and further objects will be explained hereinafter and will be particularly pointed out in the appended claims.

The invention will now be more fully explained in connection with the accompanying drawings, in which Fig. 1 is a longitudinal section of two relatively slidable parts, shown locked against relative slidable movement; Fig. 2 is a similar section, but showing the members in a different relative position; Fig. 3 is a plan of a blank from which may be manufactured the tubular shell shown in Figs. 1 and 2; and Fig. 4 is a perspective of the completed shell.

Two relatively slidable members, which may be constituted of wood, are shown at 2 and 4. As disclosed in a copending application, Serial No. 616,171, filed September 14, 1945, the member 2 may be the heel-member part, and the member 4 the toe-member part of a divided wooden last. The members 2 and 4 are illustrated as connected together for relative slidable movement along a straight line to a retracted position, illustrated in Fig. 1, and an extended position, illustrated in Figs. 2, 4 by a single element, namely, a tubular shell 6. The shell 6 is shown cylindrical, with its forward end 8 rigidly fixed in the member 4, in order that the shell 6 may project longitudinally rearward from the member 4. The rear end 10 of the shell 6 is freely slidable in a correspondingly cylindrical bore opening 12 extending longitudinally in the member 2. This arrangement, of course, may be reversed. Since the shell 6 is rigidly fixed in the member 4, relative slidable movement of the members 2 and 4 in any direction other than the longitudinal direction toward and from each other is prevented. The back-and-forth relative slidable movement of the members 2 and 4 is effected by sliding the rear end 10 of the shell 6 back and forth in the bore 12, between the extended position shown in Fig. 1 and the retracted position shown in Fig. 2.

2

The member 2 is provided also with a transversely disposed opening, also shown as a cylindrical bore, communicating with the bore 12. The inner or lower portion of the transversely disposed opening, including the region where it communicates with the bore 12, is of smaller diameter, as shown at 14, than the outer or upper portion 16. The inner end portion 14, moreover, is shown closed, and the outer or free end portion 16 open. If the shell 6 should be fixed in the member 2, of course, the opening 14, 16 would be in the member 4.

A latch plunger is slidably mounted in the transversely disposed opening 14, 16. The plunger is provided with upper and lower circular latch portions 26 and 28, of the same diameter, integrally connected together by a guide portion 30 of smaller diameter. A further guide portion 32 of similarly smaller diameter integrally connects the latch portion 26 to a circular stop member 34. The plunger is always wholly disposed in the closed-end portion 14 of smaller diameter of the transversely disposed opening, except for an uppermost integrally provided pin 42.

A compression spring 36 in the closed-end portion 14 of the transversely disposed opening yieldingly forces the plunger to its uppermost position, illustrated in Fig. 1. In this position, the stop member 34 engages against the lower closed end of a bushing or a thimble-shaped stop member 38, fixed in the open-end bushing or thimble-receiving portion 16 of the transversely disposed opening. The lower end of the thimble or bushing 38 is disposed adjacent to the junction of the portions 14 and 16 of the transversely disposed opening. It is not entirely closed, as it is perforated, so as to provide an opening 40 for receiving the guide pin 42. The guide pin 42 just fits projectingly in the opening 40, but the diameter of the stop member 34 is considerably greater than that of the opening 40. The lower end of the bushing or thimble 38 thus constitutes a stop, cooperating with the stop member 34, to limit the upward movement of the plunger under the yieldingly upward forcing action of the spring 36. The plunger is thus confined to slide back and forth in the smaller-diameter portion 14 of the transversely disposed opening, between its closed end and the bushing or thimble stop member 38, though the guide pin 42 extends into the portion 16 of larger diameter of this transversely disposed opening.

The rear end 10 of the shell 6 is shown provided with two openings at the diametrically opposed upper and lower sides of the shell. Each of these

openings is provided with two communicating portions of different widths. The portions 18 and 20 of smaller width are elongated to constitute guide portions, slightly wider than the corresponding guide portions 30 and 32, respectively, of the plunger. The portions 22 and 24 of larger diameter constitute latch portions, of slightly larger diameter than the corresponding latch portions 26 and 28, respectively, of the plunger.

In the extended position of the members 2 and 4, illustrated in Fig. 1, the larger-width latch portions 22 and 24 are alined with the transversely disposed bushing or thimble-receiving opening 16 and the opening 14. In the retracted position, illustrated in Fig. 2, the smaller-width guide portions 18 and 20 are so alined.

The plunger is mounted in the transversely disposed opening 14, 16 so as to extend through the openings 18, 22 and 20, 24 of the shell 6. The spring 36 normally forces the stop members 34 and 38 yieldingly into engagement when the members 2 and 4 occupy their extended position, illustrated in Fig. 1, thus to maintain the latch portions 26 and 28 of the plunger in their respective latch openings 22 and 24. Since the diameters of the latch portions 26 and 28 are just slightly less than the diameters of the corresponding latch openings 22 and 24, the members 2 and 4 become thus locked against relative sliding movement in the extended position, illustrated in Fig. 1. Upon pressing down upon the pin portion 42 of the plunger, as with a tool 44, in opposition to the action of the spring 36, the guide portions 30 and 32 will be caused to become alined with the respective guide openings 18 and 20. Relative slidable movement of the members 2 and 4, without wobbling or relative rotative movement thereof, will then be permitted; all that is necessary is to force them slidably toward each other, the guide portions 30 and 32 of the plunger then readily entering the guide openings 18 and 20.

To prevent the plunger being forced by the tool 44 beyond the position in which the guide portions 26 and 28 become alined with the guide openings 18 and 20, the stop member 34 may be made of a little larger diameter than the diameter of the latch opening 22. In other respects, the diameters of the latch portions 26 and 28 and the stop member 34 of the plunger may be such as to fit snugly in the portion 14 of smaller diameter of the transversely disposed opening.

The forward end 8 of the shell 6 may be fixed rigidly in a bore 48 of the member 4 by means of a metal pin 52 driven into the member 4 and through diametrically opposed small holes 54 of the member 6. The rear end 10 of the shell 6 is then slidably inserted into the bore 12. The members 2 and 4 may be held against disassembly by similarly driving a metal pin 58 into the member 2 and through diametrically opposed longitudinally disposed elongated openings or slots 62 in the shell 6. The openings 62 may be oriented ninety degrees with respect to the openings 18, 22 and 20, 24. Their width is such as to permit slidable movement therein of the pin 58, without too much play, but separation of the parts is prevented by the pin 58 engaging their end walls. This also prevents wobbling and relative rotatable movement of the members 2 and 4 during their back-and-forth slidable movement. The pin 58 and the slots 62, indeed, cooperate to guide the slidable movement. When the members 2 and 4 occupy the extended position, illustrated in Fig. 1, wobbling and rotation are further prevented by the latch portions 26 and 28 fitting snugly in the latch openings 22 and 24.

It has already been explained that wobbling and relative rotative movement of the members 2 and 4 is prevented by the cooperative engagement of the pin 58 and the latch plunger, both provided upon the member 2, with the walls of the openings 62 and the walls of the latch openings, respectively, all of which walls are provided upon the shell element 6. The wobbling and relative rotative movement that is thus prevented is about axes parallel to the axis of the cylindrical shell element 6. Wobbling and relative rotative movement of the members 2 and 4 in a direction at right angles to the axis of the cylindrical shell element 6, moreover, is prevented by the fact that the shell element 6 is rigid with the member 4. All relative movement of the members 2 and 4 is therefore prevented except the before-described relative longitudinal slidable movement.

The shell 6 may be manufactured from a rectangular metal blank, as shown in Figs. 3 and 4. Out of the blank may be stamped the pair of transversely disposed small holes 54, the pair of longitudinally extending elongated slots 62 spaced longitudinally with respect to the small holes 54, disposed transversely at equal distances from the respective long sides of the rectangle, and the pair of openings having the elongated portions 18 and 20 and the portions 22 and 24, respectively, also spaced longitudinally with respect to the small holes 54. The respective holes 54, the respective slots 62, and the respective openings 18, 22 and 20, 24 must be so positioned that they shall be respectively positioned opposite when the blank is then bent longitudinally into tubular form. As the opening 18, 22 is shown positioned centrally, along the medial longitudinal line of the rectangular blank, half of the opening 20, 24 is provided at each long side of the blank, as shown. The half openings are transversely disposed with respect to the opening 18, 22 and respectively correspond to the portion of the opening 18, 22 disposed in each side of the said medial line.

Modifications will occur to persons skilled in the art, and all such are considered to fall within the spirit and scope of the invention, as defined in the appended claims.

What is claimed is:

1. In a member having a hole with a portion having a closed end and a portion having an open end of larger width than the width of the closed end, a thimble fitted in the portion with the open end and having a perforated end disposed adjacent to the junction of the hole portions, a latch plunger slidably mounted in the portion with the closed end, the plunger having latch means and guiding means respectively of different widths and having also a stop and a portion projecting into the perforation of the thimble, and a spring at the closed end of the hole for yieldingly maintaining the plunger with its stop in engagement with the thimble end.

2. An article of the class described comprising a tube having two diametrically opposed small holes, two diametrically opposed longitudinally extending elongated slots spaced longitudinally with respect to the small holes and two diametrically opposed openings spaced longitudinally with respect to the small holes each having two portions of different width, the portions of smaller width being elongated with respect to the por-

tions of larger width, the openings being oriented ninety degrees with respect to the slots.

AUGUSTUS M. BOWZER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
953,757	Johnson	Apr. 5, 1910
1,158,816	Leeds	Nov. 2, 1915
2,038,070	Welch	Apr. 21, 1936
2,099,806	Gora	Nov. 23, 1937
2,202,909	Hufferd et al.	June 4, 1940
2,343,525	Blodgett	Mar. 7, 1944
2,409,966	Voity et al.	Oct. 22, 1946
2,450,723	Elrad	Oct. 5, 1948

FOREIGN PATENTS

Number	Country	Date
146,271	Austria	Feb. 15, 1936
165,646	Great Britain	July 7, 1921