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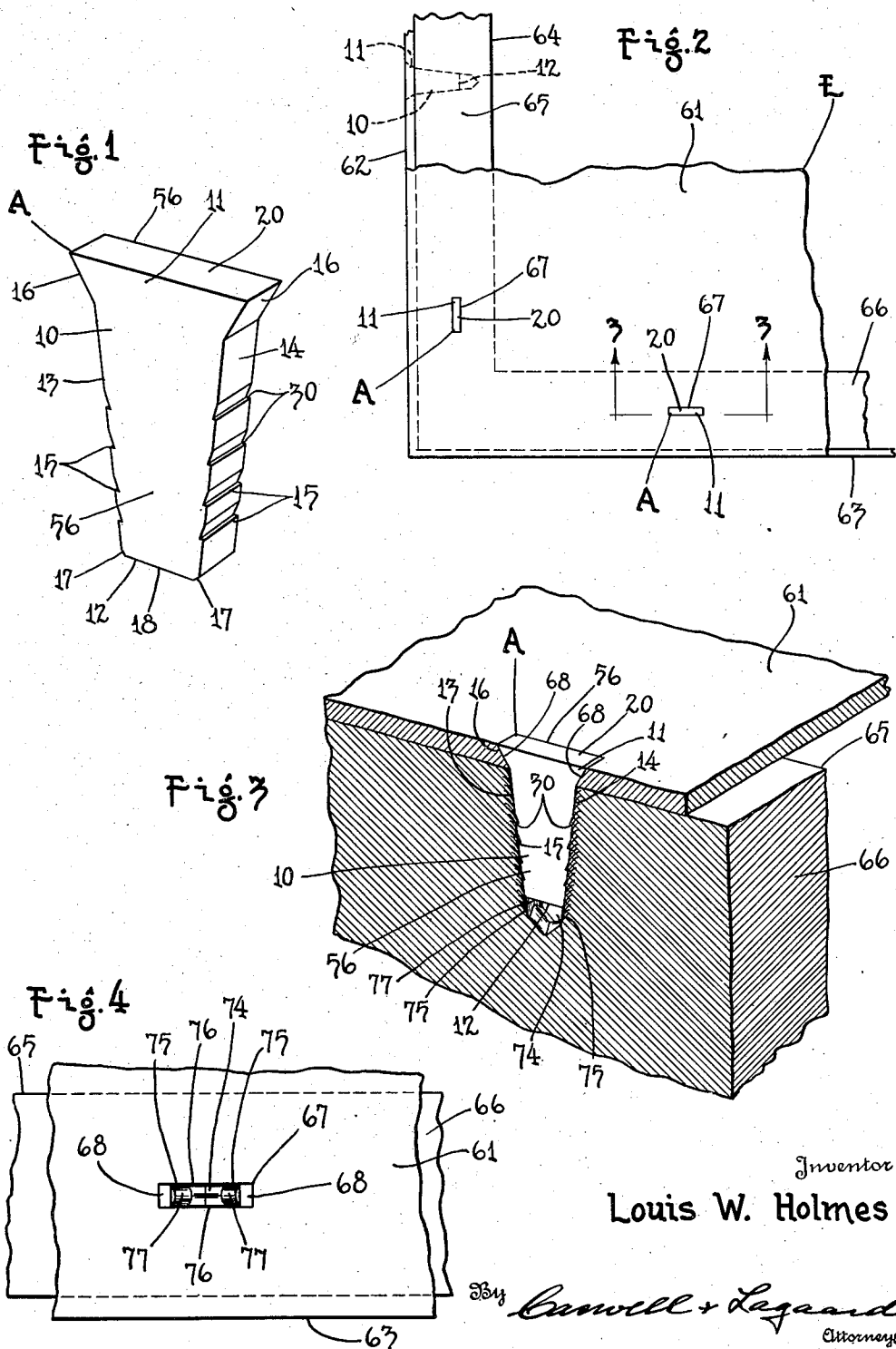
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NAIL AND METHOD OF APPLYING THE SAME

Filed April 8, 1943

2 Sheets-Sheet 1



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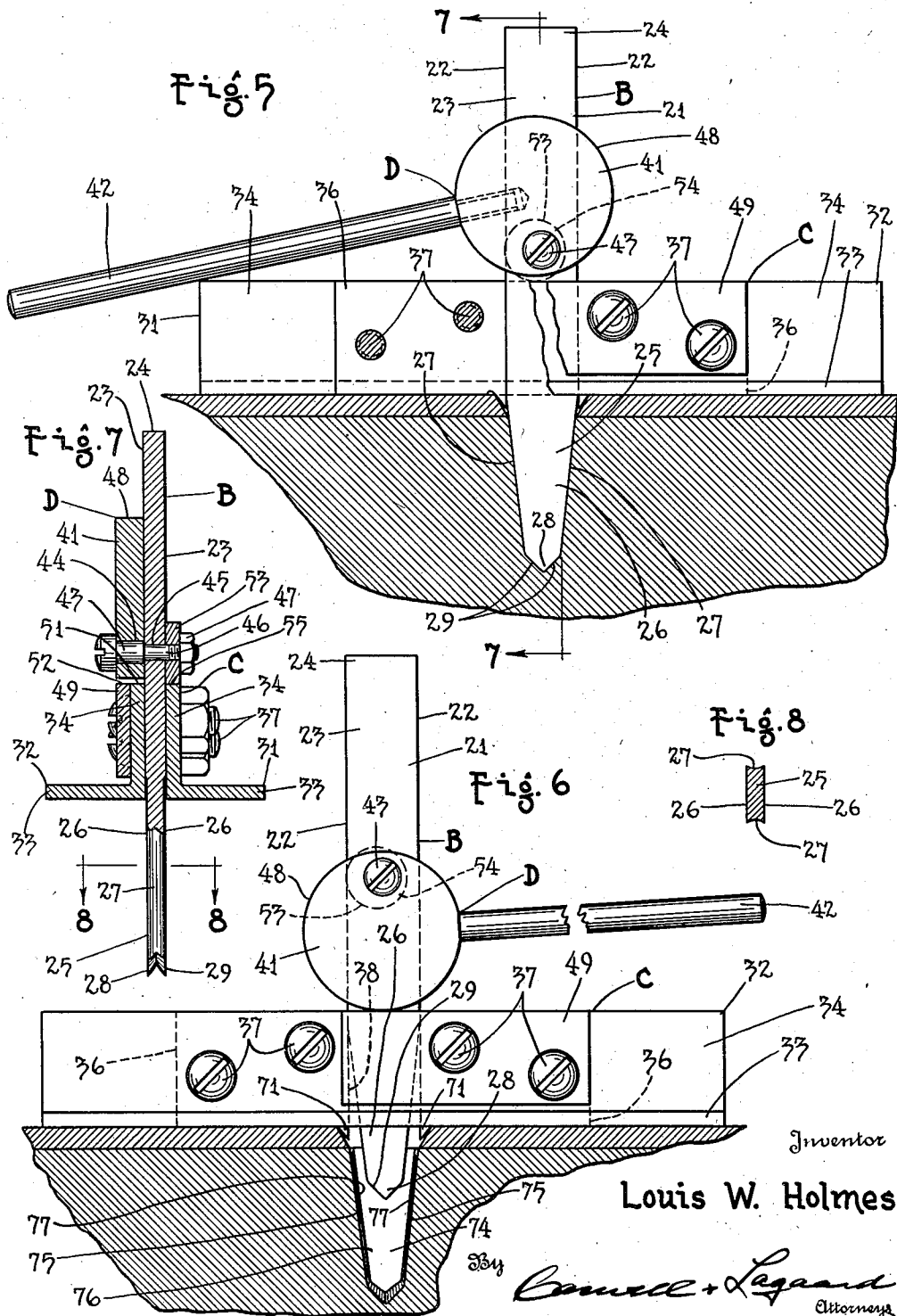
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,373,311

NAIL AND METHOD OF APPLYING THE SAME

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1. Claim. (Cl. 1—1)

My invention relates to nails and the method of applying the same and has for an object to provide a nail constructed of material other than metal and to further provide a simple and practical method of applying the same.

An object of my invention resides in providing a nail which can be constructed out of material such as the phenol formaldehyde materials, asbestos-Portland cement materials and similar plastic compositions.

A still further object of the invention resides in providing a nail which can be constructed from sheet material.

An object of the invention resides in constructing the nail with a plate-like body having tapering lateral edges and in relying principally on the friction at the edges of the nail for holding the nail in driven position.

A still further object of the invention resides in the method of applying the nail, in which a hole is formed in the object into which the nail is to be driven, of a shape corresponding to that of the nail and in which the nail is driven into the hole.

Another object of the invention resides in the method of applying the nail which consists in forming the hole with lateral edges corresponding to those of the nail and having beads thereon projecting inwardly into the hole which method further consists in driving the nail into the hole to cause the lateral edges of the nail to engage the beads and compress the same and create friction between the nail and the object into which it is driven through the beads.

Another object of the invention resides in providing a punch for forming the holes in the object into which the nail is to be driven, said punch being constructed to conform in shape to that of the nail and having a plate-like body with tapering lateral cutting edges and a tip formed with penetrating edges merging into the lateral edges.

Another object of the invention resides in constructing the punch with the surfaces of the lateral edges concave in form.

Another object of the invention resides in constructing the punch with the surfaces of the penetrating edges V-shaped in form.

A still further object of the invention resides in providing a guide for cooperation with the punch to guide the punch during entry into the object into which the nail is to be driven.

A still further object of the invention resides in providing an extracting device associated with the punch and cooperating with the guide for

withdrawing the punch from the hole formed thereby.

An object of the invention resides in providing stop means acting between the guide and tool for limiting the penetration of the punch into the object in which the hole is to be made.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is an enlarged perspective view of a nail illustrating an embodiment of my invention.

Fig. 2 is a plan view of a portion of a container illustrating the method of using the nail.

Fig. 3 is an enlarged sectional view taken on line 3—3 of Fig. 2 and drawn to a greater scale.

Fig. 4 is a plan view of a portion of the structure shown in Fig. 2, drawn to a greater scale and illustrating the formed hole prior to the reception of the nail.

Fig. 5 is an elevational sectional view of the tool and guide therefor showing the punch in its fully driven position.

Fig. 6 is a view similar to Fig. 5 showing the punch partly withdrawn from the object in which it has been driven.

Fig. 7 is an elevational sectional view taken on line 7—7 of Fig. 5.

Fig. 8 is a cross-sectional view taken on line 8—8 of Fig. 7.

My improved nail, indicated in its entirety by the reference character A is shown in detail in Fig. 1 and is constructed from sheet material.

This nail comprises an elongated plate-like body 10 having a driving head 11 formed at one end thereof and an entering tip 12 at its other end. The body 10 has tapering edges 13 and 14 whose surfaces are planiform and which converge from the head 11 toward the tip 12. In the edges 13 and 14 may be formed serrations 15 which serve to assist in retaining the nail in position when the same is driven. The head 11 is formed with shoulders 16 which cause the head to extend outwardly beyond the body 10 and to engage the member attached to the object to which the nail is to be applied. The tip 12 may have converging edges 17 and a square lower edge 18, or the same may be constructed with only the edge 18.

This edge may be square, as shown, or tapering to fit the tool, as desired. The faces 56 of the nail are planiform and parallel and are continuous throughout the body, head and tip of the nail.

In order to apply the nail A to the object to

which it is to be secured, a hole is formed in said object by means of a tool B best shown in Figs. 5, 6 and 7. This tool comprises a shank 21, plate-like in form with parallel edges 22 and parallel faces 23. The shank 21 is provided with a driving head 24 at its upper end and with a punch 25 at the lowermost end. Punch 25, similar to the shank 21, is constructed with parallel faces 26 and tapering edges 27 which converge from the shank 21 toward the tip of the tool which is indicated by the reference numeral 28. The shape of the punch 25 corresponds to that of the body 10 of the nail A. The tip 28 of the punch 25 is formed with penetrating edges 29 which are arranged in converging relation and which merge into the edges 27 of the punch. The surfaces of the edges 29 are V-shaped in form, as shown in Fig. 7, while the surfaces of the edges 27 are concave, as shown in Fig. 8. Edges 29 serve as penetrating edges for starting the tool in the object and the edges 27 serve, in continuation of said edges 29, to cut into the material of the object as the tool is driven into the same.

To facilitate the proper driving of the punch 25 into the object, a guide C is employed which is best shown in Figs. 5, 6 and 7. This guide consists of two angle shaped frame members 31 and 32 which are arranged with the bases 33 thereof in coplanar relation and with the legs 34 thereof spaced from one another an amount equal to the thickness of the tool B. For holding the two frame members 31 and 32 in proper spaced relation, two spacer blocks 36 are utilized. Bolts 37 pass through the legs 34 of the frame members 31 and 32 and through the spacer blocks 36 and hold the parts assembled. Said spacer blocks are spaced apart a distance equal to the width of the shank 23 to form a way 38 extending through the guide and along which the tool B may travel as the same is driven into the object to which the nail is to be applied.

For the purpose of removing the tool after the same has been driven into the object, an extractor, designated by the reference numeral D, is employed which comprises an eccentric 41 having a handle 42 secured thereto. Eccentric 41 is pivoted on a stud 43 which extends through a hole 44 in said eccentric and through another hole 45 in the shank 21 of tool B. The said stud is formed with a threaded shank 46 which passes through the hole 45 and which is provided with a nut 47 by means of which the stud 43 may be held in position. The hole 44 is eccentric with respect to the center of the eccentric 41, as shown in Figs. 5 and 6. When the handle 42 is raised from its position shown in Fig. 5 and swung over to its position shown in Fig. 6, the edge 48 of said eccentric engages the upper edge 51 of the leg 34 of frame member 32 and causes the tool B to rise along the way 38 and the punch 26 to be extracted from the object into which the same has been driven. To assist in reducing wear, a wear-plate 49 is applied to the leg 34 of frame member 32 by clamping the same under the bolts 37 which attach the leg 34 in place. The wear-plate 49 has a surface 52 which is coplanar with the surface 51 and which, together with the surface 51, provides sufficient bearing surface for engagement with the surface 48 of eccentric 41.

The depth to which the punch 25 may be driven is limited by an adjustable stop device 53 which consists of a small eccentric 54 mounted on the shank 46 of stud 43. This eccentric engages the upper edge 55 of the leg 34 of frame member 31 and limits the depth of penetration of the punch

25. Said eccentric may be rotated to slightly vary the depth of penetration of the tool.

In order to illustrate the method of applying the nail and of utilizing the tool to form the hole in the object in which the nail is to be driven, I have shown in Fig. 2 a portion of a box E. This box includes a top 61, a side wall 62 and an end wall 63. These walls are constructed from sheet material which are attached to a frame 64, of which the upper frame members 65 and 66 are shown. Frame members 65 and 66 are constructed preferably of dimensional lumber and are secured together at the corners and to one another in any suitable manner as is now well known in the art. Before the sheets comprising the walls 61, 62 and 63 are applied, the same are provided at suitable intervals with rectangular holes 67 which are formed with tapering ends 68 conforming to the inclination of the edges 16 of the driving head 11 of nail A. The holes 67 are so shaped that the said heads 11 fit snugly within the same with the uppermost surface of the head 20 of the nail A flush with the outermost surface of the sheets forming the walls 61, 62 and 63. A number of the nails A are illustrated in Fig. 2 as having been driven in place.

The method of using the tool B is as follows: The blocks 36 of the guide C are formed with legs 71 which are adapted to be received in the ends of the holes 67 in the sheets to be attached. These legs serve to properly position the guide so that the holes to be formed in the object to which the nails are to be applied, which in this case are the frame members 65 and 66, will be in the proper position. In applying the sheet 61, the same after holes 67 have been formed therein is placed upon the frame members 65 and 66 in proper position. The guide C is next placed over one of the holes 67 in the sheet with the legs 71 received therein. The tool B is then inserted in the way 38 with handle 42 and eccentric 41 in the position shown in Fig. 5 and the said tool driven into the frame member 65 or 66 as the case may be, by means of a hammer applied to the head 24 of said tool. When the stop 53 reaches the surface 55 of the frame member 31, the penetration of the punch into the object is terminated. Upon termination of the driving operation, the handle 42 is moved from the position shown in Fig. 5 to that shown in Fig. 6, whereupon the punch 25 is raised and practically removed from the object. Thereafter the punch may be easily withdrawn when the guide C and the tool B are lifted upwardly. When the tool B is removed, a hole 74 is formed in the object which has tapering edges 75 and parallel lateral surfaces 76. Due to the construction of the edges 27 of the punch 25, beads 77 are formed in the object along the edges 75 which project inwardly into the hole 74 from the said edges thereof.

The method of applying the nail consists in first forming the hole in the object in which the nail is to be driven, as described and then inserting the nail into the hole and driving the same by applying force to the surface 20 of the head 11 thereof by means of a hammer or any other suitable device. As the nail A passes into the hole 74, the lateral edges 13 and 14 of said nail engages the beads 77 and compress the same. During such action, the fibers of the object into which the nail is driven are dragged along with the nail in a manner indicated in Fig. 3. This causes the fibers to project downwardly as shown and when they fall opposite the notches 15 in the surfaces 13 and 14 of the nail, the fibers spring

back and engage the shoulders 30 formed by said notches, thereby assisting in holding the nail in position. The friction between the surfaces 13 and 14 and the beads 77 additionally assists in holding the nail in position.

The advantages of my invention are manifest. Where the sheets forming the walls of the structure on which the nail is to be used are formed of phenol formaldehyde products or asbestos-Portland cement products, the nails can be constructed of the same material. If desired, the said nails may be formed from the identical sheets from which the walls are constructed. In this manner, the disadvantages resulting from differences in expansion and contraction between the nail and sheet to be attached are eliminated. Also the disadvantage of rusting or corrosion of nails ordinarily employed is done away with. The nails of my invention can be constructed at a relatively low expense and are extremely serviceable. With my invention, the nail being of the same material as the wall can be surfaced and

finished with the wall surface without showing, thereby making an extremely neat and attractive construction. The nails can be either formed from sheet material or cast in a molding machine.

5 Changes in the specific form of my invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as
10 new and desire to protect by Letters Patent is:

The method of applying a nail having a plate-like body formed with converging edges to an object, which method consists in forming in the
15 object a hole conforming in shape to that of the body of the nail, and with beads extending along the lateral edges of the hole, and in driving the nail into the hole to urge the lateral edges of the nail into engagement with the heads to compress the same and create friction between the nail and
20 the object through the beads.

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