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MEANS FOR MOUNTING REMOVABLE PANELS IN DOOR FRAMES

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2 Claims. (Cl. 20—36)

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This application is a continuation-in-part of my copending application Ser. No. 743,655, now abandoned, describing a metal door. The invention disclosed herein is concerned with novel means for mounting in the door frame a removable panel.

The door of the prior application is made of two half-shells, each comprising half-sections of the two stiles and associated half-sections of the top and bottom rails, as well as half-sections of the middle rail and half-sections of additional cross-rails, if such middle and/or cross-rails are desired. The two half-shells are joined to make the door frame forming identical hollow stiles and identical hollow top and bottom rails. The middle and the cross-rails, if such are provided, are likewise identical in structure, and each forms with the stiles and with the successive rail an opening having a recessed ledge for receiving a desired and suitable panel. The size and general configuration of the panel correspond substantially to the size and configuration of the corresponding panel-receiving opening, and the panel rests peripherally on the recessed ledge associated with its opening. Conventional latch means are provided in the structure of the prior application for fastening each panel removably in place.

Further details of the structure of the door may be had by consulting the prior application, the pertinent sections of which should be treated as if they had been included herein.

In accordance with the present disclosure, I provide novel and improved means for positioning each panel in its opening in the door frame and for removably securing it in position. The new means comprises a pair of elongated mounting members, e. g., channel members, one for connection with each of two opposite sides of a door panel, and aligned apertures formed in certain portions of the rails defining the opening for such panel, for removably receiving the opposite ends of each mounting member, thus holding and securing the corresponding panel removably in mounted position.

The various specific objects and features of the invention will be brought out in the course of the detailed description which will presently be rendered with reference to the accompanying drawings. In these drawings,

Fig. 1 shows in diagrammatic perspective view a panel which, in this case, is assumed to be a rectangular screen panel;

Figs. 2 and 3 show two channel mounting members for coaction with the panel illustrated in Fig. 1, to facilitate insertion of such panel in the corresponding opening in the door frame and to secure it in position therein;

Fig. 4 shows in diagrammatic perspective view a portion of a door of the type disclosed in the

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previously mentioned copending application, forming an opening for receiving the panel represented in Fig. 1, and means forming apertures for removably receiving and holding the channel mounting members shown in Figs. 2 and 3, and therewith the corresponding door panel in position in the opening; and

Fig. 5 shows, on a smaller scale, a fragmentary vertical diagrammatic section through the structure illustrated in Fig. 4, to aid in describing the coaction of the removable panel and its mounting members with associated parts of the door frame.

Like parts are numbered alike throughout the drawings. Known details and elements will be referred to only to the extent required for conveying an understanding of the invention.

Fig. 1 shows a rectangular panel, assumed to be a screen panel, for removable mounting in the opening 38 formed in the door frame indicated in Figs. 4 and 5. The configuration and size of the panel correspond to that of the opening 38. The panel comprises a peripheral frame 11 and a screen 12. The screen may be fastened within the frame 11 of the panel in any desired and suitable manner. It is understood of course that the panel may be solid throughout and that it may be made of any desirable and suitable material.

Figs. 2 and 3 show two channel members which constitute the mounting means for removably securing the panel of Fig. 1 in position within the opening 38 of the door frame shown in Figs. 4 and 5. Each channel member is generally U-shaped in cross-section, forming a back wall 13 and two side walls 14—15, as indicated in Fig. 2. Punched and pressed out from the back wall 13 is an extension 16, and in the side wall 14 is provided a hole 17. The various parts of the second channel member are identically numbered in Fig. 3.

The channel member indicated in Fig. 2 coacts with the side wall 18 of the frame of the panel shown in Fig. 1 and, when mounted in position within the door frame, the extension 16 rests at the left edge of the top wall 19 of the panel frame. The channel member shown in Fig. 3 coacts similarly with the side wall 20 of the panel frame shown in Fig. 1, and, when in position within the door frame, its extension 16 rests on the right edge of the top wall 19 of the panel frame.

The door frame illustrated in Fig. 4 is made of two half-shells, as mentioned before, each half-shell comprising half-sections of the two stiles and half-sections of the top, bottom and middle rails, respectively. The hinge stile may be assumed to be the stile generally indicated by the numeral 24. Each stile is identical in structure, which may be briefly described in connection with the hinge stile 24. This stile comprises one half-

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section forming one stile wall 26, which may be part of the front wall of the door, portion 27 of the edge wall, the inner wall 28 and an extension 29. The other half-section of the hinge stile 24 forms portion 30 of the edge wall, portion 31 of the back wall and a forwardly bent extension forming the ledge 32. This ledge forms with the inner wall 28 a gutterlike channel which extends substantially throughout the length of the hinge stile 24. The extension 29 is disposed at the bottom of this channel. The edge wall portions 27 and 30 of the two half-sections are bent inwardly, forming aligned and outwardly flaring extensions 34—35. These two extensions are locked together by a locking member 36. Details of this locking member may be had from the co-pending application.

The lock stile 25 is made, just like the hinge stile 24, of two half-sections which, when joined together as shown, form the ledge 37 which extends longitudinally substantially throughout the length of the lock stile. The inner walls 28 and 28a of the two stiles 24 and 25 define the vertical sides of the opening 38 for receiving the panel shown in Fig. 1. The ledges 32 and 37 are recessed from the general plane of the stiles and form backings for the side walls of the panel frame.

The top rail is formed of two half-sections having a rear wall 39, which extends downwardly and forms an inwardly directed ledge 40, also indicated in Fig. 5. The ledge 40 is in a common plane with the vertical ledges 32 and 37 formed by the hinge and lock stiles, respectively. The front half-section of the top rail forms the member 41 which is suitably secured to the hinge and lock stiles, respectively. From the member 41 extends the portion 42, forming a transverse shelf from which projects a downward extension 43. The latter is nestled within the lower edge formed by the ledge 40 carried by the rear wall 39 of the top rail. The section 42 and the ledge 40 of the top rail thus form a transverse gutterlike channel similar to the vertical channels formed by the wall portions of the two halves of the hinge stile and by the corresponding wall portions of the lock stile, respectively. The free edge of the ledge 40 is disposed in a plane with the free edges of the ledges 32 and 37 of the hinge and lock stiles.

The middle rail is likewise constructed of two half-sections, one forming the front wall member 45, from which extend rearwardly the transverse walls 46—47, also shown in Fig. 5, and the latter are bent to form the portions 48—49. The other half-section of the middle rail forms the rear wall 50, the opposite sides of which are bent inwardly, forming the ledges 51—52. The free edges of these ledges are in alignment with and in a common plane with the free ends of the ledges 32 and 37 formed by the vertical ledges of the hinge and lock stiles.

The bottom rail may be constructed just like the top rail, to form with the lower portion of the ledges 32 and 37 of the hinge and lock stiles and with the ledge 52 of the middle rail (Fig. 5) an opening 55 for receiving a bottom panel in the lower portion of the door frame.

It will be seen from the foregoing description that a panel-receiving opening 38 is formed in the upper portion of the door frame, which is peripherally defined by the vertical inner walls 28 and 28a formed by the hinge stile 24 and by the lock stile 25, respectively, and by the transverse walls 42 and 46 formed by the top rail and

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by the middle rail, respectively. The coacting gutter-forming ledges 32 and 37 of the stiles and 40 and 51 of the top and middle rails are recessed from the exterior plane of the door frame, as shown.

It has been assumed that the door frame made in accordance with the drawings provides for two panel-receiving openings 38 and 55, one in its upper section and one in its lower section. It is understood of course that this has been assumed merely for the sake of giving an example, because obviously several openings such as 38 and 55 may be formed in the door frame simply by the expedient of using, in addition to the middle rail, desired intermediate or cross-rails; and, conversely, only one opening may be provided which extends substantially throughout the length of the door from the top rail to the bottom rail. Other variations are possible. For example, in the upper part of the door frame may be provided one or more panels, and in the bottom portion of the door frame may be provided an additional panel which is usually referred to as a "kick panel." The previously mentioned co-pending application furnishes examples of doors provided with such kick panel.

The panel shown in Fig. 1 may be the one to be removably mounted within the opening 38 of the door frame shown in Figs. 4 and 5. In order to accomplish the mounting, the transverse wall 42 of the corresponding half-section of the top rail (see also Fig. 5) is provided with two apertures, one at its left end, as indicated in Figs. 4 and 5 by numeral 60, and a similar aperture at the right end in back of the front wall 41, and in front of the gutterlike channel formed by the ledge 37 of the lock stile. Similarly, as shown in Fig. 4, two apertures 61—62 are formed in the transverse wall 46 of the middle rail. The apertures 60—61 at the left upper and lower corners of the panel-receiving opening 38 are in vertical alignment, and the aperture 62 of the middle rail, at the lower right-hand corner of the opening 38 is in vertical alignment with the corresponding aperture in the transverse wall 42 of the top rail at the upper right-hand corner of the opening 38. The middle rail also forms an aperture 63, as particularly shown in Fig. 5, which is the top aperture in the transverse wall section 47 at the left upper corner of the panel-receiving opening 55 and which is in vertical alignment with an aperture in the bottom rail corresponding to the aperture 60 formed in the top rail. A similar aperture is formed at the right end of the transverse partitionlike wall section 47 of the middle rail for vertical alignment with a coacting aperture formed in the corresponding partitionlike transverse wall section of the bottom rail—all for removably mounting a panel within the opening 55 at the lower end of the door frame.

Fig. 5 illustrates the manner of inserting the panel in a door frame and of removing it therefrom.

It is assumed that the panel of Fig. 1 is assembled together with its two channel mounting members shown in Figs. 2 and 3, held in assembly, as previously described, and placed in position for insertion shown in Fig. 5, numeral 13 in this figure indicating the back wall of the channel shown in Fig. 3. This assembly of the panel and its two channel mounting members is then raised from the position illustrated in Fig. 5, in the general direction of the prominent arrow at the left of the structure, and the upper

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ends of the two mounting channels are inserted into the holes 60 provided at the opposite ends of the transverse wall portion 42 of the top rail. The lower end of the assembly of the panel with its channels is worked rearwardly, in counter-clockwise direction as seen in Fig. 5, until the upper edge 19 of the panel, Fig. 1, is in engagement with the transverse wall of the top rail and thus within the top portion of the opening 38. The two channels are then moved upwardly, sliding along the sides of the panel frame, until their lower edges clear the lower edge of the opening 38, i. e., the transverse wall 46 of the middle rail, whereupon the lower end of the assembly is pushed rearwardly into the opening 38. The channels are then dropped into the corresponding apertures 61-62 in the partitionlike transverse portion 46 of the middle rail in the direction of the prominent downwardly pointing arrow. The extensions 16 of the two channels then come to rest on and engage the top wall 19 of the panel frame at opposite ends thereof. The panel shown in Fig. 1 is now in position and secured in position within the opening 38 of the door frame.

The lower panel, if such panel is provided, is inserted into the opening 55 of the door frame in a similar manner.

The panels are securely held against inadvertent removal, and all without any mechanical means such as latches or the like. They present a uniform appearance forming, as it were, a unit with the door frame without any exterior evidence of latching, locking, mounting or securing means.

The removal of a panel from the door frame is as easy as its insertion. All that is necessary is to insert a simple tool into the hole 17 in the corresponding side walls of the channel members shown in Figs. 2 and 3, and to lift these channel members until their lower edges clear the bottom wall of the corresponding panel-receiving opening in the door frame, for example, the transverse wall 46 of the middle rail which forms the bottom wall of the opening 38. The mounting channels, together with the panel, are then moved forwardly toward the position in which the channel 13 is shown in Fig. 5, and the entire assembly of the channels with the panel is then lowered until the upper edges of the channels clear the openings such as 60 in the transverse partitionlike wall 40 of the top rail. The entire assembly is then clear of the door frame.

One or both ends of the door frame may be closed by a channel member such as 65 shown in Fig. 5, disposed between the front and rear walls 41-39 of the top rail. The corresponding ends of the hinge and lock stile shells are cut down for this purpose, to provide the space required for the closure member 65. Apertures 66 may be formed in the closure member 65, one aligned with the apertures 60-61 at the left-hand upper and lower corners of the panel-receiving opening 38 and one aligned with the corresponding apertures such as 62 in the right-hand upper and lower corners of the opening 38. The provision of the closure member with its apertures 66 furnishes an alternate method of mounting the panel in its opening 38. The panel is simply inserted into the opening 38 and the two channel mounting members are dropped through

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the apertures 66 in the member 65 for locking engagement with the corresponding sides of the panel. The mounting channels come to rest when their extensions engage the top of the panel frame as before.

The above described alternate manner of removably mounting the panel provides advantages in cases where the door carries obstructions, e. g., some hardware, which would interfere with the manner of insertion illustrated in Fig. 5, or in cases where the panel is of a shape other than rectangular, e. g., oval or elliptic.

Rodlike mounting members may be used in place of the channel members shown in Figs. 2 and 3, e. g., in conjunction with panels carrying eyelets or the like, or for coaction with panels provided with borings for accommodating such rods.

The removable panel and its mounting means has been described specifically in connection with an all-metal door of the type disclosed in the co-pending application. It is understood of course that the invention is not limited to use in conjunction with such metal doors, but that it may be applied in a great many other instances, wherever it is desired to mount removably a panel within an opening or recess formed by a frame.

Changes may be made within the scope and spirit of the following claims.

I claim:

1. In a door having a frame which comprises vertically extending upright stiles and transversely extending vertically spaced rails which interconnect said stiles and form a substantially rectangular opening therewith, a panel for said opening, said panel being of substantially the same size and configuration as said opening, and a device for removably disposing said panel in said opening, said device comprising a pair of elongated cross-sectionally U-shaped panel-holding members one for removably embracing said panel substantially at each vertically extending edge thereof, the length of said panel-holding members exceeding the height of said panel measured along said vertically extending edges, said transversely extending rails having vertically aligned apertures for receiving said panel-holding members at the opposite ends thereof.

2. The structure defined in claim 1, together with stop means carried by each panel-holding member for stop engagement with said panel at the top thereof.

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