E. MIKKELSEN.

DOOR CATCH.

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1,297,221. Patented Mar. 11, 1919.

Fig. 1.

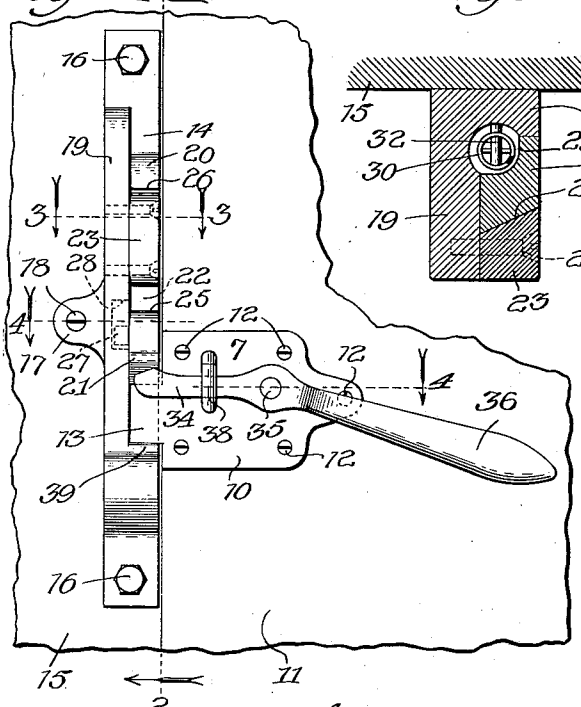


Fig. 3.

Fig. 2.

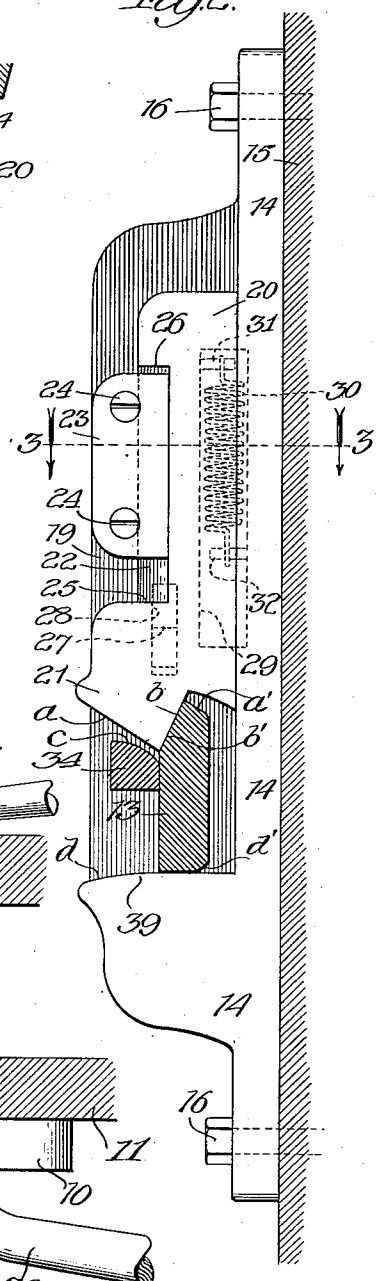
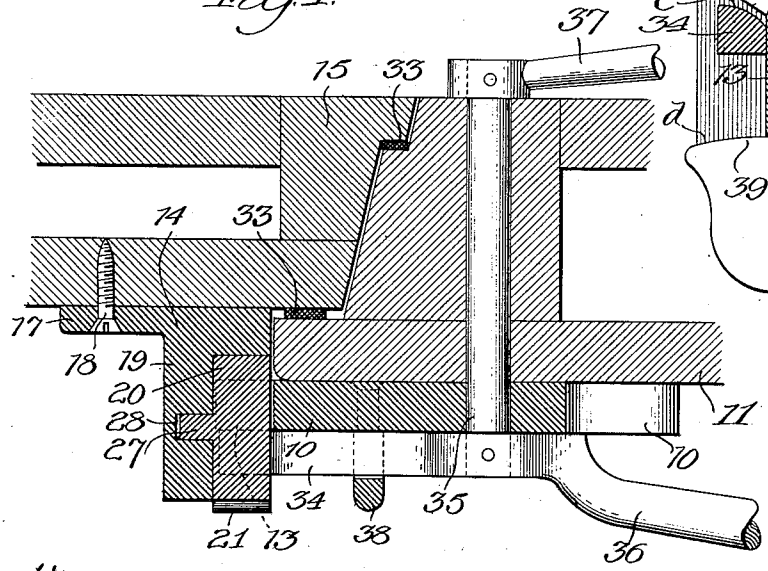


Fig. 4.



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DOOR-CATCH.

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To all whom it may concern:

Be it known that I, EDWARD MIKKELSEN, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Door-Catches, of which the following is a specification.

The invention relates to door catches and seeks to provide an improved construction more particularly adapted for refrigerator doors and which is simple in construction, will serve to hold the door snugly closed and can be readily released to open the door. A further object of the invention is to provide means whereby the trip for releasing the door catch or bolt will also serve to force the door away from the jamb. The invention also seeks to provide an improved catch in which the door and frame members cooperate to support part of the weight of the door.

The invention consists in the features of improvement hereinafter set forth, illustrated in the preferred form in the accompanying drawing and more particularly pointed out in the appended claims.

In the drawings Figure 1 is a view in elevation of the improved door catch and portions of the door and door frame whereon the catch members are mounted. Fig. 2 is a detail view on an enlarged scale with parts shown in section on the line 2—2 of Fig. 1. Fig. 3 is a detail horizontal section on the lines 3—3 of Figs. 1 and 2. Fig. 4 is a detail horizontal section on an enlarged scale taken on the line 4—4 of Fig. 1.

The improved catch is particularly designed for use in connection with heavy refrigerator doors. It comprises a metal door member or plate 10 which is adapted to be secured to the outer face of the door 11 adjacent its free vertical edge. In the construction shown, the door member or plate 10 is adapted to be secured to the outer face of the door 11 by fastening screws 12 and is provided at its outer edge with a rigid lug 13 which projects laterally beyond the edge of the door and which is preferably integral with the door member or plate 10.

The frame member of the improved catch comprises a metal strip or bar 14 which is secured to the outer face of the door frame or jamb 15 adjacent the edge of the door opening. In the construction shown, the metal strip or bar 14 is provided at its ends with perforations for receiving fastening bolts 16 and the central portion thereof is provided with an inwardly projecting lug 17 for receiving a fastening screw 18. The outer portion of the frame member 14 is provided with an outwardly projecting rib 19 and the adjacent faces of this rib and of the bar or strip 14 form an angular seat or guide for a vertically sliding bolt 20 which is provided at its lower end with a nose 21 for engaging the lug 13. The main body of the bolt is substantially rectangular in outline, but its outer vertical edge is cut away throughout a portion of its length, the face 22 of this cut away portion being inclined, as most clearly shown in Fig. 3. A shoe 23 is secured to the outer portion of the rib 19 by screws 24 and is provided with an inclined inner face which engages the inclined face 22 of the bolt and holds the latter in position. The recessed or cut away portion of the bolt is longer than the shoe and shoulders 25 and 26 at the ends of the recess are arranged to engage the ends of the shoe and thus limit the movement of the bolt.

The arrangement is such that the bolt 20 is properly held in place with its inner face substantially in line with the inner edge of the frame member 14, so that the lug 13 on the door need project only to a slight extent beyond the edge of the door.

The movement of the bolt is also guided by a laterally projecting lug 27 on its lower end which extends within a vertical slot 28 formed in the adjacent face of the rib 19. The inner corner of the bolt and preferably the adjacent portions of the parts 14 and 19 of the frame member are cut away to form a recess 29 for receiving a coiled spring 30, the ends of which are connected to pins 31 and 32 fixed respectively to the bolt and to the frame member, the spring serving to force the bolt downwardly and hold its locking nose 21 hooked over and snugly in engagement with the upper edge of the lug 13.

As shown, the nose 21 of the bolt and the upper edge of the lug 13 are provided with oppositely inclined cam faces a, a' and b, b'. As the door is closed, the cam faces a, a' cooperate to lift the bolt against the tension of the spring 30 and, in the closed position of the door, the inclined faces b, b' coöperate to force the door toward its jamb. Usually,

refrigerator doors are provided with packing strips 33, as indicated in Fig. 4, of rubber or the like and the operation of the spring-actuated locking bolt against the lug 13 serves to hold the door tightly closed with the packing strips compressed. Furthermore, any wear on the packing strips will be taken up.

A trip for the locking bolt is mounted on the door member 10. This trip is preferably in the form of an arm 34 pivotally mounted to swing over the face of the plate 10 and parallel with the vertical face of the door. Preferably, as shown, the latch is fixed to the outer end of a pivot bolt 35 which extends through the door member 10 and also through the edge of the door and is provided at its outer and inner ends with handles 36 and 37. In the preferred form shown, the handle 36 is formed in one piece with the trip arm 34. A U-shaped member or staple 38 fixed to the plate 10 extends over the trip arm and serves to hold it in position and limit its swinging movement. The end of the trip arm projects beyond the edge of the door and is preferably adapted to engage the locking bolt 20. By grasping and depressing either handle 36 or 37, the trip can be raised to lift the bolt against the tension of the spring 30 and thereby disengage it from the lug 13 so that the door can be opened, both the releasing of the bolt and opening of the door being quickly effected by the same handle.

Preferably, as shown, the end of the trip arm 34 is provided with a rounded inclined face *c* which is arranged to engage the outer inclined face *a* of the nose 21 of the locking bolt. The arrangement of these inclined faces and of the inclined faces *b* and *b'* of the bolt and lug is such that as the handle and trip arm are shifted, the bolt will not only be raised to clear the lug 13 but the free edge of the door will be forced away from its jamb. Considerable leverage can be thus exerted to force the door open and this operation greatly facilitates the opening of heavy refrigerator doors, which as stated, are usually provided with packing strips at their edges to form tight joints when the door is closed.

In the preferred construction shown, the door member adjacent its lower portion, is provided with a lip or shoulder 39 which extends beneath and is arranged to engage the lower edge of the lug 13 so as to sustain in part the weight of the door. The outer end of this lip or shoulder is downwardly inclined, as indicated at *d* and the inner portion of the lower edge face of the lug 13 is upwardly inclined, as indicated at *d'*. Preferably, as shown, the inclined faces *d* and *d'* are slightly curved and, when the door is closed, these faces will coöperate to slightly lift the free edge of the door and accurately position it with respect to the door opening. The construction thus serves to relieve the door hinges of a portion of the weight of the door when the latter is closed.

It is obvious that changes may be made in the details set forth without departure from the essentials of the invention as defined in the claims.

I claim as my invention:—

1. A door catch comprising door and frame members, a spring actuated latch for connecting said members, and a manually operable releasing trip for said latch, said parts having cam faces for forcing the door toward its jamb when said latch is operative and for forcing the door open when said trip is actuated.

2. A door catch comprising door and frame members, a latch for connecting said members, and a manually operable releasing trip for said latch mounted on said door member and having means coöperating with a part on said frame member for forcing the door away from its jamb and in a direction transverse to the plane of the door.

3. A door catch comprising a plate adapted to be secured to the outer face of the door and having a lug adapted to project beyond the outer edge of the door, a frame member adapted to be secured to the outer face of the door jamb and having a vertically disposed rib, said rib and the main body of said frame member forming an angular seat, a vertically movable, spring actuated latch bolt slidably mounted in said seat with its inner edge substantially in alinement with the inner edge of said frame member, said bolt having a nose at its lower end arranged to hook over said projecting lug, a handle pivoted on said door plate to swing parallel to the face of the door and having a projecting trip arm arranged to engage and release said latch bolt, substantially as described.

4. A door catch comprising door and frame members, a spring-actuated bolt mounted on said frame member and arranged to engage said door member, and a trip for releasing said bolt mounted on said door member and having means arranged to coöperate with a part on said frame member to force the door open and in a direction transverse to the plane of the door.

5. A door catch comprising door and frame members, a spring-actuated bolt mounted on said frame member and arranged to engage said door member, and a trip mounted on said door member and adapted to release said bolt, said parts having inclined cam faces for forcing the door toward the jamb when said bolt is operative and for forcing the door open when said trip is actuated.

6. A door catch comprising coöperating

door and frame members, a lug on said door member, a spring-actuated bolt on said frame member arranged to engage said lug and a trip for releasing said bolt pivoted on said door member and provided with an operating handle, said bolt and trip having coöperating cam faces for forcing the door away from its jamb.

7. A door catch comprising coöperating door and frame members, a lug on said door member, a spring-actuated bolt on said frame member arranged to engage said lug and a trip on said door member for releasing said bolt, said bolt and said lug having coöperating cam faces for shifting said bolt and for forcing the door against its jamb, and said trip being arranged to coöperate with said bolt to force the door open.

8. A door catch comprising a door plate having a projecting lug at its outer edge, a frame member, a vertically slidable, spring-actuated, bolt mounted on said frame member and arranged to engage the upper edge of said lug, said frame member having a supporting shoulder for engaging the lower edge of said lug, and a trip for said bolt mounted on said door member and provided with a handle.

9. A door catch comprising coöperating door and frame members, a lug on one of said members, a spring actuated bolt on the other of said members arranged to engage said lug, said bolt and lug having cam faces for forcing the door against its jamb, and a manually operable trip for releasing said bolt mounted on said door member and having means arranged to coöperate with a part on said frame member to force the door open.

10. A door catch comprising coöperating door and frame members, said door member having a projecting lug and said frame member having a supporting shoulder extending beneath and in engagement with the lower face of said lug, a releasable latch for connecting said door and frame members, said lug, shoulder and latch having cam portions for slightly lifting and centering the door and for forcing the same against its jamb, and an operating handle for said latch mounted on said door member.

EDWARD MIKKELSEN.