March 25, 1958 R. W. AHLQUIST 2,828,153

CLAMPING PLATE

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FIG. 1.

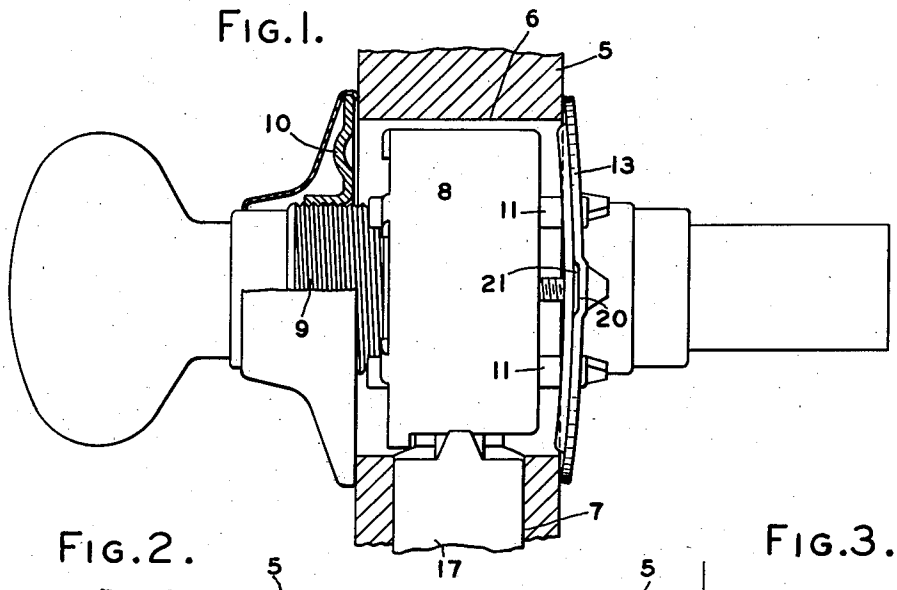


FIG. 2.

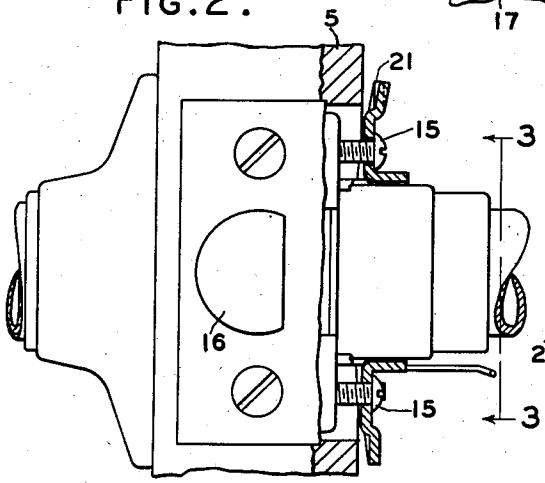


FIG. 3.

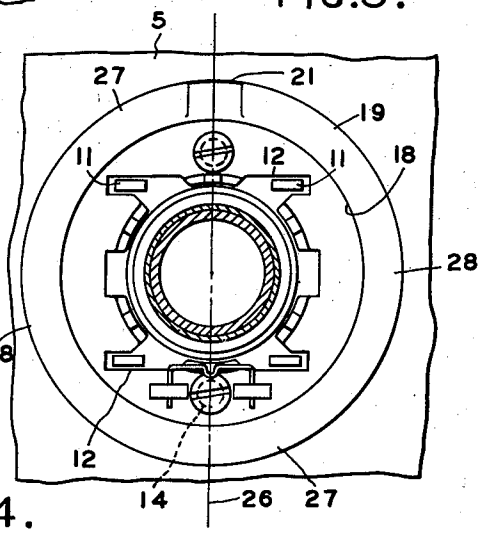
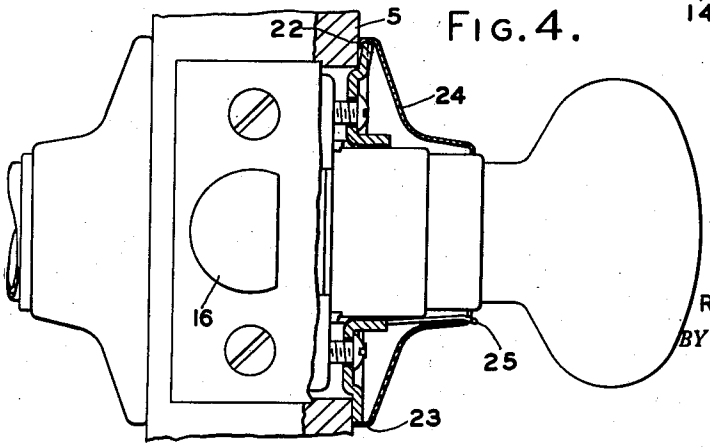


FIG. 4.



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CLAMPING PLATE

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4 Claims. (Cl. 292—357)

This invention relates to a clamping plate and more particularly to improvements in clamping plates which are used to secure the operating unit of a cylindrical door lock to a door.

Cylindrical door locks, of the type fully disclosed in United States Patent No. 2,733,088 of Leland H. Fisler et al., dated January 31, 1956, have heretofore been secured to a door by means of an inner and an outer clamping plate which abut, respectively, the inner and the outer sides of the door; the outer clamping plate usually being threaded directly to the outer sleeve extending from the case of the operating unit and the inner clamping plate being secured to said case by screws which extend through said inner plate and are threaded thereto. Heretofore, both the inner and the outer clamping plates have been made perfectly flat and, if shrinkage of the door occurred, the unit became loose and several adjustments of the screws were required until the shrinkage stopped.

The primary object of this invention therefore is to provide a clamping plate for such door locks which is adapted to compensate for door shrinkage and thereby prevent loosening of the lock operating unit.

A further object of this invention is to provide such a clamping plate which will follow the door when shrinkage occurs after the lock has been installed therein and will prevent loosening of the said lock.

Further objects and advantages of this invention will be more clearly understood from the following description and the accompanying drawings in which:

Fig. 1 is a plan view, partly in section, showing a cylindrical lock operating unit mounted in a door and my improved clamping plate in its normal condition before the screws are tightened.

Fig. 2 is a front elevational view thereof partially in central vertical section.

Fig. 3 is an end view of said plate on line 3—3 of Fig. 2.

Fig. 4 is a view similar to Fig. 2, but showing the clamping plate in tightened position.

As shown in the drawing, the numeral 5 denotes a door having an opening 6 therethrough and a smaller opening 7 extending perpendicularly thereto from the edge of the door. The cylindrical lock shown in said drawing includes an operating unit having a case 8 which fits within the opening 6 in the door and has a threaded sleeve 9 extending from the outer side thereof to which is threaded an outer clamping plate 10 which covers the said opening 6 and abuts the surface of the door adjacent said opening.

The inner side of the lock case 8 has prongs 11 extending therefrom which project through openings 12 in the inner clamping plate 13 to properly align said plate relatively to said case. The said inner plate is provided with openings 14—14 on opposite sides thereof to receive clamping screws 15—15 that extend through said holes and are threaded to the case for drawing the

outer clamping plate 10 against the outer surface of the door and the inner clamping plate 13 against the inner surface thereof to secure the case in proper position within the opening 6 to permit operation of the bolt 16 that extends from the latch unit 17 that is contained within the opening 7 and attached to the case of the operating unit.

The said inner plate 13 is recessed, as at 18, to provide an offset surrounding flange portion 19 which has an inwardly extending lip 20 forming a notch 21 that is adapted to receive a detent 22 on the annular flange 23 of an inner rose 24 which is adapted to fit over the said clamping plate and is urged in a downward direction thereon by a spring 25 so as to bias the detent 22 into the notch 21 and thereby secure the said rose to the clamping plate.

The present invention is particularly directed to improvements in the inner clamping plate 13 which allow it to compensate for any shrinkage in the door and thereby prevent loosening of the lock operating unit even though such shrinkage should occur.

In order to attain the objects of this invention, I have constructed said clamping plate of a substantially resilient or "springy" material and have formed a bend in it so that it is curved towards the door. The plate is bent about a vertical axis 26 which extends across the holes 14—14 and thereby causes the central portion 27 of said plate, through which said holes extend, to be spaced outwardly from the surface of the door when the opposite side portions 28—28 of said plate are brought into contact with the said surface prior to the tightening of the screws 15—15, as illustrated in Fig. 1.

The advantages of this invention will be more fully understood from the following explanation of the function of my improved clamping plate:

The lock is installed in the door by inserting the case 8 into the hole 6 from the outside of the door. The clamping plate 13 is then placed against the inside surface of the door and in the position shown in Fig. 1 wherein the side portions 28—28 are in contact with the surface of the door while the central portion 27 is spaced from said surface due to the curvature of the clamping plate. The screws 15—15 are then inserted through the holes 14—14 and threaded to the case 8. As the said screws are tightened, the outer clamping plate 10 will be drawn tightly against the outer surface of the door while the inner clamping plate is flexed and flattened against the inner surface of the door until it occupies the position illustrated in Fig. 4 wherein the flange 19 rests flat against the surface of the door surrounding the hole 6. The inner rose 24 is then placed over the plate, as shown, and the detent 22 is disposed in the notch 21 to retain the rose on the clamping plate under the pressure of the spring 25.

When a lock is thus secured to a door by means of my improved clamping plate and shrinkage of the door occurs, the inner plate, which normally tends to assume its original position, will flex and maintain tension on the screws 15—15, thus compensating for the shrinkage and retaining the lock firmly in position without looseness.

It will be understood that by bending the clamping plate about the vertical axis 26 instead of about its horizontal axis, a greater distance is obtained between the screws 15—15 and the portions 28—28 of the plate which engage the door so that the said plate may be more easily flattened against the surface of the door with said screws. Also, bending the plate upon the said axis 26 will prevent disengagement of the rose 24 from the clamping plate as it moves towards its normal condition as the door shrinks because the spring 25 and the

lip 20, to which the rose is attached, lie on said axis 26 and will move away from the door surface and carry the rose therewith without disturbing their relative positions; it being understood that if the plate were bent about the horizontal axis, its return towards its normal condition would cause the portions 28—28 to move away from the surface of the door and thereby force the rose 24 to move relatively to the portions 27—27 and cause disengagement of the detent 22 and the spring 25.

It will be understood from the above description that my invention provides an important advantage wherein, by a simple manufacturing operation, the conventional inner clamping plate of a door lock may be made to compensate for any changes in the thickness of the door and thereby firmly secure the said lock to the door and prevent it from becoming loosened.

I claim:

1. For a door lock of the cylindrical type having a case adapted to be disposed in an opening extending through a door and a plate at one side of said case engageable with the surface of the door surrounding the opening; a resilient clamping plate engageable with the opposite surface of the door and having opposed screw holes therein, a lip on the edge portion of said clamping plate engageable by a detent on a rose adapted to be mounted over said clamping plate for securing said rose thereto, and fastening screws extending through said holes in the plate and being threaded to the case; the said clamping plate being bent about an axis intersecting the axes of said screw holes and said lip whereby the portions of said plate adjacent said axis will normally be spaced from the door surface when the outer edge portions thereof engage said surface; the said spaced portions of the plate being drawn towards the door surface when the screws are tightened to tension the plate whereby the said opposed edge portions of the plate will follow the door surface when shrinkage of the door occurs and will maintain a force upon the said screws to prevent looseness between the case and the door.

2. For a door lock having a case adapted to be disposed within an opening through a door and means at one side of the door for locating said case in operative position in said opening, a resilient clamping plate having opposite side portions bent toward the door and adapted to engage the surface surrounding said opening at the opposite side of the door to space the intermediate portion of the plate from said surface, and fastening means adapted to extend through the said intermediate portion of the plate and be connected to the case for drawing said intermediate portion toward the door to thereby tension said plate whereby the said side portions of said plate will be urged toward the door surface and will follow the said surface to accommodate changes in the door thickness and thereby prevent loosening of the case on the door.

3. For a door lock having a case adapted to be disposed within an opening extending through a door and means for a plate locating said case in operative position in said opening, a resilient clamping plate engageable with the surface surrounding said opening at the opposite side of the door and bent about an axis extending diametrically across said plate whereby the central portion of the plate will be spaced from the door surface when the opposite side portions of said plate are in engagement with the said surrounding surface of the opposite side of the door, fastening means adapted to be extended through the portions of the plate spaced from the door and connected to the lock case for flattening the said clamping plate against the door surface and tensioning said plate whereby the said side portions will follow the door surface and compensate for changes in the thickness of the door to prevent looseness between the case and the door, and a rose mounted upon said clamping plate and secured to the said intermediate portion.

4. For a door lock of the cylindrical type having a case adapted to be disposed within an opening extending through a door and a plate at one side of said case adapted to cover said opening and to locate the case therein; a resilient clamping plate at the opposite side of the case having spaced holes in a central portion thereof and fastening screws extending through said holes and threaded to the case; the opposite sides of said clamping plate being curved toward the said surface of the door about an axis intersecting the said holes whereby the said central portion is spaced from the door surface when the edge portions of said opposite sides are in engagement with said surface; said fastening screws, when tightened, substantially flattening said clamping plate against the door surface and tensioning said plate to thereby cause said edge portions to move with the door surface, aand prevent looseness between the case and the door upon shrinkage of the door.

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