Feb. 3, 1953 W. E. WOLFE 2,627,433

DOOR LATCH

Filed July 14, 1949

FIG. 1

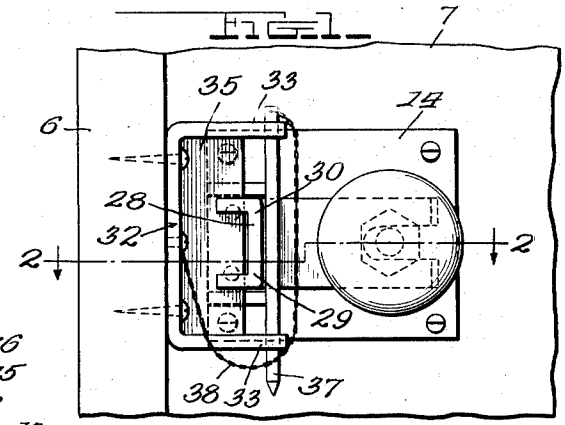
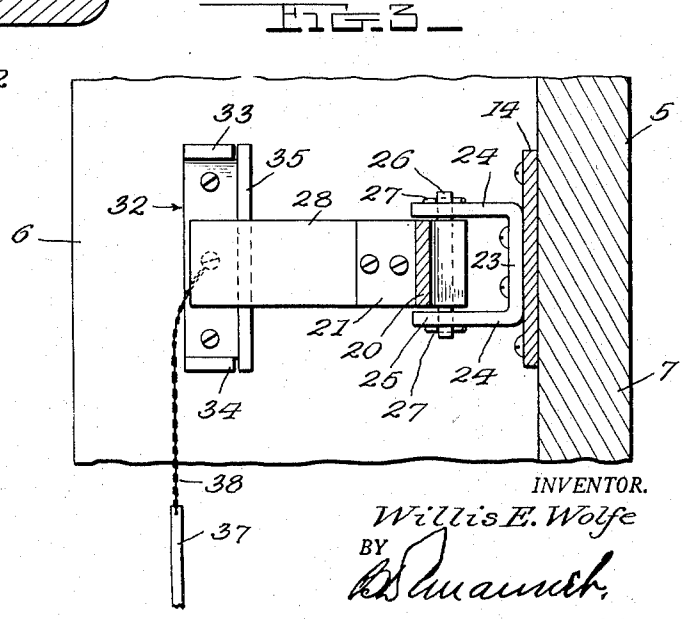


FIG. 2

FIG. 3



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DOOR LATCH

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1 Claim. (Cl. 292—127)

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This invention relates to door latches and particularly to door latches adapted for use on screen and storm doors and the like.

I have noticed that most conventional screen or storm door latches are unsatisfactory in their operation and this has largely been due to the fact that they are limited in size and weight by the thin wood construction desirable in doors of this type. The result is that knob or lever latches operated by a rotary action tend to jam. Further, the small size of the knob or latch lever in a door mechanism operated by rotary motion makes it difficult to apply the amount of twisting force necessary to overcome the large amount of friction of the cooperating parts.

One object of the present invention is to provide a latch that is operated by a push-pull action transmitted through the door knobs.

Another object of the invention is to provide a latch which has sufficient size and weight to give smooth working action of the various cooperating parts regardless of the door thickness.

A third object of the invention is to provide a latch operated by a push-pull action in which the operating force is applied in the same direction as the direction of swing of the door being opened.

Still another object of the invention is to provide a door latch which with minor adjustments is adaptable to any thickness of door.

Other and more specific objects will become apparent in the following detailed description of one form of device made in accordance with the present invention, having reference to the accompanying drawing, wherein:

Fig. 1 is an end elevational view of the door latch mechanism mounted on a screen or storm door that is fragmentarily illustrated.

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1 showing the tensioned knob-operated reciprocating shaft for actuating the door latch.

Fig. 3 is a section on the line 3—3 of Fig. 2.

In the invention herein disclosed, the reference character 6 designates the door stop of a standard door frame and the numeral 7 represents the vertical rail of a screen or storm door 5. Secured to the outer face of the rail 7 is an escutcheon plate 13 and secured to the inner face is a mounting plate 14 which in the form of the invention illustrated serves for the support of the latch mechanism.

Through the door rail 7 and plates 13 and 14 there is reciprocably mounted a shaft 8 having an outer threaded end portion 9 and an inner threaded end portion 10. Threadedly engaged

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with said end portions 9 and 10 are the knobs 11 and 12 respectively.

It will be noted that the threaded bore of each of the knobs 11 and 12 extends as deeply into the knob as possible. This gives considerable margin for longitudinal movement of the knobs relative to the shaft and permits adjustment of the door latch mechanism for varying thickness of door stock. When the knobs 11 and 12 are properly positioned and adjusted to the door thickness they are locked against rotation on the shaft 8 by the lock nuts 16 and 17.

On the outer end of the shaft 8, between the lock nut 16 and the escutcheon plate 13, if needed, is threaded an adapter bushing 15. This bushing need not be used when the latch mechanism is mounted on the thicker doors and is necessary only when the door stock is too thin to achieve proper adjustment by positioning of the knobs 11 and 12.

On the inner end of the shaft 8 between the mounting plate 14 and the lock nut 17 are threaded a spiral compression spring 19 and a pair of flat washers 18. Straddling the shaft 8 and positioned between the washers 18 are the bifurcated arms of a latch arm lever hereinafter to be described.

Adjacent the inner edge of the mounting plate 14 is attached a latch arm bracket 23 provided with inwardly extending legs 24 and 25 of equal length. Adjacent the ends of the legs 24 and 25 are drilled suitably aligned holes for receiving a pivot pin 26. The pivot pin may be held in position in any suitable manner such as by cotter pins 27.

Pivotally mounted within the legs 24 and 25 of the latch arm bracket 23 is a latch arm 28. This latch arm is preferably formed of channel-shaped stock having inwardly turned flanges 29 and 30. Near the outer end of the latch arm 28 are rectangular shaped notches 31 cut into the flanges 29 and 30, thereby forming at the outer end of each of said flanges latch noses 39 having the usual bevelled faces to ride over and be engaged with a keeper.

On the back face of the latch arm 28 and adjacent its inner end is mounted a forked lever 20. It will be noted that this lever has its inner end bent at an acute angle to form a flange 21 by means of which said lever is attached to the latch arm 28. The extended forked lever 20 thus intersects the axis of the shaft 8 at an angle slightly less than 90°. At the outer end of the lever arm 20 are bifurcated arms 22 straddling the shaft 8 and positioned as heretofore described.

The latch keeper 32 is attached by suitable

means to the door stop 6, said keeper being substantially U-shaped and having outwardly extending legs 33 and 34 and an inwardly turned keeper flange 35. The latch keeper 32 is so positioned on the door stop 6 that the keeper flange 35 is normally positioned in the notches 31 rearwardly of the latch noses 39.

Adjacent the outer ends of the arms 33 and 34 of the latch keeper 32 are provided holes 36 for receiving a lock pin 37. For suspending the pin 37 when it is not in operating position there is provided a chain 38, one end of which is attached to the keeper 32 and the other end to the upper portion of the pin 37.

The operation of the door latch mechanism is as follows. If the door 5 is approached from the outside the knob 11 is grasped with the fingers and a light pull exerted in the direction of opening of the door. The shaft 8 will thus be drawn outwardly, compressing the spring 19, and pressure will be exerted on the bifurcated arms of the forked lever 20. The latch arm 28 will then pivot about the pin 26 and the latch noses 39 will be disengaged from the latch keeper flange 35. When approached from the inside, pressure is exerted with the fingers on the knob 12 in the direction of opening of the door 5 and the latch is actuated as above described. When it is desired to lock the latch mechanism, the lock pin 37 is passed through the holes 36 of the latch keeper rearwardly of the latching end of the latch arm 28 to restrain movement of the latch relative to the keeper.

When the door 5 returns from the open to closed position, the bevelled portions of the latch noses 39 ride over the keeper flange 35, thus forcing out the latch arm 28 and compressing the spring 19. When the notches 31 are opposite the keeper flange 35 the latch arm will then snap into engaged position under the urging of the spring 19.

As evidenced by the drawing, the latching assembly and keeper are formed structurally from members of simple and standard shapes, these being readily fashioned; when assembled and positioned, the structure is of simple formation, sturdy in construction and simple in operation, the assembling and positioning activities being of simple nature. For instance, the actuator, formed of shaft or spindle 8 and the knobs 11 and 12 threaded thereto, permit application to doors differing in thickness, through the use of or mission of thimbles or bushings 15 without varying the latch assembly or keeper as to their positions, simply by adjusting the knobs on the shaft or spindle, the result being that the actuator will have the same range of movement in action, regardless of the thickness of the door, thus assuring that the assembly will operate in similar manner under all conditions, permitting the parts to be standardized structurally and assure sturdiness structurally and simplicity in operation.

The actuator is operable manually from either

side of the door for movement in one direction at will, such movement releasing the latch engagement and permitting the door to open, the latch and operator parts returning to their normal positions in the assembly through the action of spring 19 when the manual control of the operator is ended, leaving the door in open position. When the door is moved to closing position, the latch assembly repeats this cycle of rocking the latch element and compressing the spring, doing this automatically by the action of the angled free end of the latching element cooperating with wall 35 of the keeper until the nose has passed the wall, whereupon the spring rocks the latching element to place the nose in latching position, thus completing the renewed cycle.

This cyclar development is only affected when pin 37 is in its locking position behind the latching element. In this position the pin prevents rocking of the latch element and thus prevents any movement of the actuator from its normal position, so that the actuator cannot be moved while the pin is in such position, removal of the pin permitting the actuator to have its normal operating movement.

While there is herein shown the preferred form of my invention, many obvious modifications in the form and arrangement of parts may be made without departing from the spirit and scope of this invention, as defined in the appended claim.

What is claimed is:

In a door latch, a mounting plate adapted to be secured to the inner face of a door, a U-shaped latch arm bracket fixed on said mounting plate and having parallel side portions extending from the plate at right angles thereto, a pivot pin extending between and supported by said side portions, a latch arm having a pair of side flanges, said latch arm having one end extending between the side portions of the bracket and having its flanges engaged on said pivot pin, said latch arm having its free end bevelled and the flanges being notched adjacent the bevelled end adapted for engagement with a keeper, an operating arm projecting at an acute angle from said latch arm, spring means interposed between said mounting plate and operating arm and urging said latch arm into latching engagement with the keeper, and means to bias the operating arm against the action of said spring.

WILLIS E. WOLFE.

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