

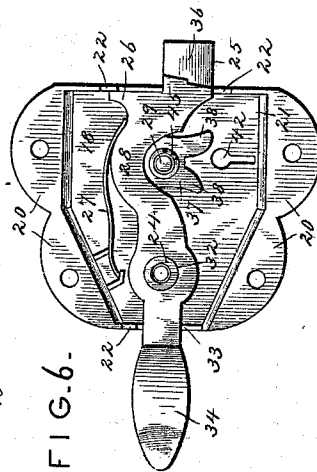
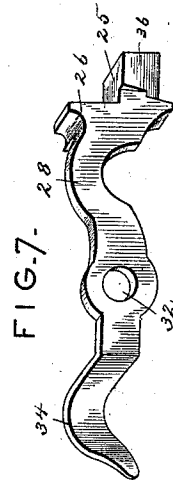
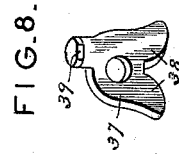
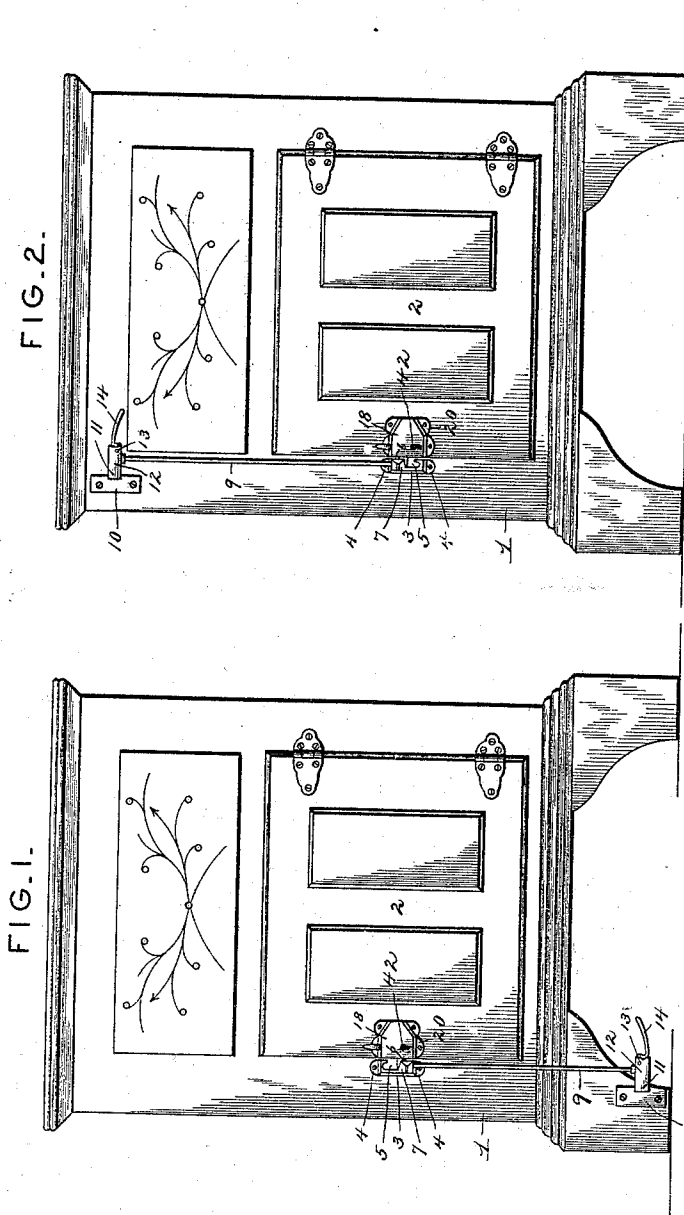
(No Model.)

2 Sheets—Sheet 1.

G. GANDERTON, H. J. O'DONNELL & J. A. TURNBULL.
REFRIGERATOR LOCK.

No. 545,955.

Patented Sept. 10, 1895.



Witnesses

Harry L. Amer.

J. D. Levens.

By their Attorneys.

Inventors
George Ganderton
Hugh J. O'Donnell and
James A. Turnbull.

C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

G. GANDERTON, H. J. O'DONNELL & J. A. TURNBULL.

REFRIGERATOR LOCK.

2 Sheets—Sheet 2.

G. GANDERTON, H. J. O'DONNELL & J. A. TURNBULL.

REFRIGERATOR LOCK.

Patented Sept. 10, 1895.



Witnesses

Harry L. Ames.

J. B. Owens.

By *Their* Attorneys.

Inventors

George Granderton
Hugh J. O'Donnell and
James A. Turnbull.

Chas. Snow & Co.

UNITED STATES PATENT OFFICE.

GEORGE GANDERTON, HUGH J. O'DONNELL, AND JAMES A. TURNBULL, OF
CLEVELAND, OHIO.

REFRIGERATOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 545,955, dated September 10, 1895.

Application filed January 31, 1895. Serial No. 536,878. (No model.)

To all whom it may concern:

Be it known that we, GEORGE GANDERTON, HUGH J. O'DONNELL, and JAMES A. TURNBULL, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Refrigerator-Lock, of which the following is a specification.

This invention has for its principal object to provide a lock for refrigerator-doors which will be capable of binding the door against the same concurrently with and in consequence of the operation of locking. This end has been sought and attained heretofore, and principally by providing a keeper for a swinging bolt, which keeper has an inclined or diagonal slot capable of receiving the bolt, and as the same swings to a locked position under the influence of its actuating-spring it will traverse the inclined slot and thereby pinch or bind the door against the frame of the refrigerator. Now, this arrangement has in practice been found to be disadvantageous, and to overcome the defects thereof we propose to form the keeper with a slot perfectly true and parallel with the frame of the refrigerator and to cause the pinch referred to above by locating the lock out of parallel with the door, so that it will extend at a relation of about ten degrees from the perpendicular thereof. Thus as the bolt swings in a vertical line it will move not truly vertically, but in a line slanting at about ten degrees from the perpendicular, which will have the desired effect, and which will not be attended by the disadvantages present in prior devices. The advantages of this improved structure are that the slanting of the lock as distinguished from the keeper is not productive of that weakness in the structure which attends the slant in the keeper, thus enabling us to produce a much more durable arrangement and also one which has increased efficiency.

A second object of the invention is to provide means for operating the lock which will be more convenient and generally desirable than those heretofore used, and which will have as a distinguishing feature a reciprocal rod or plunger associated with means for imparting to it its reciprocal movement and arranging it so that it may engage directly with

the bolt and swing the same by an immediate application of power.

Still further, an object of the invention is to provide means by which the bolt may be held incapable of movement or locked so that it will be impossible to swing it by any means and so that it may perform the function of a permanent lock as well as a fastening device nominally.

With these several objects in view the invention resides in various combinations of parts and features of construction whereby the objects above enumerated are attained, and which will receive more complete description hereinafter and be finally embodied in the claims.

In the drawings, Figure 1 represents a side elevation of one form of our improved lock. Fig. 2 is a side elevation of a second form, the variation being in the means for operating the latch. Fig. 3 is a side elevation of a lock in which the plunger-rod referred to hereinbefore is dispensed with. Fig. 4 is a vertical longitudinal section of our invention, the view being extended to the plunger-rod. Fig. 5 is a vertical section taken through the lock and looking toward the keeper and on a line at right angles to Fig. 4. Fig. 6 is a plan view of our lock, the inner plate of the casing having been broken away to disclose the operative parts. Fig. 7 is a detail perspective of the bolt of our improved lock. Fig. 8 is a similar view of the swinging locking-plate. Fig. 9 is a detail perspective of the cap-plate comprised in the casing of our lock. Fig. 10 is a plan of the inner side of the casing. Fig. 11 is a side elevation of a detail.

The reference-numeral 1 indicates a portion of the refrigerator to which our improvements are shown as applied, and 2 the door thereof. The door is to be of the usual or any preferred construction, and is connected to the frame 1 by hinges having a vertical axis and of any construction or class, with this exception.

3 indicates the keeper, which is rigidly secured to the frame, and which is formed of cast metal, and comprises lugs 4, by which it may be secured in place.

5 indicates a slot which is formed in the outer side of the keeper, and through which

the bolt passes in its connection and disconnection therewith. Directly contiguous to the slot 5, and above the same, is the parallel edge 6, which is engaged by the bolt when the lock is operating with the keeper, and which serves to hold the bolt in place. This edge extends truly parallel with the frame 1, and communicates with the inside face 7 at the outer side of the keeper, and with which the oppositely-beveled face of the bolt engages so as to automatically snap into place, all of which will be more fully described hereinafter.

The upper end of the keeper 3 has formed therein an opening which is circular in form and which has associated therewith, and at the inner side of the keeper, a plate 8, which has formed therein a semicircular opening concentric with the opening in the keeper, but smaller than the same, so as to form what may be functionally termed a "rabbit-groove," semicircular in shape. Within this opening in the keeper 3 the lower end of the tube 9 is arranged, and the said tube is held from downward movement by means of the plate 8, which bears against a portion of its lower end and effectually supports the same.

10 indicates a plate, which is rigidly secured to the frame of the refrigerator and at a point just above or on a level with the upper side of the door 2. This plate has rigidly secured to it, or formed integral therewith, a horizontally and forwardly projecting arm 11, the outer end of which carries the inwardly-projecting lugs 12. The lugs 12 are two in number and are duplicates of each other, and have at their lower outer portions the spindle 13, upon which the bell-crank lever 14 is mounted and which forms the fulcrum thereof. The bell-crank lever 14 comprises an elongated and broadened portion, which is adapted to receive the power for operating the lever, or, in other words, which serves as a hand or foot grasp. The lever 14 also comprises an inwardly-projecting short arm, which lies between the lugs 12, and which engages with the vertically-reciprocating plunger-rod 15. By these means the rod 15 is pushed downwardly, as will be more fully described hereinafter.

The movements of the lever 14 are limited by the lugs 16, which are two in number, and which project out laterally, one from each side of the lever, they being secured to a portion of the same, which is offset toward the keeper 3. These lugs 16 are adapted to engage with the outer ends of the lugs 12 as the lever swings in its operation. It will be understood that the lugs 16 will engage the respective lugs 12 at two different points—namely, at the lower outer ends of said lugs 12 and at a point about the middle of said outer ends—one being the limit of the downstroke of said lever and the other the limit of the upstroke, and the said limit of the upstroke is formed with slight indentations or notches, which are provided to permit the

lugs 16 to move inwardly and to thereby attain the proper degree of movement. The lugs 12 are provided at their lower sides and near their inner ends with a boss or short tube 17, which has at its upper end an inwardly-extending flange, and which is adapted to receive the upper end of the tube 9, whereby the said tube is held in place, and by means of the flange in the boss 17 the tube is prevented from upward movement. Thus it will be seen that the tube 9 is prevented from downward movement by the plate 8 and from upward movement by the flange in the boss 17. It will also be observed that the location of the boss 17 places the rod 15 in the proper relative position to the short arm of the lever 14 and makes it possible for the same to properly engage the rod 15.

Fig. 1 shows the tube 9 and the rod 15 as extended downwardly from the keeper 3, and with the lever 14 arranged just above the floor or surface upon which the refrigerator may rest, so as to be in position for operation by one's foot. On the other hand, Fig. 2 shows the direction in which the tube and rod extend to be reversed, and the lever 14 arranged at the upper portion of the refrigerator, so that it may be operated by one's hand or arm. No particular advantage attaches to either form, since both are substantially the same, the difference being only in the arrangement, all of which will be understood.

The lock proper will now be described. This comprises a casing having two parts—the main part 18 and the cap-plate 19. The main portion 18 forms the outer side of the lock and the edges thereof, and is provided at said edges with the lugs 20, which are perforated for the reception of screws, whereby the casing is held in place. The upper edge 21 of the main part 18 is deeper than the lower edge, which places the outer side or face of the casing out of alignment with the door and causes the same to extend out obliquely therefrom at an angle of about ten degrees from the perpendicular. The cap-plate 19 is provided at its corners with notches, which form reduced extremities on the plate and which permit said extremities to fit within the notches 22 of the main part 18 of the casing. The notches 22 of the casing, which are at the upper portion thereof and adjacent to the edge 21, are made deeper than the notches at the lower portion, and this causes the plate 19 to be located obliquely in the main part 18 and parallel with the outer side or face thereof. The ends of the plate 19 are provided with flanges 23, which are aligned with the inner sides of the edges of the casing and which lie snugly against the door. This construction assists in holding the plate 19 in place, owing to the fact that the flanges engage the door with the same result as though the whole of the plate engaged it. Thus it will be seen that the outer side or face of the casing and the cap-plate 19 extend parallel with each other, not-

withstanding their oblique relation to the perpendicular of the door.

24 indicates a stud, which is formed integral with the inner side of the face-plate of the main part 18 of the casing and which projects inwardly and transversely to the plate 19, against which the plate bears. This stud is recessed longitudinally and threaded at said recess, and the recess is capable of and adapted to receive a screw which passes through the plate 19 and into the said recess. The stud 24 also performs the function of holding the bolt in place, or, rather, as serving for its fulcrum. The bolt is of that class which is mounted on a fulcrum or axis, and which swings to be engaged with and disengaged from the keeper. It therefore comprises a free outer end 25, which is adapted to engage the keeper, an upwardly-projecting shoulder adapted to lie on the inner side of the casing and snugly against the same and forming a shoulder 26, against which the spring 27 may bear, and a curved portion 28, which is so shaped to avoid the stud 29 of the main part 18 of the casing. The under side of the bolt, at the curved portion 28, is provided with an elongated and arc-shaped depression 30, and with a rib 31, which is located directly adjacent to one side thereof and to the inner side of the curved portion 28, said rib being of a length equal to about one-half the length of the depression 30. The purpose of this peculiar construction will be hereinafter described.

Contiguous to the curved portion 28 of the bolt the same is enlarged and formed with an opening 32, which receives the stud 24, whereby the bolt is fulcrumed. The bolt extends out of the inner edge of the casing through the opening 33, and is provided at its extended end with a curved finger-grasp 34, by which it may be operated, if so desired. The spring 27 is held between the lugs 35 of the casing and has its free end projected outwardly, so as to engage the shoulder 26 aforesaid and so as to give the outer end of the bolt a tendency downward. The free outer end 25 of the bolt is provided with a beveled surface 36, which is beveled in a direction opposite to the bevel of the face 7, so that when the surface 36 and face 7 engage, the bolt will be automatically pushed downwardly and made to pass the face 7 and ride into engagement with the edge 6.

37 indicates a locking-plate, which is provided with a perforation in its center, whereby it is pivotally mounted on the stud 29, and with two spreading arms 38 at its lower side, which are adapted to be engaged by the wing of a key to effect the oscillation of the plate. The upper end of the plate 37 is provided with an outwardly-projecting lug 39, which operates within the depression 30 of the bolt, and which is capable of swinging throughout the length of the same, so as to engage the rib 31 or to disengage the same, as may be desired. The lug 39 is formed on an upwardly-project-

ing arm of the plate 37, and the outer side of this arm is provided with two converging beveled sides or faces, which give the arm a rounded shape and permit it to ride over the intermediate projection 40, formed integral with the casing. Located one on each side of the projection 40 are the end projections 41, which are two in number and which are adapted to be engaged by the arm carrying the lug 39. Thus as the plate 37 swings on its fulcrum the said arm carrying the lug 39 will be caused to ride over the intermediate projection 40 and to engage one of the end projections 41, so as to lie between said end projection and the intermediate projection. By these means the plate 37 may be held at two positions and in a secure manner. Thus it will be understood that by swinging the plate 37 the rib 31 and lug 39 may be made to engage and disengage, and that when these lugs engage the bolt will be held incapable of upward movement, and thereby locked. The swinging of the plate 37 is effected by means of a key, which may be and which is to be inserted through the opening 42 of the part 18 of the casing, and which is to be steadied by an opening 43 of the cap-plate 19.

44 indicates a lug which is formed on the part 18 of the casing and midway between the studs 24 and 29, and which is adapted to have the bolt bear against it, thereby serving to steady the operation of the same. Thus it will be seen that the bolt is arranged within the casing so as to be actuated by the spring 27, and so as to be kept normally downward, it being capable of raising under the influence of a force sufficient to overcome the influence of spring 27.

45 indicates an expansive spiral spring which embraces the stud 29, and which serves to hold the plate 27 down against the inner side of the casing and to prevent the same from becoming displaced during the operation of the lock.

The use and operation of our invention will be understood from the foregoing description, and it will be seen that the lower end of the plunger-rod 15 bears against the upper side of the end 25 of the bolt and pushes the same downwardly upon engagement therewith, so that the beveled face 36 of the bolt will engage with the face 7 of the keeper 3, and owing to the operation of spring 27 will cause the two faces to engage, thereby throwing the door open. The engagement of the parts is effected by simply allowing the two beveled faces to forcibly engage each other, whereupon the locking will be effected as in all other locks and latches.

Fig. 3 shows an arrangement wherein the rod 15 and its appurtenances are dispensed with, and wherein the lock is operated solely by means of the finger-grasp 34. Again, in Figs. 1 and 2 the finger-grasp, instead of extending horizontally from the lock, extends vertically and upwardly therefrom. This difference in the direction in which the finger-grasp ex-

tends has no material relation to the invention, it being attained by merely bending the bolt at a point within the casing. As the bolt swings in its operation it will move diagonally or obliquely from the door and will engage with the keeper which extends parallel therewith, thereby binding or pinching the door against the same and making its connection therewith secure. This will be well understood by reference to the drawings, and has been referred to and explained hereinbefore.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having described the invention, we claim—

1. The combination of a keeper having an edge extending parallel with the line of the surface to which it is to be secured, a lock casing comprising a main part having an outer side face, and upper and lower edge portions, the upper edge portion being wider than the lower so as to throw the outer side of the casing obliquely, the casing also comprising a cap plate secured to the inner side of the casing so as to extend parallel with the outer side of the said main portion and having at its ends inclined flanges, the outer edges of which extend parallel with the plane of the surface to which the casing is to be secured, and a swinging bolt mounted between the cap plate and the outer side of the main part of the casing and swinging in a line parallel with the oblique disposition of the cap plate and outer face, substantially as described.

2. The combination of a swinging bolt, a keeper engaged by the same and operating to hold the bolt in place, an arm adapted to be rigidly secured to the same surface to which the keeper is secured, a tube having one end connected to the arm and one end to the keeper and held in place thereby, a rod movable longitudinally in the tube and capable of engaging the bolt and of pushing the same out of connection with the keeper, and a bell-crank lever fulcrumed to the arm and capable of engaging the rod and of operating the same, substantially as described.

3. The combination of a keeper, a swinging bolt capable of engagement with the same, an arm adapted to be rigidly secured to that surface to which the keeper is secured and having two parallel lugs thereon, a tube having one end secured between the lugs of the arm and the other end secured to the keeper so

that the tube will be in communication with the interior of the latter, a plunger-rod reciprocally mounted in the tube and capable of engaging the bolt and of disconnecting the same with the keeper, and a bell-crank lever fulcrumed between the lugs of the arm and capable of engaging with the reciprocating rod, the bell-crank lever having a lug thereon which swings with the bell-crank and engages one of the lugs of the arm so as to restrict the movements of the bell-crank lever, substantially as described.

4. In a lock, the combination of a casing, a swinging bolt mounted therein, a spring for giving the bolt a normal tendency, the casing having formed thereon and adjacent to the bolt two end projections and an intermediate projection located between the end projections, and a swinging plate mounted within the casing and having a rounded arm carrying a stud, the stud being capable of engaging and locking the bolt and of disengaging and releasing the same, while the rounded arm is capable of riding over the intermediate projection of the casing and of lying adjacent to each of the end projections, whereby the swinging plate is held in place, substantially as described.

5. The combination of a swinging bolt, a keeper for engaging the same, a reciprocating plunger rod operating through and having its bearing in an opening in the keeper and capable of engaging the bolt and of moving the same out of engagement with the keeper, and an independent lever operating in the path of and against the opposite end of said rod for reciprocating the latter, substantially as described and for the purpose set forth.

6. The combination with a keeper, of a casing a swinging bolt therein having an arch-shaped depression and a rib lying adjacent thereto, a spring for giving the bolt a normal tendency, and a locking plate mounted within the casing so as to be capable of swinging therein and having a lug thereon, said lug being adapted to operate within the depression in the bolt and to engage the rib thereof for locking said bolt, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

GEORGE GANDERTON.
HUGH J. O'DONNELL.
JAMES A. TURNBULL.

Witnesses:
O. S. GANNON,
LOUIS SUFINSKY.