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RETAINING PLATE FOR A DOOR OR DRAWER CAM LOCK

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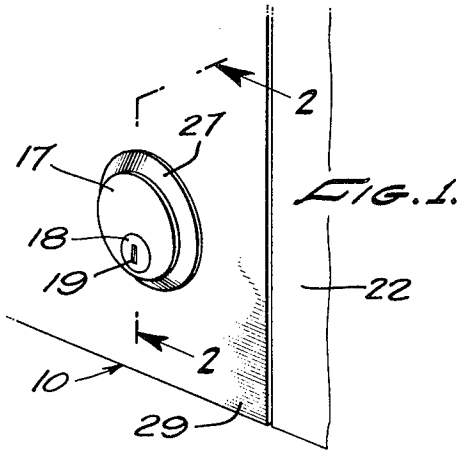


FIG. 1.

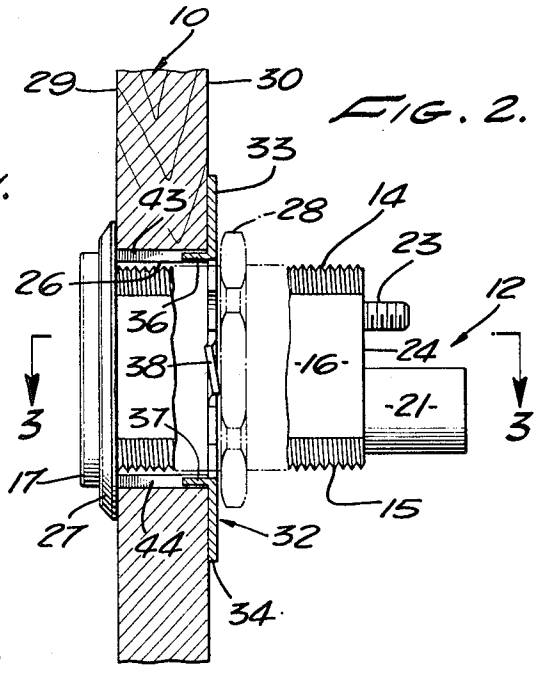


FIG. 2.

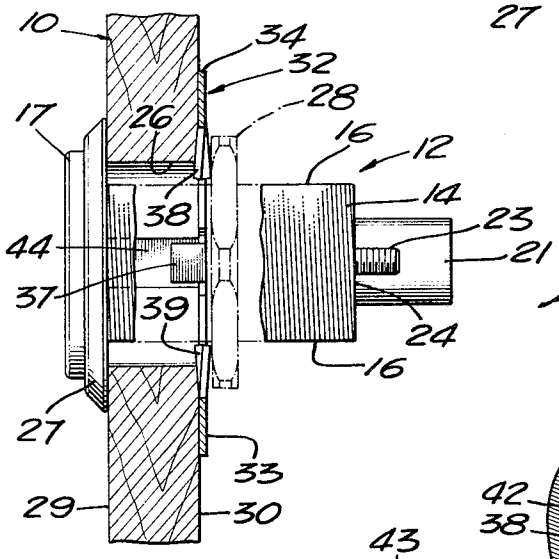


FIG. 3.

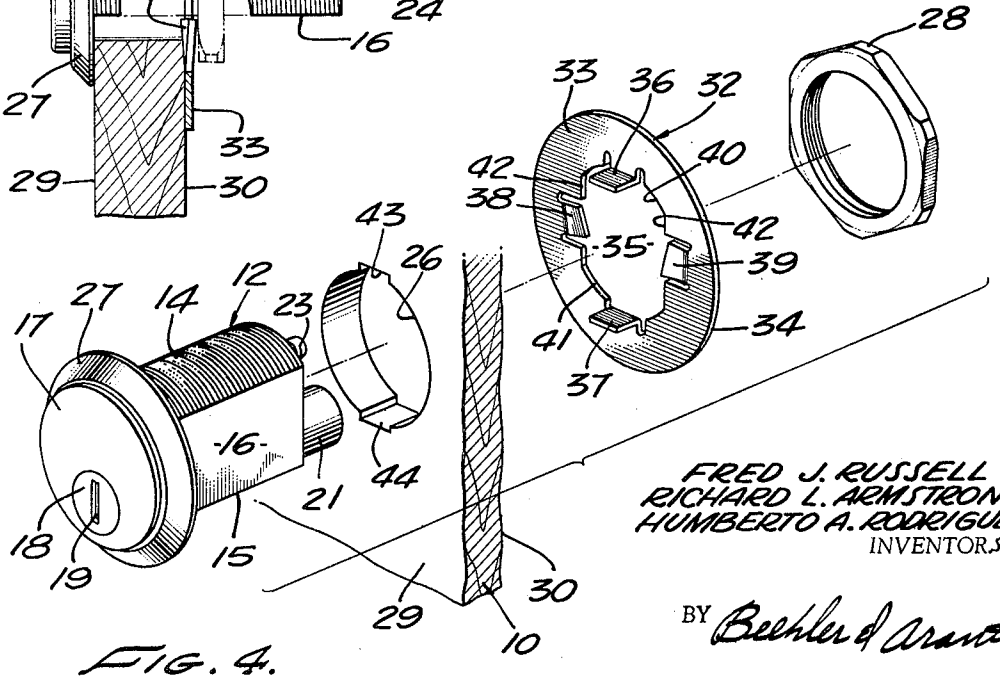


FIG. 4.

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RETAINING PLATE FOR A DOOR OR DRAWER CAM LOCK

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ABSTRACT OF THE DISCLOSURE

A retaining plate for anchoring a lock assembly on a door or drawer. The door or drawer has a circular mounting opening therethrough and a pair of cutouts formed contiguous to the opening. The lock assembly includes a partially threaded lock housing adapted for mounting in the opening and a fastening nut for engaging the threaded housing so as to clamp the lock assembly between the faces of the door. To anchor the housing against rotational movement, a retaining plate is disposed between one face of the door and the fastening nut. The retaining plate is nonrotatably mounted over the lock housing through an aperture formed in the plate. A pair of anchoring tabs protrude from the plate in engagement with the cutouts in the door. A pair of anti-loosening tabs are formed on the retaining plate so that the surfaces of each anti-loosening tab extend beyond the faces of the plate prior to engagement of the fastening nut. After the fastening nut is tightened, the lock assembly is restrained from rotating due to the engagement between the anchoring tabs and the cutouts, and the fastening nut is prevented from loosening due to the tension forces applied between the door and nut by the anti-loosening tabs.

This invention relates generally to door lock installations and particularly to a retaining plate for engaging the lock housing and the door so that the lock assembly is prevented from rotating in the mounting opening.

In the installation of certain types of locks, such as cam locks for cabinet doors, it is customary and economical to mount the lock in a circular opening drilled through the door. Usually the only provision for preventing the lock assembly from rotating is the pressure between the assembly and the door surfaces when the fastening nut is securely tightened onto the lock housing. After continuous usage, however, the fastening nut is likely to loosen slightly so as to allow the lock assembly to rotate in the mounting opening. This just described problem may be prevented by configuring the mounting opening in the door to the shape of a noncylindrical lock housing, but such a procedure greatly increases the time and expense of installing the lock assembly.

It is, therefore, among the objects of the invention to provide a new and improved retaining device which may be easily included in a lock installation so as to securely anchor the lock housing in place.

Another object of the invention is to provide a novel retaining plate which can be fitted on the lock assembly without modification of the assembly and which is adapted for engaging the lock housing in the door so as to prevent the lock housing from rotating in the door.

Another object of the invention is to provide a retaining plate of the type described which incorporates anti-loosening tabs for preventing the fastening nut, which clamps the lock assembly onto the door, from loosening.

Still another object of the invention is to provide a novel and improved retaining plate for preventing a lock assembly from rotating or loosening, and which may be economically produced to be compatible with any configuration cam lock housing.

With these and other objects in view, the invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a side elevational view of a portion of a door and jamb structure and of a lock installation, incorporating the principles of the subject invention, mounted on the door.

FIGURE 2 is a partially cut away vertical sectional view of the lock installation taken on the line 2—2 of FIGURE 1.

FIGURE 3 is a partially cut away horizontal sectional view of the lock installation taken on the line 3—3 of FIGURE 2.

FIGURE 4 is a perspective exploded view of the various parts of the lock assembly and of the mounting opening in the door.

In the embodiment of the invention chosen for the purpose of illustration, there is shown a fragment of a door **10** having mounted thereon a lock assembly embodying in part a lock core indicated generally by the reference character **12**. The lock core or housing **12** has top and bottom arcuate threaded surfaces **14** and **15**, respectively, flat side surfaces **16**, and an annular facing flange **17**. A portion of the lock core **12** contains a rotating key plug **18** in which is a keyway **19**. When a key, not shown, is inserted into the keyway **19** and rotated, it rotates the key plug **18** to which is attached a tailpiece **21**. The tailpiece **21**, in turn, is connected to and manipulates a cam latch (not shown) which serves to lock the door **10** to a jamb structure **22** in a conventional manner. A setscrew **23**, which is threaded into a rear surface **24** of the lock core **12**, serves as an alignment guide for the cam latch.

Ordinarily, the lock core **12** is mounted on the door **10** through a circular mounting opening **26** which is formed by drilling a hole, of a slightly larger diameter than that of the arcuate threaded surfaces **14** and **15**, through the opposite faces of the door **10**. A trim plate **27** fits over the arcuate threaded surfaces **14** and **15** and is retained on the lock core **12** by the rear face of the flange **17**. In accordance with the conventional installation procedures, the fastening nut **28** is threaded onto the arcuate threaded surfaces **14** and **15** of the lock core **12** until the outside face **29** and the inside face **30** of the door **10** are engaged by the inner surfaces of the trim plate **27** and the fastening nut **28**, respectively. However, as explained previously, this frictional engagement between the arcuate threaded surfaces **14** and **15** of the door **10** and the trim plate **27** and the fastening nut **28** is inadequate to securely anchor the lock core **12** on the door **10**, especially as against the rotation inducing torque applied in manipulating the key plug **18** during ordinary and continued use of the lock.

To securely anchor the lock core **12** against rotational movement relative to the door **10**, there is provided, in accordance with the principles of the subject invention, a retaining plate indicated generally by the reference number **32**. The retaining plate **32** consists of a disc **33**, preferably of metal, having a circular perimeter **34**. The central portion of the disc **33** (not shown) is removed by a punching or stamping operation, so as to form an aperture **35** and tabs **36**, **37**, **38**, and **39**. The aperture **35** is defined by arcuate upper and lower edges **40** and **41**, respectively, and straight side walls **42**, with the dimensions of the aperture **35** being slightly larger than the corresponding dimensions of a transverse cross section of the lock core **12** so as to permit the disc **33** to slide freely into position over the lock core **12**. Although the shape of the aperture **35** has been selected herein to be compatible with one of the more popular configurations of lock cores, it is understood that, in accordance with the principles of the invention, any configuration core may be utilized and the aperture **35** may then be configured similar in shape to a transverse cross section of the selected core.

Anchoring tabs **36** and **37** protrude inwardly so as to be projected toward the door **10**, and in the door **10** are provided cutouts **43** and **44** for engaging tabs **36** and **37**, respectively. The cutouts **43** and **44** may be easily added to the circular mounting opening **26** by making parallel saw cuts outwardly from the opening and then chiseling out the cutout pieces (not shown). The width of the cutouts **43** and **44** is selected so that a close fit may be provided with the side surfaces of the tabs **36** and **37**, respectively. Although two anchoring tabs are shown, it will be understood that only one tab and its corresponding cutout need be employed. Also, in the selected embodiment, the cutouts **43** and **44** are shown as extending through the door **10** from one face to the other, because such cutouts are easiest to make for the normal installation. It should be noted, however, that in accordance with the invention, the cutouts need not extend through the door **10**, and cutouts formed in only one face of the door **10** could be effectively employed.

The anti-loosening tabs **38** and **39** are bent or twisted so that the upper and lower surfaces of each anti-loosening tab **38**, **39** protrude beyond different faces of the disc **33** and, once again, although two-antiloosening tabs are shown, adequate performance may be secured with a single anti-loosening tab.

When the lock assembly is installed in the door **10**, the trim plate **27** is first fitted over the lock core **12** so as to engage the rear face of the flange **17**, and the lock core **12** is then inserted through the circular mounting opening **26**. Next, the wall of the aperture **35** is positioned around the lock core **12** and the retaining plate **32** slid into place so that the anchoring tabs **36** and **37** engage the cutouts **43** and **44**, respectively. Finally, the fastening nut **28** is threaded onto the lock core **12** and tightened so that the assembly is clamped between the inside face **30** and the outside face **29** of the door **10**.

It will be understood from the foregoing description that the new and improved retaining plate **32** is capable of obtaining all the several objects herein previously set forth. In particular, the fitting between the retaining plate **32** and the lock core **12** prevents rotational movement between the lock core **12** and the retaining plate **32**; and the engagement between the anchoring tabs **36** and **37** and the cutouts **43** and **44**, respectively, prevents rotational movement between the retaining plate **32** and the door **10**, thereby securely anchoring the lock assembly against twisting in the circular mounting opening **26**. Further, the surfaces of the anti-loosening tabs **38** and **39**, which protrude beyond the faces of the disc **33** prior to tightening the fastening nut **28**, are compressed as the fastening nut **28** is tightened, so as to provide tension forces normal to the faces of the door **10** and thereby prevent the fastening nut **28** from vibrating loose. Also, it will be understood that the retaining plate **32** may be produced from a single piece of metal in a single stamping operation in which the aperture **35** and the tabs **36**, **37**, **38**, and **39** are punched and shaped in one die, thereby providing an efficient retaining plate of extremely inexpensive and simple construction.

While the invention has herein been shown and described in what is conceived to be a practical and effective embodiment, it is recognized that departures may be made therefrom within the scope of the invention.

Having described the invention, what is claimed as new in support of Letters Patent is:

1. An anchoring combination for anchoring a lock assembly on a door having a mounting opening therethrough and at least one recess formed in the wall of the opening, said combination comprising a lock housing for said lock assembly adapted for mounting through said opening with a portion of said lock housing overlying one side of the door, and fastening means on the other side of the door for clamping the lock housing between opposite sides of the door, a plate on said other side of the door having an aperture adapted to fit slidably over the lock housing with the aperture and housing having complementary noncircular shapes whereby the plate is nonrotatably mounted on the housing, and at least one anchoring tab protruding from said plate into engagement with the recess, said fastening means being engageable with the housing and the plate whereby said lock assembly is anchored against rotational movement relative to the door when said plate is held in engagement with said other side of the door by the fastening means.

2. The anchoring device of claim **1** with said plate further having at least one anti-loosening tab formed thereon, said anti-loosening tab being shaped so as to provide a tension force between the door and the fastening means when said plate is held in engagement with said one face of the door by the fastening means.

3. The device of claim **1** wherein the aperture in said plate is substantially of the same shape as a transverse cross section of said lock housing.

4. The device of claim **1** wherein said recess is a cutout contiguous with the mounting opening and said anchoring tab protrudes from said plate at the periphery of said aperture.

5. The device of claim **2** wherein said anti-loosening tab is twisted relative to said plate so that portions thereof lie outside the plane of said plate prior to engagement of the fastening means.

6. A device for anchoring a lock assembly on a door, said door having a mounting opening therethrough and at least one recess formed on one side of the opening, said lock assembly including a lock housing adapted for mounting through said opening, and fastening means for clamping the lock housing between opposite faces of the door, said anchoring device comprising a retaining plate having an aperture adapted to fit over the lock housing with the aperture being so shaped that the retaining plate may be nonrotatably mounted on the housing, and at least one anchoring tab protruding from said retaining plate so as to be engageable with the recess, whereby said lock assembly is anchored against rotational movement when said retaining plate is held in engagement with the one face of the door by the fastening means, said retaining plate comprising a pair of anti-loosening tabs formed on said retaining plate, with each anti-loosening tab having surfaces extending beyond the inner and outer faces of the retaining plate prior to the engagement of said fastening means, whereby said anti-loosening tabs provide tension forces between the door and the fastening means when the fastening means clamp the retaining plate and said core in engagement with the door.

7. The combination of claim 1 wherein the exterior of the lock assembly is threaded and said fastening means is in threaded engagement with said lock assembly.

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