May 23, 1933. J. F. MILLAR ET AL 1,910,029

REFRIGERATOR DOORLATCH

Filed May 16, 1932

Fig. 1.

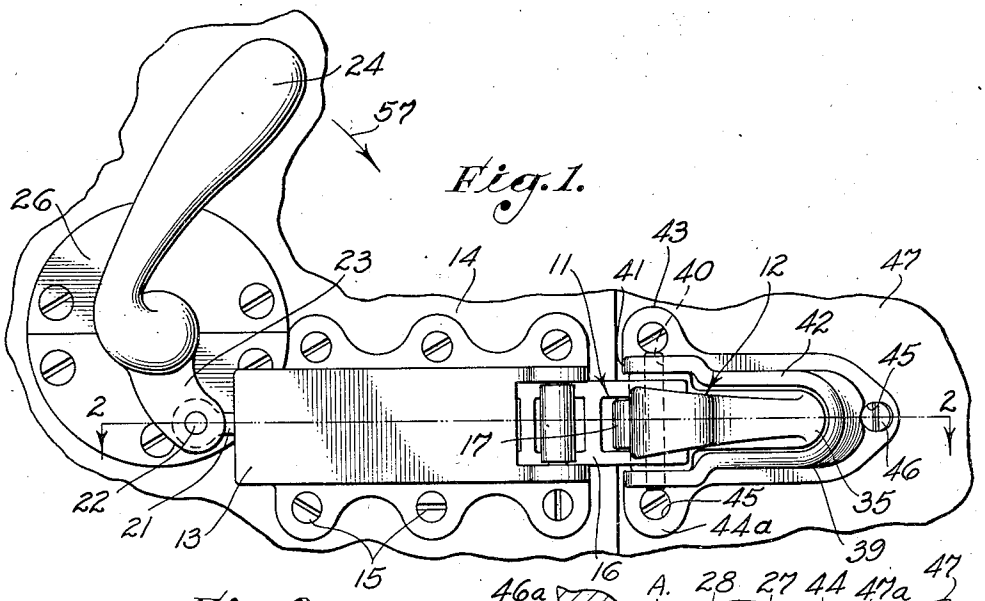


Fig. 2.

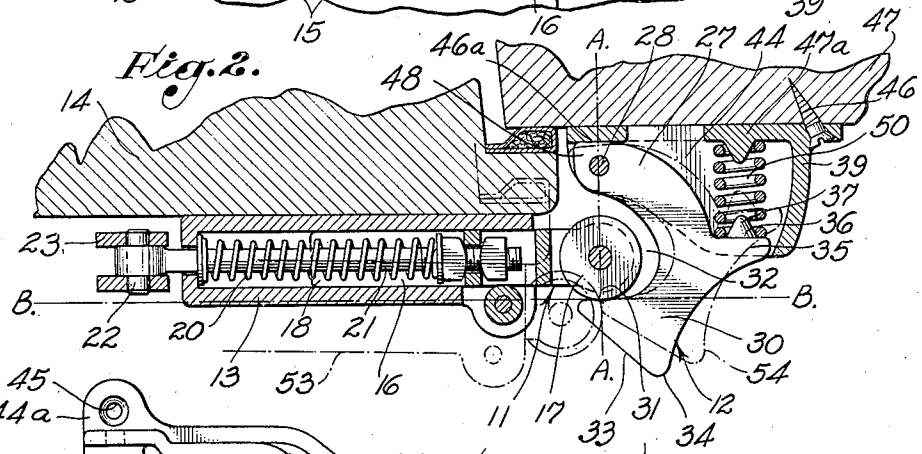


Fig. 3.

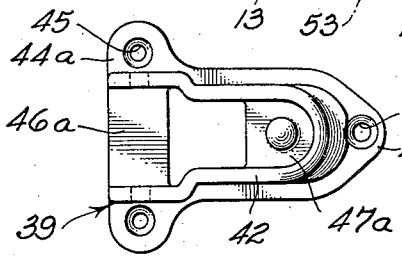
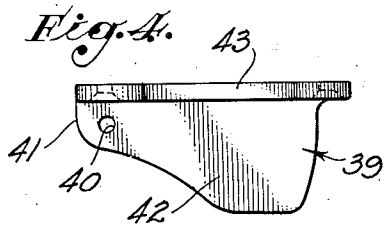


Fig. 4.



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UNITED STATES PATENT OFFICE

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REFRIGERATOR DOORLATCH

Application filed May 16, 1932. Serial No. 611,506.

This invention relates to an improved door latch, and relates to a door latch especially suitable for use on heavy doors such as refrigerator doors.

Many types of latches have been devised for this general use, such latches, to the knowledge and belief of the applicants, consisting of members adapted to move into latching engagement, one of which members yields as the members move into engagement. For instance, a simple form of such devices has a hook-shaped catch adapted for mounting on the door frame and a bolt yieldably mounted on the door. When the door is moved toward closed position the bolt strikes a sloping portion of the latch and is moved backwardly relative to the bolt supporting structure until the end of the bolt has passed the shoulder of the catch and is then permitted to drop into a position behind this shoulder. Owing to the general massiveness of these latches, the effect of the bolt striking the non-yielding catch is in the form of a pronounced blow which produces noise and vibration.

It is an object of our invention to provide a door latch in which both the bolt element and the catch element are yieldably mounted and moved apart as they come into latching engagement, thereby relieving or reducing to a minimum the blow-striking effect resulting from the engagement of the bolt with the catch of a door latch.

A further object of the invention is to provide a simplified form of yieldable catch for use in a latch assembly of this character, in which the catch member proper is swingably mounted in such a manner that it may yield to the pressure of the bolt when the bolt is approaching a position of latched engagement, but which catch member proper cannot be caused to yield by pressure of the bolt after latching engagement has been accomplished.

Further objects and advantages of the invention will be brought out in the following part of the specification.

Referring to the drawing which is for illustrative purposes only,

Fig. 1 is an elevational view of a door latch embodying our invention, the parts thereof being in closed or latched position.

Fig. 2 is a longitudinal section on a plane represented by the line 2—2 of Fig. 1.

Fig. 3 is a plan view of the catch bracket shown in Fig. 1.

Fig. 4 is an elevational view of the catch bracket with the catch member removed therefrom.

As shown in Figs. 1 and 2, our new latch device embodies a pair of cooperating latch elements 11 and 12. In the preferred form of the invention shown, the latch element 11 consists of a bolt adapted to be mounted in a supporting plate 13 which may be secured to a refrigerator door 14 by means of screws 15. The bolt 11 includes a bar structure 16 having a roller 17 at its rightward or forward end. The leftward or inner portion 18 of the bar 16 slides in the supporting plate or housing 13, and is adapted to be moved leftwardly against the force of a spring 20 by means of a bolt or link 21 which extends leftwardly from the rear end of the housing 13 to a pin 22 by which it is connected to the downwardly projecting lever portion 23 of an operating handle 24 which may be secured to the door 14 by means of a supporting plate structure 26. The latch element 12 is preferably in the form of a catch formed from a body of metal of hook-shaped form having its inner end 27 secured to a pivot 28. The outer portion 30 of the member 12 provides a shoulder or face 31 which crosses a line A—A and also lies in a plane B—B perpendicular to the line A—A. Between the shoulder 31 and the inner end 27 of the member 12 a laterally directed opening 32 is formed which receives the roller 17 of the bolt 11. The outer end 30 of the member 12 is also provided with a sloping face 33 extending from the leftward end of the shoulder 31 to an apex 34 forming the outer extremity of the member 12, and providing a sloping approach to the shoulder 31. Projecting rightwardly from the catch member 12 is a body of metal 35 integrally formed with the metal of the catch member 12, and providing an upwardly facing shoulder 36

having a hump or short pin 37 formed thereon.

A bracket 39 supports the pivot 28 which consists of a pin which extends through and between holes 40 formed in the ends 41 of a U-shaped wall 42 which projects forwardly from a base or flange 43 having ears 44*a* with openings 45 therein for screws 46 by which the bracket 39 is secured to a door frame 47. The U-shaped wall 42 defines a recess 44; the mouth or leftward portion of the recess 44 between the ends 41 of the wall 42 being faced toward the line A—A. The base 43 of the bracket 39 has a bottom wall structure consisting of wall parts 46*a* and 47*a*. The wall 46*a* being engaged by the toe 48 formed on the inner portion 27 of the member 12 serves as a stop for limiting the clockwise rotation of the member 12 on the pin 28, and the wall 47*a* is adapted to receive the upper end of a spring 50 which engages the shoulder or wall 36 of the member 12 and yieldably rotates the member 12 in such direction that the shoulder 31 thereof is maintained in a position normally crossing and perpendicular to the line A—A. The spring 50 operates and is concealed within the recess 44 formed by the U-shaped wall 42.

For convenience of description the line A—A may be called the line of engagement movement of the primary and secondary parts 11 and 12 of the latch. The closing of the door from an open position results in the movement of the extremity or roller 17 of the latch part or bolt 11 in a direction substantially as indicated by the arrow 52 of Fig. 2. When the roller strikes the catch member 12, it does not strike a solidly mounted unyielding metal member, but the catch 12 being yieldably mounted, as previously described, swings in anti-clockwise direction against the pressure of the spring 50, and at the same time the leftward reaction against the roller 17 causes the bolt 11 to move leftwardly against the pressure of the spring 20, with the result that the parts 11 and 12 pass to their respective positions, indicated by dotted lines 53 and 54, as the position of final latching engagement, shown in full lines in Fig. 2, is approached. During their movement in engagement toward latched position, the parts 11 and 12 separate or yield in directions substantially normal to the line of movement A—A, with the result that the engagement of the parts 11 and 12 is cushioned and the latching operation is easily accomplished. The roller 17 engages the shoulder 31 of the member 12 substantially on the line A—A and the pressure of the roller 17 against the shoulder 31 is outwardly along the line A—A, or, in other words, along the line which passes through the axis of the pivot means 28; accordingly, the outward pressure of the bolt structure 11 cannot produce rotation of the catch member 12. The latch device is released by relatively separating the members 11 and 12, which is accomplished by rotating the handle 25, shown in Fig. 1, in the direction indicated by the arrow 57, which results in pulling the bolt structure 11 leftwardly relative to the catch member 12.

Although we have herein shown and described our invention in simple and practical form, it is recognized that certain parts or elements thereof are representative of other parts, elements or mechanisms which may be used in substantially the same manner to accomplish substantially the same results; therefore, it is to be understood that the invention is not to be limited to the details disclosed herein but is to be accorded the full scope of the following claims.

We claim as our invention:

1. A latch device of the character described, including: a catch member; a bolt member adapted to move along a line of movement into engagement with said catch member; means for supporting said bolt member and moving the same through said line of movement, said bolt member being mounted on said supporting means so as to recede from said catch member in a direction normal to said line of movement; means yieldably forcing said bolt member toward said line of movement, a bracket for supporting said catch member, said catch member being of hook form and having its inner end pivotally secured to said bracket at a point proximate to said line of movement and having a shoulder near its outer end disposed to cross said line of movement and in a plane substantially perpendicular to said line of movement, said catch member being adapted to swing said shoulder away from said bolt member as said bolt member moves in engagement with said catch member toward latched position; means for yieldably forcing said catch member toward said bolt member, both of said members yielding as they move in engagement toward latched position; and means for separating said members so as to release the same.

2. A latch device of the character described, including: a catch member; a bolt member adapted to move along a line of movement into engagement with said catch member; means for supporting said bolt member and moving the same through said line of movement, said bolt member being mounted on said supporting means so as to recede from said catch member in a direction normal to said line of movement; means yieldably forcing said bolt member toward said line of movement; a bracket for supporting said catch member, said catch member being of hook form and having one end pivotally secured to said bracket at a point on said line of movement and having a shoulder near its other end disposed to cross said

line of movement and in a plane substantially perpendicular to said line of movement, said catch member being adapted to swing said shoulder away from said bolt member as said bolt member moves in engagement with said catch member toward latched position; means for yieldably forcing said catch member toward said bolt member, both of said members yielding as they move in engagement toward latched position; and means for moving said bolt member from engagement with said catch member.

3. A latch device of the character described, including: a catch member; a bolt member adapted to move along a line of movement into engagement with said catch member; means for supporting said bolt member and moving the same through said line of movement, said bolt member being mounted on said supporting means so as to recede from said catch member in a direction normal to said line of movement; means yieldably forcing said bolt member toward said line of movement; a bracket adjacent said line of movement, said bracket having a base portion adapted to be mounted on a wall surface and being formed with a forwardly projecting U-shaped wall thereon forming a recess, the mouth of which is directed toward said line of movement, said catch member being pivoted in said mouth, and said catch member being of hook form and having its outer end provided with a shoulder disposed to cross said line of movement and in a plane substantially perpendicular to said line of movement, and said outer end having a sloping face approaching said shoulder in position to be engaged by said bolt; a spring in said recess for forcing said catch member toward outwardly projecting position, said bolt member and said outer end of said catch member yielding in opposite directions as said bolt member moves in engagement with said sloping face of said catch member toward latching engagement with said shoulder; and means for moving said bolt member from engagement with said catch member.

4. A latch device of the character described, including: a catch member; a bolt member adapted to move along a line of movement into engagement with said catch member; means for supporting said bolt member and moving the same through said line of movement, said bolt member being mounted on said supporting means so as to recede from said catch member in a direction normal to said line of movement; means yieldably forcing said bolt member toward said line of movement; a bracket adjacent said line of movement, said bracket having a base portion with a U-shaped wall thereon forming a recess, the mouth of which is directed toward said line of movement, said catch member being pivoted in said mouth so as to swing on an axis substantially on said line of movement, and said catch member being of hook form and having its outer end provided with a shoulder disposed to cross said line of movement and in a plane substantially perpendicular to said line of movement, and said outer end having a sloping face approaching said shoulder in position to be engaged by said bolt; a spring in said recess for forcing said catch member toward outwardly projecting position, said bolt member and said outer end of said catch member yielding in opposite directions as said bolt member moves in engagement with said sloping face of said catch member toward latching engagement with said shoulder; and means for moving said bolt member from engagement with said catch member.

5. A catch device of the character described adapted for use with a bolt which moves along a line of movement into engagement with said catch device, including: a bracket having a base with a U-shaped wall thereon forming a recess adapted to be directed toward said line of movement; a catch member having its inner end pivotally secured in the mouth of said recess on an axis in proximity to said line of movement, said catch member being of hook form and having a shoulder within its outer end disposed in a position to cross said line of movement and in a plane perpendicular to said line of movement; and a spring in said recess for yieldably holding said catch member in outward position with the shoulder thereof perpendicularly crossing said line of movement.

6. A catch device of the character described adapted for use with a bolt which moves along a line of movement into engagement with said catch device, including: a bracket having a base with a U-shaped wall thereon forming a recess adapted to be directed toward said line of movement; a catch member having its inner end pivotally secured in the mouth of said recess on an axis intersecting said line of movement, said catch member being of hook form and having a shoulder within its outer end disposed in a position to cross said line of movement and in a plane perpendicular to said line of movement, there being a sloping face at the outer end of said catch member providing an approach to said shoulder; and a spring in said recess for yieldably holding said catch member in outward position with the shoulder thereof perpendicularly crossing said line of movement.

In testimony whereof, we have hereunto set our hands at Los Angeles, California, this 10th day of May, 1932.

JOHN F. MILLAR.
ANTON N. HORNUNG.