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WALLBOARD ANCHOR NAIL

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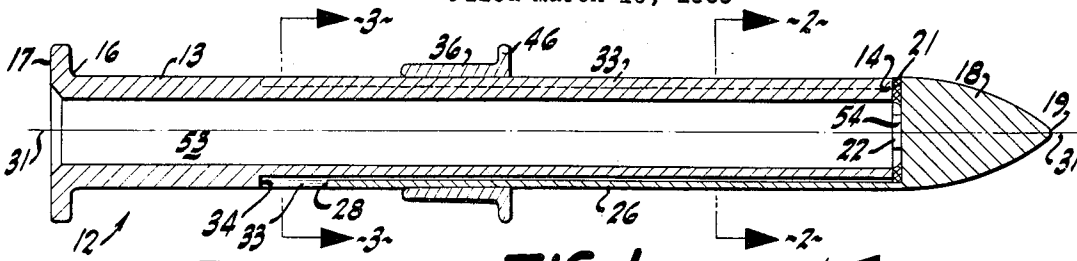


FIG. 1

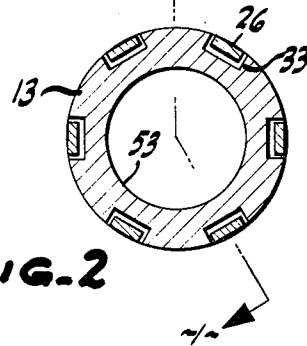


FIG. 2

FIG. 3

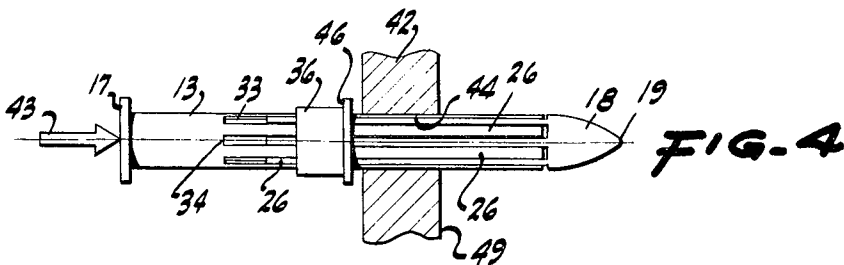


FIG. 4

FIG. 5

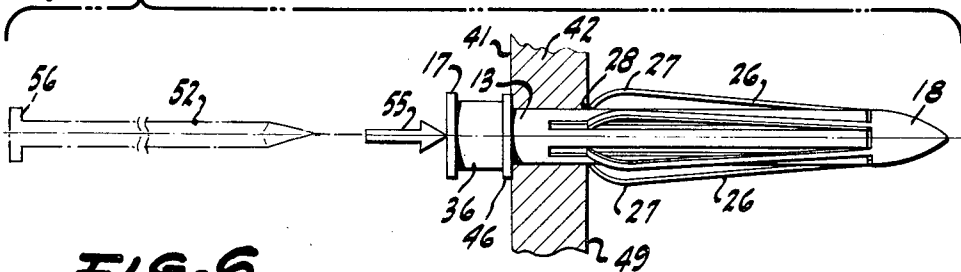


FIG. 6

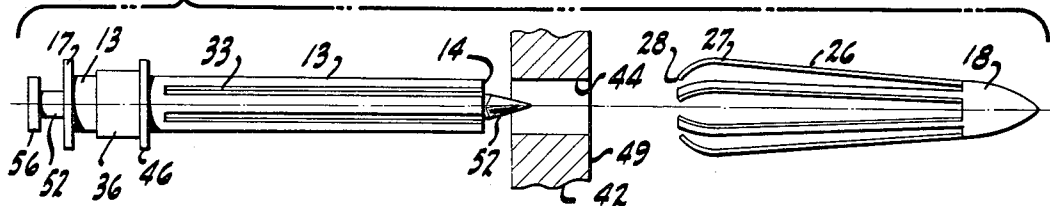


FIG. 7

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4 Claims

ABSTRACT OF THE DISCLOSURE

An elongated, centrally hollowed nail-like structure includes a forwardly extending pointed nose and a flattened base. The peripheral outer walls of the nail device are deeply striated to receive in each striation a tensioned spring wire extending rearwardly from the nose. The after ends of the spring wires are tensioned to flare outwardly and are restrained from doing so by a collar normally encompassing the tensioned, after ends of the spring wires. As the nail is driven into a wallboard, the collar engages the adjacent wall or other surface and is halted as the nail continues to be driven, thereby uncovering the flared portion of the spring wires and allowing the wires to flare outwardly as the nether face of the wallboard is cleared. An elongated impact member can subsequently be inserted lengthwise through the center of the nail and into engagement with the nose. By applying sufficient force, the nose is separated, carrying with it the attendant spring wires and allowing the nail to be taken out of the wall.

The invention relates to improvements in nails which can be anchored in wallboard either to provide a projection from the wallboard upon which articles can be supported or to fasten articles to the wallboard; and, more particularly, to wallboard anchor nails which can subsequently be removed, if desired.

The prior art, as well as the market place, is replete with fasteners of various kinds which can be used to anchor articles to wallboard, such as gypsum board and the like. For the most part these fasteners have been of the screw type, the utilization of which has involved considerable expense both with respect to unit cost and labor.

It is therefore an object of the invention to provide a wallboard anchor device which is of the nail variety as opposed to the screw-type.

It is another object of the invention to provide a wallboard anchor nail which is not only relatively inexpensive but which can also readily be installed.

It is yet another object of the invention to provide a wallboard anchor nail which can be used not only to afford a supporting projection from the wall, but also to secure a variety of items to the wall.

It is a further object of the invention to provide a wallboard anchor nail which is sturdy and reliable.

It is a still further object of the invention to provide a wallboard anchor nail which can subsequently be removed, if desired.

It is an additional object of the invention to provide a generally improved wallboard anchor nail.

Other objects, together with the foregoing, are attained in the embodiments described in the following description and illustrated in the accompanying drawing, in which:

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FIG. 1 is a longitudinal sectional view, the section being taken on the compound planes indicated by the line 1—1 in FIG. 2;

FIG. 2 is a transverse sectional view, to an enlarged scale, on the plane indicated by the line 2—2 in FIG. 1;

FIG. 3 is a transverse sectional view, to an enlarged scale, the plane of the section being indicated by the line 3—3 in FIG. 1;

FIG. 4 is a side elevational view, to a reduced scale, showing one step in the installation of the device in a section of wallboard;

FIG. 5 is a view comparable to FIG. 4 but showing the device in fully installed position, and illustrating in broken line how a conventional nail can be used to dislodge the nose and spring wires should it subsequently be desired to take out the nail;

FIG. 6 is a view comparable to FIG. 5, but showing the separation of the nose and attendant spring wires and the withdrawal of the nail from the wallboard; and,

FIG. 7 is a fragmentary view, to a reduced scale, showing a modified form of collar for especial use in securing a metal plate, or the like, to the wallboard.

While the wallboard anchor nail of the invention is susceptible of various physical embodiments, depending upon the requirements of use, substantial numbers of the herein forms have been made, tested and used, and all have performed in an eminently satisfactory manner.

The nail of the invention generally designated by the reference numeral 12, includes an elongated tube 13 extending from a forward end 14 to an after end 16 and terminating in a flanged head 17 affording a substantial impact surface area to receive the blows of a driving hammer, not shown.

Mounted on the forward end 14 of the hollow tube member 13 is a nose 18 tapered to a point 19.

Although mounting of the nose 18 on the tube end 14 can be effected in several different ways I have found that a ring 21 of a suitable adhesive such as an epoxy resin, affords a very satisfactory and inexpensive bond.

As will later be described in more detail, the bond should be such that upon the application of a sufficient forward impact force against the rear 22, or base, of the nose, the bond will rupture and thereby allow separation of the nose 18 from the tube 13 (see FIGS. 5 and 6).

Anchoring, or resistance to withdrawal, of the nail is afforded by a plurality of longitudinal spring wires 26 mounted on their forward ends to the nose 18 and extending rearwardly to form arcuate portions 27 terminating in after ends 28.

The wires 26 are resilient and are convexly flared, or bowed, as shown, it being understood that the flare could be reversed, i.e. formed with a concave curve in the opposite direction so that the after ends 28 of the wires are at the greatest radial distance from the central, longitudinal axis 31 of the nail.

The spring wires 26 can be of rectangular cross-section as depicted herein (see FIGS. 2 and 3), in which case the longitudinal slots 33, or grooves, or striations, formed along the outer periphery of tube 13 are also of rectangular configuration.

The slots 33 are slightly longer than the spring wires 26, the slots extending from the leading end 14 of the tube rearwardly to an after location 34, as shown, and are sufficiently deep so as fully to receive the thickness

of the wire, whether the wire be rectangular or circular in section.

In the manufacture of the device the spring wires 26 are neatly lodged in their corresponding grooves 33 by the confining action of an encompassing annular member 36, such as the collar shown in FIGS. 1-6, or the ring 37 illustrated in FIG. 7. The annular member 36 in either case is slidable on the tube and is so positioned relative to the resiliently flared portion of the wires as to bias the wires radially inwardly so that the wires are located entirely within their respective slots as appears most clearly in FIGS. 1-4.

Thus, when the point 19 of the nail 12 is placed against the outer surface 41 of a wallboard 42 and is driven in by a hammer, in the direction of the arrow 43 in FIG. 4, the point of the nail penetrates the board 42 and forms an opening 44 therein.

The diameter of the opening 44 is substantially identical with the base diameter of the nose 18 and the tube 13. Consequently, once the nose has penetrated the wall, the tube 13 and the retracted spring wires 26 do not offer any substantial interference to further penetration of the nail. Then, as the flange 46 on the front end of the collar 36 encounters the adjacent outer surface 41 of the wallboard, some slight resistance is encountered, partly as a result of the fairly snug fit of the collar 36 on the outer wall of the tube 13, and partly because of the spring bias of the wires bearing against the inner walls of the collar.

Continued impact on the nail head 17 causes relative motion to occur between the tube and the collar. This is to say, the collar is halted by its engagement with the wall surface 41 whereas the tube continues to penetrate inwardly. At about the relative location of the parts shown in FIG. 5, the trailing ends 28 of the spring wires 26 clear the nether face 49 of the wallboard and under spring urgency expand outwardly as shown. In other words, after the constraining effect of the collar 36 is removed, the walls defining the wallboard opening 44 continue to confine the spring wires until the after ends of the wires are clear of the opening 44, at which juncture they are free to spring outwardly and to assume the nail anchoring condition shown in FIG. 5.

The nail 12 in the FIG. 5 position is securely anchored in that it can no longer move ahead, as a result of the interference between the head 17, collar 36 and the outer wall surface 41, and it can no longer move back because the ends 28 of the expanded wire prevent it by reason of their engagement with the inside face of the wallboard.

At this juncture, the spool-shaped structure formed by the flanged collar 36 and the flange 17 of the nail head affords a very sturdy supporting device.

If, at a later time, it is desired to remove the device from the wall, it is only necessary to take an ordinary nail 52 of adequate length and of sufficiently small diameter to be inserted lengthwise in the elongated axial chamber 53 within the tube and touch the base 54 of the nose 18. Then, by driving a hammer or similar impact tool axially as indicated by the arrow 55 against the head 56 of the nail 52 with sufficient force to rupture the bond between the nose 18 and the tube 13, the nose cone 18 is separated, along with the attendant spring wires 26, from the tube 13.

The nose 18 and attached spring wires 26 thereupon fall downwardly, in the space between the framing studs (not shown), for example, and are abandoned. The balance of the nail is then taken out, as appears, for example, in FIG. 6, leaving the opening 44 in the wallboard 42 as shown. If desired, the opening 44 can be filled, as with spackle to present a neat surface.

In some instances it is necessary to mount an item, such as a plate 61 against and onto the wallboard 42. In this situation there is no need for the elongated supporting collar 36. Instead, the annular ring 37 is utilized to constrain the resilient, flared portion 27 of the spring wires. Thus, when the annulus 37 comes into abutment with the

plate 61 and is halted thereby while the tube 13 continues to be driven ahead by blows on the head 17, the spring wires 26 clear the back face 49 and are released so as to spring outwardly substantially simultaneously with the abutment of the head 17 against the annulus 37.

Other than the shortened collar length, the structure of the FIG. 7 form of device is substantially similar to the embodiment previously described. It is therefore possible to drive an elongated stem, such as the nail shank 52, axially through the central opening in the tube 13 of the FIG. 7 form of device and dislodge the head 18 attached to the tube 13, as before.

It can therefore be seen that I have provided a wallboard anchor nail which is not only inexpensive but which is also readily installed to afford a very secure fastening.

I claim:

1. A wallboard anchor nail comprising:

- (a) a hollow tube having a plurality of exterior longitudinal grooves extending from a forward position to an after location;
- (b) a pointed nose detachably affixed on the forward end of said tube, said detachably affixed nose being capable of being separated from said tube by supervening force exerted by an elongated impact member inserted lengthwise through said tube into engagement with said nose;
- (c) a plurality of spring wires disposed within said grooves and extending from said forward position toward said after location, each of said wires having a resilient, outwardly flared portion formed therein adjacent said after location and having a forward end anchored to said nose; and
- (d) an annular member slidably disposed on said hollow tube, said annular member initially encompassing said resilient flared portion of said spring wires and temporarily confining said portion, the leading end of said annular member being capable of engaging the adjacent surface of a wallboard as said hollow tube is driven into the wallboard, the engagement of said annular member with said surface being effective to halt further movement of said annular member as said hollow tube continues to be driven into the wallboard, thereby uncovering said resilient flared portion and allowing said spring wires to flare outwardly as the after end of said wires clears the nether face of the wallboard.

2. A wallboard anchor nail as in claim 1 wherein the after end of said hollow tube is flanged to afford a head capable of receiving the blows of an impact tool.

3. A wallboard anchor nail as in claim 1 wherein said annular member is a collar flanged on said leading end to afford substantial area for engagement with said adjacent surface of the wallboard.

4. A wallboard anchor nail comprising:

- (a) an elongated impact member extending from a forward end to an after end, and having a plurality of exterior longitudinal grooves formed therein;
- (b) a nose on said forward end effective to penetrate a wallboard;
- (c) a flanged head on said after end;
- (d) a plurality of spring wires carried in said grooves and extending from said nose toward said head, each of said wires having a resilient, outwardly flared portion adjacent the after end thereof; and,
- (e) an annular member slidably disposed on said impact member for successive movement from a first position encompassing said resilient flared portion of said spring wires and temporarily confining said resilient portion, to a second position rearwardly removed from said first position and uncovering said resilient portion of said spring wires, to a third position interposed between said flanged head and the adjacent outer surface of the wallboard as said impact member is driven therethrough, said resilient portion of said spring wires being confined by the

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walls of the nail hole in said second position of said annular member, and being unconfined by said nail hole walls in said third position of said annular member.

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