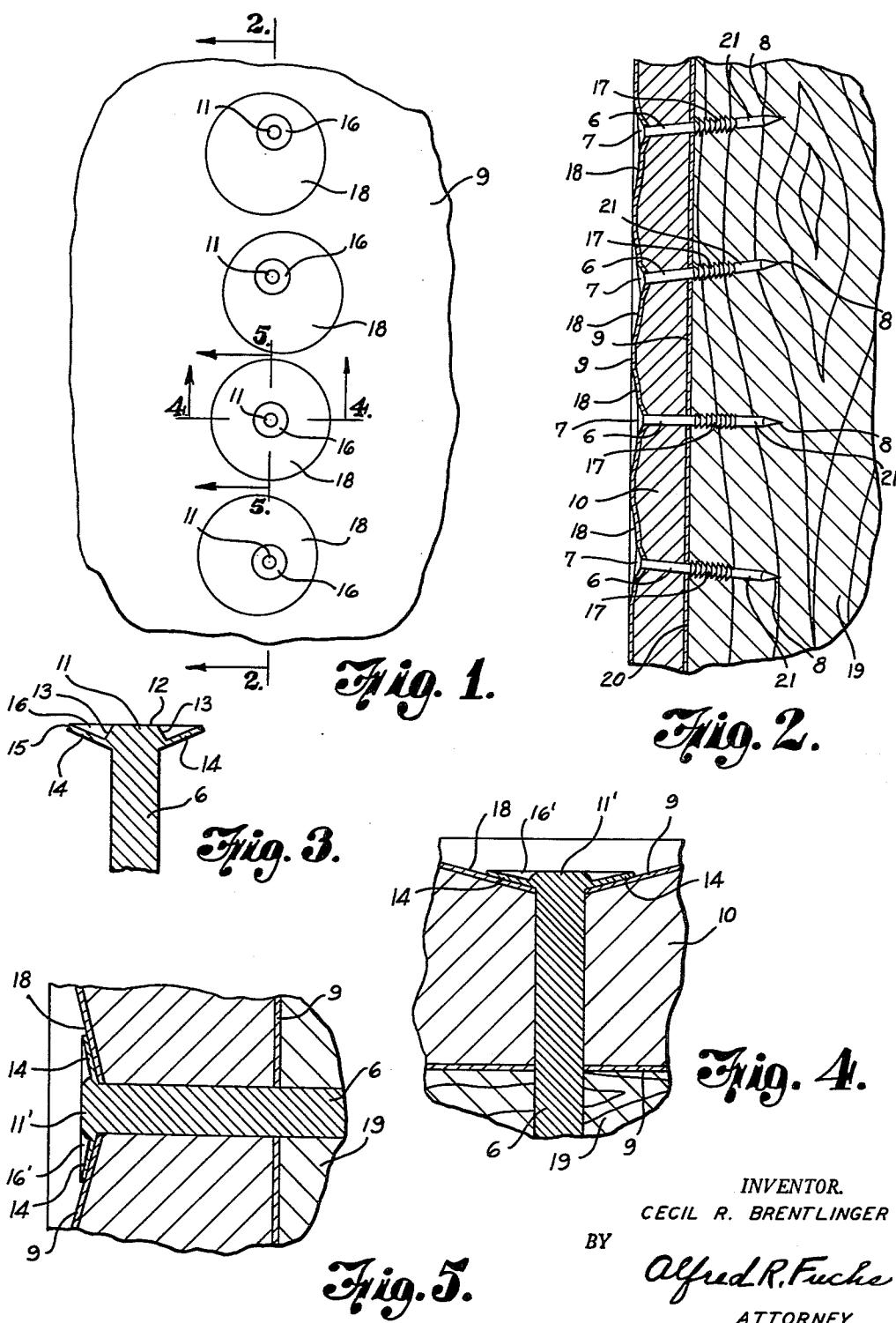


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DRY WALL NAIL WITH A FRUSTO-CONICAL
WALLED HEAD AND A SERRATED SHANK
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My invention relates to nails, and more particularly to nails for use in dry wall construction.

In dry wall construction the joints and the heads of the nails usually have a plastic material applied thereto, to hide said heads and joints and to smooth the wall. It is desirable to have recesses in the face of the wall for the reception of this plastic material in order that it will adhere to the surface of the wall. The recesses provide keying means for the plastic material to prevent its detachment from the surface of the wall. In order to provide such a recess the builder of dry wall construction, in driving the nails into the composition boards that form the wall, intentionally indents the surface with the hammer head to provide a recessed condition. However, if the nail head is flat there will be a flat portion in the wall at the nail head, which will not aid in keying the plastic material to the wall, but will interfere with such keying. It is accordingly a principal purpose of my invention to provide a nail with a head that is recessed and which will remain recessed after the nail has been driven so that the plastic coating or covering material will be keyed to the nail head.

More specifically my invention comprises a nail that has a head that is cup-shaped or recessed, which has means in the recess or cup for preventing flattening of the head when the nail is driven into a dry wall panel. The head is preferably provided with an annular wall that surrounds a central projection, which annular wall flares outwardly from the base of the projection, the projection being provided to receive the blows of the hammer to reduce the flattening action of the hammer on the annular wall, which, due to the provision of such projection, remains flaring although at a somewhat less angle than prior to the hammering action, the central projection being also somewhat reduced due to the blows of the hammer thereagainst.

In the preferred embodiment of my invention the central projection on the head is of somewhat larger diameter at the base thereof than the diameter of the shank of the nail, which provides stiffening adjacent the shank of the nail to reduce the tendency of the flaring annular wall to flatten, and said annular wall is of a frusto-conical character with the smaller end of the wall portion at the base of the central projection. While the central projection may vary somewhat in shape, it preferably is also of a frusto-conical character with a flat outer end and an inclined side wall of a conical character.

By providing a central reinforcement to absorb the shock of the hammer blows, the dished or cupped condition of the nail head is maintained, thus providing an annular keying recess, between the central projection and the flaring relatively thin side wall, for the plastic composition, that is ordinarily applied to joints and nail heads in dry wall construction.

Another important feature of my invention is that my improved nail prevents the popping or bulging of the same because the covering material did not properly adhere to the wall, and because the ordinary nail as usually made will remain in such a position that, as the wood framing to which the composition sheet of the dry wall is nailed, dries out, the shrinkage will cause the nail heads to be protruded beyond their original position with respect to the surface of the composition board. This will cause

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bulging or projecting of the nail heads if the covering plastic material does not properly adhere thereto and will cause the covering material to be bulged or project from its original position on the surface of the wall panel if it remains adhered to the nail head.

This is due to the fact that the pointed end of the nail, whether the shank of the nail is smooth throughout or where gripping means extends to the point of the nail, will be held tightly in the inner moister part of the wooden frame member to which the panel is nailed, while the outer surface portion of the frame member will dry out and shrink. Thus the wall board panel will have a tendency to move inwardly toward the point of the nail as the shrinkage of the wood frame member takes place and cause a corresponding projection of the nail head beyond the position it originally had on the outer surface of the wall panel. If the shrinkage is as little as one sixtieth of an inch it will cause the so-called popping above referred to.

It is accordingly a purpose of my invention to provide a nail that is provided with means that provides a greater gripping power for that portion of the nail that will be in the part of the wooden frame member that dries out, and to provide less gripping power for the portion of the nail that is in the moister part of the wooden frame member. In order to carry out this purpose of my invention, I provide a nail that has a shank portion that is smooth adjacent the point of the nail, and which has a gripping portion, made up of rings that extend around the shank, which will be in the portion of the frame member, near the surface, that dries out, so that as the drying takes place these gripping portions will pull on the nail so as to move the nail in an inward direction with the shrinking wood, so that the head will not be projected beyond the surface of the wall panel because of shrinkage of the frame member. Preferably a smooth portion is provided on the nail from the tip or point of the pointed end portion to the gripping portion, which is substantially equal in length axially of the nail to the gripping portion and a spacing for the gripping portion from the head of the nail is provided that is somewhat greater than the axial length of the gripping portion, to thus place the gripping portion at the right location for it to be positioned in the portion of the wood frame member that dries out.

It is particularly desirable to provide such a gripping ringed portion on the shank of a nail that is provided with a head that remains in a recessed condition after driving so that the smoothness of the wall is maintained by the combined action of the keying by the recessed head and the inward pulling action of the ringed portion to counteract the projection of the nail head due to shrinkage of the wood into which the nail is driven.

Other objects and advantages of my invention will appear as the description of the drawings proceeds. I desire to have it understood, however, that I do not intend to limit myself to the particular details shown or described, except as defined in the claims.

In the drawings:

FIG. 1 is a fragmentary face view of a dry wall panel showing my improved nail applied thereto.

FIG. 2 is a fragmentary section taken on the line 2—2 of FIG. 1.

FIG. 3 is a fragmentary longitudinal sectional view through the head and part of the stem portion of my improved nail.

FIG. 4 is a fragmentary enlarged sectional view taken on the line 4—4 of FIG. 1, and

FIG. 5 is a similar view, taken on the line 5—5 of FIG. 1.

Referring in detail to the drawings, my improved nail has a shank 6, a head 7 and a pointed end 8. The head of my nail is cup-shaped or recessed and has means in

the recess or cup for preventing flattening of the head when the nail is driven into a dry wall panel. Such a dry wall panel is shown in FIGS. 1, 2, 4 and 5, the wall panel comprising surface plies 9 of fibrous material, which may be of a paper-like character, and a body portion 10 of gypsum plaster or similar hard material.

Referring to FIG. 3 it will be noted that the head of the nail is provided with a central projection 11, which aligns with the shank 6 of the nail, and is of larger transverse diameter than the diameter of the shank 6. While the exact shape of the projection 11 may be varied, it preferably has a flat end wall 12 perpendicular to the axis of the shank and inclined side walls 13 that incline away from each other toward the shank 6, the projection 11 thus being of a frusto-conical character, with its base or widest portion adjacent the shank 6 and of greater diameter than height. Said head is also provided with a relatively thin flaring wall portion 14, which inclines in the opposite direction to the wall portion 13, said wall portion 14 being of an annular character and also frusto-conical, having its base or largest diameter portion at the periphery 15 of said head. Preferably the peripheral edge of the flaring wall portion 14 and the outer flat end 12 of the projection 11 are in transverse alignment, or substantially transverse alignment. The flaring wall portion 14 and the central projection 11 define an annular V-shaped groove 16 extending around the head of the nail.

My improved nail is also provided with a gripping portion 17 on the shank thereof between the head 7 and the point 8, said gripping portion being made up of rings that have a V-shaped cross section, with the holding surfaces of each of said rings that extend perpendicularly to the axis of the shank of the nail being directed toward the head 7.

In dry wall construction, the erector of the dry wall sections or panels ordinarily drives the nail in to such an extent that the head of the hammer that he uses provides an indentation in the face of the panel, as shown at 18 in FIGS. 1, 2, 4 and 5. This provides a recess in which the plastic material that is used as a finishing coat at the places where nailing is done and at joints in the dry wall, will be keyed thereto so as to reduce the tendency of it to split off the surface material 9. My improved nail is provided with the groove or recess 16 for the purpose of increasing this keying action, particularly at the nail heads, which, if flattened out, do not have the holding action that is desired for keying the plastic material to the nail head. While an ordinary dished headed nail, if it were kept in that condition, would serve to do such keying, the tendency of the driving action of the hammer against the head of such a nail to flatten it reduces the keying action between the head and the plastic coating material to a minimum. In order to avoid such a condition the projection 11 is provided.

In driving the nails, whether of the present invention or otherwise, into a dry wall panel member, these nails are seldom driven in straight. In fact some applicators of dry wall panels purposely drive them in at a slight oblique angle. However, in the case of the present invention it is immaterial whether the nail is driven in straight or at an angle, the projection 11 will always act in the same manner to receive the blows of the hammer and thereby preserve the grooved character of the nail head.

Referring to FIGS. 4 and 5 and comparing the same with FIG. 3, it will be seen that after the nail, which is shown prior to driving, in FIG. 3, has been driven into the frame member 19 through the wall panel into its final position, it will still be provided with a recessed head having a groove 16' therein, which corresponds to the groove 16, but is somewhat shallower, and will still have the projection thereon, which is somewhat flattened and reduced in height, being indicated by the numeral 11' in FIGS. 4 and 5. Also the angle of the flaring wall portion 14 relative to the axis of the nail will be somewhat in-

creased. However, a very definite keying groove 16' will be present in the head of the nail for the plastic coating material.

The gripping portions 17 of the nail shank 6, it will be noted, are so located and of such length axially of the nail, that the gripping portion 17 will have the approximate axial length of the portion of the nail between the end of the point 8 and said gripping portion, and that a smooth surfaced shank portion extends from the gripping portion 17 to the head of the nail, which is of a somewhat greater length axially of the nail than the gripping portion 17. The position of the gripping portion 17 is such with respect to the length of the nail and the thickness of the wall board and the location of the pointed end 8 of the nail, that after the nail has been driven into the wooden frame member 19, which is ordinarily a stud, the gripping portion 17 will be adjacent the outer surface 20 of the frame member and in the zone that will first dry out as the wooden frame member dries. Due to the position of the gripping portion 17 and the fact that the portion 21 of the nail between the point 8 and the gripping portion 17 is smooth surfaced and has less gripping action than the portion 17, the holding action of the portion 21 will be less than the pulling action of the portion 17 in an inward direction as the wood dries and the nail will tend to move inwardly further into the stud or other frame member, thus moving the head 7 inwardly as this shrinkage takes place, holding the wall panel and the nail in the same relative position, thus preventing protrusion of the head 7 of the nail from the surface material 9, which causes the nail popping or bulging at the heads of the nails hereinbefore referred to. By providing the head with the groove 16 therein for keying the plastic coating material thereto and utilizing the gripping rings 17 on the shank of the nail, any cracking off of any of the coating material at the nail heads is avoided.

What I claim is:

1. A one-piece nail having a shank having a cup-shaped head at one end thereof comprising a central flat faced projection axially aligning with said shank and having a base of greater diameter than said shank and a thin frusto-conical wall of substantially uniform thickness surrounding said central projection and flaring upwardly and outwardly from the base of said projection to the periphery of said head at an acute angle to the axis of said shank to provide an annular groove V-shaped in cross section in said head between said projection and wall extending from said projection to the peripheral edge of said head, said central projection being of a height approximately equal to the axial height of said wall to prevent flattening of said head during driving.
2. A one-piece nail having a shank having a cup-shaped head at one end thereof comprising a central frusto-conical shaped projection of greater diameter than height axially aligning with said shank, having a base of greater diameter than said shank adjacent said shank and a thin conical wall of substantially uniform thickness surrounding said central projection and flaring upwardly and outwardly from the base of said projection to the periphery of said head to provide an annular recess V-shaped in cross section in said head between said projection and wall extending from said projection to the peripheral edge of said head, said central projection being of a height approximately equal to the axial height of said wall to prevent flattening of said head during driving.
3. A one-piece nail having a shank portion having a point at one end and a cup-shaped head at the other end thereof integral therewith comprising a frusto-conical shaped central projection axially aligning with said shank, having a base diameter at least as great as the diameter of said shank and a thin annular frusto-conical wall of substantially uniform thickness surrounding said central projection and flaring upwardly and outwardly from the base of said projection to the periphery of said head at an acute angle to the axis of said shank to provide an

annular V-shaped in cross section groove in said head between said projection and wall extending to the peripheral edge of said head, said central projection being of a height approximately equal to the axial height of said wall to prevent flattening of said head during driving, gripping rings on said shank spaced from both said headed and pointed ends of said shank, said shank being smooth surfaced between said gripping rings and said pointed end, said rings extending over a length of said shank approximately equal to the length of said shank from said rings to the end of the point thereon and the length of said ringed shank portion being less than the distance from said ringed portion to said head.

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