

Nov. 3, 1925.

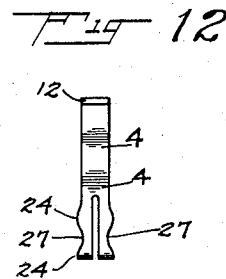
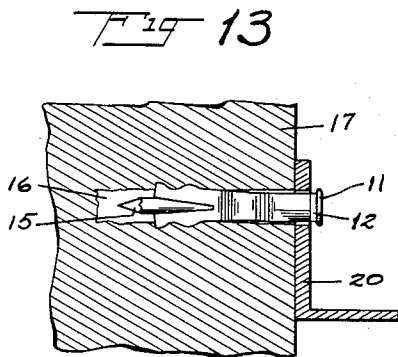
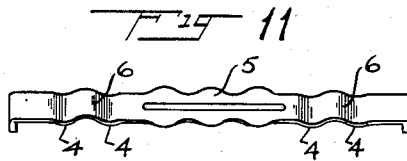
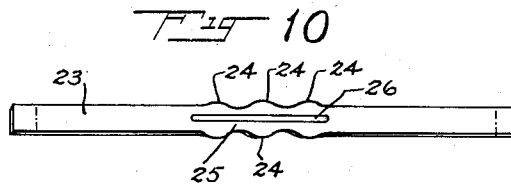
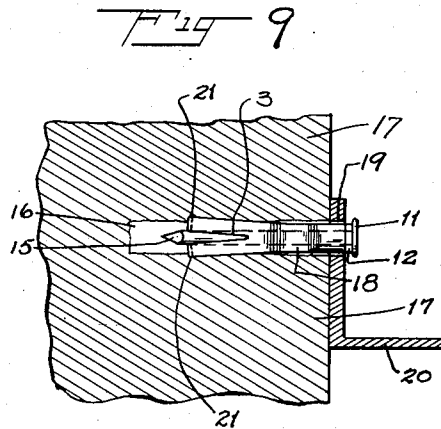
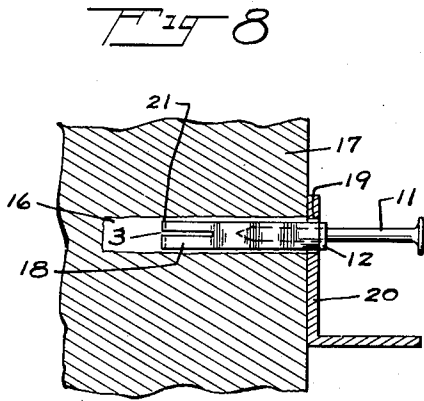
1,559,619

J. KARITZKY

CORRUGATED NAIL EXPANSION

Filed Nov. 12, 1924

2 Sheets-Sheet 2



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CORRUGATED NAIL EXPANSION.

Application filed November 12, 1924. Serial No. 749,360.

To all whom it may concern:

Be it known that I, JOHN KARITZKY, a citizen of the United States, residing at Garwood, in the county of Union and State

of New Jersey, have made certain new and useful Improvements in Corrugated Nail Expansion, of which the following is a specification, taken in connection with the accompanying drawings.

My invention relates to nail fasteners in which by merely driving the nail into the fastener, shield or expansion member the work is secured to the wall or other suitable support.

My invention more particularly relates to such a nail fastener in which the expansion member or shield is preferably formed from sheet metal and bent back upon itself to form two sides which are adapted to be forced apart by the nail as it is driven home.

My invention further covers such an expansion shield which is adapted to be expanded by the entering nail first in one direction, and then a portion of the shield or expansion, is adapted to be expanded in a different direction, to obtain a firmer grip or bond between the expansion shield and the wall, ceiling or other support in which it is located.

My invention further relates to such a nail fastener which is provided with a weakened portion near the meeting ends of the sides, and which is adapted to cooperate with the end of the nail to obtain the second expansion.

My invention further relates to such a nail expansion which has great flexibility, and which gives a maximum grip or bond in the wall or other suitable support.

My present invention is an improvement on my U. S. Patent No. 1,501,054, patented July 15, 1924.

My invention further relates to certain articles of manufacture, combinations and sub-combinations and details of construction all of which will be more fully hereinafter described and pointed out in the claims.

In the drawing I have shown two embodiments of my invention, but it is of course to be understood that my invention is not to be confined to the embodiments shown by way of illustration.

Fig. 1 is a plan view of a blank from

which I form my nail expansion or shield;

Fig. 2 is a plan view of the blank after it has been provided with transverse flutes or corrugations;

Fig. 3 is a side elevation of the complete nail expansion or shield formed from the blank;

Fig. 4 is a side elevation at right angles to Fig. 3;

Fig. 5 is a horizontal section on the line 5-5 of Fig. 3, looking in the direction of the arrows;

Fig. 6 is a horizontal section through a wall or other suitable support and the work to be supported, showing the nail about to be inserted within the nail expansion or shield;

Fig. 7 is a horizontal section, the same as Fig. 6, with the nail partially inserted in the shield of the expansion causing the first or primary expansion;

Fig. 8 is a vertical section, on the line 8-8 of Fig. 7, showing the nail in the same position as in Fig. 7;

Fig. 9 is a vertical section, similar to Fig. 8, showing the nail driven home, and causing the secondary expansion at right angles to the primary expansion;

Fig. 10 is a plan view of a modified form of blank from which a modified form of nail expansion or shield is made;

Fig. 11 is a plan view of the same blank after it has been bent to form the primary flutes or corrugations;

Fig. 12 is a side elevation of the nail expansion or shield formed from the blank shown in Fig. 11;

Fig. 13 is a vertical section showing the nail expanding this modified form of shield.

By my present invention I permit a nail expansion or shield to operate successfully in a poorly drilled hole, as for example one that is undersize, or of less diameter than would properly fit the nail expansion of my former Patent 1,501,054. I also insure that my nail expansion or shield will give the maximum grip or bond with the wall or other suitable support. I also permit different size nails to be used with one size of shield.

In the form of my invention shown in Figs. 1 to 9 inclusive I take a strip of metal 1, which may be flat roll steel aluminum, brass, lead, or in fact any suitable metal

which can be bent, and I weaken the center 2 of the blank in any suitable manner, but preferably by providing it with a slot 3.

This blank is then provided with transverse flutes or corrugations 4, 4 by bending the blank preferably in a press, though it may be bent at the same time as the blank is formed. By bending the blank on the line 5 to bring the two sides 6, 6 adjacent to each other, the flutes or corrugations 4, 4 form alternate interior and exterior projections 7, 7 and 8, 8. This leaves exterior valleys 9, 9 and interior valleys 10, 10. The interior projections 7, 7 lie adjacent to each other and form a restricted axial bore and are engaged by the nail 11, in the manner to be more fully hereinafter pointed out.

At the same time that the blank 1 is shaped and provided with the corrugations, or subsequently, the ends of the blank are bent to form flanges or stops 12, 12 and curved surfaces 13, 13; these curved surfaces when brought together, as shown in Figs. 3 and 5, form the entrance of the axial bore 14 which guides and directs the end 15 of the nail when it is inserted within the shield or expansion.

In using my shield the hole 16 drilled or otherwise formed in the wall or other suitable support 17 of masonry, brick, stone, concrete or any other suitable material, need not be of exactly the correct diameter for the reception of the shield. On the contrary my shield will successfully cooperate with the walls of the hole 16 even though the hole be undersized, irregular or otherwise poorly drilled.

The shield or expansion 18 is preferably passed through the hole 19 in the bracket 20 or other suitable work to be supported, and is then placed within the hole 16 as shown in Fig. 6. By then driving the nail 11 by a hammer, or other tool, the initial entrance of the nail within the shield 18 will force the sides 6, 6 apart thereby causing the primary expansion of the shield. As the nail moves down the shield 18 it engages successively with the different interior projections 7, 7 and forces them apart. This in turn causes the exterior projections 8, 8 to bite into the surface of the hole 16 and form a very secure bond or grip.

As the nail 11 is driven past the position shown in Fig. 7, and the end 15 of the nail 11 reaches the weakened portion 2 of the shield it will spread the weakened portion, as for example by passing through the slot 3 and cause the ends 21, 21 (Figs. 8 and 9) of the shield to expand at right angles to the main expansion caused by the nail forcing the sides 6, 6 away from each other. The parts are then in the position shown in Fig. 9.

It will be noted that by forming the shield with flutes or corrugations great adapt-

ability and flexibility is given the shield for the reason that the surfaces of the shield forming the exterior valleys 9 do not normally contact with the surface of the hole 16, thereby normally forming voids or spaces in a properly drilled hole 16. When, however, the hole 16 is undersized, my shield 18 can nevertheless be used because the exterior valleys 9, 9 formed by the flutes or corrugations, will permit the metal forming the interior projections 7, 7 to be forced away from the nail as it is driven into the shield or expansion, thereby tending, more or less, to smooth out the exterior valleys 9, 9. But to smooth out these valleys, more or less, the nail is driven home as shown in Fig. 9.

For the same reason, it will be clear that my shield may be used with nails having stems of different diameters.

I have shown in Figs. 10 to 13 a modification in which I employ two sets of flutes or corrugations arranged preferably at 90° from each other. In this form the blank 23 is provided with side flutes or corrugations 24, 24 preferably formed on the blank as it is cut. This blank is then provided with a weakened portion 25 preferably by providing it with a slot 26, in the same manner as in the other construction. By then providing the blank 23 with transverse flutes or corrugations 4, 4 and bending it at 5 so as to bring the two sides 6, 6 together the nail expansion or shield is formed which is shown in Fig. 12, having two sets of corrugations at right angles to each other.

The operation of this expansion is the same as that previously described for the form shown in Figs. 1 to 9, except that in this form the side or secondary corrugations 24, 24 make an additional and firmer bond or grip on the surface of the hole 16; and further insure that the secondary expansion, formed by expanding the end of the shield, will occur even if the hole is undersized or poorly drilled. The exterior valleys 27, 27 will permit a certain amount of flexibility in the secondary expansion, in the same manner as that described for the main valleys 9, 9.

While I have described the shields as being first cut and subsequently bent it is of course to be understood that these different steps may be performed by a punch press at minimum expense.

Having thus described this invention in connection with illustrative embodiments thereof, to the details of which I do not desire to be limited, what is claimed as new and what is desired to secure by Letters Patent is set forth in the appended claims.

What I claim is:—

1. A new article of manufacture comprising a nail expansion shield formed from sheet metal bent back on itself and provided with two sets of flutes or corrugations, one

set of flutes being located in the body of the shield and the other set of flutes being located on the edge of the shield.

2. A new article of manufacture comprising a nail expansion shield formed from sheet metal bent back on itself and provided with two sets of flutes or corrugations at an angle to each other and with means to insure that said sets of flutes or corrugations are expanded successively.

3. A new article of manufacture comprising a nail expansion shield formed from sheet metal bent back on itself and fluted or corrugated to permit flexibility in the driving of a nail and to insure the maximum grip or bond when expanded and provided with weakening means to permit a secondary expansion of a portion of the shield at an angle to the main expansion.

4. A new article of manufacture comprising a nail expansion shield formed from sheet metal bent back on itself and fluted or corrugated to permit flexibility in the driving of a nail and to insure the maximum grip or bond when expanded and provided with a slot to permit a secondary expansion of a portion of the shield at an angle to the main expansion.

5. A new article of manufacture comprising a nail expansion shield formed from sheet metal bent back on itself and fluted or corrugated to permit flexibility in the driving of a nail and to insure the maximum grip or bond when expanded its inner end being provided with secondary flutes or corrugations arranged on the edge of the shield.

6. A new article of manufacture comprising a nail expansion shield formed from sheet metal bent back on itself and fluted or corrugated to permit flexibility in the driving of a nail and to insure the maximum grip or bond when expanded, its inner end being provided with weakening means to permit a secondary expansion of a part of the shield at an angle to the main expansion, said inner end being provided with secondary flutes or corrugations.

7. The combination of a nail fastener having two corrugated or fluted sides bent back or themselves to form a shield having exterior and interior projections, the interior projections being adapted to cooperate with a nail and the exterior projections being adapted to give the maximum grip or bond when expanded, weakening means at the end of the shield to permit a nail to expand that end in a different direction from the main expansion, and a nail.

8. The combination of a nail fastener having two corrugated or fluted sides bent back on themselves to form a shield having exterior and interior projections, the interior projections being adapted to cooperate with a nail and the exterior projections being adapted to give the maximum grip or bond when expanded, secondary corrugations or flutes and weakening means at the end of the shield to permit a nail to expand that end in a different direction from the main expansion, and a nail.

JOHN KARITZKY.