April 24, 1928. 1,667,268

H. W. PLEISTER

DRIVE SCREW EXPANSION AND METHOD

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Fig 1

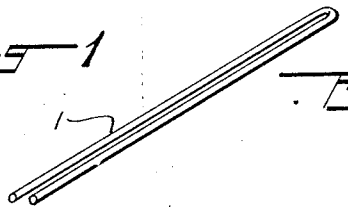


Fig 2

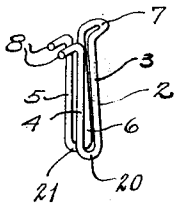


Fig 3

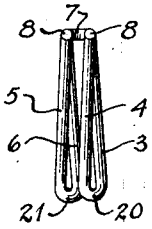


Fig 4

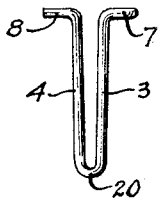


Fig 5

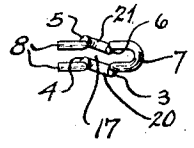


Fig 7

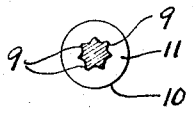


Fig 6

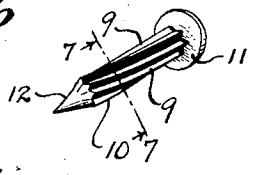


Fig 15

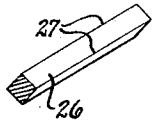


Fig 16

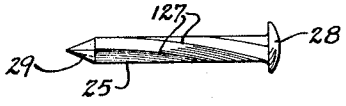
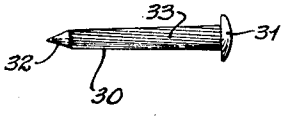


Fig 17



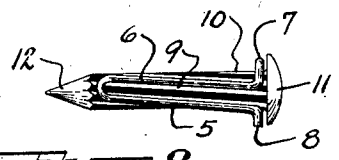


Fig 8

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Fig 9

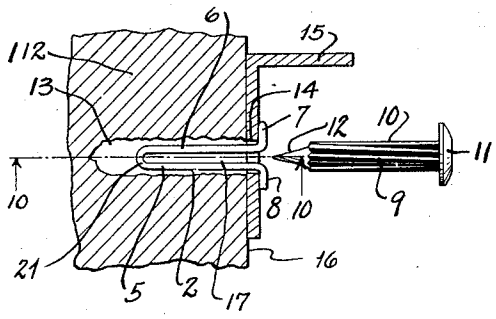


Fig 10

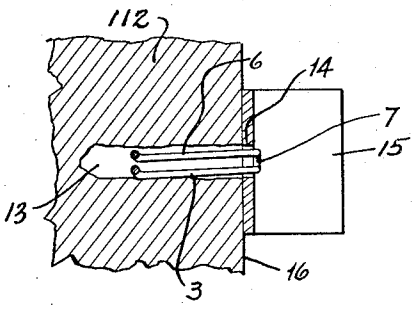


Fig 11

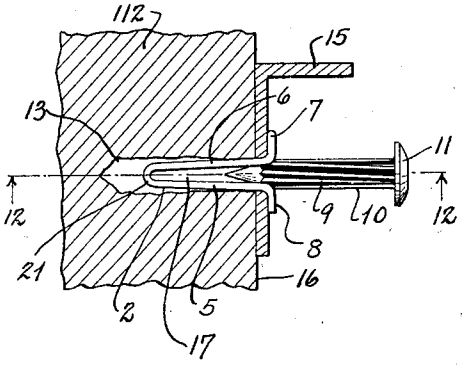


Fig 12

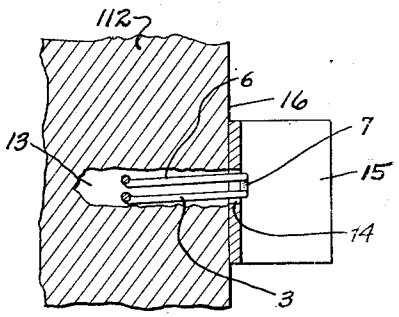


Fig 13

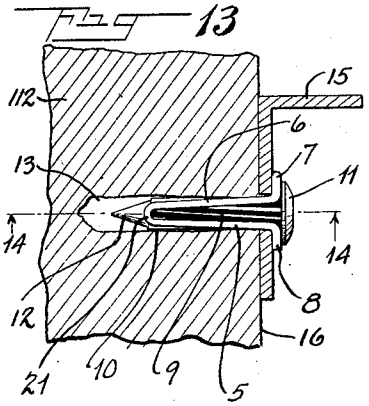
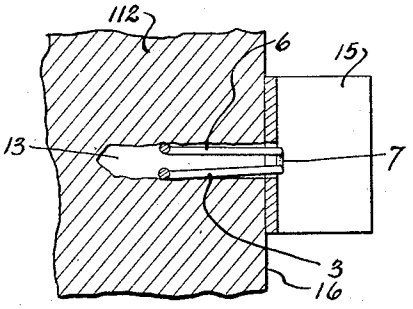


Fig 14



INVENTOR.
Henry W Pleister
BY
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Patented Apr. 24, 1928. 1,667,268

UNITED STATES PATENT OFFICE.

HENRY W. PLEISTER, OF WESTFIELD, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HENRY B. NEWHALL CORPORATION, OF GARWOOD, NEW JERSEY, A CORPORATION OF NEW JERSEY.

DRIVESCREW EXPANSION AND METHOD.

Application filed May 11, 1926. Serial No. 108,230.

My invention relates to expansions and more particularly to a drive screw expansion and the method of making it.

My invention further relates to an expansion shield formed by bending different strands of wire upon themselves, and then twisting the strands, to obtain a cheap and simple expansion shield, and one which is adapted to be expanded by a drive screw.

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

In the accompanying drawing the same reference numerals refer to similar parts in the several figures.

Fig. 1 is a perspective view of a length of wire bent back upon itself, showing the first stage of manufacturing my wire shield;

Fig. 2 is a perspective view of the completed wire shield formed by bending the double wire shown in Fig. 1 upon itself, and also twisting the strands of wire so that they may cooperate with long pitch spiral threads of a drive screw;

Fig. 3 is a front elevation of the expansion shield;

Fig. 4 is a side elevation;

Fig. 5 is a plan view of the wire shield shown in Fig. 2;

Fig. 6 is a perspective view of one form of drive screw, which I may employ as the expanding member;

Fig. 7 is a transverse, vertical section, on the line 7—7 of Fig. 6;

Fig. 8 is a plan view of the combined wire expansion shield and the drive screw with which it cooperates, the same being shown in the shipping position of the parts;

Fig. 9 is a vertical section showing the wire shield mounted in a wall, or other suitable support, and about to be expanded by the drive screw;

Fig. 10 is a horizontal section on the line 10—10 of Fig. 9, looking up in the direction of the arrows, and omitting the drive screw;

Fig. 11 is a vertical section similar to Fig. 9 showing the beginning of the initial radial expansion upon the insertion of the drive screw;

Fig. 12 is a horizontal section on the line 12—12 of Fig. 11, looking up in the direction of the arrows, the drive screw being omitted for purposes of clearer illustration;

Fig. 13 is a vertical section similar to Fig. 11, showing the drive screw driven home;

Fig. 14 is a horizontal section on the line 14—14 of Fig. 13, the drive screw being omitted for purposes of clearer illustration;

Fig. 15 is a detail of a blank from which one form of my drive screw may be made;

Fig. 16 is a detail showing one form of my drive screw made from the blank of Fig. 15 by twisting the bar to form long pitch spiral threads, then upsetting one end to form a head, and sharpening the other end to form a drive point;

Fig. 17 is a detail of a modification in which the drive screw may be tapered.

In my invention a cheap grade of comparatively soft wire 1, cut to the particular length desired, for any particular size shield, is bent back upon itself, as shown in Fig. 1, to form two strands. This double strand of wire is bent, substantially between its ends, so that the wire shield 2 (Fig. 2) is formed having strands 3, 4, 5, 6. The ends of the strands 3 and 6 are bent to form the portion 7, which is a part of the integral head of the wire shield. The ends of the strands 4 and 5 are then bent at right angles to form the portions 8, 8. These portions 8, 8 and the portions 7 form the integral head of a wire shield. The strands 3, 4, 5 and 6 are then twisted as shown more clearly in Figs. 5 and 3, to permit them to cooperate with the long pitch spiral threads 9, 9 of the drive screw 10. This drive screw is provided with a head 11 and a point 12.

A hole 13 of the required size is drilled, or otherwise formed, in the wall 12 of brick, masonry, concrete, stone or other suitable material, and into this hole is placed the wire shield 2, first passing it through a hole 14 in the bracket 15, or other work to be supported, on the face 16 of the wall or other suitable support 112. The drive screw 10 is then brought into the position shown in Fig. 9 and partially inserted into the axial bore 17 of the shield (Fig. 11). This causes the first or primary radial expansion, due to forcing the strands 4 and 5 away from the strands 3 and 6. When the point 12 of the drive screw is driven further into the expansion shield 2 and contacts with the bent portions 20 and 21, it will spread these

portions apart and give them a secondary radial expansion at substantially 90° from the primary radial expansion.

By twisting the strands 3, 4, 5 and 6 of the wire shield 2 so that they will cooperate with the long spiral screw-threads 9, 9 on the screw drive 10, it will be apparent that all portions of the strands 3, 4, 5 and 6 do not lie parallel with the longitudinal axis of the hole 13, but on the contrary, are at an angle to it. This gives an increased bearing or bond between the shield 2 and the wall of the hole 13, because any excessive strain or pull upon the work or bracket 15 is resisted by the peculiar helical or helicoidal position of these strands, which prevents, on an excessive pull or strain, any portion of a strand "tracking" the preceding portion of that strand. That is, they are not in line and any excessive strain or pull, sufficient to withdraw the shield, will cause the helical or helicoidally arranged strands 3, 4, 5 and 6 to scrape or chip the entire interior surface of the wall 18 and not merely portions of the surface of the hole, as would be the case if the strands were parallel to the longitudinal axis of the hole.

I may use various forms of drive screws instead of the form shown in Figs. 6, 8, 9, 11 and 13. For example, I may use a drive screw 25 formed from a blank of angular stock, such for example as square stock (Fig. 15), having corners 27, 27. This blank can then be twisted, in any suitable manner, in a machine, the corners 27, 27 after twisting becoming the long pitch spiral threads 127, 127 of the drive screw 25 (Fig. 16). It is, of course, understood that one end of the blank 26 is upset to form a head 28, and that the other end is sharpened to form a drive point 29.

I may also use a tapered drive screw 30, as shown in Fig. 17, having a head 31 and drive point 32 and provided with spiral threads 33, 33.

It will be noted that my expansion shield can be made at minimum cost, that it is simple, and will have the maximum efficiency for a given size shield. Being formed out of an integral piece of wire there are no parts to be assembled and consequently no parts to be lost, and no time is consumed in assembling. It is further to be noted that my wire shield is an open construction, which will freely allow galvanizing by the hot process after it has been made.

My wire shield may be formed by hand with a pair of pliers but preferably it will be made in large quantities, in a wire forming machine.

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. The method of manufacturing a wire nail expansion consisting in bending a strand of wire back on itself to form a two strand wire, then bending and twisting the two strand wire on itself to form a four-strand expansible shield, the strands of which are in a position to cooperate with long pitch spiral threads of a drive screw.

2. The method of manufacturing a wire nail expansion consisting in bending a strand of wire back on itself to form a two strand wire, then bending and twisting the two strand wire on itself to form a four strand expansible shield, the strands of which are in a position to cooperate with long pitch spiral threads of a drive screw and bending the ends of the double wire to form a head for the wire shield.

3. A new article of manufacture comprising an integral wire expansion shield formed of wire bent back on itself twice and twisted to form four integral helicoidal extending strands of wire and an integral wire head formed in two parts.

4. A new article of manufacture comprising an integral wire expansion shield formed of wire bent back on itself twice and twisted to form four integral helicoidal extending strands of wire and an integral wire head formed in two parts and a long pitch spiral threaded drive screw nested in the integral wire shield.

HENRY W. PLEISTER.