T. E. WALKER.

FRAME AND SASH CONSTRUCTION.

APPLICATION FILED AUG. 1, 1919.

1,382,578. Patented June 21, 1921.

2 SHEETS—SHEET 1.

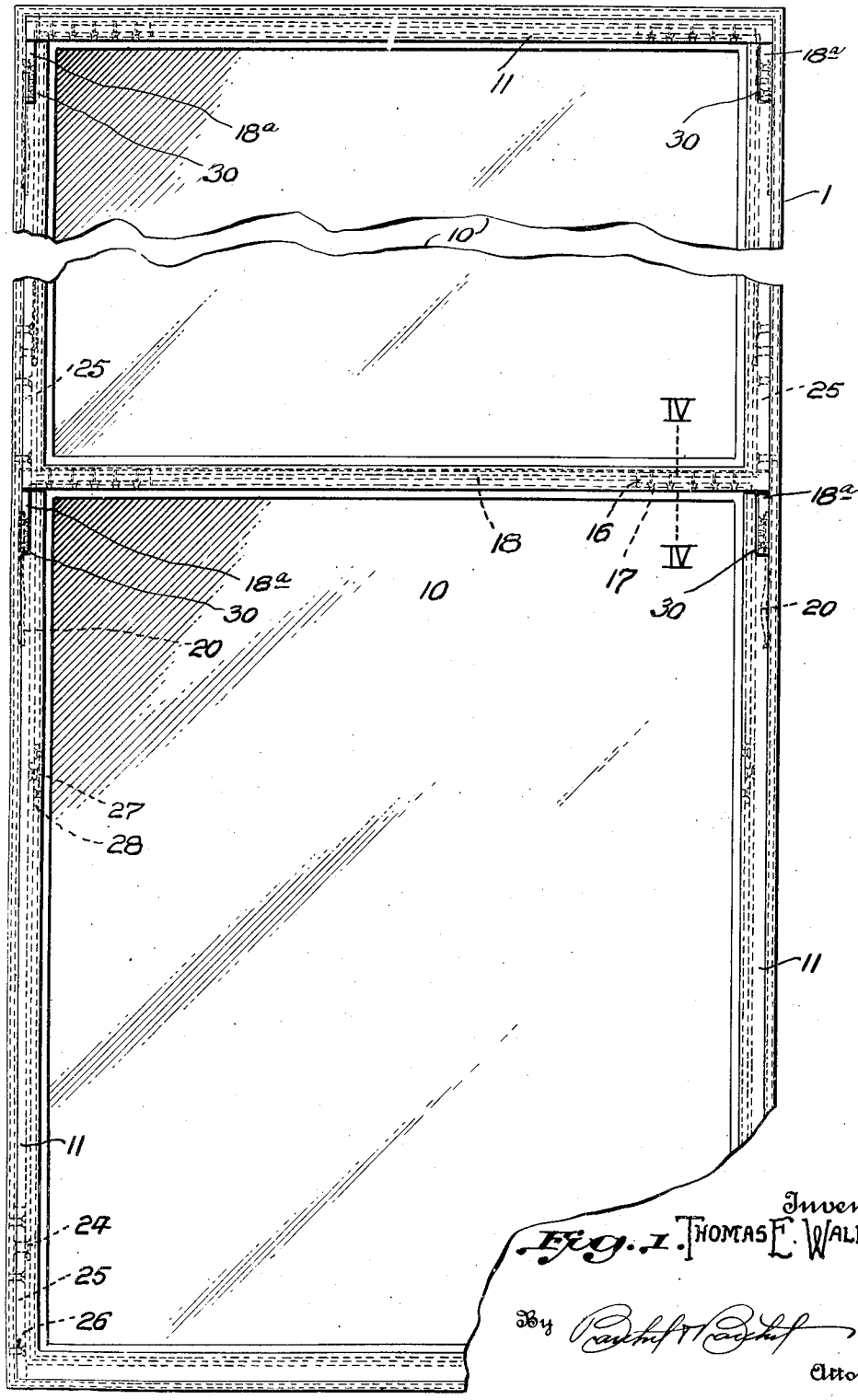


Fig. 1.

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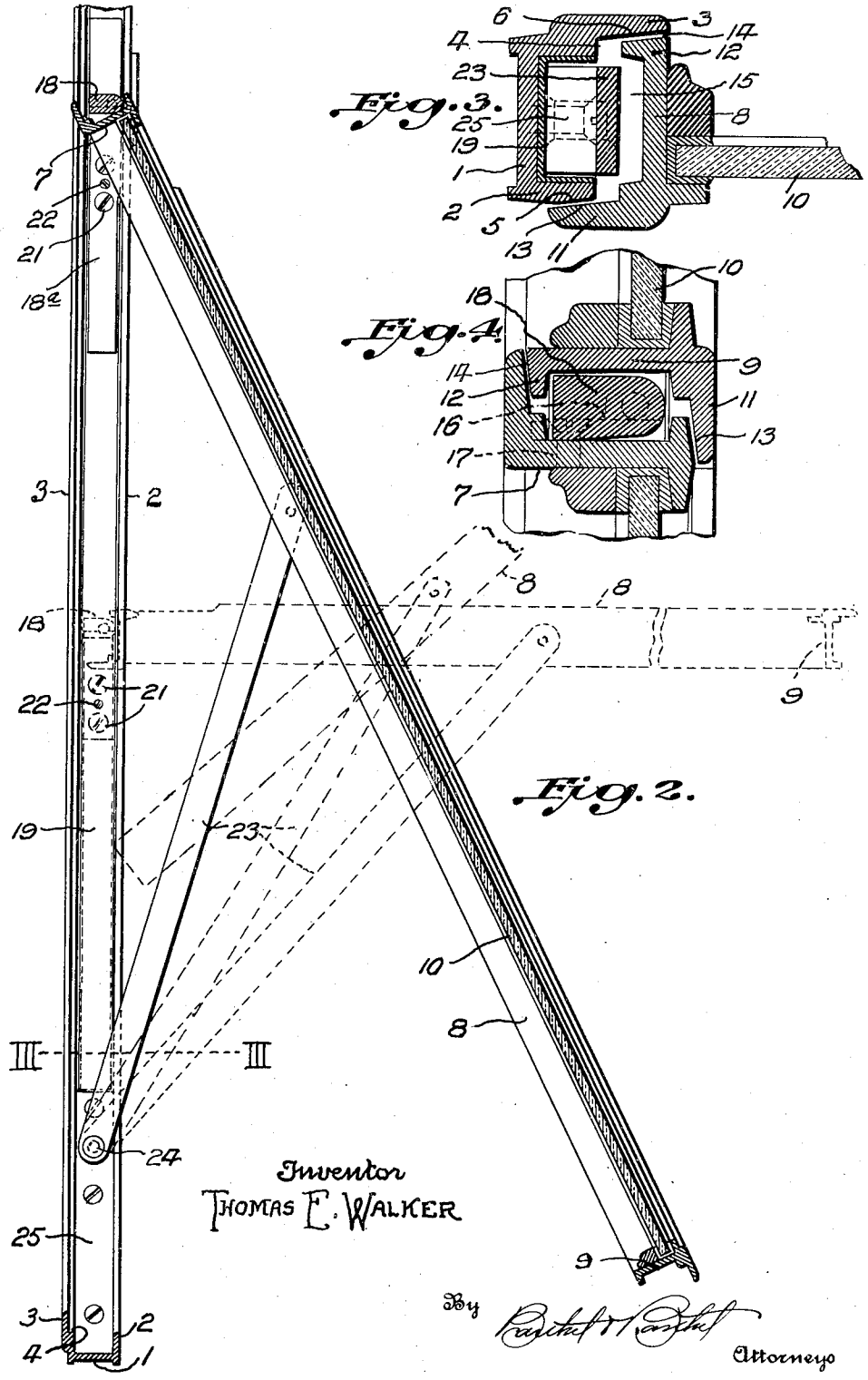
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

THOMAS E. WALKER, OF DETROIT, MICHIGAN, ASSIGNOR TO CRITTALL CASEMENT WINDOW CO., OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

FRAME AND SASH CONSTRUCTION.

1,382,578. Specification of Letters Patent. Patented June 21, 1921.

Application filed August 1, 1919. Serial No. 314,606.

To all whom it may concern:

Be it known that I, THOMAS E. WALKER, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Frame and Sash Constructions, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a frame and sash construction for windows, transoms, ventilators and composite or folding windows, either of the outward or inward opening type, the construction being associated, when necessary, with weather bars, condensation gutters, and any architectural design of window construction which will afford maximum sight lines, either with single or double glazing.

My invention aims to furnish a window frame with outwardly opening sashes that may be easily and quickly adjusted and safely supported for a desired degree of ventilation, the sashes being disposed so as to be adjusted at any desired angle relative to the frame, it being possible to reverse a sash so as to provide a maximum frame opening for ventilation in a desired direction and to be easily cleaned from inside.

My invention further aims to furnish the sashes of a window with novel meeting rails or members which will insure a positive connection between the sashes when closed, and at the same time permit of an angular adjustment of either sash. The sashes furthermore include novel means for holding the meeting rails in adjusted positions relative to the casing frame so that when the sashes are braced in their angular positions there is no danger of accidental displacement.

My invention is further characterized by a frame having a transverse hinge member slidable therein and to which a sash is hinged or otherwise connected, said hinge member having its ends held so that it may be safely adjusted without any danger of sash displacement.

My invention further aims to provide a window construction wherein the parts are made with a view of reducing the cost of manufacture and at the same time retain those features by which durability and ease of assembling are secured. With such ends in view my invention resides in the novel construction to be hereinafter considered and then claimed.

Reference will now be had to the drawings, wherein—

Figure 1 is a front elevation of a portion of a window frame and sashes in accordance with my invention, showing the outer side of the frame;

Fig. 2 is a vertical sectional view of a portion of the same showing a sash in an adjusted position in full lines and other positions indicated by dash lines;

Fig. 3 is an enlarged horizontal sectional view taken on the line III—III of Fig. 2, and

Fig. 4 is an enlarged cross sectional view of the meeting rails of the sashes, taken on the line IV—IV of Fig. 1.

In the drawings, the reference numeral 1 denotes a channel window frame made of solid steel with the top, bottom and side members thereof channel shaped in cross section so as to provide an inner leg 2 and an outer leg or facing 3, which is of greater depth than the inner leg 2 so as to afford a seat 4. As brought out in Fig. 3, the inner leg 2 has a beveled outer face 5, and the outer leg 3, adjacent the seat 4, has inner beveled face 6, the faces 5 and 6, particularly at the sides of the frame, affording a wedging or seating action of the sash relative to the frame.

One or more sashes may be associated with the frame depending on the nature of the window and considering superposed sashes, both of which may be opened outwardly, each sash comprising a hinged rail 7, side rails 8 and a bottom rail 9. Since the sashes are superposed, the hinge rail 7 of the lower sash serves as a meeting rail in conjunction with the bottom rail 9 of the upper sash, as brought out in Fig. 4. The rails of each sash coöperate in supporting suitable glazing, generally designated 10, and the side and bottom rails have a cross sectional shape which will provide inner legs 11 and outer legs 12, said legs having beveled faces 13 and

14, respectively adapted to confront and seat on the beveled faces 5 and 6 of the frame legs 2 and 3 respectively.

When the sashes are closed the legs will coöperate with the channel frames in forming inclosed spaces 15 about the top and bottom of the sashes and it is in the side spaces 15 that provision is made for supporting the sashes.

The hinge rails 7 of the sashes are substantially the same cross sectional shape as the side and bottom rails, but are reversed, as is apparent in Fig. 4, so that the long legs of said hinge rails will be at the outer sides of the sashes, and the short legs at the inner sides thereof. This permits of the long and short legs of the hinge rails meeting the short and long legs of an adjoining rail, for instance, the hinge rail 7 of the lower sash meets the bottom rail 9 of the upper sash and the hinge rail of the upper sash meets the top of the frame 1. Since the relation of these meeting parts are identical, as well as other parts of the superposed sashes, I deem it only necessary from now on to consider the construction of one of said sashes and the adjustment thereof.

Taking as an instance, the hinged rail 7 of the lower sash, said rail has hinge members 16 fastened thereto by screws or other means, designated 17 and these hinge members are connected to a transverse hinge member 18 having angular ends 18^a that extend downwardly into the side spaces 15 at the upper end of the lower sash. The hinge members 16 and 18 have the usual barrels connected by pivot pins, and the angular ends of said hinge member 18 have a sliding contact in the channels of the sides of the frame 1.

Suitably connected to the inner walls of the side channels of the frame 1 are channel shaped wear members 19 and it is in these members that the angular ends 18^a of the hinge member 18 slide and are frictionally held by flat compression springs 20 connected to the angular ends of the hinge member by screws 21. Additional screws 22 are employed for increasing the tension of the compression springs 20 and after the tension of said springs has been regulated, then the screws 21 may be tightened to hold said spring.

It is now apparent that the lower end of the sash may be swung outwardly and the upper hinged end thereof lowered in the frame 1. The sash may be placed at an acute angle relative to the frame as shown by full lines in Fig. 2; swung to an angle of ninety degrees, as shown by dash lines in the same figure, or the sash reversed so that the outer side of the sash will be disposed at an acute angle relative to said frame and be easily and safely cleaned from inside.

To hold the lower sash in an adjusted position pivoted braces or arms 23 are employed, said arms having the lower ends thereof pivotally connected, as at 24 to spacer blocks 25 set in the sides of the frame 1, at the lower end thereof, said spacer blocks being held by screws 26 or other fastening means. The outer ends of the braces or arms 23 are pivotally connected, as at 27 to spacer blocks 28 fixed on the side rails 8 of the lower sash adjacent the upper end thereof, so that said braces or arms will represent the hypotenuse of a right angle triangle at each side of the sash when said sash is in a horizontal position such as indicated in Fig. 2. It is then possible for the braces or arms to support the sash in adjusted positions at any angle relative to the frame.

When the lower sash is reversed or the hinge member thereof carried to an extremely low position in the frame 1, the spacer blocks 25 serve as end abutments to limit the lowering movement of the hinged edge of the sash, and when the sash is closed the pivoted braces or arms 23 are concealed within the side spaces 15, as brought out in Fig. 3, consequently the complete window has a normal visual appearance as though the sashes were permanently mounted in the frame. With the pivoted braces or side arms as well as the hinge members of the sashes concealed the movable parts of the window construction are protected against the elements, and on account of the novel manner in which the sashes and the frame are interlocked or fitted one within the other, it is practically impossible for climatic conditions to interfere with the operation of the sashes. Again considering Fig. 4, it will be noted that the hinge members of the lower sash are well inclosed by the hinge rail of the lower sash and the bottom rail 9 of the upper sash, and that the upper sash is held in a closed position by the lower sash. This obviates the necessity of using a sash lock at the meeting rails of the sashes since the hinge rail 7 of the lower sash provides an abutment for the inner leg of the bottom rail of the upper sash. It is therefore necessary to open the lower sash and lower the meeting rail thereof before the upper sash can be swung to an open position.

Since the upper and lower sashes are adapted to swing outwardly, it is necessary that the legs 11 be cut away, as at 30, so that the side rails of the sashes will provide clearance for the angular ends of the hinge members. The cut away portions of the leg 11 may be closed by extensions of the leg 2, which have not been shown, so that the cut away portions 30 may be clearly shown.

It is obvious that since the sashes may be swung outwardly that any curtain, shade or the like, carried thereby, will be protected and function as an awning.

While in the drawings there is illustrated

a window construction as now in use, it is to be understood that the structural elements entering into the invention are susceptible to such variations and modifications as fall within the scope of the appended claims.

What I claim is:—

1. In a window construction, a channel frame having inner and outer legs provided with beveled faces, outwardly opening sashes in said frame, means transversely of said frame hingedly supporting said sashes at points removed from the sides of said frame, each sash having channel rails with inner and outer legs providing beveled faces adapted to engage the beveled faces of said frame, the legs of said frame and sashes cooperating in providing spaces in said frame, and means in the spaces of said frame cooperating with the first mentioned means for supporting said sashes for adjustment relative to said frame.

2. In a window construction, a channel frame having inner and outer legs provided with beveled faces, outwardly opening sashes in said frame, each sash having channel rails with inner and outer legs providing beveled faces adapted to engage the beveled faces of said frame, the legs of said frame and sashes coöperating in providing spaces in said frame, angular hinge members slidable in the spaces of said frame and supporting said sashes for adjustment relative to said frame, and means bracing said sashes when open, said means being otherwise concealed by said frame and sashes.

3. A window comprising a frame, outwardly opening upper and lower sashes in said frame, and hinge members carried by the top rails of said sashes and having ends thereof slidable in said frame, the hinge member of the lower sash forming an abutment for the lower rail of the upper sash to maintain the upper sash closed.

4. In a window frame, a transverse member having its ends slidable in the sides of the frame, and a sash hinged to said member intermediate the ends thereof.

5. A window construction as characterized in claim 4, wherein said frame has wear members set therein for the ends of said transverse member.

6. A window construction as characterized in claim 4, wherein the transverse member has depending ends preventing a turning movement of said transverse member in said frame.

7. In a window construction, a frame, superposed sashes in said frame and having meeting rails, and a transverse member hingedly attached to one of said sashes and movable in said frame said transverse member being inclosed by the meeting rails of said sashes when said sashes are closed.

8. In a window construction as characterized in claim 7, the said transverse member having depending ends in said frame and the sash hinges set in from the ends of said transverse member.

9. A window construction as characterized in claim 7, and wherein additional means carried by the depending ends of said transverse member produces a frictional contact for the ends of said transverse member.

In witness whereof I affix my signature in the presence of two witnesses.

THOMAS E. WALKER.

Witnesses:
KARL H. BUTLER,
ANNA M. DORR.