

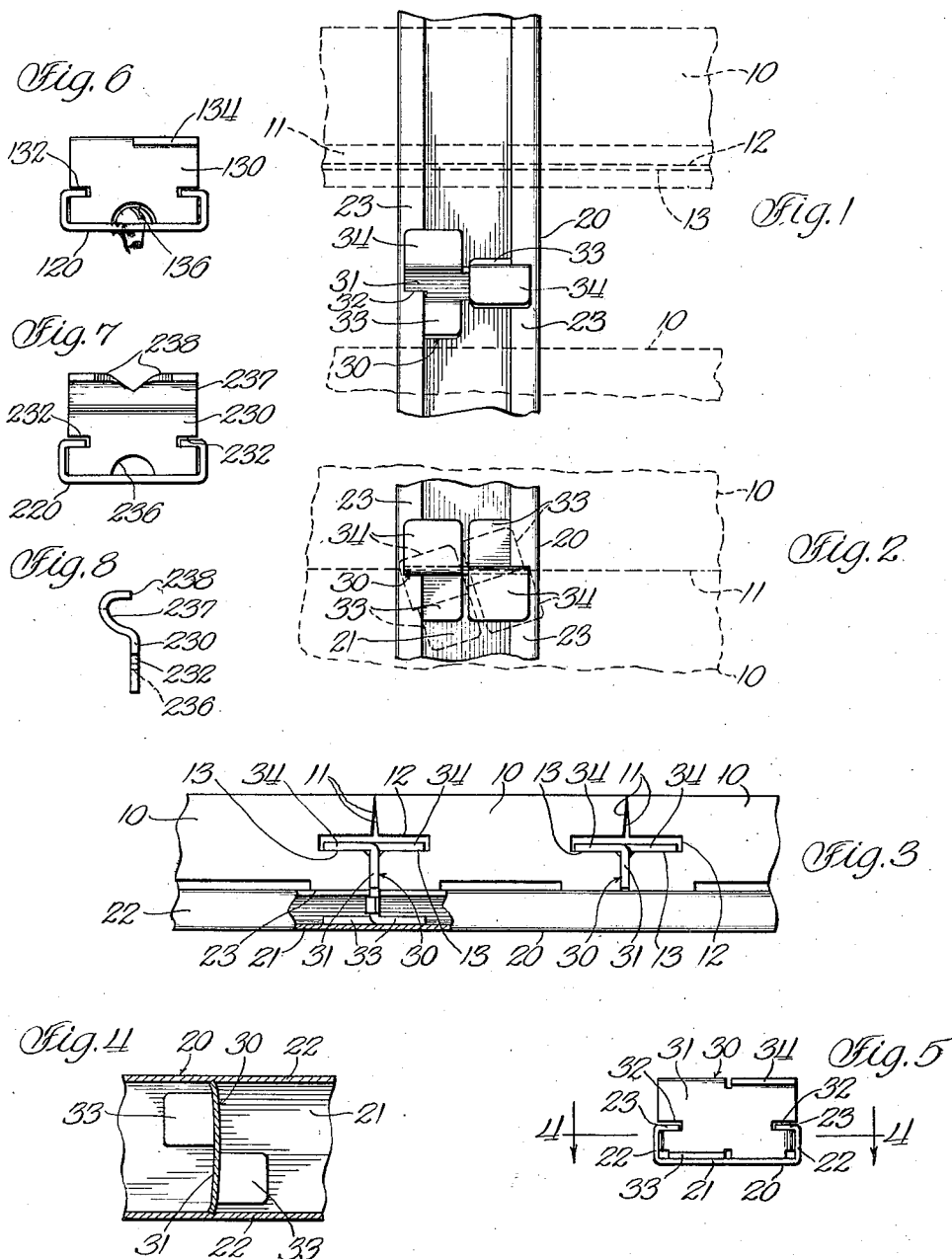
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CLIP AND CHANNEL

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CLIP AND CHANNEL

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The present invention has to do with a holding means for surface forming units such as floor boards, acoustical tiles, and the like, and relates to a clip frictionally held in a channel. The invention teaches the use of a channel upon which boards or other surface forming units rest, and a member in the channel and projecting therefrom between such boards or other units to maintain such boards or units in assembly. The clip possesses lateral extensions frictionally engaging the boards or other units and firmly maintains such units upon the channels.

The objects of the invention, among others, include the provision of the following:

15 A new fastening means for boards or other surface forming structural units, comprising a channel or similar member for supporting such boards, and a clip frictionally held in the channel for retaining the boards or other units in assembly;

20 An unique holding member having a channel support in which the holding member is maintained against displacement by resiliency and deformation;

25 A clip member having at one end a deformable section suited for attachment to a base and at its other end a section shaped to penetrate or overlap a part of a board to fasten the board in position without the use of nails;

30 A clip structure for use in a channel and so designed that the clip is maintained against upsetting during its assembly with such channel and a board resting thereon; and

35 An improved assembly of floor boards and the like in which spaced apart linear members support the boards and provide anchorage for frictionally held members which extend over or into the boards to maintain such boards against movement upon the support members.

40 These objects, and such other objects as may hereinafter appear, are obtained by the novel combination, unique construction, and improved arrangement of the several elements which constitute the invention, one embodiment of which is illustrated in the accompanying single sheet of drawings, hereby made a part of this specification, and in which:

45 Figure 1 is an exploded top angular view of the herein described channel and a clip, fragments of grooved floor boards being shown in dotted outline;

50 Figure 2 is a plan view of a clip, channel, and a fragment of a board, the full lines illustrating the position of the clip when locked against a board and the dotted outline showing the posi-

tion of the clip in the course of its assembly against a board;

Figure 3 is a side elevation of two clips, a channel, and parts of three boards;

Figure 4 is a transverse section of a clip taken on line 4—4 of Figure 5 and looking in the direction of the arrows;

Figure 5 is a front elevation of a clip locked in a section of a channel;

Figure 6 is a front elevation of a second form of clip suitable for use in a channel which is shown in cross section; and

Figures 7 and 8 are front elevation and side views of a third form of clip also suitable for use in the channel, the tongue and groove top portion of the clip not being claimed herein because it is not the joint invention of the applicants, and the channel being shown in cross section in Figure 7.

Like reference characters are used to designate similar parts in the accompanying drawing and in the description hereinafter given.

For many years boards have been nailed into position. Nails have limitations as fastening means for boards. Substitutes for nails have been used but there has been no material replacement thereof. Objections to the many proposed substitutes for nails have existed because boards fastened therewith have been inclined to creep, the substitutes have been difficult to use, and such substitutes have been costly to produce and apply and have been short lived.

The objections to nailed boards include the high cost of labor, the scarring of the boards, and the ineffectiveness of the nails to firmly hold the boards. This last objection to a nailed structure is most pronounced when boards expand from exposure to moisture. Upon expansion, the boards pull away from the nails used to hold them, or pull the nails from their original positions. This physical movement of the boards is called "creeping," and results in buckling of the boards. The boards will "squeak" when trod upon.

The present device for laying floor boards or the like overcomes all of the objections to nailed boards and in addition provides a means for fastening boards more firmly and generally at a less cost than when nails are employed. The principles of the invention are applicable to surface forming units other than floor boards as, for example, various forms of tile and the like. For a clear illustration of one form of this invention, a specific type of board is shown therewith in the accompanying drawing.

Boards 10, shown in the drawing, are especially milled, are particularly suited for use with the present clip and channel, and are highly efficient for floors requiring strength. The floor boards 10 may be of any suitable thickness. The sides of the boards 10 are designated by the reference characters 11. Grooves 12 are milled or cut in the sides 11. This may be done when the side surfaces of the board are being milled.

The depth of the groove 12 is determined by the length of the upper wings of a clip member shortly to be described. The width of such grooves should be equal to or greater than the thickness of the material of the clip. The lower surface 13 of the groove 12 is generally parallel with the top surface of the board. Preferably the outer lower corner of the groove 12 is slightly rounded or beveled as shown. The two grooves 12 in board 10 are opposed and parallel.

The sides 11 of the board 10 may be slightly beveled inwardly from the top to the bottom thereof to provide a space between contiguous boards for the web of the clip. That portion of the side 11 of the board 10 above the groove 12, if desired, may have a face perpendicular to the top face thereof. A slight inward bevel, however, has been found desirable upon such upper portion of the side 11 to secure a close match between contiguous boards. A slight bevel permits of a limited deformation at the top edge of the boards when two boards are brought together under strong pressure, while perpendicular parallel sides of any extended width prevent deformation.

Cracks which collect dust and make unsightly floors will be produced when the opposed edges of contiguous boards 10 are perpendicular unless the perpendicular sides of the contiguous boards are mechanically perfect. Under the pressure which is necessary for laying boards held in position by the clips herein described, the top corners of the boards are firmly compressed. When so compressed, the cracks between contiguous boards become microscopic in width, the resiliency of the compressed top edges of the board compensating for the irregularities in the faces thereof. Any upward distortion of the material of the boards produced by pressure and which is always slight is removed during the normal or conventional sanding operation to which the boards are subjected after they have been laid.

Each of the boards 10 is disposed upon a channel 20. The channel 20 comprises a flat base 21, upright sides 22, and inturned flanges 23. The channel 20 is secured to joists, or to sleepers, or to a sub-floor, or to any other structural element which may support a nailed floor. The channels may be countersunk in a cement sub-floor. Fastening means for holding the channels may be in the form of screws or nails or any special fastening member, including a member sunk into a cement sub-floor and into which sunken members a screw or bolt penetrating the channel 20 may later be inserted.

The clip 30 comprises an upright web 31 having slots 32 at opposite side edges thereof. The slots 32 are complementary to the flanges 23. The material of the web 31 beneath the slots 32 and extending under flanges 23 prevents the clip from being lifted out of the channel 20. The width of the web 31 below the slots 32 is slightly greater than is the internal width of the channel 20.

Wings or feet 33 extend from the bottom edge of the clip. The wings 33 may be opposed, as

shown, or they may each reach in the same direction. One wing may be substituted for the two illustrated. The outer edges of the wings are set back from the outer side edges of the adjacent web 31 as shown so that the feet 33 do not interfere with the rotation of a clip 30 in a channel 20 on an axis defined by either end of that section of the web 31 beneath the flanges 23 or at any point in the web 31 therebetween.

The top of the clip comprises also two wings 34. These project in opposite directions for insertion into or over sections of boards 10. The contact of wings 34 upon the lower face 13 of the groove 12 is frictionally firm. Some deformation of the lip of the board 10 may result. The lip, that is, the portion of the board between the surface 13 and its bottom surface, should be sufficiently deep that it will not crack or break away from the main body of the board under such compressing deformation. The frictional and deforming engagement of the wing 34 upon the lip of a board holds the board tightly upon the channel 20.

In the preferred form of clip for use upon boards of the character illustrated in Figures 1, 2 and 3, the clips 30 comprise two lower wings 33 and two upper wings 34. The lower wings 33 project oppositely to one another and oppositely to the wings 34 which latter wings are opposite to one another. This arrangement is clearly illustrated in Figure 1.

Boards 10 are laid in a floor in the following manner: Channels 20 are suitably anchored and made level. Leveling may be by grouting or by blocking. The channels may be spaced at regular intervals. They may be parallel. They may be laid in linear continuity. There is no necessity, however, for observing accuracy in the spacing of the channels other than to obtain a low cost. The channels may be laid with staggered ends if desired. One channel may be at the side of a second channel and overlap the end of the second channel to obtain a continuous supporting surface for boards.

The first board 10 laid upon the channels is positioned in any suitable manner. Generally such board abuts a wall. The edge of the board against the wall must be fastened in a manner which will prevent the wall edge from lifting. It may be nailed or fastened with a screw. Special clips may be devised therefor. After the first board has been anchored, a clip 30 is inserted into each channel 20 on which the board rests and is moved along the channel until it is close to the free edge of the board (see Figure 2). A clip is inserted into a channel and advanced therealong and brought in contact with the edge of the anchored board while being maintained in an oblique position. Obliquity is necessary because the channel has an interior width less than the width of the web of the clip beneath the slots 32 therein. Clips 30, therefore, cannot be inserted into a channel 20 or advanced along a channel with the webs 31 normal to the channel 20. The feet 33 upon the clip 30 are of less width than the web 31 as shown so that the feet will not bind upon or engage the interior walls of the channel to prevent direct contact between the end of a web and the channel.

When a clip 30 is brought into proximity with the side 11 of a board 10, the clip is ready to be driven or forced home. This may be done with a tool or in any other suitable manner. Driving a clip 30 home causes its web to become substantially normal to the channel 20 and the web 31

becomes parallel or substantially parallel with the side 11 of the board 10 against which it is driven. The web 31 should always be forced tightly and compressingly against the side of a board.

A slight bow is generally formed in the material of the clip as it is driven home. Such a deformation may be localized at one or both ends of the lower section of the web of the clip, or it may extend throughout the entire width of the lower section of the web as shown in Figure 4. Such bow or deformation in the material of the web is produced by forcing the web transversely across the channel, and is a result of an excess in the width of the clip over the interior width of the channel.

The excessive width of the clip and the ensuing bowing of the web thereof prevent retraction of the clip after it has been driven or forced home.

Retraction is prevented because a normal strain on the clip can not reverse the angle of the bow formed in the web in seating the clip in the channel, and because the material of the web bites into the material of the channel. The ends of the clip, when forced home, have a tendency to form notches into the material of the channel. The clip tends to slightly expand the channels where the ends of the web contact the channel. For that reason, the channels should be of stiffer material than the clip. The channels generally are of steel. The clips also generally are of a steel which has a fair degree of resiliency.

Succeeding boards are laid against the previously anchored ones in the manner described. The operations which have been described in respect to the positioning of a clip against the first laid board are repeated with respect to each newly laid board until the selected area is covered with boards. The last laid board is nailed or otherwise secured at its back edge if a clip cannot be used to hold it in position.

The wings 34 of the clip engage the lower face 13 of the grooves 12 in each board to hold the board at its opposite sides against any elevation from the channel, (see Figure 3). As a second board is laid against the first anchored board, the projecting wing 34 of the anchored clip 30 extends over the lower face 13 of the groove 12 in the second board to wedge the front edge of the second board upon the channel 20. The first laid clip 30 thus serves to hold one edge of the first laid board and one edge of the second laid board. The second laid board is locked in position by another clip 30 at its back edge.

The second laid board and each succeeding board thus is held in position by two firmly anchored clips 30 having wings 34 projecting into opposed grooves 12 to wedge the contiguous boards tightly against the channels 20. The previously explained bowing of the web of the clip 30 and the biting of the ends of the web 31 into the channels 20 prevents retraction of the clip 30. The firm anchorage of the clips prevents creeping of the boards. A secure assembly of channel, clips and boards may thus be obtained without the use of nails in the boards and without any of the disadvantages of nailed structures. The assembly may be had quickly even by an inexperienced carpenter. The wedging of the clips in the channel positively prevents movement of the board in a direction opposite to that from which the boards were laid.

The wings 33 project from the bottom edge of the clip 30 to rest and ride upon the top sur-

face of the channel body 21 and prevent the clip 30 from tilting while it is within the channel previous to being wedged therein. The web 31 of clip 30 is of such thickness that the clip is disposable between boards in the space provided by the beveling of the latter without deforming the sides of such boards. The position of the clip between contiguous boards 10 is clearly illustrated in Figure 3.

Other shapes or types of top ends for the clips 30 may be employed to hold boards having a different side formation from those herein shown and such clip ends may be designed to hold acoustical or other tiles if desired. Two other clips are illustrated in Figures 6, 7 and 8.

Figure 6 illustrates a clip substantially identical with the clip hereinbefore described with the feet 33 omitted. This clip comprises body 130, board holding wings 134, and side slots 132. There may be an indented lower edge 136 to facilitate movement of the clip over screw heads used to fasten the channel 120. The body of the clip below slots 132 is deformed in the channel 120 in the same manner as the previously described clip is deformed in channel 20.

Figures 7 and 8 show a clip suited for use with tongue and groove boards. Its body comprises a lower web 230 having slots 232 in the sides thereof, an indented lower edge 236, and an upper web 237 terminating in prongs 238 adapted to rest on the top of a tongue on a tongue and groove board. The top half of such clip is described in detail in the application of Leon F. Urbain, Serial No. 609,689, filed May 6, 1932, now Patent No. 2,046,593, dated July 7, 1936, and entitled "Flooring". The material of the clip beneath the slots 232 is adapted to be deformed in a channel 220 to secure tongue and groove boards in position, the clip being forced into position with the prongs 238 over the tongue of the last laid board, with the groove of the next laid board receiving and enclosing the back of the clip therein. The boards beneath the tongue and groove parts thereof are milled with the side wall inset. The matched inset side walls have sufficient space therebetween to receive the body 230 of the clip.

What we claim as new and desire to be secured by Letters Patent of the United States is:

1. A floor board clip comprising a horizontal base, a section rising vertically therefrom and wider than said base, said base being inset from the side edges of the vertical section, and oppositely directed substantially horizontal sections upon the upper edge of said vertical section to extend over sections of board.

2. In combination, a channelled support having opposed sides, boards resting thereon, and a clip between said boards, said clip having substantially horizontal oppositely directed tongues at one edge wedged over preformed upwardly directed faces of said boards and having its other end deformed and wedged between said opposed sides whereby to lock the clip in said channelled support.

3. A floor clip comprising a vertical section, substantially horizontal base portions at the lower corners of the vertical section and extending from opposite faces thereof, and substantially horizontal board gripping portions at the upper corners of the vertical section and extending from opposite faces thereof.

4. A floor board clip for co-operation with a grooved foundation having inwardly extending edges, comprising a base for co-operation with

the foundation and having portions extending parallel with the foundation beneath such edges, a single vertical section extending from the base, a substantially horizontal board gripping section

5 extending from one face of the vertical section at one side edge thereof, and a second substantially horizontal board gripping section extending in the opposite direction from the vertical section at the other side edge thereof.

10 5. In combination, a grooved foundation member having inwardly extending edges, boards resting thereon, and a clip joining the boards to the foundation member, said clip having oppositely directed horizontal base portions engaging beneath the edges of the foundation member, a
15 vertical portion extending from the base portions between the edges of the boards, and oppositely disposed board engaging portions extending over surfaces of the boards and pressing the boards
20 against the foundation member.

6. A sheet metal board clip comprising a horizontal base having a flat horizontal supporting surface of considerable extent, a vertical web bent upwardly from said base and having a greater
25 width than the width of said base, said base being inset from the side edges of the vertical web, and oppositely directed tongues bent horizontally from the top of said web.

7. A sheet metal board clip comprising a horizontal base, a single vertical web bent upwardly

from said base and having a greater width than the width of said base and extending beyond the base on both edges, and oppositely directed tongues bent horizontally from the top of said web.

8. A sheet metal board clip having a base comprising oppositely directed horizontal tongues of sheet metal, a single vertical web bent upwardly from said base members and adapted to be engaged in a channel member, and oppositely directed tongues bent horizontally from the top of said web.

9. In combination with a floor board, a clip comprising a flat horizontal base portion adapted to support the clip in proper operative position, a sheet section rising generally vertically therefrom, said flat base portion being narrower than said vertical section and inset from the side edges thereof, substantially horizontal tongues on the upper edge of said vertical section to extend over portions of a board, and a channel engaging said base portion of the clip and having opposite side walls adjacent the said side edges but offset from the edges of the base portion a distance corresponding to the distance of said inset, said channel having a wall portion adjacent said flat base portion of the clip.

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