Oct. 5, 1943. C. A. FOX 2,331,115

LATCHING DEVICE

Filed Dec. 24, 1941

Fig. 1

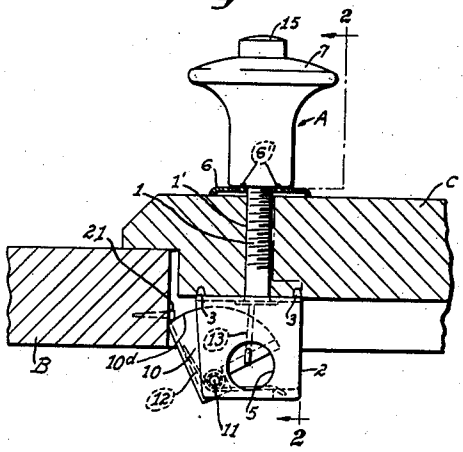


Fig. 2

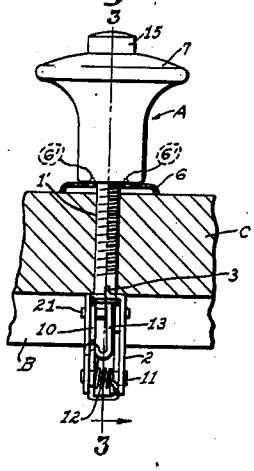


Fig. 3

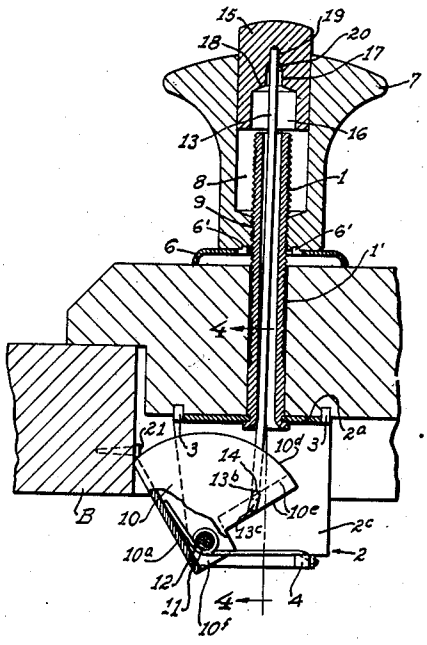


Fig. 4

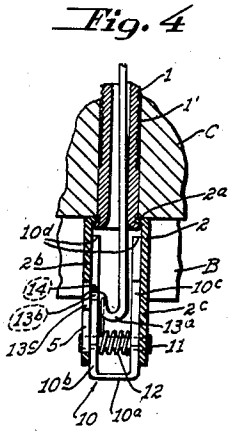
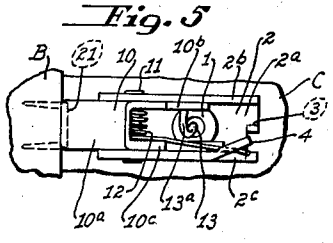


Fig. 5



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LATCHING DEVICE

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4 Claims. (Cl. 292—227)

This invention relates generally to latching devices and more specifically to latching devices of the type adapted for use in securing in closed positions doors and other closure members of cabinets, cupboards, closets, and other structures, the predominant object of the invention being to provide an extremely simple latching device of the type referred to above which is capable of performing its intended function in a simple and highly efficient manner and which may be installed in a very convenient and simple manner and secured in place in association with a door or other closure member without the use of screws or other attaching elements.

Fig. 1 is a fragmentary horizontal section showing the improved latching device in association with the door and an adjacent portion of a cabinet or other structure.

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

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 2.

Fig. 4 is a fragmentary section taken on line 4—4 of Fig. 3.

Fig. 5 is an inverted, fragmentary plan view of the cabinet and latching device assembly shown in Fig. 3.

In the drawing, wherein is shown for the purpose of illustration, merely, one embodiment of the invention, A designates the improved latching device generally. In order to provide for a complete understanding of the invention the improved latching device is illustrated in the drawing in association with a structure which includes a housing portion B and a door C, it being understood that such structure may be any one of a great variety of structures into the interiors of which access may be had through door openings closed by movable doors, or other closure members.

The improved latching device A includes an elongated, tubular member 1 which is extended through an opening 1' formed through the door with which the latching device is associated, the outer portion of the tubular member 1 being extended outwardly beyond the outer face of the door to a considerable extent as shown to the best advantage in Fig. 3. Also, as shown in Fig. 3, the tubular member 1 is provided with external screwthreads which extend throughout a considerable portion of the length thereof and to the outer end of said tubular member.

Secured to the inner end of the tubular member 1 is a bracket structure 2 which, as shown in Fig. 4, is of inverted U-shaped formation; that is to say, said bracket structure includes a bridge portion 2a from opposite sides of which are extended integral, spaced apart walls 2b and 2c. The bracket structure 2 may be rigidly secured to the tubular member 1 in various ways, for instance, the inner end portion of said tubular member may be of reduced diameter with a shoulder present at the junction of said reduced portion and the portion of the tubular member which is of normal diameter, and said reduced portion may be extended through an opening formed through the bridge portion of the bracket structure and may be crimped over to provide an annular flange between which flange and the shoulder of the tubular member is confined a portion of the bridge portion of the bracket structure located adjacent to the opening therein. The outer face of the bridge portion of the bracket structure 2 is disposed in contact with the inner face of the door C and said bridge portion has formed thereon tangs 3 which are embedded in the material of the door so as to aid in the rigid attachment of the bracket portion to the door. Also, the wall 2c of the bracket structure is slitted to provide a displaced portion 4 (Figs. 3 and 5) which serves a purpose to be hereinafter set forth, and the wall 2b of the bracket structure 2 has formed therein a circular opening 5 (Figs. 1 and 4) which likewise serves a purpose to be hereinafter made clear.

Arranged at the outer face of the door C is circular escutcheon plate 6 which is of dished shape and which has formed therethrough a centrally located opening through which the tubular member 1 extends, the edge of the inwardly turned, marginal portion of said plate contacting with the outer face of the door as shown in Figs. 1, 2, and 3. The escutcheon plate 6 receives in contact therewith the inner end face of a knob 7, said knob having an opening 8 formed therein which is open at the outer face of the knob, and having formed through its inner portion a screwthreaded opening 9 which is alined with the opening 8 but is of substantially less diameter than said opening 8. The knob 7 is screwthreadedly mounted on the screwthreaded portion of the tubular member 1, the screwthreads of the opening 9 of the knob screwthreadedly engaging the screwthreads of the tubular member, and the inner end face of said knob is screwed into close contact with the outer face of the escutcheon plate 6. The plate 6, in addition to acting as an escutcheon plate serves the additional function of acting as a spring washer which exerts pressure against the inner face of the knob 7 and thereby tends to prevent unintended rotation of

said knob with respect to the tubular member 1. Also, if desired, the plate 6 may be provided with slightly raised portions 6', similar to those formed on conventional lock washers, which tend to increase the gripping action between said plate and the knob 7.

Supported by the bracket structure 2, between the spaced walls 2b and 2c thereof, is a locking element 10, which is pivotally attached to the bracket structure 2 by a pivot rod 11 which is supported in openings formed in said spaced walls 2b and 2c of said bracket structure, the locking element being mounted on said pivot rod for oscillating movement with respect thereto. The locking element 10 is of U-shaped formation, said locking element comprising a bridge portion 10a and spaced apart walls 10b and 10c which extend from opposite side portions of said bridge portion. The locking element 10 has associated with it a torsional coil spring 12, the coiled portion of said torsional coil spring surrounding the pivot rod 11 between the walls 10b and 10c of the locking element 10, and the opposite end portions of the torsional coil spring contacting, respectively, with the displaced portion 4 of the bracket structure 2 and the bridge portion 10a of the locking element 10 as shown to the best advantage in Fig. 3. The spaced walls 10b and 10c of the locking element 10 are provided with arcuate edges 10d and with straight edges 10e which extend from ends of said arcuate edges to rectangular extensions 10f through which the pivot rod 11 extends, the wall 10c being slightly shorter than the wall 10b so that its straight edge 10e is spaced inwardly of the straight edge 10e of the wall 10b (see Fig. 3).

The locking element 10 has connected thereto an operating rod 13 which extends through the tubular member 1 and beyond the outer end of same, as shown in Fig. 3. The operating rod 13 is provided at its inner end with a curved portion 13a of substantially semicircular formation from which is extended a portion 13b which is projected through an aperture 14 formed through the wall 10b of the locking element 10. When the latching device is being assembled the portion 13b of the operating rod 13 is straight throughout its length so that said portion may be passed through the aperture 14, but after said portion 13b has been passed through the aperture 14 of the wall 10b of the locking element 10, the outer end portion of said rod portion 13 is bent over as indicated at 13c in Fig. 4. Thus the operating rod 13 and the operating element 10 are pivotally connected together, and because a portion of semicircular portion 13a of the operating rod 13 and the bent over portion 13c of said operating rod contact, respectively, with portions of the opposite faces of the wall 10b of the locking element 10 which are located adjacent to the aperture 14 formed through said wall 10b, the portion 13b of the operating rod is prevented from moving inwardly or outwardly relative to the aperture 14 through which it extends.

Supported partially within the opening 8 of the knob 7, for sliding movement therein, is a button 15, the outer end portion of which is normally projected beyond the outer curved face of said knob as shown in Figs. 1, 2, and 3. The button 15 has formed therein an opening 16 which is open at the inner face of said button, and alined with said opening 16 is an opening 17 of smaller diameter, there being an annular, inclined wall 18 joining the openings 16 and 17. Likewise the opening 17 has alined therewith an opening 19 which is of less diameter than the opening 17, and said openings 17 and 19 are joined by an annular inclined wall 20. The outer end portion of the operating rod 13 is extended into the opening 19 of the button 15, as shown in Fig. 3, the diameter of the end portion of said operating rod and the diameter of said opening 19 being such that tight gripping contact is provided between the wall of said opening 19 and the outer face of the end portion of said operating rod when said opening 19 is forced over said end portion of the operating rod. Thus the button 15 is securely fixed to the outer end portion of the operating rod 13 so that it may not be undesignedly detached therefrom.

The housing B is provided with a keeper 21 which may be of any desirable form, such, for instance, as the staple-like element shown in Figs. 1, 3, and 5, which is driven into a portion of the housing B at the proper location. The keeper 21 is engaged by the outer edge of the bridge wall 10a of the locking element 10, as shown in Figs. 1 and 3, to lock the door C in its closed position, the button 15 being depressed with respect to the knob 7 to rotate the locking element 10 about its pivot 11, against the force exerted by the torsional coil spring 12, to withdraw the edge of the locking element 10 from engagement with the keeper 21 so as to permit the door C to be swung open. The door C may be closed by holding the button 15 in a depressed condition so as to maintain the locking element 10 in its retracted position until the door reaches its closed position when the button may be released to permit the torsional coil spring 12 to move the locking element 10 outwardly into engaging relation with the keeper. Also the door C may be moved to its closed position without depressing the button 15, the locking element 10 being cammed inwardly by contact of the inclined bridge wall 10a thereof with a portion of the structure B at the door opening of said structure and said locking element snapping into engagement with the keeper 21 when the door C reaches its closed position.

It is to be noted that the bent over portion 13c of the operating rod 13 is disposed within the opening 5 formed in the wall 2b of the bracket structure 2. This arrangement provides stop means which limits movement of the locking element 10 in opposite directions, the bent over portion 13c of the operating rod 13 abutting against opposed portions of the wall of the opening to limit movement of the locking element in opposite directions.

The task of installing the improved latching device in association with a door is extremely simple and is accomplished without the use of screws or other fastening devices ordinarily employed for securing latching devices in place. The installation of the latching device is accomplished by merely forming the opening 1' through the door and passing the tubular member 1 through said opening to bring the bracket structure to its proper position at the inner side of the door where the tangs 3 are forced into the material of the door. The escutcheon plate 6 is then arranged in place and the knob 7, with the button 15 removed, is screwthreadedly applied to the tubular member 1. The button 15 is then inserted into the opening 8 of the knob 7 and its opening 19 is forced over the end portion of the operating rod 13 so that said button will be rigidly fixed to the operating rod 13, the in-

clined walls 18 and 20 centering the end portion of the operating rod so that it will pass first into the opening 17 and then into the opening 19 when the button is being applied to the end portion of the operating rod.

It is important to note that the tubular member 1 is of sufficient length to pass through doors of various thicknesses, the excess length of said tubular member being extended into the opening 8 of the knob 7 as shown in Fig. 3. Also, the operating rod 13 of the improved latching device as manufactured and sold is of the maximum length, and when the latching device is applied to a thinner door the excess length of the operating rod is nipped off, with the aid of a suitable tool, flush with the outer curved face of the knob 7. Additionally, it has been stated herein that the spaced wall 10c of the locking element 10 is of less length than the companion spaced wall 10b so as to locate the straight edge 10e of said spaced wall 10c inwardly of the straight edge 10e of the spaced wall 10b. This arrangement is followed merely to facilitate the task of connecting the inner end portion of the operating rod 13 to the wall 10b of the locking element 10 by providing sufficient room for the required operation.

I claim:

1. A latching device comprising an externally screwthreaded tubular member adapted to be extended through an opening formed through a door, a bracket structure fixed to said tubular member at the inner end thereof, a locking element pivotally supported by said bracket structure, an operating rod attached to said locking element, said operating rod including a portion which extends through an aperture formed through a wall portion of said locking element and rod portions at opposite sides of the apertured wall portion of the locking element which prevent disengagement of the operating rod from said locking element, one of said rod portions comprising a substantially semicircular rod portion located at one side of said apertured wall of the locking element and the other rod portion being a bent over end portion of the operating rod which is located at the opposite side of said apertured wall portion, a knob screw-threadedly supported by said tubular member, and a button attached to said operating rod and supported by said knob for movement with respect thereto, said button being adapted to be depressed relative to said knob to subject said locking element to pivotal movement through movement of said operating rod.

2. A latching device comprising an externally screwthreaded tubular member adapted to be extended through an opening formed through a door, a bracket structure fixed to said tubular member at the inner end thereof, a locking element pivotally supported by said bracket structure, an operating rod connected to said locking element by having a portion thereof extended through an aperture formed in a portion of said locking element, a knob screwthreadedly supported by said tubular member, and a button attached to said operating rod and supported by said knob for movement with respect thereto, said button being provided with a plurality of alined and communicating openings of different diameters the smaller of which is forced over on an end portion of said operating rod to provide tight frictional engagement between the button and said end portion of the operating rod and said button being provided with annular inclined wall portions between certain of said alined openings which guide said end portion of the operating rod into said smaller opening, said button being adapted to be depressed relative to said knob to subject said locking element to pivotal movement through movement of said operating rod.

3. A latching device comprising an externally screwthreaded tubular member adapted to be extended through an opening formed through a door, a bracket structure fixed to said tubular member at the inner end thereof, a locking element pivotally supported by said bracket structure, an operating rod attached to said locking element, said operating rod including a portion which extends through an aperture formed through a wall portion of said locking element and an upset end portion which prevents disengagement of said operating rod from said locking element, said bracket structure having an opening formed in a wall portion thereof into which said upset end portion of the operating rod extends and said upset end portion of said operating rod being adapted to contact with separated portions of the wall of said opening to limit movement of said locking element in opposite directions, a knob screwthreadedly supported by said tubular member, and a button attached to said operating rod and supported by said knob for movement with respect thereto, said button being adapted to be depressed relative to said knob to subject said locking element to pivotal movement through movement of said operating rod.

4. A latching device comprising a tubular member adapted to be extended through an opening formed through a door, a bracket structure fixed to said tubular member at the inner end thereof, a locking element pivotally supported by said bracket structure, an operating rod attached to said locking element, said operating rod including an end portion which extends through an aperture formed through a wall portion of said locking element, said bracket structure having an opening formed in a wall portion thereof into which said end portion of the operating rod extends and said end portion of said operating rod being adapted to contact with separated portions of the wall of said opening to limit movement of said locking element in opposite directions, a knob supported by said tubular member, and a button attached to said operating rod and supported by said knob for movement with respect thereto, said button being adapted to be depressed relative to said knob to subject said locking element to pivotal movement through movement of said operating rod.

CHARLES ADIN FOX.