United States Patent [19]

Colombo et al.

[11] **3,763,673**

[45] **Oct. 9, 1973**

[54] **CHAIN DOOR LOCK**

[75] Inventors: **Gregory R. Colombo,** Stillwater; **Russell W. Waldo,** St. Paul, both of Minn.

[73] Assignee: **Ideal Security Hardware Corporation,** St. Paul, Minn.

[22] Filed: **May 4, 1972**

[21] Appl. No.: **250,120**

[52] **U.S. Cl.** **70/93,** 70/370, 70/DIG. 57

[51] **Int. Cl.** **E05b 65/06,** E05c 17/36

[58] **Field of Search** 70/93

[56] **References Cited**

UNITED STATES PATENTS

3,161,035	12/1964	Adamec et al.	70/93
3,395,556	8/1968	Waldo	70/93
3,640,106	2/1972	Lorincz	70/93

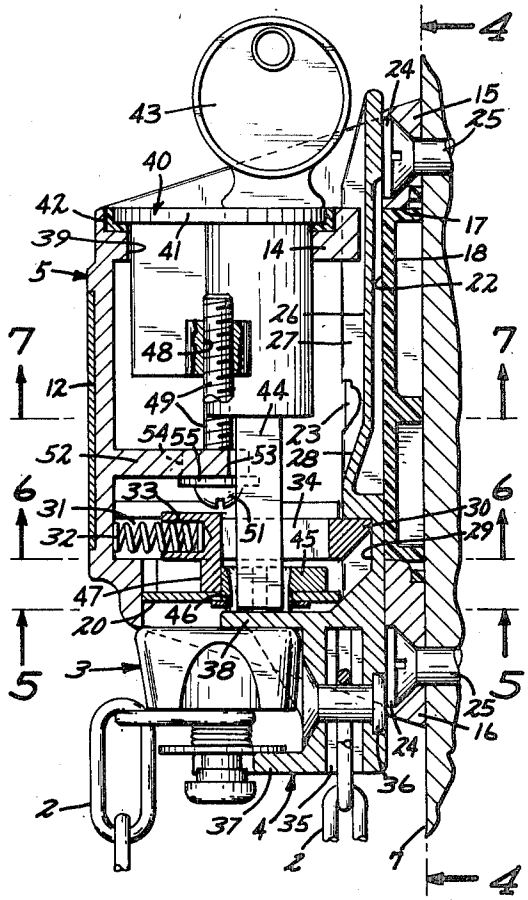
Primary Examiner—Albert G. Craig, Jr.

Attorney—Ralph F. Merchant et al.

[57] **ABSTRACT**

A chain lock for doors, including a housing defining a passage for movement of a locking slide connected to one end of a chain. A latch bolt in the housing is movable toward and away from locking engagement with the slide. A key-equipped lock is mounted in the housing for operating the latch bolt.

8 Claims, 9 Drawing Figures



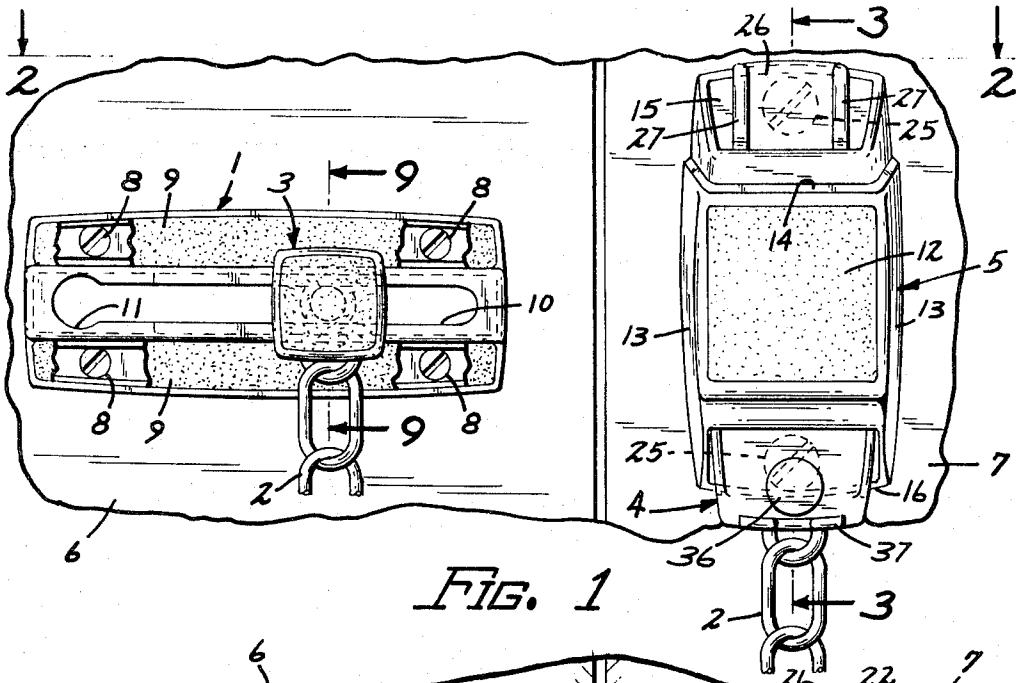


FIG. 1

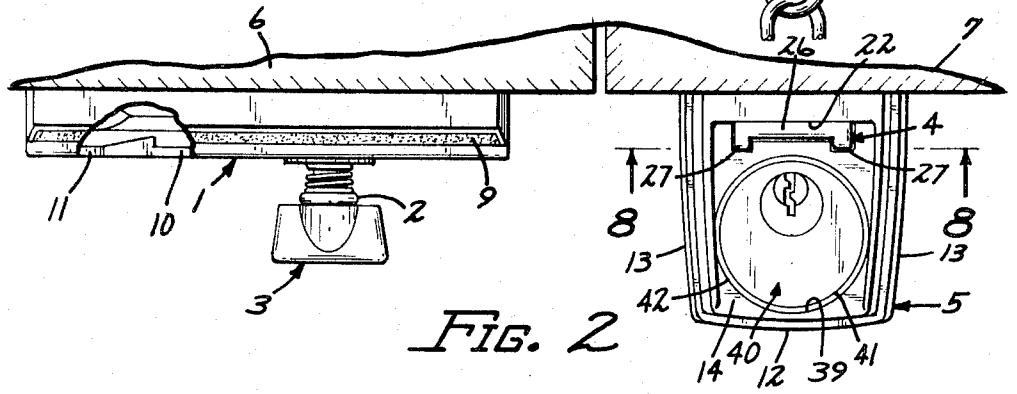


FIG. 2

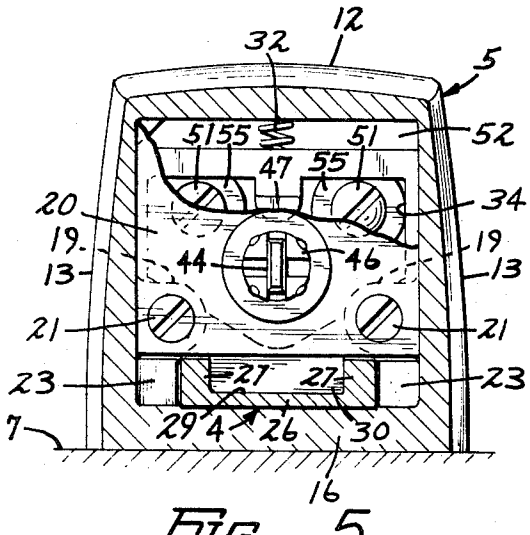


FIG. 5

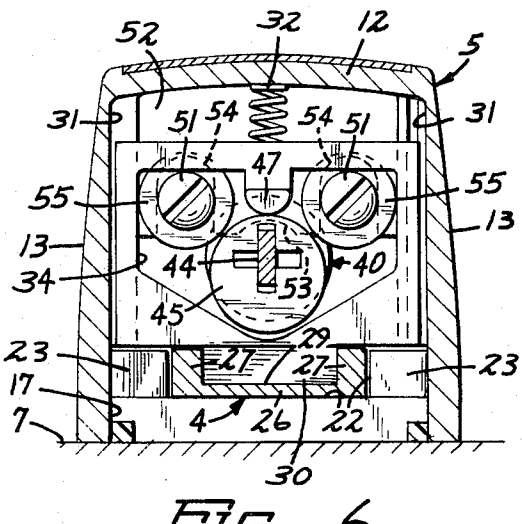


FIG. 6

FIG. 3

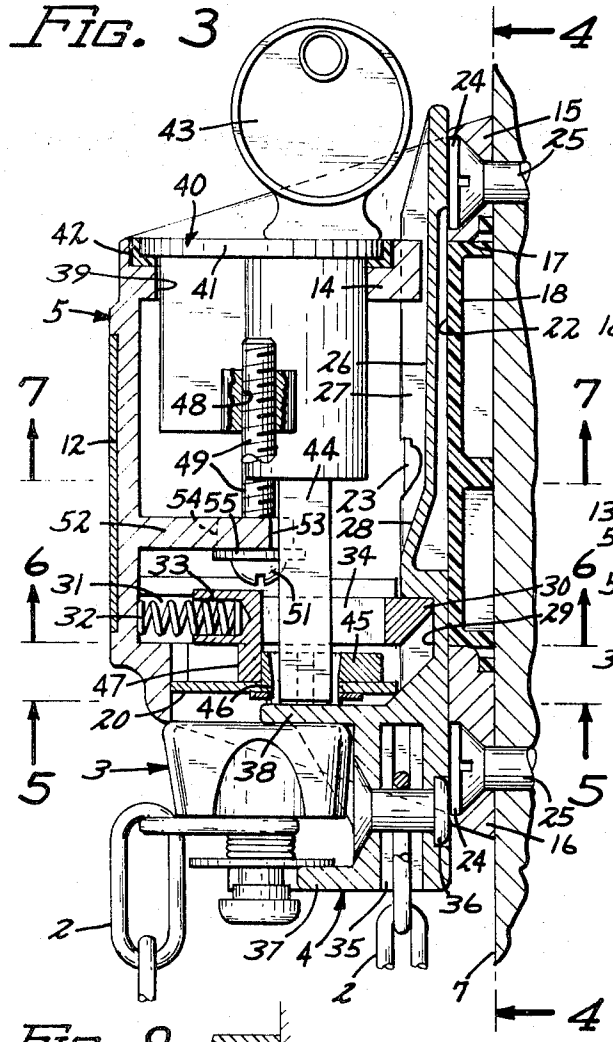


FIG. 4

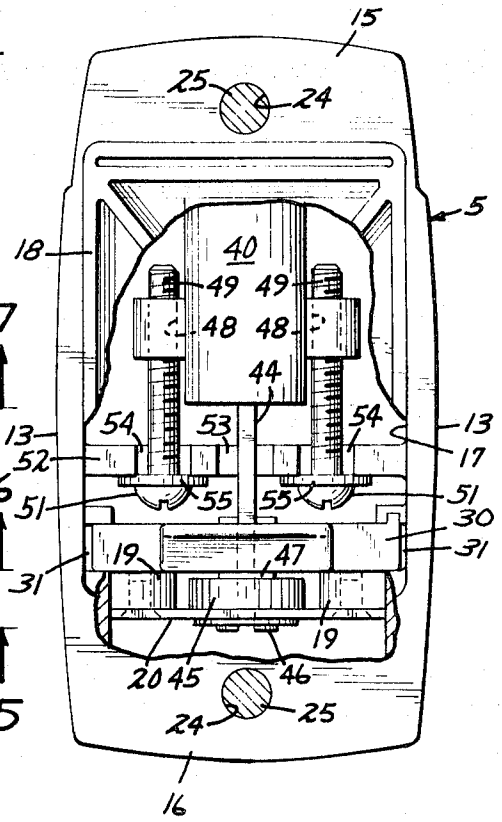


FIG. 9

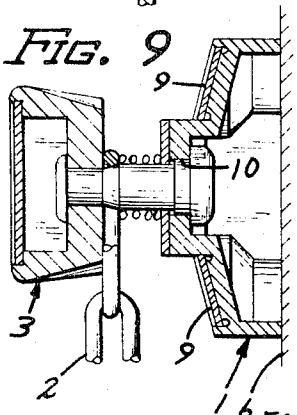


FIG. 7

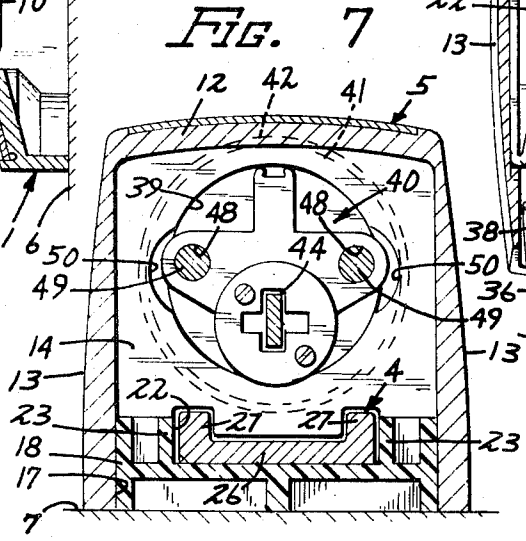
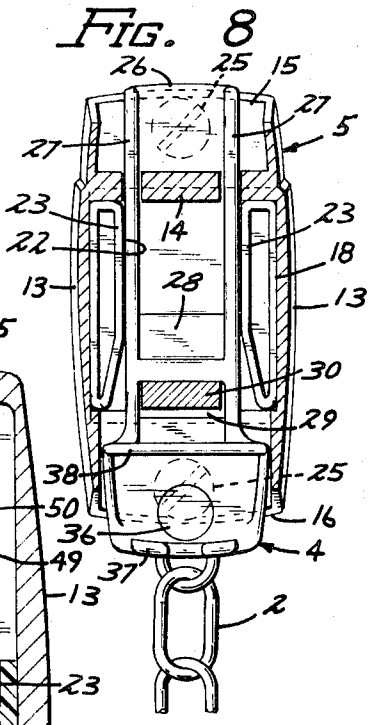


FIG. 8



CHAIN DOOR LOCK

BACKGROUND OF THE INVENTION

This invention constitutes an improvement over chain door locks generally of the type disclosed in U. S. letters Pat. No. 3,161,035 to Adamec et al., and U.S. Pat. No. 3,395,556 to Waldo. Chain door locks of these types have cylinder locks therein of a design adapted for screen or storm doors, cabinet doors, automobile doors and the like. These locks are known as wafer-type locks and are not adapted for re-keying. Further, when it is desired to replace the cylinder lock, it is difficult to find a replacement, inasmuch as this type of cylinder lock is not usually available at hardware stores and similar retail outlets.

SUMMARY OF THE INVENTION

An important object of this invention is the provision of a door chain lock having a housing which can accomodate cylinder locks of various makes and of a different type than heretofore.

Another object of this invention is the provision of a door chain lock in which, in a locked position, all of the mounting screws for various portions of the lock mechanism are covered and inaccessible.

Still another object of this invention is the provision of a door chain lock in which a cylinder lock may be quickly and easily removed from the chain lock unit housing thereof, for adjustment or replacement, by an authorized person without removing the housing from the wall or door on which it is mounted.

To the above ends, we provide a housing having an arrangement for securing the same to a door or a wall adjacent the door, the housing having a passage therethrough for reception of a locking slide. The housing has an open end and a cylinder lock receiving opening in an end wall opposite the open end, the opening being disposed laterally outwardly of one end of the slide lock passage. A cylinder lock, mounted in the housing, is secured by screws accessible only from the open end of the housing. A latch bolt engaging the locking slide to hold the same in the passage, is slidably mounted in the housing, and is moved in one direction by a cam operated by the cylinder lock. The cam is supported by a cover element mounted in the open end of the housing and secured therein by a pair of screws that are normally covered and rendered inaccessible by a laterally projecting flange on the locking slide, when the locking slide is locked in the passage. With this arrangement, an intruder cannot open a door sufficiently wide to gain entrance without a key to unlock and unlatch the locking slide, short of breaking the door or door frame. Further, the use of a housing adapted to contain a conventional pin-type cylinder lock, enables the user to have the lock adjusted for use with the same key that is used with the regular door lock.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary view in side elevation of a door and door frame showing the door chain lock of this invention mounted thereon.

FIG. 2 is a view partly in top plan and partly in section, taken on the line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary vertical section taken substantially on the line 3—3 of FIG. 2;

FIG. 4 is a view in rear elevation, as seen from the line 4—4 of FIG. 3, some parts being removed, some parts being broken away and some parts being shown in section;

FIGS. 5 and 6, sheet 1, are transverse sections taken substantially on the line 5—5 and 6—6 respectively of FIG. 3;

FIG. 7 is a transverse section taken substantially on the line 7—7 of FIG. 3;

FIG. 8 is a view partly in elevation and partly in longitudinal section, taken substantially on the line 8—8 of FIG. 2; and

FIG. 9 is an enlarged transverse section taken on the line 9—9 of FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference particularly to FIGS. 1 and 2, it will be seen that our chain lock comprises a plate member 1, a link chain 2, a coupler element 3 connected to one end of the chain 2, an elongated locking slide 4 secured to the opposite end of the chain 2, and a housing 5. The plate member 1 and housing 5 provide means for operatively connecting opposite ends of the chain 2 to a door 6 and door frame 7 respectively.

The plate member 1 is in the form of an elongated generally rectangular housing having opposite longitudinal side portions that are drilled to receive mounting screws or the like 8 by means of which the plate member 1 is secured to the inner surface of the door 6. Preferably, the heads of the screws 8 are hidden by decorative strips 9 secured to the plate member 1 by suitable adhesives. The plate member 1 is formed to provide a longitudinally extending slot 10 having an enlarged portion 11 at its end remote from the adjacent edge of the door 6, for reception of the coupler element 3. The coupler element 3 is constructed to enter the slot 10 only at the enlarged end 11 and to be moved longitudinally of the slot 10. The plate member 1 and coupler element 3 are similar to those disclosed in U.S. letters Pat. No. 3,275,364, issued to Bert A. Quinn.

The housing 5 is formed to provide an outer or front wall 12, opposite side walls 13, a top wall 14, upper and lower rear wall portions 15 and 16 respectively which cooperate with the rear edges of the side walls 13 to define an opening 17, and a rear wall insert member 18 disposed in the opening 17. Forwardly of the rear wall portions 15 and 16 and insert member 18, the housing 5 defines an open bottom. Adjacent the opening bottom, the housing side walls 13 are formed to provide laterally inwardly projecting lugs 19 which overlie opposite side edge portions of a cover plate 20 that is rigidly but releasably secured in the open bottom portion of the housing by a pair of machine screws 21 extending upwardly through suitable apertures in the cover plate 20 and screw threaded into threaded openings in the lugs 19. With reference to FIG. 5, it will be seen that the screws 21 are disposed adjacent the rear edge portion of the cover plate 20.

The rear edge of the cover plate 20, the top wall 14, rear wall portions 15 and 16, and the rear wall insert member 18 cooperate to define a vertically elongated passage 22 for the locking slide 4. As shown in FIGS. 7 and 8, the rear wall insert member 18 is formed to provide laterally spaced longitudinal ribs 23 that cooperate with the other wall portions to define the passage 22. With reference particularly to FIGS. 3 and 4, it will be seen that the upper and lower rear wall portions 15 and 16 respectively are provided with countersunk

openings 24 for reception of mounting screws or the like 25 that are screw threaded into the door frame 7 to rigidly secure the housing 5 to the door frame 7.

The locking slide 4 is formed to provide an elongated tongue 26 and laterally spaced side flanges 27 extending longitudinally from one end of the locking slide 4 toward the other end thereof. The rear end of the tongue 26 is formed to provide a cam portion 28. Further, the locking slide 4 defines a cavity 29 in longitudinally spaced relation to the cam portion 28 for reception of a latch bolt 30 that is mounted in guideways 31 in the housing sidewalls 13 for forward and rearward movements respectively out of and into latching engagement with the locking slide 4. A coil compression spring 32 having one end engaging the inner surface of the housing front wall 12 and its opposite end disposed in a recess 33 in the latch bolt 30 yieldingly urges the latch bolt 30 toward the rear wall insert portion 18 for latching reception in the cavity 29 of the locking slide 4. The latch bolt 30 is formed to provide an enlarged opening 34 therethrough, for a purpose which will hereinafter become apparent. As shown particularly in FIG. 3, the end of the locking slide 4, opposite the tongue 26 thereof, is formed to provide a longitudinally outwardly opening recess 35 for reception of the adjacent end link of the chain 2, the chain 2 being secured by a rivet 36. A notched flange 37 projects transversely of the adjacent end of the locking slide 4, and a second flange 38 projects laterally outwardly from the locking slide 4 in spaced parallel relation to the notched flange 37, and adjacent the cavity 29. As shown in FIG. 3, the space between the flanges 37 and 38 is adapted to receive the coupler element 3 to hold the same in a storage position, when the door 6 is unlocked. When the locking slide 4 is latched within the passage 22 of the housing 5, the flange 38 underlies the cover plate mounting screws 21 and renders the screw inaccessible. It will be further noted that, when the locking slide 4 is latched within the passage 22, the locking slide 4 covers the heads of the mounting screws 25, so that these screws are inaccessible for removal by an intruder.

The top wall 14 of the housing 5 is formed with a counterbored opening 39 laterally outwardly of the passage 22 for reception of a conventional flanged cylinder lock 40. The lock 40 is known as a pin lock of the type usually used in doors and readily available at hardware stores and other stores dealing with building materials and the like. The lock 40 is formed at its upper end with the usual flange 41 that rests within the counterbored portion of the opening 39. Depending on the particular make or brand of cylinder lock 40, a flanged washer or bushing 42 may be used to provide a flush mounting for the flange portion 41 of the cylinder lock 40, see FIG. 3. The lock 40 is provided with the usual key 43, and a spindle 44 that extends downwardly from the lock 40 through the opening 34 in the latch bolt 30, the lower end of the spindle 44 being connected to a cam or eccentric 45 having a portion 46 that is journaled in a suitable opening in the cover plate 20. The eccentric 45 engages a cam follower portion 47 that depends from the latch bolt 30 adjacent the opening 34 thereof, the arrangement being such that rotation of the eccentric or cam 45 by means of the key 43 will impart retracting movements to the latch bolt 30 from the locking slide cavity 29 against yielding bias of the spring 32.

The lock 41 is formed to provide a pair of laterally spaced parallel screw threaded openings 48 for reception of anchoring screws 49. Most cylinder locks of the pin type referred to above have such openings. While these openings 48 may vary somewhat in lateral spacing, they are usually disposed within an area defined by the flange 41. In many instances, the openings 48 are disposed within the area defined by the opening 39. However, to provide for the widest spacing of the openings 48 and portion of lock outwardly of the openings 48, the body opening 39 is enlarged, as indicated at 50 in FIG. 7. The anchoring screws 49 have washer equipped heads 51 that are disposed in underlying operative engagement with a generally horizontal partition 52 projecting rearwardly from the front wall 12 of the housing 5 and extending between the side walls 13 thereof. The partition 52 is formed to provide a central rearwardly opening notch 53 which provides clearance for rotary movement of the lock spindle 44, and a pair of laterally spaced rearwardly opening notches 54 for reception of the screws 49. With reference particularly to FIGS. 4–6, it will be seen that the notches 54 are of substantially greater depth and width than the diameters of the anchoring screws 49 to provide for substantial variation in the location and spacing of the anchoring screws 49. The anchoring screw washers, indicated at 55, are of sufficient size to engage the under surface of the partition 52 at different positions of the screws 49 laterally of the partition 52.

It will be noted that access is had to the anchoring screws 49 with a tool for removing the same only through the open bottom or lower end of the housing 5, and only when the cover plate 20 and latch bolt 30 are removed from the housing 5. Thus, should the door 6 be opened to the limit permitted by the chain 2, an intruder cannot gain access to the mounting screws 25, cover plate mounting screws 21, or anchoring screws 49 with a screwdriver. When it is desired for any reason to remove the cylinder lock 40, it is only necessary to move the locking slide 4 longitudinally outwardly from the passage 22, unscrew the cover plate mounting screws 21 and remove the cover plate 20 and eccentric cam 45. Access is then had to the heads of the anchoring screws 49 through the opening 34 in the latch bolt 30, as shown particularly in FIGS. 5 and 6. With the screws 49 removed from their respective threaded openings 48, the cylinder lock 40 may be lifted outwardly from the opening 39 and adjusted or replaced, as desired.

While we have shown and described a commercial embodiment of door chain lock, it will be understood that the same is capable of modification without departure from the spirit and scope of the invention, as defined in the claims.

What is claimed is:

1. A door chain lock including a chain and fastening means for securing said chain to a door and a door frame to permit limited opening of the door, one of said fastening means comprising:

a. housing means having a rear wall for mounting against one of said door and door frame and defining a longitudinal passage therethrough generally parallel with said rear wall, said housing means having one open end and an opposite end wall having an opening therethrough to the interior of the housing means laterally spaced from said passage;

b. locking mechanism including a key operated lock in said opening, and a latch bolt in said housing means for movements transversely of said passage toward and away from said rear wall;

c. yielding means urging said latch bolt toward said rear wall;

d. an elongated locking slide having one of its opposite ends secured to said chain, said locking slide being movable longitudinally into and out of said passage at said open end of the housing means, and including:

1. a longitudinally extending tongue at its other end for movement longitudinally in said passage,

2. a latch bolt engaging cam surface longitudinally inwardly of said tongue,

3. and a latch bolt receiving cavity between said cam surface and the chain mounted end of the locking slide;

e. a cover element disposed to close the open end of said housing means laterally of the adjacent end of said passage;

f. releasable means securing said cover element to said housing in the open end thereof;

g. said lock mechanism including a latch bolt engaging cam and a cooperating spindle operated by said lock for imparting latch bolt retracting movement to said cam responsive to predetermined movement of a key in said lock;

h. and screw means operatively engaging said housing means and said lock to anchor said lock in said opening, said screw means being disposed to be accessible only through said open end of the housing means and when said cover element is removed from said open end.

2. The door chain lock defined in claim **1** in which said housing means includes a transversely extending partition portion operatively engaging said screw means, said screw means comprising a pair of anchoring screws extending in directions generally parallel to said passage and screw threaded into said lock, said screws being shiftable laterally with respect to said partition portion when loosened.

3. The door chain lock defined in claim **2** in which said partition portion defines a pair of notches each receiving a different one of said anchoring screws, said notches having substantially greater transverse dimensions than said screws.

4. The door chain lock defined in claim **2** in which said housing means includes a pair of laterally spaced interior anchoring bosses adjacent said open end for engagement with said cover element, said bosses having screw threaded openings, therein, said cover element having openings each aligned with a different one of said threaded openings, and mounting screws extending through said cover element openings and screw threaded in said threaded openings.

5. The door chain lock defined in claim **4** in which said locking slide includes a transverse flange adjacent said cavity, said flange being disposed to cover said mounting screws exterior of said cover element when said locking slide is positioned to receive the latch bolt in said cavity.

6. The door chain lock defined in claim **1** in which said cover element defines an opening, said cam including a boss portion journalled in said cover element opening.

7. The door chain lock defined in claim **1** in which said releasable means comprises a pair of laterally spaced screws extending inwardly through said cover element, said locking slide including a transverse flange disposed to cover said screws exterior of said cover element when said locking slide is positioned to receive the latch bolt in said cavity.

8. The door chain lock defined in claim **7** in which said fastening means further includes a locking plate member having a portion for mounting against the other one of said door and door frame, and a coupler element secured to said chain in longitudinally spaced relationship to said locking slide, said coupler element being disposed to be releasably locked to said locking plate, said locking slide including a second flange in longitudinally outwardly spaced generally parallel relation to said transverse flange for reception of said coupler element in a storage position between said flanges.

* * * * *