Nov. 4, 1958 E. F. GAINES 2,858,584

SPLINE FOR HANGING TILE

Filed Nov. 3, 1954

FIG. 1.

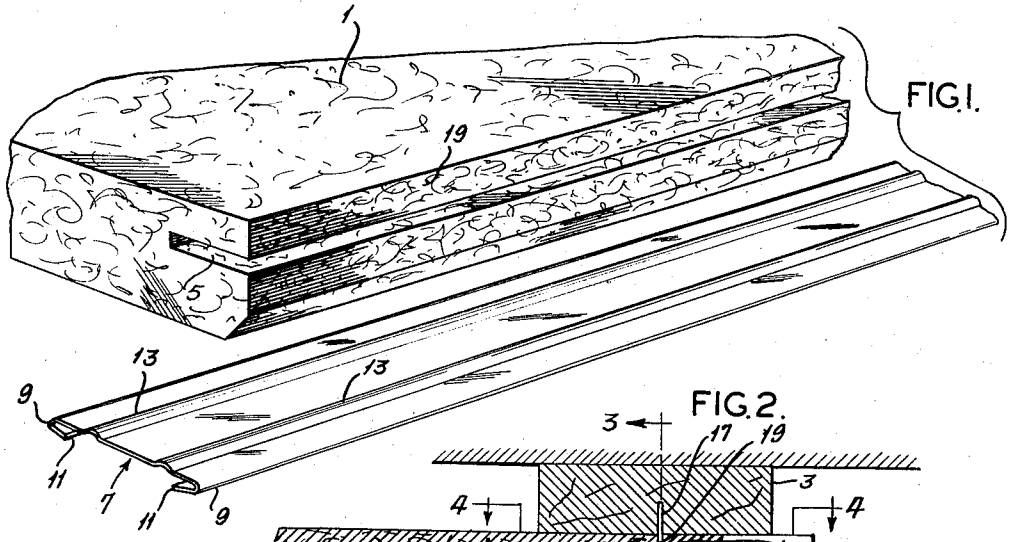



FIG. 2.

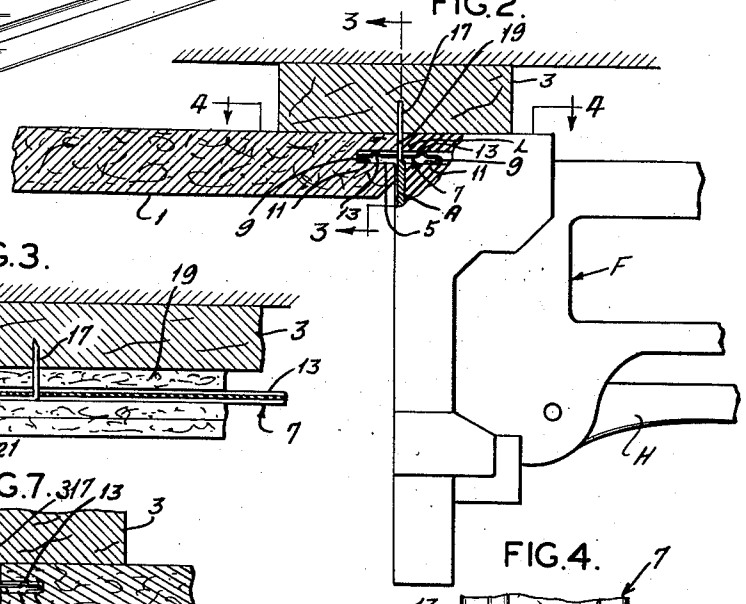



FIG. 3.




FIG. 7.

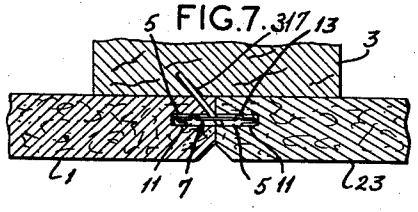



FIG. 4.

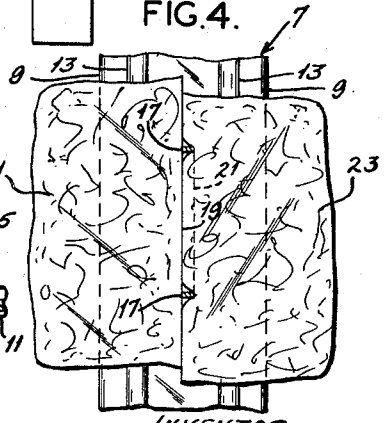



FIG. 5.

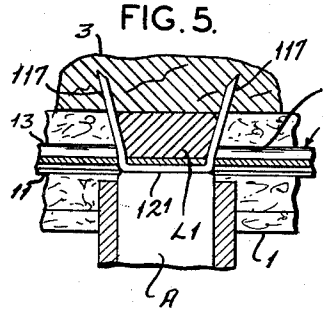
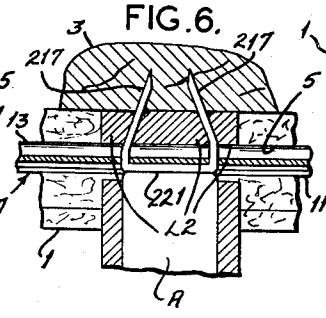



FIG. 6.




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# SPLINE FOR HANGING TILE

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Application November 3, 1954, Serial No. 466,635

2 Claims. (Cl. 20—92)

This invention relates generally to the hanging of tile, and more particularly, to the installation of edge-kerfed tile by means of splines.

My copending application Serial No. 296,919, filed July 2, 1952 discloses a method whereby tile are conveniently and expeditiously secured to a pre-existing ceiling structure in edge-abutting relationship with one another, but without exposing the fastening devices or requiring fancy configurations of the tile edges. For various reasons, the known methods of hanging tile were not satisfactory; and accordingly, my earlier application contemplates the use of tile having a low-cost saw kerf extending along its edges. The kerfs are designed to receive splines, which splines, in turn, are adapted to be penetrated by fasteners. The fasteners are driven utilizing a device of the type disclosed in my copending application Serial No. 296,920, filed July 2, 1952, now Patent No. 2,765,466, this device having a spacer lip which extends about and holds the spline outwardly from the supporting structure as the fastener is driven through the spline and into the structure.

This method is particularly adopted for installation of so-called acoustical tile which is formed of somewhat soft fibrous material. Usually the supporting structure comprises a series of wood furring strips secured in such spaced parallel relationship that one tile may bridge the space therebetween, which is to say that the center-to-center spacing of the furring strips corresponds to the length or width of a tile. In installing a tile ceiling, a spline is fitted within the kerf at one edge of a tile and the tile is positioned with this edge extending coextensively along one of the furring strips. Fasteners are then driven through the spline and into the overlying furring strip, the fasteners being located immediately adjacent the edge of the tile, preferably at intervals of from three to four inches therealong. A second spline within the kerf at the opposite edge is similarly secured to the next furring strip, and a second tile is then positioned in edge-abutting relationship with the first tile, the kerf in the second tile receiving the projecting portion of the second spline. The tile may also have kerfs for receiving splines extending at right angles to the attached splines, such additional splines being provided for leveling purposes.

It is preferably to employ a staple fastener, the base of which extends parallel with and adjacent the edge of the tile and the legs of which may be clinched or spread, as they are embedded, particularly when the supporting structure is of a type having low nail-holding strength, as in the case of gypsum board. When the tile is formed of soft material, two panels may be readily pushed into abutting relationship with one another, the legs of the staples becoming indented within the edge portion of the tile that lies above the spline. In the case of tile whose physical properties are such as to prevent easy indentation but which are, nonetheless, penetratable by the point of the fastener, the fastener is driven through the splines at an angle so as to "toe nail" through the substance of the tile above the kerf, thereby removing the legs of



the fastener from the region where they would interfere with movement of the next adjacent tile into edgewise contiguity.

This method of hanging tile necessarily requires a spline of particular characteristics, which are not attainable in splines of the type heretofore proposed. For example, wood strips are not satisfactory, because they tend to split, especially when a staple fastener is utilized. Steel strips are generally unsatisfactory because they must be prepared with fastener openings and because such openings must then be aligned with the supporting structure, and the fastener driving device must be carefully positioned with respect to the openings. Accordingly, my previous application proposes the use of flat strips of vulcanized fiber or other grainless material. While they are somewhat satisfactory, there are certain disadvantages. It will be understood that fastener driving devices of the type customarily employed for this purpose are spring-actuated or power driven. In other words, the fastener is driven with predetermined force, as by a compressed spring. Also, the base or head of the fastener should be driven up against the spline, yet in some instances, the force of the fastener driving implement may be such as to embed the head of the fastener within the spline to an extent such as to weaken the fastening connection. A thick spline, even when formed of vulcanized fiber, may present excessive resistance to penetration and require a wide kerf. Wide kerfs are undesirable because they weaken the margins of the tile. In addition, a spline formed from a flat smooth-faced strip should have a close fit with the kerf so as not to be readily displaced preparatory to and during the driving of the fasteners, yet such a close fit interferes with insertion of the spline.

Accordingly, it is an object of the invention to provide an improved spline for use in the above-described method of hanging tile. Among the more specific objects of the invention may be noted the provision of a spline having uniform low resistance to penetration, yet which resists indentation by the head of the fastener; the provision of a spline that is easily inserted within a kerf, yet which resists displacement therefrom; the provision of a spline of the character described having a reasonably secure fit within a kerf which is approximately three sixty-fourths inch in width, it being understood that saw kerfs of lesser size are generally impractical; the provision of a spline such as described which is readily cut to size; and the provision of a spline which is relatively stiff, yet lightweight.

In the attainment of these objectives, briefly, I contemplate the use of a spline which is formed of thin, soft metal, such as aluminum. In particular, a strip of aluminum which may be approximately 0.01 inch thick is formed with hemmed edges, the hems being left open so as to catch within the material of the tile after insertion of the spline. The open hems are of a thickness corresponding generally to the width of the kerf, and the strip may otherwise have ribs of hollow arcuate deformation extending continuously in the longitudinal direction, such ribs having a stiffening effect and also serving to increase the effective thickness of the spline. Necessarily, the metal strip from which the spline is formed should also be reasonably rigid in the transverse direction and should be sufficiently thick to prevent puncture of the head of the fastener while permitting puncture by the legs of a staple. It may be noted that such a thin metal spline offers little resistance to passage of the fastener after initial puncture and that such puncture is usually a predetermined quantity which can be readily controlled.

Other features of the invention will be in part apparent from and in part pointed out in the following detail

description taken in connection with the accompanying drawings, in which:

Fig. 1 is an oblique exploded view illustrating a part of a tile and a cooperating spline embodying features of this invention;

Fig. 2 is a vertical section showing the spline situated within the kerf of a tile and secured against an overlying furring strip;

Fig. 3 is a section taken on the line 3—3 of Fig. 2;

Fig. 4 is a section taken generally on the line 4—4 of Fig. 2 but showing a second tile positioned in edgewise continuity with the first tile;

Fig. 5 is an enlarged view similar to that of Fig. 3, but showing a spread staple and part of the stapler therefor;

Fig. 6 is an enlarged view similar to that of Fig. 3, but showing a clinched staple and part of a stapler therefor; and

Fig. 7 is a view similar to that of Fig. 2, but illustrating an alternative method of securing the spline.

Referring now to the drawings, there is shown a tile 1, it being understood that the invention is particularly adapted to the hanging of so-called acoustical tile. Such acoustical tile is generally formed from soft fibrous material as a panel measuring one or two feet on the side and being from one-half to one inch thick. Although the invention permits hanging of such tile upon many types of pre-existing structures, such as gypsum board and other material of low nail-holding power, a frequent practice is to provide furring strips 3 which are secured in parallel relationship to one another. The furring strips are spaced apart an amount such that the center-to-center distance corresponds to the length or width of a tile. For example, where the tile is two feet square, the center-to-center spacing of the furring strips would be two feet. Each tile is formed with a kerf 5 extending along two opposite edges and preferably along all four edges, the kerf being a conventional saw cut of about three sixty-fourths inch width. The depth or extent to which the kerf extends into the tile may be one-half inch.

These tile are used with a spline 7, which is of a width slightly less than one inch, so as to fit within the kerf of two abutting tile. The spline 7 is formed from a strip of aluminum or other soft but rigid metal that may be penetrated by a staple. For example, the aluminum alloy 3F (Aluminum Company of America designation) is satisfactory in a thickness of about 0.01 inch. The margins of the strip are folded over at 9 to flare inwardly as an open hem, the maximum thickness of which is approximately one-sixteenth inch. As such, the margins of the spline fit snugly within the kerf of the tile, and the inwardly directed edges 11 catch within the kerf to hold the spline against displacement. The spline is easily inserted since it is otherwise thin in comparison with the width of the kerf.

In addition, it may be desirable to provide hollow generally arcuate ribs 13 extending continuously the length of the spline. Such ribs increase the resistance of the spline to longitudinal bending and also serve to provide a good fit within the kerf. Inasmuch as the spline is of soft metal and is relatively thin, the resistance to puncture is relatively low and once punctured, there is substantially no resistance to further passage of the fastener until the head thereof engages the spline.

The invention contemplates, in particular, that a staple fastener 15 will be employed to secure the spline to the furring strip 3. The device F for driving the fastener has a spring or power unit, which is actuated by manipulation of a handle H, whereupon a trip is released so that an anvil A drives the staple through the spline with predetermined force. Such mechanism is disclosed in U. S. Patent No. 2,137,642 granted November 22, 1930, to Cavanagh.

While the staple 15 is driven, the outwardly projecting portion of the spline (Fig. 2) is supported by a metal lip L, which extends between the spline and supporting structure 3. This aspect of the invention is more particularly described in my copending application Serial No. 296,920, filed July 2, 1952, but briefly, the lip L is formed with walls which guide the legs 17 of the staple as they pass from the spline to the furring strip 3. In Fig. 3, the legs 17 of the staple remain straight as they are driven into the supporting structure 3, this being satisfactory when the structure is wood. Should the structure be relatively weak, however, the stapler may be designed to deflect the legs of the staple out of parallelism, thereby to provide greater holding strength. For example, Fig. 5 illustrates how the lip L1 of the stapler is formed with guide walls that spread the legs 117 of a staple; whereas Fig. 6 illustrates a lip L2 that clinches the staple legs 217. In this respect, the thin soft metal spline of this invention is superior to the thicker flat splines heretofore proposed.

As indicated, the legs 17 of the fastener extend closely adjacent the edge 19 of the tile, and the base or head 21 of the fastener is driven against the lower face of the spline. For the latter reason, a metal spline is especially desirable, when backed by a metal lip L, inasmuch as the metal resists weakening by indentation of the fastener head 21.

In practice, a spline is inserted with the kerf at one edge of the tile (the infolded edges 11 being below the body of the spline) and this edge of the tile is aligned with the nailable supporting structure 3. Fasteners are then driven along this edge at intervals of about four inches, and a second tile 23 is then positioned up against the edge 19 of the first tile as indicated in Figs. 3 and 4, the second tile would normally have a spline at its opposite edge which would be similarly secured.

In most instances, the material from which the tile is formed is sufficiently soft to permit indentation by the legs 17 of the fastener in the regions between the supporting structure 3 and spline 7, thus assuring an abutting contiguous fit beneath the spline and concealment of the fastener. In some instances, however, the tile may be of a somewhat harder material but which permits penetration by the legs of the fastener. In that event, the staple may be driven obliquely, as illustrated in Fig. 7, so as to toe nail through that portion of the tile lying above the spline 7. As such, the legs 317 of the staple are clear of the edge of the tile, thereby permitting movement of the next tile into abutting relationship with the first tile. In either instance, the head 21 of the fastener is accommodated in the kerf of the second tile 23 which is only partly filled by the thin metal spline.

Although it is only necessary to secure the splines at two edges of a tile, splines may be inserted in the other two edges for the purpose of leveling the several tile with one another. Such level splines may be rather short and are readily cut from a long spline.

From the foregoing description, it is apparent that those skilled in the art will understand the structure, function and mode of operation of the invention herein disclosed, and appreciate the advantages thereof. Although several embodiments have been disclosed in detail, it is to be understood that the invention is not limited thereto, but the drawings and description thereof are to be understood as being merely illustrative. It is realized that many modifications and variations will present themselves to those skilled in the art without departing from the spirit of this invention or the scope thereof as set forth in the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A spline for securing a single-kerfed tile to an overlying structure by means of a conventional staple fastener, comprising an elongate strip of thin, resilient nailable metal, the gauge of which is such as to permit puncture by a conventional staple, the margins of said strip being infolded to form open hems, the infolded edges of

the hems being widely spaced from one another so as to leave a single-ply open gap in the center portion through which the fastener may be driven, said open gap being of a width at least as great as the hem width, said open hems flaring outwardly in the inward direction to have a spring gripping action when inserted in the kerf of a tile.

2. A spline for securing a single-kerfed tile to an overlying structure by means of a conventional staple fastener, comprising an elongate strip of nailable metal, the gauge of which is such as to permit puncture by a conventional staple, the margins of said strip being infolded to form open hems, but terminating short of one another so as to leave a single-ply gap in the center portion through which the fastener may be driven, said open hems flaring outwardly in the inward direction to have a spring gripping action when inserted in the kerf of a tile, and hollow generally arcuate rib-like projections extending on opposite sides of the center line and in inwardly spaced relationship from the edges of the strip and on that side of the strip opposite from that on which the inturned margins lie.



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