June 24, 1930. D. CARPENTER 1,768,308

HINGE STRUCTURE FOR SIDEWALK DOORS

Filed Dec. 15, 1928

Fig. 1.

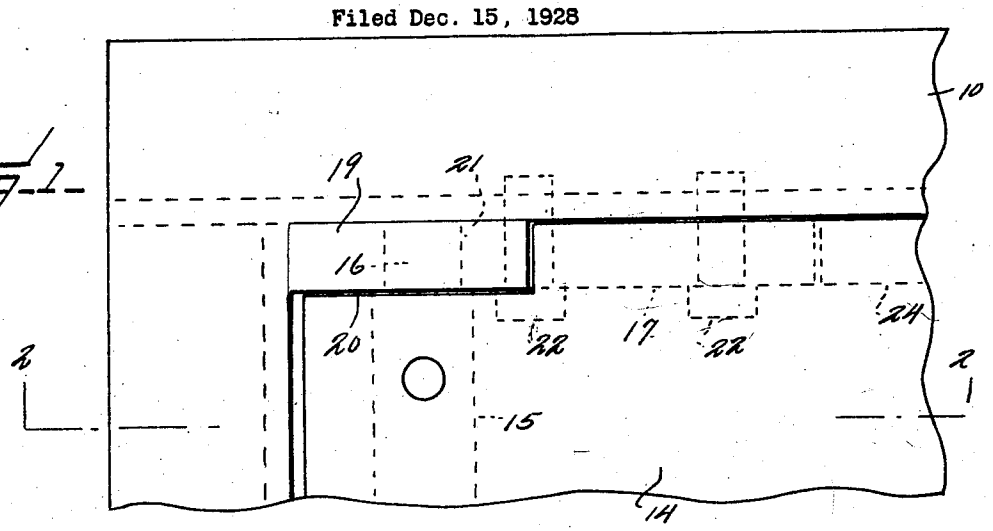



Fig. 2.

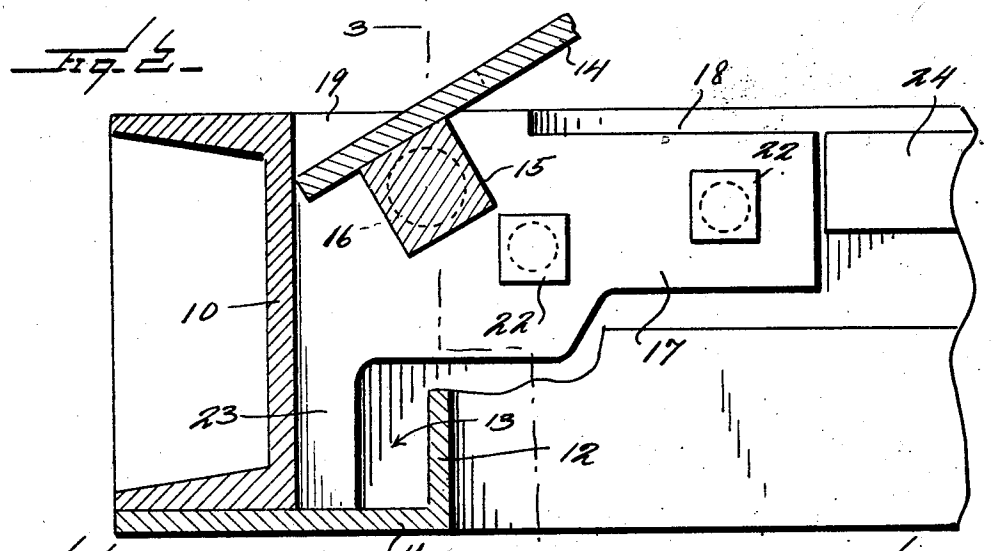



Fig. 3.

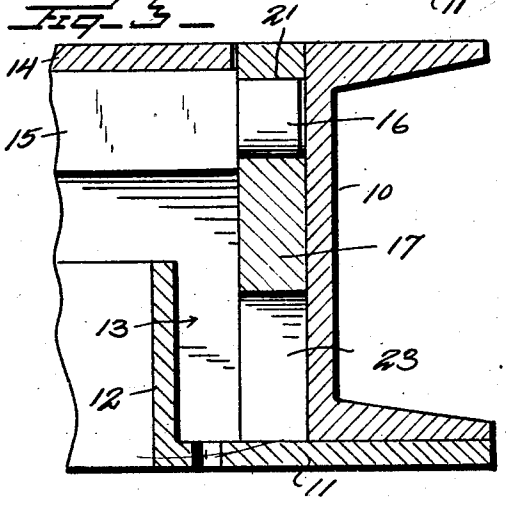
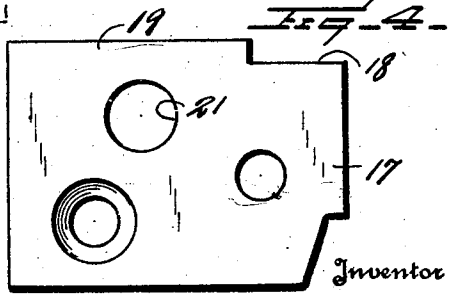



Fig. 4.




Inventor

D. Carpenter

By Frederic B. Wright

Attorney

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# UNITED STATES PATENT OFFICE

DAVIS CARPENTER, OF NEW YORK, N. Y.

## HINGE STRUCTURE FOR SIDEWALK DOORS

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This invention relates to what are known as bulkhead or sidewalk doors and particularly to means for hingedly supporting these doors. The customary manner of hinging sidewalk doors is to use a hinge consisting of two butts with a bronze pin connecting them. These doors usually have a steel channel frame constituting the door frame itself and usually embedded in concrete and it has been proposed to drill oppositely disposed holes in the channel frame and use steel pins or dowels on the door allowing the pins to pass through the holes, the pins thus constituting pivot pins upon which the doors can swing. This method of hinging doors is economical but unsatisfactory owing to the fact that it is difficult to insert the door, the door must be put in place and hinged before the door frame is made up and the holes through the channel for the pivot pins become clogged with dirt both from the inside and outside. Furthermore, the constant using of the door enlarges the holes, making the hinge loose.

With this in mind, the general object of my invention is to provide a means for hinging the sidewalk door to the frame thereof which will permit the door to be disposed within the frame and mounted thereon after the frame is set in place and which will permit the door to be set very expeditiously and at a minimum of time and expense.

A further object is to provide a construction of such character that the door may be readily removed with its supporting members at any time and as readily replaced, thus permitting the supporting members to be replaced by new ones if the old supporting members are worn at the pintle or permitting the replacement of the pintle if the pintle is worn.

A further object is to provide a construction of this character which will permit the door to fit snugly in place within the door frame and to provide means whereby the water leaking through the door will be taken care of and discharged.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a fragmentary top plan view of a sidewalk door having my improved hinge structure applied thereto;

Figure 2 is an elevation partly in section, the section being taken on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 2, but showing the door closed;

Figure 4 is an elevation of a modification of the supporting plate for the door.

Referring to these drawings, 10 designates a portion of the rectangular frame of the door. This frame as shown in Figure 2 is illustrated as made of channel iron though, of course, I do not wish to be limited to the use of channel iron for this purpose. Forming part of the door frame and attached to the lower flange of the channel iron 10 is the lower flange 11 of an angle iron whose flange 12 extends upward in spaced relation to the web of the channel iron 10 so as to form a gutter 13. This gutter 13 extends entirely around the frame on the inside thereof and at one point is provided with a drainage opening connected by pipe to the sewer in an obvious manner so as to permit any drainage seeping in around the door to be carried away.

The door 14 is preferably made of steel, or any other suitable material, braced by angle irons or channel irons and as illustrated carries bolted, riveted or otherwise attached to its under face at the butt end of the door the transverse bar 15 constituting a pintle whose ends are reduced to form gudgeons 16. It is to be understood that these gudgeons need not be formed upon the ends of a transverse bar 15 but may be made independently of each other and attached to the under face of the door. The door has a width approximately equal to the interior width of the frame 10 so as to fit down between said frame. For the purpose of supporting the door, I provide the door supporting or hinge members 17 which may be made of any suitable material but are preferably made of bronze castings. There are two of these hinge members which are

disposed at the corners of the frame so as to abut at their rear ends against the rear of the frame and fit closely against the inner faces of the frame.

The top edge of each of these hinge members is flush with the upper edge of the frame beam 10 but each hinge member is cut away at 18 to a depth equal to the thickness of the door so that the door or leaf when turned down may rest upon the upper face of this cut away portion. In order to accommodate the portion 19 which is rearward of the recess 18, the lateral edges of the door at its rear corners are cut away at 20 so that the door may swing from a vertical to a horizontal position. Each of the members 17 is apertured at 21 for the reception of the corresponding gudgeon 16 and also apertured for the passage of a plurality of bolts or screws 22. These bolts or screws extend through the member 17 and through the web of the frame beam 10. Preferably the web or frame beam will be tapped so that the bolts will have screw-threaded engagement therewith though it will be understood that nuts might be used in connection with these bolts.

It will, of course, be noted that neither gudgeon 16 extends into the web of the channel iron frame beam. In the construction shown in Figure 3, each hinge member 17 is formed at its rear end with a downwardly extending leg 23 which bears against the bottom of the gutter 13 at the rear end of this gutter. I do not wish to be limited to this, however, as the member 17 might be formed without this leg as shown in Figure 4.

Metallic strips or blocks 24 are bolted, riveted or otherwise attached to the web of the opposed angle iron frames, and these blocks or strips extend along the frame on a level with the upper edge faces of the hinge members 17 so as to support the door when the door is in a horizontal position.

It will be understood that ordinarily there are two of these doors mounted within one single frame. As before remarked, I do not wish to be limited to the use of a pintle bar 15 extending entirely across the door as while this is the best practice as reinforcing the door at this point and giving full support, it would be entirely possible to form the gudgeons as separate elements attached to the door.

It will be seen that the hinge mounting of this door is such that the door may be readily put in place and as readily removed at any time and that when the door is closed, the hinge mounting is entirely protected so that the door cannot be detached by releasing the hinge. Furthermore, it will be seen that this hinge mounting permits the door to be put in place after the frame of the door has been set in concrete or other material and that with this construction, there is no chance of the apertures for the gudgeons becoming more or less filled with concrete in the operation of setting the door frame and that there is no likelihood of the apertures or seats for the gudgeons becoming filled with dust or dirt, thus making the door hard to open and close.

The door is held snugly in place against any lateral movement for the reason that the pintles at their ends abut against the web of the channel iron frame. The door when closed fits closely against the channel iron frame at its edges and any water which may seep in around the edges of the door will be caught in the gutter 13 and drained away. My construction very greatly reduces the cost of making and installing sidewalk doors or bulk head doors of the character stated and does away with the trouble so often found in sidewalk doors of the hinge butts becoming loose.

My construction while providing relatively heavy gudgeons upon which the door operates entirely overcomes the difficulties heretofore experienced in the use of these gudgeons and the trouble in setting the door incident thereto.

It will also be noted that inasmuch as the hinge elements, blocks or plates 17 abut against the side and end channel irons of the frame and are disposed in engagement with the corners of the frame, that they are very easily set in place without measurements, without careful calculation and by unskilled labor, and all that it is necessary to do is to be sure that the bolt holes for these hinge elements are so disposed that the upper edge of the hinge element is exactly flush with the upper face of the channel iron frame. The downwardly extending leg 23 has the added advantage that it forms a guide whereby the hinge member may be set without the necessity of any particular care being taken, as when the hinge element is provided with this leg, it is only necessary that the hinge element be set so that it abuts against the rear corner of the frame with the lower end of the leg resting firmly against the gutter angle. This will bring the upper edge of the element flush with the upper face of the door frame so that when the door is closed, it will be flush with the upper face of the frame. It will be seen that with this door, the door and hinge elements are put in place and removed as a unit so that it is a very easy matter to set the door in place.

While I have illustrated certain details of construction and certain arrangements of parts, it will be understood that the principle of the invention might be applied to other forms of doors without departing from the spirit of the invention and that the details of construction might be modified in many ways without departing from the

spirit of the invention as defined in the appended claims.

I claim:—

1. The combination with a door frame, of a door having a supporting pintle bar attached to the inner face thereof and formed to provide terminal gudgeons, and gudgeon supporting elements into which the gudgeons extend, the elements being detachably engaged against and projecting from the inner face of the door frame.

2. The combination with a door frame, of a door having supporting gudgeons projecting laterally beyond the side edges of the door, and gudgeon supporting elements having apertures into which the gudgeons extend, said supporting elements being detachably engaged against and projecting from the inner edge face of the door frame confronting the edge of the door.

3. The combination with a door frame, of a door, gudgeons mounted upon the inner face of the door adjacent one end, and gudgeons supporting elements into which the ends of the gudgeons extend for rocking engagement, the gudgeon supporting elements being engaged at against the inner surface of opposite corners of the door frame and being detachably engaged with the door frame.

4. The combination with a door frame, of a door fitting the frame and having supporting gudgeons mounted upon the inner face of the door adjacent its rear end, gudgeon supporting elements detachably engaged against the inner face of the door frame and apertured for rocking engagement with the gudgeons, each of the supporting elements being cut away upon its upper face and disposed with the upper face of its rear portion flush with the upper face of the door frame, the door being cut away to accommodate the rear portion of the supporting element, that portion of the supporting element below the upper face of the door frame constituting a seat for the door when closed.

5. The combination with a door frame, of a door, the lateral margins of the door at the rear thereof being cut away, gudgeons attached to the inner face of the door and projecting below said cut away portions of the door, gudgeon supporting elements disposed against the inner face of the door frame and abutting against the rear thereof, and detachably engaged with the door frame, each supporting element having an aperture for the corresponding gudgeon and the forward portion of each supporting element being cut away to a level below the level of the upper face of the door frame to receive and form a seat for the door when the door is closed.

6. In a door structure, a rectangular frame having an inner inwardly projecting flange, a door fitting within the frame, gudgeons mounted upon the inner face of the door adjacent one end thereof, and gudgeon supporting elements having apertures into which the ends of the gudgeons extend for rocking movement, the gudgeon supporting elements being engaged flat against opposite inner faces of the door frame, and each gudgeon supporting element being formed to fit against a corner of the frame and having a leg extending inward to the inner flange of the frame.

7. The combination with a door frame defining a door opening, of a door having laterally projecting gudgeons, the distance between the tip ends of the gudgeons being less than the width of the opening and gudgeon supporting elements into which the gudgeons rotatably extend, the elements being detachably engaged with and against the edge faces of the frame confronting the edges of the door whereby when the gudgeon supporting elements are detached from the frame, the door and gudgeons are removable as a unit through the door opening.

8. In a door structure, a frame, a door having a gudgeon mounted upon and projecting laterally from the edge face of the door adjacent one end thereof and rigid with the door, and a supporting member for the gudgeon having an aperture for the reception of the gudgeon and being detachably engaged with the door frame against that face of the door frame confronting the edge face of the door.

In testimony whereof I affix my signature.

DAVIS CARPENTER.