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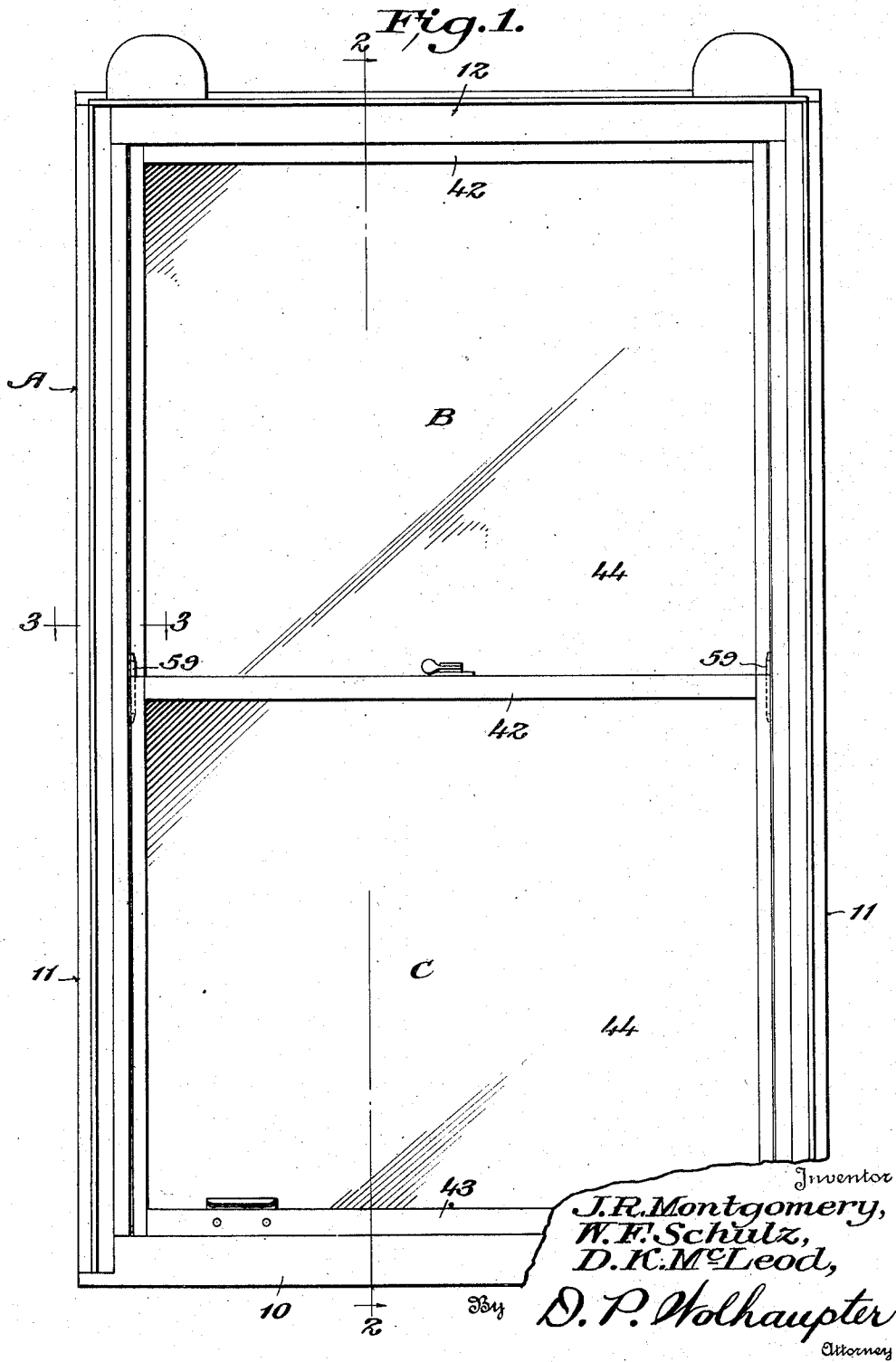
J. R. MONTGOMERY ET AL

2,189,960

METAL WINDOW

Filed Aug. 12, 1938

2 Sheets-Sheet 1



Feb. 13, 1940.

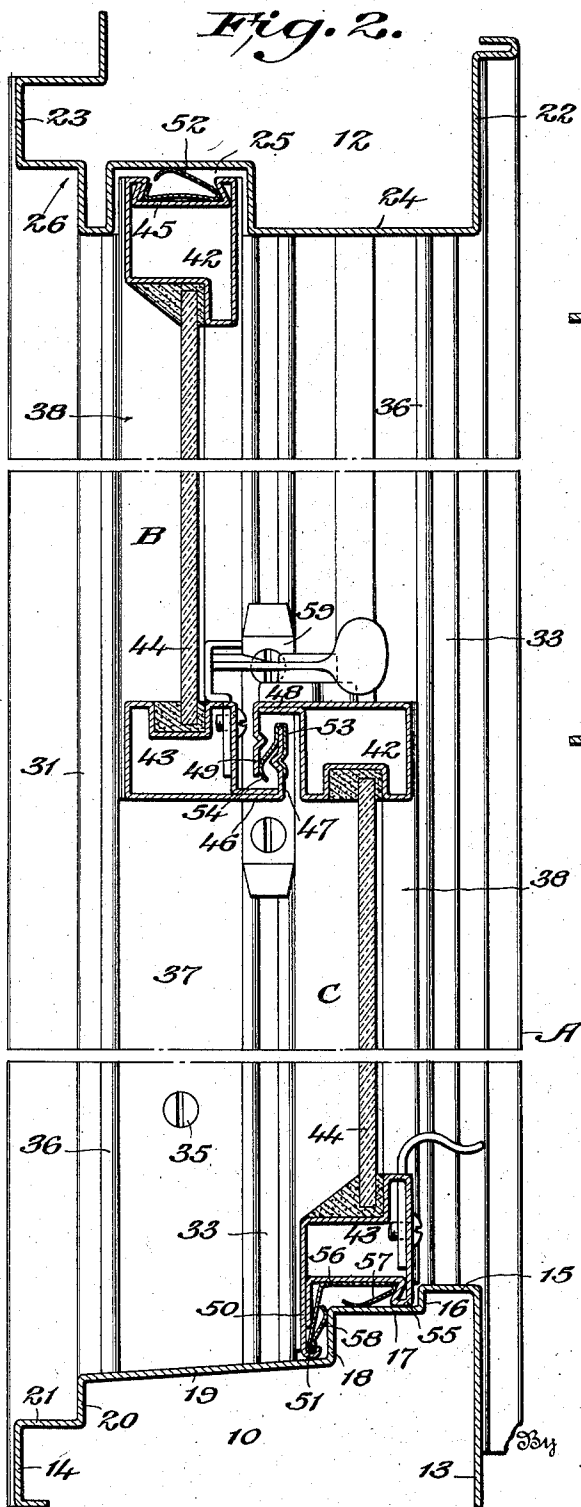
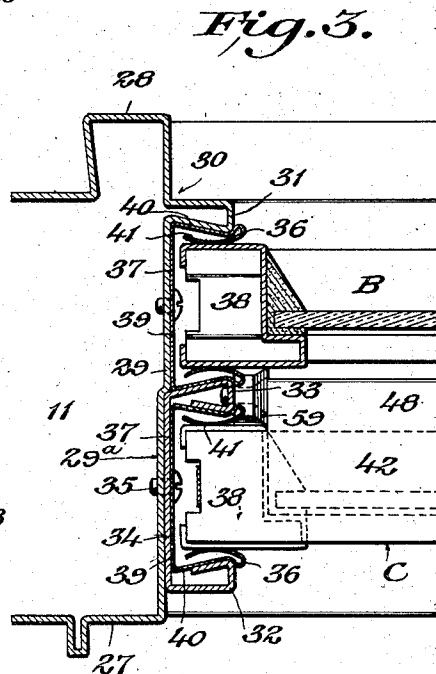
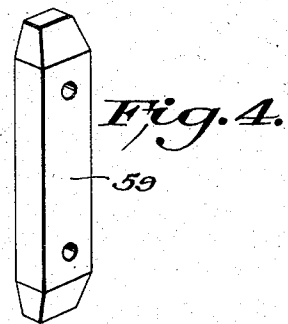
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METAL WINDOW

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2 Sheets-Sheet 2



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METAL WINDOW

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1 Claim. (Cl. 189—65)

This invention relates to metal window structures of the type including a frame having upper and lower sashes slidable therein, and has for its general object to provide a metal window structure of this type which has the appearance of a standard wooden window such as commonly is employed in the construction of dwellings; which embodies a construction whereby it may be used substantially wherever a standard wooden window has heretofore been used; which is comparatively cheap and easy to produce; which is strong and durable, and which includes simple yet efficient weatherstrips certain of which serve as yieldable guides for the sashes so that the latter are cushioned for free sliding movement.

With the foregoing and other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and defined in the appended claims.

In the accompanying drawings, wherein like characters of reference denote corresponding parts in the different views:

Figure 1 is an inside elevation of a window constructed in accordance with the invention.

Figure 2 is a vertical section on the line 2—2 of Fig. 1.

Figure 3 is a horizontal section on the line 3—3 of Fig. 1; and

Figure 4 is a perspective view of one of the sash stop elements.

A feature of the present window is that the same, although of metallic construction, very closely resembles a standard wooden window such as commonly is employed in the construction of dwellings, and this will be apparent by reference to the drawings. Accordingly, the present window may be used where standard wooden windows have heretofore been used and will not result in change in the general appearance of a dwelling or other structure in which it is embodied.

As shown, the present window comprises a frame, designated generally as A, and upper and lower sashes designated generally as B and C, respectively.

The frame A comprises, as usual, a sill 10, sides 11, 11 and a lintel 12, all rolled, pressed or otherwise suitably formed from sheet metal and joined together in a rigid, unitary structure by welding or in any other suitable manner.

The sill 10 is of generally inverted U-shape in

cross section and comprises an inner wall 13, an outer wall 14 and a top wall 15 connecting said inner and outer walls. At a point suitably spaced outwardly from the inner wall 13, the top wall 15 extends downwardly a short distance, as indicated at 16, then horizontally outward, as indicated at 17, again downwardly, as indicated at 18, then at a slight downward and outward inclination, as indicated at 19, then again downwardly, as indicated at 20, and finally horizontally outward, as indicated at 21, to the top of the outer wall 14.

The lintel 12 is of generally U-shape in cross section and comprises an inner wall 22, an outer wall 23 and a bottom wall 24. In vertical alignment with the downwardly and outwardly inclined portion 19 of the sill 10, the lintel bottom wall is formed with a downwardly opening channel 25 to accommodate the top of the upper or outer sash B when said sash is in its raised or closed position, and in vertical alignment with the stepped outer portion of the sill formed by the portions 20 and 21 thereof, the lintel 12 is similarly stepped as indicated at 26.

The frame sides 11, 11 are reversed duplicates of each other and, as in the case of the sill 10 and the lintel 12, each of said sides is of generally U-shape in cross section and comprises an inner wall 27, an outer wall 28, and a connecting wall 29. In alignment with the aforesaid stepped portions of the sill and the lintel, the sides 11, 11 are similarly stepped, as indicated at 30. Accordingly, at the outer side of the frame A there is provided a recess to accommodate either a screen or a winter sash.

The stepped portions 30 of the sides 11, 11 are formed by ribs 31 extending inwardly from the walls 29 of said sides, and, as best shown in Fig. 3, said ribs 31 serve as outer stop beads for the upper or outer sash. On the other hand, an inner stop bead for the inner or lower sash, and a parting bead between the sashes, are formed by inwardly directed ribs 32 and 33, respectively, extending along the edges of auxiliary frame side elements 34 (Fig. 3) which are fastened by screws 35 to the walls 29 of the frame sides 11, 11.

The adjacent walls of the stop and parting beads flare outwardly relative to each other, as shown in Fig. 3, and the distances between said walls are greater than the widths of the stiles of the sashes by amounts permitting the interposition of the side portions 36 of weatherstrips 37 between said beads and the stiles 38 of the sashes B and C, as also shown in Fig. 3.

By further reference to Fig. 3 of the drawings 55

it will be observed that the portion 29* of the wall 29 against which the auxiliary frame side element 34 is fastened, is outwardly offset relative to the portion of said wall which is disposed in the plane of the upper or outer sash B, by an amount approximately equal to the thickness of the metal from which the auxiliary frame side element 34 is formed. This same construction is, of course, employed at each side of the window and, as will be apparent, it insures disposition of the inner faces of the main or outer walls of the auxiliary side frame elements 34 in the same planes as the inner faces of the non-offset portions of the walls 29. Thus, the weatherstrips 37 for the respective sashes may be duplicates of each other and may be used interchangeably.

There are two of the weatherstrips 37 at each side of the window, one for each sash, and, as shown in Figs. 1 and 2, these weatherstrips are of generally U-shape in cross section and extend from the sill 10 to the lintel 12 and include outer walls 39 connecting their side portions 36, 36. Moreover, and as also shown in Fig. 3, each side portion of each weatherstrip 37 comprises an outer wall 40 and a yieldable inner wall 41 formed as a reversely bent portion of said outer wall. Furthermore, and as additionally shown in Fig. 3, the outer walls 40 are flared outwardly corresponding to, or substantially to, the flare of the adjacent walls of the stop and the parting beads, and the inner walls 41, which have free edges, whereby they are flexible, are transversely bowed or curved so that they have substantially line contact with the sash stiles.

The sectional dimensions of the weatherstrips 37 are such that they fit neatly within the channels formed by the stop and the parting beads, and due to the cooperation of their flared side walls 40 with the adjacent flared walls of said stop and parting beads, they are held effectively in said channels. If desired, however, they may be additionally secured by screws passing through their outer walls 39 into the walls 29 of the frame sides, such screws, in the case of the weatherstrips for the outer or upper sash, being comprised by the screws 36 which serve to fasten the frame side elements 34.

In addition to its stiles 38, each sash B and C includes a top rail 42 and a bottom rail 43. All of said rails and said stiles are of hollow, sheet metal construction and are suitably formed to receive glass panes 44. In addition, the top rail of the outer or upper sash has formed in its top a channel 45 of dove-tail cross section; the bottom rail of said outer or upper sash is formed at its bottom with an inwardly directed extension 46 from the inner end of which rises a flange 47; the top rail of the inner or lower sash is formed at its top with an outwardly directed extension 48 from the outer end of which depends a flange 49 which, in the closed positions of the sashes, lies outwardly of the flange 47 in overlapping relationship thereto; and the bottom rail of the inner or lower sash is formed at its outer side with a depending flange 50 which overlaps the vertical portion 18 of the top wall of the sill 10 when the sash C is closed and which, at its bottom, is turned inwardly and upwardly into a bead 51.

Fitted within the channel 45 and retained therein by the upwardly converging side walls thereof, is a weatherstrip 52 including top and bottom walls of which the former is bent from one edge of and overlies the latter and at its other edge is free, whereby it is flexible and is

designed to engage with the top wall of the lintel channel 25 to provide a seal at the top of the outer or upper sash when said sash is raised or closed.

Fitted about one of the flanges 47 or 49, in the present instance about the flange 47, is a weatherstrip 53 having a flexible, free marginal portion 54 which extends toward and engages the other of said flanges, in the present instance the flange 49, when the sashes are closed, whereby, when the sashes are closed, a seal is provided between the lower and the upper rails of the outer and the inner sashes, respectively.

Depending from the inner, bottom portion of the lower rail of the inner sash is a rib 55 the outer face of which is inclined downwardly and outwardly, and confined between the outer face of said rib and the flange 50 and the bead 51 is a weatherstrip 56 of substantially inverted L-shape in cross section having flexible, free marginal portions 57 and 58 the former of which is designed to engage the portion 17 of the top wall 15 of the sill 10 and the latter of which is designed to engage the vertical portion 18 of said sill top wall when the inner sash is closed, thereby to provide an effective seal at the bottom of the window.

Fastened against the inner faces of the parting beads 33 so as to extend short distances above and below the bottom and the top rails of the outer and the inner sashes, respectively, when said sashes are closed, are blocks 59 which serve as rigid abutments to hold the bottom and the top of the outer and the inner sashes against inward and outward movements, respectively, and also to assure proper alignment of the sashes when the sashes are closed, it being noted in this latter respect and by particular reference to Fig. 3, that the lateral extensions 46, 48 of the bottom and the top rails of the outer and the inner sashes are of lesser lengths than the widths of the sashes so as to clear the blocks 59 to permit vertical sliding movements of the sashes and to contact at their ends with the inner faces of said blocks when the sashes are closed. As shown in Fig. 4, the blocks 59 are chamfered at their ends for the purpose of guiding the sashes into proper cooperative relationship with the medial, sash positioning portions of said blocks.

In accordance with known practice, spring balances are mounted in suitable housings at the top of the frame A and are connected with the sashes by metallic tapes or other suitable flexible elements. As nothing new is claimed respecting the means for balancing the sashes, such means have not been illustrated.

Due to the flaring of the side walls of the stile accommodating channels and of the outer side walls of the weatherstrips 37, said weatherstrips not only are retained within said channels, but space is provided to accommodate the flexible inner walls 41 of said weatherstrips, and to permit them to flex, while, at the same time, the inner portions of the beads or ribs 31, 32 and 33 are maintained desirably quite close to the inner and the outer faces of the sash stiles.

Obviously, the flexible portions 41 of the weatherstrips 37 serve not only to provide effective seals at the sides of the sashes, but also to provide cushioned guides for said sashes, whereby the latter are freely slidable between raised and lowered positions.

While the weatherstrip 53 may be mounted on either of the flanges 48 or 49 in any desired manner, it will be observed that, in the present

instance, said flanges are longitudinally grooved and said weatherstrip is of channel form in cross section to be slipped over one or the other of said flanges, and a bead is formed along one of the walls of the weatherstrip to snap into the groove of the selected flange.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claim.

15 We claim:

20 In a window, a frame including a sill having a substantially horizontal wall and a substantially vertical, outwardly facing wall extending downwardly from said substantially horizontal wall, a sash slidable in said frame and including a bottom rail having a depending flange at the outer side thereof to overlap said substantially vertical wall when the sash is closed, said flange having an inwardly directed bottom portion, a rib depending from an inner portion of

said rail, the outer face of said rib being inclined downwardly and outwardly, and a weatherstrip of substantially inverted L-shape in cross section including a top flange seated against the bottom of said bottom rail and engaged at its inner end against the outer face of said rib and an outer substantially vertical flange disposed inwardly of said bottom rail flange and engaged at its lower end against the inwardly directed bottom portion of said bottom rail flange whereby it is retained in assembly with said bottom rail, said weatherstrip having a flexible free marginal portion extending from the rear end of the top flange thereof forwardly beneath said top flange for engagement with the substantially horizontal wall of the sill when the sash is closed, and further having a flexible free marginal portion extending from the lower end of the substantially vertical flange thereof upwardly and inwardly relative to said substantially vertical flange for engagement with the substantially vertical wall of the sill when the sash is closed.

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