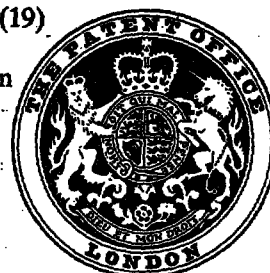


PATENT SPECIFICATION

(11) 1 534 009

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- (21) Application No. 40391/76 (22) Filed 29 Sep. 1976 (19)
 (31) Convention Application Nos. 18038/76 (32) Filed 1 Oct. 1975
 18038/76 18 Feb. 1976 in
 (33) Australia (AU)
 (44) Complete Specification published 29 Nov. 1978
 (51) INT CL² E06B 1/18
 (52) Index at acceptance
 E1J 212 213 223 241 2810 309



(54) WINDOW INSTALLATION

(71) I, LARRY KELVIN GILLIES, an Australian Citizen of Unit 3, Lot C, William Street, Beverley, State of South Australia, Commonwealth of Australia, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:-

10 This invention relates to an arrangement whereby a window frame is effectively and inexpensively installed in a building.

15 In many buildings, more particularly in framed buildings it is usual for a window assembly to be secured to the frame and for the upper surface of the window assembly to have attached thereto flashing which extends outwardly and beneath the sheathing material to shed water away from the frame. This is a standard type of installation and requires a wood frame to surround the window assembly, the wooden frame itself having the assembly secured thereto, and also the sheathing material.

25 Two of the objects of this invention are firstly to provide an improvement which will avoid the need for flashing, and secondly to provide an improvement which will avoid the need for what maybe termed 'normal' wooden frame associated with a window assembly. It is a still further object of the invention to provide a much simpler window installatio and thereby reduce costs over previous installations more particularly be reducing the amount of fitting time required. A still further object is to provide an installation which is usable with varying types of sheathing material, and wherein there is provided means which reduces danger of ingress of rain into the building under conditions, for example, of high wind.

40 In this invention a window installation comprises a window frame comprising an upper frame member assembly, a lower frame member, and two side frame mem-

bers, each having a front face portion arranged to lie contiguous with the outer surfaces of sheathing material of a structure when the window is installed therein,

the upper frame member assembly comprising an outer frame member and an inner frame member, the outer frame member having a said front face portion terminating along its lower edge i a rearwardly directed flange, the inner frame member having a flange forming its front portion which is spaced from said outer frame member front face portion to thereby form a sheathing material accommodation space which is also a water shed aperture, and

said lower frame member having a downwardly and outwardly sloping sill portion positioned vertically below said water shed aperture.

The window can be used in conjunction with a structure having a window opening in its outer sheathing material which will engage in the sheathing material accommodation space and therefore be stiffened by the upper frame member assembly across the stiffening corrugations (if any) of the sheathing material.

In another aspect the invention relates to a method of installing a window frame comprising forming a window aperture in the outer sheathing material of a structure, positioning the sheathing material adjacent the upper edge of the opening into said accommodation space of said frame, moving said frame to place said front face portions thereof contiguous with the outer surface of said sheathing material, and securing said frame to said structure.

The embodiments of the invention are described hereunder in some detail with reference to and are illustrated in the accompanying drawings, in which:-

Figure 1 is a perspective view of a window according to a first embodiment;

Figure 2 is a perspective view of a window

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according to a second embodiment;

Figure 3 is a section taken on line 3-3 of the window frame of Figure 1, but to an enlarged scale;

Figure 4 is a fragmentary section taken on line 4-4 of Figure 1, also to an enlarged scale;

Figure 5 is a fragmentary perspective view which illustrates assembly details of the upper frame assembly of Figure 1, when viewed from the front;

Figure 6 is a view corresponding to Figure 5, but when viewed from the rear, and

Figure 7 is an exploded perspective view of the stanchion illustrated in the second embodiment of Figure 2.

In the first embodiment of Figures 1, 3, 4, 5 and 6, a framed structure 10 (shown dotted) is provided with outer sheathing material 11 (also dotted) of formed sheet steel, the formation being any one of a number of different types, and for example, can be corrugated iron having a continuously curved cross section, but in this embodiment is of the so called low profile iron. The configuration of the sheathing material in cross section is not critical to use of this invention, however since the installation is effective for a wide range of shapes.

The sheathing material 11 of the building is arranged to have one sheet, or portion of one sheet, omitted to provide an aperture, or alternatively has an aperture cut therein, and a window frame 12 is inserted into the aperture. The window frame 12 comprises an upper outer frame member assembly 14, two side frame members 15 and a lower outer frame member 16, which intersects at the corners and are joined in this embodiment by welds designated 17.

As seen best in Figure 3, the upper frame assembly 14 comprises an outer frame member 19 and an inner frame member 20, both secured at their ends to side frame members 15 (Figure 6). The outer frame member 19 has a stiff edge formed by three folds, a front face portion 23 which is in a vertical plane, and terminates along its lower edge in a rearwardly directed flange 24.

The inner frame member 20 comprises a return flange 26 along its outer (or front) edge, a rearwardly extending horizontal web 27, and a downturned inner (or rear) flange 28 which stiffens the member. However there is a space designated 30 between the front face portion 23 and the return flange 26 which constitutes both a water shed space for shedding storm water which flows in the direction of arrows 'A' on Figure 3, and also an accommodation space which accommodates the sheathing material 11 near the upper edge of the opening in which the frame is positioned. The corrugations in the sheathing material 11 stiffen it against

deflection in a vertical direction, but the otherwise unsupported lower edge at the locality of the window opening receives its stiffness from the upper frame assembly which includes flange 24.

Each of the side frame members 15 has a web 33 extending inwardly to terminate in an upper flange 34 which lies in approximately the same vertical plane as the inner flange 28 of the inner frame member 20, and the side frame members 15 carry on each of them a louvre side assembly 35 for a standard louvre type window as illustrated in Figure 1 (although sash windows, hopper or sliding windows can also be accommodated, the necessary changes being made). Each side frame member also has a front face portion 36 which terminates also in a stiff edge 37. Each web 33 enters a small slot cut into the sheathing material (or alternatively, contains a small slot to accommodate the sheathing material). This is not illustrated.

The lower frame member 16 has an inwardly directed web 41 in the form of a sill having an inwardly and upwardly sloping portion 42 which terminates in an upwardly directed portion 43, followed by a horizontal portion 44 and then finally a downwardly directed flange 45, the sloping portion 42 providing water shed means for the lower edge of the window which is vertically beneath the water shed aperture 30.

Extending outwardly from the web 41 is a front face portion 46 which terminates with an outer stiff triangular section edge 47, which bears against the sheathing material 11 upon securing of the frame to its outer surface. This then provides some degree of stiffness for the outer periphery of the frame and at the same time effects a partial seal which is sufficient to reduce the ingress of water into the building which might otherwise take place, for example under the influence of high wind. Securing of the peripheral frame like member to the sheathing material may be achieved in a number of ways. It may for example be screwed to the building frame, or screwed or riveted to the sheathing material itself.

However in this embodiment installation is effected by lifting the window frame 12 into the opening in the sheath material 11 so that the sheath material enters the accommodation space 30, and tilting to a vertical position. A short Z section retaining strip 49 is inserted in endways and in the event of a window level being installed with sheathing support frame member 10 (Figure 3) prevents dislodgement of the frame.

A similar section member is also utilized however, even if the frame member 10 is not located as illustrated in Figure 3, and in such a case rests upon the upper edge of the sheet below the window.

Reference is now made to the second

embodiment of Figures 2 and 7.

Figure 2 illustrates a 'double' window having two sets of louvre frame assemblies 35, and a central stanchion 51, which comprises an outer channel 52 and an inner channel 53.

The outer channel 52 has a pair of parallel channel side walls 54 which terminate along their inner edges in outstanding flanges 55 and along their opposite edges in a central web 56 which has a forwardly projecting head 57. The upper ends of the channel side walls 54 are folded inwardly to form welding tabs 59 while the central web extends upwardly beyond the tabs, a slot is so formed to allow the inner frame member 20 to fit into the stanchion 51, and the tabs and web are spot-welded to complementary faces on the upper frame inner member 20. The lower end also has its side walls formed inwardly and sloping upwards and rearwards to conform to sill 16 or other lower frame members abutted thereby, to form tabs 59, the web extends downwardly below the tabs and the outstanding flanges also extend downwardly below the tabs, the tabs, web and outstanding flanges being welded to complementary surfaces on the sill member. Instead of draining taking place through an aperture in the sill member, it takes place between the inner walls of the outstanding bead and the front face of the sill member. It will be seen also that the wide spacing between the welds at each end of the stanchion results in a high degree of rigidity being imparted.

In some instances it is not necessary to further reinforce the stanchion, but in this embodiment a 'top hat' section channel member 53 is secured within the rear of the stanchion and the outer surfaces of its side walls are welded to the inner surfaces of the channel side walls of the stanchion, this then functioning as a splash guard to deflect any water which might otherwise enter the building. The splash guard is a shallow channel member but it can also incorporate wiring for illumination means, for example, a fluorescent tube, and in such an instance the outer surface of the splash channel can function as a reflective surface. The splash channel directs any storm water which might leak to the rear of the central web of the stanchion through the conduit onto the sill where it can drain only outwardly of the building.

One of the advantages of this aspect of the invention is that the width of the stanchion can be arranged so that the overall width of the frame will correspond to the space between facing edges of corrugated iron or other formation sheet material which sheathes a building, when one or a plurality of sheets are omitted. This then assists in the disposal of water shed by the side wall of the building.

A brief consideration of the above embodiment will indicate a number of important factors. Firstly water running down the outer surface of the sheathing material will run behind the front face of the upper outer frame member and will be shed by the inner flange between the inner edge thereof and the window inner frame member. This is a feature which has previously been avoided by the use of flashing, the method otherwise universally accepted. However this invention avoids the need for flashing and also avoids the need for additional frame work to support the window surround. No special sealing is required, and as the frame uses the natural panel widths to form a hole, fitting is reduced to a few minutes, so that a much lower cost is achieved than heretofore. The need for the additional wooden frame is usually eliminated, and the stiff edge is found to achieve a sufficient degree of sealing that ingress of moisture is effectively reduced and in many cases completely eliminated. Protruding surfaces are substantially reduced, and structural strength is better maintained, than in other more conventional window frames.

WHAT I CLAIM IS:-

1. A window frame comprising an upper frame member assembly, a lower frame member, and two side frame members, each having a front face portion arranged to lie contiguous with the outer surface of sheathing material of a structure when the window is installed therein,

the upper frame member assembly comprising an outer frame member and an inner frame member, the outer frame member having a said front face portion terminating along its lower edge in a rearwardly directed flange, the inner frame member having a flange forming its front portion which is spaced from said outer frame member front face portion to thereby form a sheathing material accommodation space which is also a water shed aperture; and

said lower frame member having a downwardly and outwardly sloping sill portion positioned vertically below said water shed aperture.

2. A window frame according to claim 1 wherein the front portion flange of said inner frame member of said upper frame assembly is a return flange, and said inner frame member terminates along its rear edge in a downturned rear flange.

3. A window frame according to either claim 1 or claim 2 comprising spot welds joining ends of both said outer frame member and said inner frame member to the side frame members.

4. A window frame according to claim 2 wherein said side frame member has a web extending rearwardly from its front face portion and terminating in an inner flange

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embodiment of Figures 2 and 7.

Figure 2 illustrates a 'double' window having two sets of louvre frame assemblies 35, and a central stanchion 51, which comprises an outer channel 52 and an inner channel 53.

The outer channel 52 has a pair of parallel channel side walls 54 which terminate along their inner edges in outstanding flanges 55 and along their opposite edges in a central web 56 which has a forwardly projecting head 57. The upper ends of the channel side walls 54 are folded inwardly to form welding tabs 59 while the central web extends upwardly beyond the tabs, a slot is so formed to allow the inner frame member 20 to fit into the stanchion 51, and the tabs and web are spot-welded to complementary faces on the upper frame inner member 20. The lower end also has its side walls formed inwardly and sloping upwards and rearwards to conform to sill 16 or other lower frame members abutted thereby, to form tabs 59, the web extends downwardly below the tabs and the outstanding flanges also extend downwardly below the tabs, the tabs, web and outstanding flanges being welded to complementary surfaces on the sill member. Instead of draining taking place through an aperture in the sill member, it takes place between the inner walls of the outstanding bead and the front face of the sill member. It will be seen also that the wide spacing between the welds at each end of the stanchion results in a high degree of rigidity being imparted.

In some instances it is not necessary to further reinforce the stanchion, but in this embodiment a 'top hat' section channel member 53 is secured within the rear of the stanchion and the outer surfaces of its side walls are welded to the inner surfaces of the channel side walls of the stanchion, this then functioning as a splash guard to deflect any water which might otherwise enter the building. The splash guard is a shallow channel member but it can also incorporate wiring for illumination means, for example, a fluorescent tube, and in such an instance the outer surface of the splash channel can function as a reflective surface. The splash channel directs any storm water which might leak to the rear of the central web of the stanchion through the conduit onto the sill where it can drain only outwardly of the building.

One of the advantages of this aspect of the invention is that the width of the stanchion can be arranged so that the overall width of the frame will correspond to the space between facing edges of corrugated iron or other formation sheet material which sheathes a building, when one or a plurality of sheets are omitted. This then assists in the disposal of water shed by the side wall of the building.

A brief consideration of the above embodiment will indicate a number of important factors. Firstly water running down the outer surface of the sheathing material will run behind the front face of the upper outer frame member and will be shed by the inner flange between the inner edge thereof and the window inner frame member. This is a feature which has previously been avoided by the use of flashing, the method otherwise universally accepted. However this invention avoids the need for flashing and also avoids the need for additional frame work to support the window surround. No special sealing is required, and as the frame uses the natural panel widths to form a hole, fitting is reduced to a few minutes, so that a much lower cost is achieved than heretofore. The need for the additional wooden frame is usually eliminated, and the stiff edge is found to achieve a sufficient degree of sealing that ingress of moisture is effectively reduced and in many cases completely eliminated. Protruding surfaces are substantially reduced, and structural strength is better maintained, than in other more conventional window frames.

WHAT I CLAIM IS:-

1. A window frame comprising an upper frame member assembly, a lower frame member, and two side frame members, each having a front face portion arranged to lie contiguous with the outer surface of sheathing material of a structure when the window is installed therein,

the upper frame member assembly comprising an outer frame member and an inner frame member, the outer frame member having a said front face portion terminating along its lower edge in a rearwardly directed flange, the inner frame member having a flange forming its front portion which is spaced from said outer frame member front face portion to thereby form a sheathing material accommodation space which is also a water shed aperture; and

said lower frame member having a downwardly and outwardly sloping sill portion positioned vertically below said water shed aperture.

2. A window frame according to claim 1 wherein the front portion flange of said inner frame member of said upper frame assembly is a return flange, and said inner frame member terminates along its rear edge in a downturned rear flange.

3. A window frame according to either claim 1 or claim 2 comprising spot welds joining ends of both said outer frame member and said inner frame member to the side frame members.

4. A window frame according to claim 2 wherein said side frame member has a web extending rearwardly from its front face portion and terminating in an inner flange



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which lies in approximately the same vertical plane as said rear flange of said inner frame member.

5 5. A window frame according to any preceding claim wherein said sill portion of the lower frame member extends rearwardly into an upwardly directed portion, a horizontal portion and a downwardly directed rear flange.

10 6. A window frame according to any preceding claim wherein the outer edge of each facing portion is a stiff edge which includes a plurality of folds.

15 7. A window frame according to claim 5 further comprising a Z section retaining strip interengageable both with said downwardly directed rear flange of the lower frame member and the structure within which the window is fitted.

20 8. A window frame according to any preceding claim further comprising a vertically extending stanchion intermediate the vertical frame members, which itself comprises an assembly of an inner channel and an outer channel, both with contiguous out-turned flanges.

25 9. A method of installing a window

frame according to claim 1 in the sheathing material of a structure, comprising positioning the sheathing material adjacent the upper edge of an opening into said accommodation space of said upper frame member assembly, moving said frame to place said front face portions thereof contiguous with the outer surface of said sheathing material, and securing said frame to said structure. 30 35

10. A window frame substantially as hereinbefore described with reference to and as illustrated in Figures 1, 3, 4, 5 and 6 of the drawings. 40

11. A window frame substantially as hereinbefore described with reference to and as illustrated in Figures 2, 3, 4, 5, 6 and 7 of the drawings.

12. A method of installing a window frame substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings. 45

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