June 21, 1938. H. J. MURPHY 2,121,531

DOOR LATCH STRUCTURE

Filed May 15, 1936

Fig. 1.

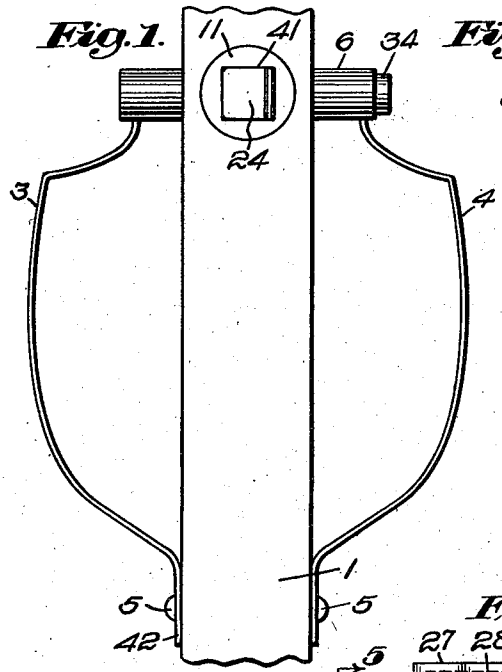


Fig. 2.

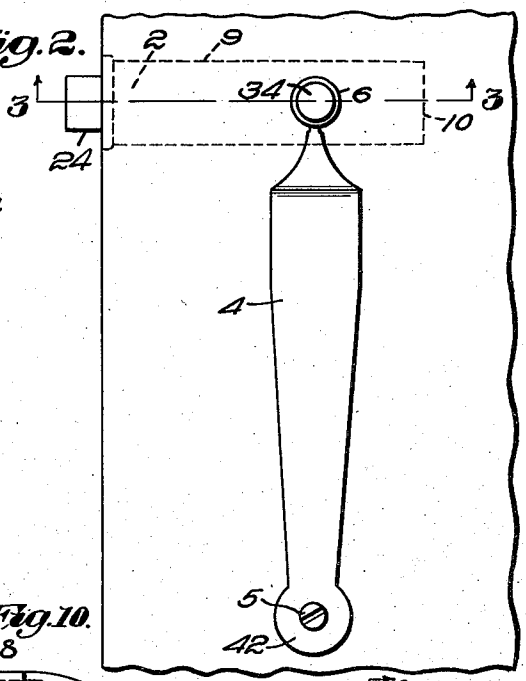


Fig. 10.



Fig. 3.

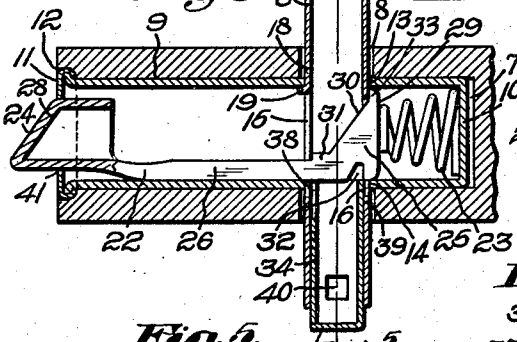


Fig. 4.

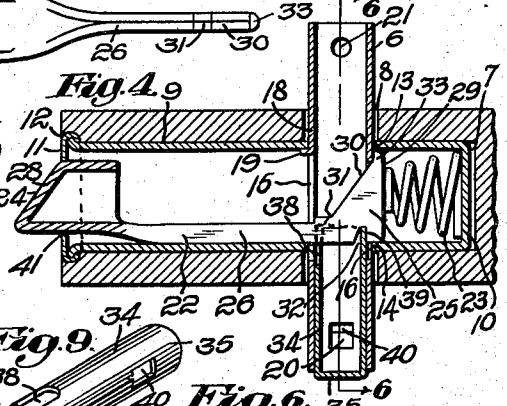


Fig. 9.

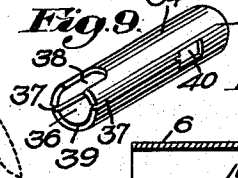


Fig. 6.

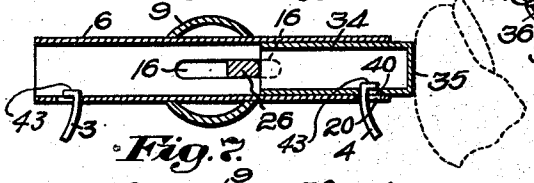


Fig. 6.

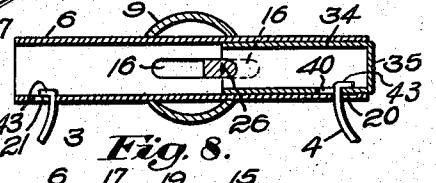


Fig. 7.

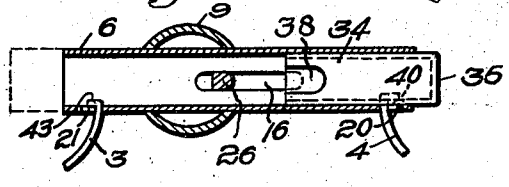
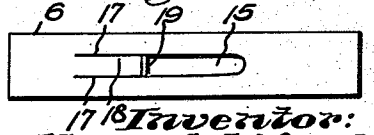


Fig. 8.



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2,121,531

DOOR LATCH STRUCTURE

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Application May 15, 1936, Serial No. 79,843

11 Claims. (Cl. 292—170)

My invention relates to an improved latching device for use with a door or similar structure and installations of the same.

One object of my invention is to provide a latching device of simple and inexpensive construction capable of being quickly and easily installed with a door or the like part and having a latch means adapted to snap under the action of a spring into a recess or aperture formed in an abutment, the device being so arranged that the latch means may be disengaged from the abutment for opening the door by longitudinal force exerted upon either of the free ends of an elongated member, the ends of which project beyond opposite faces of the part with which the latching device is assembled.

Another object of my invention is to provide a simple and inexpensive means whereby my improved latching device may be locked by a person positioned on one side of the door thereby preventing unlocking of the latching device from the other side of the door. Other objects will appear from the following description.

Referring to the drawing, which illustrates a preferred embodiment of my invention:—

Figure 1 is a front view of my latching installation including a door, a latching device assembled with the door and handle means for operating said latching device;

Fig. 2 is a side view of the installation shown in Fig. 1 with my latch casing shown in dotted lines;

Fig. 3 is a section taken along the line 3—3 of Fig. 2 showing my improved locking means in unlocked position;

Fig. 4 is a section similar to that of Fig. 3 with my locking means in locked position;

Fig. 5 is a section taken along the line 5—5 of Fig. 3 showing the manner by which my locking means is operated;

Fig. 6 is a section taken on the line 6—6 of Fig. 4;

Fig. 7 is a section similar to that of Fig. 5 but with my latch-actuating member moved to the right;

Fig. 8 is a plan view of my tubular latch-actuating member;

Fig. 9 is a plan view of my sleeve part disposed within the tubular member for locking the device; and

Fig. 10 is a side elevation of the latch member of my device.

Referring to the illustrations, I have shown in Figs. 1 and 2 my preferred installation comprising a door 1 similar to that used in building structures, a latching device 2 assembled with said door and handles 3 and 4 disposed on opposite faces of the door having one end secured to a respective face of the door by means of a screw or suitable attaching means 5, and the other end attached to respective opposite ends of a latch-actuating member 6 so that force upon either of the handles 3 and 4 is transmitted to the member 6 in a manner which will be hereinafter more fully described. Although I have preferred to illustrate my invention used in connection with a door or similar part of a building structure, it is understood that I do not wish to limit the use of my latching device to that specific installation because it is capable of satisfactory operation with many other installations.

Referring in detail to the component parts of my installation, the door 1 is provided with a round hole 7 (Figs. 3 and 4) extending into the body of the door from the surface of that edge of the door facing the abutment when the door is in closed position. A smaller hole 8 extends through the door in right-angular relation to the hole 7 and intersects the same at a predetermined point. A cylindrical casing 9, preferably made of one piece of sheet metal and having a cross-sectional area relatively less than that of the hole 7, is disposed within the hole 7 and the tubular member 6 extends through the hole 8 in a way to intersect the casing 9 (Figs. 3–7).

The casing 9 has a closed end 10 substantially adjacent to the inner end of the hole 7 and an open end in close proximity to that surface of the door facing the abutment. A cap 11 is affixed to the open end of the casing 9 and is preferably seated within a recess 12 formed in the material of the door 1 adjacent to the aperture 7 at the free edge of the door. The casing 9 has a pair of apertures 13 and 14 disposed in opposite sides of the casing and in alignment with the aperture 8 of the door so that the tubular member 6 may be extended from one side of the door through the aperture 8 and the apertures 13 and 14 of the casing 9. In normal position the member 6 is in intersecting relation to the casing 9 with the free ends of the member 6 disposed outside the respective faces of the door 1, as shown in Figs. 1, 3 and 4.

The tubular member 6, as most clearly illustrated in Figs. 3–8, is provided with slots 15 and 16 disposed on opposite sides of the member 6 and in alignment with each other. The slots are positioned relative to the free ends of the member 6 so that portions thereof are normally located within the casing 9, as shown in Figs. 3

and 4. In my preferred form, I have provided the slits 17—17 extending from an end of the slot 15 into the material of the member 6 thereby forming a spring portion 18 having a projection 19 adjacent the slot 15, as most clearly shown in Fig. 8. A substantially square aperture 20 is provided at one end of the member 6 in intermediate position relative to the slots 15 and 16 (Figs. 5–7) and an aperture 21 is provided at the other end in line with the aperture 20. Purposes of the apertures 20 and 21 will be hereinafter more fully described.

The parts of my latching device positioned within the casing 9 include a latch member 22 adapted to slide longitudinally relative to the casing 9 and a coil spring 23. Referring in more detail to my preferred slidable member 22, as illustrated in Figs. 3, 4 and 10, I have shown a one-piece part formed from a sheet metal blank having a beveled nose 24 at one end, a cam portion 25 at the other end and an intermediate connecting portion 26. The cam portion 25 and part of the intermediate portion 26 are formed by bending the blank along its center line so that the materials on opposite sides of the center line are finally disposed in adjacent face-to-face relationship. The folded portions of the slidable member are of a thickness which is relatively less than the width of the slots 15 and 16 so that they may freely pass through the slots. The beveled nose 24 is formed at the other end of the blank from the cam portion 25 by providing upstanding spaced side walls 27 (Fig. 10) with the free edges of the side walls at one end extending in angular relation to the plane of the blank and the material 28 (Figs. 3 and 4) adjacent to an end of the blank is bent back in adjacent relationship to the slanting edges of the side walls. The cam portion 25 is substantially in the form of a triangle with its base a continuation of the bottom edge of the connecting portion 26. A rear wall 29 extends at right angles to the base surface and a cam surface 30 connects the rear wall 29 with a stop means 31 (Figs. 3 and 4) raised slightly above the top of the connecting portion 26. A notch 32 extends from the bottom edge of the triangle toward the cam surface 30. In normal position of the latch member, the stop means 31, the cam surface 30 and notch 32 are disposed within the tubular member 6, as shown in Figs. 3 and 4. In my preferred form the material 33 at the vertex of the triangular-shaped cam portion is constructed and arranged to lie outside the tubular member 6 and engage the outside surface of the material of the member 6 adjacent to an end of the slot 16 when the slide member is in normal position, as shown in Figs. 3 and 4.

The spring 23 has its base disposed substantially adjacent to the closed end 10 of the casing and its other end normally in slight spring contact with the rear wall 29 of the cam portion 25 thereby maintaining the material 33 at the vertex of the triangular-shaped cam portion in engagement with the outer surface of the tubular member 6. The spring 23 may be held in proper position within the casing 9 by providing a base of such diameter as to engage frictionally the walls of the casing.

In order that unlatching of my device from at least one side of the door may intentionally be prevented, I have provided a hollow sleeve member 34 adapted to fit within one end of the tubular member 6 and slide longitudinally thereof. The preferred form of my sleeve member 34, as best shown in Fig. 9, has a closed end 35 and an open end 36. A pair of oppositely disposed slits 37 extends from the open end into the body of the sleeve to give resiliency to a portion of the sleeve so that it may have a slight spring engagement with the inside surface of the member 6 so as to prevent too free longitudinal movement relative to the member. A slot 38 is cut into the open end of the sleeve and adapted to encompass the slidable member when the sleeve is in dogging position. The material 39 adjacent to the open end and directly opposite the slot 38 is adapted to engage with the notch 32 of the slidable member 22 so as to dog the latter member against longitudinal movement relative to the casing. A square aperture 40 is provided near the closed end 35 of the sleeve member 34 and positioned in intermediate relation to the slot 38 and the engaging material 39 of the open end. The aperture 40 is adapted to align with the aperture 20 of the tubular member when the parts are in normal position, and at the same time the closed end 35 projects beyond the free end of the tubular member, as shown in Fig. 5.

In assembling the parts of my device, the holes 7 and 8 are first bored at proper positions in the door 1. The casing 9 containing the spring 23 is then inserted longitudinally into the hole 7 so that in final position the apertures 13 and 14 are in alignment with the aperture 8 of the door and the cap 11 is seated within the recess 12 adjacent to the outside edge of the door. In my preferred form, the casing 9 is held in secure position within the aperture 7 by frictional engagement between the outside surface of the casing and the material of the door surrounding the aperture 7, but I am fully aware that prongs or projections, which I have not shown, may be provided integral with the casing 9 or the cap 11 for the purpose of biting into the material of the door adjacent to the aperture 7 to aid in securing the casing 9 within the aperture.

In the next step of the assembling process that end of the tubular member 6 carrying the sleeve member 34 is inserted through the aperture 8 of the door and the apertures 13 and 14 of the casing 9 until the projection 19 abuts the outside surface of the material adjacent to the aperture 13. At this time the slots 15 and 16 of the member 6 are in alignment with the bore of the casing 9. The latch member 22 is now assembled within the casing by passing the cam portion 25 diagonally through a square aperture 41 in the face of the cap 11 and then turning the cam portion so as to pass it through the slots 15 and 16 of the member 6. The spring portion 18 of the tubular member is next contracted by pressing thereupon with a suitable tool so as to allow the projection 19 to pass through the aperture 13 of the casing. After the projection 19 has been passed through the aperture 13 it expands to normal position so as to engage the inside surface of the casing 9 for preventing withdrawal of the tubular member from the direction in which it was inserted. At the same time that the projection 19 is passed into the casing 9 the material 33 at the vertex of the cam portion 25 is moved into engagement with the outside surface of the tubular member 6 adjacent to the slot 16 and is held there by pressure of the spring 23 upon the rear wall 29 of the cam portion 25 so as to prevent withdrawal of the latch member from the casing. After the latch member has been properly fixed within the casing, the beveled nose 24 extends through the aperture 41 of the cap 11 for

snapping engagement under the action of the spring 23 with a cooperating recess of an abutment (not shown).

As a final step the handles 3 and 4 are assembled with the installation. Each of the handles 3 and 4 of my preferred form are provided with an apertured plate 42 at one end and a hook-like projection 43 at the other end. The handles 3 and 4 are secured to opposite faces of the door by means of the screws 5 which extend through apertures of the respective end plates 42 into the material of the door, as shown in Figs. 1 and 2. The projection 43 at the opposite end of the handle 3 from the plate 42 is sprung into the aperture 21 at one end of the tubular member 6 and the projection 43 at the end of the handle 4 is sprung through the aperture 20 at the other end of the tubular member, and the aperture 40 of the sleeve member 34 is normally in alignment therewith. The natural rigidity in the handles 3 and 4 prevent the projections 43 at the ends of the respective handles from slipping out of the tubular member 6 in the direction from which they were inserted.

The beveled nose 24 of my latching device may be released from latching engagement with the cooperating aperture of the abutment by respective push or pull force upon the handles 3 and 4. Force exerted upon the handle 3 toward the door 1 moves the material of the handle adjacent to the projection 43 against the material of the tubular member 6 adjacent to the aperture 21 substantially as shown in Fig. 7 thereby moving the tubular member so that the material thereof adjacent to an end of the slot 16 engages the cam surface 30 of the latch member 22 so as to force the latch member against the action of the coil spring 23. While the force is being applied, the material of the tubular member engages the cam surface 30 so as to move the slidable member 22 longitudinally of the casing until the aforementioned material reaches the stop means 31, at which time the beveled nose 24 has been drawn within the casing 9 so as to permit unlatching. Force exerted upon the handle 4 away from the door 1 serves to move the beveled nose out of latching position by exactly the same mechanical action described in connection with the force exerted in an opposite direction upon the handle 3. After the force upon either the handles 3 or 4 has been released the beveled nose 24 snaps into latching position under the action of the coil spring 23.

My latching device may be easily locked from that side at which the handle 4 is attached by pressing with one of the fingers upon the closed end 35 of the sleeve member 34, as shown in Fig. 5, so as to move the material 39, adjacent to the open end of the sleeve, into the notch 32 of the cam portion 25, as most clearly shown in Fig. 4. At the same time the slot 38 adjacent to the open end of the sleeve fits around the material of the slidable member 20 (Fig. 4). When the sleeve means is in dogging position, it is impossible to move the slidable member 20 for unlatching the beveled nose 24 by force exerted upon the handle 3 in the direction of the door due to the fact that the material 39 of the sleeve, in engagement with the slot 38, prevents the slidable member from moving longitudinally relative to the casing 9. It will be noticed from an inspection of Figs. 4 and 6 that when the sleeve member 34 is in dogging position the aperture 40 is out of alignment with the aperture 20 of the tubular member 6 with the result that if force is exerted upon the handle 4 in a direction away from the door 1, the material of the handle 4 adjacent to the projection 43 engages the material of the sleeve 34 adjacent to the aperture 40 so as to move the sleeve member out of dogging position, and as force upon the handle 4 is continued the beveled nose 24 may be moved out of latching position for opening the door. As a result of my invention it is possible to release the dogging means by the same force which is exerted upon the handle for moving the slidable member out of latching position to open the door.

I have provided by my invention a simple and inexpensive latching device which may be made for the most part out of sheet metal and which may be assembled with a door or the like part by simply boring two round holes of varied sizes in the door in the manner which has been described. The manner in which my latching device is assembled with a door, as by inserting it in quickly bored holes, is a great improvement over ordinary methods which require a great deal of cutting upon the door in order to prepare a seat for the latching device.

Although I have illustrated and described a preferred form of my invention, I do not wish to be limited thereby because the scope of my invention is best defined by the following claims.

I claim:

1. A latching device comprising an apertured cylindrical casing part, an elongated tubular member extending transversely through said casing having means preventing withdrawal thereof, said tubular member having slots on opposite sides thereof in alignment with the bore of said casing, a spring-actuated slidable bolt member disposed within said casing and extending through the slots of said tubular member, said bolt member having a latch means at one end normally extending from said casing and a cam portion at the other end, said cam portion having a cam surface disposed within said tubular member, and a portion of the material of said tubular member adjacent at least one of said slots adapted to engage said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part.

2. A latching device comprising an apertured cylindrical casing having one closed end, an elongated tubular member extending transversely through said casing, a slidable bolt member disposed within said casing and extending through said tubular member, said bolt member having a latch means at one end and a cam portion at the other end, said cam portion having a cam surface disposed within said tubular member, a spring positioned within said casing between said cam portion and the closed end of said casing, and a portion of the material of said tubular member adapted to engage said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part.

3. A latching device comprising an apertured cylindrical casing part having a closed end, an elongated tubular member extending transversely through said casing, said tubular member having slots on opposite sides thereof in alignment with the bore of said casing, a slidable bolt member disposed within said casing and extending through the slots of said tubular member, said bolt member having a latch means at one end

normally extending from said casing and a cam portion at the other end, a spring positioned within said casing between said cam portion and the closed end of said casing, said cam portion having a cam surface disposed within said tubular member, and a portion of the material of said tubular member adjacent at least one of said slots adapted to engage said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part.

4. A latching device comprising a cylindrical casing part having aligned apertures on opposed longitudinal sides thereof, an elongated tubular member extending through said apertures and finally positioned in transverse relation to said casing, said tubular member having a spring means engaging the inner surface of said casing adjacent to one of said apertures preventing withdrawal of said member in the direction from which it was inserted, a spring-actuated slidable bolt member disposed within said casing and extending through said tubular member, said bolt member having a latch means at one end normally disposed outside said casing and a cam portion at the other end having a cam surface, said tubular member having means engaging said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part.

5. A latching device comprising a cylindrical casing part, an elongated tubular member extending transversely through said casing, a spring-actuated slidable bolt member disposed within said casing and extending through said tubular member, said bolt member having a latch means at one end normally disposed outside said casing and a cam portion at the other end, said cam portion having a cam surface and a notch normally disposed within said tubular member, said tubular member having means engaging said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part, and said tubular member having a dogging means associated therewith adapted to engage with the notch of said cam portion for intentionally preventing movement of said bolt member when force is exerted on at least one end of said tubular member.

6. A latching device comprising a cylindrical casing part, an elongated tubular member extending transversely through said casing, a sleeve member disposed within said tubular member and extending part way along the length thereof, a spring-actuated slidable bolt member disposed within said casing extending through said tubular member, said bolt member having latch means at one end normally disposed outside said casing and a cam portion at the other end, said cam portion having a cam surface and a notch, said cam surface and said notch normally disposed within said tubular member, said tubular member having means engaging said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch means from a cooperating recess of another part and said sleeve adapted to be moved longitudinally of said tubular member whereby a portion of said sleeve engages with the notch of said cam portion for intentionally preventing movement of said bolt member when force is exerted on at least one end of said tubular member.

7. A latching device comprising a cylindrical casing part, an elongated tubular member extending transversely through said casing, said tubular member having slots on opposite sides thereof in alignment with the bore of said casing, a sleeve located within one end of said tubular member and extending part way along the length thereof, a spring-actuated slidable bolt member disposed within said casing and extending through the slots of said tubular member, said bolt member having a latch means at one end normally extending outside said casing and a cam portion at the other end, said cam portion having a cam surface normally aligned with the material of said tubular member adjacent said slots and a notch normally aligned with a portion of said sleeve, a portion of the material of said tubular member adjacent one of said slots adapted to engage said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part and said sleeve having means whereby it may be moved longitudinally of said tubular member whereby a portion of said sleeve is engaged with the notch of said cam portion for intentionally preventing movement of said bolt member when force is exerted on at least one end of said tubular member.

8. A latching device comprising a cylindrical casing part having one closed end, an elongated tubular member extending transversely through said casing, said tubular member having slots on opposite sides thereof in alignment with the bore of said casing, a sleeve located within one end of said tubular member and extending part way along the length thereof, a portion of said sleeve having longitudinal slots therein providing spring arms engaging the inner surface of said tubular member and a portion at one end normally extending outside said tubular member, a slidable bolt member disposed within said casing and extending through the slots of said tubular member, said bolt member having a latch means at one end normally extending outside said casing and a cam portion at the other end, a spring means positioned within said casing between said cam portion and the closed end of said casing, said cam portion having a cam surface, and a notch formed therein, said cam surface and said notch normally located within said tubular member, a portion of the material of said tubular member adjacent one of said slots adapted to engage said cam surface when pressure is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part and said sleeve adapted to be forced longitudinally of said tubular member whereby a portion of said sleeve engages with the notch of said cam portion for intentionally preventing movement of said bolt member when force is exerted on at least one end of said tubular member.

9. A latching device comprising a cylindrical casing part, an elongated tubular member extending transversely through said casing, a spring-actuated slidable bolt member disposed within said casing, said bolt member having a latch means at one end and a cam portion at the other end having a cam surface normally located

within said tubular member, a portion of the material of said cam portion normally in engagement with the material of said tubular member for limiting in one direction longitudinal movement of said bolt member relative to said casing, and said tubular member having means engaging said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part.

10. A latching device comprising an apertured cylindrical casing part, an elongated tubular member extending transversely through said casing and having means preventing easy withdrawal thereof, said tubular member having slots on opposite sides thereof in alignment with the bore of said casing, a spring-actuated slidable bolt member disposed within said casing and extending through the slots of said tubular member, said bolt member having a latch means at one end normally extending from said casing and a cam portion at the other end, said cam portion having a cam surface disposed within said tubular member and a portion normally engaging in spring contact the material of said tubular member adjacent to one of said slots for limiting in one direction longitudinal movement of said bolt member relative to said casing, and a portion of the material of said tubular member adjacent at least one of said slots adapted to engage said cam surface when force is applied longitudinally of said tubular member thereby moving said bolt member against the action of said spring for disengaging said latch from a cooperating recess of another part.

11. A latching device comprising a casing having a cross-sectional area relatively less than the diameter of a round hole formed in a door or the like part, said casing seated within said hole and extending longitudinally thereof, a spring-actuated slidable latching member disposed within said casing having a latch means at one end normally disposed outside said casing and engaged with a cooperating recess of another part, and a tubular member extending through said door and said casing transversely of said last-mentioned parts so that the free ends of said tubular member may be normally disposed outside opposite faces of said door, a sleeve disposed within one of said ends and adapted to be moved longitudinally thereof for engaging with said slidable member to prevent an unlatching thereof, and handles adapted to be disposed outside opposed faces of said door, each of said handles having one end secured to opposite respective ends of said tubular member and the other end adapted to be secured to said door, the free end of one of said handles being in engagement with said sleeve whereby said sleeve is moved out of engagement with said slidable member when force is applied to said handle in the longitudinal direction of said tubular member.

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