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DOOR LATCH

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Fig. 1.

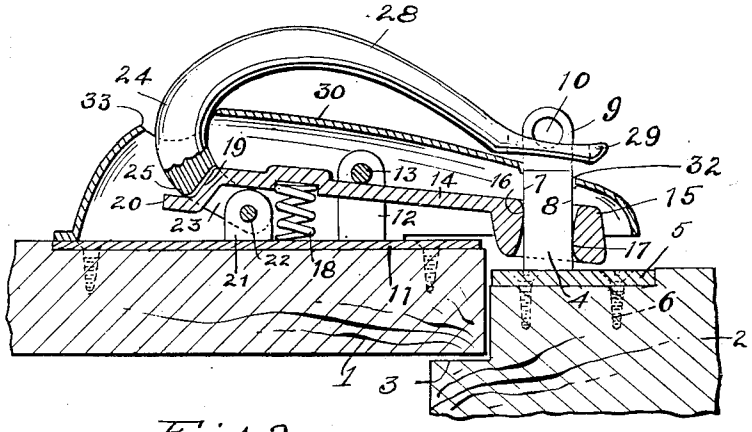


Fig. 2.

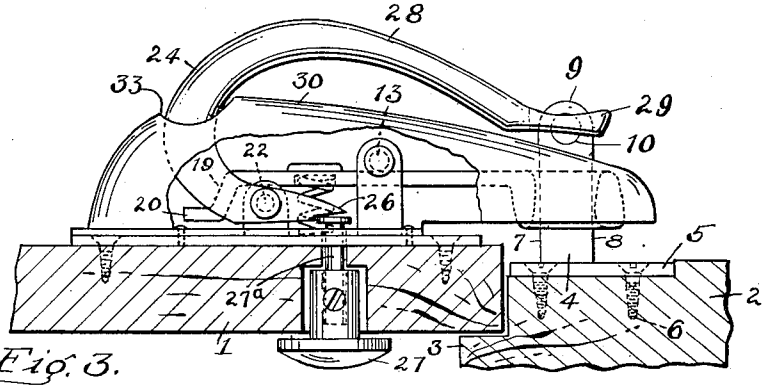
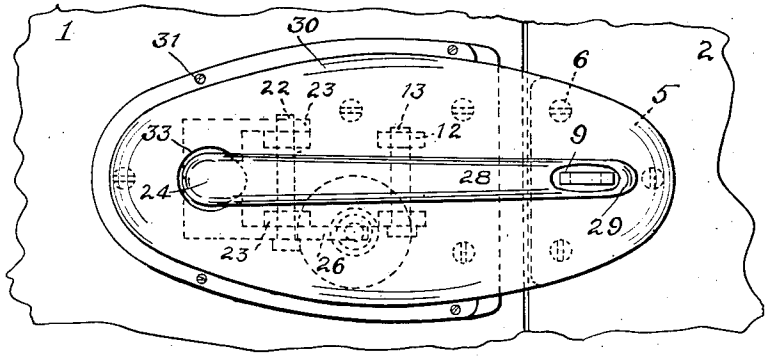


Fig. 3.



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DOOR LATCH

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5 Claims. (Cl. 292—306)

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The present invention relates to mechanisms for latching hinged closures such as doors and it has for its object to provide a form of latch comprising two interengaging members held in frictional engagement by the cam action of one upon the other, the arrangement being such that they may be disengaged by a relative movement of one of them with respect to the other.

A further object of the invention is to provide an improved means for tripping the latch member to free it from engagement with holding cam surfaces with which it engages when the door is in closed position and which may be operated from either side of the door.

To these and other ends the invention comprehends further improvements all as will be fully described in the accompanying specification, the novel features thereof being set forth in the appended claims.

In the drawings:

Figure 1 is a transverse sectional view showing a mechanism embodying the invention illustrating the cooperating parts applied to the free edge of a door and to the part of the casing with which it engages and showing the parts interlocked.

Figure 2 is a similar view but showing the parts released or in the unlocked position, and

Figure 3 is a plan view of the latch mechanisms.

Similar reference characters in the several figures indicate similar parts.

In Figures 1 and 2 there is shown in section the free edge of a door 1 and the contiguous edge 2 of the door casing having the rail or stop 3 against which the edge of the inner face of the door engages when it is in a closed position.

The latch mechanism embodies a stationary part attached to the face of casing 2 and a movable part engaging therewith carried on the door. The former is in the form of a stud 4 mounted on a plate 5 secured to the casing 2 in any suitable manner, screws 6 being shown as illustrative. The stud may be square or round in cross section the major requirement in this connection being that its opposite edges 7 and 8 be parallel. At its outer end the stud is reduced to provide a flat portion 9, extending in a direction transversely of the door, and provided with an aperture 10, for a purpose to be later described.

On the outer face of the door in central alinement with the stud 4 is a mounting plate 11 and extending outwardly therefrom are a pair of projections 12 spaced apart which form a support for a pin 13 located outwardly from the plate 11. Extending lengthwise between the projection 12

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and forwardly and rearwardly of pin 13 is an arm 14 forming part of the latch member and carrying at its outer end an enlargement or head 15. This head is carried in a position beyond the free edge of door 1 and has a perforation fitting over the stud 4 the opposite inner and outer walls of which are somewhat curved in reverse directions and shaped to provide an inner cam surface or point 16 and a similar outer cam surface or point 17. These two surfaces are offset relatively to each other and the distance between them is such that when the latch member is in a position parallel to the outer face of the door, as shown in Fig. 2, they will be disengaged from the parallel faces of the enclosed stud but when the latch member is in an inclined position they will frictionally engage the stud between them as shown in Fig. 1.

The latch member or arm is normally held in the last mentioned position by a spring 18 placed in rear of the pin 13 which constantly tends to hold the latch member in engagement with the pin 13 yet permit it to have a limited rotary movement about the pin as a center. The tail end of the latch member extends beyond the spring and is bent downwardly into a stepped formation as indicated at 19 on somewhat of an incline and thence rearwardly, as indicated at 20. Between the incline 19 and the spring 18 there is a pair of projections 21 extending outwardly from the plate 11 which carry a journal pin 22 on the opposite ends of which are pivoted the ears 23 of an operating lever 24. These ears straddle the projections 21 and the portion of the lever extending between them rests upon the incline 19, which holds the latch member against displacement rearwardly, and also bears at its lower edge 25 against the surface 20 and acts as a cam to depress the rear end of the latch member into releasing position when the lever 24 is rotated. One of the ears 23 extends forwardly of its pivot 22 and serves as an auxiliary arm 26 by means of which the latch member may be disengaged by a push knob 27 located on the inner side of door 1. This knob is located axially in alinement with the arm 26 and connected to a plunger 27a which engages said arm as shown in Fig. 2.

The releasing lever 24 is curved forwardly in the form of a goose neck which provides a convenient finger gripping portion 28 and its forward extremity 29 is slotted to engage over the reduced end of stud 4 whereby it may be locked by any suitable instrument inserted in the aperture

10, such as a pin or the hasp of a padlock, as will be understood.

It will be observed from Fig. 3 that the base or mounting plate 11 is given an oval outline which is carried out in shaping the stud mounting plate 5. This shaping of the underlying parts contributes to the application of a symmetrical enclosing dome shaped enclosing plate 30 which is secured at its edges to the rim of plate 11 by screws 31. The dome enclosure is provided at its forward end with an aperture 32 through which the stud 4 passes and at its rear end with an opening 33 which accommodates the operating lever.

What we claim and desire to protect by Letters Patent is:

1. In a door latch, the combination with a latch member pivotally supported on the outer face of a door and having a head portion extending beyond the free edge of the door and a cooperating interconnecting member mounted on the contiguous edge of the door casing, said latch head and cooperating member being provided one with cooperating cam surfaces and the other with surfaces engaging therewith of a spring for holding the latch member normally in an inclined position to effect locking engagement with said cooperating member when the door is closed and a release lever pivoted beneath and extending outwardly and forwardly over the latch member and having a shoulder engaging the latch member when said lever is moved in a direction away from the latch member to actuate the latter into a position to disengage it from the cooperating member.

2. In a door latch, the combination with a mounting plate for attachment on the outer face of the free edge of a door, a latch member pivoted thereon having a head extending beyond the edge of the door and provided with an aperture having opposed offset cam surfaces and a stud for attachment on the door casing adapted to enter said aperture and cooperate with the cam surfaces and provided with an apertured extremity, of means for yieldingly maintaining the latch member in an angular position relatively to the mounting plate, a release lever pivoted to the plate in rear of the latch member pivot and extending outwardly and forwardly over the latch member and having a free end cooperating with the apertured extremity of the stud for locking it thereto and a part on said lever engaging the latch lever for moving it into released position when said lever is moved in a direction away from the latch member.

3. In a door latch, the combination with a mounting plate for attachment on the outer face of the free edge of a door, a latch member pivoted thereon having a head at its forward end extending beyond the free edge of the door and provided with an aperture having offset opposed cam surfaces, the rear end of the latch member being provided with a stepped portion, of a stud for mounting on a door casing adapted to enter the head of said latch and engage said cam surfaces, means acting on the latch member to normally hold its cam surfaces in operative position and a releasing lever pivoted to the mounting plate beneath the latch member and forwardly of its stepped portion and having a part engaging therewith for actuating the latch member into a released position, said lever having an end curving outwardly and forwardly over the latch member and forming a finger gripping portion.

4. In a door latch, the combination with a mounting plate for attachment to the outer face of a door of oval outline provided with bosses carrying a pivot pin, a latch arm journaled thereon having ends extending forwardly and rearwardly from the pivot, its rear end having a step therein and its forward end extending beyond the free edge of the door and provided with an apertured head having offset opposing cam surfaces, and a spring acting on the rear end of the arm to normally incline it with reference to the plate, of a lever pivoted to the plate beneath the arm forwardly of its stepped portion having an actuating shoulder extending over said stepped portion serving to move the arm against the tension of the spring, said lever extending outwardly and forwardly in the plane of the arm to form a finger grip portion and provided with an apertured extremity overlying the aperture in the latch arm head and a stud for attachment to a door casing extending through the aperture of said head and lever shaped to cooperate with heads, cam surfaces and provided with an apertured extremity for the reception of a member for locking the lever against moevment on its pivot.

5. In a door latch, the combination with a mounting plate for attachment to the outer face of a door of oval outline provided with bosses carrying a pivot pin, a latch arm journaled thereon having ends extending forwardly and rearwardly from the pivot, its rear end having a step therein and its forward end extending beyond the free edge of the door and provided with an apertured head having offset opposing cam surfaces, and a spring acting on the rear end of the arm to normally incline it with reference to the plate, of a lever pivoted to the plate beneath the arm forwardly of its stepped portion having an actuating shoulder extending over said stepped portion serving to move the arm against the tension of the spring, said lever extending outwardly and forwardly in the plane of the arm to form a finger grip portion, a stud for attachment to a door casing adapted to enter the head of the latch arm and cooperate with its cam surfaces and a doom shaped shell secured at its edges to the edges of the mounting plate and enclosing the parts mounted thereon, the top of the shell extending between the arm and lever and provided with apertures through which the arm and stud extend.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
455,085	Woodstock	June 30, 1891
1,854,386	Worth	Apr. 19, 1932
2,391,884	Orlow	Jan. 1, 1946