Dec. 31, 1946. E. N. SMITH 2,413,588

FLASHING STRUCTURE FOR ROOFS

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FIG. 1

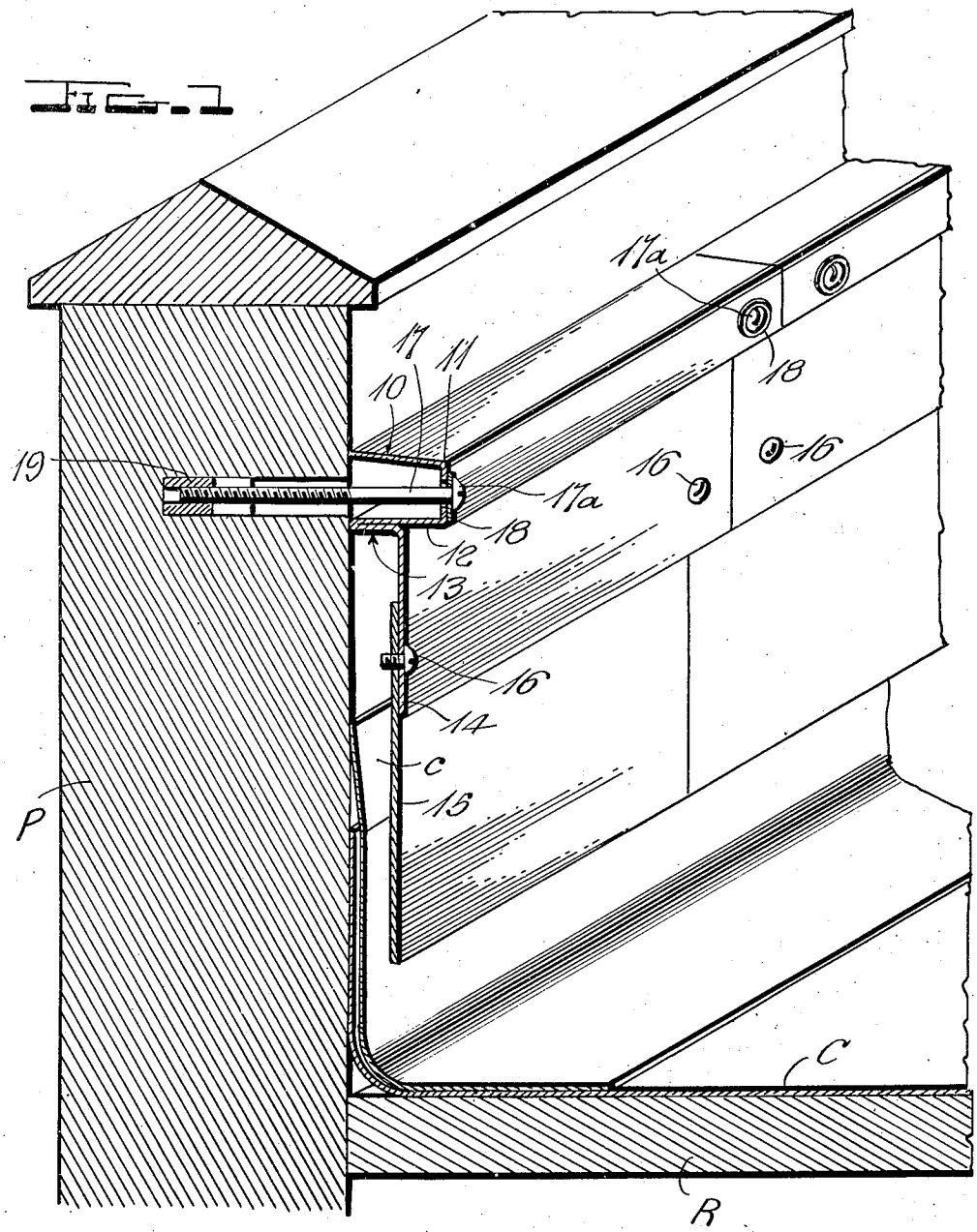
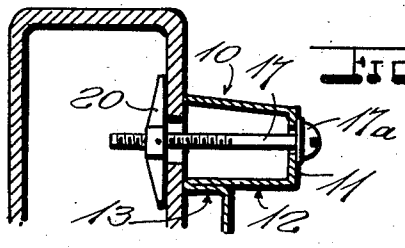


FIG. 2



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FLASHING STRUCTURE FOR ROOFS

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6 Claims. (Cl. 108—26)

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This invention relates to improvements in flashing structures for roofs, and has particular relation to structures of this type used in connection with roofing of all types where connected with a parapet wall.

Roofing of this type is generally employed in buildings employing approximately flat roofs, the front—and possibly the exposed sides—project above the body of the roof in the form of a wall, the outer exposed face of which may be more or less ornate, the type having its name due to the fact that the upstanding wall somewhat simulates a parapet with respect to the roof proper. Well-known illustrations of the type are found in buildings used as stores on business streets, although not limited to such service since less ornate dwellings are frequently formed with this type of roofing. The roofs of the type are generally flat with the surface slightly inclined downwardly toward the rear to provide drainage of the rain waters toward eaves through formations located generally at the rear of the building. The roof is generally of metal, paper or felt and frequently is covered with a bituminous coating as a means of protection.

As is apparent, the type of the roof is such as to present one or more points of vulnerability, points where weather conditions are particularly effective in producing deterioration in the life of the roof and developing leakage into the building. While the major portion of the roof surface is generally unaffected by weather conditions, the fact that the roof joins the parapet wall at an angle—slightly obtuse—presents a major condition which can lead to deterioration and leakage, since the roof covering has the characteristics of an abutting relation to the parapet and inasmuch as the angularity away from this zone is but slightly downward, there is a possibility of water getting behind and under the roof and getting into the building at the junction line, or meeting angle, a condition which tends to develop rusting, loosening from the wall or other deleterious effects in the zone of such line causing interior damage. The difficulty is increased through the fact that heavy and beating rains can affect the covering of such zone since such rain also reaches the parapet wall and drains downward therefrom to such line. As a result, such roofs must be frequently repaired, with the repair generally requiring removal of the old roof and substitution of a new one.

Efforts have been made to decrease the vulnerability in these respects, these generally involving the protection of such line zone. The

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method more frequently employed, is that of extending the covering for the tin upwardly for some distance on the inner parapet wall, thus covering the line with a continuous coating with the change in direction presented in the form of a curve so that the drainage from the parapet wall is given no opportunity of collecting at such line—the coating is made thicker at such zone to withstand the beating of the rain, and to aid in the down draining on the parapet wall the upper zone of the added coating is gradually thinned upwardly and merged or blended into the face of the wall, the purpose being to prevent seepage back of the coating and to carry the drainage away from the direct joining line. While such structure tends to reduce the collection of the water and leakage, and thus tends to prolong the life of the roof to some extent, the fact that the weather conditions also are active on this upper zone of decreasing thickness tends to render this zone vulnerable to deterioration and permit leakage developments. In some cases, the covering for the line zone has been elaborated by the use of special composite formations designed to protect the line zone—some have an extensive thickness, thus increasing the problems of the upper zone developments aside from the much higher cost and the difficulties of providing a satisfactory result, these structures are of less favor, since they do not materially prolong the life of the roof installation, due to difficulties of preventing seepage and leakage development.

The present invention has been developed as the result of efforts made by the inventor over a number of years of service in repairing roofs of this type, during which he was confronted with conditions the sources of which had been unrealized until brought into the open through particular installations. One of these findings was that rain alone was not the only hazard of weather conditions, but that winds—and even sunshine—were sources which could affect conditions, especially in the upper zone of the parapet coating and permit of the leakage development. Many other possible conditions were found, and there came a realization that a structure capable of producing a really meritorious prolongation of the life of a roof of this type would require a structure designed to reduce the hazards from these numerous sources to a minimum, this being the underlying object of the present invention.

Among the objects of the invention is the production of a flashing structure which is supported by the parapet wall and which will protect the upper zone of the applied coating against weather

conditions, including wind, hail, rain and sunshine; which will deliver the rainfall of the parapet zone on the roof beyond the immediate zone of joining line of roof and parapet to thereby protect the line zone; a structure which is entirely metallic, and which can be readily disassembled for repairs, etc., and a structure which can be fashioned at low cost, and can be readily installed and disassembled.

To these and other ends, the nature of which will be better understood as the invention is hereinafter disclosed, said invention consists of the improved construction and combination of parts, hereinafter more fully disclosed, illustrated in the accompanying drawing and more particularly pointed out in the appended claims.

In the accompanying drawing, in which similar reference characters indicate similar parts,

Figure 1 is a view partly in section and partly in perspective, showing a section of the flashing structure in service position.

Figure 2 is a detail view of a modified anchoring means.

Referring more particularly to Figure 1, P indicates a parapet wall extending upwardly from the deck or roof R, of a building—the wall P may be the upper zone of the front of the building, and is usually provided with a suitable top configuration; in practice, I prefer that the top zone have the upper surface preferably inclined with the inner and outer edges forming the similar edges of a ledge *p* projecting beyond the normal side walls of the parapet; this tends to drain the water off the top in such way that the water dripping from the ledge will fall free of the vertical wall of the parapet.

The deck or roof R leads rearwardly from wall P, preferably with a slope downward sufficient to provide for ready draining of rain, the roof being of any preferred construction, and is generally provided with any type of roofing, the latter being indicated at C, and which preferably is carried to the angle corner between the roof and parapet wall and then upwardly along the wall a distance sufficient to carry its upper zone *c* a considerable distance above the top of the roof, the actual distance depending upon the height of the parapet, and which may be as much as 50% of the height of the wall; the zone *c* is preferably of a reducing thickness, with the reduction in an upward direction, with the upper edge merging or blending into the wall, thus providing that any drainage which became manifest on the upper portion of the wall would be led from the wall on to and over zone *c* to reach the exposed face of the vertical portion of coating C; the meeting angle of the vertical and the deck portions of the coating C is preferably thickened, with the exposed face (this, however, has proven unsatisfactory since it does not remain adhered to the wall) curved to cause any drainage to readily pass on to the deck coating away from the joining line of the roof and wall.

The flashing employed with the above assemblage is generally of galvanized sheet metal construction, and while it may be fashioned to extend the entire lateral distance across the parapet wall, it is preferred to make it sectional in such direction with overlapping edges as it is very necessary that expansion and contraction be allowed for; in either case the cross-sectional contour of the flashing would be the same; the continuous form, which is not recommended, would be made up of sections permanently secured together as by a seam formation, while the sectional form would have the overlapping edges allowing the expansion and contraction. Hence, a description of the sectional form will be sufficiently explanatory.

The upper zone of the flashing structure presents the portion which is anchored permanently to the parapet wall. This zone has the upper wall **10**, a vertical wall **11** extending downwardly from the outer edge of wall **10** and a lower wall **12** extending rearwardly from wall **11**, these walls forming a hollow projecting portion with the rear wide open is such as to extend outward some distance beyond the width of the parapet wall ledge—for instance, in practice, the width of this portion may be one inch with the ledge projecting one-fourth inch; the upper wall is slightly sloping downward from its rear edge—preferably at an angle similar to that of the deck R; wall **12** is preferably horizontal. The metal is then bent to provide a forwardly-extending wall **13**, parallel to wall **12** and which may be slightly spaced therefrom, the width of such wall being less than that of wall **12**—for instance, the width of wall **13** may be one-half inch. The metal is then bent downward to form a depending wall **14**, of considerable downward width—for instance a distance of two inches, this being illustrative only, since the distance would depend somewhat on the height of the parapet wall.

Secured to wall **14**—on the inner side of the latter—is a wall **15**, referred to herein as a "fly." This wall is a flat wall, having an overall downward width of any required dimension; for instance, such dimension may be as much as eight inches or more, of which one and a half inches may underlie wall **14**. Such width dimensions are illustrative only, since they depend upon the height of the parapet wall, but they must be sufficient to carry the lower edge of the fly a considerable distance below the coating zone *c*—for instance, the latter distance may be as much as or more than two inches. The fly is secured to wall **14** by screws **16**, these being spaced apart at distances of say four inches.

The flashing thus described is secured in position by means of bolts **17** which extend through wall **11** and the space between walls **10** and **12**, and are anchored in the parapet wall. To prevent caving in of wall **11** in securing the flashing in position, a washer **18** is located on the bolt outside of wall **11** and beneath the bolt head **17***a* which may have a suitable configuration—but is preferably provided with a kerf to make it of screw-head type.

Anchoring of bolt may be in any well-known manner. For instance, if the parapet wall is solid, an opening of suitable depth is made in the wall and a sleeve-like element **19** inserted and then expanded; this element is internally threaded to receive the bolt; in other words, the sleeve is anchored in the wall and the bolt then threaded therein. If the parapet wall be a hollow wall, as in Fig. 2, the bolt may be of the toggle type in which the nut section **20** rests in contact with an inner face of the hollow wall when the bolt is in a secured position. Both are well-known methods of anchoring bolts.

The flashing is positioned on a parapet wall with the free edge of wall **10** contacting the parapet wall a short distance below the top of the latter—for instance, a distance of one and one-half inches or more; the free edge of wall **10** is drawn into close engagement with the ex-

posed parapet wall, and since wall 10 projects considerably beyond ledge *p*, drainage from the top of the parapet will fall on wall 11 remote from such edge and drain away from the latter due to the inclination of the wall 10. However, such free edge engagement remains one of the critical points in connection with the flashing since the rain which may reach the parapet below the ledge will drain downward over the wall and thus reach the edge zone. Since the edge closely engages the parapet face and wall 10 is inclined downwardly, the drainage from the face will mostly immediately flow away from the edge over the wall 10, seepage of small amounts past the edge being eliminated by application of waterproof cement or mastic.

A second point, less critical, is at the point where the bend connecting walls 12 and 13 engage the parapet wall, since this point is itself protected from the rain by the hollow projected zone formed by walls 10, 11 and 12, its critical effect would be produced by the water seeping past the upper edge which has been eliminated as heretofore mentioned. Hence, the amount of water that would reach the zone *o* of the coating of the parapet wall would be limited to that which would seep by wall 10 and would be stopped at that point.

Since the hollow projected zone vertical wall 11 lies materially outside of faces 14 and 15, with the latter materially spaced from the parapet wall, the drainage coming from wall 10 will pass down over wall 11 and fall freely on to the coating of the deck some distance away from the curved zone of the coating at the meeting angle of the deck and parapet wall, and therefore free to flow downward over the inclined face of the coating of the deck.

Hence, not only is the zone *c* and the parapet coating below it, protected against the development of leakage conditions behind the coating—to thereby reduce the possibility of damage development of the metallic or built-up portion of the roof, but the curved coating zone at the meeting point will be protected against all rain conditions since the rain content reaching the portion 14 and fly 15 will flow downward and fall from the lower edge of the fly outwardly beyond the curved zone; such beating rain below the fly would thus have to pass through the pseudo curtains produced by the falling content from wall 10 and that falling from fly 15, a condition tending to reduce the power of the rain on the curved zone.

As a result, the deck covering is practically freed from the development of conditions such as would set up rust or deterioration conditions developing on the roof, so far as these emanate from the presence of the parapet wall.

In connection with the repair of the assemblage or of the roof deck, it is apparent that the fly must be removed to permit ready access to the affected parts. The formation of the fly as separate from depending portion 14 and sectional, permits such ready removal by removal of screws 16; since the sections of the fly are more or less individual to their positions, the sections can be numbered or otherwise marked to indicate their positions, and can therefore be readily replaced in their former positions.

While the invention is usable in connection with new buildings, it is especially valuable in connection with buildings previously erected, and in which the replacing of the roof has been frequent and expensive. The assemblage can be readily applied to such buildings.

As is apparent, the combined depending portion 14 and the fly formation combinedly produce the effect of a curtain which overlies—in spaced apart relation thereto—the face of the parapet wall and a considerable portion of the coating thereof. This curtain effect not only shields the wall behind it from weather conditions such as rain and hail, but also from the sunlight, as well as from direct wind pressure. The space in rear of the curtain is open at both ends, so that wind may traverse the space, but its movement therethrough is parallel with the face and not toward it. In addition, the curtain not only shields the protected portion of the wall from the direct rays of the sun, but the open space in rear of the curtain permits air circulation therethrough so that the wall—and especially the blending zone of the coating is not subjected to the high heat conditions which result from intense sun rays, thus tending to prolong the life of such coating.

As is obvious, the flashing will prolong the normal life of the roof deck, for reasons above pointed out; however, the invention is not assumed to eliminate the need for roof repairs, since the latter may be required for reasons other than normal weather conditions.

While I have herein shown and described a preferred form of the invention, it will be understood that changes or modifications therein may be found desirable or essential in meeting the exigencies of service conditions or the individual desires of the user, and I therefore reserve the right to make any and all such changes or modifications as may be found desirable or essential, insofar as the same may fall within the spirit and scope of the invention as expressed in the accompanying claims, when broadly construed.

What is claimed as new is:

1. In flashing structures for parapet roofs, wherein the roof deck coating extends upwardly upon and blends into the wall face of the parapet wall a material distance above the meeting angle of the deck and parapet wall, and wherein the coating at such meeting angle presents a curved face of the concave type to facilitate drainage, the combination with such roof assemblage, of a flashing assemblage supported by the parapet wall and forming a curtain for a material portion or portions of the parapet wall including the blending zone of such coating, said flashing assemblage being of sheet metal type and including an integral projecting wall formation of hollow character with its upper and lower walls of similar width and with the lower wall continued with a return bend for a width less than the width of such lower wall and then bent downward to form the upper zone of the depending curtain, means for anchoring said projecting wall formation to the parapet wall with the upper wall spaced below the top of the parapet, and a flat fly formation removably secured to the under face of the depending wall of the projecting wall formation, and extending downward a material distance below such blending zone and spaced from the deck coating, whereby drainage from the parapet wall and the curtain will normally fall to the deck in two spaced parallel vertical planes both spaced from the coating curved zone with the falling drainage content tending to provide a protection barrier for the coating curved zone against beating rainfall and with the curtain forming a barrier for the coating blending zone

against rainfall, wind and sunshine access to the zone.

2. Assemblage as in claim 1 characterized in that the projecting wall formation contacts the parapet wall solely at the rear edge of the upper wall and at the bend from the lower wall to thereby leave the rear of the hollow formation open, thus affecting two seals against the wall, the anchoring means being exposed external of the vertical wall connecting the upper and lower walls and extending through the hollow interior and the open rear into the parapet wall.

3. Assemblage as in claim 1 characterized in that the projecting wall formation contacts the parapet wall solely at the rear edge of the upper wall and at the bend from the lower wall to thereby leave the rear of the hollow formation open, the anchoring means being exposed external of the vertical wall connecting the upper and lower walls and extending through the hollow interior and the open rear into the parapet wall, said means being of the bolt type with each bolt carrying a member between its head and the exposed face of the vertical wall to thereby prevent caving of such wall and of the hollow formation.

4. Assemblage as in claim 1 with the parapet wall including a top projecting ledge, such assemblage being characterized in that the upper wall of the hollow portion of the projecting wall formation is inclined downward from its free edge to facilitate the passage of drainage from the exposed portion of the parapet wall and having a width materially greater than the projected width of the ledge to thereby provide a draining face receiving the drainage from the ledge on a line remote from the meeting angle of the free rear edge of the upper wall the parapet wall to reduce the volume of drainage reaching such meeting angle and thereby eliminate seepage at such angle.

5. Assemblage as in claim 1 with the parapet wall including a top projecting ledge, such assemblage being characterized in that the upper wall of the hollow portion of the projecting wall formation is inclined downward from its free edge to facilitate the passage of drainage from the exposed portion of the parapet wall and having a width materially greater than the projected width of the ledge to thereby provide a draining face receiving the drainage from the ledge on a line remote from the meeting angle of the free rear edge of the upper wall the parapet wall to reduce the volume of drainage reaching such meeting angle and thereby eliminating seepage at such angle, the contact of the band and the angle to eliminate seepage along the parapet wall below the bend to thereby provide protection of the coating blending zone against parapet wall drainage conditions.

6. Assemblage as in claim 1 characterized in that the fly formation is in the form of a plurality of individual sheet members arranged in lateral alinement and with overlapping relation, each member being removably secured individually to the depending zone of the projecting wall formation to thereby permit removal and replacement when deck repairs are needed.

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