

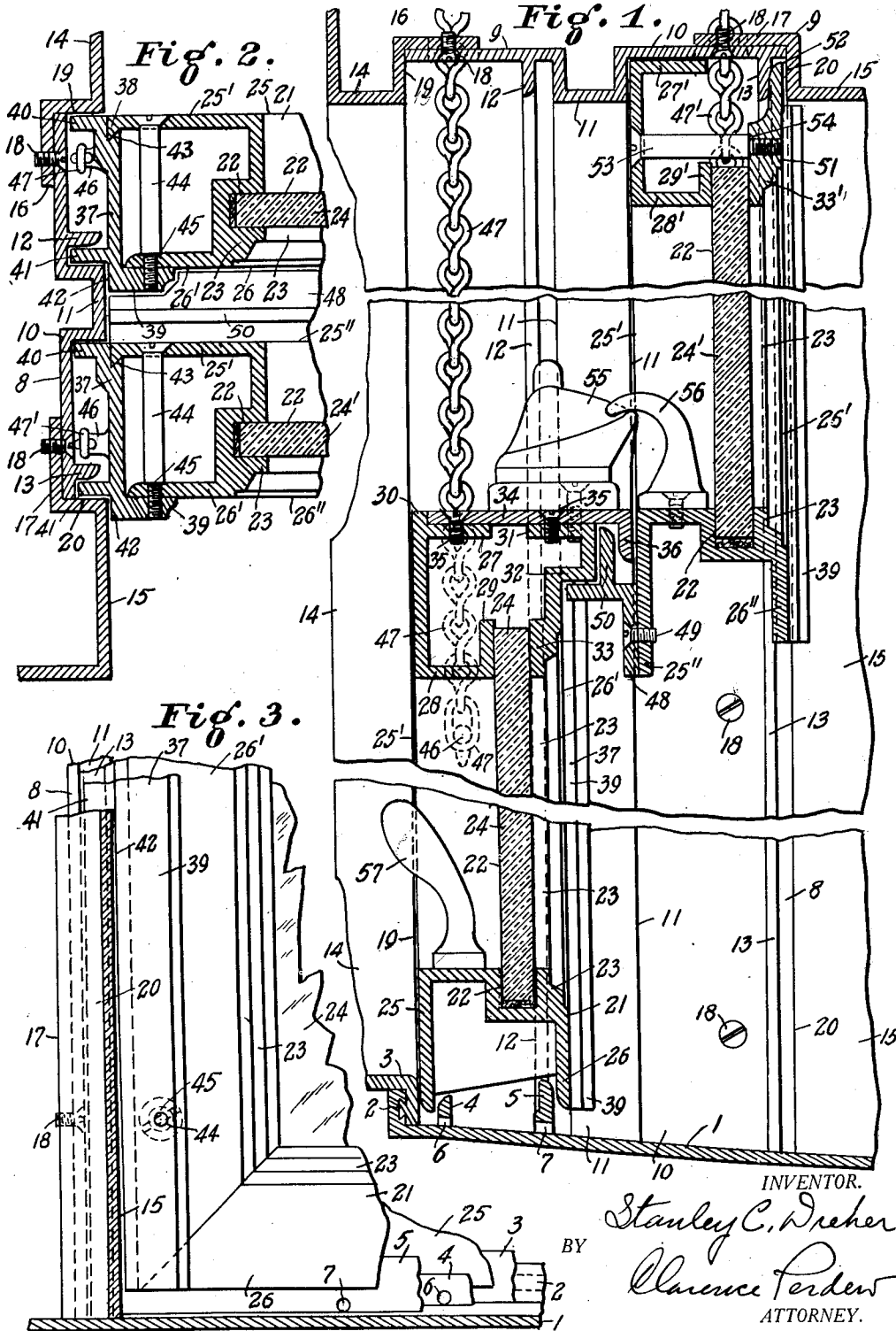
Jan. 27, 1931.

S. C. DREHER

1,789,970

WINDOW CONSTRUCTION

Filed Oct. 30, 1929



# UNITED STATES PATENT OFFICE

STANLEY C. DREHER, OF CINCINNATI, OHIO, ASSIGNOR TO THE NEWMAN MANUFACTURING COMPANY, OF NORWOOD, OHIO, A CORPORATION OF OHIO

## WINDOW CONSTRUCTION

Application filed October 30, 1929. Serial No. 403,606.

My invention relates to double-hung windows, and its object is to afford weather-tightness and easy working of the sashes of such windows, by an easily assembled and simple arrangement which, once assembled, is very firm and substantial, but which may readily be taken apart if repairs or other attention is required. Other objects will appear in the course of the following description.

I attain these objects by the device illustrated, for example, in the accompanying drawing, in which—

Figure 1 is a vertical section, intermediate portions being omitted;

Fig. 2 is a partial horizontal section; and Fig. 3 is a partial interior elevation.

The window frame comprises the sill 1 sloping downward to the outside of the window as usual; its inner edge being fixed, by a longitudinal dovetail strip 2 in a corresponding groove in the upturned edge part of the sill, to the window ledge 3 with which the strip 2 is integral. Outward from the outer edge of the ledge 3, which thus forms a shoulder, a lapping ridge 4 projects up from the sill, and farther out a second lapping ridge 5 also projects up from the sill, being somewhat higher than the first mentioned ridge 4; both of these ridges 4 and 5 being integral with the sill 1 and running from end to end thereof. These ridges 4 and 5 preferably are provided at intervals with openings 6 and 7, respectively, down next to the sill, for escape of water condensing on the inner parts of the window.

The window frame also comprises upright jambs 8, one of which is shown, and the cap 9; all of these being of the same cross-sectional shape and arrangement, consisting of a middle member 10 having a trough like projection 11 along its middle, to form the parting strip for the two sashes, and having just inward from this projection 11 a lapping ridge 12, and having near its outer edge a similar lapping ridge 13. This member 10 has the projection 11 and the ridges 12 and 13 integral with it. The inner and outer casing members 14 and 15 are offset to form edge flanges 16 and 17 lapping behind

the adjacent edge portions of the jamb or cap middle member 10, which is fastened to these casing members by screws 18 passing through the member 10 into the respective flanges. This offsetting also forms shoulders 19 and 20, respectively, facing toward the sides of the parting strip projection 11 of the member 10; thus forming channels with the respective lapping ridges 12 and 13 near the outer sides of the respective channels. It will be understood that this frame and casing assemblage is mitered and suitably secured together at the upper corners, while the bases of the jambs are abutted against the end portions of the sill 1 and suitably fastened thereto.

The lower sash comprises the bottom rail 21 of cross-section in the form of an inverted channel with an outer portion of its web stepped down, leaving a shoulder 22 facing outwardly, and with an upstanding integral bead 23 near the outer edge of this stepped-down portion, of the height of the shoulder 22. This formation results in a channel receiving the lower edge of the glass 24 of the sash. The depending flanges of this rail 21 straddle the two lapping ridges 4 and 5 when the sash is down; the inner flange 25 fitting closely between the inner ridge 4 and the edge of the ledge 3, and the outer flange 26 fitting closely against the outer side of the outer ridge 5. The ridges and flanges have their edges rounded or tapered to facilitate guidance of the sash into this relation with the sill ridges.

The lower sash top rail is made up of an inner piece, an outer piece, and a top piece. The inner piece is a channel with its top flange 27 and its bottom flange 28 outward; the latter having an upturned rib 29 along its outer edge, and the junction of the upper flange 27 with the web having an upstanding bead 30. The outer piece is a channel with its top flange 31 extending inward in the plane of the top flange 27 of the inner channel, and its lower flange 32 extending inwardly, then offset downwardly, with its lower edge offset inwardly, forming a rib 33 facing the rib 29 of the inner channel. These ribs 29 and 33 receive the upper edge part of

the glass 24; and the top flanges 27 and 31 of the two channels are spaced to admit the glass down between them. The third piece is a plate 34 lying across the top flanges of the channels and covering the glass-admitting space; being secured to the channels by the screws 35, and having its inner edge abutting the bead 30 of the inner channel. The plate 34 extends out past the outer channel, and has along its outer edge a depending lapping strip 36, integral therewith.

Each stile or side rail of the lower sash is made up of a channel similar to the sash bottom rail, and a sash edge plate 37. The stepped formation of the channel, with the shoulder 22 and bead 23, is identical with that of the bottom rail, resulting in a receptacle for the upright edge of the glass 24. The outer flange 26' of this channel is like that of the bottom rail; but the inner flange 25' is deeper, with a bead 38 of V-shaped cross-section along its edge, directed outward. Each edge plate 37 comprises a flange 39 along its outer edge, lapping outside the outer flange 26' of the channel, and two oppositely directed lapping ridges 40 and 41 on its opposite side, the inner one 40 being along the inner edge of the plate, and the outer one 41 being inward some distance from the outer edge of the plate, leaving a shoulder 42. The inner edge part of the plate, next to the ridge 40, is thickened and has in its thickened portion a groove 43 of V-shaped cross-section, throughout the length of the plate, receiving the bead 38 of the inner flange 25' of the channel.

The channel portions of the stiles are fastened to the edge plates 37 by screws 44 passing out through the inner flange 25', with their heads countersunk therein, and having their threaded parts reduced, forming shoulders 45; these reduced parts passing through the outer flanges 26' of the channels and threading into the lapping flanges 39 of the edge plates to draw these flanges tightly together, while the heads of the screws draw the inner flanges 25' so that their beads 38 wedge tightly in the grooves 43 of the edge plates. The lapping ridges 40 and 41 of the edge plates 37 fit in the inner channels of the middle members 10 of the jambs 8; the inner ridge 40 lying close to the shoulders 19 of the inner casing member 14, and the outer ridge 41 lying between the parting strip projection 11 and the lapping ridge 12, while the shoulder 42 of the edge plate 37 laps out across the face of the parting projection 11. Each edge plate 37 has a hook 46 by which it is connected to the respective sash weight chain 47.

The bottom rail of the upper sash is made up of a channel similar to that of the lower sash bottom rail, and an angle bar 48 fastened to the inner flange 25'' of this channel by screws 49 passing through its upright mem-

ber into the flange; the horizontal member of the angle bar extending inward under the lower flange 32 of the outer channel of the lower sash top rail, close to the downward offset of this flange. On top of this horizontal member of this angle bar 48, integral therewith, a rib 50 extends up to enter closely between the web of this lower sash outer channel and the depending lapping strip 36 of the lower sash top plate 34 when the window is closed. The channel of this upper sash bottom rail forms the receptacle for the lower edge of the upper sash glass 24' by means of its stepped formation, with the shoulder 22, and the bead 23, as in the lower sash. The outer flange 26'' of this channel is not as deep as the inner flange 25'' thereof.

The side rails or stiles of the upper sash are made up of channels and edge plates the same as those of the lower sash; the edge plate ridges 40 and 41 fitting in the outer channels of the jamb members 10, with the outer ridge between the casing shoulder 20 and the ridge 13 of the member 10.

The top rail of the upper sash comprises an inner channel similar to that of the lower sash top rail; the top bead 30 preferably being omitted, so that the top flange 27'' of the channel comes closely up to the cap middle member 10 with the stop extension 11 thereof lapping across the inner side of the channel. A bar 51 forms the outer side of the top rail, and has a thin upper edge 52 entering between the shoulder 20 and the ridge 13 of the cap member 10 and top outer casing member 15, respectively. The lower edge 33' of this bar is formed like the rib 33 on the lower sash, and the upper edge of the glass 24' is held between this edge part 33' and the upturned rib 29' of the lower flange 28' of the channel. The glass 24' is slipped down into place through the open top of the sash before the screws 53 are inserted. These screws pass out through the web of the channel, with their heads sunken therein, and their threaded end parts are reduced, forming shoulders 54 which bear on the inner side of the bar 51 when the threaded end parts are screwed into the bar, holding the bar in place horizontally, while the ends of the bar 51 are understood to miter with and attach to the upper ends of the outer flanges 26' of the upper sash stile channels. The upper sash weight chains 47' will be understood as being hooked to the sash edge plates, as are the chains 47 to the lower sash. The cap middle member 10 and the overlapping casing flanges 16 and 17 to which it is screwed have openings up through which the chains 47 and 47' pass, to run over suitable pulleys as usual.

A usual lock is provided for the sashes, comprising a cam device 55 screwed to the top plate 34 of the lower sash, and a hook 56 screwed to the top of the upper sash bottom rail channel; and on the bottom rail of the

lower sash a suitable handle 57 is fixed to the corresponding part of its channel. When the meeting rails of the two sashes are drawn together by the lock, a two-place closure is formed between them by the strip 36 against the upper sash rail and the rib 50 against the lower sash rail; and in addition, the top of the angle bar 48 draws up against the flange 32 of the lower sash channel. This affords a very effective closure at the meeting rails.

At the bottom of the window, the coacting sill ridges 4 and 5 and sash channel flanges 25 and 26, together with the ledge shoulder, guide the lower sash into effective closing position; and the action of the upper edge of the bar 51 between the shoulder 20 and ridge 13 has the same effect on the upper sash. At each side, the sash outer ridge 41 between the jamb ridge 13 and jamb shoulder 20, together with the lapping of the sash shoulder 42 across the face of the jamb 15, will afford only an intricate passage around the lower sash; and the same effect is produced for the upper sash by the like relation of the sash outer ridge 41 to the casing shoulder 20 and jamb ridge 13, and of the sash shoulder 42 across the casing member 15. This is added to, for the lower sash, by the adjacency of the sash inner ridge 40 to the casing shoulder 19, and for the upper sash by the same relation of its ridge 40 to the stop projection 11. Thus, very effective closure is effected at all edges of the sashes.

By making the channeled sash structure detachable from the edge plates 37, which latter attach to the weight chains and fit the jambs for effective closure as described, as well as for smooth guidance, the assembly of the window parts is facilitated; and this permits the stop strip elements 11 to be integral with the jambs and permits the latter to be set back into the casing members 14 and 15, which latter are permanently secured to the building wall and to the plaster or other finish of the wall. In ordinary window construction, a strip corresponding to one of the casing shoulders 19 and 20, as well as the parting strip corresponding to the projection 11, must be removed for removal of the sash and must be placed in position after the sash is installed, making the assemblage difficult, and practically precluding the use of the increased closure elements on the sash edges and jambs, such as are readily provided with the construction herein set forth.

It will be understood that, in mullioned windows, the formation of the respective sides of the mullions, with the jamb members 10, would be like the casing as set forth; and what is set forth as a cap may be the transom base of a transomed window.

The construction and arrangement as set forth is that of an all metal structure, in which my invention is most advantageously

embodied, and for which the peculiar shapes may be made conveniently by the metal extrusion processes; the material usually being bronze. However, substantially the same structure may be produced by rolled or pressed sheet metal, or partly of metal and partly of wood, or entirely of wood; the latter material involving the use of more bulky shapes yet having the essential elements for effecting the objects set forth. Such modifications of material, and of shapes incident thereto, as well as modifications for other reasons, may occur in various practices.

Therefore, while I have specifically described and illustrated a certain example of my invention, I do not wish to be understood as being limited to such precise disclosure, but what I claim as new and desire to secure by Letters Patent is:

1. In a window construction, a sash comprising permanent stiles and upright edge members on the respective stiles, each stile and its respective edge member having means whereby the stile and member are wedged together and each having a laterally extended part lapping across a part of the other, means detachably securing said lapping parts together and securing the stiles and members in wedged-together relation, and jambs having guideways receiving the respective edge members.

2. In a window construction, a sash stile of channel shape, one flange of the channel having a wedging surface, an edge member having a wedging surface engaging the flange wedging surface, and having a flange lapping across the opposite channel flange, and means detachably securing these latter flanges together.

3. In a window construction, a sash-stile edge member having on one side a groove with converging sides and a flange, for attachment to a stile, and having on its opposite side projections to enter a guideway.

4. In a window construction, a sash comprising a permanent stile consisting of a laterally opening channel with a flange having a bead along its edge directed toward the other flange of the channel, an edge member on said stile having a groove entered by said bead and having a flange lapping across said other flange of the channel, fastening means extending through said edge member flange and the adjacent stile flange, and a jamb having a guideway receiving said edge member.

5. In a window construction, a sash comprising a permanent stile consisting of a laterally opening channel with a flange having a bead along its edge directed toward the other flange of the channel, an edge member on said stile having a groove entered by said bead and having a flange lapping across said other flange of the channel, fastening means extending through said edge member flange and both stile flanges, and a jamb hav-

ing a guideway receiving said edge member.

6. In a window construction, a sash comprising a permanent stile consisting of a laterally opening channel with a flange having a bead along its edge directed toward the other flange of the channel, an edge member on said stile having a groove entered by said bead and having a flange lapping across said other flange of the channel, a screw having a head engaging said beaded flange and having a reduced part passing through said other stile flange with a shoulder against this other flange, and being threaded into said edge member flange, and a jamb guideway receiving said edge member.

7. In a window construction, a sash comprising a permanent stile consisting of a laterally opening channel with a flange having a bead of V-shaped cross section along its edge directed toward the other flange of the channel, an edge member on said stile, having a groove of V-shaped cross section entered by said bead and having a flange lapping across said other flange of the channel, fastening means extending through said edge member flange and the adjacent stile flange, and a jamb guideway receiving said edge member.

STANLEY C. DREHER.

30

35

40

45

50

55

60

65