J. G. SCHMIDT.

FLUSH HINGE DOOR.

APPLICATION FILED JUNE 25, 1909.

960,203. Patented May 31, 1910.

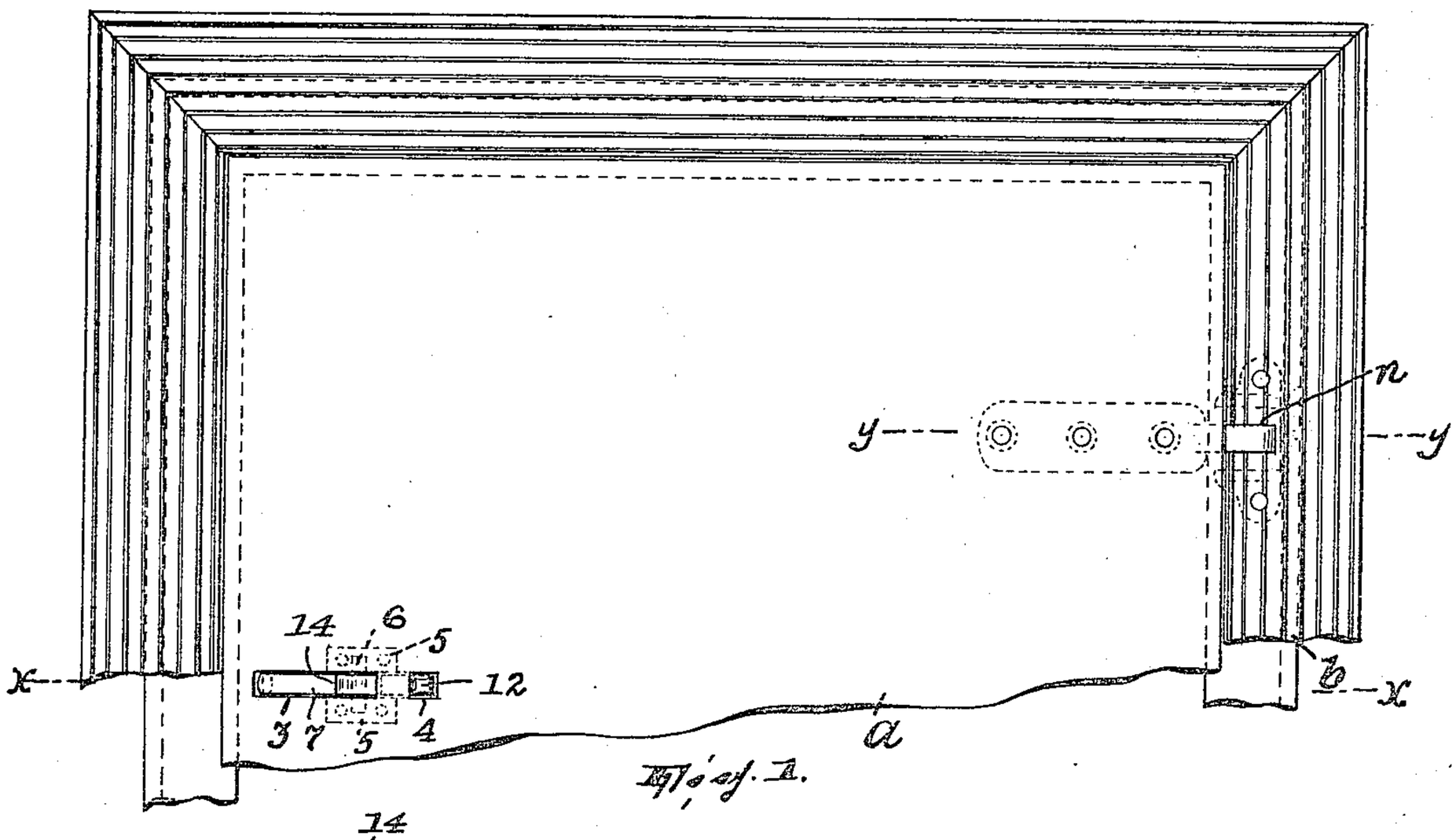

Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5. Fig. 6. Fig. 7. Fig. 8.

WITNESSES

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FLUSH-HINGE DOOR.

960,203. Specification of Letters Patent. Patented May 31, 1910.

Application filed June 25, 1909. Serial No. 504,301.

To all whom it may concern:

Be it known that I, JOHN GUSTAVE SCHMIDT, a citizen of the United States, residing in Passaic, Passaic county, New Jersey, have invented a certain new and useful Improvement in Flush-Hinge Doors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention relates to flush-hinges and it consists in certain improvements in the flush-hinge set forth in my U. S. Letters Patent No. 835,116, dated November 6, 1906, whereby a strong and durable flush-hinge is provided which may be applied to and removed from the frame although the frame may be permanently set in a concrete or other foundation not permitting removal of the frame without considerable difficulty and damage to the foundation. In my previous patent, the frame was slotted, and casings in which the door was pivoted were attached to the outer side of the frame; this made it difficult to have access to the casings in order to remove the door. In the present instance, I secure the casings removably to the inside of the frame, preferably to both its horizontal and vertical walls, whereby the door may be readily removed at any time without disturbing the frame. A further advantage of this arrangement lies in the fact that, should the casings become loosened, they may be readily readjusted, and even if left loose they cannot act by any movement incidental to such loosening to break down or disintegrate the concrete.

A further object of my invention is to provide a handle for the door so constructed as normally to stand flush therewith and close off the admission of water, but capable of being pivotally raised to afford a firm hold on the door when opening and closing it.

In the accompanying drawing, Figure 1 is a plan view of a fragment of a door and frame provided with my improved flush-hinge; Fig. 2 is a longitudinal sectional view substantially on the line *x*—*x* in Fig. 1; Fig. 3 is a vertical sectional view on the line *y*—*y* of Fig. 1; Fig. 4 is a vertical sectional view through one of the hinges, looking outwardly; Fig. 5 is a plan view of the casing; Fig. 6 is a vertical sectional view of a modified form of the invention, the plane of the section being transversely of the axis of the hinge; and, Fig. 7 is a fragmentary plan view of what is shown in Fig. 6, a portion of the frame being broken away.

a designates the door and *b* the frame. In Figs. 1 to 4, this frame comprises pieces of angle-iron *c* mitered together in rectangular arrangement, and the plates *d*. Relatively to the vertical wall *e* of each side of the frame, its horizontal wall *f* projects inwardly, while the plate *d*, which is suitably secured to each piece of angle-iron against the top of its horizontal wall *f*, projects outwardly, making the cross-section of the frame have the form of the letter T. Thus, when the frame is set in the concrete *g*, the outwardly projecting portions of the plates *d* rest on the concrete and support the frame. In Figs. 6 and 7 substantially the same effect is secured by making each section or side *h* of the frame of T-iron.

Referring now to Figs. 1 to 5, *i* is a casing open at the top and back and having a slot *j* at the front thereof. This casing has the downwardly projecting or vertical wing *k* and two laterally projecting horizontal wings *l*, the former having its back face flush with that of the casing and the latter having their top surfaces flush with that of the casing. In side elevation, the top and back surfaces of the casing form substantially a right-angle so that the casing may be fitted in the angle between the walls *e* and *f* of the frame, being held in that position by screws or the like *m* penetrating holes in the wings *k* and *l* and tapped into the walls *e* and *f*. There are preferably two such casings, and in coincidence with the slot of each the wall *f* and plate *d* are cut away to produce a slot *n*, the outer end of which forms a shoulder or abutment whose function will later appear.

Opposed recesses *o* are formed in the top of each casing, and in these recesses rest the ends of a pin *p*; the pin is circular in cross-section, but its ends are cut away, as at *q*, so as to lie flush with the top surface of the casing, the flats *r* thus produced lying in contact with the under side of wall *f* and thus preventing the pin from turning.

On each pin *p* as a fulcrum is arranged an arm or lever *s* which may be riveted or otherwise secured to the door *a*, the pivotal portion of the arm being received by the

slot *n* and having its top face higher than the rest of the arm so as to lie flush with the top surface of plate *d* when the door is closed, at which time the said pivotal portion is received by the slot *j* of the casing; when the door is open, the pivotal portion of each arm bears against the shoulder formed at the outer end of the slot *n*.

By arranging the parts so that the pin *p* is non-rotatable, the wear comes entirely on the pin, which may be of some hard metal, such as steel, allowing the casing to be cast from a softer metal, such as brass, if desired.

The frame may be permanently set in the concrete foundation *g*, whereupon the door may be attached by simply securing in place the casings *i*; should it be necessary to remove the door, it is only necessary to detach the casings.

Referring now to Figs. 6 and 7, one side of frame *h* is formed with two apertures *t* in the wall *u* thereof and with slots *t'* (of less width than the apertures but registering therewith) in the wall *v*. *w* is the casing formed open at the top and at its inner side or front. The vertical downwardly projecting wing *x* and horizontal wings *y* of this casing are disposed at the front thereof (instead of relatively at the back, as in the case of the casing *i*). Each casing is introduced into its aperture *t* under wall *v* and is secured in position by the screws *z* penetrating its wings *x* and *y* and tapped into the vertical wall *u* and the inwardly projecting portion of the horizontal wall *v* of the frame. The casing is penetrated horizontally by a pin 1 and on this pin is fulcrumed the arm or lever 2, which may be suitably secured to the door *a* and which fits the slot *t'*. When the parts are assembled, as shown in Figs. 6 and 7, the casing projecting into the slot *t*, the pin is prevented from endwise displacement since at that time it occupies partly the same plane as the vertical wall *u* and is opposed at its ends by the same. In this form also, the frame may be permanently established in its foundation and the door afterward attached by first assembling its hinge members and then introducing the casings into apertures *t* and securing them in place; to remove the door, the casings have only to be detached.

In both forms of the invention the casings are attached to the frame in such manner as to be readily accessible; in both forms, also, the pin *p* (or 1) is removable, being held in place partly by the casing and partly by the frame.

The handle shown in Fig. 1 is arranged and constructed as follows: A slot 3, extended transversely of the axis of the door, is formed in the door, and in alinement with it an opening 4. Arranged in suitable bearings 5 riveted to the under side of the door at both sides of the slot is a pin 6. This pin forms a fulcrum for the handle 7, the same being substantially a lever whose longer arm 7' is in the form of a segment whose curved edge 8 is concentric with the pin 6 and has an elliptical opening 9 extending transversely of said arm; its shorter arm 10 is so disposed that when it contacts with the under side of the door as shown in Fig. 2 the side 11 of segment lies flush with the top of the door, and said arm 10 has an upward projection 12 adapted to be received by the opening 4. Adjoining its pivot, the handle has an arc-shaped portion 13 terminating in a shoulder 14, and in its edge 8 adjoining its edge 11 the handle has a nick 15 to receive the thumb-nail. In using this handle the projection 12 is pressed upon sufficiently to raise the nick 15 above the top of the door so that the operator can insert his thumb-nail in the nick and thus raise the handle sufficiently so that a grip may be secured in the opening 9. In raising or lowering the door by means of the handle, the shoulder 14 will abut against the inner end of the slot 3 and, by limiting the movement of the handle, afford a good purchase; the part of the door between the slot and opening thus serves as a stop to limit the movement of the handle not only downwardly but upwardly.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination of a door frame having one side thereof formed with a vertical wall and a horizontal wall projecting inwardly from the vertical wall, the second wall having a transverse slot extending from the inner edge of said wall outwardly toward the vertical wall, a casing standing in opposed relation to the slot under the horizontal wall, means for removably securing the casing to each of said walls, and a door hinged in the casing and having its hinge portion movable in said slot, substantially as described.

2. The combination of a door frame having one side thereof formed with a vertical wall and a horizontal wall projecting inwardly from the vertical wall, the second wall having a transverse slot extending from the inner edge of said wall outwardly toward the vertical wall, a casing standing in opposed relation to the slot under the horizontal wall, means for removably securing the casing to each of said walls, a pin removably arranged in the casing and a door fulcrumed on said pin and having its fulcrum portion movable in said slot, substantially as described.

3. The combination of a door frame having one side thereof formed with a vertical wall and a horizontal wall projecting inwardly from the vertical wall, the second

wall having a transverse slot extending from the inner edge of said wall outwardly toward the vertical wall, a casing standing in opposed relation to the slot under the horizontal wall, means for removably securing the casing to each of said walls, a pin removably arranged in the casing and held in place by the same and the frame and a door fulcrumed on said pin and having its fulcrum portion movable in said slot, substantially as described.

4. The combination of a door frame having one side thereof formed with a vertical wall and a horizontal wall projecting inwardly from the vertical wall, the second wall having a transverse slot extending from the inner edge of said wall outwardly toward the vertical wall, a casing standing in opposed relation to the slot under the horizontal wall and being inwardly open, means for removably securing the casing to each of said walls, and a door hinged in the casing and having its hinge portion movable in said slot and in the opening of said casing, substantially as described.

5. The combination of a door frame having one side thereof formed with a vertical wall and a horizontal wall projecting inwardly from the vertical wall, the second wall having a transverse slot extending from the inner edge of said wall outwardly toward the vertical wall, a casing standing in opposed relation to the slot under the horizontal wall, means for removably securing the casing to said frame, and a door hinged in the casing and having its hinge portion movable in said slot, substantially as described.

6. The combination, with a frame and a door pivoted therein, said door having a slot and an opening alined with the slot and spaced therefrom, of a pin crossing the slot at a right angle thereto, and a two-armed lever forming a handle and penetrated between its ends by and fulcrumed on said pin and movable thereon in a plane perpendicular to the door and through the slot, said lever having each arm thereof longer than the distance from the pin to the end of the slot which adjoins the opening, whereby the lever will be limited in its pivotal movement in one direction by one of its arms, and in its pivotal movement in the other direction by the other of its arms, engaging the door between the slot and opening, and one arm of said lever having a projection registering with and adapted to enter the opening, substantially as described.

In testimony, that I claim the foregoing, I have hereunto set my hand this 23rd day of June, 1909.

JOHN GUSTAVE SCHMIDT.

Witnesses:
JOHN W. STEWARD,
WM. D. BELL.