July 17, 1951 R. L. HALLOCK 2,560,643

NAIL WITH SPREADING POINTS

Filed Aug. 1, 1945

Fig. 3.

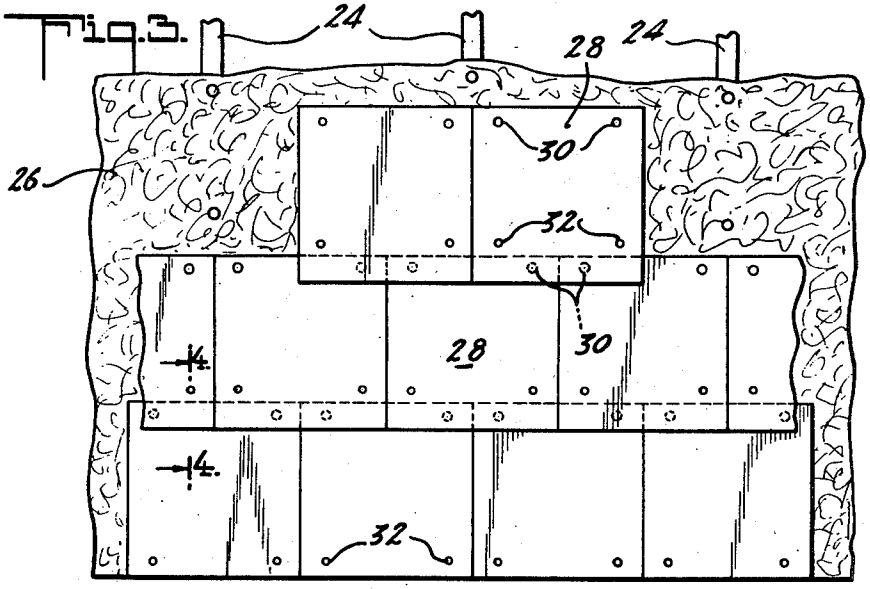


Fig. 5.

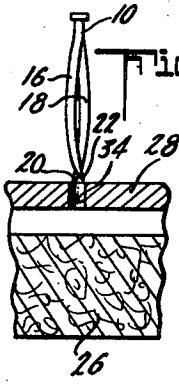


Fig. 6.

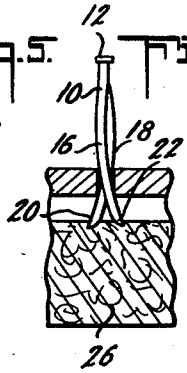


Fig. 7.

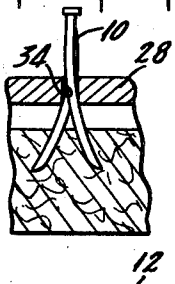


Fig. 8.

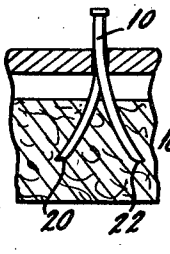


Fig. 9.

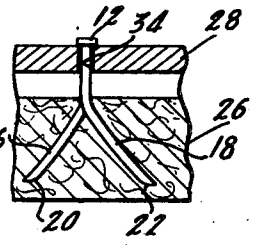


Fig. 1.

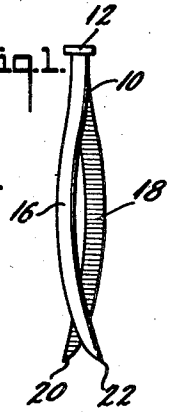


Fig. 2.

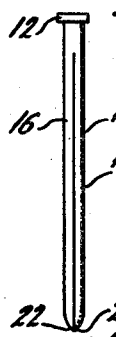
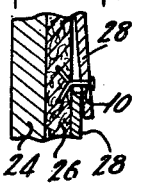


Fig. 4.



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NAIL WITH SPREADING POINTS

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Application August 1, 1945, Serial No. 608,190

1 Claim. (Cl. 85—31)

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The present invention relates to fastening devices and has particular reference to nails. Still more particularly the invention relates to nails for attaching bodies of relatively hard or firm material to bodies of soft and relatively weak material such as fibrous wall board building material and the like, in which ordinary nails do not have adequate holding power. The general object of the invention is to provide a new and improved form of fastening device, specifically a nail, which is of simple integral construction, which may be as readily manufactured and sold substantially as cheaply as the ordinary wire nail and which, when driven into soft material in accordance with its intended use, is capable of holding in such material against substantial stress of the order which would pull an ordinary nail from such material. Other and more detailed objects will hereinafter appear.

The invention is particularly useful for the retention of building shingles of slate or other hard material such as compressed asbestos or the like, when applied to side walls of buildings formed by any of the numerous relatively soft fibrous wall boards or other insulating material now commonly used for inner side wall construction and will accordingly be described in connection with such use although it is to be understood that the invention is applicable to many other uses.

In the drawings forming a part hereof:

Fig. 1 is a side elevation of a nail embodying the principles of the invention;

Fig. 2 is a side elevation of the nail of Fig. 1 taken at right angles to Fig. 1;

Fig. 3 is a fragmentary side elevation of one application of the invention to building construction;

Fig. 4 is a fragmentary section taken on the line 4—4 of Fig. 3; and

Figs. 5 to 9 inclusive are fragmentary views showing the action of the nail when driven in accordance with its intended use.

Referring now to Figs. 1 and 2, the nail designated generally at 10 comprises a head 12 and a shank portion 14 which in the example shown is bifurcated to provide two prongs 16 and 18 which, as will be observed from Fig. 1, are symmetrically bowed outwardly from the axis of the nail from their penetrating pointed ends 20 and 22 to the place where they are united near the head end of the shank. As will be observed from these figures, the penetrating ends of the prongs are in juxtaposed relation to present a substantially single or common penetrating end for the nail.

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Referring now more particularly to Fig. 3, a form of building construction for which the nail of the invention is particularly applicable is illustrated. In this figure the side wall of a building is shown which comprises a series of spaced vertical studs 24 of wood or other suitable material to which is nailed or otherwise secured a sheathing 26 of fibrous wall board or other soft material.

The outer surface of the wall is formed by shingles 28 which may be of compressed asbestos or other hard material and which are provided with preformed nail holes near their margins for the reception of nails or other fastening devices. In the example shown the shingles are laid in the usual over-lapping relation and the principal holding power for sustaining the weight of the shingles and for retaining them against the sheathing may be provided by any one of a number of known fastening devices indicated at 30 and passing through the upper portions of the shingles which are masked by the lower edges of the row of shingles next above. One such device is disclosed and claimed in my co-pending application Serial No. 519,729 filed January 26, 1944, now U. S. Patent No. 2,498,627 granted February 21, 1950, but devices of the kind used for the purpose of providing the principal support are ordinarily considerably more expensive than ordinary nails and, moreover, frequently require heads of a size or shape not desirable, from the standpoint of appearance, for exposure.

When shingles are laid in the usual manner as illustrated, it is highly desirable, if not essential, particularly when the shingles are attached to soft material, to employ other fastening means than that which can be applied to the masked upper ends of the shingles. This is particularly true in the case of slate or composition shingles which frequently are laid with a much smaller amount of over-lapping than is the case with the usual wooden shingle. The reason for this is that, particularly with small over-lapping, air pressure due to strong winds is likely to loosen or even rip strongly fastened shingles from their foundation because of the leverage which such pressure under the lower portions of the shingles can exert on shingles fastened only adjacent their upper margins. To eliminate this possibility, holding means for retaining the shingles against their foundation at or near their lower margins is highly desirable and this holding means must be exposed. This is accomplished in the present instance by utilizing the nail of this invention which, in the example illustrated,

is applied at 32 near the lower marginal edges of the shingles but above the line of the upper margin of the next lower row of shingles.

As previously noted, the shingles are provided with pre-formed nail holes, one such hole being indicated at 34 in Figs. 5 to 9.

By reference to these figures, the action of the nail in providing a firm fastening in the soft material 26 will be largely evident. As seen from Fig. 5, the size of the nail 10 will be chosen with reference to the size of the nail hole 34 so that the penetrative end of the nail will freely enter the aperture. The extent to which the prongs are bowed is, however, greater than the diameter of the aperture and as the nail is driven the bowed prongs will be progressively guided by the walls of the aperture in oblique opposite directions so that when the nail is driven home the prongs will have been bent as shown in Figs. 6 to 9. The guiding action of the aperture through which the nail is driven is aided by the natural tendency of the material 26 to further separate the prongs as soon as they have been started in the material in oblique paths but with many of the very soft materials now being employed for building purposes this effect is of minor importance compared with the guiding or cam action of the aperture in the hard material through which the nail first passes.

The nail may be made of any suitable malleable material capable of being readily bent and for the purposes of a finishing nail, such as the example above described, copper or other nonferrous and malleable metal or alloy provides a highly satisfactory material.

I have found from actual test and experiment that a copper finishing nail of substantially the proportions illustrated, when driven through a suitable aperture in a hard shingle of approximately one-quarter inch thickness into very soft material such as that commercially known as Celotex, will separate approximately as shown in Fig. 9 and that in even this very soft material a relatively small nail comparable to the usual wire finishing nail of an inch to an inch and a half in length will afford substantial holding power requiring stress of the order of twenty to twenty-five pounds to pull it from the material. While for the purposes of illustrating the invention I have shown a bifurcated finishing type of nail, it will be apparent that the number of prongs is not necessarily limited to two and that other forms of head portion may be employed. Also, it is to be understood that the invention is not confined in its use to a nail alone but that the principles of the invention may be applied to other devices embodying prong shank portions operative, in accordance with the principles of the invention, to imbed themselves and hold in soft material when the device of which they form a part is driven or otherwise forced home. It will also be evident that the specific configuration to which the prongs are spread may be varied, but it is to be noted that it is preferable that the prongs be bent so as to be substantially symmetrical with respect to the longitudinal axis of the shank in order to facilitate driving the shank home without tendency for the portion which has not entered the material to bend laterally.

It will therefore be understood that the scope of the invention includes all forms of device falling within the scope of the appended claim.

What is claimed is:

A nail of malleable material for securing a first body of relatively hard material having a preformed aperture therein to a second body of relatively softer material, said nail comprising a shank portion bifurcated to provide two adjacent prongs extending from the penetrative end of the nail for a substantial distance along the length of the nail, said prongs having sharpened juxtaposed ends capable of entering said aperture and said prongs being bowed outwardly away from each other in the plane of bifurcation, the penetrative end of each prong lying to the side of the axis of the nail opposite that to which the prong is bowed, said prongs being bowed to an extent such that the transverse distance across the prongs at a place intermediate their ends is greater than the diameter of said aperture to cause said bowed portions to be engaged by the wall of the aperture when the nail is driven therethrough to thereby move the intermediate portions of the prongs toward each other in the plane of bifurcation and cause the penetrative ends of the prongs to follow obliquely diverging paths in said plane in said second body of material.

ROBERT LAY HALLOCK.

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