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Canfield

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[54] **CHAIN-TYPE DOOR FASTENING DEVICE**

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[52] **U.S. Cl.** **292/264**

[51] **Int. Cl.** **E05c 19/08**

[58] **Field of Search** 292/262, 264; 70/93

[56] **References Cited**

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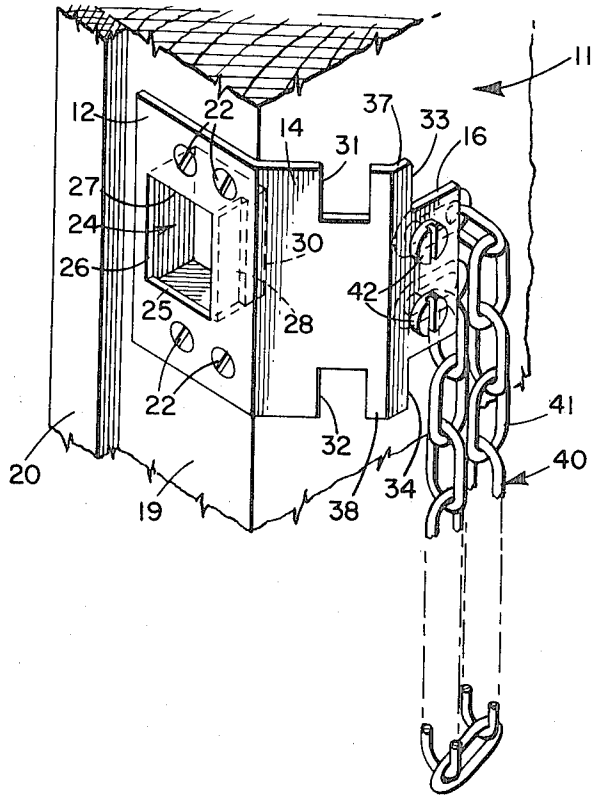
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[57] **ABSTRACT**

A chain-type door fastening device mounted on the door jamb and integrated into the strike plate assembly of the conventional door knob and latch. The chain-type door lock comprises a loop of chain that can be slipped over the door knob when the door is closed, allowing the door to be opened a few inches so the occupant can scrutinize a caller. However, there is also provided a chain locking means in the form of a pawl for engaging a link of the chain to shorten the loop of chain when the door is closed, thereby precluding the opening of the door even if the other latch is opened.

8 Claims, 3 Drawing Figures



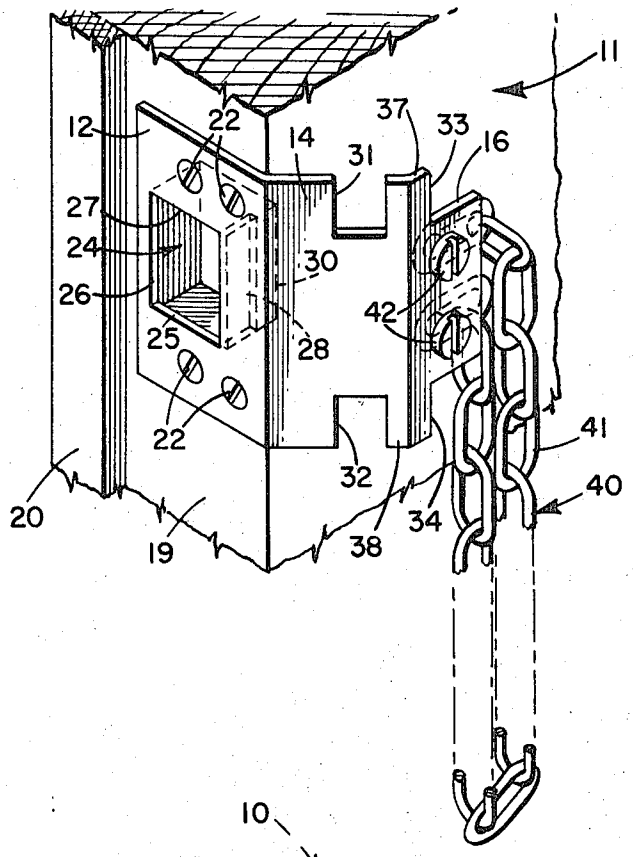

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FIG. 1

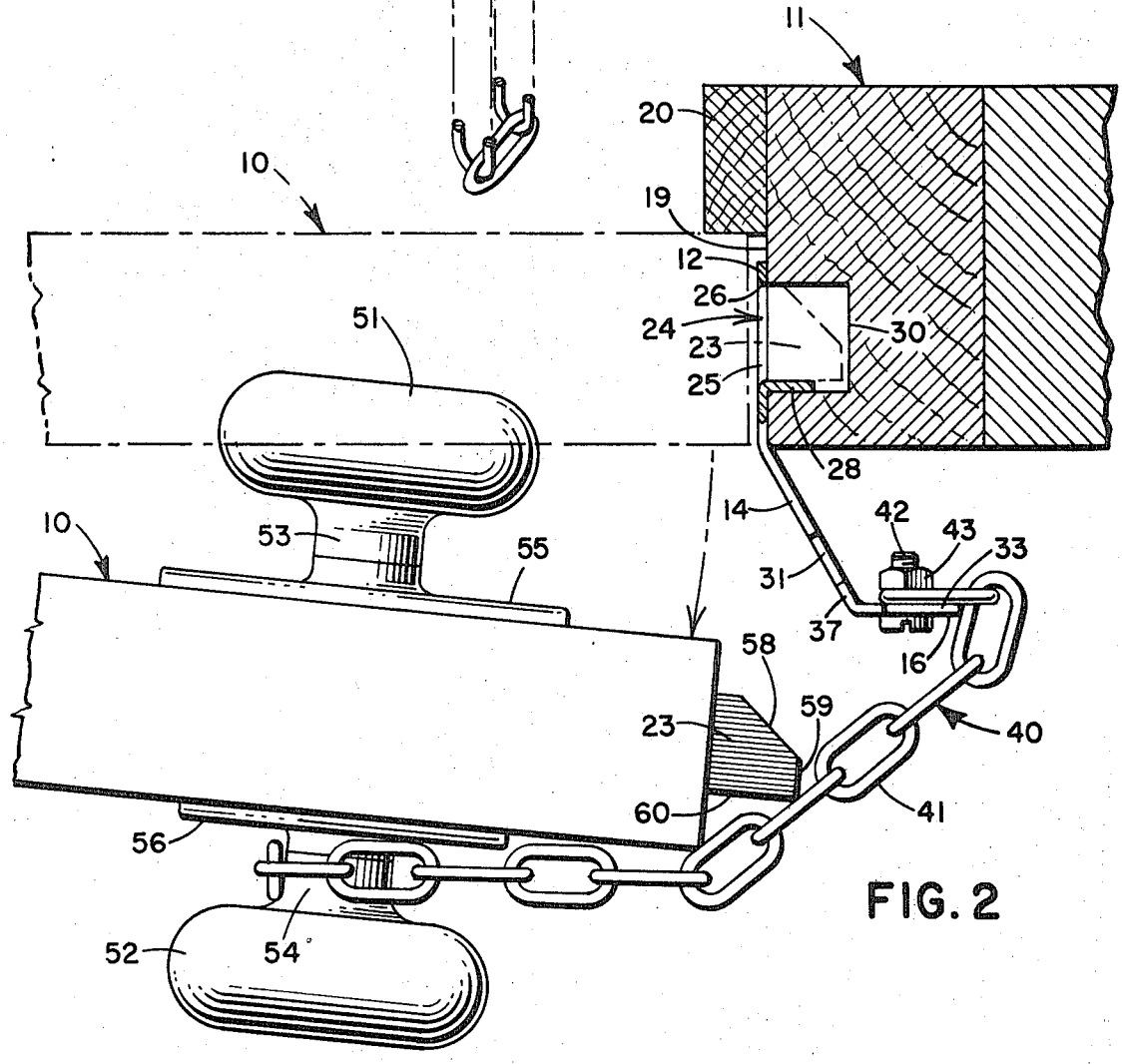

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FIG. 2

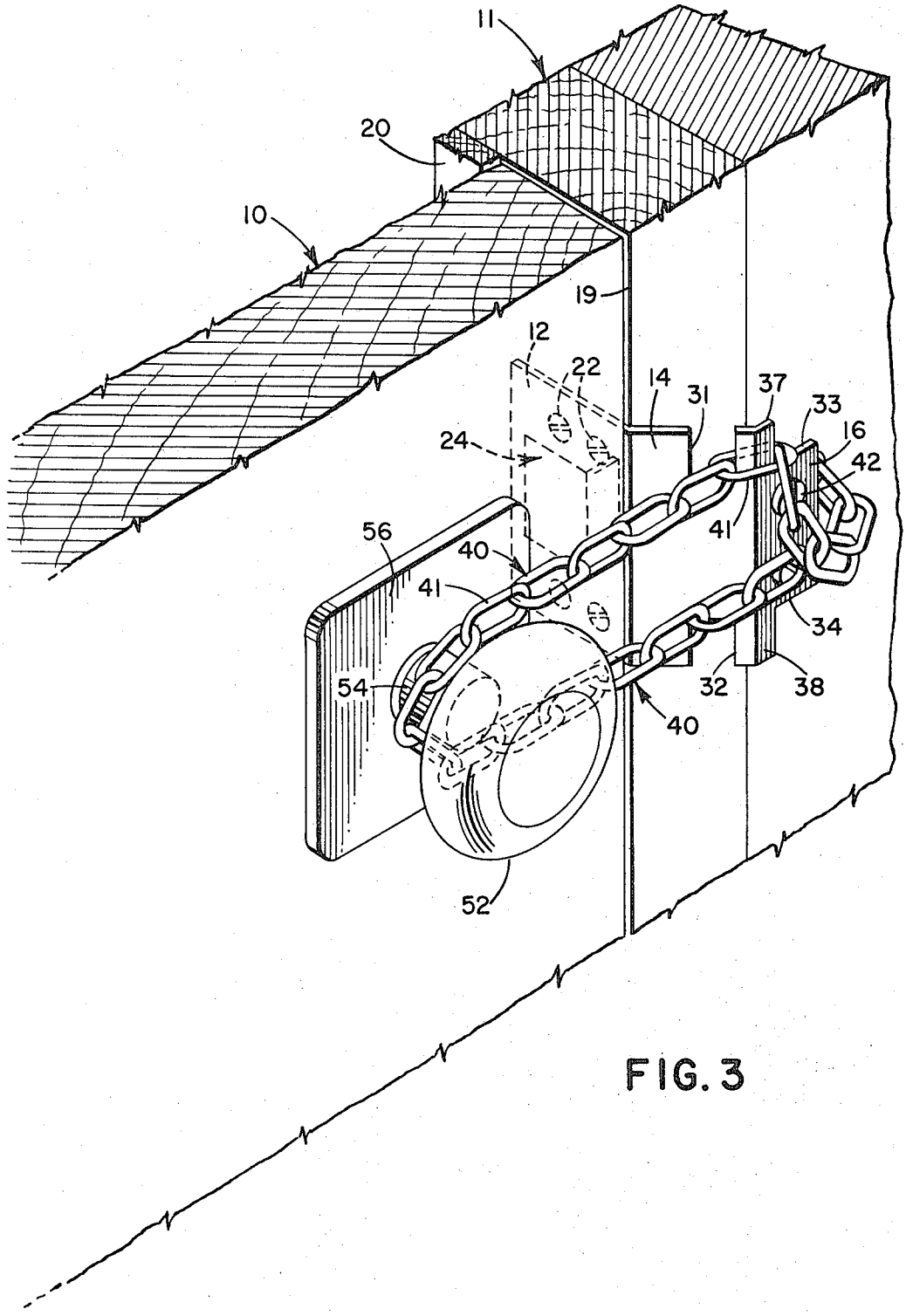


FIG. 3

CHAIN-TYPE DOOR FASTENING DEVICE

BACKGROUND OF THE INVENTION

This invention pertains generally to door locking systems and more particularly to chain-type door fastening means.

In order to provide optimum security for the occupant of a room it is necessary that a door be equipped with three locking systems:

1. A conventional door knob operated lock having a latch spring biased to the engaged position and movable to the disengaged position by operating the door knob. These latches typically are key-lockable, and the latch engages a strike plate installed in the door jamb.

2. A dead-bolt type lock on the inside of the door. This lock is not operable from outside of the room.

3. A safety chain that allows the occupant to open the door a few inches to allow the occupant to see and converse with a caller, without allowing the door to be forced completely open.

The requirement for the above three types of locks is particularly true in hotels, motels and like establishments. In the past, it has been common to attach to the doors of such commercial establishments three separate locking means for performing the above three functions. Such an arrangement is expensive to install and maintain, and the occupant must concern himself with the three separate devices.

Furthermore, travelers are concerned with providing a positive, tamper proof lock on the door of a commercial establishment. Quite often, dead-bolts are not installed, or are inoperable, or a type of bolt lock is used that can actually be opened by the management. In this case, entry can be gained by use of a stolen master key, for example. While the prior art has portable devices for positively locking doors from the inside, such as wedges and poles, these can easily be improperly installed, and thus their effectiveness is questionable.

SUMMARY OF THE INVENTION

The chain-type door fastening device of this invention performs the function of both a dead-bolt lock and a safety chain. It can also be presented as a portable unit that can be easily temporarily installed and removed.

The device constructed in accordance with this invention comprises a plate which is attached to the door jamb and which may be integral with the normal strike plate that is engaged by the door knob operated latch. Attached to the plate is a loop of chain of such length as to allow it to be slipped over the door knob when the door is closed. Then, when the door is opened, the chain is pulled taut about the stem of the door knob, allowing the door to be opened an amount sufficient to allow the occupant to see and converse with a caller. Also installed on the plate is a lock means that can be engaged by one of the links of the chain. Thereby, when the door is completely closed, the slack in the chain that would otherwise be present and allow the door to be opened slightly can be removed by pulling the chain taut and engaging the locking means with the appropriate link in the chain. In other words, the length of the loop is shortened. Thus, the door cannot be opened from the outside even if the knob operated latch were released.

This invention is easily installed and can be used with most doors. It functions as and replaces two elements: the dead-bolt lock and the safety chain. It is simple and effective, yet requires no maintenance. In its portable form it supplements existing locking devices.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a preferred embodiment of the invention integrated with the strike plate;

FIG. **2** is a top view, partially in section, showing the device of FIG. **1** in one of the operating conditions; and

FIG. **3** is a perspective view of the device of FIG. **1** in the other operating condition.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention is described with regard to a conventional door **10** and door frame **11.** The invention comprises a strike plate **12,** a lock plate **14,** and a chain attachment plate **16.** A chain, the details of which are explained below, is attached to chain plate **16.**

The conventional door frame **11** includes a door jamb surface **19** faced with a molding strip **20.** Normally, a conventional strike plate (not shown) would be installed in door jamb **19.** Strike plate **12** of the inventive device replaces the conventional strike plate and duplicates the functions thereof. Strike plate **12** is of rectangular shape and is provided with a plurality of openings through which screws **22** pass to attach the inventive device to door jamb surface **19.** Strike plate **12** is also provided with an opening **24** for engaging the conventional door knob operated latch **23.** Opening **24** typically presents on three sides edges **25, 26** and **27** on the fourth side a flange **28** perpendicular to opening **24** which the door latch engages. Adjacent to opening **24,** cut into door jamb surface **19,** is a box-like recess **30** for receiving latch **23.** It should be understood that strike plate **12** can be of other designs, as necessary to accommodate other types of door latches.

A lock plate **14** is attached to or integral with strike plate **12.** Lock plate **14** is at an angle to strike plate **12** outwardly of the door opening in order to engage and cam inwardly the door latch **23,** and also in order to space chain plate **16** outwardly of the door opening so that chain **40** is not easily caught between door **10** and frame **11.**

Chain plate **16** is attached to or integral with lock plate **14.** Lock plate **14** is provided with a pair of cut-out portions **31** and **32,** and chain plate **16** is provided with a pair of cut-out portions **33** and **34,** adjacent of these openings defining upstanding chain shortening and fastening pawls **37** and **38.** The size and shape of pawls **37** and **38** accommodate the link **41** of chain **40.** Pawl **37** is used when the device is installed on doors opening to the left, and pawl **38** on doors opening to the right, with the entire device being turned around.

A loop of chain **40** having a plurality of links **41** is attached to chain plate **16** by means such as a pair of screws **42** extending through openings in chain plate **16** and secured by nuts **43.** Chain **40** must be at least of such length as to slip over knob **52.**

A complete understanding of the invention can best be grasped by a discussion of the operation of the device. First of all, looking to FIG. **2,** a door **10** is pro-

vided with a conventional lock set including door knobs **51** and **52** having neck portions **53** and **54,** and being mounted respectively on knob plates **55** and **56.** Door knobs **51** and **52** are interconnected with each other and operate latch **23** in the conventional manner. Likewise, in conventional manner, latch **23** is provided with an inclined surface **58,** an end surface **59,** and a side surface **60.** Conventionally, latch **23** is spring-loaded to the position shown in FIG. **2.**

In order to utilize the inventive device, the door **10** is first closed to the position shown in phantom in FIG. **2.** As door **10** is closed, latch **23** is cammed inwardly by lock plate **14** until latch **23** finally seats in recess **30** with side surface **60** in engagement with flange portion **28** of strike plate **12.** Chain **40** is then slipped over door knob **52,** so that it is draped around neck **54.** The length of chain **40** must be at least sufficient to pass over door knob **52** without effort, but need be no longer. The maximum length of chain **40** should be such that chain **40** cannot be slipped over knob **52** unless door **10** is fully or almost fully closed. With chain **40** loosely draped over neck portion **54,** door **10** can be opened to the point shown in solid lines in FIG. **2,** about **1** or 1 ½ inches. In such a position, chain **40** is drawn tightly about neck portion **54.** The door **10** is now open to sufficient distance to allow the occupant to observe and converse with a caller. However, door **10** cannot be fully opened, nor can chain **40** be disengaged from door knob **52.** Pushing on the outside of door **10** simply increases the tension of chain **40.** Screws **22** are preferably of the one-way type, so that one cannot easily remove the entire strike plate **12** when door **10** is ajar as is shown in FIG. **2.** Thus, the invention fulfills a superlative manner the functions of the conventional safety chain.

However, this inventive device also functions as a dead-bolt lock. Looking now to FIG. **3,** when door **10** is fully closed, the loop of chain **40** is slipped over knob **52** and is pulled taut. Then, the appropriate link **41** of chain **40** is engaged with pawl **37.** This shortens the loop of chain **40** and holds door **10** closed even if latch **23** is retracted. Efforts to force the door **10** when latch **23** is retracted are resisted by screws **22** and by flange **28.**

The inventive device is shown herein as a permanent installation, replacing the conventional strike plate normally found in the door jamb, and replacing the usual dead-bolt and safety chain. However, it should be noted that the basic principles of the invention are also applicable to a portable device which functions in addition to all other locks. The portable device functions as a dead-bolt. In this portable embodiment, the device is exactly as pictured. However, it need not have openings for screws **22.** To install the portable device, door **10** is opened, and strike plate **12** is superimposed upon the existing strike plate in the door frame (not shown), so that flange **28** protrudes into the opening of the existing strike plate. Door **10** is then closed, with strike plate **12** interposed between the existing strike plate and the edge of door **10.** The device is thus held firmly in place by the engagement of flange **28** with the existing strike plate and cannot be removed so long as door **10** remains closed. Lock plate **14,** chain plate **16,** and chain **40** extend into the room. Chain **40** is then slipped over knob **52** and is drawn taut, and then an appropriate link **41** is engaged, with pawl **37,** in the same manner as with the permanent embodiment.

To one skilled in the art, a number of variations and modifications of the above described preferred embodiment of the invention may come to mind. For example, while a pair of pawls **37** and **38** have been shown to engage links **41** to hold chain **40** taut, other means could be used, such as slots into which a link **41** could be slipped. Likewise, lock plate **14** and chain plate **16** need not be integral with strike plate **12,** but a normal strike plate can be used and chain attachment plate **14** can be attached directly to the door frame. However, the basic principles of the invention still apply. It should therefore be understood that the invention is not to be limited to the preferred embodiment described above but is governed in scope only by the scope of the appended claims.

What is claimed is:

1. A chain-type door fastening device for use with a door having a door frame and a door knob, said device comprising:

chain means and means for attaching said chain means to said door frame at a point substantially in alignment with said door knob and adjacent to said door knob when said door is in the closed position against said door frame, said chain means being disposed in a loop extendable outwardly from said door frame, said loop being of a first length sufficient to extend about said door knob when said door is in said closed position, and

chain shortening and fastening means attachable to said door frame and engageable with said chain means for shortening said chain means to define said loop in a second length shorter than said first length and to fasten said chain in said short length, whereby said loop can be drawn taut about said door knob to said second length and fastened thereat when said door is in said closed position to preclude opening of said door, said door being openable a small amount when said loop is disengaged from said chain shortening and fastening means.

2. The chain-type door fastening means of claim **1** wherein said door frame has a recess for receiving a door knob operated latch means installed on said door, and wherein said means for attaching said chain means comprises flange means extendable into said recess and engageable therewith.

3. The chain-type door fastening device of claim **1** wherein said means for attaching said chain means comprises a chain mounting plate, said chain means and said chain shortening and fastening means being attached to said chain mounting plate.

4. The chain-type door fastening device of claim **3** wherein said chain shortening and fastening means comprises a pawl engageable with said chain means.

5. The chain-type door fastening device of claim **3** wherein said means for attaching said chain means further comprises a strike plate mounted on said door frame and engageable with door knob operated latch means installed on said door, said chain mounting plate being attached to said strike plate.

6. The chain type door fastening device of claim **5** wherein said door frame has a recess for receiving door knob operated latch means installed on said door and wherein said strike plate comprises:

a strike plate opening aligned with said recess, and

a flange attached to said strike plate along that edge of said strike plate opening that lies in the direction

said door opens, said flange being substantially perpendicular to said strike plate and extending into said recess.

7. The chain-type door fastening device of claim 3 wherein said chain mounting plate is spaced laterally from the line of travel of the edge of said door whereby said chain when hanging from said chain mounting plate hanges spaced from said door so as not to inhibit movement of said door.

8. A chain-type door fastening device for use with a door having a door frame, a door knob having a neck portion and door knob operated latch means, and a recess in said door frame for receiving the door knob operated latch means, said device comprising:

chain mounting means comprising a strike plate attachable to said door frame, said strike plate having a strike plate opening alignable with said recess and a flange attached along that edge of said strike plate opening that lies in the direction said door opens, said flange being substantially perpendicular to said strike plate and extendable into said recess, a lock plate attached to said strike plate and extending outwardly therefrom in the direction said door opens, said lock plate having a portion inclined away from said door to cam said door knob operated latch means inwardly as said door is closed, and a chain mounting plate attached to said lock plate,

a loop of chain attached to said chain mounting plate, said loop being of a first length sufficient to extend about said door knob when said door is in the closed position, and

chain shortening and fastening means mounted on said chain mounting means and engageable with said chain to shorten said loop to a second length closely about said neck portion of said door knob, whereby when said loop is in said first length said door can be partially opened, but when said loop is in said second length said door is fastened substantially in the closed position.

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