This invention relates to an improved scupper arrangement particularly suitable for metallic windows. In metallic windows of the horizontal sliding sash type such as shown in U.S. Patent 2,733,487 and of other types it is necessary to provide weep holes to permit the moisture to drain from the sill channels. A problem that the industry has sought to solve for a long time is how to provide a weep hole that will permit a continuous drainage regardless of wind pressure and yet will not permit the moisture to be blown back into the room.

Many attempts in this direction have been made by workers in the industry but these have met with indifferent success; to make the weep holes small enough to resist the tendency of a back flow of the moisture under wind pressure and yet large enough for satisfactory drainage has posed a problem that has not been completely solved.

The present invention, however, solves these problems and results in an improved scupper arrangement that is able continuously to drain the moisture from the sill even against great wind pressure but yet prevents the backing up of the moisture in the sill and possible overflowing into the room.

In accordance with the present invention there is provided in the sill of a window a relatively large weep hole opening which is covered by an outside flap. This flap freely swings over the weep hole to cover it against outside air blowing in but yet, while covering the weep hole, permits water to drain out from the sill even against great wind pressure.

A better understanding of the invention together with a fuller appreciation of its many advantages will best be gained from the following description given in connection with the accompanying drawings wherein:

Figure 1 is a face view of a portion of a window sill fitted with a scupper arrangement according to the invention;

Figure 2 is a cross-sectional view taken as indicated by lines 2—2 in Figure 1;

Figure 3 is an enlarged cross-section of the scupper flap taken as indicated by lines 3—3 in Figure 1;

Figure 4 is an exploded perspective view, somewhat enlarged, of the scupper flap and its mounting hinge plate; and

Figure 5 is a bottom view of the flap taken as indicated by lines 5—5 in Figure 2.

With reference particularly to Figures 1 and 2, there is shown a channeled window sill 12 which may be horizontally mounted on the lower edge of a window opening in a building (not shown). Hinged along a vertical line and mounted above the sill is a sash frame 14, which, as seen in Figure 2, is adapted to be swung outward, i.e., away from the sill when the window is opened. When the window is closed, frame 14 fits snugly against the sill as shown.

Sill 12, which is hollow, is provided with one or more large weep holes 16 through which water and the like can drain to the outside. Each weep hole is positioned low enough on the sill through its vertical wall 18 so that the lower wall 20 of the sill is as high as or higher than the lower edge of the weep hole. To promote the flow of water over the front edge of wall 20, it is chamfered at 21 along a generally 45° angle. Mounted on the outside of wall 18 in front of each weep hole is a thin generally but not entirely flat flap 22 which is free to swing open, as indicated by the dotted lines in Figure 3, or closed as shown by the solid lines in Figure 3 and in Figure 2. Flap 22, as seen in Figure 4, is suspended from its top edge by two horizontal tongues 24 integral with the flap and engaged very loosely in the two open ends 26 of an upwardly curved lip 28 of the plate 30. Lip 28, as seen in Figure 3 has a relatively wide flat inside surface 31 from which flap 22 hangs and by virtue of which the flap is urged flush against plate 30. When the flap is swung out to the dotted line position indicated, the square shouldered under faces of tongues 24 move outward along the inside surface 31 against the upwardly curved portion of lip 28. This increases the tendency of the flap to swing flush against plate 30 and permits easy opening and closing of the flap.

Plate 30, shown separately in Figure 4 has a large center opening 32 which, when the plate is secured in place on sill wall 18 as seen in Figures 2 and 3, is contiguous and generally coextensive with weep hole 16. Just above tongues 24 on flap 22 are two outwardly bent ears 34 which by coming against plate 30 limit the outward swinging of the flap to the dotted line position indicated in Figure 3.

Because of the loose engagement of flap tongues 24 within curved lip 28, the flap is in effect suspended on a floating hinge. This minimizes the likelihood of the flap binding in any position and makes the flap lie flush against plate 30 when closed and freely and quickly swinging even under extremely light pressures. It will be appreciated that the structure of this hinge and flap arrangement is very simple, moreover, a flap can be fitted over almost any weep hole in an already installed window.

When a gust of wind blows against the outside of the window, flap 22 will swing closed over weep hole 16 in face to face contact with plate 30 and effectively prevent rain and the like from being blown into the weep hole. To enable water to or moisture to drain out from the sill when flap 22 is closed, the flap is provided with an outwardly bent center section 36. This section is bent with a taper across its width, as seen in Figure 5, and along its length, as seen in Figure 3. Thus, when the flap is closed there exists a thin tapered opening 38 between the inside face of flap section 36 and the lower portions of plate 30 and sill wall 18. Even with high winds blowing against the flap, water will still be able to drain through weep hole 16 and opening 38 to the outside.

The reason or reasons for this phenomenon are not fully understood but it may be due to capillary action of the water within tapered opening 38 or it may be due to a Venturi tube effect caused by the wind blowing past the mouth of this opening. In any event the scupper arrangement provides a very effective but inexpensive drain for a window sill and the like. Liquid flow out from the sill will be allowed even against high winds and when there is no wind, i.e. when the flap is free to swing open, greater quantities of liquid and fairly large objects and debris can be flushed through the weep hole.

In a weep hole-flap arrangement, substantially identical to that illustrated herein, which has been built and successfully tested good water drainage through tapered
opening 38 was obtained even in the face of winds as high as 50 knots. The inside bottom edge of flap 22 along section 36 as seen in Figure 5 was bent approximately \( \frac{3}{4} \) inch out from the plane of the flap leaving a \( \frac{3}{4} \) inch width for opening 38 at the bottom. Section 36 extended upward for approximately half the width of the flap. This section was formed simply by bending flap 22 outward along a vertical centerline by the required amount. Chamfered face 21 was inclined at 45° and extended down along the lower edge of opening 32 in plate 30 as shown in Figure 2. The shapes and relative sizes and positions of the flap, weep hole and plate 30 were substantially exactly as shown herein. The above description of the invention is intended in illustration and not in limitation thereof. Various changes may occur to those skilled in the art and these may be made without departing from the spirit or scope of the invention as set forth.

This application is a continuation in part of co-pending application, Serial No. 446,627, filed July 29, 1954, Patent No. 2,827,674, issued March 25, 1958.

I claim:

1. In a window construction the combination of a sill comprising a bottom wall and an outer vertical wall extending across and substantially normal to said bottom wall, said outer wall being provided with a drain opening having its bottom edge defining surface intersecting with and inclined outwardly and downwardly from and in draining relation to the top surface of said bottom wall, and a flap positioned outside of said outer wall to extend across and overlapping edge portions of said opening and having a hinge connection with said outer wall adjacent to said opening whereby lower edge portions of the flap are free to swing out of said outer wall toward and from said opening, said flap having a midportion of its lower edge flared outwardly from out of the normal plane of said flap whereby in closed position, said lower edge portion extends across said opening and beyond the ends of the lower edge of said inclined edge defining surface of the opening, and said flared portion of the flap is spaced from said lower edge of said inclined surface to afford a narrow drain opening of maximum width at its midportion and tapering toward its ends between the flap and said vertical wall.

2. In a window construction which includes a sill having a bottom wall and an outer vertical wall provided with a weep hole for draining water from said bottom wall through said outer vertical wall, the combination with said outer wall of a drainage controlling flap connected to the outer face of said outer wall to swing freely toward and from weep hole covering position, said flap having lateral edge portions which in closed position of the flap overlaps said outer wall at lateral edges of said weep hole, and said flap having at its free end and between said lateral edge portions an intermediate portion of convex transverse sectional contour which in closed position of the flap overlaps the bottom edge of said weep hole, said convex portion of the flap being arranged and adapted to maintain between said weep hole and said flap, even when the latter is in weep hole covering position under high wind pressure, a drainage opening which varies in effective width from a maximum at its midportion to a minimum at its ends to provide at least some effective drainage through said weep hole.

3. In a weep hole controlling device for a window construction wherein the sill has a bottom wall and an outer vertical wall which is provided with a weep hole for draining water from said bottom wall, the combination of a base plate attachable to said outer wall and having an opening arranged and adapted to register with said weep hole, and a drainage controlling flap loosely mounted on said base plate to swing freely to-and-fro from and to said weep hole covering position, said flap having lateral edge portions which in closed position of the flap overlaps said lateral edges of said base plate opening, said flap having at its free end and between said lateral edge portions an intermediate portion of convex transverse sectional contour which in closed position of the flap overlaps the bottom edge of said base plate opening, said convex portion of the flap being arranged and adapted to maintain between said opening and said flap, even when the latter is in weep hole covering position under high wind pressure, a drainage passageway of maximum width at its midportion and tapering toward its ends to provide at least some effective drainage through said weep hole and said base plate opening.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Inventor</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>987,946</td>
<td>Bugler</td>
<td>Mar. 28, 1911</td>
</tr>
<tr>
<td>1,097,879</td>
<td>Reichard</td>
<td>May 26, 1914</td>
</tr>
<tr>
<td>1,451,021</td>
<td>Hanson</td>
<td>Apr. 10, 1923</td>
</tr>
<tr>
<td>2,203,733</td>
<td>Strandt</td>
<td>June 11, 1940</td>
</tr>
<tr>
<td>2,787,034</td>
<td>Hauck</td>
<td>Apr. 2, 1957</td>
</tr>
<tr>
<td>2,827,674</td>
<td>Hauck</td>
<td>Mar. 25, 1958</td>
</tr>
</tbody>
</table>