Dec. 12, 1950 J. G. SULLIVAN ET AL 2,533,847

WEATHER STRIP INSTALLATION FOR WINDOWS

Filed May 3, 1948 2 Sheets-Sheet 1

FIG. 1

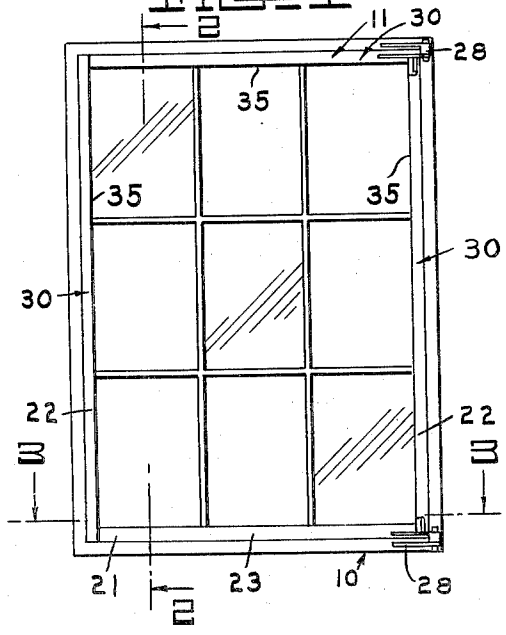


FIG. 2

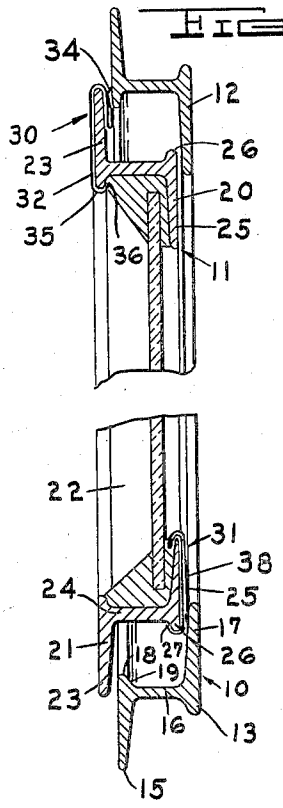


FIG. 6

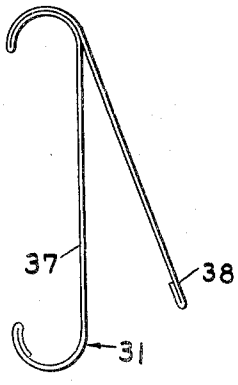
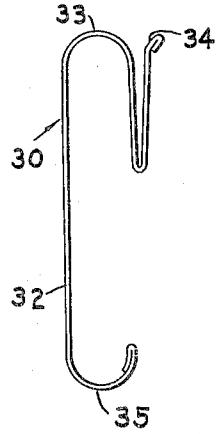


FIG. 7



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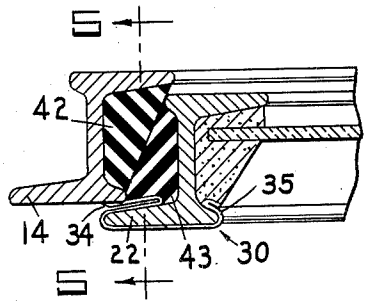
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FIG. 3



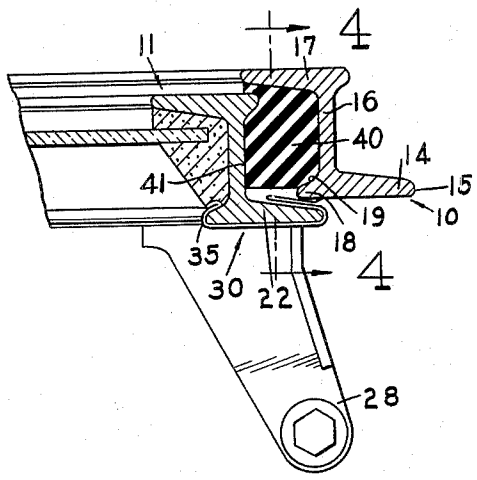


FIG. 5

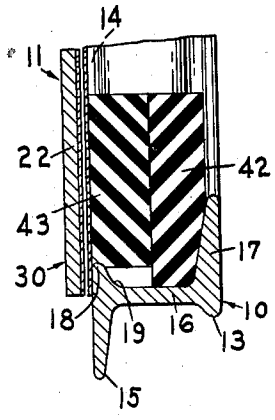
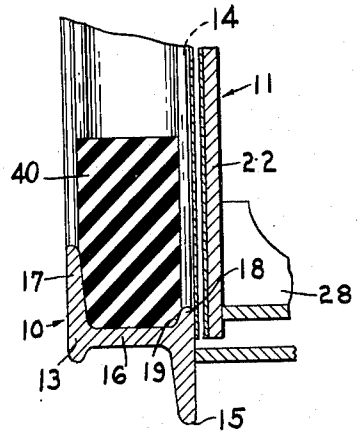


FIG. 4



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WEATHER STRIP INSTALLATION FOR WINDOWS

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2 Claims. (Cl. 189—65)

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This invention relates generally to window constructions having a swinging type sash and having weather sealing means for the sash.

It has been the practice to weather seal casement windows by supporting weather strips of suitable design on the top, bottom and side bars of the swinging sash frame in such positions that portions of the strips respectively engage corresponding bars of the main frame when the sash is swung to its closed position relative to the main frame. Although weather stripping of various different designs has been used, nevertheless, it has been the practice to apply the strips to the outer sides of the top, bottom and side bars of the sash frame. Over extended periods of use the above practice has proved troublesome, because moisture accumulates in the weather strip applied to the bottom bar of the sash frame and soon causes rusting of the bottom bar.

With the above in view, it is one of the features of this invention to overcome the above objection by installing the weather strip at the bottom of the sash on the inner face of the bottom bar of the sash frame, where it is protected from the weather, and, at the same time, performs its weather sealing function at least as well as when installed on the outer face of the bottom sash frame bar. Moreover by installing the weather strip on the inner face of the bottom sash bar, interference with the usual sash hinge is avoided, and it is not necessary to slot or otherwise fashion the strip to provide clearance for the hinge.

In many steel or metal casement windows the bars making up both the main and sash frames are generally Z-shaped in cross section. These bars are located with the flanges of the Z in parallel vertical planes, and in the closed position of the sash a space is provided around the sash frame between the web portions of the adjacent Z-shaped bars of both frames. Thus weather escaping through the joint between the adjacent bottom bars of the frames at the outer side of the window may pass upwardly through the spaces between adjacent side bars of the frames, and it is a further feature of this invention to close or seal opposite ends of the space between the bottom frame bars in the closed position of the sash frame.

The foregoing as well as other objects will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings, wherein:

Figure 1 is an elevational view of a typical casement window embodying weather sealing means forming the subject matter of this invention;

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Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a sectional view taken on the line 5—5 of Figure 3;

Figure 6 is an enlarged sectional view of one of the weather strips employed to weather seal the casement window shown in Figure 1; and

Figure 7 is a similar view showing another weather strip employed in the casement window.

It will be understood as this description proceeds that the weather sealing means forming the subject matter of this invention is not restricted for use in connection with any specific type of casement window. However, for the purpose of illustration, we have shown our improved weather sealing means as applied to a metal casement window of the type used extensively in the trade.

Briefly the casement window selected herein for the purpose of illustration comprises a main or fixed frame 10 adapted to be installed within a suitable window opening and a sash frame 11 adapted to assume a position within the main frame 10. The main frame 10 comprises top, bottom and side bars 12, 13 and 14 respectively. These bars are generally Z-shaped in cross section, and are permanently secured together with the flange portions thereof lying in laterally spaced planes substantially parallel to the plane of the window opening.

As shown particularly in Figures 2 and 3 of the drawings, the arrangement is such that the laterally outer flange 15 on the main frame bars extends outwardly with respect to the window opening from the web 16 of the main frame bars. The laterally inner flange 17 of the main frame bars extends inwardly with respect to the window opening from the web 16 of the frame bars. It will further be noted from Figures 2 and 3 of the drawings that the laterally outer ends of the webs 16 are formed with projections 18 which extend inwardly with respect to the window opening for a limited distance and provide shoulders 19.

The sash frame 11 is also composed of top, bottom and side frame bars 20, 21 and 22 respectively. The sash frame bars are also substantially Z-shaped in cross section and are permanently secured together with the flanges thereof disposed in planes substantially parallel

to the plane of the sash frame. It will be noted from the drawings that the laterally outer flange 23 on the sash frame bars project outwardly from the web portions 24 of the bars, and the laterally inner flanges 25 project inwardly from the web portions 24. It will further be noted that the web portions 24 are formed with outwardly extending projections 26 at the laterally inner side of the sash frame to provide shoulders 27 which are similar to the shoulders 19 described above in connection with the main frame.

The above construction is such that when the sash frame is in its closed position with respect to the main frame, the web portions 24 on the sash frame are spaced laterally inwardly from the corresponding web portions 16 on the main frame. It will further be noted that the inner surfaces of the flanges 23 on the sash frame are adapted to abut the outer surfaces of the flanges 15 on the main frame and the inner surfaces of the flanges 25 on the sash frame are adapted to abut the outer surfaces of the inner flanges 17 on the main frame. In accordance with conventional practice, one side of the sash frame is connected to the corresponding side of the main frame by hinges 28. These hinges are arranged to enable outward swinging movement of the sash frame with respect to the main frame and may be of any suitable design.

In order to weather seal the casement window briefly described above, the two types of weather strips shown in Figure 6 and 7 of the drawings are provided. The specific design of the weather strips forms no part of the present invention, and may be varied considerably without departing from the spirit and scope of this invention. The strips shown for the purpose of illustration may be formed of spring bronze, or any other metal having the requisite characteristics. The strip shown in Figure 7 of the drawings is designated generally by the numeral 30, and is applied to the outer flange 23 of the top and side bars on the sash frame 11. The strip shown in Figure 6 is designated generally by the numeral 31, and is installed on the inner flange 25 of the bottom bar on the sash frame.

The weather strip 30 actually comprises three parts respectively attached to the outer flanges 23 on the top and side bars of the sash frame. All of the parts are substantially the same in construction with the exception that the part of the strip 30 on the top bar 20 of the sash frame and the part of the strip extending along the side bar at the hinged side of the sash frame are cut away to provide clearance for portions of the hinges 28. In detail the weather strip 30 comprises a substantially flat portion 32 corresponding substantially in width to the width of the adjacent flange 23 and adapted to extend over the outer face of the latter flange. The outer edge of the flat portion 32 is fashioned to form a channel 33 of a dimension to receive the outer edge of the flange 23, and the inner leg of the channel is return bent to provide a resilient tongue 34 which intimately contacts the adjacent surface of the flange 15 on the main frame to provide a weather-tight seal. The inner edge of the flat portion 32 is curved inwardly as at 35 in a manner to have a "snap-on" engagement with a shoulder 36 formed on the sash frame. Thus when the sash frame is in its closed position in the main frame, a fluid-tight seal is provided around the top and opposite sides of the sash frame.

The weather strip 31 extends for substantially the full length of the inner flange 25 on the bottom bar 21 of the sash frame and need not be slotted to accommodate any part of the hinge. The strip comprises a substantially flat portion 37 having a width approximating the width of the flange 25 on the bottom bar 21, and adapted to extend over the inner face of the flange 25 on the bottom bar 21. The outer edge of the flat portion 37 is curved laterally outwardly to have a "snap-on" connection with the projection 26 and shoulder 27 formed on the bottom bar 21. The inner edge of the flat portion 37 is similarly curved outwardly to have a "snap-on" connection with the inner edge of the flange 25 on the bottom bar 21 of the sash frame. The curved portion at the inner edge of the strip 31 is return bent in the manner shown in Figure 6 of the drawings to provide an inwardly extending resilient part 38 which is adapted to assume a position between the portion 37 of the strip and the adjacent surface of the flange 17 on the main frame to provide a weather seal at the bottom of the sash frame when the latter is swung to its fully closed position with respect to the main frame. Inasmuch as the strip 31 is installed on the inner flange 25 of the bottom bar 21 on the sash frame, it follows that the strip 31 is protected from the weather, and any tendency for the bar 21 to rust as a result of moisture accumulation between the same and the strip 31 is reduced to the minimum.

It will be understood from the foregoing that no provision is made in the form of a sealing strip at the outer side of the bottom bar 21 on the sash frame. Thus there is a possibility of outside air escaping into the space existing between the web portions 16 and 24 on the main frame and sash frame, respectively. This air could conceivably pass upwardly between the adjacent web portions of the frames at opposite sides of the latter and escape into the room or other enclosure. In order to avoid such a possibility, provision is made herein for closing opposite ends of the space provided between the webs 16 and 24 on the bottom bars of both frames. In detail the foregoing is accomplished at the hinged side of the sash frame by a block 40 of a resilient material, such for example, as felt, rubber or rubber composition. The block 40 is seated at its lower end on the web 16 of the bottom bar 13 on the main frame and extends upwardly within the adjacent side bar 14 of the main frame. It will be noted from Figure 3 of the drawings that the block 40 is positioned at the inner side of the main frame by the adjacent inner flange 17 on the main frame and by the shoulder 19 formed by the projection 18 on the main frame. In order to avoid any possibility of displacement of the block 40, the latter is preferably cemented or otherwise secured in position. The laterally inner face 41 of the block 40 is substantially flat for engagement with the adjacent side bar 22 of the sash frame when the latter is swung to its closed position. The cross sectional area of the block 40 is such that the block is placed under compression by the adjacent side bar 22 on the sash frame to insure an air-tight seal at the adjacent end of the space provided between the bottom bars of the sash and main frames.

The opposite end of the space between the bottom bars of the two frames is closed by a pair of resilient blocks 42 and 43. The block 42 is seated at its lower end on the bottom frame bar 13 and extends upwardly along the adjacent side bar 14 of the main frame. The block 43

is supported on the side bar 22 of the sash frame at the swinging edge of the latter in a position to register with the block 42. The two blocks are preferably cemented or otherwise permanently secured in place and have the mating faces inclined at an angle to effectively contact with one another when the sash frame is swung to its closed position with respect to the main frame. Thus it will be noted that opposite ends of the space existing between the bottom bars of the sash and main frames are effectively sealed or closed, so that any outside air escaping into the space is prevented from passing into the room by the cooperation of the resilient blocks and the weather strip 31.

What we claim as our invention is:

1. A window construction comprising a main frame having a web defining an opening and having flanges extending in opposite directions from the inner and outer edges of the web, a sash frame positioned within the main frame and having one side edge hingedly connected to the adjacent side edge of the main frame for swinging movement, said sash having a web spaced laterally inwardly from the web of the main frame and having a flange extending laterally outwardly from the outer edge of the web and engageable with the outer side of the main frame, a flange extending laterally inwardly from the inner edge of the sash frame web and engageable with the outer side of the inner flange on the main frame, weather strips supported on the outer flanges of the top and side bars of the sash frame and having portions respectively engageable with the outer surfaces of the corresponding bars of the main frame, a weather strip supported on the inner flange of the bottom sash bar and having a portion engageable with the adjacent face of the inner flange on the bottom bar of the main frame, a resilient block supported in the main frame at the lower end of the main frame side bar adjacent the hinged side of the sash frame and engageable with the corresponding side bar of the sash frame in the closed position of the latter to close the adjacent end of the space existing between the web portions of the bottom bars of the sash and main frames, a resilient block supported in the main frame at the lower end of the main frame side bar adjacent the swinging side of the sash frame and having an inclined face, and a resilient block supported on the lower

end of the side bar at the swinging side of the sash frame and having an inclined face engageable with the inclined face of the adjacent block on the main frame in the closed position of the sash frame to close the other end of the space aforesaid between the web portions of the bottom bars of the sash and main frames.

2. A window construction comprising a main frame, a sash frame having the top, bottom and side bars spaced laterally inwardly from the corresponding bars of the main frame, means hingedly connecting one side bar of the sash frame to an adjacent side bar of the main frame, weather sealing strips supported on the top and side bars of the sash frame at the outer sides of the latter bars and engageable with the corresponding bars of the sash frame, a weather strip supported on the bottom bar of the sash frame at the inner side of the latter and engageable with the adjacent surface of the bottom frame bar, a resilient block supported in the main frame at the lower end of the main frame side bar adjacent the hinged side of the sash and engageable with the corresponding side bar of the sash frame in the closed position of the latter to close the adjacent end of the space existing between the bottom bars of the frames, a resilient block supported in the main frame at the lower end of the main frame side bar adjacent the swinging edge of the sash frame and having an inclined face, and a resilient block supported on the lower end of the side bar at the swinging edge of the sash frame and having an inclined face engageable with the inclined face on the resilient block aforesaid in the closed position of the sash frame to close the other end of the space provided between the bottom bars of said frames.

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