

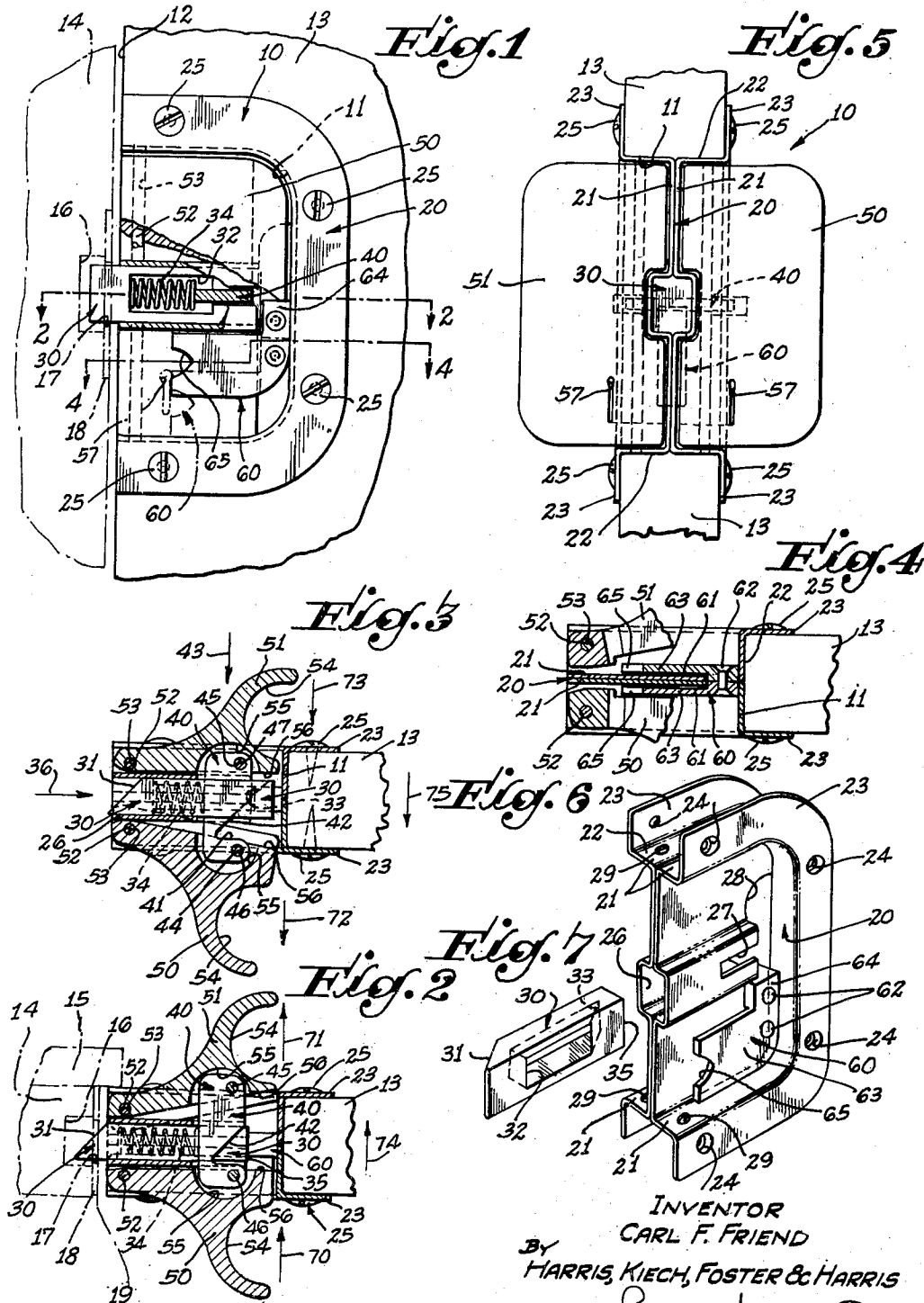
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BOLT CASING

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FOR THE FIRM
ATTORNEYS.

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BOLT CASING

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My invention relates to a means for releasably restraining an edge of a member and, more specifically, to a device of this general nature which is particularly adapted for latching and locking doors, windows, gates, or other like members, which will hereinafter be referred to by the general term "door."

Most conventional door latching mechanisms employ handles which must be rotated or otherwise manipulated in a direction which does not correspond to the direction of motion to be communicated to the door. Conventional devices of this character frequently require that persons unfamiliar with the latching mechanism involved expend a considerable measure of time in experimentation before finally effecting operation thereof. Although normally such an expenditure of time merely represents an undesirable inconvenience, situations may arise which demand that an unfamiliar door be operable instantaneously to permit passage therethrough without inordinate delay. A primary objective of my invention, therefore, is the provision of a latching device which permits operation of the door by merely pushing or pulling on suitable handles to effect displacement of the door in the direction of the applied force.

Conventional door handles are apparently designed primarily to perform a specified operation with little thought of safeguarding the hands of persons using the door or of providing handles with a smooth and uniform surface. Since common door handles are accessible from almost any angle, injuries resulting from inadvertent insertion of the hands between the handle and door, or between the edge of the door and door jamb are not uncommon.

Another primary objective of my invention, therefore, is to provide door handles which are only accessible for operation in a region removed from the edge of the door and which do not require that the hand of an operator be inserted between the handle and the door. I prefer to provide handles which are smooth and uniform to prevent injuries to person or damage to clothing and which are adapted to facilitate cleaning operations. The provision of handles of this character further results in a device which offers a distinctive and pleasing appearance and which may be employed to supplement conventional decorative installations.

Door locks in general acceptance at present are ordinarily installed in mortised holes in the door and are provided with suitable handles for actuating the latching mechanism. The mortising and subsequent installing operations are relatively complex and necessitate partial disassembly of the lock set to permit insertion of the various components thereof into the corresponding mortised holes. Simplification of the installing oper-

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ations is another primary objective of my invention. I prefer to provide a door lock assembly which may be inserted into an ordinary cut-out or notch in the edge of the door and which may be secured to the door in a simple manner. The invention also permits installation of the door lock set without any necessity for disassembly thereof, thereby materially reducing the installation time required.

An additional objective of my invention is to provide a door lock set which may be employed in either a normal upright position or in an inverted position without alterations.

A further objective is to provide a convenient and simple means for locking the latching mechanism of the door lock assembly.

These and other objectives of my invention may be realized by means of the embodiment shown in the accompanying drawing, which is for illustrative purposes only, wherein:

Fig. 1 is a side view of the door lock set with parts broken away to reveal the details of the latching and locking mechanisms;

Fig. 2 is a horizontal section taken along the line 2—2 of Fig. 1 and illustrates the latched position of the device;

Fig. 3 is a view similar to Fig. 2, but illustrates the unlatched position;

Fig. 4 is a horizontal section taken along the line 4—4 of Fig. 1 and illustrates the construction of the locking mechanism in detail;

Fig. 5 is a front view of the door lock assembly;

Fig. 6 is a perspective view of a housing for the latching and locking mechanisms; and

Fig. 7 is a perspective view of a latching bolt.

The door lock set, indicated generally by the numeral 10, is positioned in a cut-out or notch 11 which extends inwardly from the forward edge 12 of a door 13, the latter being disposed adjacent a door jamb 14 and a door stop 15, which are shown in phantom. The door jamb 14 is provided with an opening 16 therein which is in registry with an opening 17 in a latch plate 18, the latter being adapted for engagement with the door lock set 10, as will be described in detail hereinafter.

The door lock set 10 includes a housing 20 containing a latching bolt 30 which may be reciprocated in the direction of the longitudinal axis thereof by a transversely displaceable actuating link 40, displacement of the latter being effected by handles 50 and 51 which are pivotally connected thereto and which are pivotally mounted on the housing 20. The latching bolt 30 may be locked in the latched position by means of a locking bolt 60 adapted for insertion between the latching bolt 30 and the housing 20, as will be described in detail hereinafter.

The housing 20, as best shown in Fig. 6, preferably comprises a pair of complementary plates 21, the outer edges of which cooperate to form

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a channel section 22 which is complementary to and adapted for insertion in the notch 11 in the door 13. Sides 23 of the channel 22 embrace the door 13 in the vicinity of the notch 11 and are provided with holes 24 therethrough to permit securing the housing 20 to the door 13 by screws 25. The central portions of the plates 21, which may be secured together by spot welding or otherwise as is well known in the art, cooperate to define a longitudinal guide passage 26 adapted for the reception of the latching bolt 30. The guide passage 26 is provided with a transverse slot 27 therethrough which is adapted to receive the actuating link 40 therein, and the housing 20 is provided with an elongated opening 28 therethrough for the reception of the locking bolt 60. The forward ends of the channel 22 are provided with holes 29 therethrough to permit pivotal attachment of the handles 50 and 51, as will be described in detail hereinafter.

The forward end 31 of the latching bolt 30 is tapered as illustrated to permit facile insertion thereof into the opening 17 in the latch plate 18, and the central portion of the latching bolt 30 is provided with an elongated opening 32 therethrough to permit transverse insertion of the actuating link 40. The rear end of the opening 32 is inclined to define a cam surface 33 adapted for engagement with the actuating link 40, and a coil spring 34 is disposed in the opening 32 and coacts with the latching bolt 30 and the link 40 to maintain the tapered end 31 of the bolt 30 within the opening 17 in the latch plate 18. The rear end face 35 of the latching bolt 30 is adapted for engagement with the locking bolt 60, as will be discussed hereinafter.

The actuating link 40 is provided with a notch 41 therein which defines a cam surface 42, the latter being complementary to and adapted for engagement with the cam surface 33 of the latching bolt 30 to cause longitudinal motion of the bolt 30 in the direction of the arrow 36 when the link 40 is displaced transversely in the direction of the arrow 43. The ends of the actuating link 40 are pivotally attached to the handles 50 and 51 by pins 44 and 45 extending through holes 46 and 47 in the link 40.

The handles 50 and 51, as best shown in Figs. 2 and 3, are pivotally secured to the housing 20 by means of pins 52 extending through holes 53 therein and through the holes 29 in the forward ends of the channel 22. The handles 50 and 51 are preferably of the general smooth and arcuate form illustrated and diverge toward the rear of the door lock set 10. The rear edges of the handles 50 and 51 are provided with grooves 54 therein which are preferably of a semi-circular configuration as illustrated to permit convenient reception of the fingertips of a person desirous of opening the door 13. The inner surfaces of the handles 50 and 51 are provided with recesses 55 therein for the reception of the pivoted ends of the actuating link 40 and are provided with grooves 56 which are adapted to receive the guide passage 26 therein. Transverse holes 57 through the handles 50 and 51 are provided to permit insertion of a key (not shown) into engagement with the locking bolt 60.

The locking bolt 60 is preferably formed in two complementary sections 61 which may be secured together by rivets 62 as illustrated in Fig. 4, or otherwise as is well known in the art. The locking bolt 60 is provided with a pair of arms 63 which embrace the central portion of the housing 20 and is provided with a locking projection 64

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which is adapted for insertion between the rear end face 35 of the latching bolt 30 and the housing 20 to prevent rearward retraction of the forward end 31 of the latching bolt 30 from the opening 17 in the latch plate 18. The forward or free ends of the arms 63 are provided with notches 65 therein which are engageable by a key (not shown) inserted through one of the key holes 57 to effect operation of the locking bolt 60 to lock or unlock the door, the unlocked position of the locking bolt 60 being shown in phantom in Fig. 1.

Referring to Fig. 2 and assuming an open position for the door 13 with the locking bolt 60 in the unlocked position, the door 13 may be closed in the direction of the arrow 74 by pushing on the handle 50 (or the door 13 or pulling on the handle 51 as indicated by the arrows 70 and 71, respectively). The tapered forward end 31 of the latching bolt 30 will engage the entering edge 19 of the latch plate 18 and the bolt 30 will be displaced rearwardly, thereby compressing the spring 34. As the tapered end 31 enters into registry with the opening 17 in the latch plate 18, the compressed spring 34 will urge the tapered end 31 into the opening 17, thereby latching the door 13 with the forward edge 12 of the latter abutting the stop 15 as best shown in Fig. 2. The locking bolt 60 may then be actuated by a suitable key to lock the door 13.

When the door 13 is to be opened in the direction of the arrow 75 of Fig. 3, the locking bolt 60 may be unlocked and the door 13 opened by placing the fingertips in the groove 54 in the handle 50 and pulling thereon as indicated by the arrow 72, or by pushing on the handle 51 in the direction of the arrow 73. The displacement of the handles 50 and 51 effects transverse displacement of the actuating link 40 in the direction indicated by the arrow 43 whereby the cam surfaces 33 and 42 cooperate to retract the latching bolt 30 and effect disengagement between the tapered end 31 and the latch plate 18.

From the preceding discussion, it will be apparent that the forces applied to the handles 50 and 51 are always in the direction of motion to be communicated to the door 13, whether a closing or opening operation be involved. Thus, a person desirous of opening or closing the door 13 need merely obey his natural impulses regarding the operation thereof. It should further be noted that since the handles 50 and 51 are only adapted for operation by the fingertips at the rear edges thereof when pulling thereon, the handles 50 and 51 are only accessible in a region well removed from the edge 12 of the door 13, thus making inadvertent insertion of the hands between the door 13 and door jamb 14 virtually impossible. The design of the handles 50 and 51 and grooves 54 also prevents entrapment of the hands between the door 13 and the handles 50 and 51, a common occurrence with conventional handles of the knob or loop type. The smoothness and uniformity of the handles 50 and 51 makes injuries to person or damage to clothing impossible, since there are no rough projections to cause such injury or damage. Furthermore, the handle design obviates the frequent damage to clothing resulting from hooking a pocket of a garment over the conventional door handles. The handles 50 and 51 are adapted for fabrication from any suitable metallic or thermoplastic materials in a variety of pleasing colors and may be employed to offer a material contribution to the color scheme of a room. The uniform smoothness

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and regularity of the surfaces of the handles 50 and 51 also greatly facilitate cleaning and polishing operations.

The novel configuration of the housing 20 permits insertion of the door lock set 10 in a simple cut-out or notch 11 and materially facilitates installation of the device 10, since the latter may be inserted in the notch 11 as a completely assembled unit with no necessity for the removal of knobs or handles. Conventional units require mortising operations to provide suitable holes and require partial disassembly in order to effect installation thereof, both being rather laborious operations. My invention also provides a door lock set 10 which may be employed either in the normal upright or in an inverted position without any alterations whatsoever.

The housing 20, link 40, and bolts 30 and 60 are preferably fabricated from suitable metallic materials while the handles 50 and 51 are preferably formed of an appropriate thermoplastic material. It will be understood, however, that the scope of the invention is not to be limited to the materials suggested, since any suitable materials may be employed, as is well known in the art. It will be understood also that although I have illustrated an application of my invention to a door 13 which is operable in only one direction and whose travel is limited by a door stop 15, I do not intend to be limited to the exact construction shown, since my underlying inventive concept relates to a device which may readily be adapted for employment with doors operable in both directions.

The specific embodiment which I have described herein for the purpose of disclosing my inventive concept will suggest to those proficient in the art various other changes, substitutions, and modifications, many of which may be incorporated without departing from the spirit of the invention; I do not intend, therefore, to be limited to the specific disclosures contained herein and hereby reserve the right to all such changes, substitutions, and modifications that properly lie within the scope of my appended claims.

I claim as my invention:

1. As an article of manufacture, a housing for a latching device including contiguous members whose outer edges are oppositely deformed to define a substantially U-shaped channel section therebetween and whose central portions are oppositely deformed to define a guide passage therebetween.

2. As an article of manufacture, a housing for a latching device for employment with a door having a notch extending inwardly from an edge thereof, including a pair of united members having outwardly deformed peripheral portions which cooperate to define a substantially U-shaped channel section adapted for insertion in the notch and having outwardly deformed central portions which cooperate to define a guide passage which is adapted for the reception of a latching bolt.

3. A housing for a latching device which is adapted for employment with a door having an edge with a notch therein, said housing including a pair of united members having outwardly deformed peripheral portions which cooperate to define a substantially U-shaped channel section adapted for receiving portions of the door surrounding the notch, said members including con-

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tiguous, united central portions having outwardly deformed segments which cooperate to define a guide passage for a latching bolt, said central portions having openings therethrough for a locking bolt adjacent the base of said U-shaped channel section.

4. As an article of manufacture, a housing for a latching device which is adapted to be mounted in an opening in a door, said housing comprising a pair of housing members each having a peripheral flange, said peripheral flanges being spaced apart and defining a substantially U-shaped channel section therebetween, said channel section being adapted to receive portions of the door adjacent the opening therein, said housing members having central portions which are adapted to be connected together and one of which is provided with a guide for a latching bolt.

5. In a housing for a latching device which is adapted to be mounted in a notch in an edge of a door, the combination of: a housing structure adapted to be inserted into the notch in the door and having walls which define a guide passage having a longitudinal axis and which completely surround said guide passage in planes substantially parallel to said axis, said axis being substantially perpendicular to the notched edge of the door when said housing structure is inserted into the notch, and said guide passage being adapted to receive a latching bolt which is reciprocable along said axis; and a pair of spaced, generally U-shaped flanges on said housing structure, said flanges being adapted to engage opposite sides of the door adjacent the notch therein when said housing structure is inserted into the notch.

6. A housing for a latching device as set forth in claim 5 wherein said guide passage is open at both ends.

7. In a housing for a latching device which is adapted to be mounted in a notch in an edge of a door, the combination of: primary walls defining a channel which is substantially U-shaped both in elevation and in cross section, said channel being adapted to receive portions of the door adjacent the notch therein when said latching device is mounted in the notch; and secondary walls connected to said primary walls and defining a guide passage having a longitudinal axis which is substantially perpendicular to the notched edge of the door when the latching device is mounted in the notch, said secondary walls completely surrounding said guide passage in planes substantially parallel to said axis, and said guide passage being adapted to receive a latching bolt which is reciprocable along said axis.

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