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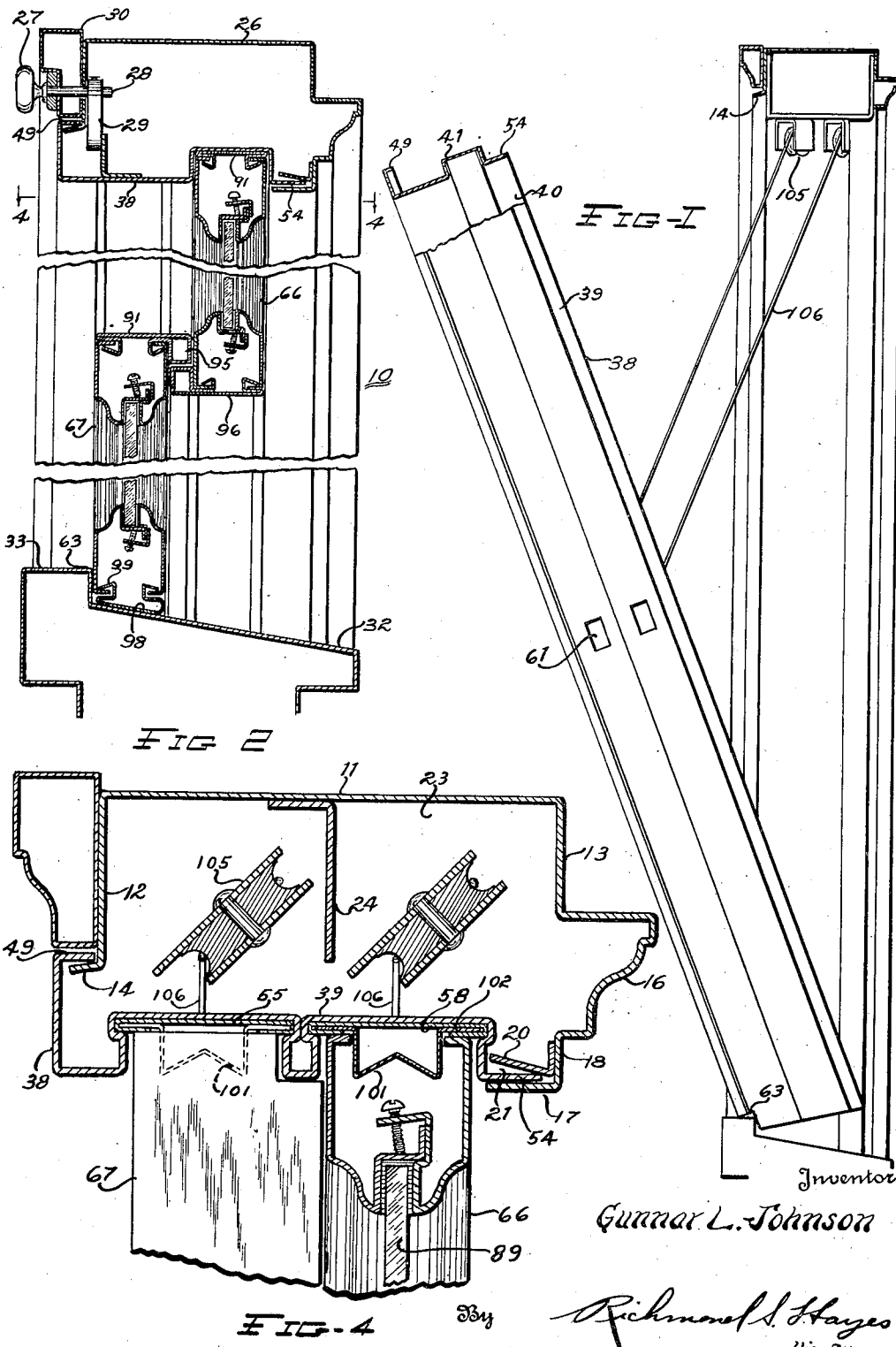
G. L. JOHNSON

2,018,308

SASH WINDOW

Filed Oct. 11, 1933

2 Sheets-Sheet 1



Oct. 22, 1935.

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SASH WINDOW

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2 Sheets-Sheet 2

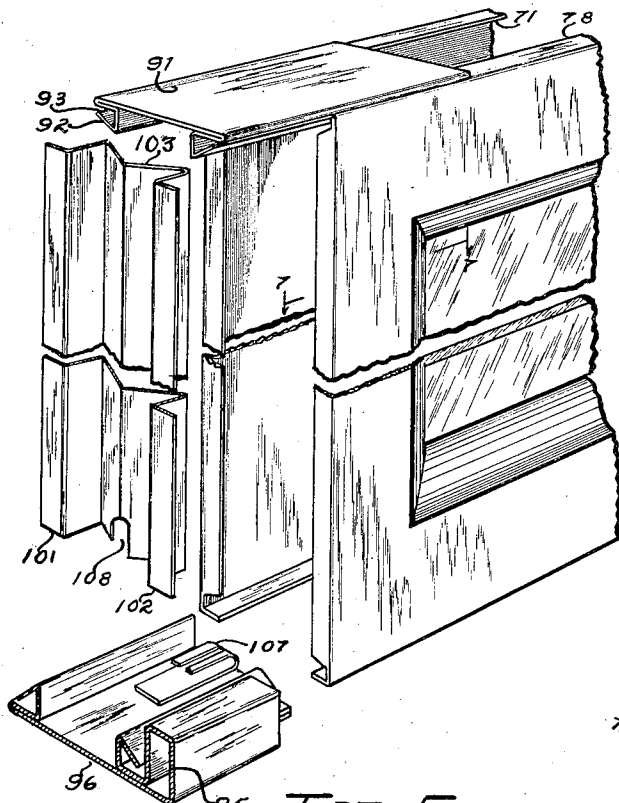


FIG-5

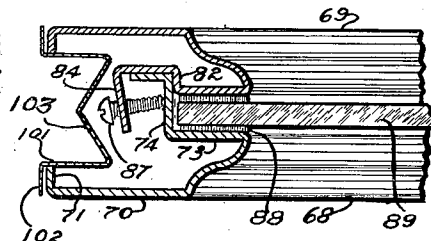


FIG-7

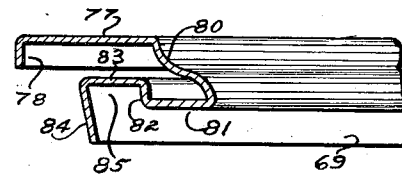


FIG-6

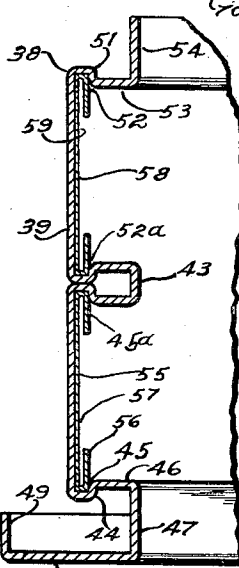


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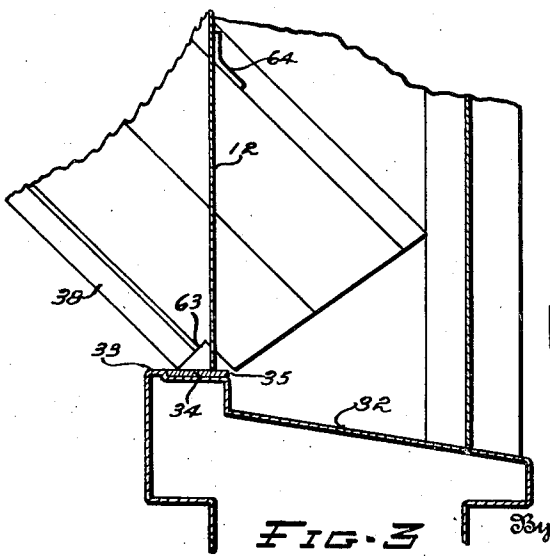


FIG-3

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UNITED STATES PATENT OFFICE

2,018,308

SASH WINDOW

Gunnar L. Johnson, Jamestown, N. Y.

Application October 11, 1933, Serial No. 693,130

8 Claims. (Cl. 189-72)

This invention relates to an improvement in sash windows and more particularly to those which may be manipulated to facilitate cleaning or to change or control ventilation of a room.

The preferred embodiment of the invention discloses a unitary structure, insertable as such, into a window opening and which consists essentially of a building frame, guide frame and one or more sash windows.

It is recognized that windows of the sash type constructed from wood do not lend themselves as readily to improvement necessitated by the continuous advance in building design. The more recent trend, therefore, has been to develop sash windows in metal which would meet all the requirements of the wood window and in addition have certain advantages thereover.

The principal objection to windows constructed from metal lies in their cost of manufacture and installation. It has become increasingly evident that the cost of metal windows must be greatly reduced to compete with the reasonable price of wooden windows of this type. The present invention represents a development and refinement of metal window parts for the purpose of providing an inexpensive metal window which may be easily assembled or disassembled and this therefore constitutes the principal object of the invention.

Another object of the invention lies in the provision of a window structure of this class comprised of a stationary or building frame, a removable guide frame, and one or more sash windows removably mounted in the guide frame.

A further object of the invention lies in the provision of a window structure of this class in which a sash and guide frame may be simultaneously swung inwardly for the purpose of permitting cleaning the exterior surface of the sash.

A still further object of the invention lies in the provision of a window structure of this class in which a weather seal is provided between each pair of relatively movable elements, the parts for this purpose being definitely associated with each of the elements.

Another and further object of the invention lies in the provision of a window structure of this class which, by reason of the simplicity of design of the component parts thereof, makes possible the manufacture and assembly of a comparatively inexpensive metal window.

Other and further objects of the invention will be more clearly understood from a consideration of the following specification which is taken in

conjunction with the accompanying drawings and in which,

Figure 1 is a vertical sectional view of one modification of this invention showing the guide frame swung inwardly of the fixed or building frame;

Figure 2 is an enlarged vertical sectional view showing upper and lower sashes mounted in the guide frame and the guide frame located in the building frame;

Figure 3 is an enlarged fragmentary vertical sectional view showing details of structure which permit swinging the guide frame and sashes inwardly of the building frame;

Figure 4 is an enlarged horizontal sectional view taken substantially on the line 4-4 of Figure 2;

Figure 5 is a partially exploded perspective view of the elements which comprise one of the sashes;

Figure 6 is a disassembled view of a pair of complementary elements which make up one rail of a sash;

Figure 7 shows the complementary elements assembled to form a sash rail, being taken substantially on the line 7-7 of Figure 5; and

Figure 8 is a vertical sectional view of a part of the building frame showing weather strip portions mounted therein.

Referring to the drawings, one modification of the invention is shown. This structure is adaptable for mounting in assembled form as a unit into a suitably proportioned building wall opening. For the purpose of a clearer understanding of the invention, the structure is considered as being comprised of a fixed or building frame, guide frame, and sash.

The building frame, generally indicated by the reference numeral 10, is of any desired generally channel shape in cross section, the present disclosure providing a base wall 11, inner side wall 12, and outer side wall 13. (Fig. 4). The inner wall 12 terminates in a flange 14 substantially parallel with the wall 11. The outer wall may be, as shown in the drawings, formed with any suitable trim 16, this trim terminating in turn in an inwardly directed flange 17 substantially parallel to the wall 11. Secured to the inner face of the flange 13 adjacent flange 17, is a full length strip 20 which together with flange 17 forms a full length V-shaped pocket 21, the purpose of which is hereinafter more fully described. The compartment 23, formed by the walls of the building frame 10, serves to house sash cables and weights, an angle strip 24 being welded or otherwise joined to the wall 11 to space the weights of

the upper and lower sashes. The head portion 26 of the frame 10, similar in contour to the structure above described, may be provided with a knob 27 supported on a shaft 28. The inner end of this shaft is fitted with a latch member 29 which may be rotated by the knob 27 to engage and retain the guide frame in position within the building frame. Although the shaft 28 and knob 27 are shown mounted in a removable trim member 30, the trim can form part of the building frame and the particular method of mounting this latch constitutes no part of the invention. The sill 32 of the fixed frame 10 is of conventional design with the exception that a horizontal rail portion 33 thereof on which the guide frame rests is formed with suitable indentures 34 in which are located fiber or other pads 35.

The guide frame 38 considered as a whole is U-shaped, being comprised of side walls 39 and 40 and top wall 41. Inasmuch as the sides of the frame are of identical contour, only one will be described in detail. Reference is now had particularly to Figure 8 wherein the wall 39 is shown to be divided into two adjacent vertical portions separated by a rib 43. This rib may be formed from a separate element or, as disclosed, be made integral with the adjacent portions of the wall 39. The inner vertical edge of the wall 39 terminates in a return bent flange 44 which provides a full length pocket or recess 45. From the flange 44 a finished portion is provided by flanges 46, 47 and 48. The flange 48 terminates in a return flange 49 which, when the guide frame is mounted in the building frame, overlaps flange 14 of said frame. The outer vertical edge of the wall 39 is formed with a return bent flange 51 which provides a recess or pocket 52. From the flange 51 the wall is continued in flanges 53 and 54, the latter being adapted to fit into the V-shaped pocket 21 formed in the building frame 10. Figure 4 clearly discloses the manner in which the vertical wall 39 of the guide frame functions to produce a weather tight seal with the corresponding wall of the building frame 10. It will be noted that the rib 43 is spaced slightly from the wall 39 and provides therewith opposed recesses 45a and 52a. Recesses 45 and 45a receive a flexible lightweight metal strip 55. This strip lies against the inner face of the wall 39 and is provided with return bent flanges 56 which form opposed recesses 57. Similarly a metal strip 58 is mounted in the recesses 52 and 52a, being formed to provide opposed recesses 59. Flange 53 serves with the rib 43 and wall 39 to provide a guideway for the upper sash, whereas flange 46, wall 39 and rib 43 provide a guideway for the lower sash. Midway of each of the walls 39 and 40 are openings 61 through which the sash weight cables project to be joined to the sashes.

Flanges 46, 47, 48 and 49 of the walls 39 and 40 are cut away at their lower ends to provide shoulders 63 (see Figures 2 and 3) which rest upon pads 35 in the sill 32. A stop plate 64 is secured in any suitable manner, as by welding, to each of the walls 39 and 40 a short distance upwardly of their lower edges. These plates project outwardly of the walls to which they are joined a sufficient distance for their engagement with the wall 12 of the building frame 10 and serve to define the limit of inward movement of the guide frame when it is swung inwardly on the pads 35. As heretofore mentioned, the guide frame is U-shaped and, being open at the bottom, walls 39 and 40 are somewhat flexible. Consequently when it is desired to entirely remove the guide

frame from the building frame the lower ends of walls 39 and 40 are pressed inwardly toward each other to disengage the stop plates 64 from the walls 12 of the building frame.

The present invention includes provision for upper and lower sashes which are generally indicated by the numerals 66 and 67. With the exception of a weather strip joined to the lower edge of the lower sash 67, these sashes are identical and therefore only sash 67 will be described in detail. Referring particularly to Figures 5, 6, and 7, it will be noted that the sash 67 is comprised of two rectangular elements 68 and 69. The element 68 is formed with an inner wall 70 which terminates along one vertical edge in a right angle flange 71 and along the other edge in a trim portion 72 which provides a shoulder 73 against which a glass panel may be positioned. From the shoulder 73 a flange 74 continues to form a seat for the edge of the glass panel and 20 this flange in turn terminates in a right angle flange 75 which is parallel to the inner wall 70. The other element 69 is provided with an outer wall 77 which terminates along one vertical edge in a right angle flange 78, corresponding to flange 71 of the other element. The other vertical edge of the wall 77 terminates in a further trim portion 80 which provides a further glass panel retaining shoulder 81. From the shoulder 81 flanges 82, 83 and 84 are continued to form a 30 recess 85 into which, when the elements 68 and 69 are assembled, flange 75 of the element 68 projects. When these elements are assembled, a portion of the flange 74 lies against the shoulder formed by flanges 82. A plurality of screws 35 87 are mounted in suitable threaded openings in the flange 84. These screws when turned down bear against flange 74 at an angle governed by the angularity of flange 84 for the purpose of drawing the two elements into pressure abutment with each other. Rubber or other suitable padding 88 encloses the edges of the glass panel 89 and is engaged, when the elements are assembled, by flanges 73, 74 and 81.

The sash frame thus far described presents 45 a member having suitably finished inner and outer faces and a glass panel. The sides, top and bottom of the sash frame, however, present outwardly opening channels. The top of the sash, being exposed to view, is closed by a plate 90 which is provided with return bent flanges 92 along the under face thereof. These flanges form restricted mouth recesses 93 into which flanges 71 and 78 of the sash frame project. The springiness of flanges 92 is sufficient to prevent rattling or accidental dislodgement of this plate. As shown in Figure 2 of the drawings, the plate 91 may be provided with a downwardly overhanging portion 95 which forms a sash width shoulder engageable with a corresponding 60 shoulder on the bottom plate 96 of the upper sash to provide a weather tight seal at the meeting edges of the two sashes. While the portions 95 and 96 are shown to be rectangular, it is contemplated that they be formed with interfitting flanges to effect a better seal than with two contacting portions as disclosed. The bottom edge of the lower sash is closed by a flexible plate 98 which is disposed with an angularity corresponding with that of the sill 32. The edges of this 70 plate are provided with return bent flanges 99 which form restricted mouth recesses for receiving flanges 71 and 78 of the sash frame.

The sides of the sash are closed by metal strips 101. These strips have flanges 102 which are 75

spaced slightly from the adjacent flanges 71 and 73 of the sash frame. The plate projects inwardly of the sash frame having a V-shaped central portion 103 which gives additional flexibility to an already somewhat flexible metal strip. Flanges 102 are adapted to fit into recesses 57 of the plate 55 which, as above set forth, is mounted in the guide frame 38. Interfitting of these elements insures a weather tight seal. Furthermore, since plates 55 and 58 of the guide frame and plates 101 of the sash are of brass or other suitable alloy, excellent bearing contact between the sash and guide frame is had. A slight amount of lubricant between these relatively movable plates is sufficient to assure free reciprocation of the sash over a long period of time.

Mounted in the building frame 10 adjacent the top wall 26 and in any suitable manner, are pairs of rollers 105. The rollers may be of the swivel type or fixed as disclosed in the drawings. If fixed, they will be mounted at an angle to permit unhampered travel of sash cables 106 thereover when the guide frame and sash are swing inwardly of the fixed frame as shown in Figure 2 of the drawings. Each cable has a suitable weight (not shown) secured to one end thereof. The other end of the cable projects through one of the openings 61 in the guide frame and is engaged with a V-shaped bracket 107 which is permanently secured to the bottom plate 98 of the lower sash 67 or at the bottom plate 96 of the upper sash 66. The brackets 107 are sufficiently close to the ends of plates 98 and 96 so that the cables 106, when the openings 108 in side plates 101 register with guide frame openings 61, may be projected into the sashes and engaged with the brackets. Before removing the guide frame entirely from the building frame, the sash cables 106 must be disengaged from the brackets in a manner the reverse of that described.

Although applicant has shown and described only one specific means for fastening two rectangular elements together to form the rails of a sash, and only one disclosure of suitable weather stripping means for the sash, it will be apparent to those skilled in the art that modifications or adaptations of this structure may be made and are contemplated in so far as they may be within the scope of the hereunto annexed claims.

Having thus set forth my invention what I claim as new and for which I desire protection by Letters Patent is:—

1. In a window structure, a removable sash frame including a guide channel, a sash mounted in said frame, said sash having an outwardly opening channel rail adjacent said guide channel, means in said guide channel, and further means in said sash rail cooperating to provide a weather tight seal between said frame and said sash.

2. In a window structure, a removable sash frame including a guide channel, a sash mounted in said frame, said sash having an outwardly opening channel rail adjacent said guide channel, guide means in said guide channel, laterally movable means in said sash rail, said guide channel means and said movable means cooperating to provide a weather tight seal between said frame and said sash irrespective of any misalignment of said sash with said frame.

3. In a window structure, a removable sash frame including a guide channel, a sash in said frame, said sash having an outwardly opening channel rail adjacent said guide channel, a strip mounted in and closing the opening in said channel rail, said strip including a resilient portion located in said rail and a pair of flanges projecting outwardly of said rail, and means in said guide channel for receiving and interfitting with said strip flanges to provide a weather tight seal between said frame and said sash.

4. In a window structure, a removable sash frame including a guide channel, a strip in said guide channel, return bent flanges terminating the vertical edges of said strip, a sash in said frame, said sash having an outwardly opening channel rail adjacent said guide channel, means mounted in said channel rail, said means having guide portions projecting beyond said channel rail and interengaging with the strip flanges of said guide channel whereby to provide a floating connection between said sash and said frame which at all times forms a weather seal.

5. In a window structure, a removable sash frame including a guide channel, a strip mounted in and secured to said channel, return bent flanges defining the vertical edges of said strip, a sash in said frame, said sash having an outwardly opening channel rail projecting into said guide channel, a strip mounted in and closing the opening in said channel rail, said strip including a resilient portion located in said rail, flanges on said strip projecting outwardly of said rail, said flanges interfitting with said return bent flanges in said guide channel strip, said sash strip being movable inwardly or outwardly of said channel rail whereby to provide, under all conditions, a weather tight seal between said frame and said sash.

6. In a window structure, a frame, a guide channel in said frame, a sash in said frame, a rail of said sash projecting into said guide channel, a pair of interfitting vertically relatively movable elements, said elements being secured in said channel against lateral displacement, one of said elements being frictionally engaged with said sash rail.

7. In a window structure, a frame, a guide channel in said frame, a sash in said frame, a pair of interfitting vertically relatively movable elements, said elements being located in said channel and secured against lateral displacement, means securing one of said elements against vertical displacement relative to a rail of said sash, said one element being frictionally engaged with said rail throughout its length, and laterally relatively movable with respect thereto.

8. In a window structure, a removable sash frame, a guide channel in said frame receiving said sash, a strip mounted in said channel, a further strip projecting into a rail of said sash and laterally movable with respect thereto, said further strip being interengaged with said first strip to prevent relative lateral displacement and being vertically movable with respect to said first strip whereby any lateral displacement of said sash will not affect the weather seal between said sash and channel.

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