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CLIP NAIL

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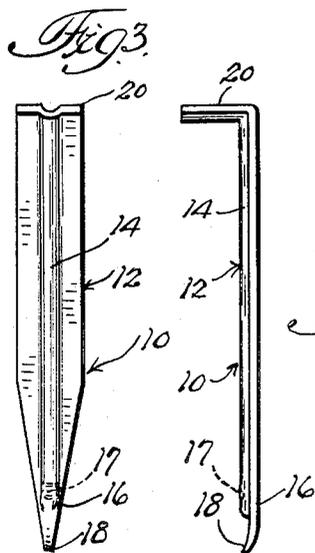
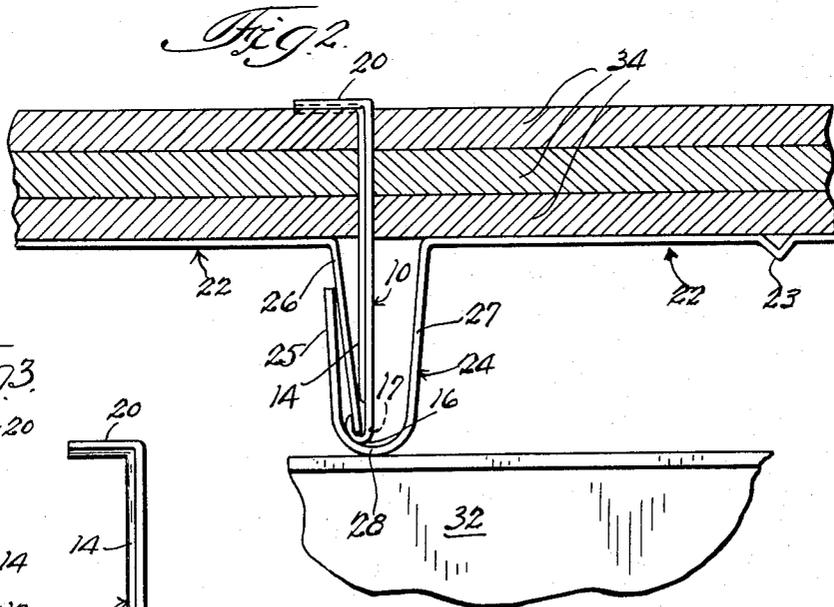
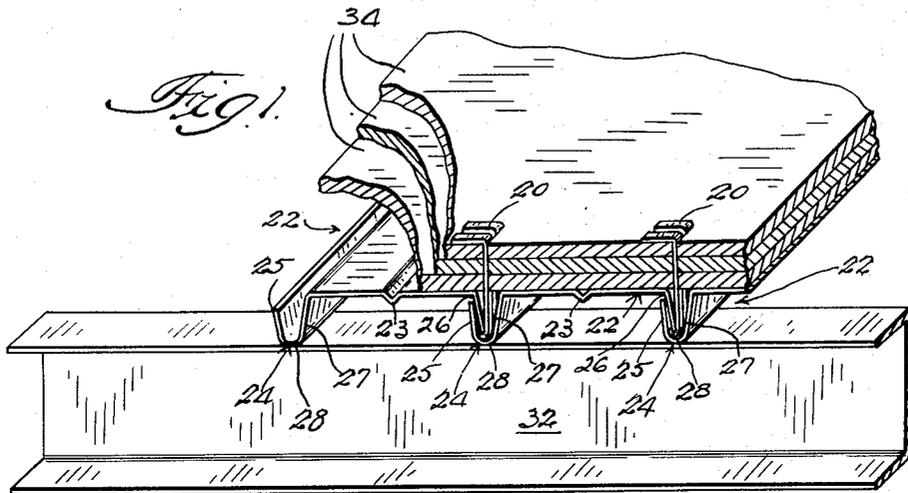


Fig. 4.

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CLIP NAIL

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3 Claims. (Cl. 50—218)

This invention relates to an improved clip nail and, more particularly, pertains to a clip nail which is adapted to secure sheetlike materials to interlocking metal plates.

One of the more economical and satisfactory roof constructions for industrial buildings comprises sections of sheet metal commonly referred to as roof decks which are fabricated of steel and arranged in an overlapping, interlocking relationship. The roof is constructed by arranging sections of the steel decks in edge-to-edge relationship; each of the decks is secured to a supporting steel purlin or beam by welding, or by means of clips, bolts, or other equivalent securing means. Each of the decks is composed of heavy gauge sheet metal having longitudinal ribs formed therein for purposes of strengthening the deck, whereby the resistance thereof to bending is increased.

Each of the roof decks has a marginal edge which substantially defines an erect U in cross section. The distal arm of the U, however, is shorter than the proximal arm formed integrally with the remainder of the deck. The other opposed edge of each deck is bent downwardly at an angle slightly greater than 90° and is adapted to rest in the trough formed by an erect U edge of an adjacent deck member. It is thus apparent that the latter interlocking engagement between two adjacent deck members effects an overlapping joint.

Because of the high thermal conductivity of the above-described steel decks, it is essential that insulation be provided so as to decrease heat radiation therefrom, and thus decrease heat loss from the interior of the building on which disposed, in the winter; and also to prevent excessive heat transmission into the building during the summer. Consequently, sheets of heat insulation material of the usual type, which may be composed of asbestos, glass fiber, wood, etc., are disposed on the surface of the deck, and roofing is subsequently applied thereover.

The means previously employed for affixing of the insulation, usually in sheet form, comprised a layer of asphalt which was mopped over the deck surface. The layers of insulation sheeting were then applied over the roof while the asphalt was still in the molten condition. As many layers as were deemed essential were applied, but for each layer a molten asphalt base was first applied to the underlying surface. The expense of such a method of insulating was not only time consuming, and as a result expensive, but in addition the asphalt detracted greatly from the fire resistance of the building. Should a fire occur, there was a possibility that the decks of the metal roof might warp enabling molten asphalt to drop into the underlying building interior, thereby contributing greatly to the spreading and intensity of the fire.

It is an object of this invention, therefore, to provide a means for securing sheet materials to the above-described interlocking deck plates which may be readily applied with a minimum of effort.

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It is a further object of this invention to provide a means for securing insulating sheeting to a metal deck construction which requires no special tool in the course of utilizing the same.

5 It is a still further object of this invention to provide a means for securing sheet materials to interlocking metal plates which may be readily fabricated and which is inexpensive to manufacture.

10 The above and other objects will become more apparent upon proceeding with the following detailed description read in the light of the accompanying drawings, and from the appended claims.

In one embodiment of the means which is adapted to 15 secure sheets of insulating materials to interlocking metal plates, a clip nail is provided comprising a shank portion having a reenforcing rib running therethrough which terminates adjacent the distal end limit of the shank portion. Formed integrally with the opposed end limit of the shank portion is a clip nail head portion. The distal end 20 portion of the clip nail shank portion is of pointed configuration and the end limit thereof is curved slightly outwardly and may also be scored to enable it to bend easily in the direction of curvature when driven against a stop surface.

25 The above-described clip nail is to be used in conjunction with overlapping steel roof decks in a manner which will hereinafter be explained in greater detail.

For a more complete understanding of this invention reference should now be had to the drawings, wherein:

30 Fig. 1 is a perspective view of clip nails securing overlapping sheets of insulating material to interlocking plate members;

Fig. 2 is an enlarged fragmentary side elevational view of a portion of the assembly illustrated in Fig. 1;

35 Fig. 3 is a front elevational view of a clip nail formed in accordance with the teachings of this invention; and

Fig. 4 is a side elevational view of the clip nail of Fig. 3.

40 Referring now to the drawings, and more particularly to Figs. 3 and 4, a clip nail 10 is illustrated having an elongated shank portion 12 which has disposed therein a centrally disposed rib 14, the purpose of which is to reinforce the shank portion 12 against any force tending to bend the shank portion in a direction which is transverse 45 to the longitudinal axis thereof. A distal end portion 16 of the clip nail shank portion 12 is pointed so as to facilitate penetration of any materials through which it is driven in the normal course of its utilization.

50 It will be seen from Figs. 3 and 4 that the pointed end portion 16 will bend readily because of its narrowing width. A score line 17, shown in dotted lines in Figs. 3 and 4 may be disposed, if desired, in the pointed portion 16 of the clip nail to facilitate bending thereof.

55 Referring to Fig. 4, it will be noted that an end limit 18 of the pointed portion 16 of the clip nail is curved inwardly in the same direction as the direction in which a head portion 20 is disposed relative to the shank portion 12. It is obvious that the pointed portion may curve 60 outwardly and the resulting clip nail would also perform to advantage. However, all clip nails used in a single roofing installation should have uniform structural characteristics to facilitate replacement and initial installation of the same. The head portion 20 of the clip nail 10 may 65 also have the reenforcing rib 14 disposed therein and has the obvious functions of facilitating the driving of the clip nail through layers of materials to which the nail is to be secured and also securing the sheeting to the decks once the nail is driven into place.

70 Referring now to Fig. 1, a usual type of roof construction employing overlapping deck sections is illustrated with which the provided clip nail may be utilized. As previ-

ously mentioned each roofing deck 22 has one edge end limit which substantially defines an upturned U 24. An arm 25 of the U 24 which defines the distal end portion of one edge of the deck 22 is shorter than an opposed arm 27 which defines the other arm of the deck U edge 24. Each deck also has reinforcing ribs 23 running along the length thereof as seen in Figs. 1 and 2. The two arms 25 and 27 are spaced apart by a bight portion 28. Each U-shaped end limit 24 of each roof deck 22 is adapted to interlock with a depending edge 26 of an adjacent roof deck. As will be noted from Fig. 2, the depending edge 26 is disposed at an angle slightly greater than 90° to the remaining portion of the roof deck.

In the normal course of assembly, the bight portion 28 of each roof deck is welded or otherwise fixedly secured to a supporting member such as a beam 32 illustrated in Figs. 1 and 2. A second roof deck section is relatively disposed so as to have its angular edge 26 depend into and rest on arm 25 of the U-shaped trough 24 of an adjoining roof deck section so that the relationship illustrated in Fig. 2 is assumed. The bight portion 28 thereof is then welded to the supporting beam 32 and a fixed relationship between two roof deck sections is had. Layers 34 of insulating material which may be of fiber glass, asbestos or other equivalent materials of composition are then disposed over the interlocking roof decks.

The clip nails 10 are then disposed over the interlocking edge portions of the roof decks and driven downwardly. The curved end limit 18 of each is readily bendable. The latter end limit will abut against the stop surface or bight portion 28 of each roof deck edge, curve in the predetermined direction of curvature which will be the direction in which the head portion of each clip nail is disposed relative to the shank portion thereof, and wrap itself about the distal end limit of the roof deck edge 26 disposed in the U-shaped edge end portion of the adjacent roof deck. It is obviously from Fig. 2 that the layers of insulation 34 are thus fixedly secured to the roof deck sections and may not move relative to the decks.

It has been found that if the insulating sheets are composed of light materials such as glass wool, the clip nail should preferably also be composed of a thin gauge readily bendable material such as aluminum. If clip nails are employed which are bendable only with the application of a large axial thrust, slipping of such nails from the vertical position occurs in the course of insertion which renders proper assembly most difficult. Consequently, clip nails of substantial thickness or clip nails which are otherwise bendable only with difficulty should preferably be employed only with dense or hard insulating materials.

It is apparent that a clip nail construction has been provided which is simple in design, readily insertable, and requires no special tool in the course of the utilization thereof. The formation of each clip nail is obviously simple, requiring merely a blanking and a forming operation.

Although the clip nail 10 has been described and illustrated for use in securing asbestos sheeting, gypsum board, insulation board, etc. to sheet metal roofs, it is apparent that the nail 10 is adapted for use in floor and siding constructions as well as other type constructions in which a layer of material able to be penetrated by the clip is secured to a supporting surface. The supporting surface must obviously be used in combination with a stop surface for bending the end limit of the clip nail and a depending surface around which the clip nail end limit will lock.

Since modifications may be made in the illustrated clip nail construction which will still remain within the ambit of the inventive concepts herein disclosed, it is intended, therefore that this invention be limited only by the scope of the appended claims.

I claim:

1. In a joint construction, a plurality of interlocking deck members having one projecting lateral edge and one U-shaped edge defining opposed edge portions thereof, said lateral edge of one deck being interlockingly received within the U-shaped edge of an adjacent deck, said projecting lateral edge being disposed at an angle of greater than 90° to the horizontal in the normal joint assembly whereby said edge may be supported by means of a line contact on the distal edge of said U-shaped edge, the distal end of said lateral edge terminating adjacent the bottom of said U-shaped edge, sheet materials disposed on said interlocking decks, and clip nail means having a readily bendable end portion traversing said sheet portion, said readily bendable end portion being disposed over a bottom surface portion of the U-shaped edge and about the terminal edge of said projecting lateral edge in the normal position of assembly, the interval between the projecting lateral edge end limit of said one deck and the surface of the U-shaped edge of said adjacent deck being greater than the thickness of said readily bendable clip nail end portion, whereby said clip nail end limit may readily bend upon striking the bottom surface of said U-shaped edge, pass through said interval and interlockingly engage the terminal edge portion of said projecting edge.

2. In a joint construction, interlocking deck members, each of said deck members having one edge end limit disposed downwardly at an angle of slightly greater than 90° to an attached substantially planar deck portion, each of said decks having a second edge end limit defining an upturned U, said decks being interlocked by means of the downwardly disposed edge of one deck in an upturned U of an adjacent deck, said downwardly disposed edge engaging the distal edge of said U portion, the distal end of said deck downwardly disposed edge being spaced from the surface of said U edge, sheet materials disposed on said deck members, a clip nail securing said sheet materials to said decks and having a shank portion and a head portion angularly disposed thereto, a reinforcing rib formed in said head and shank portions, said clip nail having a readily bendable terminal end limit joined to said shank portion, the interval between said downwardly disposed deck edge end limit and the surface of said U-edge in which disposed being greater than the thickness of said readily bendable clip nail terminal end limit, whereby said clip nail bendable end limit may traverse said sheet materials, strike the surface of said U-shaped edge and curve around the edge end limit of said downwardly disposed edge end limit and interlockingly engage therewith upon the exertion of a downward axial thrust on said clip nail in the normal course of joint assembly, said clip nail readily bendable end limit being curved about the edge end limit of said downwardly disposed edge in interlocking engagement.

3. In a joint adapted to secure sheet materials to a metal roof, a plurality of interlocking deck members comprising said roof, sheet materials disposed on said deck members, each of said deck members having a projecting edge and a substantially U-shaped edge, said deck members interlocking by means of a projecting edge of one deck disposed in a U-shaped edge of an adjacent deck, said projecting edge contacting and being supported by the distal edge of said U-shaped edge, said projecting edge forming a downwardly tapering side of a channel formed with said U-shaped edge in which disposed, the distal end of said tapering side being spaced from the inner surface of said U-shaped edge, and clip nail means having a readily bendable terminal portion adapted to curve in a predetermined manner upon striking a stop surface after an axial thrust is exerted thereon, said clip nail means traversing said sheet materials and engaging a stop surface in said U-shaped edge by means of said readily bendable terminal portion, the interval between said projecting edge and the surface of said U-shaped

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edge in which disposed being greater than the thickness of said readily bendable clip nail terminal portion where-
 by said clip nail terminal portion may readily bend upon striking the stop surface of said U-shaped edge and traverse the interval between the projecting edge end limit and the U-shaped edge in the normal course of joint assembly, said clip nail terminal portion being curved about said projecting edge distal end limit in interlocking engagement.

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