

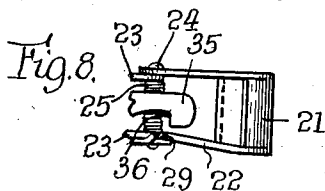
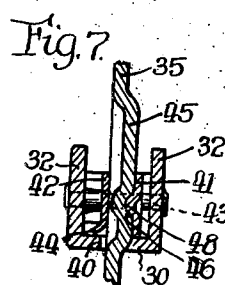
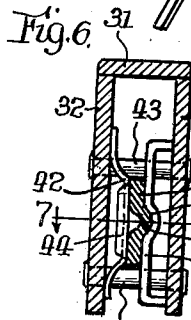
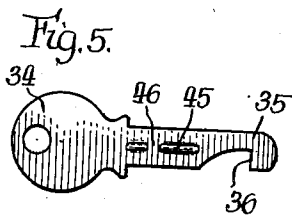
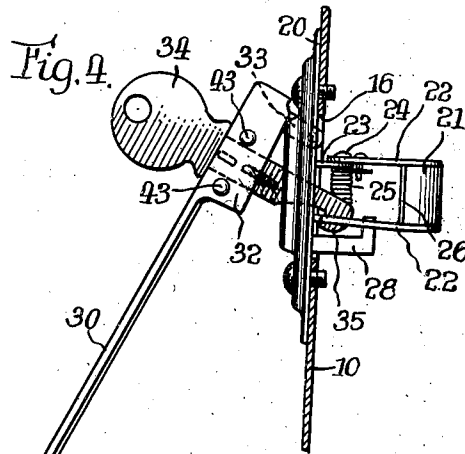
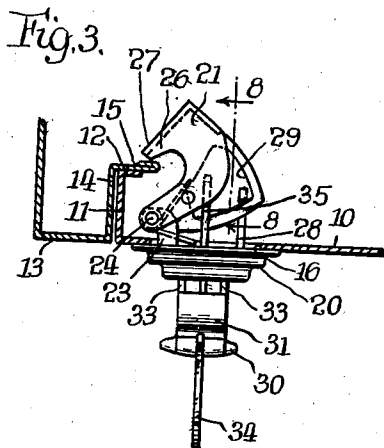
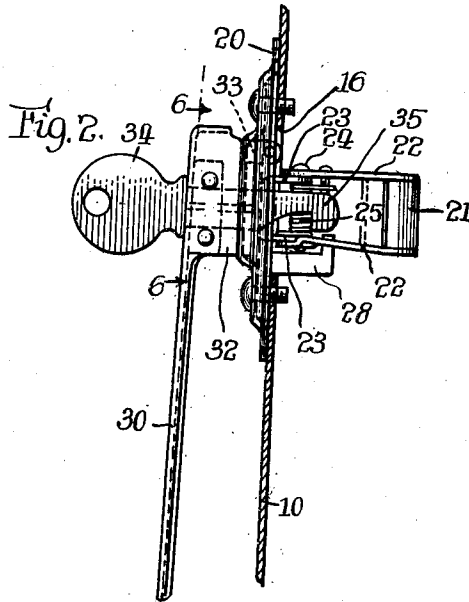
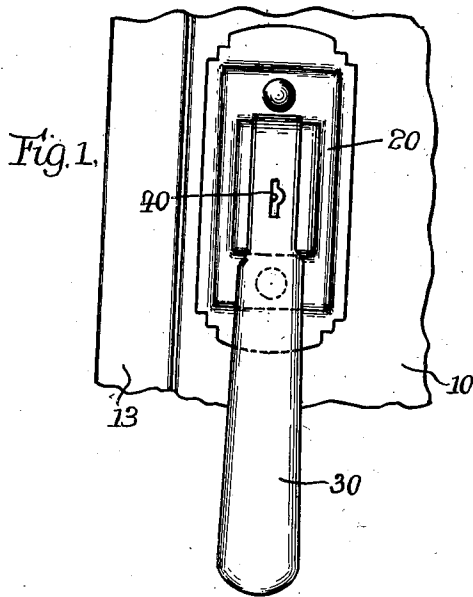
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L. W. SKOBEL

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LOCK

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UNITED STATES PATENT OFFICE

2,167,009

LOCK

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15 Claims. (Cl. 70-149)

The invention relates generally to locks and more particularly to a lock for a door or the like.

The general object of the invention is to provide a lock in which the operator for the latch member may be rendered operable to move the latch member only by the insertion of a readily removable member.

Another object is to provide a lock in which the latch member and the operator therefor may be connected only by a readily removable member.

Still another object is to provide a lock comprising a latch member and a shiftable support for a key with the key adapted to engage and operate the latch member upon movement of the shiftable support.

It is also an object to provide a lock comprising a latch member, a handle for operating the latch member, and a readily removable key providing the sole operating connection between the latch member and the handle, whereby removal of the key prevents operation of the lock.

A further object of the invention is to provide a lock having an operating handle and a spring-operated latch member, with a key for connecting the handle and latch member and for shifting the latch member against the action of the spring.

Other objects reside in the provision in a lock of this character of a key which is yieldably held in place when inserted into the lock, and which is caused to engage the latch member by movement of the handle.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing, in which:

Figure 1 is a front elevational view of a lock embodying the features of the invention and showing the lock mounted on a door.

Fig. 2 is a vertical section through the door showing a side elevation of the lock.

Fig. 3 is a horizontal section through the door showing a plan view of the lock.

Fig. 4 is a view similar to Fig. 2 but showing the parts in release position.

Fig. 5 is a view of a key employed with the lock. Fig. 6 is an enlarged fragmentary section taken on the line 6-6 of Fig. 2.

Fig. 7 is an enlarged fragmentary section taken on the line 7-7 of Fig. 6.

Fig. 8 is a fragmentary section taken on the line 8-8 of Fig. 3.

A lock embodying the features of the invention comprises briefly a latch member and an operator therefor which are normally disconnected. To operatively connect the latch member and the

operator, a readily removable member is provided which is insertible into the lock for operatively connecting the operator with the latch member. The readily removable member is shaped so that it may be inserted and withdrawn from the lock without moving the latch member, but when the readily removable member is in place, movement of the operator causes the readily removable member to engage and move the latch member. In order that the readily removable member may not accidentally drop out of the lock, means is provided for yieldably retaining it in place.

For purposes of illustrating the invention, the preferred embodiment of the invention is shown in a form suitable for use on the door of a cabinet made of sheet metal. The door is indicated at 10, and ordinarily the metal around the edge of the door is bent inwardly as at 11 and reversely as at 12 (see Fig. 3) to give rigidity to the door and an appearance of thickness. The wall of the cabinet, indicated at 13, is correspondingly bent inwardly, as at 14, and then parallel to the door, as at 15, to match the corresponding portions on the door and provide a tight closure.

The lock is preferably mounted on the door 10, an aperture 16 being provided therein to permit parts of the lock to extend therethrough. The lock, in its preferred embodiment, comprises a body member 20 in the form of a face plate mounted on and rigidly secured to the outer face of the door and covering over the aperture 16.

Carried on the inner face of the body member 20 is a latch member 21 shaped to engage the bent portion 15 of the wall of the cabinet. The latch member, in order that it may be of inexpensive construction, is made of sheet metal bent to provide two parallel spaced arms 22. The latch member is preferably pivotally mounted on the body member, a pair of spaced brackets 23 extending rearwardly from the body member with a pivot pin 24 extending therethrough and through the spaced arms 22 of the latch member. It is here shown as of the spring-operated type, a torsion spring 25 being mounted on the pivot pin 24 for urging the latch member toward its closed or locking position.

The portion of the latch member which engages the wall of the cabinet is in the form of a lip 26 with a cam surface 27 on its outer face to swing the latch member sufficiently to permit it to pass and engage the wall of the cabinet on closing the door. To prevent the latch member from being moved too far by the torsion spring 25, a retainer 28 extends rearwardly from the

body member, the end of the retainer 28 being in the form of a hook entering an aperture 29 in the latch member. To simplify the manufacture of the lock, the two brackets 23 and the retainer 28 may be formed by bending rearwardly integral portions of a plate rigidly secured to the rear face of the body member 20.

The operator, in the present instance, is in the form of a handle 30 pivotally supported at its upper end by the body member 20. To this end, the handle at its upper end has a box-like structure comprising a top wall 31 and side walls 32 preferably integral with the handle. The side walls are in spaced relation to each other and have integral portions 33 extending through the body member and pivotally supported thereby.

It will be noted that the handle 30 and the latch member 21 are normally not operatively connected. One of the chief features of the invention is to provide a readily removable member which when in place is movable into engagement with the latch member to shift it, and thus provides the operative connection between the handle and latch member. In the preferred embodiment, the readily removable member is in the form of a key 34. The key is preferably carried by the handle, which in one sense is merely a shiftable support for the key, and has a shank 35 extending through the body member and in between the two arms 22 of the latch member. The inner end of the shank has a hook-like portion 36 which is normally out of engagement with the latch member. On swinging movement of the handle, the hook-like portion 36 moves first downwardly into the aperture 29 in the lower arm of the latch member and then forwardly to swing the latch member to a release position against the action of the torsion spring 25. The movement is thus generally longitudinal of the key, and the key constitutes the sole operative connection between the handle and the latch member.

Since the key constitutes an operative part of the lock, it is desirable to retain it in place to prevent it from accidentally falling out. The key is preferably carried by the handle 30 which is provided with means for yieldably holding the key in place. Preferably said means is housed in the box-like portion of the handle formed by the walls 31 and 32, the key being insertible therein through a key-receiving aperture 40 in the handle. As shown herein, said means comprises a fixed plate 41 and a spring plate 42 between which the key is inserted, as shown in Figs. 6 and 7. The fixed plate 41 is a bridge-like structure held in place by a pair of transverse pins 43, while the spring plate 42 has its ends forked to fit around the two pins. The spring plate normally is forced toward the fixed plate but has a round lip 44 on its forward edge to guide the key between the two plates on insertion.

To firmly yet yieldably hold the key in place, the shank 35 thereof has a longitudinal ridge 45 therein which is interrupted as at 46. Correspondingly the fixed plate 41 has a groove 47 to receive the ridge 45, and in the groove 47 is a transverse rib 48 adapted to enter the interruption 46 in the ridge 45 of the key when the latter is fully in place. Thus, when the key is inserted, it is first guided between the two plates by the lip 44, and the ridge 45 on the key bearing against the rib 48 of the fixed plate causes the spring plate to yield sidewardly. When the key is fully in place, the rib 48 and the in-

terruption 46 are opposite each other and the spring plate forces the key sidewardly so that the rib enters the interruption. The key is thus firmly but yieldably held in place, since to be removed, it has to move sidewardly to disengage the interruption 46 and the rib 48 against the action of the spring plate. The end of the ridge 45 and the rib 48 provide sufficient camming action to move the key sidewardly. The two pins 43 are so spaced as to provide guides for the upper and lower edges of the key.

In operation, it will be noted that, when the key is out of the lock, the torsion spring 25 causes the latch member to remain in its locked position, the retainer 28 holding the latch member against movement beyond the proper position. If the door is open, by merely forcing the door closed, the cam surface 27 on the latch member when it strikes the wall of the cabinet forces the latch member sidewardly, and as soon as the lip 26 on the latch member passes the edge of the wall, the torsion spring 25 immediately causes the latch member to engage the wall.

To unlock the door, the key is inserted into the handle, and upon movement of the handle, the hooked end 36 of the key moves downwardly into the aperture 29 in the lower arm of the latch member, and then pulls the latch member to its release position against the action of the torsion spring 25. Since the key is not normally in engagement with the latch member and is only moved into engagement therewith by movement of the handle, the key may be withdrawn without disturbing the latch member.

When the key is inserted into the handle, the lip 44 causes it to enter between the two plates 41 and 42. The ridge 45 on the key bearing against the rib 48 on the fixed plate 41 forces the spring plate 42 sidewardly. When the key is fully inserted, the spring plate 42 forces the key sidewardly so that the rib 48 on the fixed plate fits into the interruption 46 on the key and the ridge 45 on the key fits into the groove 47 in the fixed plate. To withdraw the key, a slight pull is sufficient to force it sidewardly against the action of the spring plate. Thus, the key is firmly but yieldably held in place when inserted so that it cannot accidentally fall out.

From the above description, it will be apparent that I have provided a lock in which the operator for the latch member may be rendered operable to move the latch member only by the insertion of a readily removable member in the form of a key, the latter constituting the sole operative connection between the latch member and the operator. The latch member is spring-operated so that it tends to move to a locked position, and the key when inserted does not move into engagement with the latch member until the handle is shifted. The key is firmly but yieldably held in place when inserted so that it cannot accidentally fall out.

I claim as my invention:

1. A lock comprising, in combination, a shiftable latch element, a supporting member shiftable in the operation of the latch element, and a member removably carried by the supporting member and engageable with the latch element for shifting it, said member being removable from and replaceable on said supporting member in the normal operation of the lock.

2. A lock comprising, in combination, a latch element swingable in a predetermined plane, a support movable in a different plane, a member having means to engage said element removably

carried by said support and movable with said support to pivot the latch element.

3. A lock comprising, in combination, a latch element shiftable in a given plane, a support movable in a plane perpendicular to the first-mentioned plane, a member having means to engage said element removably carried by said support and movable with said support to shift the latch element.

4. A lock comprising, in combination, a body member, a latch member movably mounted on the inner side of said body member, a handle movably supported by and extending exteriorly of said body member, and a readily removable key carried by said handle in a position accessible from the exterior of said body member and extending through said body member to operatively connect said handle with said latch member.

5. A lock comprising, in combination, a latch member, an operator therefor, and a readily removable key carried by the operator and having a hook portion movable into engagement with the latch member for moving the latch member to a release position upon movement of the operator.

6. A lock comprising, in combination, a body member, a latch member pivotally supported on the inner side of said body member, a handle pivoted on said body member and extending exteriorly thereof, and a readily removable key inserted in the handle and having a hook portion movable into engagement with said latch member to swing the latch member on its pivot upon pivotal movement of the handle.

7. A lock comprising, in combination, a body member, a latch member pivotally supported on the inner side of said body member, a torsion spring tending to swing said latch member to its latching position, an operating handle pivoted on said body member, and a readily removable key carried by the handle and having its inner end shaped to engage said latch member to swing it against the action of the spring upon swinging movement of the handle.

8. A lock comprising, in combination, a latch member, an operator therefor, a readily removable member connecting said operator with said latch member, and means separate from said removable member for yieldably holding said removable member in place to prevent accidental removal thereof.

9. A lock comprising, in combination, a latch member, an operator therefor, a readily removable key carried by said operator and adapted to engage and move said latch member upon movement of the operator, and means for yieldably retaining said key in said operator.

10. A lock comprising, in combination, a latch member, an operator therefor, a readily removable key carried by said operator and having a portion extending adjacent said latch member

and normally out of engagement therewith so that it may be withdrawn without disturbing the latch member but engageable therewith upon movement of the operator, and means for yieldably retaining said key in said operator in position for engagement with said latch member.

11. In a lock comprising a latch member, a handle for operating the latch member, and a readily removable key carried by said handle and connecting said handle and latch member, said key having a ridge extending along one side thereof with an interruption in the ridge, in combination, means for yieldably retaining said key in said handle comprising a fixed plate and a spring plate adapted to receive the key therebetween, said fixed plate having a rib extending transversely of the ridge on the key and adapted to enter the interruption in said ridge when the key is fully inserted, said spring plate yieldably holding said rib in the interruption in the ridge in the key.

12. A lock comprising, in combination, a movable latch member, an operator therefor having a swinging movement, and a readily removable member for connecting the operator and the latch member, said removable member normally being out of engagement with said latch member but being caused to move into engagement with the latch member and to move the latch member by the swinging movement of said operator.

13. A lock comprising, in combination, a movable latch member, a handle pivoted adjacent its upper end, and a key insertable into the handle for connecting the handle with the latch member, the swinging movement of the handle about its pivot causing the inner end of the key to swing into engagement with said latch member and then to move the latch member.

14. A lock comprising, in combination, a movable latch member, a pivoted handle, and a key insertable into the handle and having one end adapted to engage the latch member for connecting the handle with the latch member upon swinging movement of the handle, the engageable end of said key being so positioned relative to the pivot for the handle that the key will have a substantial component of movement toward the latch member during the first part of its movement to swing into engagement with said latch member and then will have a substantial component of movement in the plane of movement of the latch member to swing the latch member.

15. A lock comprising, in combination, a shiftable latch element, a member having means to engage the latch element, and a support for said member and shiftable to cause said member to shift said latch element, said member being removable from and replaceable on said support in normal operation of the lock.

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