Nov. 29, 1955 R. R. CAMERON 2,724,873

HERMETICALLY SEALED DOUBLE PANE WINDOWS

Filed April 19, 1954

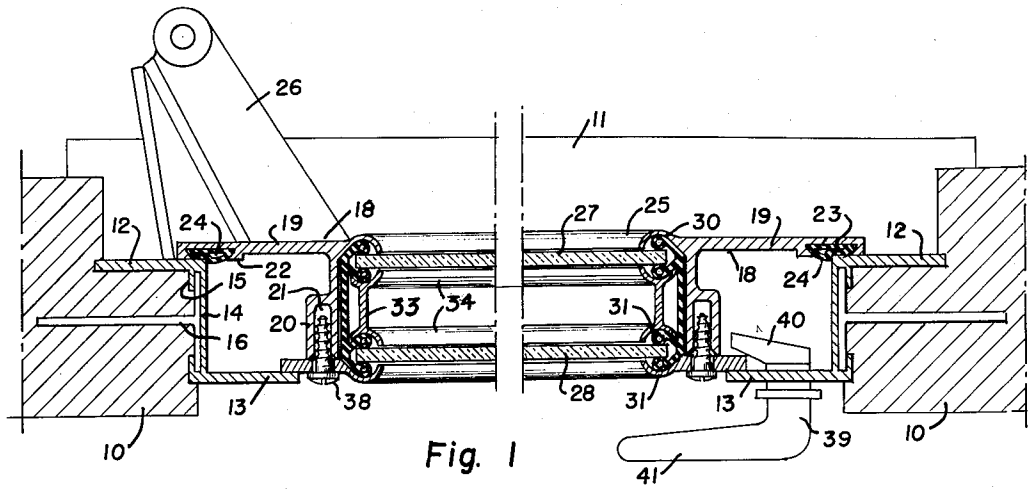


Fig. 1

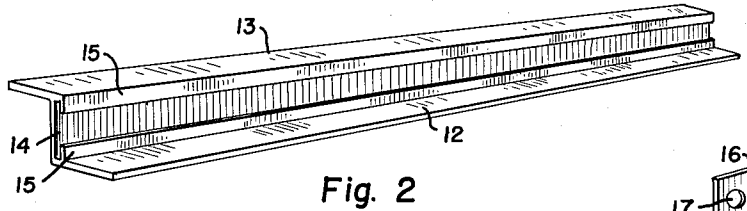


Fig. 2

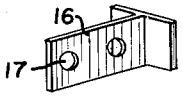


Fig. 3

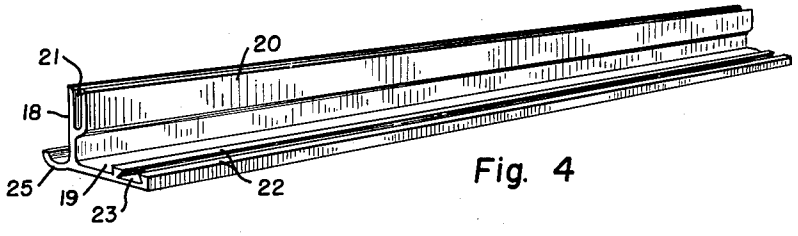


Fig. 4

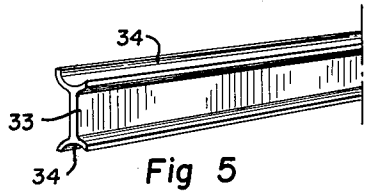


Fig 5

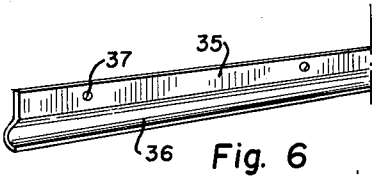


Fig. 6

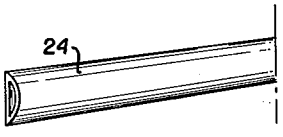


Fig. 7

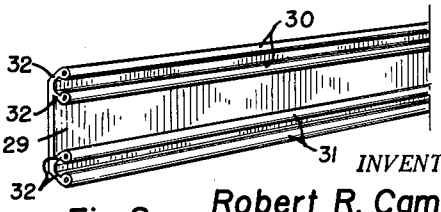


Fig. 8

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2,724,873

Patented Nov. 29, 1955

2,724,873

HERMETICALLY SEALED DOUBLE PANE WINDOWS

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Application April 19, 1954, Serial No. 423,942

1 Claim. (Cl. 20—56.5)

This invention relates to a double-pane window and has for its principal object the provision of simple and highly efficient extruded metal members from which a highly efficient double-pane sash can be quickly and easily assembled, and which will provide a sash in which the space between the two glass panes will be hermetically sealed.

Another object of the invention is to provide a double glass pane package assembly which will enable the two glass panes to be furnished as a complete sealed assembled unit which may be installed in a metal sash without requiring any additional time or labor over the installation of a single pane and without disturbing the seal between the two panes.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a fragmentary cross-section through an installed double-pane window embodying the improvements of this invention;

Fig. 2 is a perspective view illustrating a type of metal extrusion used for forming the window frame for the improved sash;

Fig. 3 is a similar perspective view illustrating a type of anchor employed for anchoring the frame in the wall masonry;

Fig. 4 is a similar perspective view illustrating a type of metal extrusion employed for forming the improved sash;

Fig. 5 is a perspective view illustrating a pane separator employed in the improved sash;

Fig. 6 is a similar perspective view illustrating a pane-retaining molding employed on the sash;

Fig. 7 is a similar perspective view illustrating a resilient weatherstrip employed on the improved sash; and

Fig. 8 is a similar perspective view illustrating a resilient double pane retaining and sealing band employed in the invention.

In Fig. 1, sections of a conventional wall at each side of a window opening are indicated at **10** and the window sill at **11**.

The frame of the improved window is formed from an extruded frame member, as illustrated in Fig. 2, having an outer wall flange **12**, an inner wall flange **13**, and a medial frame portion **14**, producing a somewhat Z-shaped cross-section. Two parallel, hook-like retaining flanges **15** extend along the opposite sides of the frame portion **14** in spaced relation thereto. The frame members of Fig. 2 are welded together to form the window frame, which is embedded in the masonry walls **10**.

To assist in retaining the frame in the wall, a plurality of T-shaped anchor members **16** are provided, as illustrated in Fig. 3. These anchor members are placed

against the sides of the frame portion **14** and turned to position their T-shaped heads between and beneath the retaining flanges **15** so that the anchor members will project from the frame at spaced positions for embedment in the walls **10**. The anchor members **16** are provided with nail holes **17** through which they may be nailed to temporary supporting braces during the building of the walls. The holes also serve to more firmly anchor the anchor members in the concrete or mortar of the walls.

The sash of the improved window is formed from an extruded sash member, as illustrated in Fig. 4, comprising a sash portion **18** and a sash flange **19** positioned at right angles to each other to form a substantially L-shaped cross-section. A screw-retaining strip **20** is formed on the sash portion **18** in parallel spaced relation thereto to form a longitudinally extending, continuous screw-receiving channel **21**.

Two dovetailed ridges **22** are formed along the flange **19** adjacent the edge of the latter and in spaced-apart relation to form a dovetailed weatherstrip groove **23**. A fixed hook-shaped molding strip **25** is formed on the sash member and projects from the intersection of the sash portion **18** and the flange **19** substantially in the plane of the flange **19**. A hollow, resilient chord-shaped weatherstrip **24**, as shown in Fig. 7, is provided for installation in the dovetailed groove **23** of the sash frame, as shown in Fig. 1. The sash members of Fig. 4 are welded together to form a sash to fit the frame formed by the members of Fig. 2 such as shown in Fig. 1. The sash carries two glass panes **27** and **28** and is hinged to the frame by any suitable hinge, such as indicated at **26**.

The glass panes **27** and **28** are completely surrounded by a resilient, elastic enclosing and sealing band **29**, as illustrated in Fig. 8. The band **29** is extruded from any suitable resilient material, such as rubber, neoprene, flexible plastic, or the like, and is formed with two pairs of hollow, cylindrical beads **30** and **31** extending longitudinally of one face of the band.

The beads are supported in spaced relation to the plane of the band **29** on continuous, flaring, resilient leg strips **32**. The two pairs of beads **30** and **31** are designed to resiliently engage the opposite faces of the peripheral edges of the two panes **27** and **28**, and when in place are held in sealed relation to the panes by the inherent elasticity of the leg strips **32**. The pair of beads are maintained in fixed, spaced relation with each other by means of an elongated rigid spacer strip **33**, illustrated in detail in Fig. 5. The side edges of the spacer strip **33** are flared and curvated to form a bead-receiving groove **34** along each side edge of the strip.

When assembled, the band **29** extends continuously around the four sides of the two panes **27** and **28** and is stretched to flex it around the corners of the panes in sealing relation thereto. The two extremities of the surrounding band are vulcanized or cemented together to form a continuous, endless, hermetically sealing strip. The spacer strips **33** rigidly retain the pairs of beads and the panes **27** and **28** in accurate spaced relation. The two panes **27** and **28** with the spacer strips **33** and the surrounding band **29** form a complete integral unit which can be removed from or installed in the sash as a unitary pane assembly.

The pane assembly is retained in place in the sash by means of a removable molding strip **35**, illustrated in Fig. 6, formed with a continuous arcuate bead channel **36** along one of its edges, and perforated at spaced intervals, as shown at **37**, to receive suitable self-threading retaining screws **38**.

The pane assembly is installed in the sash frame by sliding the two panes and their surrounding sealing band **29**, with the enclosed spacer strips **33**, into the enclosure of the sash portions **18** of the sash. The molding strip

35 is then placed in position and secured by means of the self-threading metal screws 38 which will extend through the perforations 37 into the screw-receiving channel 21 and form retaining threads in the walls of the latter. As the molding strip is brought to its final position, it will force the outer bead of the pair of beads 31 against the pane 28, the pane 28 against the inner bead of the pair of beads 31, the inner bead 31 against the spacer strip 33, the spacer strip against the inner bead of the pair of beads 30, the inner bead of the pair of beads 30 against the pane 27, and the pane 27 against the outer bead of the pair of beads 30, and the outer bead of the pair of beads 30 against and into the fixed molding strip 25 to provide a hermetically sealed enclosure between the two panes and to securely and resiliently retain the panes in place.

A suitable lock shaft 39 extends through the inner wall flange 13 of the window frame. The lock shaft 39 is provided with a locking cam 40 at its inner extremity which can be turned to engage the molding strip 35 by means of a suitable handle 41 to lock the sash frame closed.

It will be noted that when locked closed, a double seal is provided around the sash frame: first, a contact seal between the molding strip 35 and the inner flange 13; and a second air-tight seal between the resilient weatherstrip 24 and the inner edge or corner of the outer wall flange 12.

It is desired to call attention to the fact that there is a very small thickness of metal to conduct heat through the window frame and through the sash frame since the frame portions 14 and the sash portions 18 are relatively thin. Thus, condensation on the metal portions is materially reduced.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied, within the scope of the appended claim, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

A double pane window sash comprising: a rectangular rigid frame; a fixed arcuate molding strip extending inwardly from and about one face of said frame; a pair of similar glass panes; a resilient band completely surrounding said pair of panes; two pairs of longitudinally extending, spaced outer and inner resilient beads formed on said band, each pair of beads engaging the outer and inner edges of one of said panes, said band being positioned within said frame with the outer bead of one of said pairs bearing against said fixed molding strip; a spacing strip positioned between the inner beads of the two pairs of beads about the peripheries of said panes, said spacing strip having a bead-receiving groove along each of its side edges in which the inner beads are received; a removable molding strip having a bead-receiving groove engaging the outer bead of the other pair of beads; and means for drawing said removable molding strip toward the opposite side of said frame so that said latter strip will compress all of said beads against their respective panes to provide a hermetic seal thereto.

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