

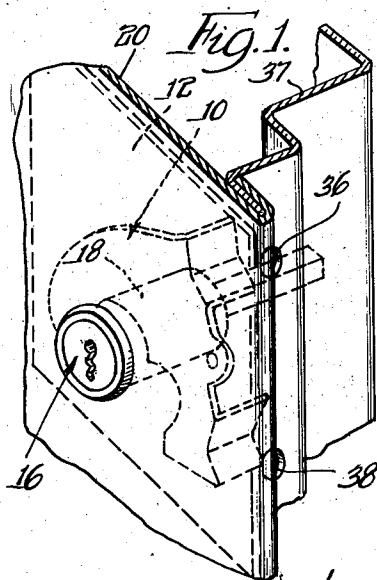
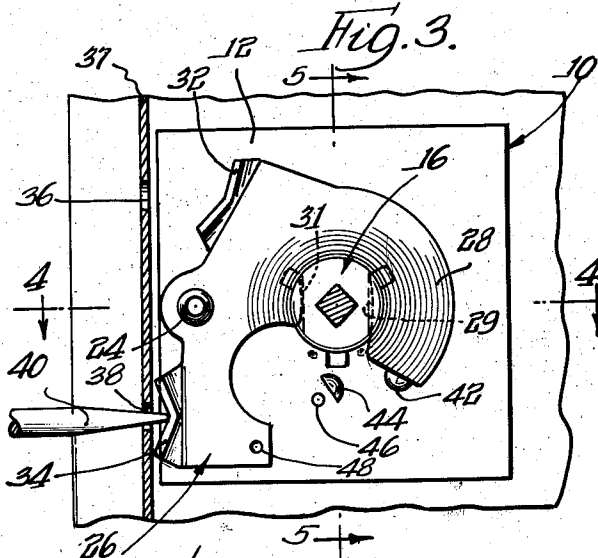
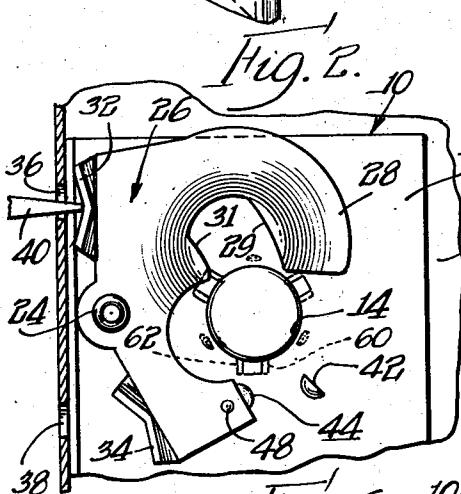
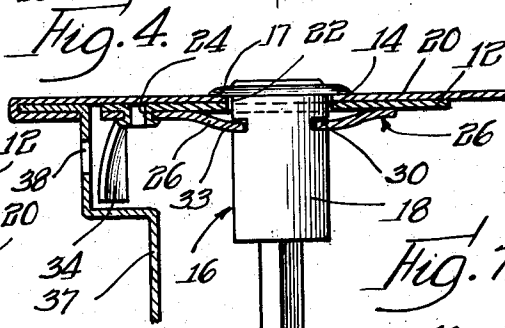
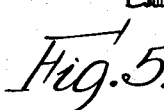
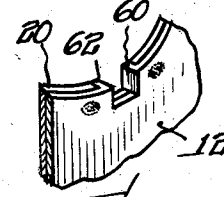
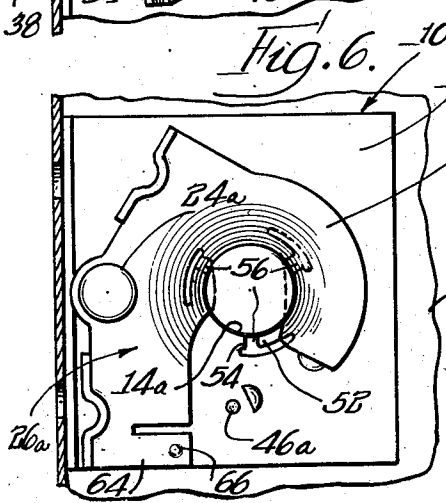
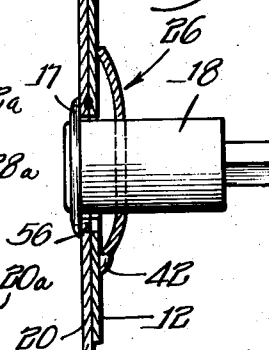
Sept. 16, 1952

O. J. POUPITCH

2,610,500

LOCK RETAINER

Filed July 8, 1948



INVENTOR.

Ougljesa Jule Poupitch
BY
Moore, Olsen & Thayer
Attys.

UNITED STATES PATENT OFFICE

2,610,500

LOCK RETAINER

Ougljesa Jules Poupitch, Chicago, Ill., assignor to
Illinois Tool Works, Chicago, Ill., a corporation
of Illinois

Application July 8, 1948, Serial No. 37,611

12 Claims. (Cl. 70—370)

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This invention is directed generally to fastening devices and more specifically to a retainer device for removably securing lock structures in apertured panels.

Cylinder locks, generally referred to as pillar locks in the automobile industry, are used extensively for example, in the automotive industry, on doors and compartments. These locks generally consist of a cylindrical lock body or sleeve with an outwardly extending annular shoulder at one end, the sleeve serving as a housing for the lock mechanism. When the lock structure is mounted in the aperture of a work panel, the lock body normally extends beyond the surface of the panel opposite to that engaged by the annular shoulder. In order to secure the lock body in proper position on the work panel it must be held against both axial and rotative movement. When the lock structure is mounted in an automobile car door or the like, the lock body with its associated retaining means is housed between the outer and inner panels of the door. Therefore, it is an important object of the instant invention to provide a lock retainer for lock structures of the type described above which will permit mounting or removal of the lock structure with a minimum of effort and without dismantling the compartment in which the lock body and retaining means are housed.

It is another important object of the present invention to provide a lock retainer of the type described above which is designed to retain the lock against axial and rotative movement relative to the panel in which it is mounted.

It is a further object of the present invention to provide a lock retainer of the type hereinbefore described which may be secured to a supporting panel so as to be in operative position at all times.

It is still a further object of the invention to provide a lock retainer of the type heretofore referred to which will prohibit unauthorized removal of the lock structure from a panel, that is, which will prevent removal of the lock structure when a door panel is in closed position.

It is a further object of the present invention to provide a lock retainer as above described which may be made from sheet material by practicing well-known manufacturing methods and which may be produced economically.

It is still another object of the present invention to provide a lock retainer adapted for use in existing installations such as automobile door panels and the like, without the necessity of changing the panel structure and without the use of special tools.

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These and other objects will be more obvious upon reading the following detailed description and reference to the accompanying drawing wherein:

Figure 1 is a perspective view of a door assembly with one embodiment of the lock retainer operatively associated therewith;

Figure 2 is a rear elevational view of the lock retainer in lock-receiving position on a panel;

Figure 3 is a rear elevational view of the assembly shown in Figure 2 with the lock retainer in operative association with a lock structure;

Figure 4 is a cross sectional view of the lock retainer taken along the line 4—4 in Figure 3;

Figure 5 is a cross sectional view of the lock retainer taken along the line 5—5 in Figure 3;

Figure 6 is a rear elevational view of a modified form of the lock retainer;

Figure 7 is a fragmentary perspective view of the means used to position the lock retainer on a panel; and

Figure 8 is a fragmentary perspective view of the means used in mounting the lock retainer of Figure 6 on a panel.

Referring to the drawing more in detail, wherein like numerals have been employed to designate similar parts throughout the various figures, it will be seen that the present invention contemplates a lock retainer or fastener means made from sheet material and designated generally by the numeral 10. The lock retainer 10 which comprises the instant invention includes a base plate 12 having an aperture 14. The base plate 12 is mounted on a panel 20, which is provided with an aperture 22, and this aperture is aligned with the aperture 14 in the base plate 12 so as to receive a lock 16, including sleeve 18 having a flange 17. In the embodiment shown in Figures 1 to 5, inclusive, the base plate 12 has been welded to the panel 20 as best seen in Figure 7. Other suitable methods for securing the base plate are contemplated as will be seen hereinafter. A tubular collar or stud 24 is extruded from the base plate 12 at a predetermined distance from the aperture 22. A retainer plate or locking member 26 is pivotally mounted on the tubular collar 24 and the free end of the tubular collar is flared outwardly to secure the retainer plate 26 to the base plate 12. While this is the preferred method of securing plate 26 to plate 12, it may be accomplished by a rivet, screw or the like. Retainer plate 26 is provided with a C-shaped clamping head 28 which is preferably arched or dished in a direction away from the adjacent base plate. The C-shaped head or arm 28 has its internal margins 29 and 31 par-

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tially overlying the lock-receiving aperture 14 to provide means or edges for engaging the body 18 of the lock 16. These body engaging edges 29 and 31 are adapted to embrace the lock body 18 within recesses or grooves 30 and 33 provided on opposite sides of the lock body 18. The arched configuration of the head provides cam surfaces along the margins 29 and 31 of the clamping head 28, these cam surfaces enabling the retainer plate 26 to draw the lock assembly axially into mounted position on the panel 20.

Along one margin of the retainer plate 26 are two laterally extending engaging ears or tabs 32 and 34. These tabs are positioned opposite apertures 36 and 38, respectively, which are provided in the inner panel 37 of the door unit. When engaged by a tool such as a screw driver 40, the retainer plate 26 may be rotated to lock-receiving position (as in Figure 2), or likewise, to retaining position (as in Figure 3), as desired. By this arrangement the necessity of removing the inner panel 37 to disengage the mounting means is eliminated and mounting or dismounting of the lock structure on the panel is accomplished with great facility. Ears or tabs 32 and 34 preferably are recessed by having a concave or angular face so that positive engagement of the surface with a tool such as screw driver 40 is assured, as seen in Figure 3. Furthermore, by forming the tabs 32 and 34 in this manner, a stronger tab portion is provided. When the lock retainer is mounted on a vertical panel the retainer plate 26 is preferably mounted with the clamping head 28 overhanging the aperture 14. This insures retention of the lock structure in the panel by the retainer plate 26 despite vibrations and other forces which might tend to cause disengagement of the retainer member 26 from the lock body 18.

The base plate 12 is provided with stops 42 and 44 for limiting the pivotal movement of the retainer plate 26 relative to the base plate 12. Complementary locking detents 46 and 48 are provided on the base plate 12 and retainer plate 26, respectively, to releasably hold the locking plate in lock-receiving or locking position.

In operation, the retainer plate 26 is moved to lock-receiving position, as shown in Figure 2, to permit insertion of the lock body 18 through the apertures 22 and 14 in the outer panel and base plate, respectively. Shoulder or flange 17 of the lock body 18 engages the outer surface of the panel 20. A tool such as screw driver 40 is then inserted through aperture 36 and the retainer plate rotated about pivot 24 toward locking position. As rotation progresses, the inner margins 29 and 31 of the retainer plate 26 engage the shoulders provided by the recesses 30-33 in the lock body. The lock assembly is retained against rotative movement by the clamping action of the oppositely positioned engaging margins 29 and 31 of the clamping head 28 and the oppositely positioned grooves 30 and 33 of the lock body 18. The arched margins 29 and 31 of the clamping head 28 draw the lock structure axially to seat the flange 17 of the sleeve 18 against one surface of the panel and to retain the lock structure in this position.

Figure 6 shows another form of lock retainer 10a contemplated by the instant invention. Lock retainer 10a comprises a base plate 12a and a retainer plate 26a pivotally mounted on the base 12a by rivet member 24a. The margin of aperture 14a of the base plate 12a is provided with a series of spaced keyways or slots 56. The base plate 12a about the periphery of the aperture

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14a is provided with pairs of circumferentially extending arms 52 and 54 which have formed thereon portions adapted to coact with the edges of panel 20a defining keyways 56 for securing the base plate 12a to the panel 20a. Arms 54 are hook-shaped and adapted to be hooked over a radially extending edge of keyways 56 to engage both surfaces of panel 20a upon rotation of the base plate relative to the panel 20a, after which the L-shaped resilient arms 52 latchingly engage the opposite radially extending wall of the keyways 56. The arm 52 is necessarily resilient to permit engagement of the hook-shaped arm 54 with the panel 20a prior to the registration of the flange 58 of the L-shaped arm 52 with the keyways 56. Retainer plate 26a has a resilient arm 64 sheared or struck from the retainer plate. This resilient arm has a dimple or detent 66 which is adapted to engage a complementary portion 46a provided in the base plate 12a for holding the retainer plate in lock-receiving position. A second dimple similar to portion 46a, not seen in Figure 6, is engaged by detent 66 of the retainer plate to hold the plate in locked position relative to the base plate 12a.

In Figure 7 is shown the base plate 12 having a plurality of tabs 60 and 62 to engage opposite walls of keyways in the panel 20. This is a preferred form where the lock retainer is mounted on the panel by welding or the like. These lugs assure proper positioning of the lock retainer unit 10 on the panel 20 and thereby facilitate the subsequent welding of the unit to the panel.

From the foregoing it will be apparent that the present invention contemplates a lock retainer of extremely simple and practical construction which is adapted to retain a lock structure on an apertured panel. The provision of engaging tabs or arms 32 or 34 on the retainer plate 26 and apertures 36 and 38 in the inner panel affords simple means for operating the lock retainer structure when it is secured to the panel and eliminates the burden of gaining access to the back structure by removal of panel sections etc. The arching of the clamping head of the retainer plate provides a very sturdy clamping head, and at the same time provides the cam surfaces essential for securing the lock against axial movement on the panel. The C-shaped construction of the clamping head affords positive locking of the fastener against rotative movement relative to the panel. The lock retainer mounting provides a unit which remains in operative position at all times, and in addition, precludes the possibility of unauthorized dislodgment of the lock by vibration, tampering or jarring.

For purposes of illustration, one practical application of the retainer device has been shown, namely, the application thereof to cylindrical or pillar locks. Obviously, the invention is not restricted to use in this particular field, but is capable of many other practical applications. It is to be understood that this invention should be limited only by the scope of the appended claims.

The invention is hereby claimed as follows:

1. In a structure including spaced apart panels having at least one set of adjacent edges joined, one of said panels having an aperture therein to receive a lock structure, a fastener for securing said lock structure in said apertured panel comprising a retainer plate pivotally mounted with respect to said apertured panel, said retainer plate including means for engaging the lock structure to retain the lock structure in mounted position on said panel, and tool engaging means on

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said lock engaging means, said tool engaging means being positioned adjacent one of the panels whereby a tool may be inserted through an apertured portion of the panel to engage said tool engaging means and to move said lock engaging means into engaging position and out of engaging position.

2. In a structure including spaced apart panels having at least one set of adjacent edges joined, one of said panels having an aperture therein to receive a lock structure, a fastener for securing said lock structure in said apertured panel comprising a base plate mounted on the inner side of said apertured panel, said base plate having an opening in registration with the aperture in the panel for receiving the lock structure; means pivotally mounted on said base plate for engaging the lock structure to retain the lock structure in mounted position on the panel; and tool engaging means on said lock engaging means, said tool engaging means being positioned adjacent one of the panels whereby a tool may be inserted through an apertured portion of the panel to engage said tool engaging means and to move said lock engaging means into engaging position and out of engaging position.

3. In a structure including spaced apart panels having at least one set of adjacent edges joined, one of said panels having an aperture therein to receive a lock structure, a fastener for securing said lock structure in said apertured panel comprising a base plate mounted on the inner side of said apertured panel, said base plate having an opening in registration with the aperture of the panel, a retainer plate pivotally mounted on said base plate so as to be shiftable in parallelism with the plane of said base plate, said retainer plate including a clamping head adapted to embrace the lock structure to hold the lock structure on the panel, a tool engaging portion mounted on said retainer plate on each side of the pivot point of said retainer plate, said tool engaging portions being positioned adjacent one of the panels to engage a tool inserted through an apertured portion of the panel whereby to move said retainer plate to the lock retaining position when one of said tool engaging portions is acted upon and to move said retainer plate to the disengaging position when the other of said tool engaging portions is acted upon.

4. In a structure including spaced apart panels having at least one set of adjacent edges joined, one of said panels having an aperture therein to receive a lock structure, a fastener for securing said lock structure in said apertured panel comprising a base plate mounted on the inner side of said apertured panel, said base plate having an opening in registration with the aperture in the panel for receiving the lock structure, a C-shaped clamping head pivotally mounted on said base plate adapted to embrace flattened portions and engage shoulder portions of the lock structure to retain the lock structure in fixed position upon the panel, said head being transversely arched and presenting cam surfaces to retain said lock structure against axial movement relative to the panel, and tool engaging means on said clamping head, said tool engaging means being positioned adjacent one of the panels whereby a tool may be inserted through an apertured portion of the panel to engage said tool engaging means and to move said clamping head into engaging position and out of engaging position.

5. In a structure including spaced apart panels

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having at least one set of adjacent edges joined, one of said panels having an aperture therein to receive a lock structure, a fastener for securing said lock structure in said apertured panel comprising a base plate mounted on the inner side of said apertured panel, said base plate having an opening in registration with the aperture in the panel for receiving the lock structure, a retainer plate pivotally mounted on said base plate, said retainer plate including a clamping head adapted to embrace flattened portions and to engage shoulder portions of the lock structure to prevent axial and rotative movement of the lock structure relative to the panel, and tool engaging means on said retainer plate, said tool engaging means being positioned adjacent one of the panels whereby a tool may be inserted through an apertured portion of the panel to engage said tool engaging means and to move said retainer plate into engaging position and out of engaging position.

6. In a structure including spaced apart panels having at least one set of adjacent edges joined, one of said panels having an aperture therein to receive a lock structure, a fastener for securing said lock structure in said apertured panel comprising a base plate mounted on the inner side of said apertured panel, said base plate having an opening in registration with the aperture in the panel for receiving the lock structure, a retainer plate pivotally mounted on said base plate, shoulder means on said base plate to limit pivotal movement of said retainer plate relative to said base plate, said retainer plate including a clamping head adapted to embrace flattened portions and to engage shoulder portions of the lock structure to prevent axial and rotative movement of the lock structure relative to the panel, and tool engaging means on said retainer plate, said tool engaging means being positioned adjacent one of the panels whereby a tool may be inserted through an apertured portion of the panel to engage said tool engaging means and to move said retainer plate into engaging position and out of engaging position.

7. In a structure including spaced apart panels having at least one set of adjacent edges joined, one of said panels having an aperture therein to receive a lock structure, a fastener for securing said lock structure in said apertured panel comprising a base plate mounted on the inner side of said apertured panel, said base plate having an opening in registration with the aperture in the panel for receiving the lock structure, a retainer plate pivotally mounted on said base plate, said retainer plate including a clamping head adapted to embrace flattened portions and to engage shoulder portions of said lock structure to retain said lock structure in fixed position on said panel, complementary means on said retainer plate and said base plate which coast releasably to retain said plates in relative position to each other, and tool engaging means on said retainer plate, said tool engaging means being positioned adjacent one of the panels whereby a tool may be inserted through an apertured portion of the panel to engage said tool engaging means and to move said retainer plate into engaging position and out of engaging position.

8. In a fastener for securing a lock structure in an apertured panel including an apertured base plate and a C-shaped retainer plate pivotally mounted thereon, laterally extending tab means formed on the base plate, said tab means being adapted to extend into the aperture formed

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in the panel and to engage edges of the aperture in the panel for mounting the base plate on the panel.

9. In a fastener for securing a lock structure in an apertured panel including an apertured base plate and a C-shaped retainer plate pivotally mounted thereon, laterally extending hook shaped arm means formed on the base plate, said arm means being adapted to engage the front and rear surfaces of the panel adjacent the aperture therein for mounting the base plate on the panel.

10. A fastener for securing a lock structure in an apertured panel and comprising a base plate having an opening for registration with the panel aperture, a retainer plate pivotally mounted on said base plate for movement in parallelism with the plane of the said base plate, said retainer plate including a C-shaped clamping head disposed at one side of the pivotal connection between the retainer plate and the base plate and adapted to engage shouldered portions of the lock structure to retain the same in fixed position, said head being transversely arched and presenting cam surfaces to retain the lock structure against axial movement, and means providing tool engaging surface portions disposed on opposite sides of the pivotal connection between the retainer plate and the base plate in relative positions such that selective pressure on one or the other of said tool engaging surface portions

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will shift the retainer plate and clamping head into or out of lock engaging position.

11. A fastener as claimed in claim 10, wherein the tool engaging surface portions are recessed to enable positive engagement of a tool therewith for shifting the retainer plate.

12. A fastener as claimed in claim 11, wherein the recessed tool engaging surface portions are provided on tabs extending laterally from the plane of the retainer plate.

OUGLJESA JULES POUPITCH.

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