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MEANS FOR SECURING FLOOR BOARDS AND THE LIKE

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Fig. 2.

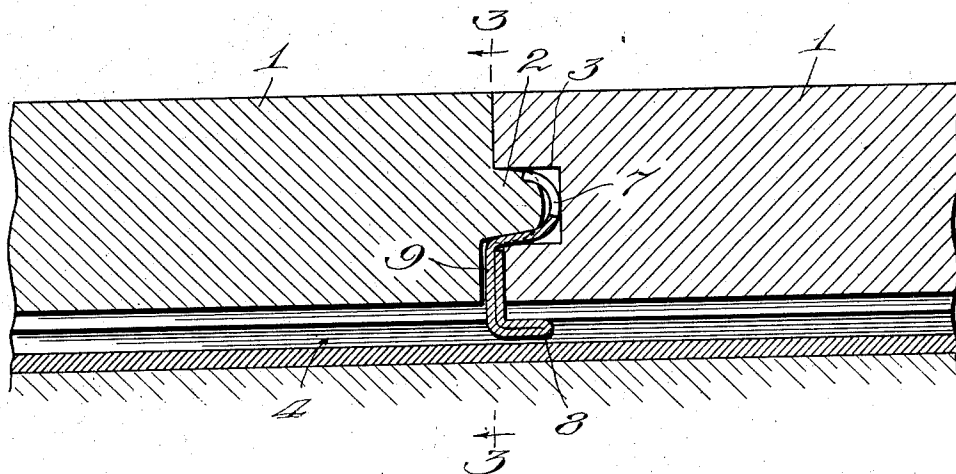


Fig. 3.

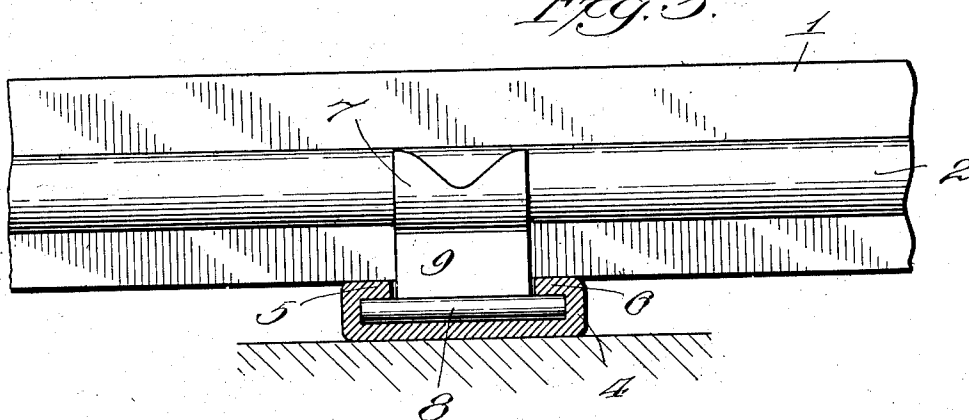
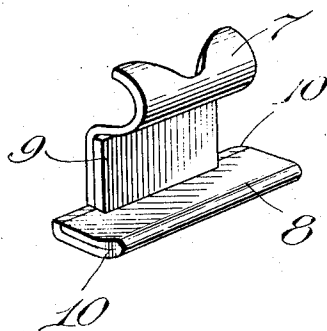


Fig. 1.



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UNITED STATES PATENT OFFICE

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MEANS FOR SECURING FLOOR BOARDS
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6 Claims. (Cl. 20—8)

It has heretofore been proposed to secure floor boards to a foundation, without nailing, by providing the foundation with undercut grooves or slots to receive the lower ends of clips engaged with the boards and holding them down. In order that the boards be securely held, it is necessary that there be a binding action between the clips and the foundation to lock the clips in the slots. If there be no such binding action, the clips will be free to slide in either direction along their slots and they will consequently fail to hold the boards tightly together. For example, in the event that a board is slightly bowed in the plane thereof, it must be straightened in the laying of the floor and must be held in the straightened condition. Unless the clips become immovable after such a bowed board has been driven into a condition of straightness then, as soon as the pressure on the board is released, the board will push the clips back ahead of it and will return to its bowed state. The most satisfactory clip that has heretofore been employed in laying a nailless floor is one in which the stem is of an inverted T-shape, the cross arms of the T being engaged in the undercut portion of the slot in the foundation and the stem extending up between the meeting edges of two boards and terminating in a trough-like part seated in the groove of one board and partially embracing the tongue of the other board. In laying a floor, one board after another is placed on the foundation, a row of clips being engaged with the trailing edge of each board as it is laid down, and these clips being forced home by driving the next board up against them. It will be seen that the driving forces that are thus applied to the clips act on the stem portions of the clips at some distance above the cross arms in the slots. Consequently, if these cross arms are long enough to bind even slightly against the side walls of the slots, the lower ends of the clips will tend to remain stationary while the upper ends are driven forward. Therefore, since these clips must be made of sheet metal in order that their cost may be low enough to permit of their use, it almost invariably happens that one cross arm or the other of each clip will simply bend back when the clips are forced home, thus destroying the binding action of the clips within the slots and leaving the clips free to slide in either direction along the slots in which they are engaged.

Since the trough-like part of the clip must share with the tongue on a board the space within the groove in the next board, the thickness of the metal in the trough-like part of the clip is

an important factor; and, because the clips have heretofore been made of heavy metal, their use has not been entirely satisfactory.

The undercut portions of the slots in the foundation must, of course, be deep enough to accommodate cross arms at the lower ends of the clips. If these cross arms are wide, measured in the vertical direction, and the foundation is in the form of steel channel bars, these bars must be made thick.

The present invention may be said to have for its objects to product a sturdy clip which will effectively hold a board flooring or the like to a foundation; which will not become deformed so as to loosen its holding power in the act of being driven home; which will take hold of the tongues of boards of the tongue and groove type without requiring that the tongues be loose in the cooperating grooves; and which will permit the use of channel-shaped foundation members of minimum depth or thickness. The invention also has for a further object to make it easier to assemble the clips in a floor structure as will hereinafter be explained.

I have found my improved clip to be not only an improved clip but also one that may be produced at a lower cost than the old types. Therefore, viewed in one of its aspects, the present invention may be said to have for its object to produce a clip which shall cost less to manufacture than do other types that have been used commercially to a greater or lesser extent.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a perspective view of one of my improved clips; Fig. 2 is a vertical section through a floor embodying the present invention, taken along the longitudinal center line of one of the supporting channel-shaped foundation members; and Fig. 3 is a section on line 3—3 of Fig. 2, showing in elevation all of the parts except the channel-shaped foundation member.

Referring to the drawing, 1, 1 represent ordinary floor boards of the tongue and groove type, each board having at one long edge a tongue 2 extending throughout the length thereof, and at the opposite edge a correspondingly located groove 3 adapted to receive the tongue on an adjacent board. These boards are shown as laid upon a

suitable foundation having therein undercut grooves or slots extending at right angles to the length of the boards; the foundation consisting of shallow structural steel bars or beams 4, U-shaped in cross section; only one of the members 4 being illustrated. The marginal portions of the side walls of the members 4, adjacent to the long free edges, are bent inwardly toward each other, as indicated at 5 and 6, to produce longitudinal internal flanges as is common in this type of construction. The space between the inner edges of the two flanges, together with the main space or chamber underlying the flanges, constitutes an undercut groove or slot.

My improved clip comprises a part adapted to engage with the tongue on one board and be received in the groove in which that tongue is nested, a stem part extending downwardly to the foundation, and a shoe portion positioned in and extending entirely across the wide portion of the groove or slot in the foundation. The shoe portion, instead of continuing down from the stem in the plane of the latter, is bent at right angles to the plane of the stem so that its vertical thickness is small and its width, measured in the direction of the length of the groove or slot, is considerable. In the preferred form of clip it is composed of a single piece of sheet metal shaped at one end into a trough-like part or hook 7. The remainder of the metal piece is folded flat upon itself along a line parallel with the axis of the trough, producing a section of double thickness. This section of double thickness is again folded along a line parallel with the first fold, so as to bring the portion 8 farthest from the element 7 into a plane at right angles to the stem portion 9 which is contiguous to the element 7; the portion 8 constituting the foot or shoe and the portion 9 the stem of the clip. In other words, the stem and the foot or shoe constitute an L-shaped member of double thickness, while the trough-like tongue-engaging element 7 forms a continuation of one thickness of the vertical arm of the L. The vertical arm of the L is preferably as wide as the length of the trough 7, whereas the horizontal arm of the L, namely, the shoe or foot, is considerably wider so as to project laterally beyond both side edges of the vertical arm or stem. The width of the entire upper part of the clip is slightly less than the distance between the flanges 5 and 6 of the foundation member, whereas the width of the foot or shoe is such that, when the foot or shoe is introduced into the foundation member so as to lie below the flanges 5 and 6 and is then turned so as to bring it crosswise of the foundation member, the side edges of the foot or shoe bind against the side walls of the members 4 and cause the clip to be firmly held against sliding movements along the foundation member.

In applying a clip to a foundation member, it is inserted through the opening in the top of the latter while lying in a more or less diagonal position. Then, after the clip has been slid along close to the board in advance thereof with which it is to engage, it is twisted about so as to place it crosswise of the member 4, as shown in Figs. 2 and 3. This last shifting of the clip causes it to bind in the member 4 and thereafter it becomes necessary to use force in order to move it straight ahead.

In order to facilitate the turning of the clip after it has been inserted in the trough of the foundation member, so as to place it crosswise of the latter, I make one of the front corners of

the shoe or foot and the diagonally opposite rear corner rounded, as indicated at 10, 10. This expedient permits the clip to be turned easily until it begins to engage with the sides of the metal foundation member, after which it wedges itself in place against the side walls of the latter. A row of clips having been applied to a board that has already been laid, say the left-hand board in Fig. 2, another board is set on a foundation and driven into tight engagement with the first board, the hook or trough elements of the clips enter the groove in the second board while the edge face of the second board below the groove contacts with the stem parts of the clips, all as shown in Fig. 2, and the clips are therefore driven straight ahead until the free long edges of the hook or trough elements of the clips bite into the top of the tongue close to the outer edge of the latter.

It will be seen that the pressure on the clips, during this driving action of the board behind them, is distributed in such a way that the clips are moved forward bodily, no opportunity being given for the lower ends of the clips to lag behind. Furthermore, because of the rugged construction of the stem and foot or shoe portions of the clips, it would take a much greater force to bend or distort the foot or shoe elements than can possibly be applied by simply driving a board home in the ordinary course of laying a floor. Consequently, if the clips fit tightly initially, they will remain tight, being simply driven into their final positions of rest without becoming loosened in the troughs of the foundation members.

Assuming that the left-hand board in Fig. 2 was originally sprung or bowed so that it tends, at the section appearing in Fig. 2, to move toward the right, it will be seen that the pressure which it exerts on the clips cannot cause the clips to become loose for, at most, the clips might be canted slightly, so as to cramp the feet or shoes thereof between the overlying flanges and the bottom walls of the foundation members. In other words, there is very little danger that a board will not remain in close contact with the next board ahead of it after it has once been brought into that position.

Another advantage of my improved clip is that the clip at all times stands substantially upright after it has once been inserted in the undercut groove or slot, this being due to the fact that the distance between the flanges 5 and 6 and the bottom wall of each of the members 4 need be only slightly greater than the thickness of the foot or shoe member of one of the clips, and therefore there can be only a slight rocking movement of a clip around a transverse horizontal axis. This is of importance because clips for the same purpose, as heretofore constructed, will not normally stand upright, and it was therefore necessary always to bring them close to the board in front of them before laying down the next board. My improved clips may simply be set into the grooves or slots in the foundation, as close to a board as they may happen to come, and then be driven up in unison by the succeeding board.

It will also be noted that, since the stem and foot portions of my improved clip are of double thickness, these parts will be sufficiently strong and rugged even though the clip be made of much thinner sheet metal than formerly. As a result of the use of thinner metal stock, the upper hook or trough portion of the clip takes up less room than heretofore and consequently does not interfere with the proper seating of the tongue of one

board in the groove of the next board as is often the case with clips made of heavier stock.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the exact structural details thus illustrated and described but intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

10 I claim:

1. The combination with a foundation member having therein an undercut slot and floor boards of the tongue and groove type resting on said foundation crosswise of said slot, of a metal clip rising from said slot between the meeting edges of two of the boards, said clip having a foot element lying flatwise in the undercut portion of the slot and wedged against the side walls of the latter.

20 2. The combination with a foundation member having therein an undercut slot and floor boards of the tongue and groove type resting on said foundation crosswise of said slot, of a metal clip rising from said slot between the meeting edges of two of the boards, said clip having a foot element lying flatwise in the undercut portion of the slot, said foot element being of such a length as to fit tightly between the side walls of the slot, and diagonally opposed corners of the foot element being rounded to permit the clip to be turned crosswise of the slot after having been inserted at an angle.

3. A clip fashioned from sheet metal folded upon itself into an L-shape in cross section, both arms of the L being of double thickness, and one

thickness of the upright arm of the L being extended and formed into a hook shape.

4. A clip fashioned from sheet metal folded upon itself into an L-shape in cross section, both arms of the L being of double thickness, one thickness of the upright arm of the L being extended and formed into a hook shape, and the horizontal arm of the L being wider than the upright arm and projecting beyond the latter at both sides.

5. The combination with a foundation member having therein an undercut slot and floor boards of the tongue and groove type resting on said foundation crosswise of said slot, of a metal clip rising from said slot between the meeting edges of two of the boards, said clip having a long wide foot element lying flatwise in the undercut portion of the slot, the thickness of said foot element being only slightly less than the depth of the wider portion of the slot whereby the clip is held substantially upright.

6. The combination with a foundation member having therein an undercut slot and floor boards of the tongue and groove type resting on said foundation crosswise of said slot, of a metal clip rising from said slot between the meeting edges of two of the boards, said clip being in the shape of an L the horizontal arm of which constitutes a foot element lying flatwise in the undercut portion of the slot, means at the upper end of the upright arm of the L nested in the groove of one of the boards and interlocked with the tongue of the other board, said foot element being of a thickness only slightly less than the depth of the wide portion of the slot.

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