Aug. 4, 1936. J. E. BALES 2,049,939

LOCKING DEVICE

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FIG. 1.

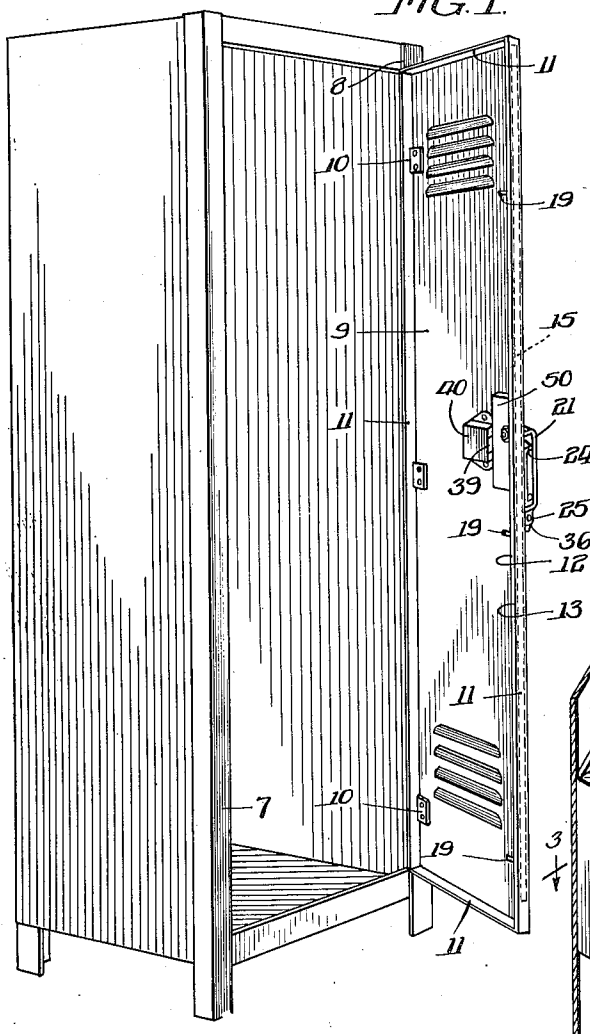


FIG. 2.

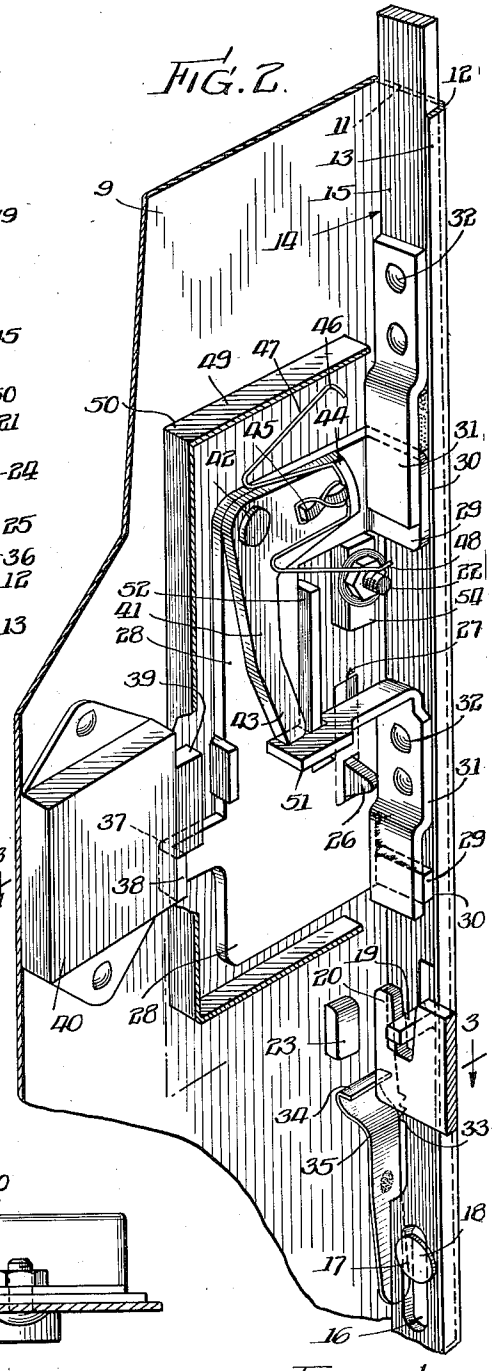
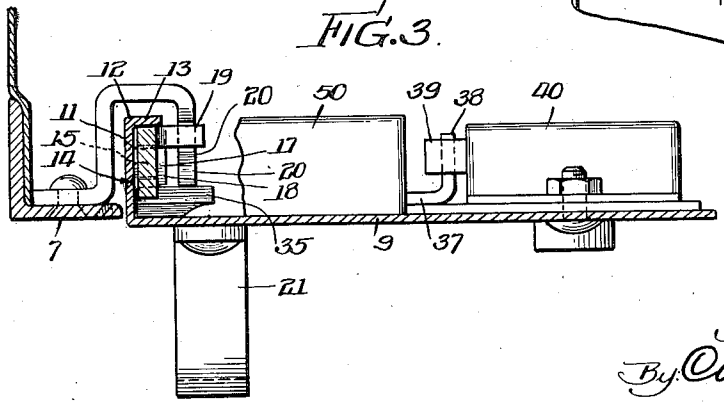


FIG. 3.



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FIG. 4.

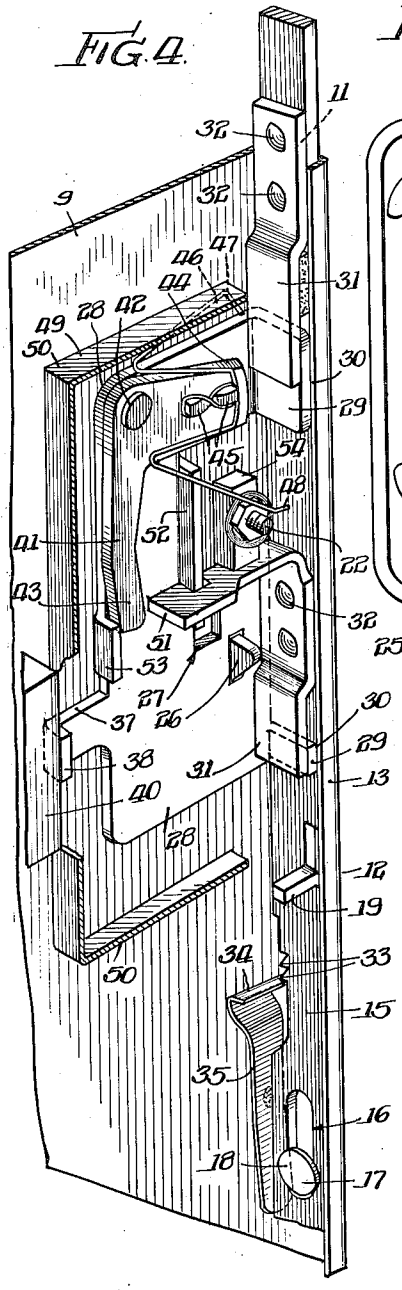


FIG. 5.

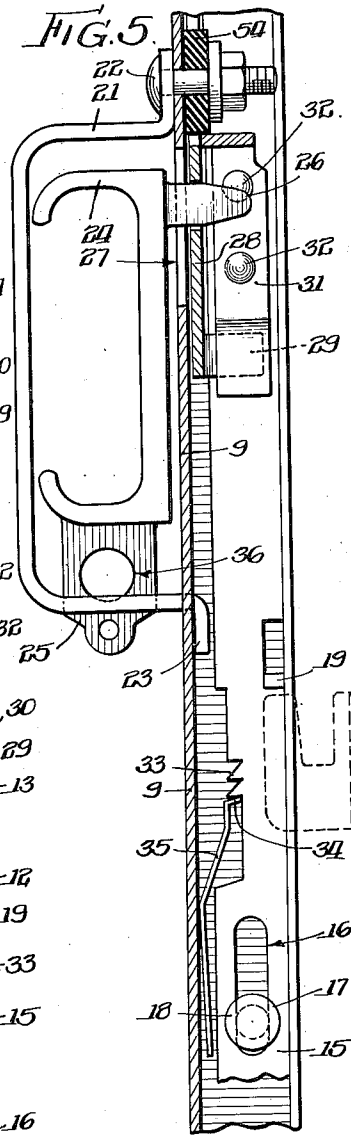
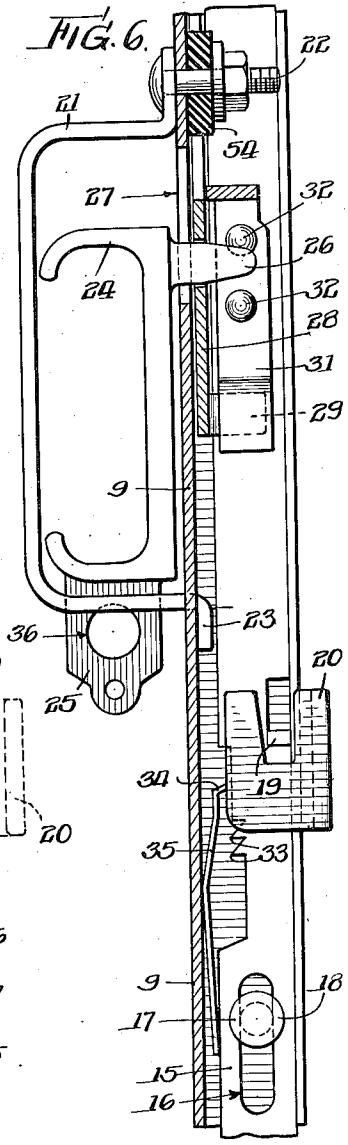


FIG. 6.



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UNITED STATES PATENT OFFICE

2,049,939

LOCKING DEVICE

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Application November 23, 1932, Serial No. 644,007

18 Claims. (Cl. 292—334)

This invention relates to lockers and particularly to lockers made of sheet metal. More specifically the invention relates to a locking mechanism for sheet metal lockers.

The primary object of the invention is to provide a new and improved locking construction which permits pre-locking, that is, the lock may be locked while the door is in open position and then, when the door is pushed to closed position, a locking rod will lock the door and prevent it being reopened until a key controlled mechanism, such as a cylinder lock or a padlock, is unlocked to permit manipulation of the locking device controlling mechanism.

Another object of the invention is to provide a sheet metal locker with a locking mechanism which includes a plate and a locking rod, the plate having slidable movement relative to the slidable movable locking rod.

Another object is to provide new and improved means for a locker locking rod for holding the rod in up or unlocked position during manipulation of a locking device, and which, when engaged during closing movement of the door, will release mechanism to permit the rod to drop to door locking position.

Other objects of the invention are the provision of locking mechanism and a locking rod, the provision of means for permitting slidable movement of the locking mechanism relative to the locking rod, the provision of means for holding the rod up in unlocked position and which, when engaged by a part of the locker, will cause disengagement of the holding means to permit the rod to drop to locked position, and the provision of means for preventing movement of the rod when the locking mechanism is locked and when the rod is dropped to door locking position.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

The accompanying drawings illustrate a selected embodiment of the invention and the views therein are as follows:

Fig. 1 is a detail perspective view of a sheet metal locker and embodying the invention.

Fig. 2 is a detail perspective view of the locking mechanism showing the locking rod in its normal locked or lowered position, parts being broken away for the sake of clearness.

Fig. 3 is a detail transverse sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a view similar to Fig. 2 showing the locking mechanism in unlocked and raised position.

Fig. 5 is a vertical sectional view showing the locking rod in raised or unlocked position.

Fig. 6 is a view similar to Fig. 5 showing the locking rod in lowered or locked position.

The locker herein shown for illustrative purposes is provided with side jambs 7 and 8. A sheet metal door 9 is swingingly mounted on the jamb 8 by means of hinges 10. The peripheral edges of the door are bent inward from the inner face to provide the inwardly extending flanges 11. A side flange 11, at the free end of the door, is bent at 12 to provide an inwardly extending ledge 13, thereby providing a three-sided recess 14 into which a locking rod 15 is slidably arranged.

The locking rod 15 is provided with spaced slots 16 through which rivets 17 extend. The rivets 17 extend through the side flange 11 at the free end of the door and have heads 18 on their inner ends for the purpose of holding the locking rod against the side flange 11 and still allow for slidable movement of the rod 15.

The rod 15 is provided with right angle projecting fingers 19 which are struck out and bent from the rod to provide locking fingers which cooperate with keepers 20 fastened to the jamb 7.

A door operating grasp 21 is arranged on the outer face of the door and has its upper end fastened thereto by means of a fastening member 22. The lower end of the grasp extends through a slot in the door and has its lower end bent as indicated at 23, Figs. 5 and 6. An operating handle 24 is arranged within the boundary of the grasp 21 and has a tail-piece 25 provided at its lower end which extends through a slot formed in the bottom of the grasp 21. A projection 26 is formed on the upper end of the handle 24 and extends through an elongated slot 27 formed through the door. This projection 26 also projects through and assists in supporting a plate 28 which is thus rendered movable vertically upon vertical movement of the handle 24. The plate 28 is provided with inwardly extending upper and lower flanges 29 which overlap the outer or open surface of the locking rod 15 as indicated at 30. Offset upper and lower members 31 are fixed to the rod, such as by rivets 32, and receive the flanges 29 of the plate 28. Thus, the flanges 29 are received between the outer face of the rod 15 and the inner face of the members 31. The plate 28 is suitably held on the inside face of the door by means of the projection 26, and the flanges 29 received between the outer turned ends of the members 31 and the outer face of the locking rod 15. Therefore, vertical movement of the handle 24, which movement is

limited by the slot 27, will raise the rod 15. The rod 15 is provided with ratchet teeth 33 which are engaged by the end 34 of a spring clip 35 which is fastened to the inner face of the door. When the rod is raised, the spring clip 35 will engage the ratchet teeth 33 and hold the rod in up unlocked position so long as the door is in open or partly open position. However, during closing movement of the door, such as when the door is pushed all the way shut, the keepers 20 will strike the spring clip 35, push it inwardly and disengage the clip from the teeth 33, thereby permitting the rod 15 to drop to closing position by gravity. The construction so far described includes a handle having vertical slidable movement relative to the locking rod. When the handle is moved upwardly, engagement of the flanges with the members 31 will cause the rod 15 to be raised to unlocked position. Then, when the door is opened, the spring clip 35 will hold the rod in up or unlocked position, freeing the locking fingers 19 from the keepers 20. However, upon release of the handle 24, the handle and the plate 28 will drop downwardly by gravity.

The tail-piece 25 is provided with an opening or hole 36 to receive the bow or shackle of a padlock when the handle 24 has dropped by gravity to its normal position, Fig. 6. The handle 24 is thereby locked and cannot be raised. When the door is closed, however, the spring clip 35 will be moved away from engagement with the ratchet teeth and thereby the rod is free to lock with the keepers 20. The door will thus be in locked position, as shown in Fig. 6. However, for the sake of clearness, no padlock is shown passing through the hole 36.

The plate 28 is also provided with an outwardly extending tongue 37 which is bent to provide an outwardly extending ledge 38. This ledge cooperates with a bolt 39 on a cylinder lock 40. Therefore, instead of using the padlock through the hole 36, the draw-bolt 39 of the cylinder lock 40 will extend above or across the path of the projecting ledge 38 and prevent the handle 24 from being raised. To open the door when it is in locked position with the rod down, and the draw-bolt of the lock 40 against the ledge 38, it would be impossible to open the door under ordinary normal circumstances. However, when a key is applied to the lock 40 to withdraw the bolt 39, the handle 24 may be raised. The raising of the handle, as previously described, will also raise the slidable rod 15. Then, when the door is pulled to open position, the rod 15 will remain in up position because the spring clip 35 will be in engagement with the ratchet teeth 33. In this position the locking fingers 19 will be out of engagement with the keepers 20 or in the position shown in Fig. 5. As soon as the handle 24 is released, the handle is free to drop even though the locking rod is held upwardly. As soon as the handle drops, the handle being connected to the plate 28, the plate will also drop. Therefore, the lock 40 may be locked to bring the bolt 39 in the path of the ledge 38. Thus, when the door is pushed closed, the jamb will strike the spring clip 35, cause disengagement of the clip from the teeth 33 and allow the fingers to drop into the keepers and thereby lock the door. This construction permits the handle 24 to be locked and prevent movement thereof, but will permit the locking rod to drop by gravity when the door is shut.

It would still be possible, however, to open the locker by slipping a wire through an opening in the door, cause engagement of the wire with one of the lock fingers 19 and thus raise the locking rod. However, to prevent such unauthorized opening of the locker door, a locking trigger 41 is provided.

The locking trigger 41 is pivoted to the plate 28 as indicated at 42 and has a downwardly extending trigger finger 43 and a rear tail-piece 44. The tail-piece 44 is provided with struck-out parts 45 to which a spring 46 is attached. The spring 46 has an upper spring end 47 and a lower spring end 48. When the handle 24 is raised upwardly, the spring end 47 will engage a ledge 49 on the cover plate 50, and upon such engagement, the spring 46 will turn the trigger 41 to substantially vertical position as shown in Fig. 4. The handle 24 will then be free to drop downwardly, but the rod 15 will remain in up position. However, as soon as the locking rod is dropped by the closing of the door, the end 48 of the spring 46 will engage the fastening element 22 and swing the trigger on its pivot 42 to the position shown in Fig. 2 in which position the end of the trigger will lie immediately above an arm 51 which is bent from one of the members 31. Therefore, if a wire or other device were slipped through an opening in the door and engage one of the fingers 19, the rod 15 could not be raised as it would strike the lower end of the trigger 43. In raised position the end 47 of the spring is compressed by its engagement with a part of the casing 50, thereby turning the trigger on its axis or pivot and freeing it from the ledge or arm 51, allowing the plate to drop relative to the locking rod 15. When the door is closed, the spring clip 35 will become disengaged from the rod and the weight of the rod moving downwardly, will bring the finger or ledge 51 below the bottom of the trigger 41 at which time the end 48 of the spring 46 will turn the trigger so that it will lie directly in the path of the ledge or finger 51. Therefore, when the door is closed and locked, it is impossible to raise the rod 15 or to raise the handle 24. Turned flanges 52 and 53 are bent up from the plate 28 on opposite sides of the plate to limit the pivotal movement of the trigger 41.

A rubber plug 54 is fastened in position on the inner face of the door to provide bumpers or strikes for the plate 28 during upward or downward movement thereof.

Operation

When the door is closed and locked, the parts will assume the position shown in Fig. 2. The end 47 of the spring 46 will be away from the ledge 49 of the cover plate or casing 50, but the end 48 of the spring will engage the fastening member 22 and the trigger will be turned to engage the arm or ledge 51 which is fixed to the rod 15. Therefore, the handle 24 cannot be operated to raise the rod, nor can the rod be raised independently of the handle. However, upon the insertion of a key to move the locking bolt 39 to unlocked position or the removal of a padlock from the opening 36 in the tail-piece, the handle 24 may be raised. Raising of the handle 24 will also raise the locking rod 15 a distance sufficient to permit the locking fingers 19 to free themselves from the slots in the keepers 20. The door is thus free to be opened. Upon opening movement of the door, the spring clip 35 will engage the ratchet teeth 33 and hold the locking rod 15 in up or unlocked position. Also, upon release of the handle 24, the handle is free to

slide downwardly independent of the locking rod 15 and the parts will assume the position shown in Fig. 4. The tail-piece 25 will then be extended through the slot in the bottom of the handle 24 and a padlock may be inserted therein while the door is open. Or, instead of using the padlock, a key may be inserted in the lock 40 to shift the draw-bolt 39 into locked position relative to the projecting ledge 38. All the parts are thus in locked position with the exception of the locking rod 15 and the safety trigger 41. When the door is pushed to closed position, the keepers 20 will strike the spring clip 35 and disengage the clip from the teeth 33 and the rod will drop, by gravity, to locked position bringing the locking fingers 19 into locking position relative to the keepers 20. During the downward movement of the locking rod 15, the ledge or arm 51 will be moved below the bottom of the trigger 41 and the spring end 48 of the spring 46 will move the trigger on its pivot to the position shown in Fig. 2. The rod and handle are thus mantained in locked position and the door cannot be opened without the use of a proper key.

The invention provides a locking device which permits pre-locking, that is, the locks on the door may be locked while the door is in its open position. This is made possible due to the fact that the locking device or locking rod operates independent of the outside lock controlling handle. The purpose of this arrangement is that the locker may be unlocked and then immediately have the locking members locked while the door is opened either by use of a flat key lock, a padlock, or a combination lock. It is then only necessary to push the door closed as the locking mechanism will then function and the door will be securely locked without any manual operations. The locking device is relatively simple, requires only the use of few and simple parts, and it may be made very economically. The locking device is positive in operation and prevents opening the locker door except in the ordinary normal manner by the employment of a proper key.

Changes may be made in the form, construction, and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. In a locker construction, a slidably mounted locking rod, a handle manually operated for moving the rod to unlocked position, means for holding said rod in unlocked position, means for releasing said last named means whereby the rod will be released and returned to locked position, lock controlled means for preventing operation of said handle to operate the rod, and pivotally mounted means for preventing movement of said rod when said rod is in locked position and said locking means are in locked position.

2. A locking device for lockers and the like comprising a slidably mounted locking rod, a handle manually operated for moving the rod to unlocked position, means for holding said rod in unlocked position, means for releasing said last named means whereby the rod will be released and returned to locked position, lock controlled means for preventing operation of said handle to operate the rod, pivotally mounted means for preventing movement of said rod when said rod is in locked position and said locking means are in locked position, and spring means for controlling the pivotal movement of said pivoted means when the rod is in unlocked position and said locking means are unlocked.

3. In a locker construction having spaced jambs, a door between said jambs and hingedly supported on one of said jambs, and a locking rod slidably mounted on the inner face of the door at the free edge thereof, the combination of a plate slidably mounted on the inside of said door, a handle on the outside of the door for sliding the plate upwardly, means on the plate and engageable with the locking rod for raising the rod when the plate is slid upwardly, and means for holding the rod in raised position, said plate sliding downwardly to normal lowered position by gravity upon release of said handle.

4. In a locker construction having spaced jambs, and a door between said jambs and hingedly supported on one of said jambs, and a locking rod slidably mounted on the inner face of the door at the free edge thereof, the combination of a plate slidably mounted on the inside of said door, a handle on the outside of the door for slidingly raising the plate, means on the plate and engageable with the locking rod for raising the rod when the plate is raised, means for holding the rod in raised position, said plate dropping to normal lowered position by gravity upon release of said handle and causing disengagement of said first named means with the rod, and locking means engaging said plate for preventing operation of said handle.

5. In a locker having spaced jambs, and a door between said jambs and hingedly supported on one of said jambs, a locking device comprising a locking rod slidably mounted on the inner face of the door at the free edge thereof, a plate slidably mounted on the inside of said door, a handle on the outside of the door for raising the plate, means on the plate and engageable with the locking rod for raising the rod when the plate is raised, a clip for holding the rod in raised position, said plate returning the normal lowered position by gravity upon release of said handle, and means engaging said clip when the door is moved to closed position to release said clip from the rod and permit the rod to drop to locked position by gravity when so released.

6. A door locking device comprising a locking rod slidably mounted on the inner face of a hinged door at the free edge thereof, a plate slidably mounted on the inside of said door, a handle on the outside of the door for raising the plate, means on the plate and engageable with the locking rod for raising the rod when the plate is raised, means for holding the rod in raised position when raised by the plate to unlock the door, said plate returning to normal lowered position by gravity upon release of said handle, locking means engaging said plate for preventing operation of said handle, key controlled means for locking said handle in lowered position and preventing operation of said handle and means for releasing the rod from raised unlocked position, said rod dropping by gravity to locked position when released.

7. A locking device for doors comprising a locking rod slidably mounted on the inner face of a hinged door at the free edge thereof, a plate slidably mounted on the inside of said door, a handle on the outside of the door for slidingly raising the plate, means on the plate and engage-

able with the locking rod for raising the rod when the plate is raised, a clip on the door for holding the rod in raised unlocked position, said plate returning to normal lowered position by gravity upon release of said handle, means engaging said clip when the door is moved to closed position to release said clip from the rod and permit the rod to drop to locked position by gravity when so released, and key controlled means for locking said handle in lowered position and preventing operation of said handle and consequently preventing operation of the rod.

8. A locking device comprising a locking rod slidably mounted on the inner face of a hinged door at the free edge thereof, a plate slidably mounted on the inside of said door, a handle on the outside of the door for raising the plate, means on the plate and engageable with the locking rod for raising the rod when the plate is raised, means for holding the rod in raised position, said plate returning to normal lowered position by gravity upon release of said handle, locking means engaging said plate for preventing operation of said handle, a finger on said rod and trigger means on said plate for engaging said finger for preventing upward vertical movement of said rod independently of the handle.

9. A locking device comprising a locking rod slidably mounted on the inner face of a swingingly mounted door at the free edge thereof, a plate slidably mounted on the inside of said door, a handle on the outside of the door for raising the plate, means on the plate and engageable with the locking rod for raising the rod when the plate is raised, said rod when raised being in unlocked position to permit opening of the door, a clip, for holding the rod in raised unlocked position, said plate returning to normal lowered unlocked position by gravity upon release of said handle, means engaging said clip when the door is moved to closed position to release said clip from the rod and permit the rod to drop to locked position by gravity when so released, key controlled means for locking said handle in lowered position and preventing operation of said handle and consequently preventing movement of the rod when in lowered position, detent means rigid with said rod, and means pivoted to said plate for engaging said detent means to prevent upward vertical movement of said rod independently of the handle.

10. A locking member adapted to be slidably mounted on the inner face of a swingingly mounted door at the free edge thereof, a handle slidably mounted on the outside of the door and having slidable movement independent of the locking member, means operably associated with the handle and locking member to move the locking member to unlocked position upon movement of the handle in a predetermined direction, means for holding the locking member in unlocked position when the door is moved from the locking jamb, means for locking the handle to prevent movement thereof, and means for releasing the locking member when the door is moved to closed position to permit the locking member to return to locked position even though the handle is maintained in locked immovable position.

11. A locking member adapted to be slidably mounted on the inner face of a swingingly mounted door at the free edge thereof, said member having struck-out lugs, a handle slidably mounted on the outside of the door and having slidable movement independent of the locking member, means operably associated with the handle and locking member to move the locking member to unlocked position upon movement of the handle in a predetermined direction, means for holding the locking member in unlocked position when the door is moved from the locking jamb, means for locking the handle to prevent movement thereof, means for releasing the locking member when the door is moved to closed position to permit the locking member to return to locked position even though the handle is maintained in locked immovable position, and keepers on the locking jamb and receiving the lugs on the locking member when the door is in closed position.

12. A locking member slidably mounted on the inner face of a hingedly fastened door at the free edge thereof, said member having struck-out lugs, a handle slidably mounted on the outside of the door and having slidable movement independent of the locking member, means operably associated with the handle and locking member to move the locking member to unlocked position upon movement of the handle in a predetermined direction, means for holding the locking member in unlocked position when the door is moved from the locking jamb, means for locking the handle to prevent movement thereof, means for releasing the locking member when the door is moved to closed position to permit the locking member to return to locked position even though the handle is maintained in locked immovable position, keepers on the locking jamb and receiving the lugs on the locking member when the door is in closed position, and means preventing independent movement of the locking member when the door is in closed position and the handle is in locked position.

13. In combination, a member for locking a door in closed position in its frame, actuating means for moving the locking member to unlocked position, means for holding the locking member in unlocked position, locking means operated exteriorly of the door and adapted to be locked when the locking member is held in unlocked position, means engageable with a part of the door frame when the door is moved to closed position to release the locking member for return to locked position, and means operable when the door is closed for preventing independent movement of the locking member relative to the actuating means.

14. In combination, a member for locking a door in closed position in its frame, actuating means manually operable to move the locking member to unlocked position, locking means operable exteriorly of the door to lock the actuating means when said locking member is in unlocked position, means operable to release the locking member for return to locked position when the door is moved to closed position in its frame, and latch means operable when the locking member reaches locked position to prevent independent movement of the locking member with respect to the actuating means.

15. In combination, a member for locking a door in closed position in its frame, actuating means manually operable to move the locking member to unlocked position, locking means operable exteriorly of the door to lock the actuating means when said locking member is in unlocked position, means operable to release the locking member for return to locked position when the door is moved to closed position in its frame, and latch means shiftable into position preventing independent movement of the locking member with

respect to the actuating means, when the locking member reaches locked position.

16. In combination, a member for locking a door in closed position in its frame, actuating means manually operable to move the locking member to unlocked position, locking means operable exteriorly of the door to lock the actuating means when said locking member is in unlocked position, means operable to release the locking member for return to locked position when the door is moved to closed position in its frame, latch means operable when the locking member reaches locked position to prevent independent movement of the locking member with respect to the actuating means, and means operable to retract said latch means from latching position when the actuating means is moved in raising the locking member to unlocked position.

17. In combination, a member for locking a door in closed position in its frame, actuating means manually operable to move the locking member to unlocked position, locking means operable exteriorly of the door to lock the actuating means when said locking member is in unlocked position, means operable to release the locking member for return to locked position when the door is moved to closed position in its frame, latch means operable when the locking member reaches locked position to prevent independent movement of the locking member with respect to the actuating means, and yielding means operatively associated with said latch means to normally retain the same in latching position, said yielding means being operable when said actuating means is shifted to move the locking member to unlocked position to retract the latch means from latching position in order to permit the actuating means to return to normal lockable position while the locking member remains in unlocked position.

18. A locking member adapted to be movably mounted on a door, a manually actuatable member mounted on the outside of the door for movement independent of the operation of the locking member, means operably associated with the manually actuatable means and the locking member to move the locking member to unlocking position upon movement of the manually actuated means in a predetermined direction, mechanism for holding the locking means in unlocked position when the door is moved from the locking jamb, means for locking the manually actuatable means to prevent movement thereof, and means for releasing the locking member when the door is moved to closed position to permit the same to return to locked position even though the manually actuatable means is held in locked position.

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