May 8, 1934. A. L. HANSEN 1,957,642

LOCK

Filed May 16, 1932 2 Sheets-Sheet 1

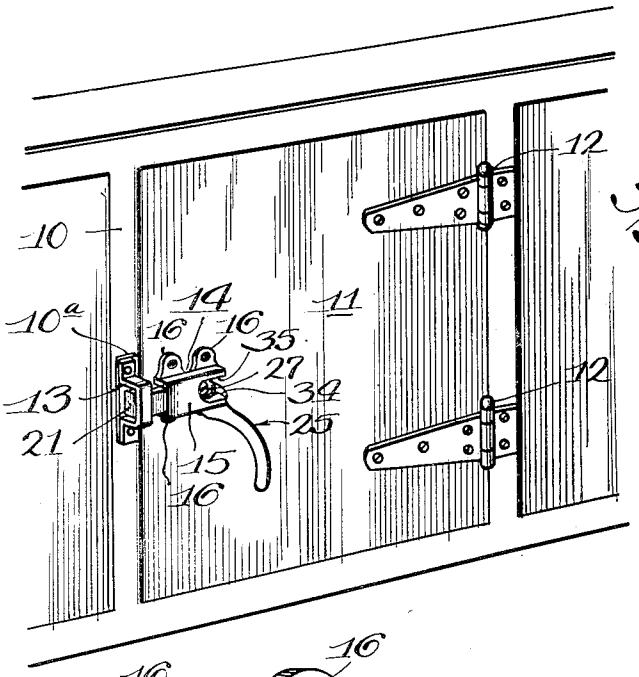


Fig. 1

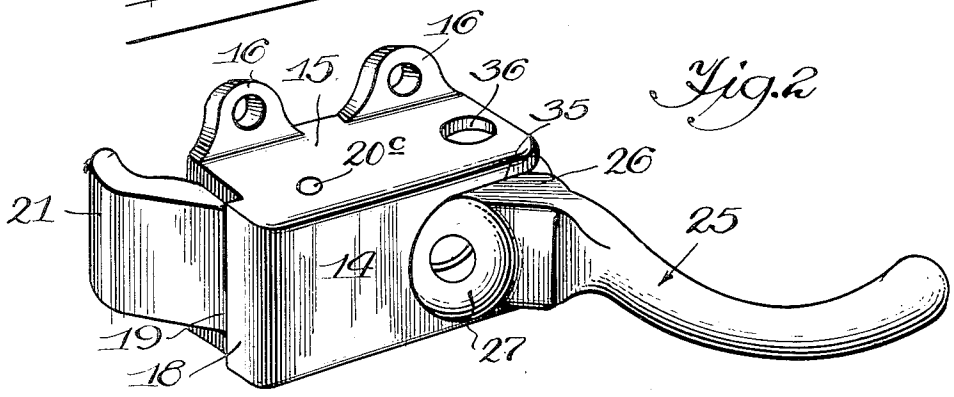


Fig. 2

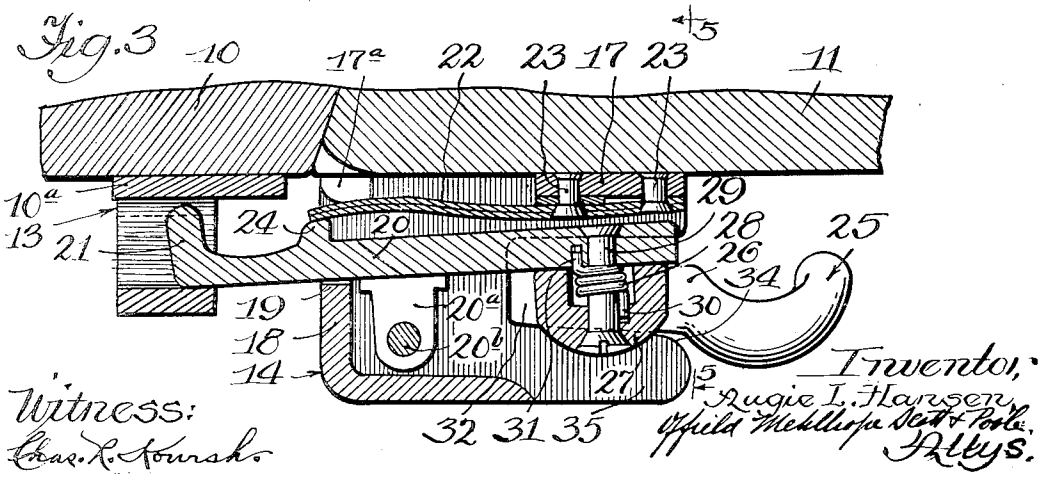


Fig. 3

Witness:
Chas. L. Hursh.

Inventor,
Augie I. Hansen,
by Mitchell Strauch Scott & Poole
Attys.

May 8, 1934. A. L. HANSEN 1,957,642

LOCK

Filed May 16, 1932 2 Sheets-Sheet 2

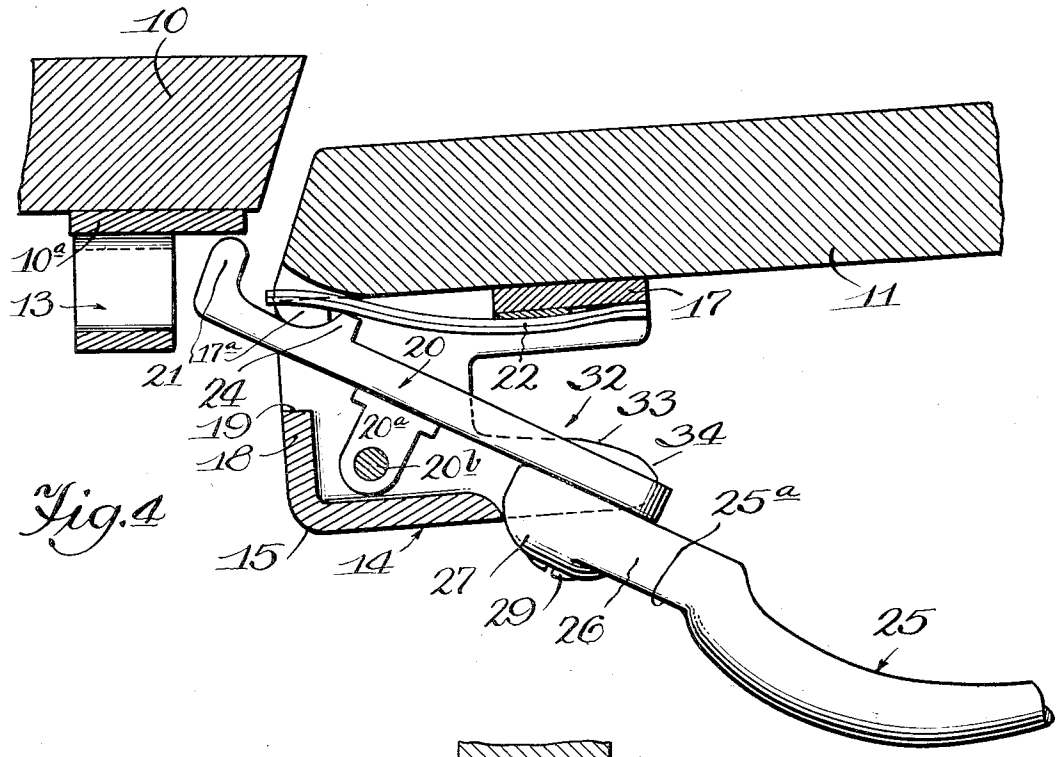


Fig. 4

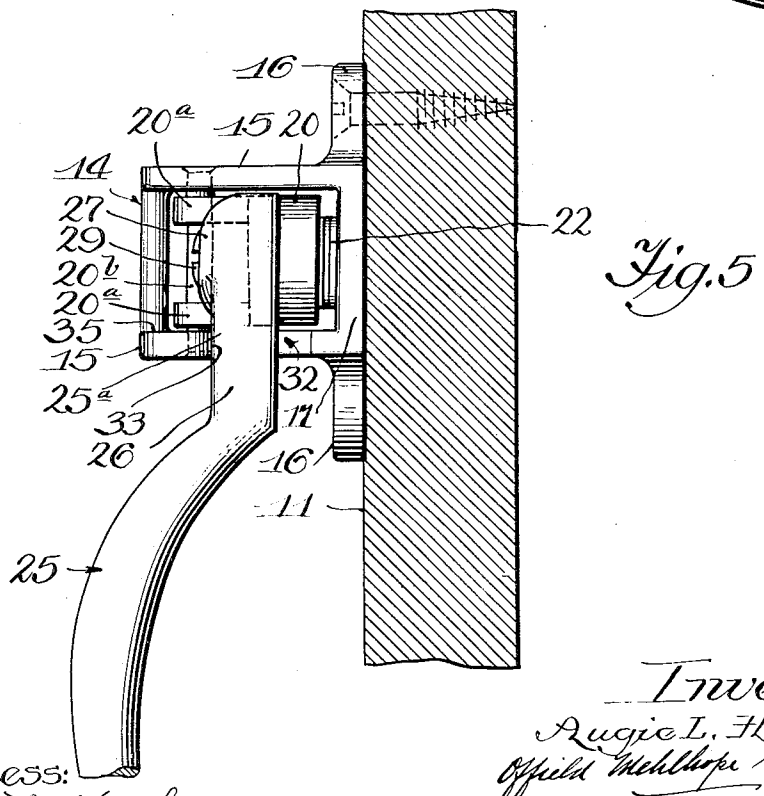


Fig. 5

Witness:
Chas. R. Komrsh.

Inventor,
Augie L. Hansen,
Offield Mehlhope Scott & Poole
Attys.

Patented May 8, 1934 1,957,642

UNITED STATES PATENT OFFICE

1,957,642

LOCK

Augie L. Hansen, Chicago, Ill., assignor to A. L. Hansen Mfg. Co., Chicago, Ill., a corporation of Illinois

Application May 16, 1932, Serial No. 611,580

10 Claims. (Cl. 292—332)

This invention relates to improvements in locks, and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The object of the invention is to provide a lever bolt lock which is automatic in operation so that the bolt will be latched or engaged in the keeper and locked against disengagement therefrom by a jar or the like, on the mere operation of slamming the door to which the lock is applied.

Another object of the invention is to provide a lock in the use of which the door to which it is applied will be further jammed in closed position and the locking parts will be more securely positioned against disengagement by a jar or other force to which the door is subjected,—as when in use on a truck—by the bouncing of the truck in driving over a rough road.

The advantages of my invention will appear more fully as I proceed with my specification.

While in no way limited thereto, the improved lock is of particular advantage when applied to the doors on refrigerator trucks and is illustrated herein as so applied.

In the drawings:—

Figure 1 is a perspective view of the part of a truck having a door to which the improved lock is applied.

Figure 2 is a perspective view of the lock.

Figure 3 is a view representing a horizontal section through the lock as it appears with the bolt engaged in the keeper and the door locked in place.

Figure 4 is a view similar to Figure 3 showing the lock disengaged from the keeper and in process of breaking the seal which maintains between the door and its frame in doors of the kind when the door is closed.

Figure 5 is a view representing a vertical section through Figure 3 in a plane indicated by the line 5—5 thereof.

Referring now to that embodiment of the invention illustrated in the drawings:—10 indicates the frame of a doorway as on a truck; 11 indicates the door hinged in said door frame, as indicated at 12, 12; 13 indicates a keeper of familiar form on the door frame adjacent the door opening; 14 indicates the lock as a whole, carried by the door. The lock 14 consists of a box-like housing 15 provided with apertured ears 16, two at the top and two at the bottom, in the plane of the base of the lock for securing the housing to the door. The housing is open at the back except for a narrow base plate 17 at the right end,—that is to say, the end away from the keeper—which end is otherwise open, and two inwardly extending lugs 17*a*, 17*a* at the other end of the casing.

18 indicates the end wall of the housing towards the keeper. Said wall terminates about midway of the depth of the housing and presents a transverse, vertical shoulder or stop 19 which extends parallel to the base of the housing. 20 indicates the bolt. Said bolt extends the length of the housing, below the shoulder 19, above the lugs 17*a*, 17*a* and beyond the housing, where it has an L-shaped end 21 which engages under the keeper 13. The bolt is provided on its front face with laterally off-set, transversely spaced lugs 20*a* by means of which it is pivotally mounted on a vertical pin 20*b* suitably secured in the top and bottom walls of the housing, as indicated at 20*c*. A flat or leaf spring 22 is fixed at one end to the base 17 of the housing by rivets, or otherwise, as shown at 23. Said spring extends the length of the housing and has its free end engaged against an off-set 24 on the rear face of the bolt in the neighborhood of the stop 19. Said spring normally holds the bolt 20 in engagement with the stop 19. When the bolt is swung away from the stop 19, the off-set 24 slides inwardly and away from the end of the spring 22. With the engaging point of the bolt with the spring and the pivot of the bolt off-set from opposite sides thereof, the bolt passes shortly from a position of effective spring pressure acting to force it towards the shoulder 19 to a position where the contact of the spring with the bolt is substantially in dead center relation to the pivot of said bolt. In the second position, the bolt is arrested by the engagement of its lateral margins with the lugs 17*a*, 17*a* and is held there by the friction of the off-set 24 against the spring 22.

The bolt is manually operated by means of a handle 25. Said handle is curved outwardly away from the plane of the base of the housing to give room between it and the door to which the housing is attached for the hand which grasps the handle. At its end, adjacent the bolt, the handle has a flat base 26 engaged against the front face of the bolt, and a rounded boss 27 projecting from its own front face. A cylindrical recess 28 in said base opens towards the bolt. The handle base 26 is pivoted to the bolt by means of a rivet and screw 29, the screw extending through the head of the boss 27. A coiled spring about the screw is located in the recess 28 and has its ends bent parallel to the axis of

the screw,—one end, 30, taking into a suitable hole in the head of the boss, and the other end, 31, taking into a suitable hole in the adjacent face of the bolt in such manner that the spring acts to rotate the handle downwardly at an angle to the longitudinal axis of the bolt.

In the lower wall of the housing is formed a slot 32 which presents an inwardly facing edge 33,—that is to say, an edge facing towards the bolt. Said edge is curved outwardly, as indicated at 34, towards the end of the housing and is slightly inclined in the other direction (that is, the direction leading to the keeper) towards the base of the housing. The edge 33 is adapted to be engaged by the flat base 25*a* of the handle when the bolt is at or near to the shoulder 19 of the housing.

The vertical front face of the housing is provided with a slot 35, which is of the width of the flat base 25*a* of the handle so that when the handle is in line with the bolt, as when in horizontal position, the bolt may be disengaged from its keeper by swinging the handle outwardly away from the door, as shown in Figures 2 and 4.

The operation of the lock is as follows: Assume the door open and the parts of the lock in the position indicated in Figure 4 with, however, the door itself swung entirely or partially open. In such case the bolt and the handle will stand with their longitudinal axes in alignment, as shown in Figures 2 and 4, this position being maintained by the engagement of the base 25*a* of the handle in the slot 35 in the front wall of the housing,—notwithstanding the tension of the coiled spring in the connection of the handle and bolt. It will be noted that in this position the bolt is in engagement with the lugs 17*a*, 17*a* and the off-set 24 on the bolt has moved to a position inwardly and away from the end of the spring 22, so that the point of application of the power of said spring is substantially on a dead center with reference to the pivot pin 20*b* of the bolt. The spring is thus ineffective when the parts are in this position, except to retain the bolt in said position by its frictional engagement with the off-set 24.

If the door now be slammed, the L-shaped end 21 of the bolt will engage the frame of the doorway, which is preferably protected at this point by a metal plate 10*a* extending under the loop of the keeper. The bolt end, preferably rounded as shown, when it strikes the plate 10*a*, acts to swing the bolt on its pivot pin 20*b*. As it strikes said plate at an angle, it readily slides thereon and as the bolt swings more and more towards its engaging position with the shoulder 19, the off-set 24 moves nearer and nearer to the end of the leaf spring 22. As a result, when the door approaches closed position, the bolt 20 is snapped sharply by the spring towards the shoulder or stop 19 with its end engaged under the keeper, as shown in Figure 3. When the bolt is brought to this position, the front face of the base 25*a* of the handle stands in the plane of the inwardly inclined edge 33 of the housing and, actuated by the coiled spring and by the force of gravity acting on the handle itself, said handle will drop, swinging on its pivotal connection with the bolt into a downwardly inclined position, in which the front face of said base engages with the edge 33. The latching engagement of the bolt with its keeper is thus locked. Any further downward movement of the handle will act to swing the end of the bolt to which it is attached towards the base of the housing, since the inclined edge 33 acts as a wedge against the base of the handle. This movement of the handle end of the bolt towards the base of the housing causes the bolt to act as a lever of the second class with the fulcrum provided by the engagement of the end of the bolt 21 with the keeper and with the power exerted by the pivot pin 20*b* on the housing and then to the door, thus more tightly wedging the door against the jamb.

It is obvious that any jarring of the housing or of the parts of the lock, as by the bumping of the truck over the road, will drive the handle further down in its wedging engagement with the edge 33 until finally it will come to a vertical position, in which the door is completely driven home with respect to the jamb. If desired, a padlock or any other suitable device may be used, as now customary with locks of the kind, to present a locked obstruction to prevent the swinging up of the handle and the disengagement thereby of the bolt from its keeper. To this end a hole 36 is provided in the top wall of the housing. However, this is not necessary to maintain the latter with the handle in its downwardly locked position, because, as pointed out, every jar tends to simply more tightly wedge the handle back of the edge 33 of the housing.

In opening the door, the handle is swung upwardly to bring its longitudinal axis into alignment with the longitudinal axis of the bolt. It is then swung from the position shown in Figure 3 to the position shown in Figure 4. It will be obvious that in performing this operation, the L-shaped end of the bolt will engage the frame of the doorway or the flat plate 10*a* protecting the same, and the handle 25 and bolt together will act as a lever of the second class with the fulcrum at the end of the bolt to force the door outwardly and break the usual seal.

I claim as my invention:—

1. A lock comprising in combination with a keeper, a housing, a bolt providing a lever pivotally mounted in said housing and projecting therefrom to engage said keeper, said housing providing a stop to limit the swinging movement of said bolt in one direction, a spring in said housing engaging said bolt and acting to swing said bolt towards said stop but being ineffective in this respect when said bolt is a predetermined distance from said stop, said spring providing means exerting a force on said housing tending to close a door with which said housing is connected when said bolt is in engagement with said keeper.

2. A lock comprising in combination with a keeper, a housing, a bolt pivotally mounted in said housing and providing a lever projecting therefrom to engage said keeper, said housing providing a stop to limit the swinging movement of said bolt in one direction, a spring in said housing engaging said bolt and acting to swing said bolt towards said stop but being ineffective in this respect when said bolt is a predetermined distance from said stop, and manual means for swinging said bolt on its axis, said manual means being movable relative to said bolt and into engagement with said housing to operate said bolt, said bolt providing a lever of the second class with said keeper as a fulcrum.

3. A lock comprising in combination with a keeper, a housing, a bolt pivotally mounted in said housing and providing a lever projecting therefrom to engage said keeper, said housing providing a stop to limit the swinging movement of said bolt in one direction, a spring in said

housing engaging said bolt and acting to swing said bolt towards said stop but being ineffective in this respect when said bolt is a predetermined distance from said stop, and manual means for operating said bolt, said manual means being capable of and being spring-compelled to a movement relative to said bolt and into engagement with said casing to thereby operate said bolt, said bolt providing a lever of the second class with said keeper as a fulcrum.

4. In combination with a door frame and a door, a keeper on said door frame, a lock housing on said door, a bolt pivotally mounted on a vertical axis in said housing and projecting therefrom to engage said keeper, a stop provided by said housing to limit the outward swinging movement of said bolt, a spring in said housing engaged with said bolt tending to force it towards said stop, a portion of said bolt being adapted to be arranged relatively to said spring and the pivot of said bolt to apply the action of said spring to said bolt in the direction of its pivot to thereby render the spring ineffective to move said bolt when the bolt is swung to a predetermined distance from said stop, and manual means for operating said bolt as a lever with said keeper or said door frame as a fulcrum.

5. In combination with a door frame and a door, a keeper on said door frame, a lock housing on said door, a bolt pivotally mounted on a vertical axis in said housing and projecting therefrom to engage said keeper, a stop provided by said housing to limit the outward swinging movement of said bolt, a spring in said housing engaged with said bolt tending to force it towards said stop but being ineffective in this respect when the bolt is swung to a predetermined distance from said stop, manual means for operating said bolt, and means presented by said housing engageable by said manual means to operate said bolt as a lever of the second class against said keeper to jamb said door in said frame.

6. In combination with a door frame and a door, a keeper on said door frame, a lock housing on said door, a bolt pivotally mounted on a vertical axis in said housing and projecting therefrom to engage said keeper, a stop provided by said housing to limit the outward swinging movement of said bolt, a spring in said housing engaged with said bolt tending to force it towards said stop but being ineffective in this respect when the bolt is swung to a predetermined distance from said stop, manual means for operating said bolt, said manual means being both spring-controlled and gravity-controlled, and means presented by said housing engageable by said manual means to operate said bolt as a lever of the second class against said keeper to jamb said door in said frame.

7. A lock comprising in combination with a keeper, a housing, a bolt extending from the housing to engage said keeper and being pivotally mounted in the housing on a vertical axis off-set from its front face, a stop presented by said housing to limit the forward swing of said bolt, said bolt having an off-set near said stop on its rear face, a flat spring mounted in said housing and engaged with said off-set, and manual means for swinging said bolt extending beyond said housing, said housing being provided with a slot to permit said manual means to be swung forwardly.

8. A lock comprising in combination with a keeper, a housing, a bolt extending from the housing to engage said keeper and being pivotally mounted in the housing on a vertical axis off-set from its front face, a stop presented by said housing to limit the forward swing of said bolt, said bolt having an off-set near said stop on its rear face, a flat spring mounted in said housing and engaged with said off-set, spring-controlled manual means pivoted to said bolt and tending to assume a downwardly inclined position with reference thereto, said housing presenting a rearwardly inclined edge to be engaged by said manual means when it is in inclined position, said manual means projecting beyond said housing and said housing being provided with a slot in the plane of said bolt to permit said manual means to swing outwardly to operate said bolt as a lever.

9. A lock comprising in combination with a keeper, a housing, a bolt providing a lever pivotally mounted in said housing and projecting therefrom to engage said keeper, means providing stops to limit the swinging movement of said bolt in opposite directions, a spring in said housing engaging said bolt and acting to swing said bolt in one direction but being ineffective in this respect when said bolt is at the limit of its swinging movement in the opposite direction, and manual means for swinging said bolt on its axis, said means being capable of a movement relative to said bolt and into engagement with said housing to operate said bolt, said bolt providing a lever of the second class with said keeper as a fulcrum.

10. A lock comprising in combination with a keeper, a housing, a bolt providing a lever pivotally mounted in said housing and projecting therefrom to engage said keeper, means providing stops to limit the swinging movement of said bolt in opposite directions, a spring in said housing engaging said bolt and acting to swing said bolt in one direction but being ineffective when said bolt has been swung to the inward limit of its movement, and manual means for operating said bolt, said last mentioned means being capable of movement relative to said bolt and into engagement with said casing to operate said bolt, said bolt and keeper being adapted to cooperate with each other and said bolt providing a lever of the second class having said keeper as a fulcrum.

AUGIE L. HANSEN.