

Oct. 10, 1961

R. A. SNYDER

3,003,386

SHEET METAL NAIL WITH SPREADING LEGS

Filed April 30, 1958

FIG. 1

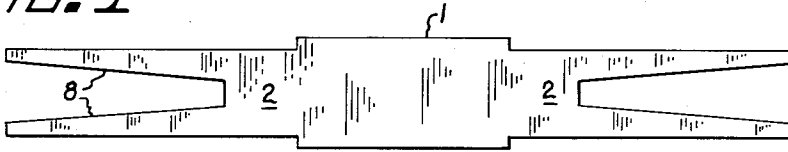


FIG. 2

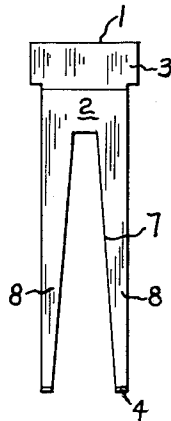


FIG. 3

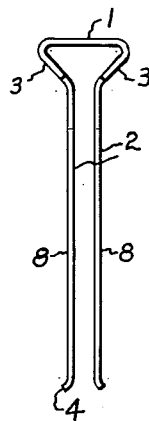


FIG. 4

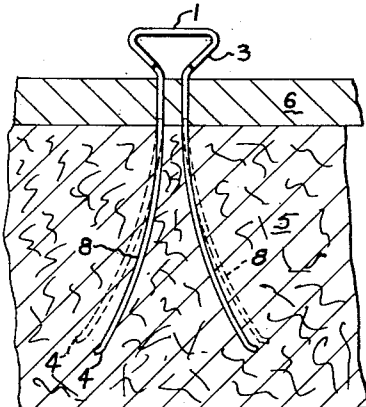
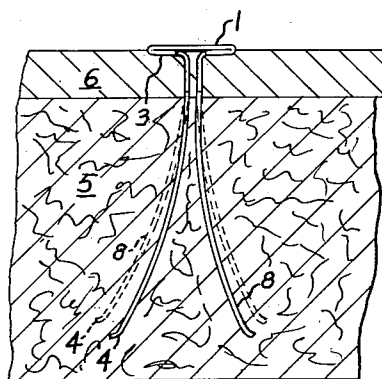


FIG. 5



INVENTOR.

RICHARD A. SNYDER

BY

J. S. Murray
ATTORNEY

1

3,003,386

SHEET METAL NAIL WITH SPREADING LEGS

Richard A. Snyder, Detroit, Mich., assignor to Crescent Brass and Pin Company, Detroit, Mich., a corporation of Michigan

Filed Apr. 30, 1958, Ser. No. 731,974

1 Claim. (Cl. 85—13)

This invention relates to nails formed from blanks of sheet metal or the like, such a nail comprising a pair of legs adapted to diverge responsive to a driving force, and to thus strongly resist extraction.

An object of the invention is to form such a nail with a pair of legs, similarly slotted upwardly from their free ends and thus forming two pairs of prongs, the prongs of each leg diverging materially from those of the other leg when the nail is driven, and the two pairs of prongs being free to assume different divergencies.

Another object is to form the mid portion of a blank stamped from sheet material with a head comprising upper and lower plys, the lower ply being in two halves and having a pair of adjoining legs extending respectively downward from the respective halves, the head having a width exceeding that of the legs to establish a seal against any flow of fluid beneath the heads.

These and various other objects are attained by the construction hereinafter described and illustrated in the accompanying drawing, wherein:

FIG. 1 is a top plan view of a blank of sheet material from which my improved nail may be formed.

FIG. 2 is a side elevational view of a nail fashioned from said blank.

FIG. 3 is a relatively transverse elevational view of such nail.

FIG. 4 is a view of the nail with its prongs driven into and interconnecting two members, and diverged within one of said members to resist their withdrawal.

FIG. 5 shows the final driven position of the nail, with its head collapsed.

In these views, the reference character 1 designates the rectangular head-forming mid portion of an elongated sheet metal blank and 2 a pair of duplicate legs integrally oppositely projecting from said mid portion. The legs are bent at their junctures with the head portion to extend initially in spaced parallelism transversely to said portion. The head portion is bent transversely thereof to form reinforcing end panels 3 respectively carrying the respective legs and initially converging downwardly at an included angle approximating ninety degrees. The free ends of the legs are bent to diverge slightly from each other, as indicated at 4, so that resistance offered by material receiving the nail will progressively spread the legs apart as they penetrate such material, as best appears in FIGS. 4 and 5. Such figures show a plate of roofing or other building material 5, to which a sheet of waterproofing material 6 is secured by the improved nail. When the panels 3 encounter the sheet 6, they yield downwardly responsive to the impact-receiving mid panel of the head, thus forming the latter with upper and lower plys. Such flexure of the panels 3 shifts the upper portions of the legs toward each other and thus compresses such material of the plate 5 as has been engaged between said portions, such compression being a factor in resisting extraction of the nail. The two-ply head will be embedded in the

2

sheet material 6, flush with the top face of such material, responsive to a final driving impact.

Each of the legs 2 is formed with an elongated slot 7 extending from the free end of such leg, the opposed edges of each such slot preferably converging slightly as they extend upwardly. Thus each leg forms two downwardly tapered prongs 8, respectively opposed to and paired with corresponding prongs of the other leg. As best appears in FIGS. 4 and 5, there may be differential divergencies of the two pairs of prongs resulting from different resistances offered by the plate 5 to advance of the prongs. Provision of the described dual pairs of prongs materially increases retention of the nail in its driven position.

A desirable feature of the described nail is affording the two-ply head a width materially exceeding that of the legs. Thus when the head is finally embedded in the sheet material 6, there is formed a tight seal throughout the periphery of the head. In finishing a roof, it is common to apply to the sheet 6 a coating of tar which is initially molten and highly fluid. A thorough seal at the nail heads is essential to prevent such tar penetrating to and possibly through the plate 5.

The tapering form of the prongs 8, best shown in FIG. 2, is of importance in inducing the desired divergency of each pair of prongs, progressively increasing resistance to such divergency as the penetration of the material 5 progresses. By terminating the slots 7 in a materially downwardly spaced relation to the nail head, flexure of the upper portions of the legs is largely avoided thus spacing the divergent portions of the prongs downwardly from the top face of the plate 5 and assuring an ample thickness of material between said face and the flexed portions of the prongs.

The described nail is particularly useful in affording secure retention in material of low density and commonly of a cellular nature, such material being preferred for many installations because of its lightness and excellent heat insulating property. In such material, ordinary roofing nails would provide no satisfactory connection.

The initial angular relation between the central impact panel of the nail head and the underlying panels 3 is of importance in avoiding collapse of the head before the legs have been fully driven into the plate 5 while affording such collapse after the position shown by FIG. 4 is established. By providing an initial included angle of substantially ninety degrees between the panels 3, such panels quite strongly reinforce the head while the prongs are entering the plate 5, while affording the requisite collapse of the head responsive to impact applied when further advance of the head is resisted by its seating on the sheet 6. The reinforcing effect derived from the panels 3 as the legs penetrate material, largely reduces the likelihood of the head being distorted due to any lateral component of applied impact.

What I claim is:

A nail formed from an elongated blank of sheet material and having a head formed by the mid-portion of such blank and having a pair of flexible elongated legs respectively formed by the respective end portions of the blank and extending similarly downward from the head in spaced substantially parallel relation, the length of said legs materially exceeding their width, each leg having a slot upwardly extending from its lower end and terminating in the upper portion of such leg, said slots being progres-

sively reduced in width as they extend upwardly, said slots dividing each leg into a pair of relatively flexible elongated prongs, each prong progressively increasing in width from its lower end toward its upper end, and the lower end portion of each prong being bent to downwardly diverge from the longitudinal axis of the nail, whereby the legs will spread apart as the nail is driven, thereby resisting withdrawal of the nail, said head comprising a central panel to receive driving impact, and a pair of panels having upper ends integrally connected to opposite ends of the central panel and bent to converge downwardly toward said legs and to underlie said central panel, the width of said pair of panels exceeding the width of the legs, whereby shoulders are formed at the junctions of said panels and said legs.

5

10

15

References Cited in the file of this patent

UNITED STATES PATENTS

1,608,773	Crippen	Nov. 30, 1926
2,132,295	Hawkins	Oct. 4, 1938
2,150,788	Shippee	Mar. 14, 1939
2,369,961	Gisondi	Feb. 20, 1945
2,745,308	Gisondi	May 15, 1956
2,895,369	Andersen	July 21, 1959

FOREIGN PATENTS

302,765	Great Britain	Dec. 27, 1928
306,052	Italy	Feb. 23, 1933