Nov. 3, 1959 G. H. DETTMAN 2,910,741

SAFETY DEVICE FOR SWINGING DOORS

Filed Nov. 2, 1956

Fig. 1.

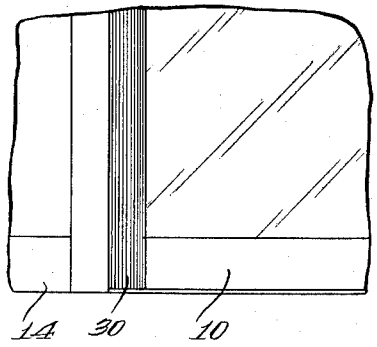


Fig. 3.

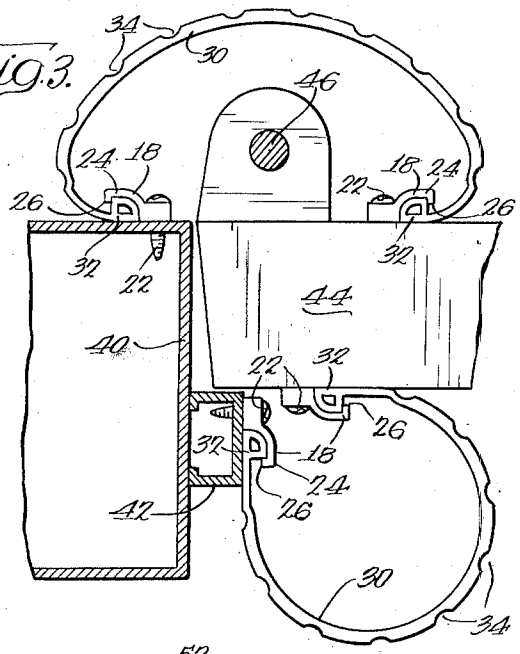


Fig. 2.

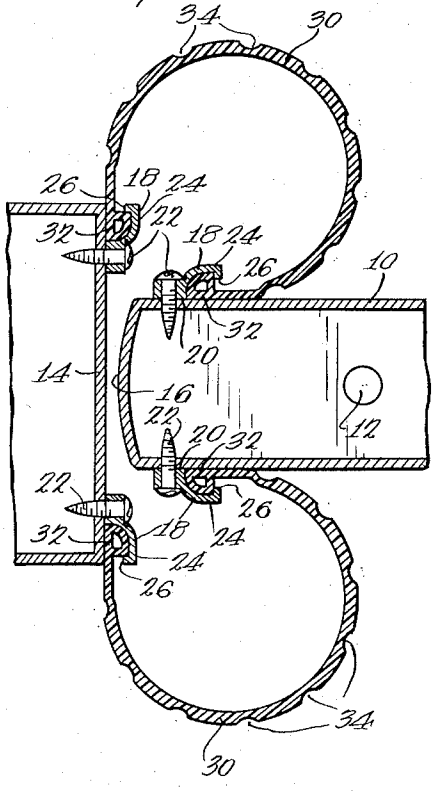
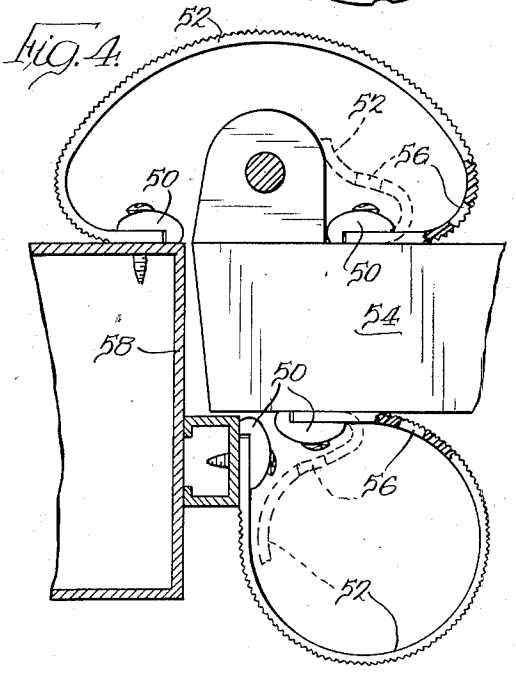


Fig. 4.



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SAFETY DEVICE FOR SWINGING DOORS

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5 Claims. (Cl. 20—16)

The present invention relates to safety devices for use with swinging doors.

Swinging doors, when open, expose a space at the rearward or hinged edge of the door, which closes when the door is closed, and this is occasionally a source of injury particularly to children, and especially so when such doors are automatically actuated. Usually the injuries are occasioned by a finger or hand being trapped between the rearward edge of the door and the jamb when the door closes, such that the hand is subjected to a rather severe crushing force.

One object of the invention is to provide an improved swinging door assembly in which protection against the insertion of fingers into a gap between the hinge edge of a swinging door and an adjacent door jamb is afforded by finger excluding structure positioned and mounted in an improved manner which completely conceals the mounting means for the excluding structure while at the same time increasing the inherent serviceability and durability of the excluding structure.

A further object is to provide a swinging door assembly in which an improved construction achieves the above recited object while at the same time providing for quick and easy attachment and detachment of the finger excluding structure which bridges the gap between the door and the door jamb.

Other objects and advantages will become apparent from the following description of preferred embodiments of my invention which is illustrated in the accompanying drawings.

In the drawings, in which similar characters of reference refer to similar parts throughout the several views:

Figure 1 is a front elevation of the lower rear corner of a door and the associated door jamb, showing the general appearance of the door and jamb with the safety accessory which forms the subject matter of the present invention installed;

Fig. 2 is a horizontal sectional view of the rearward portion of a center pivot swinging door and the associated jamb equipped with my safety device;

Fig. 3 is a top view of the rear portion of an offset pivot door and associated jamb having my safety device thereon; and

Fig. 4 is a view similar to Fig. 3 but showing an alternative form the invention may take.

Referring initially to Figs. 1 and 2 of the drawing, I have shown a center pivoted door at **10** with the pivoting axis located approximately at **12**. This door is of the conventional metal type and it is associated with a jamb **14**. Were it not for the protective device shown in these figures it will be appreciated that as the door is pivoted about the axis **12** to open position, which ordinarily is from 90° to approximately 105°, a considerable gap will be opened between the rearward edge of the door **16** and the face or edge of the jamb **14**. This gap is wide enough to permit the easy inadvertent insertion of a hand or portion thereof, such that serious injury could result when the door is subsequently closed.

To afford protection against this type injury I apply to the front and back face of the door, in a position near the rearward edge thereof, a vertically extending anchor channel member **18**. This channel member may most conveniently be formed as an extrusion of aluminum for instance, and has a flat portion **20** which is secured against the face of the door by self-tapping or sheet metal screws **22**. If it is used with wood doors, wood screws may of course be used. The anchor strip **18** is so formed as to have an overhanging lip portion **24** terminating in a rib or hook **26** which extends inwardly toward the face of the door a short distance. The overhanging lip **24** extends away from the rearward edge of the door as shown in Fig. 2.

Identical strips **18** are also attached to the door jamb on the front and back sides of the door near the outer edges of the jamb and in any event far enough outwardly from the rearward edge of the door so that there will be no interference between the rearward edge of the door and these anchor strips when the door is swung.

A generally rectangular, finger excluding strip **30** is provided at each of its vertical edges with hollow collapsible beads **32** which are adapted to be pushed past the anchor lip **26** in face to face contact with the surface of the door **10** or jamb **14** until an outward projection upon the bead snaps into place behind the lip **26** thereby inhibiting withdrawal of the bead from the anchor strip **18**. The pliable member **30**, for the sake of appearance, preferably extends from top to bottom of the door and thus as the door swings, the pliable member **30** will distort so as to accommodate this movement. Ordinarily when the door is closed, the member **30** will have a substantially cylindrical contour in so far as the surface seen by an observer is concerned.

Although any of several materials may be used for forming the member **30**, I prefer to use a plastic polyvinyl chloride extrusion and I prefer that it be vertically fluted as shown at **34**. This fluting is attractive in appearance and additionally contributes to the flexibility of the member, particularly in distributing the flexibility throughout the horizontal length of the member rather than concentrating the bending action to a few regions, and yet the member retains sufficient rigidity to prevent a child from pushing it inwardly sufficiently to get a portion of the hand trapped within the slot between the rearward edge of the door and the door jamb. The horizontal width of the member **30** from one vertical edge to the other is to some extent a matter of choice, but I prefer that it have a developed width of approximately eight inches, since I have found that such length will accommodate almost all types of doors and hinging arrangements in general use.

Referring now to Fig. 3 of the drawings which shows a door having an offset pivot, the door jamb in this instance is indicated at **40** and as is customary is equipped with a stop **42**. The door is indicated at **44** and has an offset hinge pivot positioned at **46**. With this arrangement the installation on the side of the door away from the pivot is almost the same as previously described in connection with the center pivoted door, excepting that the anchor strip **18** is attached to the door in a position slightly farther from the rearward edge thereof, and the similar strip secured to the door jamb is preferably attached directly to the stop **42**. As in the previous example, the flexible member **30** is secured in place after the retaining strips **18** have been attached by pushing the beads at the vertical edges thereof past the hooked edge of the retaining strips until the bead snaps in place.

At the opposite side of the door, the member **30** passes over the pivot **46** at its center and is attached by the strips **18** which are secured to the face of the door and to the face of the jamb in positions which are about

equidistant from the pivot 46. As with the arrangement of Fig. 2, when the door is swung to open position about its pivots 46, both of the members 30 will distort sufficiently to accommodate the necessary movement without the edge beads pulling away from the retaining strips 18 and without inhibiting door movement.

The installations of Fig. 2 and Fig. 3, which are typical of about all of the types found in use, can be made on either side of the door with identical securing strips 18, screws 22 and flexible strips 30. It is not necessary, therefore, to stock and use different types or sizes of these members for different type door installations. At most they would need simply to be cut to length for short doors.

At any time it is desired to remove the safety strip 30, either the top or bottom end can be pried outwardly from beneath the hooked edge 26 of the member 18, after which the strip can be pealed away from the retaining strips without difficulty. If, therefore, after long service, it is necessary to replace the flexible member, it can easily be pealed away from its retaining strips 18 and a new flexible guard installed without the necessity for removing the channels 18.

Ordinarily I prefer the arrangement illustrated in Figs. 1, 2 and 3, but it will be appreciated that the mechanism shown requires a specially extruded plastic strip and anchor rails, and that therefore some tooling cost is involved. The cost is justified if production of the accessory is reasonable, but the alternative arrangement of the invention illustrated in Fig. 4 is suggested where it is desired to make use of readily available standard materials. In Fig. 4, the retaining strips 18 are replaced by the rails indicated at 50. These may be cut lengths of any of a number of hardware shapes and simply are for the purpose of providing a clamping member for a flexible strip 52. The flexible strip 52, in the present instance, is a length of corrugated rubber used ordinarily for floor runner strips, stair treads and the like. As in the previous example I prefer to use this material with the corrugation or fluting extending vertically.

The arrangement of Fig. 4 is installed by laying the corrugated rubber member, about eight inches wide, in face to face contact with the door 54 with the corrugated surface facing the door, and then placing the strip 50 along its rear edge. Then using the screw holes which usually are already provided in the rolled or extruded strip 50 as pilot openings, holes of appropriate size are drilled through the rubber strip and into the door. Approximately an inch and a half or so from this edge of the strip, the rubber member 52 is punched or drilled with holes 56 in alignment with the screw holes just previously drilled. If desired, of course the rubber member 52 and the securing rails 50 can be supplied in kit form with the holes through the rails, the screw holes through the rubber strip at the edges, and the holes 56 already predrilled or punched in the members.

In any event, after the screw holes have been properly drilled in the door and through the rubber member 52, and the holes 56 have been provided, the strip 50 is removed and the opposite edge of the rubber strip is secured to the face of the door jamb 58 by means of screws passed through holes in the other retaining strip 50. These screws are tightened so as to complete the attachment of the edge of the flexible strip 52 to the door jamb.

Thereafter the securing strip 50 is properly located against the smooth face of flexible strip 52 at the opposite edge and the retaining screws inserted through the securing strip and the flexible strip. The diameter of the screw holes in the flexible strip is smaller than the outer diameter of the screws and therefore retains the screws in the above described inserted position. The corrugated face of the flexible strip 52 is then placed against the door 54 in the original position and bent sharply over the securing strip 50 to the dotted line position shown in Fig. 4 so that a screwdriver may be inserted through the openings 56 to drive the screws home in the holes previously drilled in the door 54. Thereafter, releasing the flexible member 52 permits it to spring outwardly to the position shown by the full lines in Fig. 4.

It will be noted that with the arrangements of Figs. 1, 2 and 3, no visible trace of the mounting hardware appears in the final assembly, thereby giving an extremely neat and uncluttered appearance. In the arrangement of Fig. 4 none of the hardware is in evidence and the only interruption of the contour of the smoothly rounded flexible strip is the appearance of the several holes 56. They are, however, sufficiently close to the face of the door so that they are not obtrusive. With either arrangement, if a child pushes against the flexible member, it may bow inwardly slightly, but not sufficiently to permit any portion of the body to be caught by the closing door.

From the above description of a preferred embodiment of my invention it will be appreciated that variations and modifications can be made without departing from either the scope or spirit of the invention and that therefore the scope of this invention is to be measured by the scope of the accompanying claims.

Having described my invention, what I claim as new and useful and desire to secure by Letters Patent of the United States is:

1. A safety device for covering the space between the hinged edge of a swinging door member and the associated vertical jamb member which comprises a flexible strip overlying said space, one vertical edge of said strip being bent inwardly toward the hinge and secured to the door member near the hinged edge thereof with the outer face of said strip against said door member, said strip being bent inwardly toward the hinge at its opposite edge and secured with its outer face against the jamb member, the securing means at at least one of said edges comprising a vertical anchor strip fastened to its member, said strip having a lip spaced outwardly from the last said member and projecting away from the adjacent door edge so as to provide a free edge to overlie the edge of said flexible strip, the free edge of said lip being turned inwardly whereby said anchor strip in conjunction with said member presents a vertically extending pocket with a narrow vertical slot between said free edge and said member extending thereinto, the edge portion of said flexible strip extending through said slot and having an edge enlargement to substantially fill said pocket, and said enlargement being deformable to permit said enlargement to be pushed through said slot into said pocket.

2. The combination called for in claim 1 in which the flexible strip is formed to provide a plurality of spaced apart vertically extending parallel flutes.

3. A safety device for covering the space between the hinged edge of a swinging door member and the associated vertical jamb member which comprises a flexible strip overlying said space, one vertical edge of said strip being bent inwardly toward the hinge and secured to the door member near the hinged edge thereof with the outer face of said strip toward said door member, said strip being bent inwardly toward the hinge at its opposite edge and secured with its outer face toward the jamb member, the securing means at at least one of said edges comprising a vertical anchor strip fastened to its member, said strip having a lip spaced outwardly from the last said member and projecting away from the adjacent door edge so as to provide a free edge to overlie the edge of said flexible strip, the free edge of said lip being turned inwardly whereby said anchor strip presents a vertically extending pocket with a narrow vertical slot extending thereinto, the edge portion of said flexible strip extending through said slot and having an edge enlargement to substantially fill said pocket, and said enlargement being deformable to permit said enlargement to be pushed through said slot into said pocket.

4. The combination called for in claim 3 in which the

flexible strip is formed to provide a plurality of spaced apart vertically extending parallel flutes.

5. A safety device for covering the space between the hinged edge of a swinging door member and the associated vertical jamb member which comprises a flexible strip overlying said space, one vertical edge of said strip being bent inwardly toward the hinge and secured to the door member near the hinged edge thereof with the outer face of said strip toward said door member, said strip being bent inwardly toward the hinge at its opposite edge and secured with its outer face toward the jamb member, said flexible strip being formed to provide a plurality of spaced apart vertically extending parallel flutes, and the major portion of said flexible strip having a substantially uniform curvature in horizontal section when the door is closed.

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