

July 31, 1934.

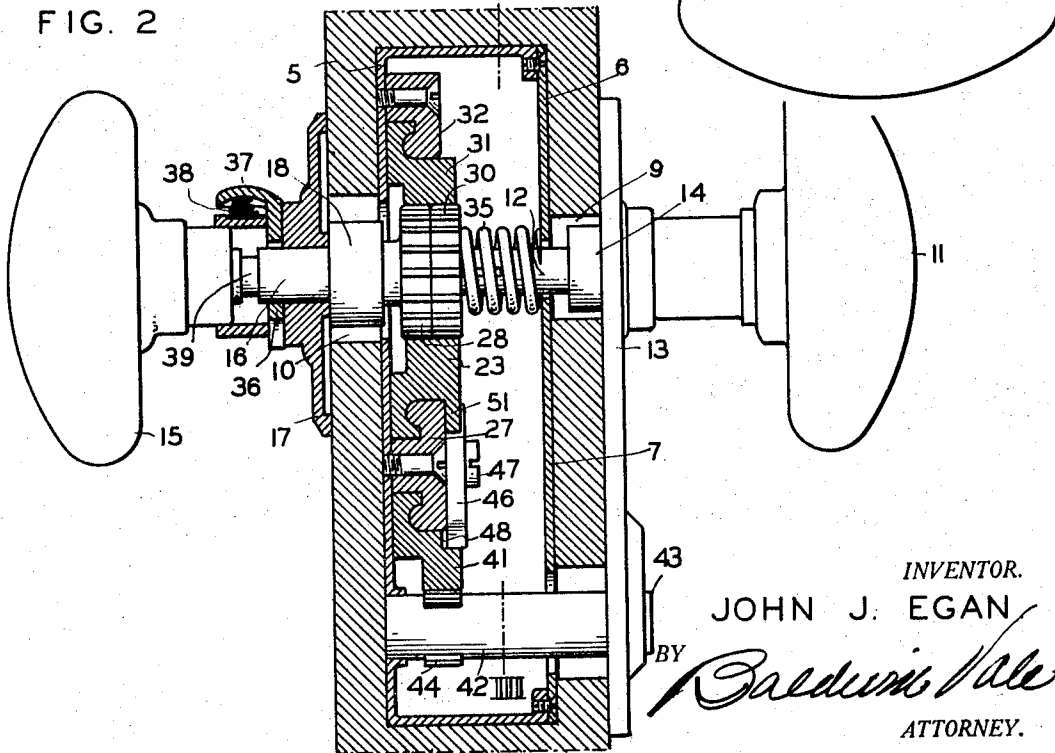
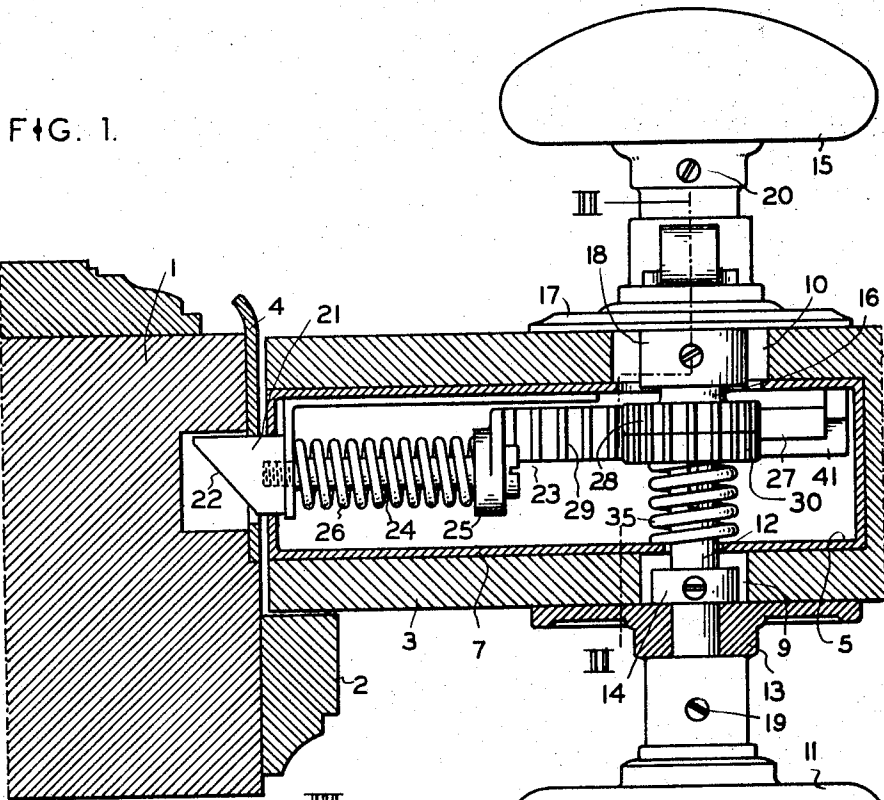
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1,968,285

DOORLATCH

Filed Aug. 20, 1932

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 3.

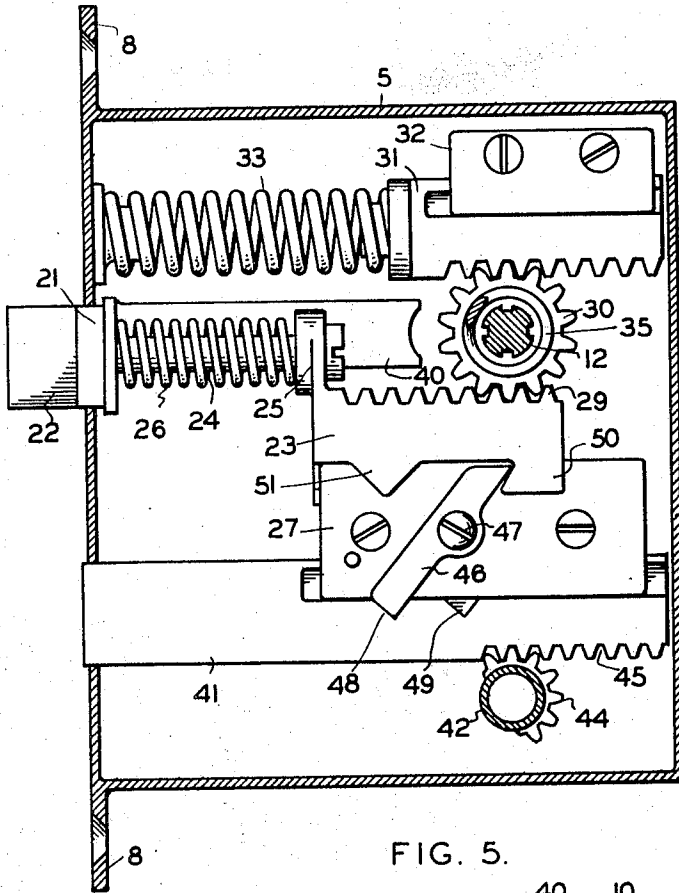


FIG. 5.

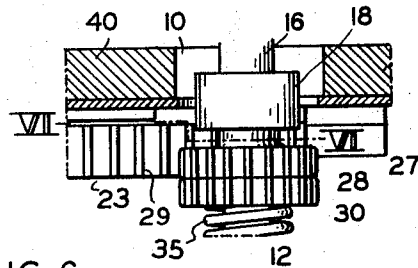


FIG. 4.

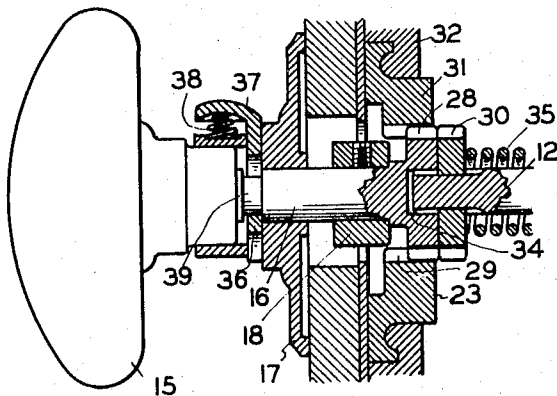
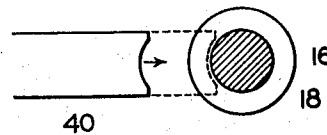


FIG. 6.



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# UNITED STATES PATENT OFFICE

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## DOORLATCH

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7 Claims. (Cl. 292—172)

This invention relates to improvements in door latches and more particularly to combined door latches and locks having operating handles on both sides of the door.

5 The principal object of the invention is to incorporate within the latch means by which the door may be locked from one side thereof by disengaging the operating handle on the opposite side.

10 Another object is to prevent reengagement of the disengaged handle except by operation of the proper control.

Another object is to allow free rotation of the disengaged handle without effecting the latch.

15 Another object is to arrange the latch unit so as to permit the complete removal of the disengaged handle and escutcheon plate without leaving a sufficient opening to permit the entry of the necessary tools to force the latch.

20 Another object is to prevent the opening or closing of the door from either side when the outer handle is disengaged.

Another object is to safeguard against persons being "locked out" except by the intentional locking of the door bolt by the proper key.

25 Another object is to lock the door bolt against operation when the latch is engaged.

A further object is to provide a latch of strong and durable construction.

30 Other objects and advantages appear as the description progresses.

In this specification and the accompanying drawings, the invention is disclosed in its preferred form. It is, however, to be understood that it is not limited to this form because it may be embodied in other forms without departing from the spirit of the invention as defined in the claims following the description.

In the accompanying two sheets of drawings:  
40 Fig. 1 is a horizontal section taken at the level of the operating handles of a latch constructed in accordance with this invention.

Fig. 2 is a transverse vertical section of the same taken along the line II—II in Fig. 1.

45 Fig. 3 is a longitudinal vertical section of the same taken along the line III—III in Fig. 2.

Fig. 4 is a fragmentary detail in vertical section of a portion of Fig. 2 showing the outer handle disengaged.

50 Fig. 5 is a fragmentary plan view from above of the same.

55 Fig. 6 is a vertical section taken along the line VI—VI showing the means by which opening or closing of the door is prevented when the outer handle is disengaged.

In detail, the construction illustrated in the drawings, referring more particularly to Figs. 1, 2 and 3, comprises the conventional door jamb 1, having the vertical stop 2 attached thereto against which the stile 3 abuts to bring the door 60 latch into alignment with the strike plate 4 which is gained into the jamb 1.

The latch provided by the present invention is contained within the casing 5, the open front of which is closed by the cover plate 6 screwed 65 thereto. The door stile 3 has the horizontal recess 7 mortised therein at the desired height for the latch to receive the casing 5, which is fixed within the stile in the usual manner by 70 screws passing through the side lugs 8.

The construction of the door with its framing and the cooperation of the latch and strike plate is conventional and may be varied to meet architectural conditions.

The registering holes 9 and 10 are bored 75 through the sides of the stile and intersect the central recess 7. The conveniently shaped outer handle 11 has its neck fixed upon the spindle 12 which is mounted in the ornamental escutcheon plate 13 and extends through the hole 9 into the casing 5. The boss 14 abuts the escutcheon 80 plate 13 to retain the spindle 12 in fixed longitudinal position.

The inner handle 15 is fixed on the spindle 16 which extends through the hole 10 into the casing 85 5. The spindle 16 is slidably mounted in the escutcheon 17 and is provided with the boss 18 arranged to abut the escutcheon to limit the outward movement of the handle and spindle. For 90 finer adjustment, the handles 11 and 15 can be threaded on the spindles 12 and 16 and retained in adjusted position by setscrews such as 19 and 20 in accordance with conventional practice.

The latch 21 protrudes from the front of the casing 5 and has the inclined face 22 which has 95 the cam action against the end of the strike plate 4 when the door is closed. The latch is loosely connected to the latch bar 23 by the stem 24 threaded in the head of the latch and freely 100 engaging through the lug 25 offset from the end of the latch bar. The spring 26 encircles the stem 24 and expands between the latch head and the lug 25, thus permitting resilient retraction of the latch when the door is closed. The latch bar 23 105 is slidably mounted within the casing 5 by the guide 27 engaging over a longitudinal groove in the latch bar and screwed to the side of the casing.

The small pinion 28 is fixed on the end of the spindle 16 and is operatively enmeshed in the 110

rack teeth 29 provided in the latch bar 23. The pinion 30 is of similar size and pitch and is splined on the end of the opposite spindle 12 and is also enmeshed with the rack teeth 29 alongside the pinion 28.

These pinions are both retained against vertical movement away from the teeth 29 by the rack 31 engaging the top of the pinions. The guide 32 slidably mounts the rack 31 against the side of the casing by engaging over a longitudinal groove in the side of the casing. The heavy tension spring 33 expands between the end of the rack and the casing and urges the rack toward the rear of the casing. This pressure is transmitted through the pinions 28, 30 and resiliently advances the latch bar to project the latch 21 to its fullest extent.

The handle 15 may be manually pushed inward to thrust the pinion 28 against the slidably mounted pinion 30 to move it laterally out of engagement with the racks 29 and 31. The pinion 28 has the axial hole 34 provided therein to receive the end of the spindle 12 when the pinion is thrust laterally as shown in Fig. 4. The spring 35 encircles the spindle 12 and expands between the casing cover 6 and the side of the pinion 30 to normally urge the pinion into operative engagement with the racks 29, 31.

The detent 36, slidably mounted within the escutcheon 17, has a central opening there-through to pass the spindle 16 and is operated by the external integral button 37. The pyramid spring 38 expanding underneath the button 37 urges the detent upward against the spindle 16. The spindle has a groove machined therein at 39 arranged to be engaged by the resiliently mounted detent when the handle 15 is pushed inward to retain the handle in adjusted position.

The stop 40 is fixed to the head of the latch 21 and is offset therefrom and is arranged to enter the space between the pinion 28 and the boss 18 when the latch is retracted in opening and closing the door. When the handle 15 is pushed inward as shown in Figs. 4 and 5, the stop 40 abuts against the boss 18 to prevent the retraction of the latch for a purpose to be later disclosed.

The above described construction is sufficient to serve as a complete latch unit for interior doors such as those of bedrooms, bathrooms, and the like. For entrance doors, however, additional key-operated means are required so that the door may be locked from either side. A suitable locking means for this purpose is shown in detail in Figs. 2 and 3.

The bolt 41, engageable with a recess in the strike plate 4, is slidably mounted within the casing 5 by the guide 27 which has a flange engaging over a longitudinal groove in the bolt. The cylinder 42 has the conventional locking means therein, which may be operated by inserting the requisite key at 43 on the outside of the door. The toothed segment 44 is mounted on the cylinder 42 and is enmeshed with the rack teeth 45 provided on the underside of the bolt 41 to operate the bolt when the cylinder is rotated by the proper key.

The detent pawl 46 is pivoted on the guide 27 at 47 and is engageable with either of the slots 48 or 49 in the bolt 41 depending upon whether the bolt is retracted or advanced. The latch bar has the trips 50 and 51 depending therefrom and adapted to cooperate with the upper end of the pawl 46. When the latch bar 23 is advanced as shown in Fig. 3, the trip 50 engages the pawl 46 to direct it into one of the slots 48—49, thus rep-

dering forced operation of the bolt virtually impossible. Retraction of the latch bar engages the trip 51 against the pawl, displacing it from the slots 48, 49 and permitting the operation of the bolt by the key.

The invention operates substantially as follows: The latch may be retracted by manually operating either of the handles 11 or 15 to rotate the pinion 28 or 30. This moves the latch bar 23 toward the rear of the casing, thus pulling the stem 24 inward to retract the latch 21 from engagement with the strike plate. When the latch is thus retracted the door can be swung open in the usual manner.

The rotation of the pinions 28, 30 also moves the upper rack 31 forward, against the tension of the spring 33. The release of the operating handles 11, 15 permits the expansion on the compressed spring 33 to force the rack 31 rearward and rotate the pinions 28, 30. This advances the latch bar 23 and restores the latch 21 to its initial position.

When the door is closed, the inclined face 22 of the latch is brought into contact with the curved end of the strike plate 4. As the closing of the door progresses, the latch rides up onto the strike plate depressing itself into the casing 5 without operating the latch bar 23. Upon the completion of the door closing, the expansion of the compressed spring 26 snaps the latch into the hole provided therefor in the strike plate.

To lock the door from the inside, the inner handle 15 is manually pushed inward to thrust the pinion 28 against the slidably mounted pinion 30 to move it laterally out of engagement with the racks 29, 31 against the tension of the spring 35. With the pinion 30 thus disengaged, the outer handle is rendered completely inoperative with respect to the latch 21 and can be freely rotated without affecting the latch bar. When the outer handle 11 is disengaged as described, the escutcheon plate 13 and the spindle 12 can be removed, without uncovering the casing 5 sufficiently to admit the necessary tools to force open the latch.

The inner handle 15 is retained in its adjusted position by the resiliently mounted detent locking into the slot 39 in the spindle 16. This rigidly fixes the pinion 28 in the lateral position shown in Figs. 4 and 5, thus insuring pinion 30 remaining out of engagement with the latch bar 23.

The thrusting of the handle 15 inward also brings the boss 18 into longitudinal alignment with the end of the stop 40 which is attached to the latch 21. When the boss is in this position, it blocks any rearward movement of the latch 21, thus effectively preventing retraction of the latch 21 and the opening and closing of the door. This is a desirable safety feature to insure against persons becoming "locked out" after setting the inner handle to disengage the outer handle 11. The stop 40 also provides additional security against the latch being forced open by intruders.

The inner handle 15 is restored to its initial position by manually depressing the button 37 to disengage the detent 36 from the slot 39 in the spindle 16. The pinion 30 is urged back into engagement with the racks 29, 31 by the expansion of the spring 35, thus restoring the spindle 16 and the handle 15 to the position shown in Fig. 2. The outer handle 11 may then be operated to draw the latch as above described.

The door may also be locked from the outside by inserting the proper key into the lock at 43. The handle 11 is then manually rotated to retract

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the latch bar 23, causing the trip 51 to displace the pawl 46 from the slot 48. The key at 43 is then operated to rotate the cylinder 42 and the segment 40 to advance the bolt 41 into engagement with the registering opening provided therefor in the strike plate 4. The handle 11 is subsequently released, permitting the spring 33 to advance the latch bar 23 to its former position. The trip 50 then impinges on the pawl 46 to move it into engagement with the slot 49. This provides a strong, effective means for locking the bolt against tampering therewith.

The installation of the present unit in the door stile will be obvious upon examination of the drawings. The mechanism, without the handles 11, 15 and their respective spindles and operating pinions are previously assembled in the casing 5 and the whole is fixed in the horizontal recess 7 in the usual manner. The spindle of the handle 11 is subsequently inserted through the hole 9 and fixed in place therein by screwing the escutcheon plate to the exterior of the door stile. The pinions 28, 30 are inserted through the larger hole 10 and the handle 15 and its spindle are mounted in place in the escutcheon 17, thus completing the installation of the assembly.

Having thus described this invention what I claim and desire to secure by Letters Patent is:

1. A door latch comprising a latch bar, a latch member resiliently connected to said latch bar, a pair of slidably mounted drive members engaging said latch bar, operating handles adapted to actuate each of said drive members, means for moving said drive members laterally to disengage one of the drive members from said latch bar, a detent for retaining said drive member disengaged from said latch bar, and resilient means urging said disengageable drive member into engagement with said latch bar.

2. A door latch comprising a casing, a latch bar slidably mounted in said casing and having rack teeth thereon, a latch member resiliently connected to said latch bar, a pair of slidably mounted pinions enmeshed with said rack, operating handles in operative engagement with said pinions, means for moving one of said pinions laterally out of mesh with said rack by advancing the opposite pinion thereagainst, a detent for retaining the opposite pinion in advanced position, and resilient means urging the disengageable pinion into mesh with said rack.

3. A door latch comprising a latch bar, a re-

siliently retractable latch member connected to said latch bar, a pair of drive members engaging said latch bar, operating handles adapted to actuate each of said drive members, means for moving one of said drive members laterally out of engagement with said latch bar, and a stop fixed to said latch member and extending into juxtaposition with said drive members and adapted to prevent retraction of the latch member when one of said drive members is disengaged.

4. A door latch comprising a casing; a latch bar slidably mounted in said casing and having rack teeth thereon; a latch member resiliently connected to said latch bar; a pair of operating handles having spindles mounted on the door and extending into said casing; one of said handles with its spindle being slidably mounted with respect to said door; pinions mounted on said spindles and enmeshed with said rack; means for disengaging the pinion mounted on the opposite spindle from said rack by thrusting inward said slidably mounted handle; a detent for retaining said handle in adjusted position; and resilient means for urging the disengageable pinion into mesh with said rack.

5. A latch comprising a latch bar, a pair of drive members engaging said latch bar, operating handles in operative engagement with each of said drive members, and means for moving both of said drive members laterally to disengage one of said members from said latch bar.

6. A latch comprising a casing; a latch bar having rack teeth therein; a pair of pinions engaging said rack teeth; operating handles adapted to actuate said pinions; and means for moving both of said pinions laterally to disengage one of said pinions from said rack.

7. A latch comprising a casing, a latch bar slidably mounted in said casing; a slidable spindle extending into said casing; an opposed fixed spindle extending into said casing; an operating handle on each of said spindles; a drive member fixed on said slidable spindle and operatively engaging said latch bar; a second drive member slidable on said fixed spindle and similarly operatively engaging said latch bar; and means for shifting said slidable spindle to move both of said drive members laterally to disengage said second member from said latch bar.

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