March 3, 1942. R. T. AVARD ET AL 2,274,647

ROOF FLASHING

Filed Oct. 30, 1939

Fig. 1.

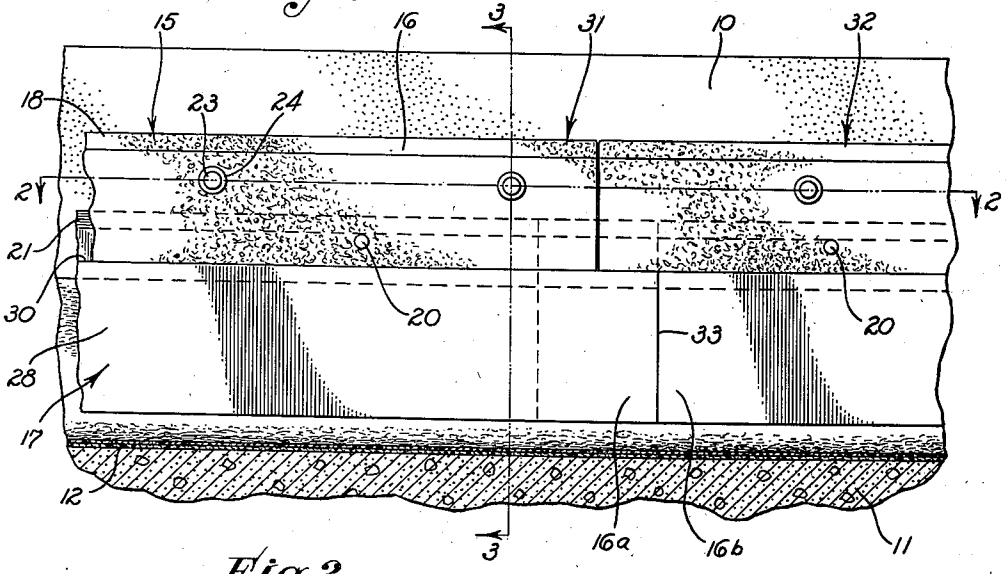


Fig. 2.

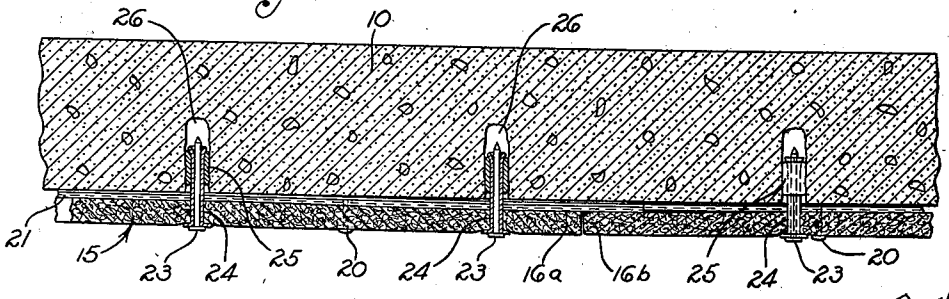


Fig. 3.

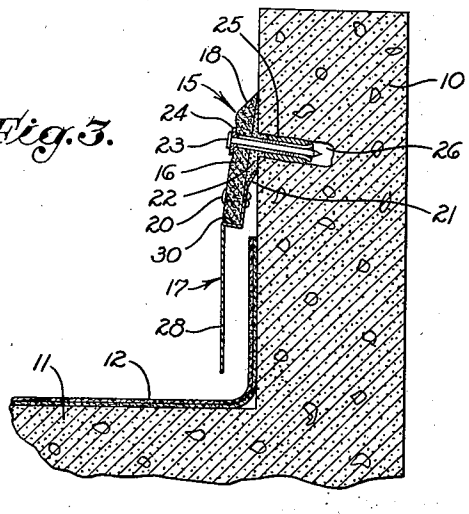
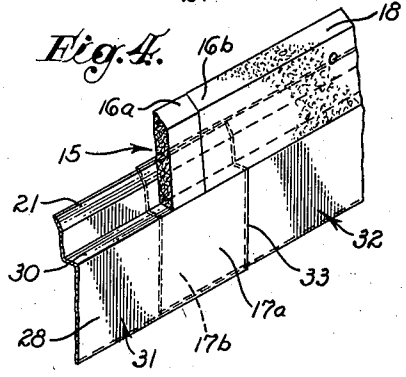


Fig. 4.



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ROOF FLASHING

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7 Claims. (Cl. 108—26)

Our invention relates to roof flashing with special reference to flashing for vertical walls bordering upon roof coverings.

The older roof flashing constructions of the character under consideration here, involve the conception of extending an upper edge of a counterflashing into the vertical wall that borders upon the roof covering, the edge of the counterflashing being embedded in the wall or otherwise anchored behind the face of the wall. The purpose of embedding the upper edge of the counterflashing in the wall is to insure that water flowing down the face of the wall initially contacts the outer surface of the counterflashing below the upper edge of the counterflashing and is thereby prevented from flowing over that upper edge into the space behind the counterflashing. Such flashing constructions require a reglet groove in the wall to receive the upper edge of the counterflashing. The necessity of providing the reglet groove involves expense above the cost of the counterflashing and, moreover, the groove is often incorrectly located either because the roofline is not determined at the time the groove is formed, or because the roof line is subsequently changed.

More recent flashing constructions have been devised for application to a vertical wall without the necessity of providing a reglet groove in the wall, the installed flashing lying wholly forward of the wall face. In a typical construction of this type, a metal flashing sheet is nailed or otherwise attached to the face of the wall at spaced points, and is shaped to form with the wall a longitudinal recess which is packed with a plastic sealing material to keep water from flowing down the face of the wall into the space behind the flashing sheet. Such more recent constructions designed to eliminate the necessity of grooving the face of the vertical wall have not been satisfactory in practice because of certain unsolved problems involved in sealing the juncture of the flashing with the wall. The effectiveness of the seal is too often shortlived, cracks forming either between the sealing material and the wall or between the sealing material and the flashing sheet. Servicing of such an installation is required to maintain the flashing and it is not uncommon to find the longitudinal sealing recess completely drained of sealing material.

Some of the important features of our invention may be appreciated by considering some of the defects and sources of trouble in prior art structures of the type just described, as brought to light by our studies of various installations.

First, exposed metal flashing mounted directly on the face of a vertical wall is subject to thermal expansion and contraction with changing weather so that it is impossible to maintain fixed relationship between the metal flashing and the wall. The relative movement involved in such expansion and contraction makes it exceedingly difficult, if not impossible, to maintain a seal that is strictly fluid-tight.

Second, the metal flashing in the usual construction is anchored positively to the wall at spaced points and, therefore, is not free to expand and contract longitudinally without distortion. As a consequence, in warm weather the metal tends to buckle away from the wall between the points of anchorage.

Third, the metal fastening means usually employed for holding the flashing strip against the wall at the spaced points also expands in hot weather and relaxes the pressure of the metal flashing against the wall.

Fourth, since relative movement along the juncture of the flashing with the wall is inevitable, the sealing means that is employed to maintain the seal must have a certain degree of plasticity. The only sealing materials found to have the required properties in practice are materials that become semi-fluid in hot weather and, therefore, most likely to flow at the time when maximum leakage spaces are formed.

Fifth, it is a common practice to turn the upper edge of the metal flashing sheet outward to favor the introduction of the sealing material into the sealing recess behind the flashing sheet. The disadvantage of such a configuration is that it not only favors the introduction of the sealing material, but also favors the entrance of water from the face of the wall into the sealing space. Any water leaking from the sealing space, of course, drops into the very zone the flashing is intended to protect from water.

The general object of our invention is to overcome or avoid defects and sources of trouble of the character listed above, and to provide a roof flashing construction that obviates the necessity of a reglet groove, yet provides a seal as positive, permanent, and trouble-free as the older procedure of actually embedding the upper edge of the counter-flashing in the material of the vertical wall. More specifically, some of our objects are to maintain effective contact of the metal flashing with the wall notwithstanding thermal expansion and contraction of the flashing, to

maintain effective pressure on the flashing by the anchoring means, notwithstanding thermal expansion of the anchoring means, to minimize the heating of the sealing material in hot weather thereby to minimize the tendency of the sealing material to liquefy, and to provide a metal flashing sheet of such configuration and such relationship with the wall as will discourage any tendency for water on the face of the wall to enter the space back of the flashing sheet.

Underlying our invention is the novel conception that these objects may be attained and the various problems solved by employing heat-insulating material over the sealing material, by employing the heat-insulating material in cooperation with the metal flashing sheet to form a substantially leak-proof sealing space, and by anchoring the flashing sheet to the wall indirectly through the medium of the heat-insulating material.

The above and other objects, features, and advantages of our invention may be understood by reference to the following detailed description considered with the accompanying drawing.

In the drawing, which is to be taken as illustrative only:

Figure 1 is a face view of a fragment of a wall with our invention applied thereto, the roof at the foot of the wall being shown in section;

Figure 2 is a horizontal section through the wall and flashing, taken as indicated by the line 2—2 of Figure 1;

Figure 3 is a transverse section, taken as indicated by the line 3—3 of Figure 1; and

Figure 4 is a diagrammatic view in perspective on a smaller scale to reveal more clearly the construction of a flashing joint.

The drawing shows a vertical wall 10 and a roof 11, both of which, for example, may be formed of concrete as indicated. The surface of the roof is covered with flexible roofing material 12 that is marginally turned up against the face of the wall 10. The function of a roof flashing is to overhang the upturned roofing material in a waterproof manner.

The roof flashing of our invention, generally designated by numeral 15, comprises an upper non-metallic strip 16 and, therebelow, a metal flashing sheet 17. The upper strip 16 is preferably a heat-insulating material, relatively thick, slightly flexible, and somewhat yielding or resilient in its internal structure. All of these characteristics may be had by employing a compressed sheet of cane fiber or other fibrous material impregnated with some suitable bituminous binder. It will be apparent to those skilled in the art that other sheet materials may be substituted for such composite material in the practice of our invention, with or without sacrificing some of the ideal characteristics.

Preferably, the upper edge of the strip 16 is beveled to provide a sloping shoulder 18. When the invention is applied to a plain wall, such as indicated in the drawing, this sloping shoulder favors diversion of the water away from the face of the wall, and when the face of the wall is finished with a layer of stucco or plaster, the sloping shoulder 18 provides a base surface against which the lower edge of the finishing layer abuts.

The fibrous strip 16 overlies the upper marginal portion of the flashing sheet 17 and is attached thereto in any suitable manner, for example by spaced split rivets 20. Preferably, the upper longitudinal edge of the flashing sheet is formed with an inwardly-turned lip 21. Such a lip or flange 21 disposed as indicated in Figure 3 serves the triple purpose of providing a yielding or spring action favoring contact of the metal edge with the wall 10 under all temperature conditions, of providing a configuration that favors diversion of downwardly flowing liquid to the outer surface of the flashing sheet, and of causing the fibrous strip 16 to be tilted away from the wall so that the flashing sheet 17 cooperates with the fibrous sheet and the wall to form a substantial sealing space of triangular cross-sectional configuration. This sealing space is filled with sealing material 22 which may be mastic or any plastic cement of suitable properties, and it is important to note that the relatively thick fibrous strip 16 insulates the sealing material 22 against external heat.

The fibrous strip 16 is anchored to the wall 10 at spaced points in any suitable manner. The drawing shows a well-known type of fastening means for such purpose comprising a nail 23 in a tubular sheath 24, the nail and sheath extending into a lead sleeve 25. The lead sleeve 25 is placed in a suitable cylindrical hole 26 that is drilled into the wall, and the nail 23 is driven into the sleeve with an expanding action that wedges the assembly into permanent engagement with the wall.

Several features of the invention may be noted at this point. In the first place, the drawing shows that the nail 23 extends through the body of the sealing material 22, the nail being in the zone of the sealing space occupied by the sealing material and acting directly to maintain sealing efficiency. In the second place, a fibrous strip 16 of the character described has a desirable degree of flexibility and, under pressure from the nail 23, tends to bow laterally with a spring action. The third feature to be noted is that each of the nails 23 when driven home compresses the material of the fibrous strip 16, the nail locally distorting the resilient fibers.

A lower portion 28 of the flashing sheet 17 is spaced from the wall 10 with liberal clearance so that the roofing material 12 may be replaced conveniently when required without disturbing the roof flashing 15. In the preferred form of our invention, the metal flashing sheet 17 is offset to form a longitudinal shoulder 30 adjacent the lower edge of the fibrous strip 16, the offset being sufficient to place the lower portion 28 of the flashing sheet substantially flush with the face of the fibrous sheet.

The spring action of the metal lip 21, the lateral spring action of the fibrous strip 16, and the resiliency of the material locally compressed by the nails 23, all contribute to permit a liberal tolerance in the thermal expansion and contraction of the nails and of the material of the lip without lowering the effectiveness of the combination in the function of confining the sealing material in the sealing space. With the added feature that the fibrous strip 16 effectively insulates the sealing material from the sun's rays and tends to keep the sealing material from liquefying, we insure maintaining the seal and, therefore, the efficiency of the flashing over periods of many years without the necessity for servicing or any attention whatsoever.

In this regard, it is to be noted that the upper edge of the metal flashing sheet expands and contracts longitudinally without buckling between the points at which the sheet is attached to the fibrous sheet 16. One reason the flashing sheet 17 does not buckle under thermal expansion and contraction is that the sheet is given

a certain longitudinal rigidity by the bend that forms the lip 21 and by the bends of the offset that forms the longitudinal shoulder 30. A more important factor in avoiding buckling of the flashing sheet, however, is that the flashing sheet is in effect "floatingly" mounted, since the resilient material of the fibrous strip 16 yields locally sufficiently to permit the rivets 20 to accommodate themselves to thermal expansion and contraction of the flashing sheet.

A further feature of our invention is that it lends itself to a highly efficient joint construction for the juncture of adjacent lengths of flashing. Such a joint is indicated in Figures 1 and 2 and is shown with special clarity in Figure 4. Referring to Figure 4, we show an end portion 17*a* of the flashing sheet at the end of one section 31 of flashing overlapping the end portion 17*b* of the flashing sheet of an adjoining flashing section 32. The corresponding ends of the fibrous strips 16*a* and 16*b*, respectively, of the flashing sections 31 and 32 abut together, preferably the line of abutment being staggered from the vertical edge 33 of the end portion 17*a* of the outermost flashing sheet. In forming such a joint at the adjoining ends of two flashing sections, the sealing material is applied liberally between all the overlapping surfaces and at the abutment of the two fibrous strips.

The preferred form of our invention specifically described above for the purpose of disclosure and to illustrate the principles involved will suggest to those skilled in the art various changes, modifications, and substitutions that do not depart from our underlying inventive concept, and we specifically reserve the right to all such changes, modifications, and substitutions that come within the scope of the appended claims.

We claim as our invention:

1. A roof flashing adapted for a wall above the edge of a roof covering, comprising: a relatively thick non-metallic strip for anchoring to said wall; and a metal flashing sheet having its upper edge underlying said strip, said flashing sheet being attached to said strip, said upper edge portion of said flashing sheet being bent away from said strip to define therewith and with said wall a space for sealing material to prevent water from flowing down the wall behind said sheet.

2. A roof flashing as set forth in claim 1 in which said strip comprises fibrous material impregnated with a binder.

3. A roof flashing adapted for a wall above the edge of a roof covering, comprising: a flashing sheet for mounting on the wall to overhang said edge of the roof covering; and a strip of heat-insulating material overlapping the upper margin of said sheet and attached thereto, said strip extending sufficiently above the top edge of said sheet to permit the assembled roof flashing to be anchored to said wall by fastening means extending through the strip above said sheet.

4. A roof flashing as set forth in claim 3 in which the top edge portion of said flashing sheet is bent to cause said strip to tilt outward from the wall and thereby define with the wall and the sheet a sealing space.

5. The combination with a wall bordering upon a roof covering of: a strip of relatively thick heat-insulating material spaced above said covering; a body of sealing material interposed between said wall and said strip, said body being shielded from radiant heat by said strip; a flashing sheet extending downward from said strip to overhang said roof covering, said strip and sealing body being disposed and adapted to prevent the passage of water over the top edge of said sheet into the space between the sheet and the wall; and means anchoring said strip and flashing sheet to said wall.

6. A combination as set forth in claim 5 in which the upper portion of said sheet lies between said strip and the wall and in which said upper portion of the sheet is bent to serve as spacer means between said strip and the wall, thereby tilting said strip and forming with the strip and the wall a space of substantial cross section for said sealing body.

7. A combination as set forth in claim 5 in which said flashing sheet is attached to and supported by said strip, and in which the upper marginal portion of the sheet is bent to space the lower edge of said strip away from the face of said wall.

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