July 4, 1933. E. W. NORTH 1,916,848

CONCEALED REFRIGERATOR LOCK

Filed May 22, 1931

Fig. 1.

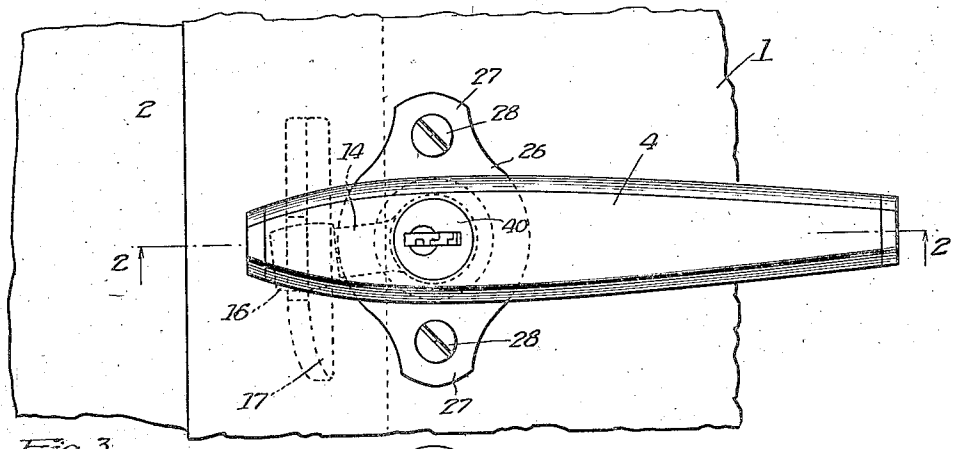


Fig. 3.

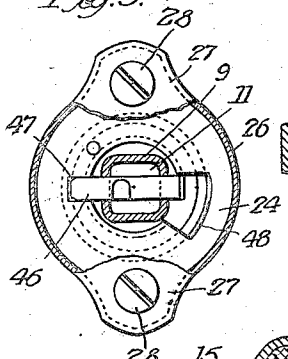
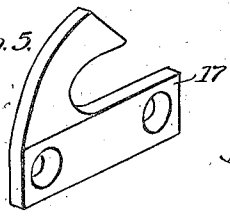


Fig. 2.

Fig. 4.

Fig. 5.



Witness
R. B. Davison.

Inventor
Edwin W. North

By Wilson, Dowell, McInnis & Rehm
Attys.

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UNITED STATES PATENT OFFICE

EDWIN W. NORTH, OF ROCKFORD, ILLINOIS, ASSIGNOR TO NATIONAL LOCK CO., OF ROCKFORD, ILLINOIS, A CORPORATION OF DELAWARE

CONCEALED REFRIGERATOR LOCK

Application filed May 22, 1931. Serial No. 539,188.

This invention relates to locks such as concealed door locks and is particularly adaptable to refrigerator locks where special problems are involved.

In certain instances it is desirable to not only latch a refrigerator door in closed position but also to lock the door in latched position. Whether the latch is of the locking type or not it is always desirable to have the lock concealed within the door and when the locking feature is also required it is desired to have the locking feature incorporated inconspicuously with the latching mechanism. When a latch and/or lock is installed within a refrigerator door in such a manner as to conceal the working parts thereof the parts within the door being nearer to the interior of the refrigerator are in fairly good heat conductive relation to the interior of a refrigerator. These interior parts which are normally in heat conductive relation to the handle consequently provide a means for a transfer of heat through the lock and to the handle between the interior of the refrigerator and the exterior. This transfer of heat not only results in a loss of efficiency in the refrigerator but also causes condensation and may even cause frosting upon the exterior handle.

It is the purpose of this invention to provide a concealed latch which may be locked, which is particularly suitable for refrigerators in that it will not transfer heat causing a loss in efficiency of the refrigerator or condensation, which may be readily installed without weakening the door structure, which is easily operable, and which is neat and attractive in appearance.

In accordance with this invention, the working parts to be concealed within the door are arranged in such a manner as to occupy very little space and are enclosed within a single housing preferably cylindrical. A handle is provided for actuating the lock and is heat insulated from the interior parts, the handle being preferably made of some heat insulating material which substantially encloses the heat conducting elements that may project through the door. In the preferred construction the post or stem is also heat insulated from the bolt as well as from the housing to further eliminate heat conductivity through the lock.

A better understanding of the novel features and construction of this invention will be apparent from the foregoing description illustrating one embodiment of this invention given in connection with the drawing, in which:

Fig. 1 is a front elevation of a portion of a cabinet door having a latch thereon embodying the principles of this invention.

Fig. 2 is a horizontal longitudinal section taken through approximately the center of the latch along lines 2—2 of Fig. 1.

Fig. 3 is a transverse section through Fig. 2 taken on line 3—3 of Fig. 2.

Fig. 4 is a transverse section taken on line 4—4 of Fig. 2.

Fig. 5 is a perspective of the keeper or strike.

In the illustrated embodiment of this invention a lock embodying the principles thereof is shown as applied to a mortised refrigerator door 1 arranged to abut against a door frame 2 and close a door opening defined thereby, the lock mechanism proper being concealed within a bore 3 formed in the door leaving the handle only extending exteriorly of the door.

The lock is operable by means of the handle 4 having a ferrule or sleeve 6 seated therein the handle preferably being of some suitable heat insulating material such as bakelite and molded onto a flanged end 7 of a tubular post or stem section 8. The tubular section terminates in a squared end 9 which receives a similarly squared end 11 of a solid section 12 of the post, the latter being a continuation of the tubular section. Journalled upon the post adjacent the other end thereof, that is, upon the interior end of the solid portion 12 of the stem, is a bolt 13 having a laterally extending arm 14 which carries a roller 16 arranged to latchingly engage a keeper 17 secured to the edge of door frame 2 and extending into a recess 15 formed in the rabbet of the door. The bearing portion of the bolt 13 is relatively long and is provided with a bushing 18 of some insulating material

which serves to insulate the bolt from the stem as well as provide a bearing member therefor.

The interior of the bolt member facing the handle is provided with a pair of diametrically opposite projecting lugs 19 which interlock with a somewhat similar pair of lugs 21 fixed to and projecting radially from post 12. The lugs 19 and 21 are of proper width to allow limited rotation of the bolt upon the stem 12, the bolt being rotatable by the stem after the lost motion has been exceeded.

A coil spring 22 surrounding the stem and bolt having one end 23 engaging the bolt and its opposite end engaging a plate 24 normally urges the bolt toward one limit of its rotary movement and also urges the bolt and stem in one direction, namely, counter-clockwise, as viewed in Fig. 1. Plate 24 lies within the escutcheon 26 and is provided with a pair of laterally projecting tongues 27 drilled to receive the securing screws 28 which serve to retain the entire latch within the door.

The stem is rotatably supported adjacent its exterior end adjacent the inner end of the handle by an inturned flange 29 formed on the escutcheon, the latter flange forming a bearing for the inner end of sleeve 6 which surrounds the tubular end 11 of the post. The inner end of the post is rotatably supported by the inturned flange 30 of a cup-shaped housing 31 which surrounds and encloses the entire interior end of the stem, spring, and bolt, the housing being provided with an opening 32 through which arm 14 of the bolt may project, the outer end of the housing is provided with an out-turned flange 33 which is received within the escutcheon and is secured therewith against rotation by screws 28.

The interior end of the stem is reduced in diameter as at 34 where it extends through the housing and is peened over as at 36 to secure the housing and stem together. A pair of washers 37 and 38 are placed between the peened head 36 and the outer surface of the interior end of the housing to take the thrust between the stem and housing. Washer 38 is preferably formed of some insulating material to further insulate the stem from the housing.

In order that the handle may be locked against movement when desired, a lock or key cylinder 40 is rotatably secured within the outer end of the tubular portion 8 of the stem and is retained therein by an expanding spring collar 41 which engages an annular groove 42 in the cylinder and also engages a pair of slots formed in the tubular stem portion. The lock cylinder is arranged to receive a key 43 by means of which the cylinder may be rotated in the usual manner when unlocked, the locking tumblers not being shown. The inner end of the lock cylinder carries a pin 44 projecting outwardly and eccentrically from the end of the cylinder which engages a locking slide 46 slidingly mounted in suitable aligned openings formed transversely through the post members. Locking slide 46 when in one position engages in a slot 47 of substantially the same width as the slide formed in plate 24 and when in its other position engages in a relatively wider slot 48 formed in plate 24 diametrically opposite slot 47. It follows that when slide 46 engages in slot 47 the stem and handle are securely locked against rotation and when slide 46 engages in slot 48 the handle and stem may be rotated through a limited arc determined by the width of slot 48. The permissible movement of the handle and slot is sufficient to allow roller 16 to be disengaged from keeper 17.

It follows from the above that a latch has been provided which may be locked when desired, the latch being very compact and easily operable due to the manner of supporting the bolt and the stem. The bolt action is positive in one direction only, that is, the handle throws the bolt into open position but when the door is snapped shut the bolt moves independently of the stem against the action of the spring. It is also apparent the handle is insulated from the stem or post due to its insulating properties and that there is substantially no opportunity for heat transfer through the lock and consequently substantially no resulting condensation. The manner of insulating the bolt and housing from the stem further reduces the possibility of heat transfer through the lock. Furthermore the lock is so arranged and constructed that it may be confined and totally enclosed within a relatively small housing which requires only a relatively small aperture within the door to receive the entire lock and another small recess to receive the keeper with no resulting weakening of the door.

It is obvious that the lock described may be applied to other purposes than a refrigerator though it is particularly well adapted for refrigerating use in combination with a door thereof in such a manner as to prevent loss of efficiency in the refrigerator due to heat conduction through the lock. It is also apparent that many changes may be made in the structural details of the embodiment shown for purposes of illustration without departing from the spirit and scope of the invention as defined in the following claims.

I claim:

1. In a concealed refrigerator lock, a post, a handle secured to one end of said post for rotating the latter and a bolt secured to said post for rotation therewith, and means for heat insulating said bolt from said post to prevent transmission of heat from said bolt to said post.

2. In a concealed refrigerator lock, a post, a handle secured to one end of said post for rotating the latter, a bolt secured to said post

for rotation therewith, and a heat insulating member between said bolt and said post to prevent transmission of heat from said bolt to said post.

3. In a concealed refrigerator lock, a post, a handle secured to one end of said post for rotating the latter, a bolt secured to said post for rotation therewith and journalled thereon for limited rotation relatively to said post, and a heat insulating bushing between said bolt and said post to prevent transmission of heat from said bolt to said post.

4. In a concealed refrigerator lock, a post, a handle secured to one end of said post for rotating the latter and a bolt secured to said post for rotation therewith, a housing enclosing the interior portion of said post and means for substantially heat insulating said housing from said post.

5. In a concealed refrigerator lock, a post, a handle secured to one end of said post for rotating the latter and a bolt secured to said post for rotation therewith, means for heat insulating said bolt from said post, a housing enclosing the inner portion of said post, and means for heat insulating the inner end wall of said housing from said post.

6. In a concealed refrigerator lock, a post, a handle secured to one end of said post for rotating the latter and a bolt secured to said post for rotation therewith and journalled thereon for limited rotation relatively to said post, a heat insulating bushing between said bolt and said post, a housing enclosing the interior portion of said post, and means for heat insulating the inner end wall of said housing from said post.

7. In a concealed refrigerator lock, a post, means for rotatably supporting said post adjacent each end, a handle secured to one end of said post for rotating the same, and a bolt permanently secured to said post for rotation therewith upon rotation of said post in one direction while permitting relative rotation between said post and bolt in the other direction.

8. The combination of a refrigerator door, with a concealed lock therefor adapted to be mounted within the door and comprising a post having its major portion and inner end lying within the door, a bolt operatively connected to the inner end of said post for actuation thereby and a handle of heat insulating material secured to and substantially enclosing that portion of the post lying without the door to thermally insulate the latter portion of the post from the atmosphere, whereby transfer of heat from said bolt to said handle and frosting of the latter is substantially eliminated.

9. The combination of a refrigerator door, with a concealed lock therefor adapted to be mounted within the door and comprising a post having its major portion and inner end lying within the door, a bolt operatively connected to the inner end of said post for actuation thereby, means for thermally insulating said bolt from said post, and a handle of heat insulating material secured to and substantially enclosing that portion of the post lying without the door to thermally insulate the latter portion of the post from the atmosphere, whereby transfer of heat from said bolt to said handle and frosting of the latter is substantially eliminated.

10. In a concealed refrigerator lock, a post, a handle secured to one end of said post for rotating the latter, a bolt, and means for permanently securing said bolt to said post for rotation therewith in one direction while permitting limited rotation relatively to said post in the other direction.

11. In a concealed refrigerator lock, a post, a handle secured to one end of said post for rotating the latter, means for locking said handle and said post against rotation, and a bolt fixedly secured to said post for rotation therewith in one direction, said bolt being journalled thereon for limited rotation relatively to said post in the other direction.

In witness of the foregoing I affix my signature.

EDWIN W. NORTH.