Jan. 17, 1967 R. C. KINSER 3,298,135

RIGHT OR LEFT HINGED DOOR AND DOOR FRAME ASSEMBLY

Filed April 27, 1964

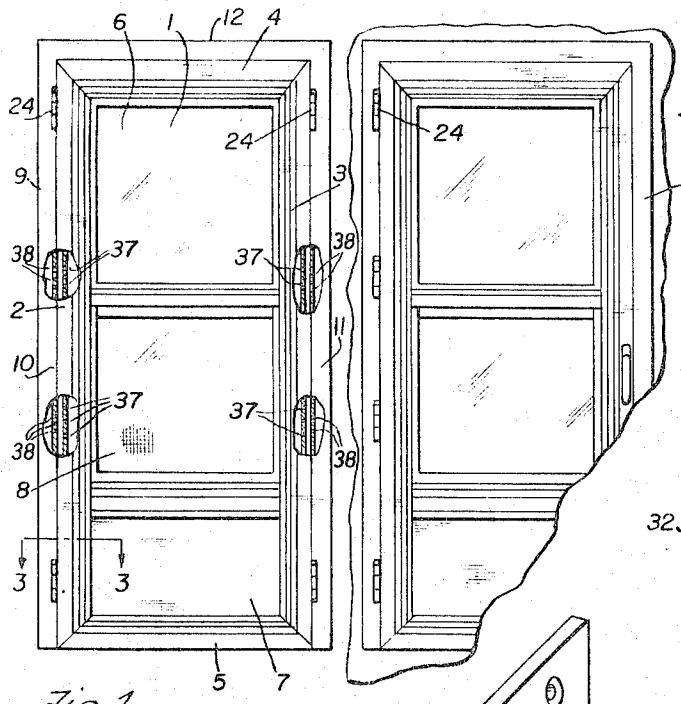


Fig. 1.

Fig. 2.

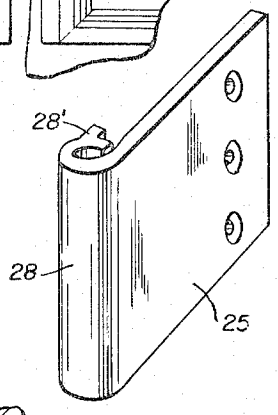


Fig. 4.

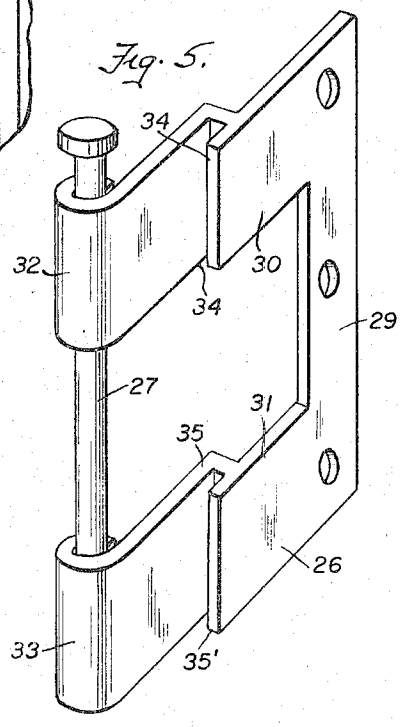


Fig. 5.

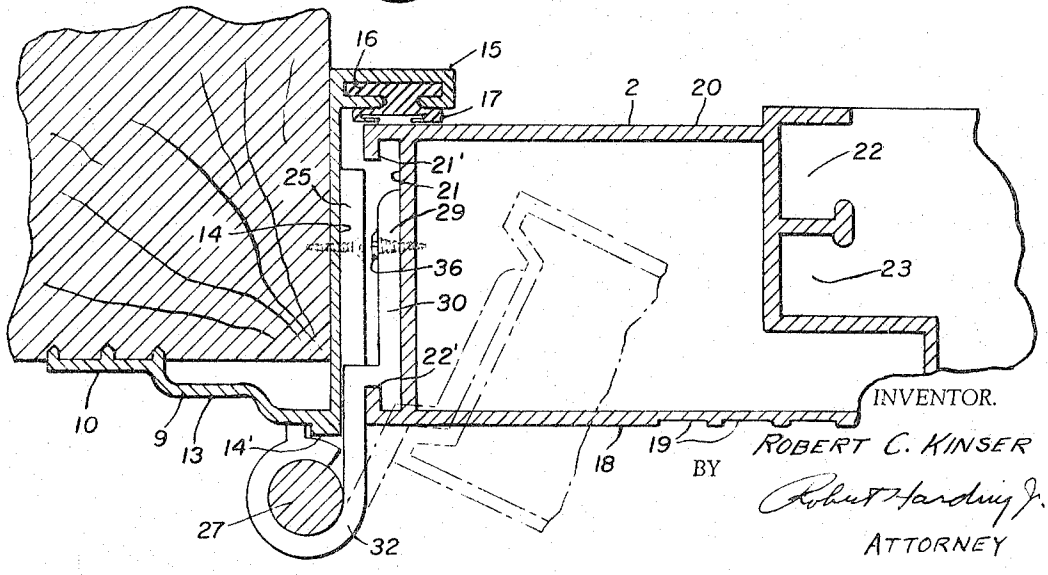


Fig. 3.

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RIGHT OR LEFT HINGED DOOR AND DOOR FRAME ASSEMBLY

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This invention relates to door and door frame construction, and has for its principal object to provide a door and door frame assembly which can be easily applied to a door frame opening, whereupon, by means of a simple adjustment, the door may be made to hinge at either side, as desired.

Another object of the invention is to provide an extruded metal door and door frame assembly which, after mounting in the door frame opening, may be made to hinge at either side by a simple adjustment which does not require any alteration of the structure.

Another object of the invention is to provide a special hinge for a door which facilitates hinging the door at either side with a minimum of adjustment.

Another object of the invention is to provide a method of installing a door and door frame assembly for left or right hand opening.

Still another object of the invention is to provide a method of assembling a door and door frame for easy installation to open either from the left or from the right.

Other objects and objects relating to the construction and assembly of the parts of the frame and door will be apparent as the description of the invention proceeds.

The invention is illustrated in the accompanying drawings, in which:

FIGURE 1 is a front view of the door and door frame of the invention as it appears assembled for installation;

FIGURE 2 is a front view of the same door and door frame installed in a door opening and arranged for hinging at the left;

FIGURE 3 is an enlarged sectional plan view, taken on the line 3—3 of FIGURE 1 and showing the manner of attaching the hinges;

FIGURE 4 is a perspective view of that part of the hinge which is attached to the door frame; and

FIGURE 5 is a perspective view of that part of the hinge which is attached to the door itself.

The objects of the invention are achieved by a unique door and door frame assembly which is intended to be supplied by the manufacturer in a temporarily assembled condition with removable-pin hinges on each side. In this condition the door is locked in the frame. The whole assembly is then inserted in the doorway and the frame secured in place. If it is desired to have the door swing at the left, for example, the pins of the hinges at the right of the door are removed. Then the door is swung out about the left hinges, and the hinge parts on the right side of the door and frame are removed and applied to the left side of the door and frame in places already provided for them and spaced from the other hinges. The pins are then reinserted and the hinging arrangement is then complete with all the hinges on the desired side. The handle and latch are then attached in the normal manner on the opposite side from the hinges.

Referring now more specifically to the drawings, the door **1** is shown as a storm door made of aluminum with extruded, hollow, side members **2** and **3** and top and bottom members **4** and **5**. These members are rigidly secured together in any desired manner at their ends, as by corner brackets, not shown, which are inserted in the members and to which the members are screwed. A glass panel **6** is shown at the top of the door and a kick plate **7** is shown at the bottom. In between the two

is a screen **8** and a glass panel arranged to slide upwardly so that the screen may be uncovered when desired. This arrangement of the door is in accordance with the usual construction of this type of storm door and forms no part of the present invention.

The door **1** is shown mounted in a door frame **9** formed of members **10**, **11**, and **12** at the left, right, and top of the door, respectively. The members **10**, **11**, and **12** are extruded in a special shape, as shown in FIGURE 3, in somewhat the form of a Z and this door frame member is usually referred to as a Z bar. It comprises an exposed facing portion **13** having a number of different levels to give it a decorative effect and to increase the strength, a flat portion **14** at right angles to the facing portion **13**, and a stop flange **15** at right angles to the flat portion **14**, these three portions forming the Z construction. The flange **15** is provided with a channel **16** facing forward in which a weather strip material **17** is inserted having a suitable cross-section so that a portion of it will lie outside the channel and act as a stop and a seal for the door when it is in closed position.

FIGURE 3 shows a cross-section of the side member **2** of the door, the side member **3** and top member **4** being the same. The side member **2** is hollow and has a front surface **18** which may be provided with decorative grooves **19**, and a flat surface **20**. The surface which forms the side of the door is provided with a channel **21** which extends the entire length of the member. This channel provides increased strength for the member and also provides a place for securing the portion of the hinge which is attached to the door, as will be later described. The opposite side of the member **2** is provided with grooves **22** and **23** for mounting the several panels **6**, **7**, and **8**.

In order to hinge the door on the frame, I provide specially shaped hinges **24**, the parts of which are shown in FIGURES 4 and 5. Each hinge consists of three parts: a straight part **25** to be attached to the door frame **9**, an offset, bifurcated, part **26**, to be attached to the door **1**, and a pin **27** to hold the two parts pivotally together.

The straight part **25** is shown in perspective in FIGURE 4 and comprises a flat, rectangular sheet of metal, one end of which has been looped around, as at **28**, to form a tube to receive the removable pin **27**. The offset part **26** of the hinge is shown in perspective in FIGURE 5 and comprises a U-shaped plate with a central, connecting, flat portion **29** at the base of the U and two legs **30** and **31** extending outwardly from the portion **29**. The ends of the legs **30** and **31** are bent around to form coaxial tubes **32** and **33**, respectively, to receive the pin **27**. The spacing between the two legs **30** and **31** is just a little greater than the length of the tube **28** on the part **25**, so that the tube **28** can fit between the tubes **32** and **33** when the hinge is assembled.

The legs **30** and **31** are offset about half way between the connecting portion **29** and the tubes **32** and **33**, as at **34** and **35**, in such a manner that the ends of the legs carrying the tubes **32** and **33** lie in one plane which is parallel to but spaced from a plane in which the connecting portion **29** and the other ends of the legs **30** and **31** lie. The spacing between these two planes is sufficient to permit the portions **25** and **29** of the hinge to lie parallel to each other with enough clearance to accommodate the screw heads **36** used to attach the two parts to the frame and the door.

The distance from the offsets **34** and **35** to the extreme end of the connecting portion **29** is such that this portion of the hinge will fit within the channel **21**, as shown in FIGURE 3. Also, it is desirable that the hinge parts be positively aligned with the door and Z bar. To this end the Z bar is provided with a ridge **14'** on the facing portion **13** at the corner thereof, and the tubular portion

28 of the hinge part 25 is provided with a ridge 28' extending lengthwise thereof and adapted to lock over the ridge 14' on the Z bar when the hinge part 25 is attached to the Z bar, as shown in FIGURE 3.

Also the channel 21 is provided with inwardly turned flanges 21' and 22', and the legs 30 and 31 of the hinge part 26 are provided with flanges 34' and 35' which extend parallel to the ends of the legs and are adapted to lock over the flange 22' when the part 26 of the hinge is attached to the door, as shown in FIGURE 3.

At the factory, the door and frame are assembled, as shown in FIGURE 1, with two hinges 24 on each side. The hinges are preferably positioned near the top and bottom, so that the screws can be screwed into the corner brackets for greater strength. The door and frame are shipped in this condition with the handle and latch in a separate package.

In order to install the door, the assembled door and frame are placed in the door opening and the frame screwed fast in this position. This insures that the frame will be square and that there will be suitable clearance for the door to swing freely without binding.

Then, which ever way it is desired to have the door swing, the hinge pins on the opposite side are removed. This permits the door to be swung outwardly on the other hinges. The hinge parts from which the pins have been removed are then removed from the door and casing and are attached to the hinged side of the door and casing, suitable holes, indicated at 37 and 38 in FIGURE 1, being provided on the door and the Z bar for mounting these hinges. It is then necessary to drill holes for attaching the handle and latch, and when the handle has been mounted, the installation is complete.

The invention is particularly adapted to aluminum doors made of extruded members, but may also be used with solid doors or doors of other materials. The channel for seating the offset part of the hinge has been shown in the door, but it might be in the Z bar, or both the Z bar and the door might be channeled and both parts of the hinge offset to a lesser extent, the purpose of the offset being to provide not more than one thickness of the hinge material between the front edge of the door and the frame and so reduce the required spacing.

It will be seen that I have provided a very simple door and door frame assembly which may be easily installed and the door of which can be made to swing in either direction with a minimum of adjustment and without any alteration of the structure except for the application of the handle and latch.

While the invention has been illustrated in connection with a storm door, fabricated of extruded aluminum members, the invention may be used with any type of door or other closure, and I do not therefore desire to limit my invention to the construction shown and described, except by the limitations contained in the appended claims.

What I desire to claim and secure by Letters Patent is:

1. A door and door frame assembly comprising:
(a) a door frame having side and top frame members;
(b) a door positioned within said frame;
(c) at least two longitudinally spaced hinges on each side of said door, each hinge having a first part attached to said door and a second part attached to said frame, the parts having aligned tubular portions spaced away from the surface of said door, the tubular portions of the hinges on each side of said door being aligned, and removable hinge pins pivotally connecting said first and second parts;
(d) means in said side frame members longitudinally spaced a predetermined distance from said hinge parts for locating other second hinge parts so that the tubular portions thereof will be alinged with the tubular portions of said first-mentioned hinge parts; and
(e) means in the sides of said door, longitudinally spaced the same predetermined distance from said first parts of said hinges for locating other first hinge parts in position for cooperation with said other second hinge parts with the tubular portions all in alignment when said other second hinge parts are attached to said door frame.

2. A door and door frame assembly, as defined in claim 1, in which the side frame members and the door sides form hinge-supporting parts, and one of said parts is recessed to receive a portion of one of the hinge parts, said one hinge part having a flat portion adjacent the tubular portion and a portion which is offset from said flat portion to fit into said recess, the other hinge part having only a flat portion adjacent the tubular portion, whereby said first and second hinge parts adjacent the tubular portions may lie in one plane providing a single thickness of metal between the edges of the door and door frame nearest the hinge pins.

3. A door and door frame assembly comprising:
(a) a door frame having side and top frame members, the side members of said frame being extruded aluminum Z bars;
(b) a door positioned within said frame and having sides of extruded aluminum, said Z bars and said door sides forming cooperating hinge-supporting parts;
(c) at least two longitudinally spaced hinges on each side of said door, each hinge having a first bifurcated part attached to said door and a second part attached to said frame, the parts having aligned tubular portions spaced away from the surface of said door, two tubular portions in the bifurcated portions of said first part and one in said second part to fit between said bifurcated portions, the tubular portions of the hinges on each side of said door being aligned, and removable hinge pins pivotally connecting said first and second parts, one of said cooperating hinge-supporting parts having a longitudinal recess to receive one of the hinge parts, and said hinge part having a portion which is offset to fit into said recess, whereby said first and second hinge parts adjacent the tubular portions may lie in one plane providing a single thickness of metal at the edges of the door and door frame nearest the hinge pins;
(d) means in said side frame members, longitudinally spaced a predetermined distance from said hinge parts for locating other second hinge parts, so that the tubular portions thereof will be aligned with the tubular portions of said first-mentioned hinge parts; and
(e) means in the sides of said door, longitudinally spaced the same predetermined distance from said first parts of said hinges for locating other first hinge parts in position for cooperation with said other second hinge parts with the tubular portions all in alignment when said other hinge parts are attached to said door frame.

4. The method of installing a door and door frame assembly having at least two removable-pin hinges on each side which comprises:
(a) inserting the assembled door and door frame in the door opening;
(b) attaching the frame to the door opening structure;
(c) removing the pins from the hinges on a first side of the doors;
(d) swinging the door out about the hinges on the second side;
(e) removing the hinges from said first side of the door and frame;
(f) attaching the removed hinges to the second side of the door and frame, spaced from hinges already on that side; and
(g) reinserting the removed hinge pins in the hinges just attached.

5. The method of assembling a door and door frame

for easy installation to open either from the left or from the right which comprises:

(a) attaching at least two first pin hinge parts to each side of said door frame;

(b) attaching at least two cooperating second pin hinge parts to each side of the door at positions to cooperate with said first hinge parts when said door is in place in said frame;

(c) making holes for additional hinges in the sides of the door frame longitudinally spaced from the hinges already attached;

(d) making holes for said additional hinges at correspondingly longitudinally spaced positions in the sides of said door;

(e) inserting said door in said door frame with the hinge parts cooperating; and

(f) inserting the hinge pins in the hinges to lock the door in place in the frame.

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