DOOR LATCH OPERATING MECHANISM
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4 Claims

ABSTRACT OF THE DISCLOSURE
An elongated pull type latch handle having a latch releas- ing reciprocating spindle projecting therefrom, a lever operatively connected to the spindle, and a trigger member operatively connected to the lever and extending generally parallel to the handle. The lever is movable toward the handle to impart latch-releasing movement to the spindle.

BACKGROUND OF THE INVENTION
Pull-type door handles in present use are, in many instances, pivotally mounted on doors and, as such, must be of relatively heavy construction to be durable in use. Other pull-type handles rigidly mounted on doors, utilize push buttons to unlatch the doors, these being somewhat inconvenient to use, inasmuch as the buttons must be pushed in a door closing direction while simultaneous pulling pressure is applied to the handle in a door opening direction.

SUMMARY OF THE INVENTION
An important object of this invention is the provision of a door handle having latch release mechanism including an actuating trigger member which is grasped with the pulling handle and moved toward the handle in a door opening direction, whereby to unlatch and open the door by simultaneously pulling on the trigger member and handle.

Another object of this invention is the provision of a door handle having a latch release mechanism which, except for the trigger member, is tamper proof when mounted on a door.

To these ends, I provide a handle having one end portion defining a cavity, a latch releasing spindle projecting longitudinally from the cavity and in a direction to extend transversely through a door when the handle is mounted thereon, lever means in the cavity operatively engaging the latch releasing spindle, and an elongated trigger member extending generally parallel to the handle and having an end portion projecting into the cavity and connected to the lever means. The trigger member is disposed between the handle and the door when the handle is mounted thereon and, when moved toward the handle in the direction of door pulling movement of the handle, operates the lever means to impart latch releasing movement to the spindle.

DESCRIPTION OF THE DRAWINGS
FIG. 1 is a fragmentary view in section of a door and door frame, the latch operating mechanism of this invention being mounted on the door;
FIG. 2 is an enlarged fragmentary section taken substantially on the line 2—2 of FIG. 1;
FIG. 3 is a still further enlarged fragmentary section taken on the line 3—3 of FIG. 2;
FIG. 4 is a fragmentary section taken on the line 4—4 of FIG. 2; and
FIG. 5 is an exploded perspective of the latch operating mechanism of this invention.

DETAILED DESCRIPTION
The present latch operating mechanism is intended for use primarily with storm or screen doors, but can be applied to various other hinged closure members. A door of the storm or screen, or combination storm and screen variety is indicated at 1, the door being assumed to be hingedly mounted in the door frame, a portion which is shown and indicated at 2. Door latch mechanism indicated in its entirety by the reference numeral 3, is rigidly mounted as, by screws or the like 4, to the inner surface 5 of the door 1, as will hereinafter be more fully described, the screws 4 extending through flanges 6 of a latch housing 7. The latch 3 includes a latch bolt 8 pivotally mounted in the housing 7 by means of a pin or the like 9, a latch release handle 10 also pivotally mounted on the pin 9, a latch release detent 11 pivotally mounted in the housing 7 by means of a pin or the like 12, a latch operating slide 13 engageable with one side of a rigid strike 14 mounted on the door frame 2, and a coil compression spring 15 yieldingly urging the slide 13 toward the strike 14. As shown in FIG. 4, the latch bolt 8 engages the opposite side of the strike 14 to hold the door 1 in a closed position, the latch bolt 8 being normally held in its latching position by engagement of the detent 11 with a shoulder portion 16 on the latch bolt 8. The latch bolt 8 is formed to provide a tongue 17 disposed within a cooperating notch in the slide 13, so that sliding movements of the slide 13 in a direction transversely of the door 1 imparts latching and unlatching movements to the latch bolt 8. The release handle 10 is formed to provide an edge portion 18 that engages an adjacent portion of the detent 11 to rotate the same away from the latch bolt shoulder 16, whereby the spring 15 yieldingly urges the slide 13 in a direction to impart opening movements to the door 1 and swinging movements to the latch bolt 8 in a strike releasing direction about the axis of the pin 9, and in a clockwise direction with respect to FIG. 4. Upon closing movements of the door, the slide 13 engages the strike 14 to compress the spring 15, and move the latch bolt 8 into engagement with the strike 14 to hold the door closed. The detent 11 is yieldingly urged in a direction of its pivotal movement on the axis of the pin 12 to engage the shoulder 16 by suitable spring means, not shown. A coil compression spring 19 is interposed between a pair of lugs 20 and 21 on the latch housing 7 and release handle 10 respectively to yieldingly urge the handle 10 in a direction of pivotal movement away from the door 1.

The above described latch mechanism 3 is fully disclosed in my copending U. S. patent application filed Aug. 16, 1967, Ser. No. 660,987, and, in and of itself, does not comprise the instant invention. Hence, in the interest of brevity, further detailed showing and description thereof is omitted. However, it will be appreciated that, while the door latch operating means described is eminently suitable for use with the above described latch mechanism, it can be used with various spindle operated latch mechanisms presently in use.

In the embodiment of the invention illustrated, an elongated handle 22 is shown as being of cross-sectionally generally U-shape, having an enlarged end portion 23 in the nature of a housing defining a cavity 24. The opposite end of the handle 22 includes a transversely projecting end portion 25 having an opening 26 for reception of a screw or the like 27 by means of which the end portion 25 is secured to the door 1, as shown in FIG. 2. As shown, the end portions 23 and 25 project toward the outer surface 28 of the door 1 from the intermediate hand grip forming portion 29 of the handle 22. The upper end portion 23 of the handle 22 is formed to provide a pair of horizontally disposed vertically spaced mounting stems.
30 and 31 that are adapted to extend through openings 32 and 33 drilled through the door 1, the stems 30 and 31 being drilled and screw threaded to receive the mounting screws 4, as shown in FIG. 2.

A generally tubular body member 34 is received in the cavity 24, and defines an axial passage 35 disposed intermediate the mounting stems 30 and 31 and parallel there to, the body member having a generally vertically elongated mounting flange 36 at one end thereof, the flange 36 having spaced openings 37 and 38 for reception of the mounting stems 30 and 31 respectively. The opposite end of the body member 34 is adapted to be received in a recess portion 39 in the cavity 24, the flange 36 abutting a wall surface 40 of the end portion 23 and a shoulder portion 41 on the mounting stem 31, the shoulder portion 41 being shown in FIG. 5. The body member further includes a pair of laterally spaced parallel depending flanges 42 having aligned openings 43 therein, and defines a pair of diametrically opposed axially elongated slots 44 adjacent the flange 36, the slots 44 communicating with the axial passage 35. A conventional key operated cylinder lock 45 is mounted in the passage 35 at the end portion thereof opposite the flange 36, access being had to the cylinder lock through an opening 46 in the end portion 23.

A spindle carrying head 47 comprises a shank portion 48 and a pair of axially spaced generally cylindrical flanges 49, and is axially slidably received in the passage 35, the shank portion 48 being operatively connected to the cylinder lock 45 in the usual manner for common rotation therewith and for limited axial sliding movement with respect thereto. The head 47 is further formed to provide an axially extending cross sectionally generally rectangular recess 50 for reception of an elongated latch releasing spindle 51 that extends axially of the head 47 and passage 35. The spindle 51 is adapted to extend longitudinally through a transverse opening 52 through the door, the outer end of the spindle 51 engaging an arm portion 53 of the latch release detent 11, whereby, when axial movement is imparted to the spindle 51 inwards through the door 1, the spindle pivotsly moves the latch detent 11 in a latch bolt releasing direction. The spindle 51 further extends through a central cross sectionally rectangular opening 54 in a rotating locking member 55 mounted in the latch housing 7, rotation of the spindle 51 imparting like rotary movement to the locking member 55 to releasably lock the detent 11 against rotation. Rotation is imparted to the spindle 51 on its longitudinal axis by the usual key, not shown, applied to the cylinder lock 45.

A pair of substantially identical generally vertically disposed levers 56 are disposed at opposite sides of the body member 34 and are journaled intermediate their ends on a pin or the like 57 that extends through the aligned openings 43 in the flanges 42. At their upper ends, the levers 56 are formed to provide stub shaft portions 58 that project inwards through adjacent ones of the slots 44 and into diametrically opposite sides of an annular groove 59 defined by the flanges 49 on the head 47. At their lower ends, the levers 56 are further provided with laterally inwardly projecting stub shaft portions 60 disposed in axial alignment.

An elongated trigger element 61 is disposed adjacent the hand grip portion 29, and has its lower end formed to provide a fulcrum element 62 that engages the bottom of an upwardly opening nook or seat 63 at the lower end of the hand grip portion 29. The trigger 61 is disposed at least partially within the confines of the cross-sectionally U-shaped hand grip portion 29, and at its upper end is formed to provide a transversely extending plate-like portion 64 and a pair of laterally spaced parallel flanges 65 projecting upwardly from the plate-like portion 64. The trigger 61 is provided with aligned openings 66 each for reception of a different one of the stub shaft portions 60 of the levers 56. As shown particularly in FIGS. 2 and 3, the plate-like portion 64 of the trigger member 61 substantially closes the bottom of the cavity 24, so that when the handling mechanism contained therein is mounted on the door 1, access to the mechanism within the cavity 24 is extremely difficult, rendering the same substantially tamper-proof.

As above indicated, the handle 22 and mechanism carried thereby is intended for use on that side of a hinged door against which pulling effort is made to open the door, such as on the outside of an outwardly opening door. Thus, when it is desired to open the door 1 from the outside, the user merely grasps the hand grip portion 29 of the handle 22, the fingers of the user's hand automatically squeezing the trigger member 61 toward the hand grip portion 22, causing the trigger member 61 to swing on the fulcrum element 62, moving the levers 56 in a counterclockwise direction with respect to FIG. 2 and about the axis of the pin 57. This movement of the levers 56 imparts axial movement of the head 47 and spindle 51 toward the latch 3 to pivotally move the latch detent 11 out of engagement with the shoulder 16 of the latch bolt 8. When this occurs, as above described, the spring 15 will move the slide 13 in a direction to release the latch bolt 8 from the strike 14 and impart initial opening movement to the door 1.

If desired, spring means, not shown, may be utilized to move the trigger member 61 in a direction in opposition to retracting movement to the head 47 and spindle 51, when the trigger member 61 is released. However, this action is normally accomplished by the above-mentioned latch detent spring, not shown.

This invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the objectives set forth. By placing one's fingers in the opening defined by the outer surface 28 of the door and the trigger member 61, and exerting a gentle pulling force on the trigger member 61 in a door opening direction, the latch bolt is immediately released without the necessity for pushing on a latch release button or similar device.

What is claimed is:

1. Door latch operating means comprising:
   (a) an elongated handle having one end portion arranged to be mounted on one side of a hinged door so that the door is released responsive to pulling of the handle in a direction away from the door, said one end portion defining a cavity;
   (b) a latch releasing spindle projecting transversely from said one end portion of the handle in a direction to extend transversely through the door for operative engagement with latch mechanism on the door;
   (c) a head on said spindle defining a radially outwardly opening annular groove;
   (d) a body member mounted in said cavity and defining a passage coaxial with said spindle, said head being axially slidable in said passage, said body member further defining a transverse opening to said passage;
   (e) an elongated trigger member extending generally longitudinally of the handle and moveable toward and away from the handle adjacent said one end portion of the handle;
   (f) lever means operatively engaging said trigger and including a shaft portion extending through said transverse opening and into said annular groove;
   (g) and means mounting said lever means in said end portion on an axis extending in a direction transversely of said spindle, said lever means being responsive to movement of said trigger member toward said handle to impart movement to said lever means in a direction outwardly of said one end portion of the handle.

2. The door latch operating means defined in claim 1, in which said lever means comprises a pair of levers disposed at opposite sides with latch aligned openings 66 each for reception of a different one of the stub shaft portions 60 of the levers 56.
through said body and journaling said levers intermediate their ends, said body member having aligned openings through opposite sides thereof to said passage, said levers having aligned transverse shaft portions at one end each extending inwardly through an adjacent one of said transverse openings and operatively engaging said spindle carrying head.

3. The door latch operating means defined in claim 2, in which said trigger member includes an end portion disposed within the cavity and defining transverse opening means parallel to said mounting pin, said levers having opposed axially aligned transverse shaft portions at their ends opposite said first mentioned shaft portions and journalled in said opening means.

4. The door latch operating means defined in claim 1, characterized by a cylinder lock mounted in said body member and operatively connected to said spindle carrying head, said one end portion of the handle having an opening therefor through for reception of a portion of said lock.

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