Oct. 26, 1965 R. L. DAUENBAUGH ETAL 3,213,654

POP-OUT HANDLE AND LOCK ASSEMBLY

Filed Sept. 17, 1962 3 Sheets-Sheet 1

Fig. 1.

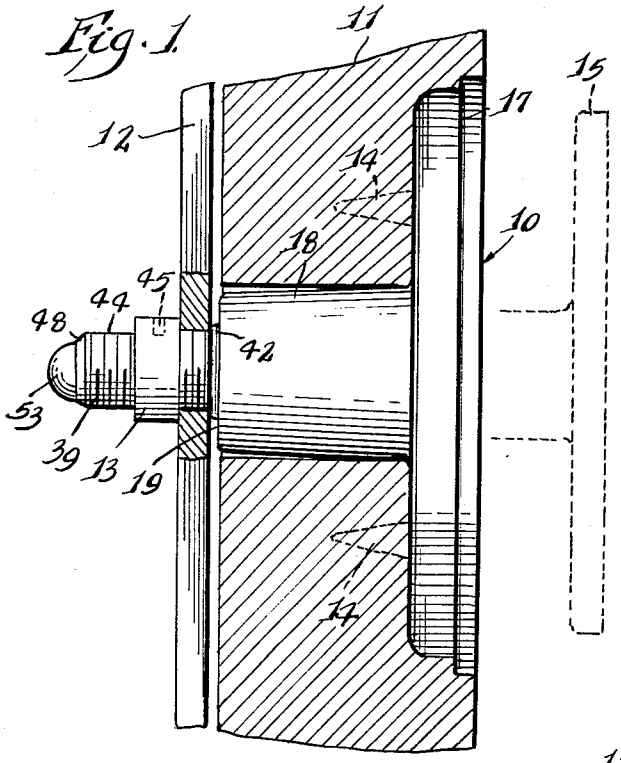


Fig. 2.

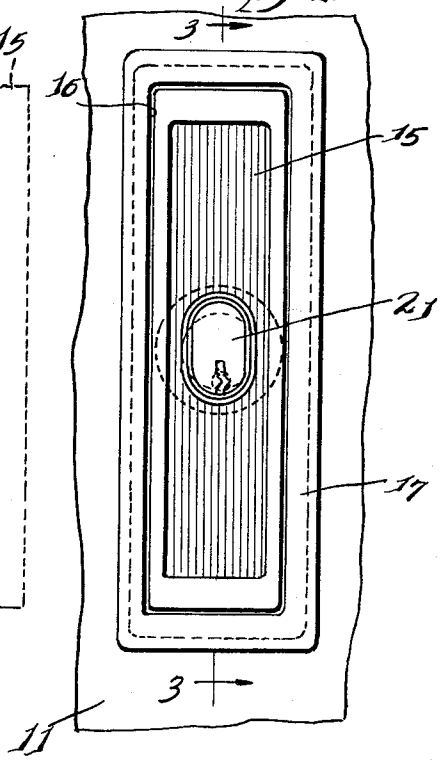


Fig. 5.

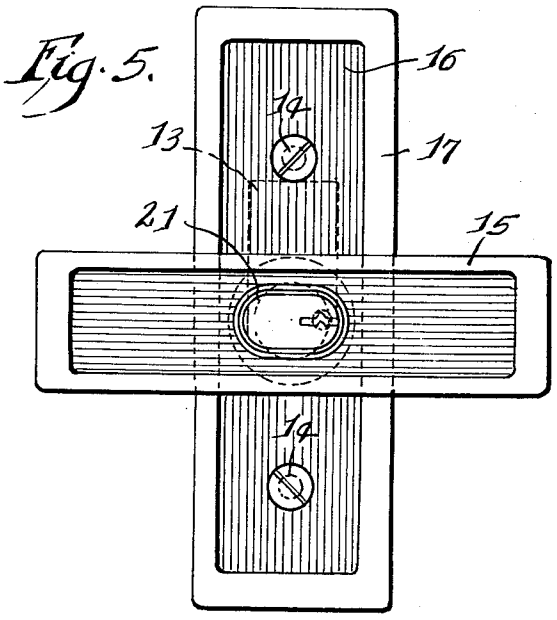
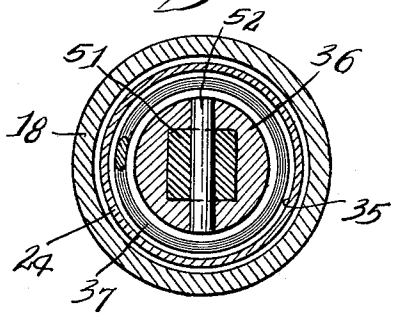


Fig. 6.



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POP-OUT HANDLE AND LOCK ASSEMBLY

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Fig. 7.

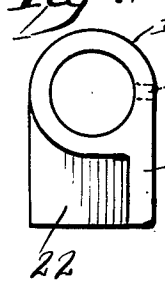
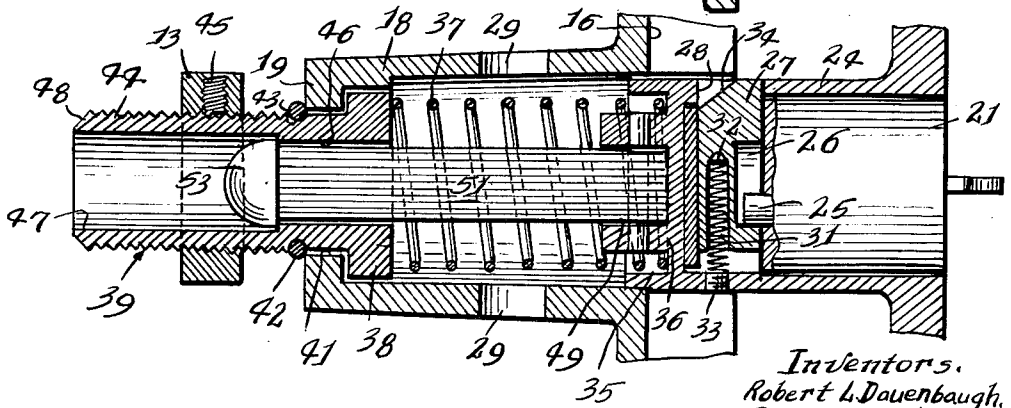


Fig. 3.

Fig. 4.



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POP-OUT HANDLE AND LOCK ASSEMBLY

Filed Sept. 17, 1962 3 Sheets-Sheet 3

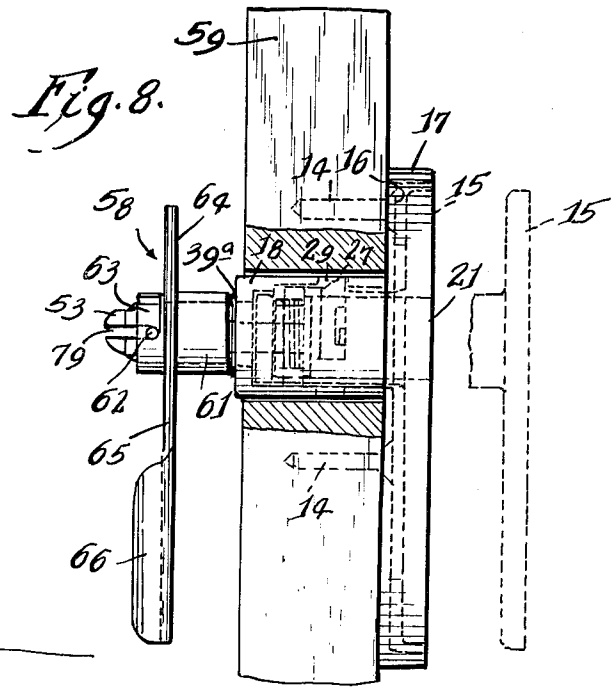
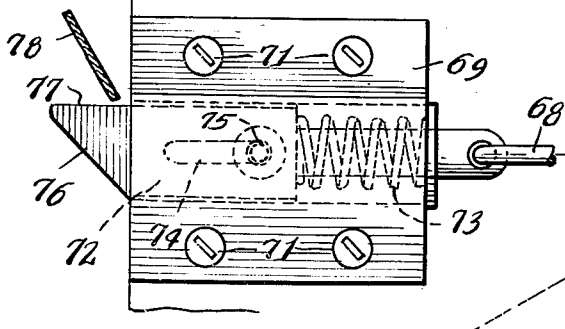


Fig. 8.



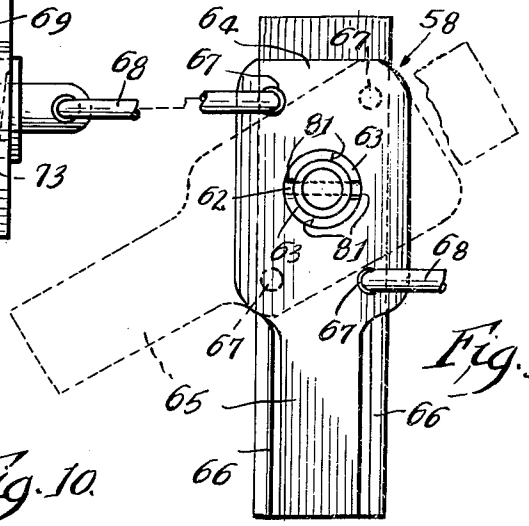


Fig. 9.

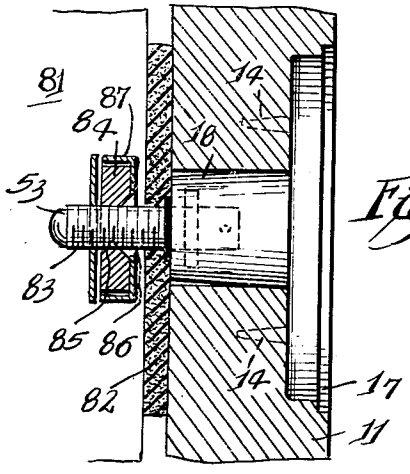


Fig. 10.

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United States Patent Office 3,213,654
Patented Oct. 26, 1965

3,213,654

POP-OUT HANDLE AND LOCK ASSEMBLY

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Filed Sept. 17, 1962, Ser. No. 224,044
13 Claims. (Cl. 70—208)

The present invention relates to a novel lock and handle for a door of an enclosure and more particularly to a novel pop-out handle having a lock integral with the pop-out handle and latching means actuated by rotation of the handle to unlock the door of a vending machine or enclosure such as a garage, walk-in cooler or other cabinet.

Of the commercially available vending machines, the majority do not have any handle which can be grasped by service personnel in opening the door or hinged front of the machine. Without such a handle, the door or front of the machine is liable to be opened by turning and pulling on the key used to unlock the machine with the result that the key breaks off or the lock is often damaged. Otherwise service personnel must grasp an undercut or protruding portion or edge of the machine for use as a handle.

With respect to enclosures such as garages, a protruding handle is normally provided to withdraw the latching bolts and a separate key lock must be operated with a key in conjunction with the handle to allow the handle to rotate. If the connection between the handle and lock is damaged or if either the handle or the key lock is inoperable, the unit cannot be operated.

An important object of the present invention is the provision of a novel pop-out handle and lock assembly where the handle is normally retracted to a position where it is unavailable for operation and cannot be grasped by an operator unless released by use of the proper key. Thus, there are no protruding parts capable of being twisted or damaged.

Another important object of the present invention is the provision of a novel handle where a key-operated tumbler lock is integral within the handle and upon actuation of a proper key in the lock the handle is released and automatically pops out to its advanced operative position to be grasped by the operator to release.

A further object of the present invention is the provision of a handle which when manually rotated will release the door latch so that the vending machine or other enclosure may be opened by the operator for any desired purpose.

The present invention also comprehends the provision of a novel motion transmitting connection which allows reciprocation of the handle between its advanced and retracted positions and rotation of the handle to actuate the latch means releasing the door of the enclosure.

For a garage door or walk-in cooler application the present invention further comprehends the provision of a handle on the interior of a door which is actuated by rotation of the pop-out handle, and a lost motion means to permit manual rotation of the interior handle independent of the pop-out handle to release the door latching means.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

In the drawings:

FIGURE 1 is a side elevational view of the novel handle and lock assembly as applied to a vending machine having a side locking lip or strike and shown with the handle retracted and with the handle in its popped out position shown in dotted lines.

FIG. 2 is a front elevational view of the assembly and showing a key-operated lock in the handle.

FIG. 3 is an enlarged vertical cross-sectional view taken on the line 3—3 of FIG. 2 viewed in the direction of the arrows with the handle shown in full lines in its retracted or inoperative position and shown extended or withdrawn in dotted lines, the bolt being adapted to engage and interlock with the side locking part or strike on the machine.

FIG. 4 is a fragmentary cross-sectional view similar to FIG. 3, but showing the assembly with the handle released and in its extended or popped out position.

FIG. 5 is a front elevational view of the assembly showing the handle in its extended or advanced position and rotated through an arc of 90° to move the locking bolt to its unlocked position.

FIG. 6 is a vertical cross-sectional view taken on the line 6—6 of FIG. 3 and viewed in the direction of the arrows.

FIG. 7 is a front elevational view of the locking bolt and showing the camming surface adapted to engage the locking part or strike.

FIG. 8 is a side elevational view of another embodiment of a novel handle and lock assembly having an interior handle and mechanism for actuating the latches of an overhead garage door.

FIG. 9 is a rear elevational view of FIG. 8 showing the interior door handle and one of the latch bolts for the garage door.

FIG. 10 is a side elevational view partially in vertical cross-section of a further embodiment of the present invention for a walk-in cooler or other cabinet having a sealed door and showing a latch means used to compress a sealing gasket with the handle capable of rotation through 360°.

Referring more particularly to the drawings wherein is shown illustrative embodiments of the present invention, FIGS. 1 to 7, inclusive, disclose a novel pop-out handle and lock assembly **10** secured within the hinged door or other closure **11** of a vending machine such as used for vending candy, cigarettes, etc., and in which locking is effected by engagement of a locking part or strike **12** on the frame or cabinet of the machine by means of the latch bolt **13**. The assembly is secured to the door **11** by suitable securing means such as screws **14** or the like.

The handle and lock assembly as shown in FIGS. 1, 2, 3 and 5 includes a spring-loaded handle **15** conformably received within a pocket or recess **16** in an escutcheon **17** shown as recessed or mortised within the door **11**, it being understood the handle **15**, when locked in pocket **16** by the spring lock bolt **27**, cannot be rotated to unlatch and open the door. A central cylindrical housing **18** for the lock mechanism extends rearwardly and is part of the escutcheon **17** and terminates at the rear wall **19**. A key-operated lock **21** of the tumbler variety is shown centrally positioned within the handle **15** and this handle and its lock assembly are slidably received within the housing **18**.

Now more particularly referring to FIGS. 3 and 4 where the details of the pop-out assembly and lock are shown, the bolt **13** is shown in its engaging or locking position with the side latching lip or strike member **12**. As seen in FIG. 7, a sloping camming surface **12** is formed on the extended latching end **23** of the bolt **13**. The handle **15** has a central cylindrical body **24** extending rearwardly into the cylindrical housing **18** and stopping short of the rear wall **19** of the latter. Mounted within the cylindrical body **24** is the key-operated lock **21** having an eccentric pin **25** extending from the

rear of the lock and received in an elongated recess **26** for actuating the lock bolt **27** upon turning of the key. In locking position, the lock bolt projects through an opening **28** in the body **24** and an aligned opening **29** in the housing **18** and is moved or biased to its locking position shown in FIG. 3 by an expansible spring **31** having one end received in a recess **32** in the bolt and the opposite end seated in the body **24** in an opening **33** closed by a threaded plug. The bolt has a camming surface **34** to engage the interior of the housing **18** and retract the bolt as the handle is moved from its advanced position to its retracted position, permitting the handle to be locked without using the key.

At the rear of the body **24** is an annular groove **35** defining a central positioning projection **36** for receiving one end of an expansion spring **37** in the annular groove **35** and the opposite end bearing against the flanged end **38** of the bolt bushing **39** which extends through an opening **41** in the rear wall **19** of the housing **18**. The spring **37** tends to drive the cylindrical body **24** of the handle **15** and force it outwardly to the advanced or pop-out position shown in FIG. 4. In this position the key has been turned to release position and the handle has popped out. However, upon release of the key, the lock bolt **27** is spring-biased or driven upwardly with its projected end and its camming surface **34** extending through and beyond the opening **28**. In this released position (dotted lines in FIG. 3), the eccentric pin **25** and key are spring-actuated and returned to the position shown. It is to be noted that the key is removable only in the locked position of FIG. 3.

The bolt bushing **39** is retained in position by a resilient O-ring **42** of natural or synthetic rubber received in an annular groove **43** adjacent the wall **19** of the housing, although a metal retaining ring could be used in place of the O-ring **42**. The bushing **39** is externally threaded at **44** for a substantial portion of its length to adjustably mount the interiorly threaded latch bolt **13**. A set screw **45** located in the side of the latch bolt positions and secures the bolt onto the bushing at the desired adjustment relative to a strike or other engaging surface on the member **12** which is a part of the fixed cabinet. The bushing has a central square opening **46** in the forward flanged end **38** opening into an enlarged circular opening **47** extending to and through the rear end **48** of the bushing.

The projection **36** on the body **24** which is a part of the handle **15**, contains a square blind opening **49** adapted to conformably receive one end of a square spindle **51** extending through the opening **46** of the bushing **39**. An anchoring pin **52** is inserted into aligned openings in the projection **36** and spindle **51** to secure the spindle to the cylindrical body **24** of the handle **15**. On the opposite end of the spindle **51** is an enlarged rounded head **53** which conformably slides within the cylindrical passage or opening **47** and limits longitudinal movement of the handle **15**, the body **24** and the spindle **51** due to engagement of the head **53** and its shoulder **54** with the junction of the square and cylindrical openings **46** and **47**, respectively.

In operation, with the handle **15** in its retracted locked position and the door or closure latched as shown in full lines in FIGS. 1, 2 and 3, a proper key **56** is inserted in the lock **21** and turned actuating the eccentric pin **25** to retract the bolt **27** against the action of the spring **31**. When the bolt **27** is withdrawn from the opening **29** in the housing **18**, the spring **37** actuates the handle **15** to its pop-out or advanced position shown in FIG. 4. The enlarged head **53** moves in the cylindrical passage **47** and the square spindle **51** moves in the passage **46** until the peripheral shoulder **54** on the round head **53** abuts the limiting shoulder **55** in the passage **47**. The handle **15** is then grasped by the operator and rotated counterclockwise for approximately 90°.

Turning the handle **15** also rotates the cylindrical body **24** of this handle and the square spindle **51** secured

thereto by the pin **52**. As the opening **46** in the flanged end **38** of the bushing **39** is square and complementary to the spindle, rotation of the spindle **51** rotates the bushing **39** and the latch bolt **13** (FIG. 5) to release the door **11** from engagement with the surrounding frame or cabinet **12** so that the released door may then be swung open. A stop **57** is contemplated in the housing **18** cooperating with the flanged end **38** of the bushing **39** to limit rotation of the handle and latch bolt through approximately 90° for this operation.

To close and latch the door **11**, the movements are reversed with the door being moved to a closed position and the handle **15** rotated clockwise through approximately 90° to rotate the bolt **13**. In this movement the camming surface **22** on the end **23** of the bolt engages the locking lip or strike member on the frame or cabinet **12** and the door and locking lip on the machine are urged together to a fully closed and latched position. Then the handle is pushed inward against the action of the spring **37** and the camming surface **34** on the lock bolt **27** engages the housing **18** to retract the bolt into the body **24**. The elongated slot **26** in the bolt **27** allows movement of the bolt relative to the pin **25** of the lock **21** during this closing movement. This permits the door to be locked without having to use a key. Inward movement of the handle continues until it is received in the recess **16** of the escutcheon **17** which then prevents handle rotation for unlatching the door, and the bolt **27** is driven or moved outwardly into the opening **29** in the housing **18** which retains the handle in a locked position as shown in FIG. 3.

FIGS. 8 and 9 disclose the utilization of the pop-out handle and lock assembly **10** for a garage door or similar member for an enclosure where the door is of the overhead variety travelling on laterally positioned tracks. The handle and lock mechanism shown in these figures is substantially the same as that disclosed in FIGS. 1 to 5 except the lock mechanism **21** is located off-center in the handle **15** and the latch bolt has been replaced by an interior handle **58**.

The escutcheon **17** housing the handle **15** is secured to the door **59** by suitable fastening means **14** and the cylindrical housing **18** extends through the door and contains an identical lock and pop-out assembly as previously described. The bushing **39a** has a smooth exterior surface and a sleeve **61** slips over the bushing and is actuated thereby. The handle **58** is integral with or affixed to the sleeve **61** and the sleeve is retained on the bushing by a locking pin **62** extending through and secured to the bushing **39a** with the ends of the pin extending beyond the bushing to prevent the sleeve **61** from being removed from the bushing. A pair of opposed slots **63** are cut into the outer edge of the sleeve to receive the pin **62** with the slots extending around the sleeve over an arc of approximately 60°. Slots **63** permit the inside handle **58** to be turned to open the door, even though the outside handle **15** is securely locked in the recess **16**.

The interior handle **58** is formed of a substantially rectangular member or body **64** having the sleeve **61** extending centrally therethrough and adjacent one end. A handle portion **65** having flanged rounded edges **66** depends from the member **64** to be grasped by the operator. The member **64** has a pair of openings **67** positioned at opposite corners of the member and each adapted to be connected to one end of an actuating chain, wire sash cord or other suitable connecting means **68** having its other end connected to a spring bolt **72** of the door latch means.

The door latch means includes a bracket **69** secured adjacent each edge of the door **59** by screws or other suitable means **71** (only one latch means being shown in FIG. 9 although two may be used). A spring bolt **72** driven outwardly to latching engagement by an expansion spring **73** is housed in the bracket **69** and has an elongated slot **74** therein cooperating with a rivet or pin **75**

mounted in the bracket to limit longitudinal movement of the bolt. A camming surface **76** is blanked on the end of the bolt **72** and angularly disposed to the latching surface **77** on the bolt cooperating with a strike **78** on the enclosure for the door for preventing raising of the door except when the latch bolt is retracted. The disclosed latch may be of conventional design.

To allow freedom of movement for the pop-out handle **15**, the enlarged rounded head **53** has a slot **79** cut therein to encompass the locking pin **62** when the handle is retracted and to allow movement of the head and its associated spindle **51** when the handle is popped out.

The latching mechanism for the overhead door **59** is capable of operation from either side of the door. From the outside, the key **56** is inserted in the lock **21** to withdraw the lock bolt **27** and allow the handle **15** to pop out. Turning the handle counterclockwise causes the pin **62** to bear against edges **81** of the opposed slots **63** and rotate the sleeve **61** which is part of the interior handle **58**. Rotation of the handle as shown in the dotted lines of FIG. 9 causes actuation of the chains or cords **68** to withdraw the spring bolts **72** to release position, wherein the latching surfaces **77** are withdrawn from engagement with the strikes **78** and the door may be raised.

When the door is lowered, the camming surfaces **76** engage the strikes **78** causing the spring bolts **72** to be cammed inwardly or retracted so the door can be closed and the spring bolts **72** urged to their normal latching position shown in FIG. 9 through the action of the expansion springs **73**. This returns the interior handle **58** and the outer handle **15** to normal vertical position and, if the user desires, the latter is retracted into the recess **16** in the escutcheon **17** and locked through the locking bolt **27**, or the outer handle **15** may be left in the extended position, free of recess **16** and then used only as a latching handle whereby the door may be opened without the need of using the key **56**. To lock, all that is required is to push the handle in as explained above.

To unlock the door from the interior, the handle portion **65** is grasped and rotated in a clockwise direction as seen in FIG. 9 to withdraw the spring bolts **72** and release the door from the strikes **78**. The slots **63** in the sleeve **61** having a length of an arc of approximately 60° allows the handle **58** to rotate independent of the bushing **39a** and locking pin **62** for interior actuation.

In both of the disclosed and above described embodiments of the present invention, the door or closure is adapted to be opened from the exterior by insertion of the proper key and turning of the key through an arc of approximately 45° to retract the spring lock bolt **27**, whereupon the operating handle **15** is released and springs or pops out of its escutcheon **17**. The handle is then free to turn and when turned unlatches the door from a strike or part on the encompassing frame to permit the door to be opened.

In FIG. 10 is disclosed another embodiment and application of the present invention to the door **11** of a cabinet **81** such as a walk-in cooler or the like having a sealing gasket **82** adapted to be compressed between the door and cabinet. In this embodiment, the structure of the pop-out handle assembly is identical to that shown in FIGS. 1 to 9, inclusive, except for the omission of the stop **57** in the housing **18** whereby to permit the handle to rotate through at least 360°, and the removal of the locking or latching bolt **13** shown in FIGS. 1, 3 and 4.

In this form of the invention the inner threaded portion of the bolt bushing **83** is screwed directly into an internally threaded strike or fixed nut **84** in a housing in the cabinet **81**. Thus latching is effected by the threaded bolt bushing **83** engaging the nut **84** and compressing the gasket **82**. This bolt bushing **83** is similar to the bolt bushing **39** except the flange **38** is devoid of any stop notch to permit rotation through at least 360°. The threaded opening **85** within the fixed nut **84** has a countersunk opening **86** to guide or direct the bushing **83** into the fixed nut and threadedly engage the latter shown within a housing or fixed part **87** of the cabinet.

This embodiment operates in a manner similar to the embodiment of FIGS. 1 to 7 except that when the handle **15** is popped out, it is grasped by the operator and rotated counterclockwise to retract and disengage the threaded bushing **83** from its nut or strike **84**. When closing and locking the door, the bushing **83** is moved to engage the strike **84** and the handle **15** rotated clockwise to draw the door and cabinet together and compress the gasket **82**, thus sealing the enclosure. Then the handle **15** may be retracted into the escutcheon **17** to lock the handle against rotation.

While the pop-out handle and lock assembly has been shown and described as being advantageously applicable to a vending machine, garage door, walk-in cooler or the like, it is not our desire or intent to unnecessarily limit the scope or utility of the features of the invention by virtue of these illustrative embodiments.

Having disclosed the invention, we claim:

1. A pop-out handle and lock assembly adapted for latching and unlatching a door or other closure, comprising a recessed escutcheon secured to said door and having a cylindrical housing extending through the door, a handle mounted for reciprocable movement between a locked and an unlocked position and for rotary movement relative to said escutcheon and conformably received within said recess in the retracted, locked position of the handle, a cylindrical member projecting from the rear of said handle and extending into said cylindrical housing, a key-operated lock assembly mounted in said handle and cylindrical member, a lock bolt in said cylindrical member and operatively connected to said lock assembly, spring-biasing means urging said lock bolt through said cylindrical member and into an opening in said housing to retain the handle in its retracted locked position, means urging said handle and cylindrical member to an extended position with the handle spaced from the escutcheon, a spindle secured to said cylindrical member and extending beyond said cylindrical housing, said spindle terminating in an enlarged head, a bushing rotatably mounted in said cylindrical housing and extending therebeyond having a central passage receiving said spindle and enlarged head, means operatively connecting said bushing and spindle for rotary movement but allowing relative reciprocation therebetween, and latch means actuated by said bushing to latch and unlatch the door.

2. A pop-out handle and lock assembly as set forth in claim **1**, in which said latch means comprises a latch bolt adjustably mounted on the inner end of said bushing.

3. A pop-out handle and lock assembly as set forth in claim **1**, including lost motion means between said lock bolt and lock assembly to allow inward movement of the lock bolt when the handle is moved toward its locked position into the recess in the escutcheon.

4. A pop-out handle and lock assembly as set forth in claim **1**, in which said latch means includes a latch bolt mounted for rotary movement and having a camming surface to engage a part of the enclosure for the door.

5. A pop-out handle and lock assembly as set forth in claim **1**, in which said latch means includes a sleeve mounted on said bushing, an interior handle secured to said sleeve, a spring-loaded bolt on at least one edge of the door cooperating with strike means on the enclosure for the door, means connecting the spring-loaded bolt and interior handle to withdraw the bolt upon rotation of the handle, means connecting said bushing and sleeve for rotation when the exterior handle is rotated, and lost motion means to allow the interior handle to have limited rotation independent of the bushing.

6. A pop-out handle and lock assembly comprising a recessed or flush mounted escutcheon adapted to be secured to a door and having a part projecting through the door, a handle mounted for rotation and limited reciprocation in said escutcheon said handle received within said

escutcheon when in retracted position and extending beyond the escutcheon when in projected position for retracting a bolt to unlock a door, a spring-biased lock bolt in said handle and normally extending into an opening in said escutcheon part to retain said handle in the escutcheon, a key-operated lock mounted within said handle and operatively connected to said lock bolt for actuation and retraction of the latter, means to bias and project the handle outwardly of said escutcheon, a bushing extending rearwardly from said escutcheon part and rotatably mounted therein, means operatively connecting said handle and said bushing for rotation including a spindle, an enlarged rounded head on the rear end of the spindle, said bushing having a bore to receive said spindle and an enlarged passageway to receive said enlarged head when the handle is unlocked and spring-biased to its extended position, and a latch bolt carried by said bushing and movable to latching and unlatching position by turning of the extended handle.

7. A pop-out handle and lock assembly adapted for latching or unlatching a door or other closure to an encompassing frame, comprising an escutcheon secured to the closure and having a pocket therein and a tubular part extending through the closure, a handle conformably received within the pocket in the escutcheon and movable between a locked position in the pocket and an extended unlocked position and rotatable in said extended position relative to the escutcheon to open the closure, a tubular body extending rearwardly of the handle into the tubular part of the escutcheon, a lock assembly mounted in said handle and tubular body, a lock bolt mounted in said body and operatively connected to said lock assembly, an expansion spring biasing the lock bolt through an opening in the body and extending into engagement with the tubular part, said tubular part having an opening to receive the end of the lock bolt and thereby retain the handle in its locked position, a latch bushing having a flanged end within the tubular part and the bushing extending through the rear open end of the tubular part, an expansion spring located between the flanged end of the bushing and the inner end of the tubular body urging the handle to its extended position, a square spindle secured to the inner end of the tubular body, the bushing having a square bore extending partially therethrough from the flanged end and joining an enlarged cylindrical opening extending longitudinally through the remainder of the bushing, said square bore adapted to conformably receive the square spindle, an enlarged rounded head on the end of said spindle and longitudinally movable in the cylindrical opening in the bushing, said head being of a greater diameter than the length of a side of the square opening so as to limit outward movement of the spindle and handle, and latch means actuated by said bushing.

8. A pop-out handle and lock assembly as set forth in claim 7, in which said latch means includes an elongated bolt secured adjacent one end to the latch bushing and a camming surface formed on the opposite end of the latch bolt adapted to contact and latch onto a part on the encompassing frame for the closure and progressively draw the latter into closed position.

9. A pop-out handle and lock assembly as set forth in claim 7, in which said latch means includes a sleeve mounted on said bushing, an interior handle secured to said sleeve, spring-loaded bolts on at least one edge of the door cooperating with strike means on the enclosure for the door, a connection between each spring-loaded bolt and the interior handle and adapted to withdraw the spring-loaded bolts upon rotation of said interior handle, means connecting said bushing and said sleeve for rotation when the exterior handle is rotated, and lost motion means to allow the interior handle to have limited rotation independent of the bushing.

10. A pop-out handle and lock assembly as set forth in claim 9, in which said lost motion means includes a pin secured to the bushing adjacent its rear end and extending therebeyond on the opposite sides of the bushing, and oppositely disposed elongated open slots in the edge of the encompassing sleeve receiving the extended ends of the pin, the rounded head on the square shank being slotted to encompass the pin and allow reciprocal movement of the head.

11. A pop-out handle and lock assembly comprising a recessed escutcheon having a housing extending through and secured to a door by means of mounting screws, a rotatable handle adapted to be retracted into and fit flush within the escutcheon preventing handle rotation and provided with a lock bolt engaging said escutcheon housing to prevent outward movement of the handle, means in said handle operatively connected to said lock bolt to withdraw the bolt from said housing and release said handle, means yieldably biasing said handle to an extended position outwardly of the escutcheon, a spindle secured to said handle and projecting beyond said housing, said spindle terminating in an enlarged head adapted to limit movement of said handle, a bushing rotatably mounted in and extending beyond said housing and having a central passage therethrough receiving said spindle and enlarged head, said bushing and said spindle being operatively connected for joint rotary movement but allowing relative reciprocatory movement, and latch means actuated by said bushing for releasing the door upon rotation of the extended handle.

12. A pop-out handle and lock assembly as set forth in claim 11, in which said latch means is a latch bolt secured on said bushing for actuation by turning of the extended handle.

13. A pop-out handle and lock assembly as set forth in claim 11, in which said latch means includes a sleeve mounted on said bushing, an interior handle secured to said sleeve, a spring-loaded bolt on at least one edge of the door cooperating with strike means on the enclosure for the door, a connection between each spring-loaded bolt and the interior handle and adapted to withdraw the spring-loaded bolts upon rotation of said interior handle, means connecting said bushing and said sleeve for rotation when the exterior handle is rotated, and lost motion means to allow the interior handle to have limited rotation independent of the bushing.

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