Dec. 17, 1957 K. A. DOMINO 2,816,332

PIVOTED WINDOW MOUNTING

Filed March 13, 1953 2 Sheets-Sheet 1

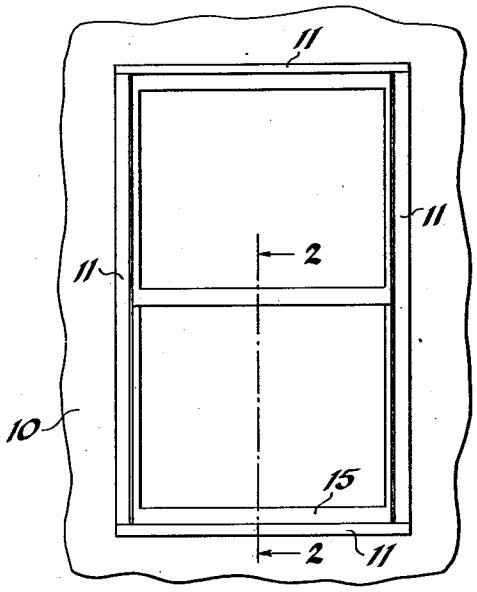


Fig. 1

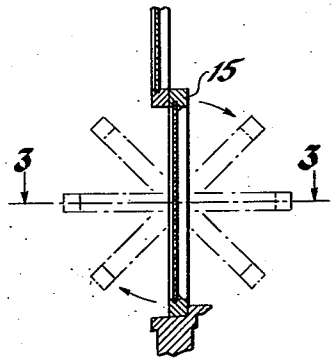


Fig. 2

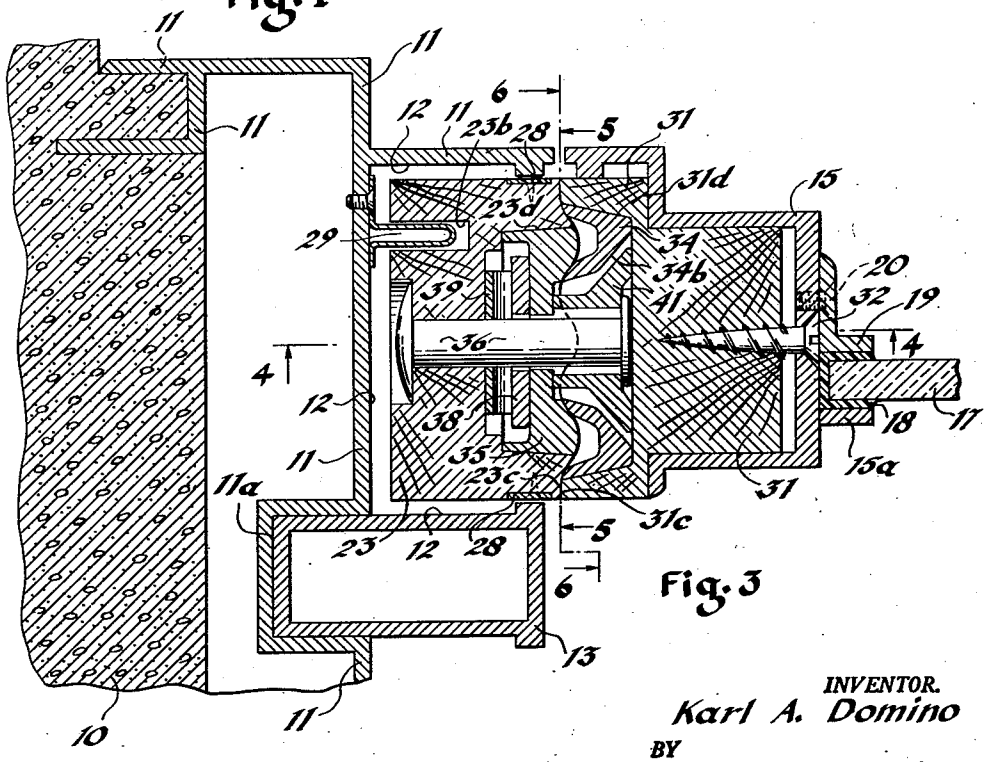


Fig. 3

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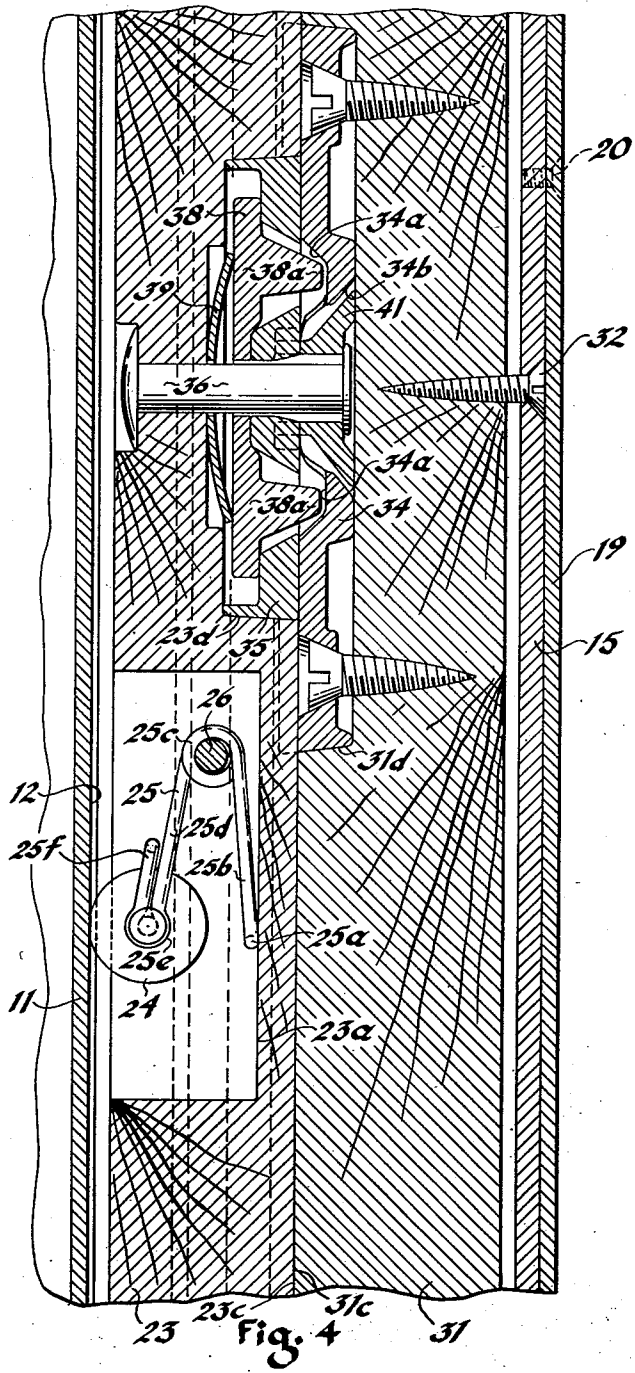


Fig. 4

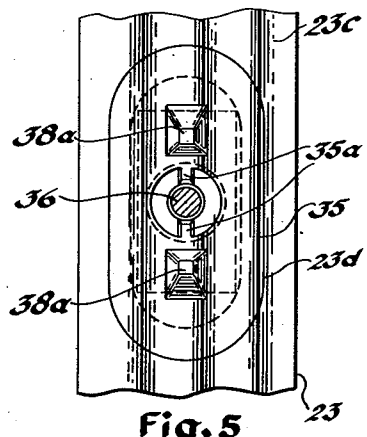


Fig. 5

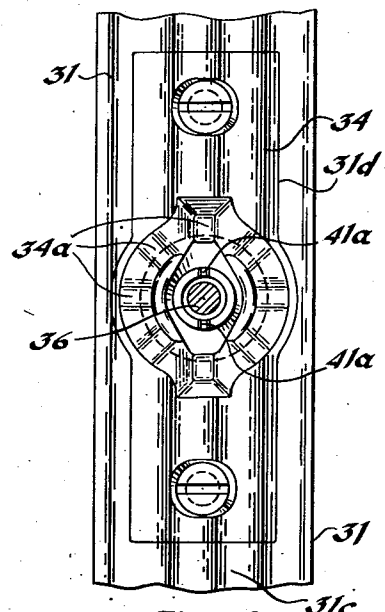


Fig. 6

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PIVOTED WINDOW MOUNTING

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4 Claims. (Cl. 20—49)

This invention relates to improvements in a window mounting and more particularly to a horizontally pivoted window mounting.

An object of the present invention is to provide a window mounting having structural simplicity, being economical to manufacture, being easy to assemble, being of strong and sturdy nature, having operating efficiency, and having a long wear life.

Other features of this invention reside in the arrangement and design of the parts for carrying out their appropriate functions.

Other objects and advantages of this invention will be apparent from the accompanying drawings and description and the essential features will be set forth in the appended claims.

In the drawings,

Fig. 1 is an outside view of a window frame mounted in a building wall and having two window sashes therein;

Fig. 2 is a vertical sectional view, taken along the line 2—2 of Fig. 1, showing the horizontally pivotal action of the lower window sash about its transverse axis in the different dot-dash and solid line positions;

Fig. 3 is an enlarged horizontal sectional view through one side of the window sash and window frame taken along line 3—3 in the solid line position of Fig. 2;

Fig. 4 is a vertical sectional view through the window frame and window sash taken along the line 4—4 of Fig. 3;

Fig. 5 is a vertical view along the line 5—5 of Fig. 3 looking toward the window mounting strip member but with the window sash and sash strip removed; while

Fig. 6 is a vertical view taken along the line 6—6 of Fig. 3 along the same line as Fig. 5 but looking in the opposite direction toward the window sash and sash strip.

Before the window mounting here illustrated is specifically described, it is to be understood that the invention here involved is not limited to the structural details or arrangement of parts here shown since window mountings embodying the present invention may take various forms. It also is to be understood that the phraseology or terminology herein employed is for purposes of description and not of limitation since the scope of the present invention is denoted by the appended claims.

Those familiar with this art will recognize that this invention may be applied in many ways, but it has been chosen to illustrate the same in connection with a window sash pivotally mounted on a horizontal axis in a window frame. This invention is especially intended for use when both the window sash and window frame are made of metal for long life and durability. The window sash is not only horizontally pivoted but also can travel vertically within the window frame. This structure permits the window pane in the window sash to be washed on both sides and permits the window sash to be swung around to an approximately horizontal position so as to provide minimum obstruction to the ventilating air entering and leaving the building through the open window.

A metal window frame **11** in Figs. 1 and 3 is secured to the masonry or wooden structure **10** of a building with generally U-shaped grooves **12** parallel to and facing each other in the opposite inner vertical walls of the window frame. Each groove **12** is formed by a removable member **13**, removably held in a channel **11***a* of frame **11** for assembly and disassembly, coacting with the balance of the window frame **11** to form a U-shaped groove, shown as opening toward the right in Fig. 3.

A metal window sash as located within the window frame **11** with this sash being shown at **15** and being preferably made of aluminum or other light-weight material so that the window can be easily pivoted about its horizontal transverse axis. A glass window pane **17** in Fig. 3 is secured thereto in a U-shaped channel within a channel strip **18** of plastic, putty, felt, or any other satisfactory material. The opposite side walls of the U-shaped channel are formed by a projection **15***a* formed integral with the metal window sash and by an L-shaped member removably secured to the sash **15** by screws **20** to serve as a removable side wall of the U-shaped channel during assembly or removal of the glass window panes **17**.

The movement of the lower metal window sash **15** in Figs. 1 and 2 will be first briefly considered. The window sash can slide vertically in the facing U-shaped grooves **12** for raising and lowering the window sash, and the window sash **15** can also be pivoted about its horizontal transverse axis, as shown in Fig. 2. These types of movement are made possible by means located between the window sash and the window frame grooves **12** on opposite sides of the window sash **15** for slidably and pivotally mounting this sash in the frame. Since both of these means are identical, only one will be described.

A window mounting wooden strip member **23** in Figs. 3, 4 and 5 is slidably mounted in its associated U-shaped groove **12** for vertical longitudinal travel. This window mounting strip member **23** is secured to the window sash **15**, in a manner to be brought out in more detail later, so that the window sash can be raised and lowered in the window frame **11**. Spring pressed rolling means is carried by the window mounting strip member **23** rollingly urged against a portion of the U-shaped groove **12** in Fig. 4 remote from the window sash **15**. This means takes the form of two or more rollers **24** with each similarly mounted in recessed portions **23***a* above and below the vertical center of the strip member **23**. Only one is shown in Fig. 4 but all are identical. A one-piece wire spring **25** is bent into proper form from one end **25***a* extending into a length **25***b*, a coil **25***c* around a pin **26** fixed to the member **23** but bridging across the recessed portion **23***a*, a straight portion **25***d*, a loop **25***e* around one end of the axle of roller **24**, and a bail **25***f* over to the other side of the roller **24** to form a similar and symmetrical structure on the other side of the roller with its end terminating at the first end **25***a*. It should be readily apparent that this spring **25** normally biases the roller **24** to the left in Fig. 4 against the bottom of the U-shaped groove **12** since the spring ends **25***a* bear against the bottom of the recessed portion **23***a*.

A sash cord, chain, or sash balance tape can be secured to the corresponding pin **26** at the upper end of the window mounting strip member **23** with a groove formed in the left surface of window mounting strip member **23** in Fig. 4 connecting the recessed portion **23***a* and the upper edge of the window mounting strip member **23** to provide a passageway for the sash cord, chain, or sash balance tape.

Metal wear strips **28**, **28** are countersunk into opposite sides of the window mounting strip member **23** in Fig. 3 to provide metal to metal contact with the metal window

frame **11** to reduce the wear on the wooden strip member **23** even though it is made of hard maple.

A metal or other type weather strip **29** in Fig. 3 is secured to the U-shaped groove or slot **12** of the window frame **11** to provide a weather seal while sliding in the vertical groove or rabbet **23***b* formed in the window mounting strip member **23**.

The window sash **15** is also mounted for pivoting about a horizontal transverse axis in the manner shown in Fig. 2. The structure providing this pivoting includes a wooden sash strip **31** secured to the metal window sash **15** by a plurality of spaced screws **32** in Figs. 3 and 4. The window mounting wooden strip member **23** and the wooden sash strip **31** have sealing, contiguous or abutting faces **23***c* and **31***c*, respectively, between them, as shown in Figs. 3, 4, 5 and 6. These sealing faces have mating, corrugated or rippled faces with the elements forming the corrugations being vertical lines. A bearing plate **34**, secured by screws to the wooden sash strip **31** in Figs. 3, 4 and 6, is countersunk into a recess **31***d* into the sealing face **31***c*. A housing plate **35** in Figs. 3, 4 and 5 is countersunk into a recess **23***d* in the sealing face **23***c* of the window mounting wooden strip member **23**. It should be noted that the surfaces of both the bearing plate **34** and housing plate **35**, where flush respectively with sealing faces **31***c* and **23***c*, are correspondingly corrugated to nest with the strips and with each other in a corresponding fashion. A pivot pin **36** extends through aligned holes in bearing plate **34**, housing plate **35**, and the window mounting strip member **23** in Figs. 3 and 4 to secure the first two mentioned members to the strip member **23**. This pin **36** has heads at opposite ends to limit the relative separation of the parts on the pin for a reason to be brought out in more detail hereinafter. It should now be apparent that when the window sash is in the solid line position in Fig. 2, the corrugations on sealing faces **23***c* and **31***c* nest together; when the window sash **15** is rotated to one of the dot-dash line positions in Fig. 2, the ridges of the corrugations are forced out of the grooves and bear against the crests of the opposing ridges to thus separate the sealing faces **23***c* and **31***c* to the depth of the corrugation. The reason for the corrugations will be gone into more in detail later.

Stop means are provided for stopping the swing of window sash **15** in any dot-dash line or the solid line position in Fig. 2. This takes the form of a dogged plate **38** in Figs. 3 and 4 telescoped over pin **36** with this pin extending through a central hole in the dogged plate **38**. This dogged plate is located between the housing plate **35** and the bottom of the recess **23***d* in the window mounting strip member **23**. A leap spring **39** with a hole through its middle, telescoping over the pin **36** in Figs. 3 and 4, resiliently urges the dogged plate **38** to the right in Figs. 3 and 4 toward the bearing plate **34**. The dogged plate **38** has dogging means, consisting of two spaced dogs **38***a*, **38***a*, projecting through aligned holes in the housing plate **35** into dogging contact with stop portions or detents **34***a* in Figs. 4 and 6 on the bearing plate **34**. These detents **34***a* are approximately uniformly arcuately spaced around a circle having a diameter approximately equal to the distance between dogs **38***a*, **38***a*. It should be readily apparent that the dogs, under the bias of the spring **39** will normally seat into diametrically aligned detents **34***a* but that, rotation of the window sash **15** will force the lugs out of this space by the camming action between the dogs **38***a* and the sides of detents **34***a* against the bias of spring **39** so that the window sash **15** can be readily rotated from one position to the other in Fig. 2 although it will stay located in any given position until a substantial turning force is exerted.

It should also be noted that the resilient bias on springs **25** and **39** will tend to resiliently urge the corrugated sealing faces **23***c* and **31***c* into frictional contact so that the window sash **15** will not turn freely even in an intermediate position but will tend to maintain its given position. However, it should be readily apparent that a smaller turning force will move the window sash **15** out of an intermediate position than that required to move it out of one of the dot-dash line or solid line positions in Fig. 2 wherein the dogs **38***a* and stop detents **34***a* coact together.

A sealing action exists between the abutting sealing faces **23***c* and **31***c*. The interlocked mating corrugations on the sealing faces, when they are pulled laterally together, provide a sealing action. Structure is provided for moving the window mounting wooden strip member **23** in Fig. 3 and its counterpart on the opposite side of the window sash **15** toward each other in their respective U-shaped grooves **12** into sealing engagement. The four or more rollers **24** spring-biased by their associated springs **25** not only cause a lateral movement to provide a sealing action but also make easier the lowering and raising of the window sash **15** in the frame **11**.

Other structure also helps pull the sealing faces of the strip laterally toward each other to provide sealing. A member **41**, having an outer tapered annular surface, has a hole therethrough telescoped over the pivot pin **36** in Figs. 3 and 4 and fitting into a socket **34***b* in the form of a frustum of a cone with its socket located in the bearing plate **34**. It should be noted that there is a key-way **41***a* extending diametrically across member **41** in Fig. 6. This key-way coincides with and drivingly engages a key **35***a* extending diametrically across the housing plate **35** so that no relative rotational movement takes place between the housing plate **35** and the annular member **41**. This structure combined with the headed pivot pin **36** will at all times draw and hold together the strips **23** and **31** with the sealing faces **23***c* and **31***c* abutting in sealing contact, since the heads on opposite ends of pin **36** limit the relative separation of the parts. The strips will be caused to move laterally together when the weight of the window sash **15** or the strip **23** causes relative vertical, longitudinal, or lengthwise movement of the strips **23** and **31** in Fig. 4 so that the conical or tapered surfaces will coact like a cam to pull the strips together.

It should be noted that there is a small space between the tapered annular member **41** and the socket **34***b* in Fig. 4 so that the ridges of the corrugations can readily abut against each other when the window is turned to one of the dot-dash line positions in Fig. 2. But when the window sash **15** is in the solid line position in Fig. 2 with the corrugations mated together, the weight of the window sash **15** and its glass pane **17** acts through the tapered or conical surfaces to crowd or wedge strips **23** and **31** together. However, when the window sash is turned to one of the intermediate dot-dash line positions, in Fig. 2, the full bearing surface of the tapered annular member **41** and the cone shape socket **34***b* coact together to provide a full bearing surface for ease of operation. Even in an intermediate position between any two adjacent positions shown in Fig. 2, the weight of the window sash **15** continues to be carried on the tapered and cone shape surfaces so that the strips **23** and **31** continue to be drawn laterally together to cause a binding friction between the ridges of the corrugations which acts to hold the window sash **15** in any given position of rotation. Then, when the window sash is brought around to the solid line position in Fig. 2, the mating corrugations are drawn together and held tightly by this same structure.

Although the window frame **11** and the window sash **15** are made of metal, the window mounting strip member **23** and the sash strip **31** are made of hard maple wood. Sash **15** is preferably made of aluminum for lightness and easy manipulation. If metal were used throughout, it would have to be oil lubricated with this oil drying and tending to gum so as to prevent satisfactory window operation. The corrugated wood sealing faces **23***c* and **31***c* are much more satisfactory and will readily slip relative to each other after wax or grease has been applied thereto since the wax or grease soon permeates the wood and becomes a part of it to provide

a long life of satisfactory operation. Although this metal and wood combination has been the best, it should be understood that other satisfactory material combinations might be used.

It should be noted in Fig. 3 that the window frame **11** and the window sash **15**, being made of metal, are designed to protect the wood strips **23** and **31** against the deteriorating effect of the weather. The weather exposed side of this window is the upper edge of the Fig. 3 structure. It should be noted that window frame **11** and the window sash **15** substantially meet at the upper end of section lines 5—5 and 6—6. Very little of the wood strips **23** and **31** is exposed to the weather. It should be noted that the upper wear strip **28** coacts with the upper side wall of the U-shaped groove and that the metal window sash **15** has a downwardly projecting wall near this exposed portion to limit exposure to a minimum. Also, the L-shaped member **19**, used in holding the glass window pane **17** in place, covers and protects from the weather the head of wood screw **32** connecting the window sash **15** and the sash strip **31**.

It should now be apparent that this invention relates to a window mounting wherein the window sash **15** is horizontally pivoted on window mounting strip members **23** about its transverse axis for rotation about coaxial pivot pins **36**, **36** located on opposite sides of the sash **15** with strip members **23** adapted to be moved laterally inwardly to provide sealing action and to travel longitudinally or vertically in the opposite U-shaped grooves **12** of the window frame **11**. The window sash **15** can be readily pivoted about a horizontal transverse axis to any of the positions shown in Fig. 2 or any intermediate position therebetween or completely pivoted to substantially close the window opening so that the glass window pane **17** can be washed on both sides and so that the window can be opened to provide proper ventilation.

Although only lower sash **15** in Figs. 1 and 2 has been described, it should be readily understood that the same structure can be used in the upper sash.

Various changes in details and arrangement of parts can be made by one skilled in the art without departing from the spirit of this invention or the scope of the appended claims.

What I claim is:

1. In a horizontally pivoted window mounting, comprising a window sash, and means located on opposite sides of said sash for pivotally mounting said sash to a window mounting strip member, said means on one side comprising a sash strip secured to the outer edge of said sash, said sash strip and strip member having mating sealing contiguous faces between them, a bearing plate secured to and countersunk into the sealing face of one of said strips, a housing plate countersunk into the sealing face of said other strip, a pivot pin extending through aligned holes in said bearing plate and housing plate and said other strip, said pin having heads at opposite ends, and a dogged plate surrounding said pin and located between said housing plate and other strip, said dogged plate being resiliently urged toward said bearing plate with dogging means projecting through said housing plate into dogging contact with stop portions on said bearing plate.

2. In a horizontally pivoted window mounting comprising a window sash, and means located on opposite sides of said sash for pivotally mounted said sash to a window mounting strip member, said means on one side comprising a sash strip secured to the outer edge of said sash, said sash strip and strip member having mating

corrugated sealing contiguous faces between them, a bearing plate secured to and countersunk into the sealing face of one of said strips, a housing plate countersunk into the sealing face of said other strip, a pivot pin extending through aligned holes in said bearing plate and housing plate and said other strip, said pin having heads at opposite ends, a tapered annular member surrounding said pin in a frustum of a cone shape socket in said bearing plate so that the sealing faces are drawn tightly together by lateral movement of said strips upon weight actuated relative lengthwise movement of said strips, and a dogged plate surrounding said pin and located between said housing plate and other strip, said dogged plate being resiliently urged toward said bearing plate with dogging means projecting through said housing plate into dogging contact with stop portions on said bearing plate.

3. A window mounting for a window frame having parallel U-shaped grooves facing each other in opposite inner walls, comprising a window sash located within said window frame, and means located between said sash and said frame grooves on opposite sides of said sash for slidably and pivotally mounting said sash in said frame; said means on one side comprising a window mounting strip member slidably mounted in its associated U-shaped groove, a sash strip secured to the outer edge of said sash, said sash strip and strip member having mating corrugated sealing contiguous faces between them, spring pressed rolling means carried by said window mounting strip member rollingly urged against the portion of said groove remote from said window sash to urge said sealing faces together, a bearing plate secured to and countersunk into the sealing face of one of said strips, a housing plate countersunk into the sealing face of said other strip, a pivot pin extending through aligned holes in said bearing plate and housing plate and said other strip, said pin having heads at opposite ends, a tapered annular member surrounding said pin in a frustum of a cone shape socket in said bearing plate so that the sealing faces are drawn tightly together by lateral movement of said strips upon weight actuated relative movement of said strips, and a dogged plate surrounding said pin and located between said housing plate and other strip, said dogged plate being resiliently urged toward said bearing plate with dogging means projecting through said housing plate into dogging contact with stop portions on said bearing plate.

4. In a horizontally pivoted window mounting, as set forth in claim 1, wherein said sash strip and strip member are wooden, and wherein said frame and sash are metal and substantially meet on the weather exposed side in window closed position to protect said wood.

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