Nov. 23, 1937. H. ROSENBERG 2,099,990

WEATHERPROOFING FASTENER

Filed Oct. 23, 1934

Fig. 1.

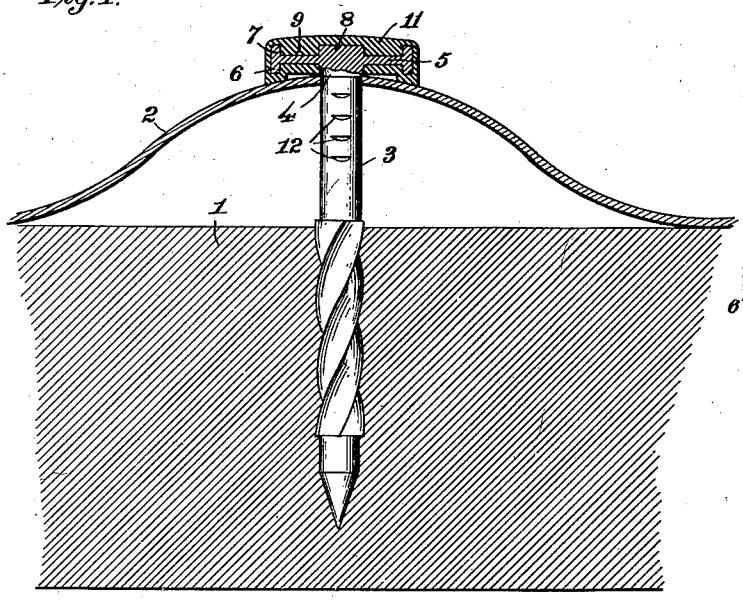


Fig. 4.

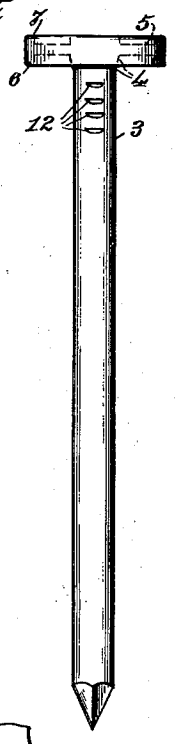


Fig. 2.

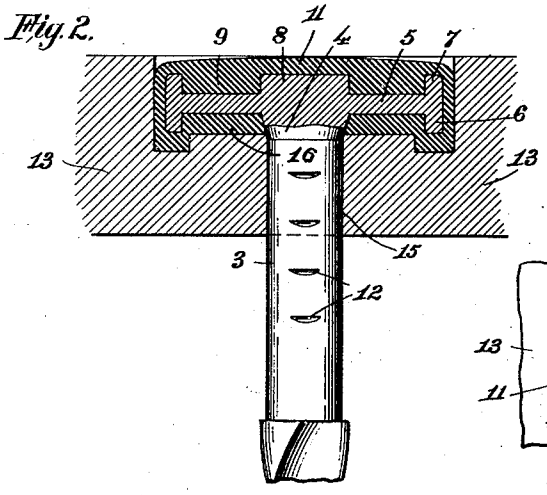
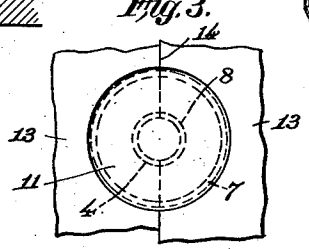


Fig. 3.



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WEATHERPROOFING FASTENER

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11 Claims. (Cl. 85—28)

This invention relates to improvements in hammer-driven fasteners of the type provided with a soft, malleable metal head or similar covering for its head for use in anchoring sheet metal, such as corrugated iron, or like roof coverings, to sub-structures or other supports.

The invention has among its objects increased efficiency in insuring against leakage between the metal roofing and the roofing-engaging portions of the head of the fastener, and another object is the anchorage of the lead or other soft metal to the fastener both in a manner to insure such non-leaking joint and to insure against dislocation, spreading, detachment, or other injury to the soft metal.

A still further object is the provision of special anchorage means for connecting the soft metal to the fastener while providing increased strength for the fastener at its head end, and also providing greater ease and efficiency in approach for facilitating application of the soft metal to the fastener.

With these and other objects in view as will in part hereinafter become apparent and in part be stated, the invention includes a fastener having integral means for causing a soft metal plate or covering engaging the fastener to present an edge in the direction of movement when the fastener is being driven in with such edge immediately backed by the more stable or harder metal of the fastener.

The invention also comprises a fastener body and an integral head frame having a tapering portion meeting the body, and a web circumferentially outstanding from the enlarged end part of the tapering portion, and a lead or like soft metal covering enclosing the margin of the web.

The invention still further includes the said features with a flange on the periphery of the web extending in the direction of movement of the fastener when the same is being driven into place, and the invention also includes a similar flange upstanding from the peripheral portion of said web.

The invention also comprises certain other novel constructions, combinations, and arrangements of parts as subsequently specified and claimed.

In the accompanying drawing,—

Figure 1 is a cross section through a fragment of roofing structure illustrating an embodiment of the present invention, the body of the fastener being seen in elevation and its head in section.

Figure 2 is an enlarged, fragmentary view of the fastener detached, part of the body being broken away for the saving of space.

Figure 3 is a fragmentary plan view illustrating a method of making the fastener illustrated in Figures 1 and 2.

Figure 4 is a view in side elevation of a fastener embodying the same head structure as the fastener of Figures 1 and 2 but with the soft metal covering omitted, and with a part of the body modified to cause the structure of Figure 4 to correspond in body formation to the conventional wire nail.

Referring to the drawing by numerals, 1 indicates a board or rail or other sub-structure or appropriate support for a sheet of metal 2, which sheet is usually that of a roof covering, such as corrugated galvanized iron or the like, but, of course, the sheet 2 may be ceiling or other sheet metal, and the support 1 may be otherwise located than beneath sheet 2. The sheet 2 is fastened to the support 1 by fasteners which are essentially of the type of nails or like hammer-driven fasteners, each consisting of a body 3 and a head frame made up of a tapering portion or inverted cone frustum 4 having at its upper extremity a circumferential outstanding web 5, which web in turn, at its periphery, is provided with a down-turned or pendent flange 6 and upturned flange 7, the directions of "down" and "up" being considered from the assumption that the fastener 3 is in an upright position with its entering end downward. The tapering portion 4 is a cone frustum formed integral at its lower end with the body 3 and integral at its upper end with the web 5, a portion of the material preferably upstanding at 8 above the plane of the upper surface of web 5 to provide both an integral impact-receiving or crown portion and also to produce an annular channel 9 lying between the upstanding flange 7 and the crown portion 8. A flat edge is provided by the lower terminus or free margin of flange 8 presented in the direction of movement of the parts when driven into work. Flange 6 provides between itself and the cone frustum 4 a circumferential channel 10 similar to the circumferential channel 9. The free margins of flanges 6 and 7 are preferably slightly rounded at the edges to reduce likelihood of cutting the overlying lead when the fastener is being driven to place, but, between these rounded edges, said margins are flat, and particularly that of flange 6 so that the overlying lead presents a flat circumferential edge to the engaged work when the fastener is applied.

The cone frustum 4 and its integral parts 5, 6,

7, and 8 comprise a head frame or head portion for the body 3. These are covered by a layer or coating of lead or like soft metal 11. The layer or coating 11 may be applied in any of various acceptable ways, such as by having the head frame sufficiently heated, supplied with flux, and dipped into a body of molten soft metal, and then wiped or inserted into a matrix or otherwise treated for shaping the lead covering and eliminating excess lead. Or the coating 11 may be applied by a stamping operation while the lead is cold, or it may be produced otherwise as preferred. It is desirable that the lead coating or covering 11 shall enclose the peripheral portions of the web 5 at least to the extent of having the lower or free margin of the flange 6 covered to present an annular flat edge of soft metal in the direction of movement when the fastener is driven into place. It is also desirable to have a sufficient amount of the soft metal extend laterally inward of the flange 6 to fill or substantially fill the channel 10 to provide additional resistance against dislocation of the lead covering during handling and during application under hammer blows. It will also be noted that the channel 9, providing inner and outer shoulders against which the lead filling of the channel engage, will resist tendency of the lead covering 11 to spread or loosen from the head frame during hammering of the fastener.

The body of the fastener 3 may be of any of various forms, such, for example, as the screw-nail construction shown in Figures 1 and 2, and seen in my Patent No. 1,912,099, or may be of any other desired form adapted for use in work to provide the requisite non-leaking anchorage.

As the structure seen in Figure 3 is identical with that seen in Figures 1 and 2, except for the conventional wire nail shape of the body, the same reference numerals have been applied and the same description equally applies. The body 3 in each instance is shown as possessing the indentations 12 produced by the gripping device that holds the wire blank during action of the header in cold-flowing the head frame from the material of said blank. This heading operation is done by a stamping die engaging the outer end portion of the blank and compressing it into an appropriate, cooperating matrix-die shaped and proportioned to produce the cone frustum 4, the channel 10, and the flange 6. The stamping die produces the channel 9 with the resulting upstanding portion 8 and flange 7. Said dies are also shaped to delimit the periphery of the web 5, which is the outer substantially cylindrical face of the flanges 6 and 7.

When it is desired to apply the coating or covering 11 by flowing the lead or like soft metal, the body 3 may be deposited in a hole or recess provided in an appropriate support and sufficiently near the same diameter as body 3 to prevent the cone frustum 4 from entering. Thus, cone frustum 4 and the balance of the head frame are held in an upstanding position above the support so as to leave the head frame available for access of lead stock to be flowed about the upper and outer surfaces of the head frame and around the periphery thereof to cone 4. This can be done in various ways. Preferably molten lead in just the required measured quantity is cast about the head frame while it is hot and supported and enclosed as seen in Figures 2 and 3. The lead, of course, can be cold-flowed to enclose the head frame if subject to sufficient pressure and properly confined and directed.

Thus, the coating 11 may be applied either by dipping or stamping, or otherwise, and in any case may be caused to occupy the annular groove or channel 10 as well as cover the other parts above the said channel and thus fill the annular channel or groove 9.

In use, the fastener is driven like a nail through the sheet metal 2 into the support 1 and the flat edge of the lead or other soft metal coating overlying the free margin of the flange 6 will be presented to and forced, and if necessary mashed, into non-leaking engagement with the outer surface of the sheet metal 2. In driving the fastener to this position, a hammer blow or hammer blows is or are delivered to the lead overlayed crown portion 8 of the head of the fastener. Whereas in heretofore proposed types of flat-head nails with lead-coated heads, it has been found that a hammer blow at times spreads and thus loosens or cracks the lead coating, the present head frame resists the tendency toward spreading or radial expansion of the lead coating under the hammer blow, and, accordingly, prevents any loosening or other injury to any part of such coating. The flange 7 effectively resists any tendency of the lead surrounded by it to spread, crack or be injured by hammer blows, and thus also prevents loosening of the lead from the periphery of the head frame. Flange 6 also confines the lead in channel 10 against loosening or spreading, and the lead coating is thus fully protected both above and below web 5. In other words, the circumferential bead of lead of coating 11 which fills the channel 9 and the similar filling of channel 10 shoulder against the flanges 7 and 6 and thereby effectively resist radial flow or spreading. An efficient and dependable non-leaking anchorage connection is thus assured when the fastener is employed. One great difficulty with a spread, loosened, or similarly injured lead coating is that it is frequently unobserved until a leaky condition of the roof or other structure calls the defect to attention. Thus the present invention obviates a difficulty that is always harmful and is likely to be obscure.

It should be understood, of course, that the term "soft metal" as employed in the appended claims is intended to include any soft metal appropriate for the purpose of forming a leak-tight joint, and particularly lead and the various alloys that are highly malleable.

As seen in Figures 2 and 3, one acceptable and efficient mode of applying the coating involves the use of a support or matrix 13, made of two sections and divided at 14 to be opened or moved apart for insertion and removal of nails. When a nail is inserted into a notch 15 of one section of matrix 13 and the similarly notched cooperating section is brought into contact with the first and its notch registering with notch 15, the two notches will snugly encircle body 3 with the lower terminal portion of cone frustum 4 closing the upper end of the hole or recess formed by the two notches. An upstanding part 16 beneath web 5 causes the flowing lead to assume the offset to provide the flat annular edge of lead enclosing flange 6. Of course, when molten lead is poured on top of the head frame when thus positioned, it is desirable to apply a shaping tool to the upper surface of coating 11 while it is yet hot to give it the finish seen in Figure 2, but this is a detail of manufacturing operation that can be readily provided for. Of course, for quantity production the matrix 13 will be provided with nail-receiving portions in the multiple and be fed and

discharged automatically, and the lead supply and shaping of the upper surface will also be done by automatic machinery.

What is claimed is:—

1. In fasteners, the combination, with a body, of a head frame therefor having means for receiving a soft metal coating, said head frame having an abruptly shouldered, inwardly facing, metal imprisoning portion about and above the upper surface of the main portion of the head frame to resist spreading or loosening of the upper coating of the head frame under hammer blows, and a soft metal coating covering said head frame.

2. The combination as claimed in claim 1 wherein the shouldering is formed by a channel in the head frame located and shaped to receive and embrace a bead of the soft metal coating.

3. In fasteners, the combination, with a relatively hard metal body, having a head frame comprising an outstanding web terminating peripherally in an upstanding flange, and an upstanding central crown portion producing with the upstanding flange an annular channel in the upper side of the head frame, of a soft metal coating for the head frame including a bead of soft metal imprisoned in the annular channel.

4. The combination as claimed in claim 3 with a pendent flange also extending from the web and formed with an abrupt internal shoulder, the soft metal coating for said frame extending down to, across, and within the pendent flange.

5. In fasteners, the combination, with a body, of a head frame therefor having an outstanding web terminating peripherally in an abrupt upstanding flange and an abrupt pendent flange, and a soft metal coating for said head frame having portions surrounded by the upstanding and pendent flanges and a portion underlying the pendent flange.

6. A head frame of hard metal for a driven fastener and a coating of soft metal therefor, said head frame comprising a cone frustum, a web circumferentially outstanding therefrom, and broad-based marginal flanges upstanding and pendent from the periphery of the web, said flanges having abrupt, inwardly facing shoulders for retaining the soft metal in place.

7. A hammer-driven fastener head frame comprising a cone frustum having an outstanding web at its base, an upstanding crown portion above the web in line with the cone frustum, and upstanding and pendent broad-based flanges at the periphery of the web, said flanges having abrupt, inwardly facing shoulders.

8. In fasteners, the combination with a body, of a head frame, a soft metal head therefor, said head frame having an upstanding marginal flange, abruptly shouldered to resist spreading or loosening of the soft head metal under hammer blows, and the head frame being formed with a crown portion upstanding at least to the level of the marginal flange for receiving the force of the hammer blows from the soft metal head and transmitting such force directly to the body.

9. In a fastener, in combination, a body, a head frame, said head frame comprising upper and lower marginal flanges and a central driving boss extending upward at least as far as the upper marginal flange, and a soft metal head enclosing said head frame and fitting the same, said soft metal head being of greater height in its middle portion than in the marginal portion which overlies the upper flange to protect the marginal portion of the head against injury by hammer blows.

10. In a fastener, in combination, a body, a head frame, said head frame including a radially extending flange portion formed on the body, an upstanding marginal flange portion and a central driving boss extending upward at least as far as the upper marginal flange, and a soft metal head enclosing said head frame and fitting the same, said soft metal head being of greater height over the driving boss than over the marginal flange to protect the marginal portion of the head against injury by hammer blows.

11. In a fastener, in combination, a body, a head frame, said head frame including a radially extending flange portion formed on the body, and a depending marginal flange portion which, with the body, defines an abruptly shouldered annular channel in the under side of the head frame, and a soft metal head enclosing and fitting the head frame, said soft metal head including a depending marginal flange of substantial height.

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