

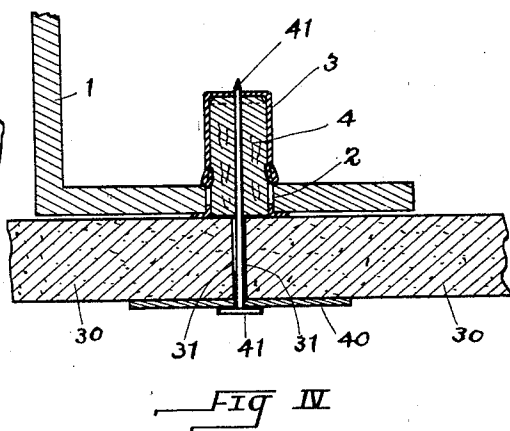
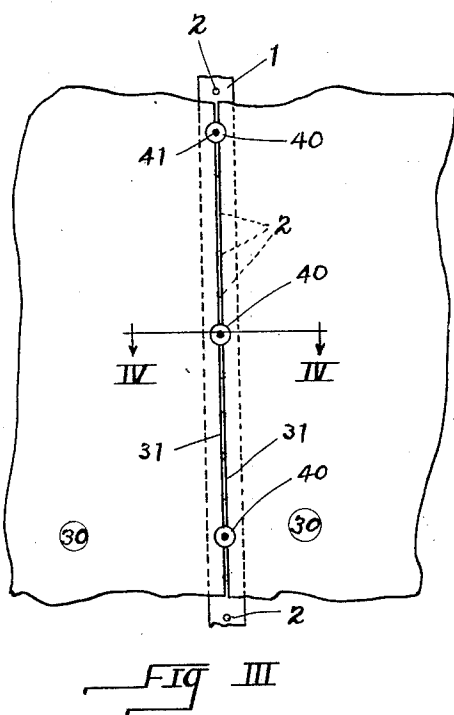
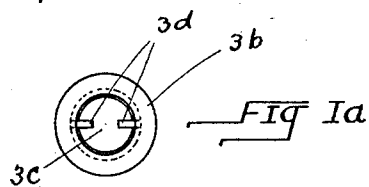
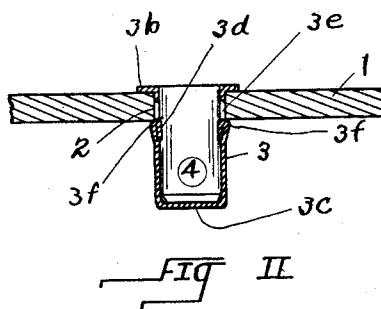
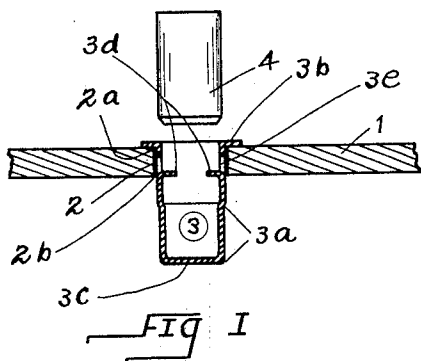
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L. H. LEE

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WALL BOARD FASTENER

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UNITED STATES PATENT OFFICE

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WALL BOARD FASTENER

Application filed July 8, 1930. Serial No. 466,378.

This invention relates to a fastening device; a device for installation in plates, or structural members of metal. The device embodies certain new and useful characteristics, and, in the following specification I shall show one of the many applications in which the device may be employed. Notice is hereby given of my co-pending applications Serial No. 446,419, filed April 22nd, 1930, Serial No. 450,144, filed May 6th, 1930, and Serial No. 477,810, filed August 26th, 1930.

In the accompanying drawings Fig. I is a view in cross section, showing fragmentarily a portion of a structural steel section, in which element the thimble or cup portion of my fastening device has been installed, and showing in side elevation a nailable plug, ready for permanent insertion in said thimble; Fig. Ia shows in plan the open end of the thimble; Fig. II is a view in cross section, similar to that of Fig. I, showing the plug permanently nested within the thimble, and the thimble permanently locked within the steel section; Fig. III is a fragmentary view, in side elevation, of the abutting edges of two wall-forming boards; three complete wall fasteners are shown in position of service; and Fig. IV is a view in cross section, taken on the plane IV—IV of Fig. III, illustrating the manner in which a complete fastener secures the wall boards to a structural steel frame member.

The steel plates or steel frame members 1, to which wall boards, ground strips, or other fixtures are to be secured, are provided with orifices 2 for the reception of cups or thimbles 3 at convenient points throughout the length of the steel frame members. Within each cup 3 a plug 4 is secured, the plug being a nailable plug—a plug which has the capacity of receiving and retaining a driven nail, or a screw. The thimbles themselves are of distinctive construction; they are conveniently stamped of sheet metal, such as brass, copper, steel, copper-coated steel etc. After the thimbles are formed they are annealed, to afford a certain degree of ductility or expansibility.

The orifices 2, as they are formed in the frame members 1, vary slightly in size. To the end that the insertion of the thimbles may be readily accomplished, the lower portion 3a (Fig. I) of each thimble is of diminished cross-sectional extent. One end of the thimble comprises a flange 3b, overlying the peripheral edge 2a of the orifice 2 wherein it is fitted; the other terminal of the thimble includes a portion for limiting the extent of insertion of its associated plug 4. Such plug-limiting portion advantageously is a flange or web 3c. Each thimble also includes in structure a plurality of inwardly-extending projections 3d; these projections 3d are stamped from the wall material of the thimble at 3e, and deflected downward to approximately the position in which they are illustrated in Fig. I.

It will be noted that projections 3d, when the thimble is inserted in an orifice 2, are located adjacent the lower periphery 2b of the orifice. As a whole, the structure of the thimble is such that the powerful insertion of the plug 4 serves to adjust the thimble to a locked position within the orifice 2. That is to say, without the aid of separately-formed locking means, the thimble is so constituted that the insertion of a plug 4 (as shown in Fig. II) is adapted to expand the thimble into locking position in the orifice 2.

The plug 4, as is evident, co-operates with the thimble to effect a locking of the thimble in the orifice. When the plug has been powerfully moved into the thimble (Fig. II), the projections 3d will have been pressed to overlapping position on the inner wall of the thimble, and, as a result, the wall of the thimble (at the regions 3f) will have been distorted or bulged to wedge securely the assembled plug and thimble within the orifice. As mentioned above, the plug 4 is a nailable plug, and advantageously it is formed of a slightly compressible material, such as wood or hemp. As a matter of fact, creosote-treated maple plugs have been formed to function well. It is also of importance to form the plugs slightly larger in cross-section than the bore of the thimble. This is for the reason that upon driving the plug into the thimble (it being

remembered that the thimble is laterally expandable in at least so much of its length as lies within the orifice 2) the wall of the thimble expands into tight contact with the wall of the orifice. At the same time, the plug 4 laterally contracts into a tight, permanent lodging within the thimble. Thus, it will be understood that the thimble (in expanding laterally into tight fit with the wall of the orifice 2) becomes secured in the orifice. The bulging of the thimble wall, particularly the bulging of the wall at a localized region (3f) intermediate the length of the body of the thimble, affords additional means for preventing the removal of the thimble. A nail or screw which is driven into the plug of such an assembled device has been found to be very securely held.

The securing of wall boards to steel frame members has always been a problem. The clips, expansion devices, and clamps which have been employed hitherto have been costly to install. I provide a device which permits a nail to be quickly driven into the metal frame of a building—a device which requires but little more time to install than is required for the driving of a nail into wooden frame members. In securing wall boards, such as the boards 30, to the steel frame members (1) of a building, the edges of the wall boards are brought to abutting position over the aligned series of orifices 2 in the steel members (Fig. III). Any desired number of fastening devices (3, 4) having first been installed as desired in the steel member (1), the wall boards are permanently attached by means of disks or plates 40 and driven nails 41 (see Fig. IV). The disks 40 may each be in form a flat piece of metal, as shown; and, they may conveniently be perforated for the better retention of such outer coat of plaster as usually is applied to the installed wall boards. Through each disk 40 a nail 41 is driven, between the edges 31 of the wall boards 30 and into a fastening device 3, 4. So, wall boards, and other similar material may be cheaply, quickly and strongly secured to the steel frame of a building.

The web 3a for positively limiting the extent of insertion of the plug 4 prevents the plug from being forced through the thimble during nailing, and the metal of which the thimble is formed is desirably of such nature that the nail may be driven through it, as indicated in Fig. IV.

In this specification I show thimbles or cups which, upon the driving of a nailable plug into each thimble, expand into locked position within an orifice. That is, the insertion of a plug into a thimble is adapted to effect the lateral expansion of the thimble, whereby the wall of the thimble is either laterally bulged or displaced into a locking position over the peripheral edge of the orifice wherein it is fitted. Although the co-opera-

tion between the thimble and the plug in this respect is to my mind preferable, I contemplate the use of a special machine or tool to effect the expansion of a thimble into locked position within a steel frame member, the plug being later inserted.

I claim as my invention:

1. In combination with a steel frame member having an orifice, a fastening device to permit the nailing of material immediately to such steel frame member, which fastening device comprises a thin-walled body of metal which is secured in said orifice, said thin-walled body including a portion overlying the one peripheral edge of said orifice, the wall of said body being laterally expandable to overlie at a point intermediate its length the other peripheral edge of said orifice, and a nailable plug laterally compressed and secured in said body.
2. In combination with a steel frame member having an orifice, a fastening device to permit the nailing of material immediately to such steel frame member, which fastening device comprises a thin-walled body of metal which is located in said orifice, said thin-walled body including a portion overlying the one peripheral edge of said orifice, and a nailable plug which is laterally compressed into secure position within said body, said body also including a wall portion which is adjusted, upon the bringing of the plug to such compressed position, to overlie the other peripheral edge of said orifice.
3. In combination with a steel frame member having an orifice, a fastening device to permit the nailing of material immediately to such steel frame member, which fastening device comprises a thin-walled body of metal which is secured in said orifice, said thin-walled body including a portion overlying the one peripheral edge of said orifice, the wall of said body being laterally expandable to overlie the other peripheral edge of said orifice, and a nailable plug laterally compressed and secured in said body, said body also including in its structure means for the limitation of the insertion of said plug in the body.
4. In combination with a steel frame member having an orifice, a fastening device to permit the nailing of material immediately to such steel frame member, which fastening device comprises a thin-walled body of metal which is located in said orifice, said thin-walled body including a portion overlying the one peripheral edge of said orifice, and a nailable plug which is laterally compressed into secure position within said body, said body also including a wall portion which is adjusted, upon the bringing of the plug to such compressed position, to overlie the other peripheral edge of said orifice, said body also including in its structure means for the limitation of the insertion of said plug in the body.

tation of the insertion of said plug in the body.

5 5. In combination with a steel frame member having an orifice, a fastening device to permit the nailing of material immediately to such steel frame member, which fastening device comprises a thin-walled body of metal which is located in said orifice, said thin-walled body including a portion overlying
10 the one peripheral edge of said orifice, a wall portion which extends into the bore of said body, and a nailable plug which is inserted and secured in the body, the insertion of said plug being adapted to move said wall
15 portion and to effect the lateral expansion of the wall of said body over the other periphery of said orifice.

6. In combination with a steel frame member having an orifice, a fastening device to
20 permit the nailing of material immediately to such steel frame member, which fastening device comprises a thin-walled body of metal which is located in said orifice, said thin-walled body including a portion overlying
25 the one peripheral edge of said orifice, a wall portion of said body offset inwardly thereof, and a nailable plug which is inserted and secured in said body, the insertion of said plug being adapted to move said wall portion and
30 to effect the lateral expansion of the wall of said body over the other periphery of said orifice, said body also including in its structure means for the limitation of the insertion of said plug in said body.

35 7. A plug-receiving member for the securing of a nailable plug within an orifice, which member includes a thin-walled body of metal, means at the one terminus of such body for limiting the insertion of the member in said
40 orifice, and means adjacent the other terminus of said body for limiting the insertion of said plug in said member, the wall of said member being adapted, upon the insertion of said plug, to yield laterally into tight engagement
45 with said orifice, and to bulge, at a point intermediate its length, into locking position in said orifice.

8. A plug-receiving member for the securing of a nailable plug within an orifice,
50 which member includes a thin-walled body of metal adapted to be inserted in said orifice, said member being adapted to receive a nailable plug, and the wall of said body being adapted, upon the reception of said plug, to
55 yield laterally into tight engagement with said orifice, and to bulge at a point intermediate its length into locking position in said orifice.

In testimony whereof I have hereunto set
60 my hand.

LEFFMAN H. LEE.