Jan. 5, 1960 F. W. CREW 2,919,570

LATCH MECHANISM

Filed Sept. 26, 1957

Fig. 1.

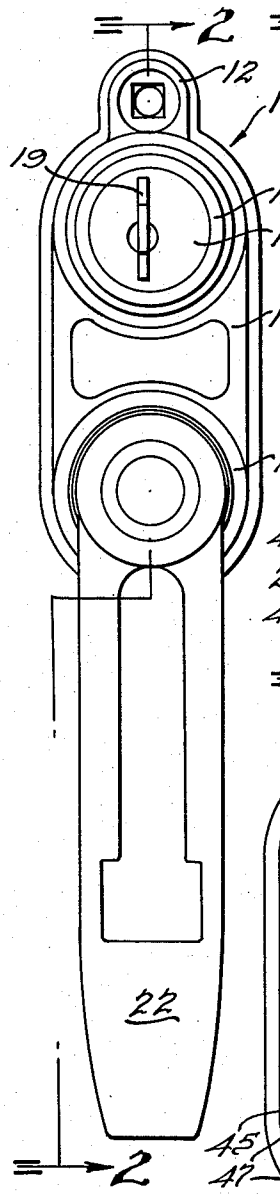


Fig. 2.

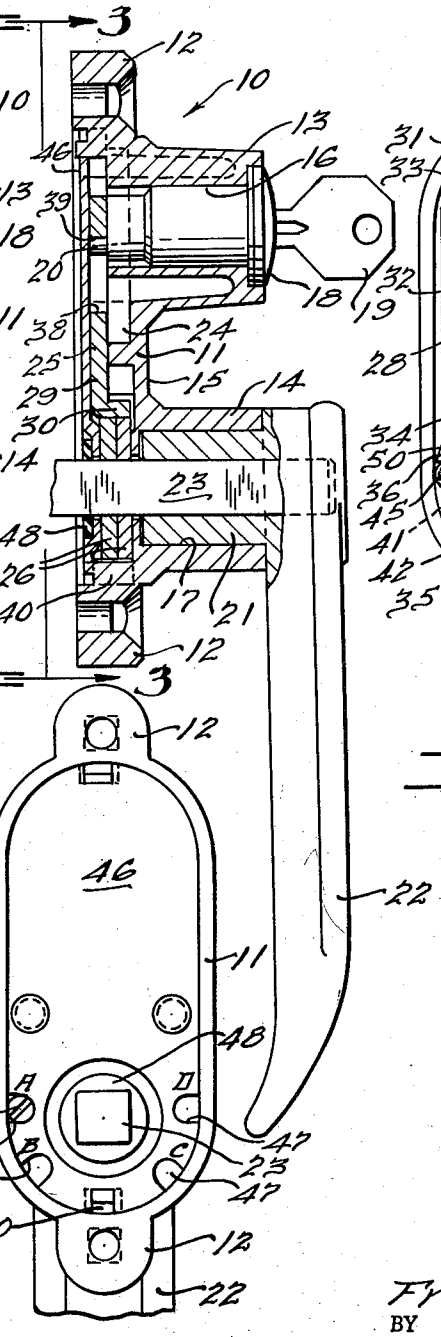


Fig. 4.

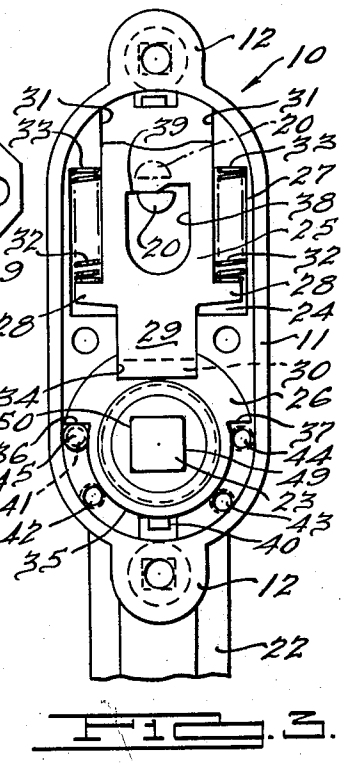


Fig. 3.

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LATCH MECHANISM

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1 Claim. (Cl. 70—211)

This invention relates to a combination door handle and mounting plate assembly for the swinging doors of various structures, the assembly including a means for locking the handle against movement.

The door handle assembly embodying the present invention is particularly adapted for doors having a relatively thin cross-sectional thickness, such as found on metal panel doors used on vehicle truck bodies or the like. It is a characteristic of the present invention that all of the operational parts of the mechanism are carried by and within an ornamental casing adapted to be fastened to the exterior surface of the door. It is further characteristic of the present invention that the arc through which the handle is swingable to actuate the latch mechanism adapted to be operatively connected thereto may be controlled by a simple presetting device whereby the handle may be swingable only to either the left or to the right or through an intermediate range. And, it is an object of the present invention to provide a compact, inexpensive, light weight but rigid and durable assembly fully adapted for the purposes intended.

Other objects, advantages and features of the present invention will appear in the following description and appended claims taken in conjunction with the accompanying drawing, wherein:

Fig. 1 is a front elevation of the door handle and mounting plate assembly embodying the present invention;

Fig. 2 is a view in part sectional taken substantially through line 2—2 of Fig. 1;

Fig. 3 is a view taken substantially through the line 3—3 of Fig. 2 looking in the direction of the arrows, the rear cover plate of the mechanism having been removed; and

Fig. 4 is a rear view of the structure embodying the present invention as it appears with the rear cover plate in place.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawing, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

This application is a continuation-in-part of my copending application Serial No. 605,982, filed August 24, 1956.

In the drawing there is illustrated a preferred embodiment of the present invention comprising a handle and mounting plate assembly, generally designated **10**. The operative mechanism of the assembly **10** is contained within a housing or body **11** which is substantially oval in shape (see Fig. 3 or 4) and which is provided with apertured appendages **12** adapted to receive rivets or square shank bolts (not shown) for securing the assembly **10** on the exterior surface of a door, such as a metal

panel door on a truck body or on a metal garage door.

As seen in side elevation, the housing or body **11** is of relatively thin cross-section (see Fig. 2). The housing or body **11** is provided with two frustum shaped bosses **13** and **14**. The bosses **13** and **14** are located at each end of the body **11**. The longitudinal axes of the two bosses **13** and **14** are parallel to each other and normal to the surface **15** of the body **11**. Each of the bosses **13** and **14** are provided with cavities or bores **16** and **17**, respectively, adapted to receive cylindrical devices.

It will be noted that the bore **16** in the boss **17** is adapted to receive a conventional key cylinder locking mechanism **18**. The key cylinder mechanism **18** is of a conventional type adapted to be actuated by a key inserted therein, the key being shown at **19**. When the key is inserted in the key cylinder locking mechanism, the key may be manipulated to cause turning movement of an eccentrically mounted pin **20**, for a purpose to be hereinafter explained.

The bore **17** of the boss **14** is adapted to receive the cylindrical shank **21** of a handle **22**. The handle **22** is shown as an elongated member adapted to be easily grasped and swung for operation of a latch bolt mechanism. Extending from the shank **21** is a stem **23** which may be of any desirable length.

The present invention is not directly concerned with the nature of the latch bolt mechanism operated by the door handle and mounting plate assembly **10** shown herein. It is believed readily apparent that the stem **23** may be operatively connected to a conventional roll back mechanism for moving a sliding latch bolt from door latched to door unlatched position. Or, that the stem **23** may be adapted to carry a bell crank lever connected by a cable means to a slidable latch bolt movable from a door latched to a door unlatched position. Therefore, it is deemed unnecessary to go further than the stem **23** for an understanding of the present invention.

The present invention is concerned with the provision of a means for rendering the door handle **22** unswingable thereby preventing any turning movement of the stem **23** which might be transmitted to a latch bolt by any appropriate linkage or cable system. Accordingly, it will be noted that the housing or body **11** is of a substantially hollow or shell-like construction, it being hollowed out from the underside and so as to provide a recess **24** adapted to receive the operative parts of the mechanism. These operative parts comprise a lock bolt or plate **25** and a pair of lock cams **26**.

The lock bolt or plate **25** is slidably journalled in one end section **27** of the recess **24**. The lock bolt or plate **25** is substantially rectangular in shape and has two laterally extending ears **28** and a longitudinally extending projection **29** terminating in a lug **30** extending at a substantially right angle to the plane of the plate **25**. The upper end of the plate **25** projects into guide ways **31** which are a longitudinal extension of the recess section **27**. The lock bolt or plate **25** is continually urged in the direction of the handle stem **23** by a pair of coil springs **32** located on each side thereof. The coil springs lie between the end wall **33** of the recess section **27** and the lateral ears **28** on the lock bolt or plate **25**.

Although a pair of lock cams **26** are shown, they are identical and operate as a unit. The metal thickness required makes it impractical to stamp the cams from a single thickness of metal. It being most economical to stamp the cams **26** of lighter guage metal, two cams are provided to give the required strength. Each cam is provided with a square hole at its center so that it fits over the square stem **23** of the handle and is turnable thereby. Each cam is provided with a notch **34** of a

width complementary to the width of the lug **30** on the lock bolt or plate **25**. Each cam is provided with a reduced diameter section **35** on the edge thereof opposite the notch **35**, which section extends for an effective distance of 180°. The terminal edges of the reduced diameter section provide a left abutment **36** and a right abutment **37**, as viewed in Fig. 3, for a purpose to be explained.

Referring to Fig. 3, it will be noted that the eccentrically mounted pin **20** projects into a longitudinally extending aperture **38** in the lock bolt or plate **25**. The pin **20** as it is swung about the center of the key cylinder mechanism **18** upon the key **19** being turned therein is adapted to engage the upper edge **39** of the aperture **38** and thereby to raise the lock bolt or plate **25** against the opposing force of the springs **32**. When the pin **20** has raised the lock bolt or plate **25** a sufficient distance to remove the lug **30** out of the notch **34** of the cams, the handle is freely swingable, except for the restriction placed on said swinging movement by certain control elements as will now be explained.

The first control element comprises a stop lug **40** located at the bottom of the recess **24** and on the longitudinal axis of the housing or body **11**. The stop lug **40** is so positioned that it lies in the path of either of the cam abutments **36** or **37**. Without anything further, the swinging movement of the handle would be restricted to a 90° movement to either the left (clockwise) or to the right (counterclockwise) as viewed in Fig. 1. However, further provision is made for selectively restricting the swinging movement of the handle even further. The bottom surface of the portion of the recess **24** in which the cams **26** operate is provided with a series of tapped holes **41**, **42**, **43** and **44** respectively, spaced 45° apart. By the judicious placement of one or more pins **45** in the proper tapped hole or holes, the swinging movement of the handle may be restricted to a predetermined range.

For example, in Fig. 3 the pin **45** is shown placed in the tapped hole **41**. Thus, as viewed in Fig. 3 the handle cannot be swung in a counterclockwise direction (clockwise as viewed in Fig. 1) since the cam abutment **36** is in abutting relation to the pin **45**. The handle can only be swung in a clockwise direction (counterclockwise as viewed in Fig. 1) through a 90° range of movement, that is, until the abutment **37** engages the permanent stop **40**. If the pin **45** were removed from the hole **41** and placed in the hole **44**, the handle would again be swingable through a 90° movement but only in a direction opposite to the previously described arrangement.

If for any reason it were desired to limit the handle movement to a 45° range in a clockwise direction as viewed in Fig. 3, it is only necessary to position a pin **45** in holes **41** and **43**. The pin **41** prevents any movement from the starting position in a counterclockwise direction and the pin **43** limits the clockwise movement to 45° since the abutment **37** will engage the pin **43** after such movement has occurred.

The placement of pins **45** in holes **42** and **44** restricts movement to a 45° counterclockwise movement as viewed in Fig. 3. The placement of pins **45** in holes **42** and **43** restricts movement of the handle to 90°, that is, 45° on each side of the center.

As shown in Fig. 4, the back cover plate **46** is provided with access holes **47** through which the pins **45** may be withdrawn for repositioning. The cover plate **46** is preferably held in place by a lock ring **48** which snaps on the projecting portion of the handle stem **23**.

It will be readily understood that the pins **45** may be permanently press fit, if desired, into suitable holes to give a handle mechanism having the desired operating characteristics. However, the present handle mechanism with screw insertable pins **45** is particularly adapted for use by truck body manufacturers. It is thus possible to supply a standard handle mechanism which may readily be adapted for use on left hand, right hand or other compartment doors by the mere repositioning of the pins **45** prior to installation. It thus enables the handle assembly to be produced on a volume basis even though the sales volume to individual truck body or the like manufacturers is on a small lot basis.

In Fig. 3, the handle assembly is shown in handle locked condition. That is, the lug **30** on the lock bolt or plate **25** is in engagement with lock cam notches **34**. To release the handle for swinging movement, it is necessary to insert the key **19** in the key cylinder mechanism. Upon the key being turned the eccentric pin **20** will swing from the solid line position to the dot and dash line position shown in Fig. 3. The lock bolt or plate **25** will be moved upwardly against the opposition of the springs **32** and the lug **30** will be withdrawn from the cam notches **34**. The handle may then be swung with the range of swinging movement being limited according to the pre-installation placement of the pin or pins **45** and also as limited by the fixed stop lug **40**.

Once the handle has been moved so that the cam notches **34** are out of alignment with the lug **30** on the plate **25**, the key may be returned to its neutral position and withdrawn from the key cylinder mechanism **18**, if desired. The peripheral surfaces of the lock cams **26** will hold the lock bolt or plate in its uppermost position until the handle is turned to align the lug **40** with the cam notches **34**. As soon as this alignment occurs, the springs **32** will cause the lock bolt or plate **25** to automatically drop down and the lug **40** to enter the notches **34** thus restoring the handle to locked condition.

Referring to Fig. 4, the access holes **47** are shown with reference indicia alongside. These indicia are used in pre-setting the swinging range of the handle according to the following chart.

Pin In	
A	90° right.
B—D	45° left.
C—A	45° right.
D	90° left.
B—C	45° right-left.

The right or left referred to is the direction of swinging movement of the handle as viewed in Fig. 1.

It will be readily understood that the handle locked position may be other than the vertical position illustrated. The handle may assume a locked condition in a horizontal position so as to extend to the right or left of the housing or body **11**, the latter being positioned as viewed in Fig. 1. The initial placement of the cams **26** on the stem **23** controls the locking position of the handle. That is, if the cams **26** are placed so that the notch **34** is adjacent the side **49** (see Fig. 3) of the stem **23**, the handle in locked position will be in a horizontal direction and the handle would extend to the left side of the housing **11**, as viewed in Fig. 1. It would then be necessary to place a pin **45** in the hole **41** to prevent the handle from being swung above the horizontal level since such movement would cause it to hit the key **19**. Should it be desired to place the handle to extend to the right as viewed in Fig. 1, the cams would be positioned on the stem **23** so that the cam notches would lie adjacent the stem side **50**. The pin **45**, in this instance, would be positioned in the hole **44**. Should it be desired to limit the downward swinging movement of the handle from a horizontal position to a position at a 45° angle thereto, it would be necessary to place a pin **45** in either the hole **42** or the hole **43**, as the case might be.

From the foregoing, it is believed apparent that the structure embodying the present invention provides a simple multi-use door handle mechanism which may be easily adjusted to provide the desired characteristics of operation.

I claim:

A latch actuating mechanism comprising a housing

having spaced boss portions projecting outwardly from one surface thereof, handle means turnably journalled in one of said boss portions, key cylinder means housed within the other of said boss portions, said handle means including stem means projecting beyond the surface of said housing opposite said one surface, lock cam means coupled to said stem means within a first recess in said housing, said lock cam means being provided with a peripheral notch and a pair of peripherally spaced abutments, a lock plate member slidably journalled within a second recess in said housing, said first and second recesses lying in spaced co-planar relationship and being interconnected by a longitudinally extending slot, said lock plate member having an abutment portion thereon projecting through said slot in a substantially co-planar relationship to said lock cam means, said abutment portion in locked condition of said latch mechanism being normally engaged with said notch to render said lock cam means and thereby said handle means nonturnable, guide means guiding said lock plate member for movement in a straight line, said guide means comprising longitudinally extending substantially parallel walls of a longitudinal extension of said second recess, said extension being diametrically opposite said slot, means operatively connecting said key cylinder means to said lock plate member

whereby said key cylinder means upon actuation thereof is effective to move the lock plate member to position the abutment portion thereon out of engagement with said notch, spring means mounted within said second recess at each side of said lock plate member in co-planar relation thereto, said spring means urging said lock plate member toward normal lock cam means engaging position, fixed and selectively positionable stops carried by said housing, each of said stops projecting into said first recess and interposed between said lock cam means abutments, said fixed and selectively positionable stops coacting with said lock cam means abutments to limit the turning movement of said handle means in a predetermined direction and to a predetermined range of movement when said lock plate member abutment portion is out of engagement with said notch.

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