Aug. 15, 1933. A. W. NELSON 1,922,494

CASEMENT WINDOW

Filed Aug. 15, 1931 2 Sheets-Sheet 1

Fig. 1

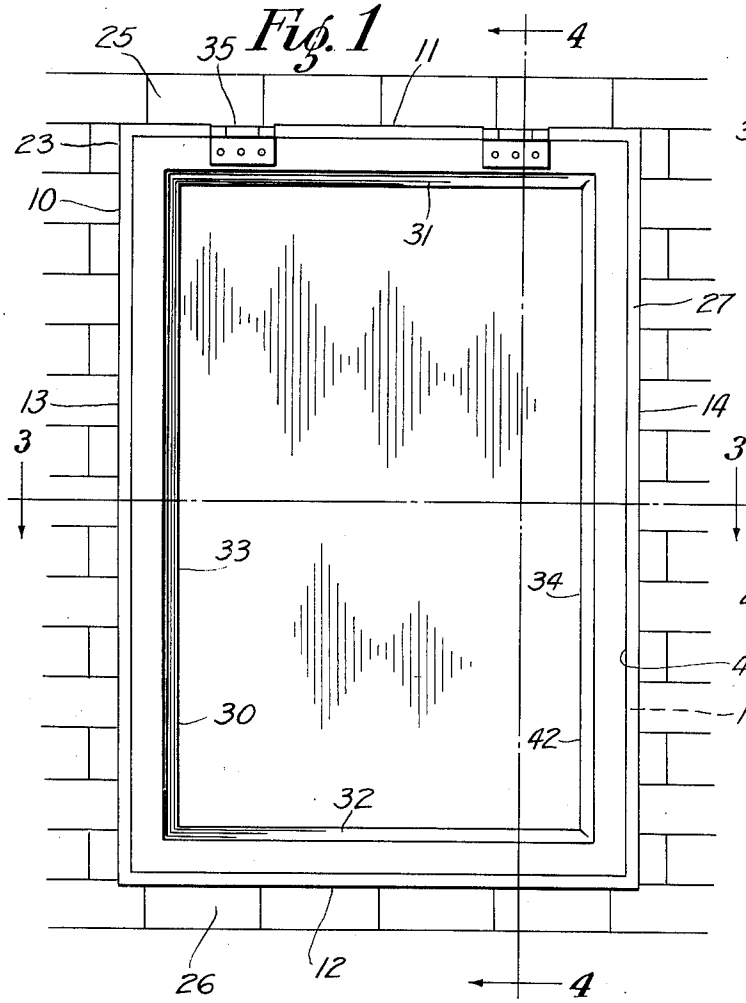


Fig. 2

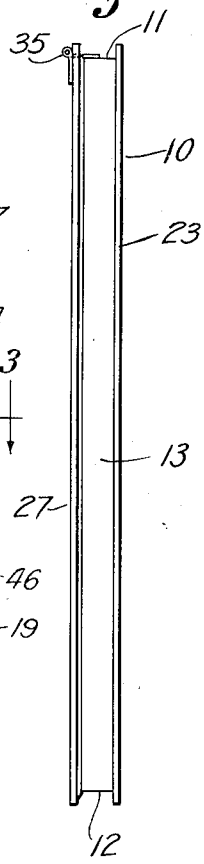
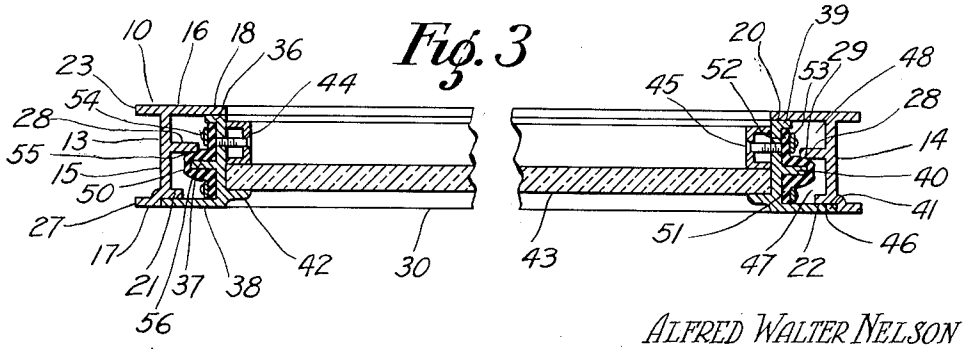


Fig. 3



ALFRED WALTER NELSON
INVENTOR.

BY Otis W. Holmgren
ATTORNEY.

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CASEMENT WINDOW

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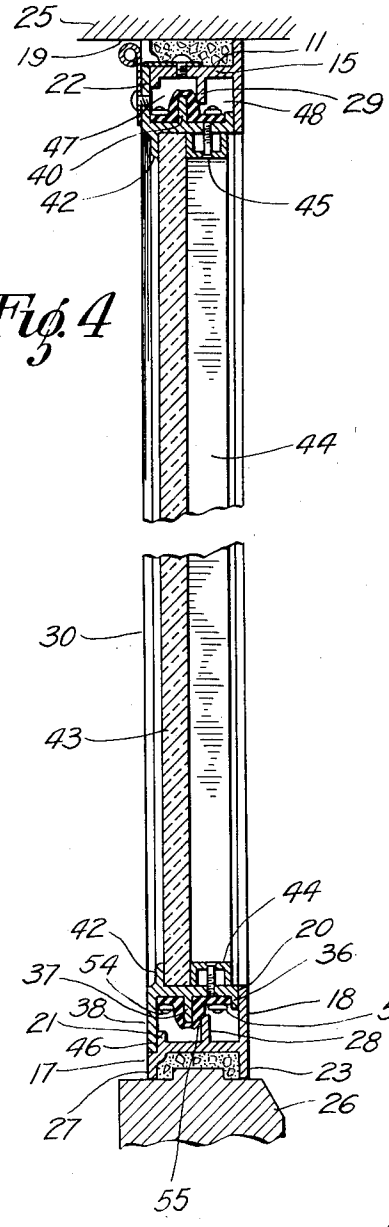


Fig. 4

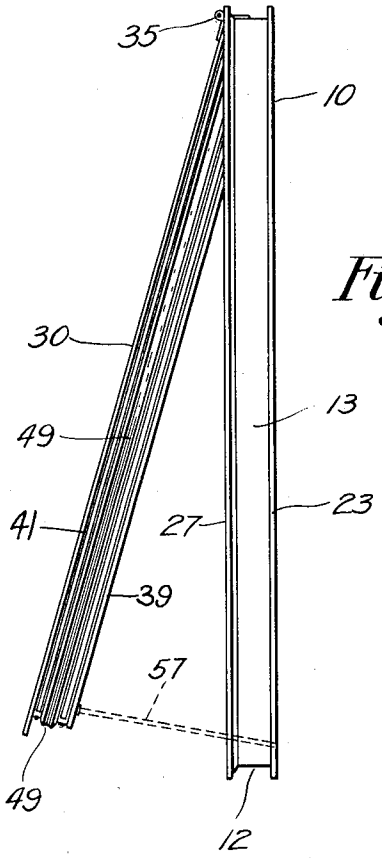


Fig. 5

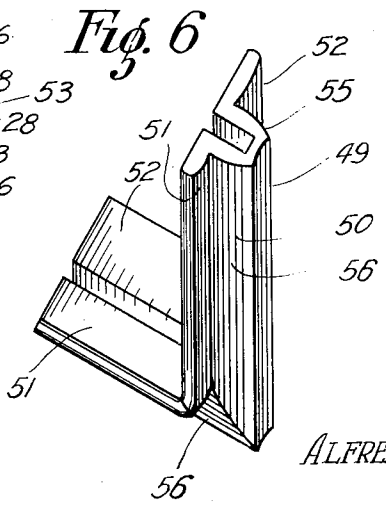


Fig. 6

ALFRED WALTER NELSON
INVENTOR.

BY Otto W. Holmgren
ATTORNEY.

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UNITED STATES PATENT OFFICE

1,922,494

CASEMENT WINDOW

Alfred Walter Nelson, Pelham Manor, N. Y.

Application August 15, 1931. Serial No. 557,231

15 Claims. (Cl. 189—65)

This invention relates to casement doors, windows and the like, and more particularly to a window of this type having an outer frame formed of metal and incorporated in the wall of the building or other structure, and a sash frame, also formed of metal, and arranged for either outward or inward opening and closing movement relative to the stationary outer frame.

The primary object of the invention is to enable the casement window to be thoroughly weathertight at all points about the meeting portions between the sash and outer frame, the sash being closely bedded in the outer frame at three distinct points of contact; one outer, one inner and one intermediate the outer and inner points of contact; in contradistinction to casement windows of this general character in which but one or two points of contact have been provided, with or without intermediate "baffle" members calculated to afford so-called points of "'weathering", but which have not provided the thoroughly tight closure necessary for certain uses.

Another object of the invention is to provide a metal casement window formed of an outer frame and a sash the meeting portions of the frame and sash including complementary portions having metal to metal contact at the inside and outside of the window, and an intermediate point of contact which desirably includes a more or less resilient element or weathering member interposed between opposing central rib portions formed on the outer frame and sash, whereby a plurality of wind break chambers are produced to positively prevent the passage of water or air.

Yet another object of the invention is to provide a metal casement window which will be thoroughly weathertight throughout, rigid and durable in construction, neat in appearance, and economical in cost of manufacture.

Still another object of the invention is to provide a construction of the above character which may be employed as a window, door, transom or the like, and in which the sash may be swingably hinged at the top, bottom or one of the sides, or pivotally mounted within the outer frame either vertically or horizontally, the sash being formed as a single unit, or in a pair or plurality of sections, and with any desired number or character of lights.

With the above and other objects in view, which will appear as the specification proceeds, the invention resides in a certain novel construction and combination and arrangement of parts, clearly described in the following specification and fully illustrated in the accompanying drawings, which latter show an embodiment of the invention as at present preferred.

In the drawings:

Figure 1 is a front elevation, illustrating the casement window built into the wall of a building or like structure;

Figure 2 is a side elevation of the window;

Figure 3 is a transverse sectional view through the window, taken substantially on the line 3—3 of Figure 1, looking in the direction of the arrows;

Figure 4 is a vertical sectional view through the window, taken substantially on the line 4—4 of Figure 1;

Figure 5 is a side elevation, substantially like that shown in Figure 2, but with the sash in partly open position; and

Figure 6 is a detail perspective view illustrative of the construction of the weathering element for the central rib of the sash.

The casement window in this instance comprises an outer window frame 10 including top and bottom members 11 and 12, and side members 13 and 14, respectively, preferably formed of extruded metal, such as aluminum, steel or other suitable material. These outer frame members have a cross-sectional shape of substantially F form, each member including a side portion 15, a right-angular inner portion 16, and an outer portion 17 parallel with the inner portion 16. The top, bottom and side portions, in the case of the rectangular window herein shown, are mitre-joined one to another at the corners of the window, as by welding or otherwise.

Each of the inner frame portions 16 includes an inwardly extending flange portion 18 parallel with the window opening 19, and at the inside of the latter, the joined portions 18 of the several outer frame members forming a continuous inner contact flange 20; and each frame portion 16 also includes an inwardly extending flange portion 21 parallel with the flange portion 18, at the outer side of the window opening, and of less width than the flange portion 18, the said portions 21 of the several outer frame members combining to produce an outer contact flange 22.

The inside flange portions 18 each include a co-extensive aligned portion 23 extending away from the window opening and toward the building walls 24, head 25 and sill 26 of the window opening, and the outside flange portions 21 are provided with integral offset portions 27 parallel with the portions 23; the several portions 23 and 27 being suitably embedded in the wall to secure the outer frame 10 rigidly in place.

Intermediate the flange portions 18 and 21 of each outer frame member I provide a rib portion 28, parallel with said flange portions, the rib portions 28 of the outer frame members combining to produce an intermediate contact flange 29 of less width than the inner contact flange 20 and of greater width than the outer contact flange 22, the purpose of which will presently appear.

The sash frame 30 is formed as a substantial counterpart of the window frame 10, and desirably of the same material, and includes top and bottom members 31 and 32, and side members 33 and 34, respectively; and this sash frame 30 is in the present instance hinged, as indicated at 35, to swing outward from the building wall (Fig. 5).

Each of the sash frame members includes flange portions 36, 37 and 38, which when the several sash frame members are joined to each other combine to produce inner, intermediate and outer contact flanges 39, 40 and 41, respectively, of progressively greater width from inside to outside of the window, arranged parallel with each other and being also arranged parallel with and in opposing relation to the inner, intermediate and outer contact flanges 20, 29 and 22, respectively, of the window frame 10.

The sash frame members 31 to 34, inclusive, also include flanged portions which extend inwardly parallel with the window opening, and which combine to produce a continuous glass detaining flange 42 to receive a light of glass 43, which latter is secured in place by a suitable glazing bead member 44 held in place by screws or equivalent fastenings 45.

An important feature of the invention is to obtain an absolutely weatherproof, tight closure for the sash. This I accomplish in a novel manner which overcomes certain the of the defects inherent in casement windows where, for instance, only two points of contact have been provided between the sash and outer frame, so that even though what may be termed "baffle" members have been provided between the contact points, it has been possible, under heavy weather conditions, for rain and wind to beat through the joints.

For accomplishment of the important object just referred to, I construct the window so that when the sash is closed the inner contact flange 39 of the sash abuts directly against and in close contact with the inner contact flange 20 of the outer frame; and the outer contact flange 41 of the sash seats in snug interlocking relation in a recess or groove 46 of non-straight or angular conformation at the outer side of the outer frame so that said contact flange 41 abuts directly against the outer surface of the contact flange 22 of the frame, with the outer surface of the flange 41 flush with the outer surface of the offset flange portions 27 of the window frame, the outer edge of the sash flange 41 being thus adapted to afford a tortuous passage for the elements at this point of contact, if through looseness due to wear or otherwise any wind or rain should succeed in passing said outer edge at the outer point of contact.

Furthermore, the intermediate point of contact between the frame and sash, which latter point of contact includes the flange portions 29 and 40 of the frame and sash, respectively, is constructed to afford a plurality of wind break chambers 47 and 48 which are effectively closed one from another. To this end the parts are constructed so that the intermediate opposing flanges 40 and 29 of the sash and frame are spaced slightly from and overlap each other; and a specially constructed weathering member or strip 49 is provided therebetween.

In this instance, the weathering member 49 is formed of molded rubber, and includes a U shaped portion 50 arranged to embrace the intermediate contact flange 40 of the sash, a substantially right angular flange portion 51 arranged to abut against the sash frame members and to extend to the outer frame contact flange 22, and a slightly wider flanged portion 52 to similarly engage the sash frame members and to extend to the inner contact flange 39 of the sash, these flange portions 51 and 52 being securely attached to the sash frame members by metal securing strips 53 and suitable screws 54 or other fastenings.

It will be noted that the construction of the weathering member is such that the outside of the top of the U shaped portion is slightly concave, while the leg portions of the U are somewhat thicker, whereby there are produced enlarged rounded cushion portions 55 and 56, braced and supported by the overlapping end of the intermediate sash flange. The innermost cushion portion 55 is thus arranged to be wedgingly compressed against the side of the intermediate frame flange, thereby to provide a tight point of meeting with the intermediate contact flange of the outer frame, while the entire construction of the weathering member provides for efficient coaction when the window is closed, besides strengthening and rigidifying the construction and maintaining its effectiveness during long continued usage.

It will be understood that the weathering member 49 may be provided on the intermediate flange of the outer frame instead of on the sash, if desired. Also, the contact flange 21 of the sash may be formed with the tortuous recess 46 instead of the frame-flange 22 if desired.

The three-point contact thus provided between the sash and its frame, the outer and inner points being metal to metal in a tortuous arrangement, and the intermediate contact being metal to rubber, or an equivalent of the latter, providing a plurality of wind break chambers each effectively sealed from the other, thus enables the window to be thoroughly weathertight and efficient under extreme weather conditions.

While the casement window is herein shown of rectangular form, the same may be circular, or any other desired shape. Also, instead of the sash being hingedly connected and arranged to be held open by means of a suitable bar or hook or the like as indicated at 57, the sash may be pivotally mounted in the outer frame. Any suitable lock or other hardware may be provided. The sash may include any desired number of lights and may even be constructed in a plurality of sections or in one or more pairs in the same frame, as will be understood; the essential feature of the invention residing in the construction of the weatherproof three-point meeting contact between the sash and window frame.

Considerable particularities of description, as to materials, part details, proportions, capacities and utilities may have been herein indulged in, but it will be understood that these statements, made with particular reference to the one now preferred of various possible embodiments of the invention which is illustrated in the drawings, are not in any way to be taken

as definitive or limitative of the invention; but that the language of the following claims is intended to cover all generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language might be said to fall therebetween; the scope of protection contemplated herein being taken solely from the appended claims, interpreted as broadly as is consistent with the prior art.

What I claim is:

1. A metal casement window and the like including, in combination, an outer frame and a sash, said frame including inner, intermediate and outer flange portions parallel with the window opening, and said sash including flange portions arranged to abut directly against the inner and outer flanges of said frame and an intermediate flange portion overlapping the intermediate flange of said frame, said outer frame including an offset portion forming a recess extending around the outer flange of said sash whereby to provide an interlocking joint at the latter's point of meeting with the frame, and resilient sealing means on one of said intermediate flanges adapted to abut against the other and be compressed therebetween.

2. A metal casement window and the like including, in combination, an outer frame and a sash, said frame including inner, intermediate and outer flange portions parallel with the window opening, and said sash including flange portions arranged to abut directly against the inner and outer flanges of said frame when swung thereagainst, an intermediate flange portion adjacent to and overlapping the intermediate flange of said frame, and a compressible weathering element on one of said intermediate flange portions to engage the other intermediate flange portion, whereby to afford a three-point weathering contact between the sash and frame, the meeting parts of the abutting outer flange portions of the sash and frame including surfaces in different planes forming a tortuous line of engagement when the window is closed.

3. A metal casement window and the like including in combination, an outer frame and a sash, said frame including inner, intermediate and outer flange portions parallel with the window opening and of progressively less width from inside to outside, said sash including inner, intermediate and outer flange portions of progressively greater width from inside to outside, the inner flange of said sash being arranged to abut directly against the inner flange of said frame and the outer flange of the sash arranged to abut against the outer flange of said frame when said sash is swung to closed position, said outer frame including an offset portion forming a recess extending around the outer flange of said sash whereby to provide an interlocking joint at the latter's point of meeting with the frame, and a compressible weathering element on the intermediate flange of the sash to engage a side of the intermediate flange of the frame, whereby to afford a three-point weathering contact between the sash and outer frame.

4. A metal casement window as set forth in claim 1, in which the resilient sealing means comprises a weathering member including a substantially U-shaped body portion to embrace one of said intermediate flanges, and substantially right angular base portions, and means to secure said base portions in place at opposite sides of said last mentioned intermediate flange and between the inner and outer flanges of said sash.

5. A metal casement window as set forth in claim 3, in which the weathering element comprises a resilient member including a substantially U-shaped body portion to embrace said intermediate sash flange, and substantially right angular base portions, and means to secure said base portions in place at opposite sides of said intermediate sash flange.

6. A metal casement window as set forth in claim 2, in which the weathering element comprises a molded rubber member including a substantially U-shaped body portion to embrace the intermediate flange of said sash, and substantially right angular base portions, and means to secure said base portions upon said sash, said U-shaped body portion having a concave end portion and an enlarged rounded side portion for abutting cushioning engagement with the intermediate member of said outer frame.

7. A metal casement window as set forth in claim 3, in which the weathering element comprises a molded rubber member having a substantially U-shaped body portion to embrace the intermediate flange of said sash, and substantially right angular base portions, and fastening strips to secure said base portions upon said sash, said U-shaped body portion having a concave end portion and an enlarged rounded side portion for wedging engagement with the intermediate flange of said outer frame.

8. A metal casement window as set forth in claim 1, in which the resilient sealing means comprises a weathering member including a substantially U-shaped body portion to embrace one of said intermediate flanges, and substantially right angular base portions, and means to secure said base portions in place at opposite sides of said last mentioned intermediate flange, said U-shaped body portion including an enlarged rounded side portion for engagement with said last mentioned intermediate flange.

9. A metal casement window as set forth in claim 3, in which the weathering element comprises a resilient member including a substantially U-shaped body portion to embrace said intermediate sash flange, and substantially right angular base portions, and means to secure said base portions in place at opposite sides of said intermediate sash flange, said U-shaped body portion including an enlarged rounded side portion for wedging engagement with said intermediate frame flange.

10. A construction as set forth in claim 2, in which the compressible weathering element includes a substantially U-shaped body portion to embrace one of the intermediate flanges and substantially right-angular base portions, and means to secure said base portions in place at opposite sides of the embraced flange and between the inner and outer flanges associated with the latter.

11. A construction as set forth in claim 2, in which the compressible weathering element includes a molded rubber member including a substantially U-shaped body portion to embrace one of the intermediate flanges, and substantially right-angular base portions, and means to secure said base portions in place at opposite sides of the embraced flange, said U-shaped body portion having a concave end portion and an enlarged rounded side portion for abutting cushioning engagement with the opposite intermediate flange.

12. A casement window and the like including, in combination, an outer frame and a sash, said frame and sash having contact at a plurality of points, and said frame and said sash each including a flange portion arranged in adjacent overlapping spaced relation, and a compressible weathering element on one of said flange portions to engage the other flange portion, whereby to afford a weather contact between the sash and frame, said compressible weathering element comprising a member formed of resilient material and including a substantially U-shaped body portion disposed about one of said flange portions in embracing relation and substantially right-angular base portions; and means to secure said base portions in place at opposite sides of the embraced flange portion.

13. The construction set forth in claim 12, in which the weathering element includes a concave end portion, and an enlarged rounded side portion for abutting engagement with said other flange portion.

14. A casement window and the like including, in combination, an outer frame and a sash, said frame including inner, intermediate and outer flange portions adapted to be disposed in parallel with the window opening, said sash including inner and outer flange portions arranged to abut directly against the inner and outer flanges of said frame when moved thereagainst, and an intermediate flange portion adjacent to and overlapping the intermediate flange of said frame, and a compressible weathering element on one of said intermediate flange portions to engage the other intermediate flange portion, whereby to afford a three-point weathering contact between the sash and frame, said compressible weathering element comprising a substantially U-shaped body portion to embrace one of said intermediate flange portions, and substantially right-angular base portions, and means to secure said base portions in place at opposite sides of the embraced intermediate flange portion.

15. The construction set forth in claim 14, in which the weathering element includes a concave end portion, and a convex side portion coextensive therewith for abutting engagement with said other intermediate flange portion.

ALFRED WALTER NELSON.