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CHAIN DOOR GUARD

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Fig. 1.

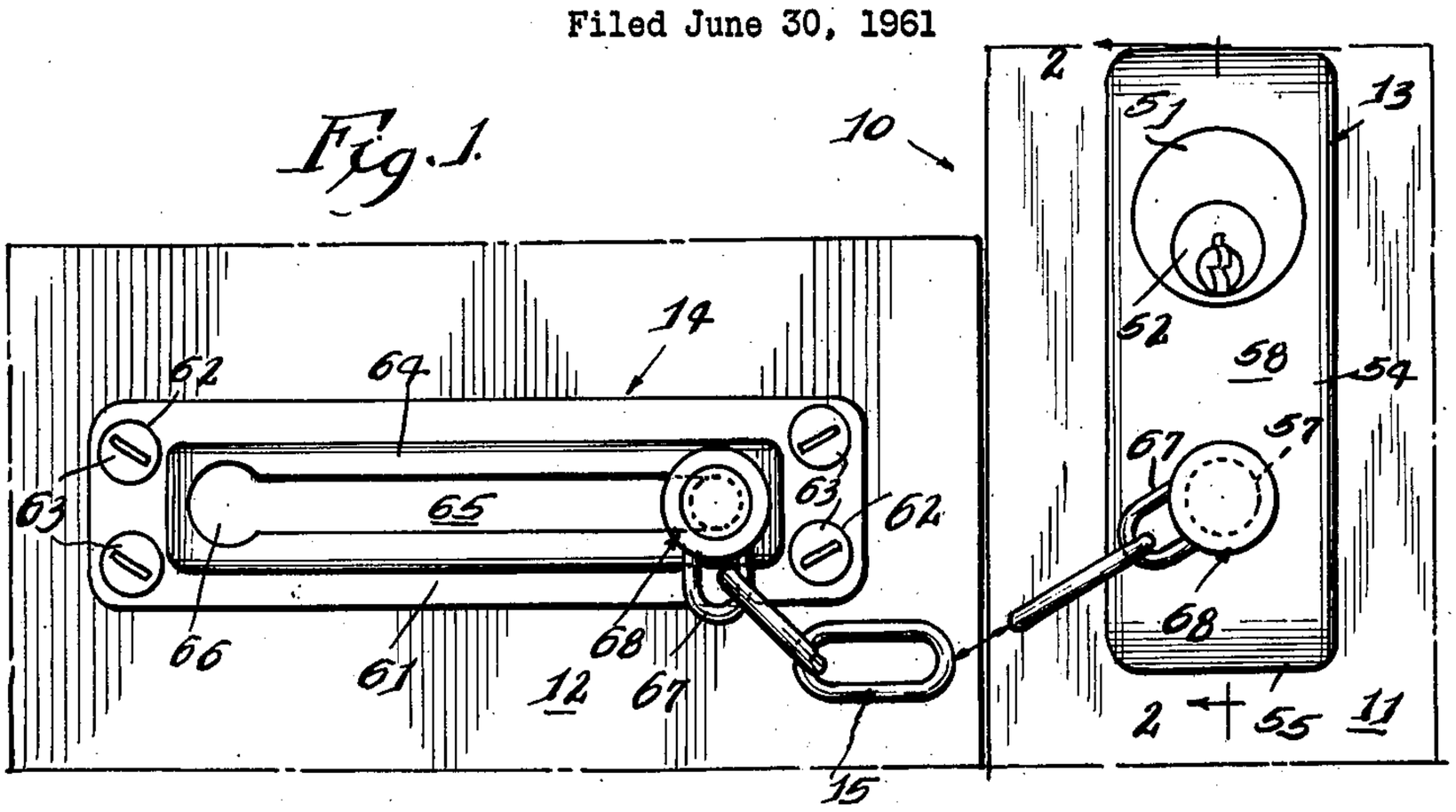


Fig. 2.

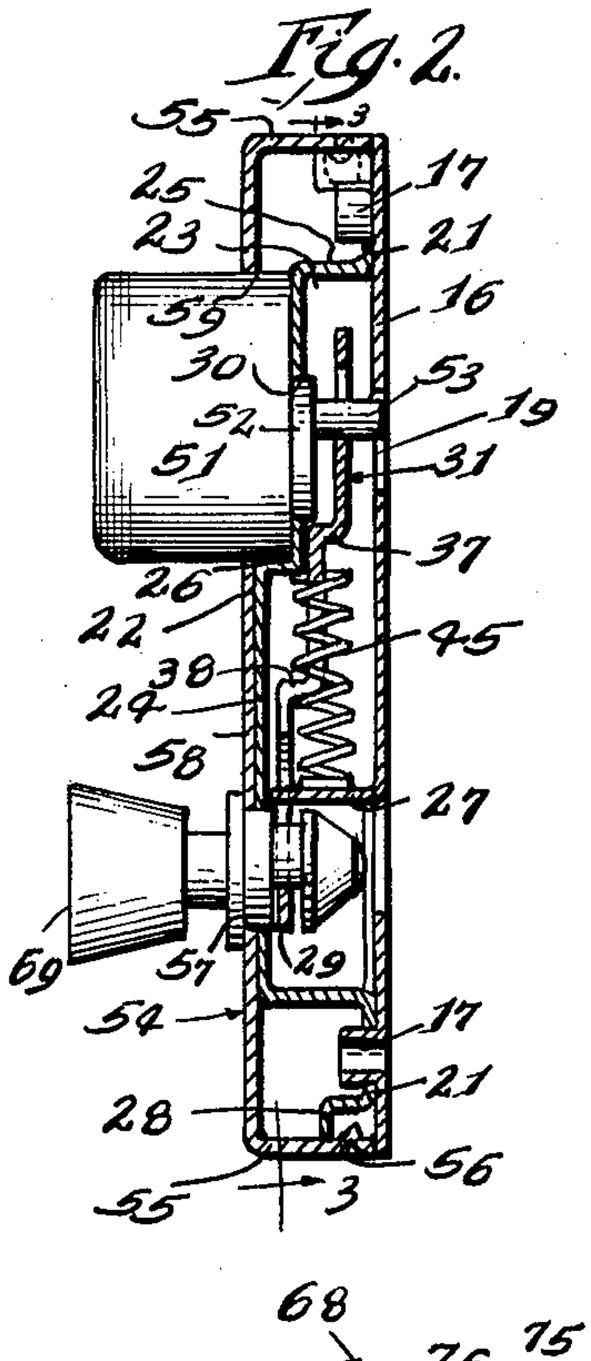


Fig. 3.

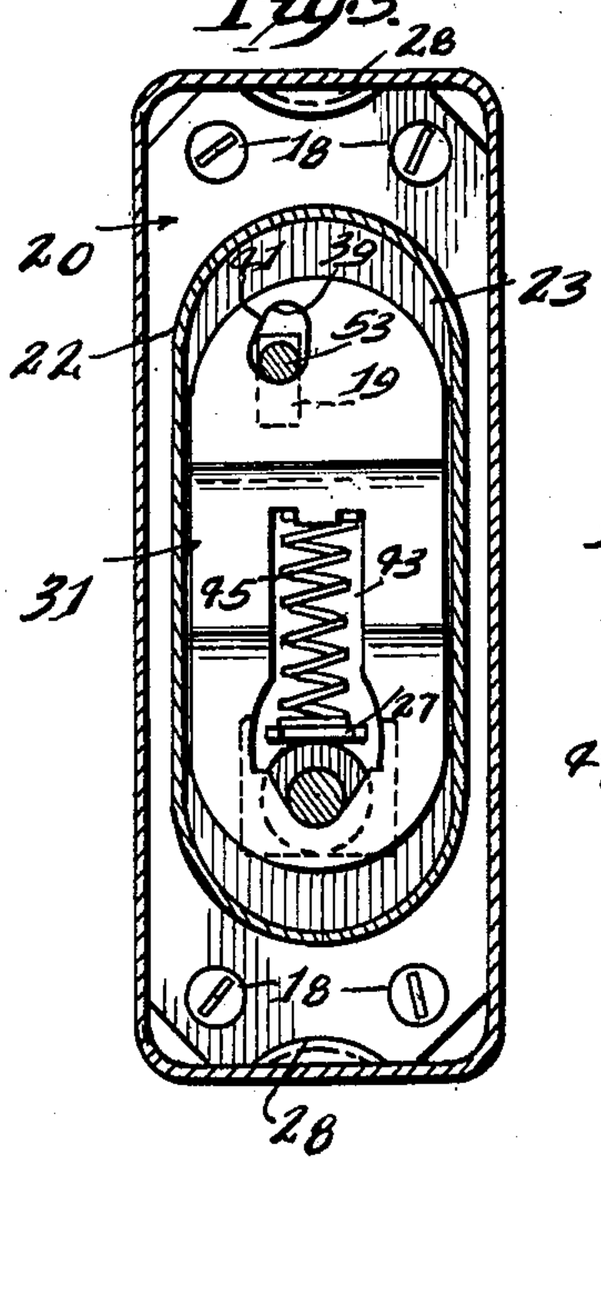


Fig. 4.

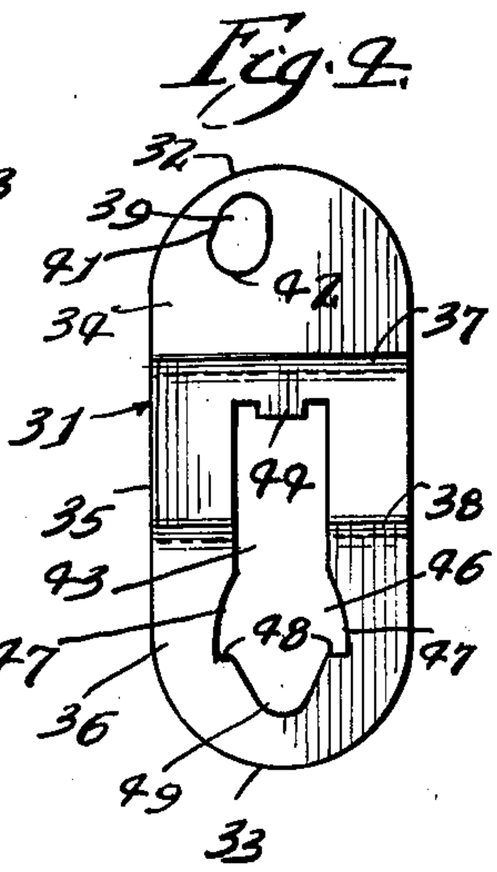
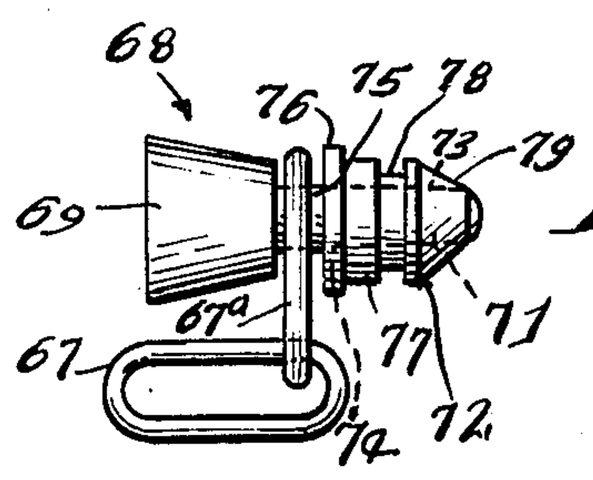


Fig. 5.



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CHAIN DOOR GUARD

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The present invention relates to a novel chain door guard and more specifically to a combined chain door guard and lock capable of being released from the inside of the house or from the exterior of the house when the door is opened to the extent allowed by the chain.

The common chain door guard in use today involves a bracket secured to the interior of the door frame and having a chain detachably secured to a slide bracket attached to the interior of the door adjacent the first bracket. The chain terminates in a locking knob which is inserted in an enlarged end of a slot in the slide bracket and slides in the slot due to an undercut groove in the knob. When the knob is in the opposite end of the slot, the door can be opened to a limited extent depending on the length of the chain, and can only be released from the slide bracket when the door is closed, and then only released from the interior of the door. This assembly provides an added measure of safety in preventing unauthorized intruders from gaining access into a home or other building so protected.

The present invention retains the advantages found in the prior chain door guards and adds the further important advantage of permitting an occupant to gain access by releasing the chain from the bracket secured to the door frame by use of a proper key in a lock in the interior door frame bracket. This lock is capable of releasing the attached end of the chain opposite to that in the slide bracket and can be actuated by a person at the exterior of the home or other building by reaching into the room through the limited opening between the door and the frame offered by the chain.

An important object of the present invention is the provision of a novel chain door guard which can be released by a person from either side of the door, but only by a person at the exterior having the proper key to unlock the door to a limited extent afforded by the chain, and the proper key to unlock the chain door guard. Each end of the chain terminates in a locking knob one of which is inserted and slidable in a slide bracket attached to the door and the other in a locking bracket or housing assembly secured to the door frame. From the interior of the room, the chain can either be released from the slide bracket or from the locking bracket. From the exterior of the door, the chain can only be released from the locking bracket after the door has been unlocked and opened to the extent permitted by the attached chain.

Another important object of the present invention is the provision of a cylinder lock in the locking bracket secured to the interior of the door frame and adapted to release one end of the locking chain when the lock is actuated by a proper key.

A further object of the present invention is the provision of a novel locking means within the locking bracket on the door frame which is actuated by a key-operated lock in the said bracket. The locking means includes a member adapted to engage the locking knob on one end of the chain to hold the knob securely in the bracket, the locking knob being insertable into an opening in the locking bracket and having means for actuating said locking means to securely lock this knob in its bracket or housing.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

In the drawing:

FIGURE 1 is a front elevational view of the novel chain door guard as attached to the interior of a door and door frame and with the chain in operative locking position with the door closed.

FIG. 2 is a vertical cross-sectional view taken on the line 2—2 of FIG. 1 looking in the direction of the arrows and showing the locking mechanism within the locking bracket or housing assembly.

FIG. 3 is a vertical cross-sectional view on the line 3—3 of FIG. 2 and looking in the direction of the arrows.

FIG. 4 is a front elevational view of the novel locking bolt provided in the locking mechanism.

FIG. 5 is a side elevational view of a locking knob attached to one end of the chain.

Referring more particularly to the disclosure in the drawing in which is shown an illustrative embodiment of the present invention, FIG. 1 discloses the novel chain door guard 10 secured to a door frame 11 and its associated door 12. The door guard 10 includes a locking bracket or housing assembdly 13 secured to the door frame 11, a slide bracket 14 secured to the door 12, and a chain 15 detachably connected to the brackets 13 and 14 to limit the extent of opening of the door.

The locking bracket or housing assembly 13 includes a back plate 16 having cylindrical embossments 17 at each corner to receive anchoring screws or fastening means 18 to secure the back plate and the bracket 13 to the door frame 11. A rectangular opening 19 is shown in the plate 16 for a purpose to be later described. Mounted in parallel abutting relationship with the back plate is a lock housing 20 with openings 21 at the corners thereof fitting conformably over the embossments 17, which are staked to hold the lock housing and back plate together and also to receive screws 18 to secure the above assembly to the door frame. The back plate and lock housing may be additionally secured together by welding or soldering the ends thereof. A stepped elevated portion 22 is provided on the lock housing 20 forming a chamber or enclosure 23 between the lock housing 20 and the back plate 16 to receive a locking mechanism. A higher area 24 of the elevated portion 22 is separated from a lower area 25 by a step or shoulder 26 as shown in FIG. 2.

The back plate 16 is provided with an inwardly extending tongue or ear 27 which projects into the higher elevated area 24. An arcuate portion 28 (FIGS. 2 and 3) is formed at the opposite ends of the lock housing 20 to form detent means to hold a cover on the bracket. The higher elevated area 24 contains an annular depression providing an opening 29 for a purpose to be later described. The lower elevated area 24 also has an opening 30 to receive the plug of a cylinder lock to be described later.

Within the elevated portion 22 of the plate 20 is housed a stepped bolt 31 (FIG. 4) of generally rectangular shape but with rounded ends 32, 33. This bolt is of the same general shape as the enclosure formed by the elevated portion 22 but shorter in length, and is transversely divided into three sections 34, 35, 36 by the steps 37, 38. The upper and lowermost section 34 contains an offset irregular opening 39 which is narrow adjacent the rounded upper end 32 and broadens out at 41 to its base 42. A longitudinally extending elongated slot 43 extends over the greater portion of the length of the sections 35, 36, the slot terminating adjacent the step 37 in an end having a depending projection 44 to anchor one end of an expansion spring

45 with the other end of the spring seated on the inwardly extending ear 27 of the back plate 16 to constantly bias the bolt 31 upwardly as seen in FIGS. 2 and 3. The step 38 elevates the section 36 to a location where it overlies the ear 27 of the back plate 16.

The slot 43 terminates in the section 36 in a gradually widening area 46 having diverging edges 47, 47 terminating in lateral shoulders 48, 48 and a converging and rounded end 49 which is generally aligned with the opening 29 in the lock housing 20. The spring 45 allows reciprocable movement of the bolt 31 within the elevated portion 22 of the housing 20.

A cylinder lock 51 is mounted on the lock housing 20 with the rotatable plug 52 of the lock extending through the opening 30 of the housing 20 and terminating adjacent the bolt 31. A pin 53 is eccentrically mounted on and extends from the end of the plug 52 through the irregular opening 39 in the bolt 31 and into the opening 19 in the back plate 16. When the bolt is in its normal elevated or locking position, the pin 53 abuts the lower broad base 42 of the opening 39 and the upper side of the opening 19; the opening 19 limiting the reciprocable movement of the pin 53 and substantially preventing any lateral movement of said pin.

A cover 54 is formed to conformably fit over the lock assembly with its housing 20 and base plate 16. The ends 55, 55 of the cover have indentations 56 which form anchoring detents received in the arcuate portions 28 on the lock housing 20 to hold the cover tightly in position. An opening 57 in the face 58 of the cover is aligned with the opening 29 in the lock housing 20, and a larger opening 59 in the cover is aligned with and receives the cylinder lock 51 abutting the housing 20.

The slide bracket 14 comprises a substantially rectangular plate 61 having openings 62 adjacent the corners for suitable securing means 63. A longitudinally extending rectangular elevated portion 64 is provided on the plate 61 and has a longitudinally extending slot 65 with an enlarged opening 66 at the end of the slot farthest from the door frame 11. The chain 15 is composed of a series of interlinked loops or links joined at each end 67 to an identical locking member 68, each comprising a locking knob 69 having a stepped shank 71 extending therefrom, and a lock bushing 72 having a central opening 73 to accommodate the shank 71. The opening 73 is counterbored as at 74 to received the enlarged portion 75 of the shank 71 to space the bushing from the locking knob 69. The bushing is formed with a flange 76 at the end of the bushing nearest the knob 69 and a body 77 having an annular groove 78 formed therein and spaced from the flange 76. The end of the bushing is chamfered as at 79. Each end link 67 of the chain 15 is received around the enlarged shank portion 75 between the knob 69 and the flange 76, and the knob and bushing are assembled by deforming or riveting the end of the shank 71.

When the components of the locking bracket 13 are assembled and the brackets 13 and 14 secured to the door frame 11 and the door 12, respectively, the chain 15 has a locking member 68 on either end. The enlarged end 66 of the slot 65 in the slide bracket 14 is of sufficient size to accommodate the body 77 of the bushing 72 and the edges of the remainder of the slot 65 are adapted to enter the annular groove 78 in the bushing 72 to hold the chain 15 onto the bracket. The aligned openings 29 and 57 in the lock housing 20 and the cover 55, respectively, accommodate the body 77 of the bushing, and the enlarged area 46 of the slot 43 receives the body 77. In the normal position, the spring 45 biases the bolt 31 upwardly so that the edges of the rounded end 49 will engage and enter the annular groove 78 in the bushing 72 to hold its locking member 68 securely in the locking bracket 13.

If the one locking member 68 engages the slot 65 in the slide bracket 14 and the other locking member connected to the other end of the chain 15 is to be attached to the locking bracket 13, this other locking member 68 is urged into the openings 29 and 57 and the chamfered end 79 engages the end 49 of the slot 43 and cams the bolt 31 downward against the action of the spring 45 until the end 49 is opposite the annular groove 78 in the bushing 72, at which time the spring 45 will bias the bolt 31 upward to lock its locking member 68 in place. The irregular opening 39 is of such length as to provide lost motion means so the pin 53 on the cylinder lock plug 52 will not obstruct this movement of the bolt 31.

To release the locking member 68 from the locking bracket 13 from the exterior of the door 12, the door is opened to the extent afforded by the chain 15, the hand inserted through the opening and the proper key inserted in the cylinder lock 51 and rotated to rotate the plug 52 and reciprocate or move its associated pin 53. Movement of the pin 53 depresses or moves the bolt 31 downward against the action of the spring 45 until the locking member 68 is released and can be withdrawn from the locking bracket 13.

While a chain door guard of a particular and effective construction has been shown and described by way of illustration, it is not our intent or desire to unnecessarily restrict the invention by virtue of this limited showing. It is also contemplated that specific descriptive terms employed herein be given the broadest possible interpretation consistent with the actual disclosure.

Having disclosed the invention, we claim:

1. A chain door guard for attachment to the interior of a pair of relatively movable members such as a door and a door frame and adapted to be released by means of a key inserted by an operator at the exterior of the door when the latter is opened to an extent permitted by the chain, comprising a slotted slide bracket affixed to the interior of one member and a locking bracket affixed to the interior of the other member, a chain having similar and interchangeable detachable locking knobs secured to each of its opposite ends to releasably connect the chain to the slide and locking brackets, said locking bracket including a back plate securely affixed to said other member, a lock housing and a key-operated cylinder lock secured to said back plate, a cover for said locking bracket secured to and covering said back plate to prevent removal of said bracket, spring-loaded locking means in said lock housing, and means operatively connecting the cylinder lock to the locking means so that insertion of a key in the cylinder lock and operation thereof will release the one locking knob inserted in the locking bracket from the locking means.

2. A chain door guard as set forth in claim 1, in which the locking means includes a slidable bolt normally spring-biased to a locked position.

3. A chain door guard as set forth in claim 1, in which each locking knob includes a shank and a locking bushing secured together, said bushing having a tapered end for guiding the bushing into a slot and an annular groove to detachably connect the bushing to either of said brackets.

4. A chain door guard for attachment to the interior of a pair of relatively movable members one of which is a door and the other a door frame to prevent unauthorized opening of the door sufficient for a person to enter therethrough, comprising a locking bracket secured to one of said members and a slide bracket secured to the other of said members and having a longitudinally extending slot with an enlarged opening at one end away from said locking bracket, and a chain having interchangeable locking knobs secured to each end one of which is adapted to be releasably connected to the slide bracket via the enlarged end of the longitudinal slot and the other locking knob to the locking bracket, said locking bracket including a back plate and a housing thereon secured to said one member, said housing having an elevated portion to form a chamber between it and said

back plate, a locking bolt mounted and vertically slidable in said chamber and having a stepped contour, an irregular offset opening adjacent one end of the bolt and a longitudinally extending slot with an enlarged end adjacent the opposite end of the bolt, a cylinder lock mounted on the elevated portion of said housing and having a plug extending horizontally through said housing, a pin eccentrically mounted on said plug and extending into said irregular opening, a cover for said housing and back plate and secured thereto, said cover and said housing having openings aligned with the enlarged end of the slot in the locking bolt, and said locking knob on each end of said chain including a knob having a centrally extending shank, a locking bushing secured on said shank and spaced from said knob with the chain connected to the locking knob between said knob and its locking bushing, said bushing having a cam end surface and an annular groove receiving the edges of the longitudinal slot in the slide bracket or the edges of the longitudinally extending slot of the locking bolt.

5. A chain door guard as set forth in claim 4, including means to spring-bias said locking bolt into its locking position and camming surfaces on the enlarged end of said slot of the locking bolt, the camming surfaces engaging the cam end surface of the locking knob when said knob is inserted in the bracket and engaging the annular groove in the locking bushing of said knob to lock the knob in said bracket, said irregular opening in said bolt being of such contour as to allow limited movement of said bolt without actuating said cylinder lock.

6. A chain door guard for attachment to the interior of a pair of relatively movable members such as a door and a door frame to which the door is hingedly mounted

with the chain guard adapted to be released by means of a key inserted by an operator at the exterior of the door when the door is opened to an extent permitted by the chain, comprising a slotted slide bracket affixed to the interior of one member and a key-operated locking bracket affixed to the interior of the other member, a chain of a length sufficient to open the door to but a limited extent, said chain having similar and interchangeable locking knobs one secured to each of the opposite ends of the chain with one knob received and slidably but detachably engaged in the slotted slide bracket and the other knob received and detachably engaged in an opening in the locking bracket, a key-operated lock in said locking bracket having a projecting eccentric pin, and a spring-loaded locking bolt in said locking bracket having means for automatically locking and retaining one of said knobs when the latter is inserted into the opening in the locking bracket, means on said locking bolt adapted to receive said eccentric pin so that operation of said lock actuates the locking bolt, said last mentioned knob being released for withdrawal upon insertion and turning of the proper key in the lock to release the locking bolt by said eccentric pin.

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