

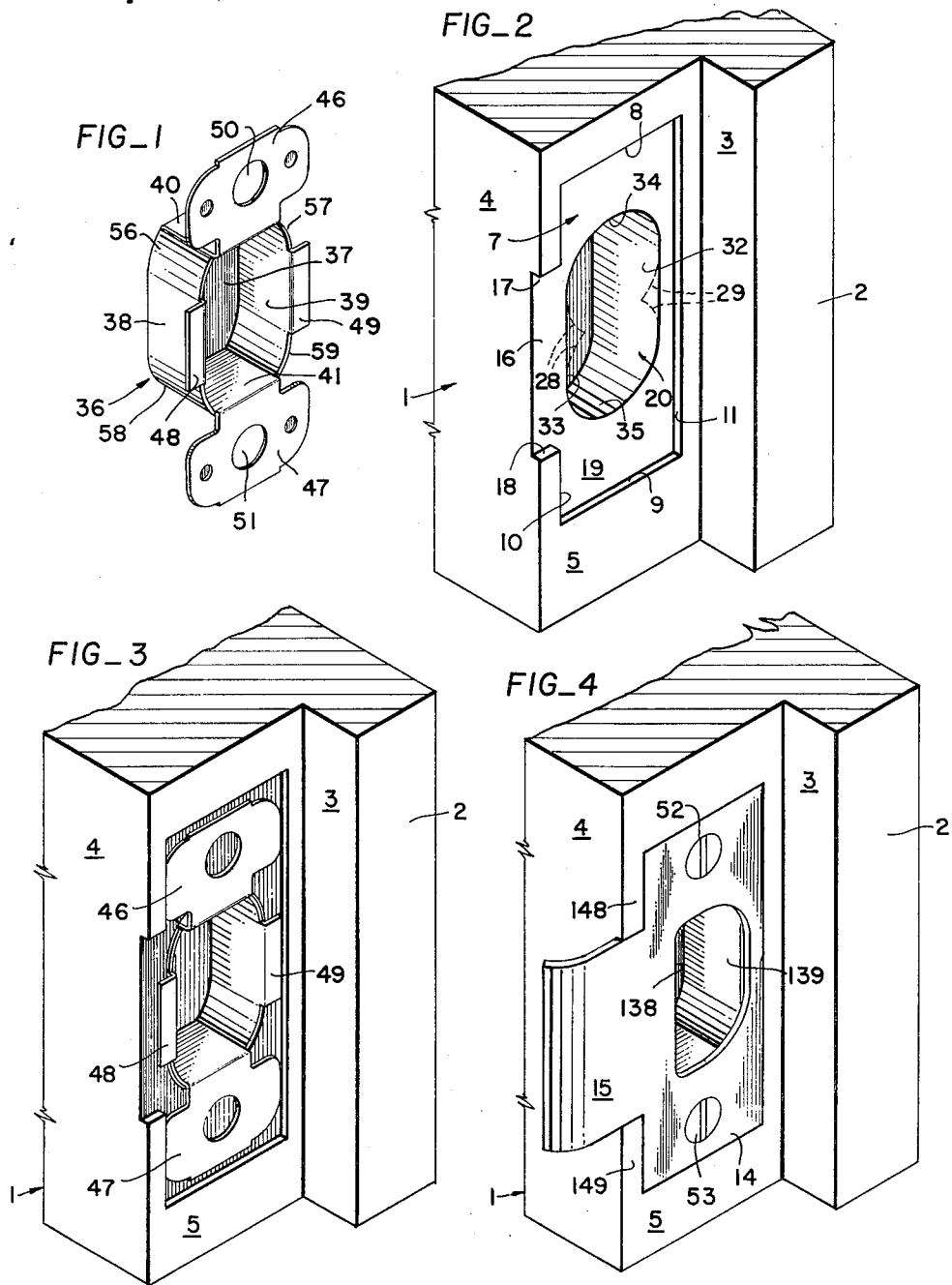
Oct. 9, 1962

E. L. SCHLAGE ET AL
METHOD OF FORMING AND INSTALLING
A STRIKE BOX AND STRIKE PLATE

3,057,053

Filed April 13, 1959

3 Sheets-Sheet 1



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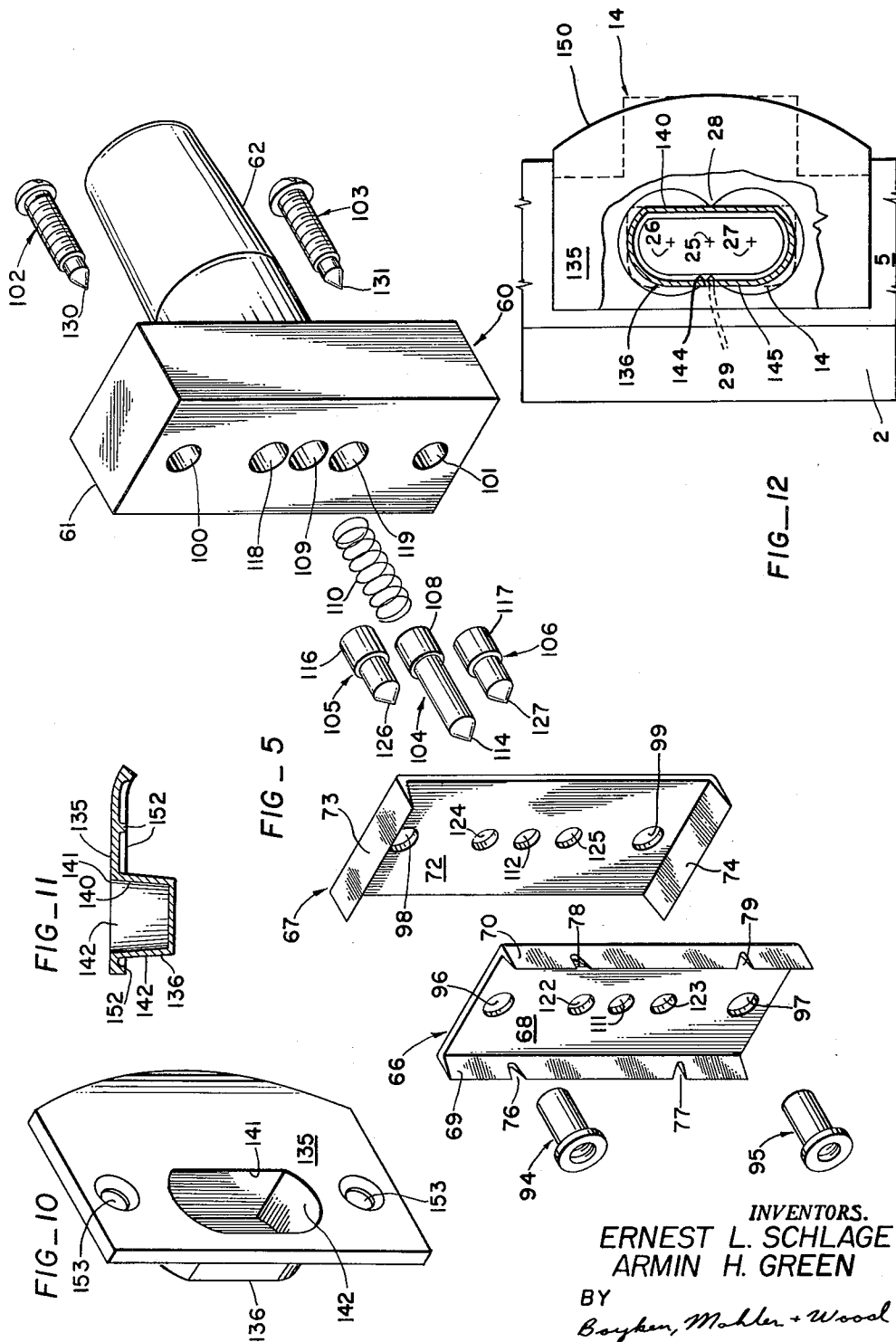
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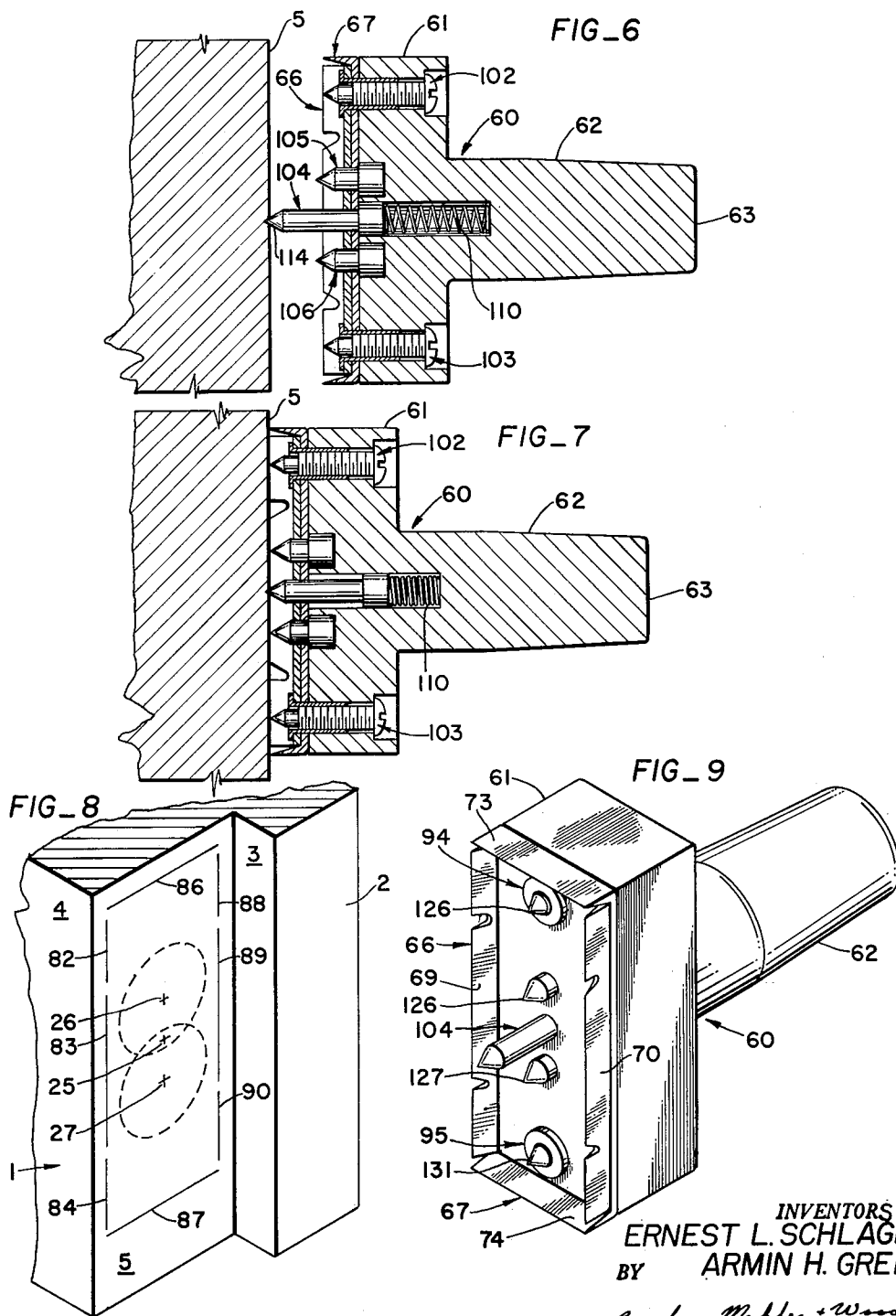
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1

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METHOD OF FORMING AND INSTALLING A STRIKE BOX AND STRIKE PLATE

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This invention relates to a strike for a door and particularly to a method of installing a strike plate and its associated box. The invention also provides a novel strike box and combination strike and strike plate.

The main object of the invention is the provision of an improved method for installing a strike plate and strike box on a doorjamb in an accurate manner.

Still another object of the invention is the provision of a novel method of forming the recess that receives the strike box so that the strike box and strike are in their proper positions relative to the latch bolt when installed.

Other objects and advantages of the invention will be seen from the following specification and from the drawings:

FIG. 1 is a perspective of one form of strike box made in accordance with the invention;

FIG. 2 is a perspective of a portion of a doorjamb prepared to receive the strike and strike box;

FIG. 3 is a perspective similar to FIG. 2 showing the strike box of FIG. 1 installed;

FIG. 4 is a perspective similar to FIG. 2 showing the strike installed over the strike box;

FIG. 5 is an exploded perspective of the various elements of the mortise forming and locating tool;

FIG. 6 is a vertical cross section of the assembled tool about to be applied to a doorjamb;

FIG. 7 is a vertical cross section of the assembled tool showing the same applied thereto in mortise cutting position;

FIG. 8 is a perspective of a doorjamb showing schematically the various markings involved in the invention;

FIG. 9 is a perspective of the assembled tool;

FIG. 10 is a perspective of the strike and strike box combination of the present invention;

FIG. 11 is a horizontal cross section through the combined strike and strike box of FIG. 10;

FIG. 12 is a semischematic side elevation of the doorjamb with portions broken away showing the manner in which the recess is formed to accommodate the combination strike and strike box of FIGS. 10, 11.

In detail, and with reference first to FIGS. 2, 3, 4 and 8 the invention is adapted to be employed in a door installation that includes a doorjamb 1 provided with a doorstop 2. It will be understood that the door (not shown) swings from a doorjamb opposite jamb 1 and one face of the door fits, in its closed position, against the face 3 of stop 2 with the opposite face of the door usually substantially coplanar with the face 4 of the jamb 1.

By the present invention a conventional relatively shallow strike mortise 7 is formed in jamb 1, having upper and lower sides 8, 9 respectively and front and rear sides 10, 11 respectively.

A strike 14 (FIG. 4) is adapted to be received within the mortise shown in FIG. 2 and the depth of said mortise is equal to the thickness of the strike 14 so that the outer face of the latter is coplanar with the face 5 of jamb 1.

Strike 14 is provided with an integral lip 15 which is curved to cam the latch bolt (not shown) to an inner retracted position relative to the door as the door approaches closed position.

To accommodate said lip 15 the mortise (FIG. 2) is enlarged to provide a channel portion 16 extending from the front side 10 of the mortise to the front face 4 of

2

jamb 1. Said channel portion 16 is defined by upper side 17 and lower side 18.

The bottom 19 of the mortise 7 is provided with a central recess generally designated 20 which is adapted to receive the latch bolt of the door therein when the latter is in closed position. The method of forming recess 20 will now be described.

As best seen in FIG. 8, the operation of installing the strike and strike box is commenced by establishing a point 25 of the face 5 of jamb 1. This point 25 should be on the central axis of the latch bolt of the door when the door is closed and may be marked by means of a marking tool such as that illustrated on Russel Patent No. 2,638,682. Said reference patent illustrates a method of marking point 25 so that the same is on the axis of the bore that receives the latch bolt which axis of course corresponds to the central axis of the latch bolt.

By means of a tool, which will subsequently be described, a pair of points 26, 27 are then established at equal distances above and below point 25. A boring bit is then applied to points 26, 27 successively and holes are bored with said points as centers and to the desired depth of recess 20. Since the bores intersect in the example shown in FIG. 2 the small portions of the jamb remaining between the bores indicated schematically by dotted lines 28, 29 in FIG. 2 are readily removed by a chisel.

The recess 20 thus formed is provided with a pair of vertically extending parallel sidewalls 32, 33 and upper and lower semicylindrical endwalls 34, 35 respectively.

Said recess 20 is adapted to receive therein a strike box 36 such as that illustrated in FIG. 1. Said box is formed from relatively thin material such as sheet steel and includes a bottom 37, opposite sidewalls 38, 39 and upper and lower endwalls 40, 41.

Integral with upper and lower endwalls 40, 41 are lugs 46, 47 respectively which are adapted to fit against the bottom 19 of mortise 7 when the box is received in recess 20 as seen in FIG. 3. As an additional positioning means lugs 48, 49 in continuation of sidewalls 38, 39 may also be provided to lap over the open side of recess 20. Lugs 46, 47 are apertured as at 50, 51 for receiving therethrough screws 52, 53 (FIG. 4) which secure the strike to jamb 1.

As seen in FIG. 1, strike box 36 is formed so that the junctures 56, 57 between sidewalls 38, 39 and endwall 40 are formed to about the same radius as the bores which formed recess 20. Similarly junctures 58, 59 between sidewalls 38, 39 and endwall 41 are formed to the same radius. The spacing between sidewalls 38, 39 is also predetermined so that box 36 is snugly received in recess 20. It will be apparent from this structure, although clearance exists between the endwalls 40, 41 of box 36 and the semicircular endwalls 34, 35 of recess 20, the box 36 will nevertheless be automatically centered relative to recess 20 with the endwalls 40, 41 equally spaced from the point 25 (FIG. 8) which represents the central axis of the latch bolt. Interference between the latch bolt and the strike box is therefore effectively obviated.

The tool for locating and forming the strike will now be described:

As best seen in FIG. 5, the tool comprises a body 60 of any suitable material such as resilient plastic provided with a generally rectangular head 61 and a handle portion 62 provided with an end face 63 (FIG. 6) adapted to be struck by a hammer.

On the side of head 61 opposite handle portion 62 there are secured a pair of channel shaped cutters 66, 67. Cutter 66 comprises a web 68 connecting a pair of vertically extending flanges 69, 70 formed with cutting edges. Similarly, cutter 67 comprises a web 72 connecting a pair of horizontally extending flanges 73, 74 also formed with cutting edges. Flanges 73, 74 are slightly

3

deeper than flanges 69, 70 so that when cutters 66, 67 are secured together to head 61 the cutting edges thereof are substantially coplanar (FIG. 6).

Flange 70 of cutter 66 is provided with a pair of notches 78, 79 which are spaced apart a distance which indicates to the carpenter the points in mortise 19 at which the channel 16 should be cut to accommodate lip 15 of the strike. Thus, as shown in FIG. 8, the notched flange 70 marks colinear line segments 82, 83, 84 and it is a simple matter for the carpenter to cut, with his chisel, the upper side 17 and lower side 18 of the channel portion 16 of mortise 19 which receives lip 15 of strike 14. It will be noted that the ends of lines 82, 84 define the width of channel 16 and to this end the notches 78, 79 are formed so that ends of said lines are well defined.

In a similar manner flange 69 of cutter 66 is provided with notches 76, 77 which may also be employed for the same function as notches 78, 79 on flange 70. By providing notches on both flanges it is not necessary to hold the tool with any particular side up or down to make the proper cuts. Furthermore, the cuts made by the tool are always correctly positioned regardless of whether the door is left or right hand.

It will be understood that the sharpened upper flange 73 of cutter 67 forms the cut 86 in FIG. 8 and lower flange 74 forms cut 87. Flange 69 of course forms colinear cuts 88, 89, 90. The fact that the cuts defining the mortise 19 are spaced apart slightly does not affect the efficacy of the tool as it is a simple matter to join up the adjacent cuts by means of a chisel.

Cutters 66, 67 are secured together and to head 61 of body 60 by means of a pair of internally threaded flanged sleeves 94, 95 which are passed through holes 96, 97 in web 68 of cutter 66 and holes 98, 99 in web 72 of cutter 67. A pair of bores 100, 101 are formed in head 61 to receive said sleeves and screws 102, 103 are threadably secured in sleeves 94, 95 from the opposite side of head 61 (FIG. 6).

Before said cutters are secured to head 61, a guide pin 104 and a pair of marking pins 105, 106 are mounted on head 61.

Pin 104 is relatively long and is provided with an enlarged head 108 which is slidably received in an elongated bore 109 in head 61. Also received in bore 109 is a compression spring 110 (FIG. 6) which serves to urge pin 104 outwardly of said bore at all times. Upon assembly of the cutters 66, 67, pin 104 is slidably received through holes 111, 112 in said cutters respectively. Pin 104 is formed to a point 114 at its end opposite its head 108 so as to be received in the indentation formed by the locating tool and which indentation has hereinbefore been described as point 25 in FIG. 8.

In use, it is a simple matter to apply the pointed end of guide pin 104 to the point 25 of FIG. 8 and then urge the cutters 66, 67 against the jamb 1 against the force of spring 110. It is of course necessary to line up cutting flanges 69, 70 vertically before striking handle 62 with a hammer, but this is a simple matter because the carpenter has adjacent vertical surfaces as reference planes.

Marking pins 105, 106 are also provided with enlarged heads 116, 117 respectively which are received in bores 118, 119 in head 61. The depth of bores 118, 119 is equal to the length of heads 116, 117 so that said pins are firmly secured in said bores. Holes 122, 123 are provided in cutter 66 and holes 124, 125 are provided in cutter 67 for receiving said pins 105, 106 therethrough, and the length of said pins is predetermined so that their pointed ends 126, 127 extend slightly beyond the plane of the cutter edges of the cutters 66, 67. In this manner, when the mortise forming cuts are made by the cutters as shown in FIG. 8 indentations at points 26, 27 are also made so that the carpenter has definite marks for positioning his boring tool to start boring the bores for recess 20.

Screws 102, 103 which are used to secure the cutters to the head are also provided with points 130, 131 which,

4

when the cutters are assembled, are preferably about coplanar with the cutting edges thereof. In this manner the operation of forming the cuts shown in FIG. 8 also results in the jamb being indented by points 130, 131 of screws 102, 103 to indicate the axes of the holes to be drilled by the carpenter for receiving screws 52, 53.

It will therefore be apparent that the above described tool will, in one operation, cut the jamb for sinking the strike, locate the holes to be bored for forming the recess to receive the strike box, and also locate the screw holes for receiving the screws which are used to secure the strike to the jamb.

The present invention also contemplates the provision of a one piece combination strike box and strike plate such as that shown in FIGS. 10, 11. In this case the strike plate 135 and the strike box 136 are preferably cast integrally of a suitably resilient plastic such as nylon, as best seen in FIG. 11.

Heretofore attempts have been made to provide a metal one piece strike and strike box but such attempts have been unsuccessful and have resulted in structures which require a separable bottom on the strike box held to the sides of the box by bent lugs.

It has been found, by employing a resilient plastic such as nylon, a unitary strike box and strike may be cast as shown in FIGS. 10, 11. In such a case it will be noted that by forming the box portion 136 complementarily to the recess in the jamb such as the recess 20 in FIG. 2, the box serves as a positioning means for the strike plate 135.

The manner in which the bores which form the recess for the latch bolt may be made to cooperate effectively with the strike box 136 is illustrated in the semischematic drawing, FIG. 12. First, referring to FIG. 2, it will be noted that the vertical sidewall 33 of the recess 20 is nearer to the outer or front face 4 of the jamb 1 than the edge 138 of the strike opening 139 that receives the latch bolt. This is because the centerline of the latch bolt (not shown) is centrally disposed relative to recess 20 when the door is closed and the position of edge 138 is such that it serves as a keeper for the flat side of the latch bolt.

However, when the strike and strike box are formed integrally as shown in FIG. 11 it is necessary, to permit die casting the same, that the side 140 of the strike box 136 be adjacent the edge 141 of the opening 142 of the strike 135. Referring now to FIG. 12, it is seen that by retaining the cusp 28 that is adjacent the front face 4 of the doorjamb, the box 136 may be formed so that the side 140 engages the cusp 28 as shown on FIG. 12. In such a case it is merely necessary to chisel out the opposite cusp 29 to form a short vertically extending side 144 (FIG. 12) to engage side 145 of strike box 136.

By the above described structure it is seen that the strike box and the recess into which it is inserted are complementarily formed so that considerable resistance is developed against the strike being pulled away from the jamb by the application of a force on the door tending to open it. Such resistance is not present when the strike and strike box are not integrally connected.

Referring again to FIG. 4 it is seen that forceable removal of strike 14 is resisted, not only by screws 52, 53 but also by the narrow strips 148, 149 of the jamb 1 that remain after the mortise 7 (FIG. 2) is formed. The manner of mortising the strike shown in FIGS. 2, 3 and 4 is therefore desirable for this reason. However, when the strike box and strike plate are formed integrally as shown in FIGS. 10, 11 and 12 the mortising operation may be simplified as shown in FIGS. 10, 12 by making the length of the camming lip 150 equal to the length of the strike plate 135. In this way the work of the carpenter is simplified because it is only necessary to follow cuts 86, 87, 89 (FIG. 8) in making the mortise. The resulting structure, however, is stronger than that shown in FIG. 4.

5

Additional resistance to failure of the strike plate may be achieved by casting the rear side of the plate 135 with ribs 152 to form a grid. This not only results in a saving in material but when the plate is secured tightly to the jamb the ribs 152 are embedded in the jamb and further resist pulling out of the plate.

Further simplification of the process of installing the strike and strike plate may be effected by omitting the screw holes 153 (FIG. 10) as shown in FIG. 12 and employing adhesive of any suitable nature to adhere the strike plate to the jamb of the door. In such a case the adhesive may be applied to the back side of the strike plate and to the box if desired so that it fills the recesses of the grid formed by the ribs 152. By applying pressure to the strike plate the same may readily be adhered to the jamb.

The above specific descriptions of the preferred forms of the invention are not to be taken as restrictive of the same as it is obvious that various modifications as to details may be made without departing from the spirit of the invention.

We claim:

1. The method of forming and installing a strike box on a jamb comprising the steps of: establishing a point on said jamb coinciding with the axis of the latch bolt of the associated door, establishing a pair of centers respectively above and below said point, boring two holes of equal diameter in said jamb on said centers and removing the material of said jamb between said holes to form a vertically elongated recess having parallel sidewalls and semicylindrical endwalls, providing a strike box having parallel sidewalls spaced apart a distance about equal to the diameter of said holes and endwalls spaced apart a distance slightly less than the maximum length of said recess and formed at each of its junctures between said sidewalls and endwalls to a radius about equal to the radius of said holes, whereby when said box is received in said recess said sidewalls and said junctures are in closely fitting relationship relative to the adjacent sides of said recess and said endwalls are spaced equal distances from said point.

2. The method of forming and installing a strike box on a jamb comprising the steps of: establishing a point on said jamb coinciding with the axis of the latch bolt of the associated door, establishing a pair of centers respectively above and below said point, boring two holes of equal diameter in said jamb on said centers and removing the material of said jamb between said holes to form a vertically elongated recess having parallel sidewalls and semicylindrical endwalls, providing a strike box having parallel sidewalls spaced apart a distance about equal to the diameter of said holes and formed at its endwalls substantially complementarily to the endwalls of said recess, whereby when said box is received in said recess said endwalls of said box are spaced equal distances from said point.

3. The method of forming and installing a strike box on a jamb comprising the steps of: establishing a point on said jamb coinciding with the axis of the latch bolt of the associated door, establishing a pair of centers respectively above and below said point, boring two

6

holes in said jamb with each of said holes having a diameter less than the spacing between said centers whereby a vertically elongated recess is formed having a pair of cusps on opposite sides of said recess, casting a strike box of plastic material and a strike plate integral therewith, and inserting said box in said recess with said box in engagement with the one said cusp that is nearer the hinge side of said jamb.

4. The method of forming and installing a strike box on a jamb comprising the steps of: establishing a point on said jamb coinciding with the axis of the latch bolt of the associated door, establishing a pair of centers respectively above and below said point, boring two holes in said jamb with each of said holes having a diameter less than the spacing between said centers whereby a vertically elongated recess is formed having a pair of cusps on opposite sides of said recess, casting a strike box of plastic material and a strike plate integral therewith, removing enough of the one of said pair of cusps that is adjacent the inner side of said jamb to permit inserting said box in said recess with said box in engagement with the other of said cusps, and so inserting said box in said recess.

5. The method of forming and installing a strike box and strike plate on a door jamb comprising the steps of: casting a strike box of plastic material and a strike plate integral therewith, forming a recess on said jamb to receive said box therein, and adhering said plate to said jamb with an adhesive when said strike box is in said recess.

6. The method of forming and installing a strike box and strike plate on a door jamb comprising the steps of: casting a strike box of plastic material and a strike plate integral therewith, and providing said plate with outwardly projecting ribs on the same side of said plate as said box, forming a recess on said jamb to receive said box therein, and adhering said plate to said jamb with an adhesive when said strike box is in said recess.

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