Dec. 20, 1927. 1,653,359

J. E. GOEWEY

BOLT ANCHOR

Filed July 8, 1926

Fig 2

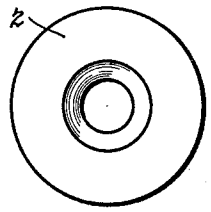


Fig 1

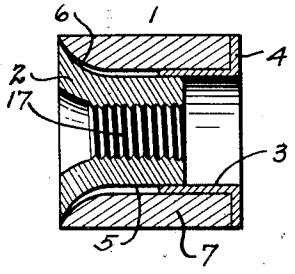
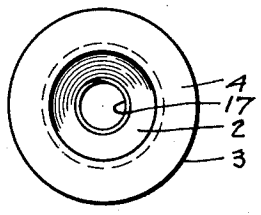


Fig 3



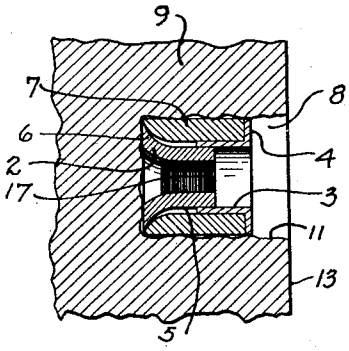


Fig 4

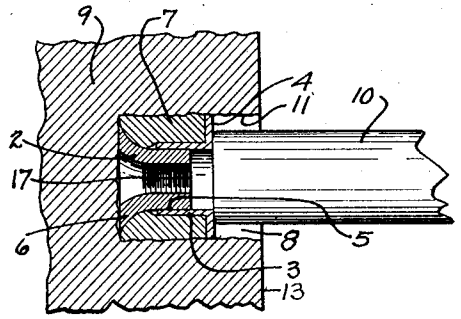


Fig 5

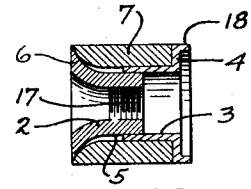


Fig 7

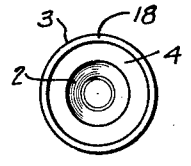


Fig 8

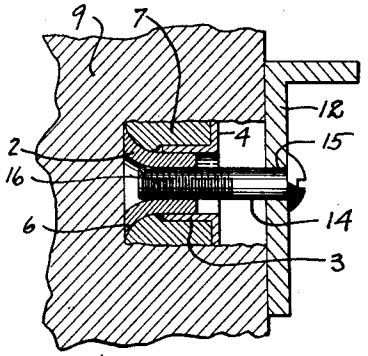


Fig 6

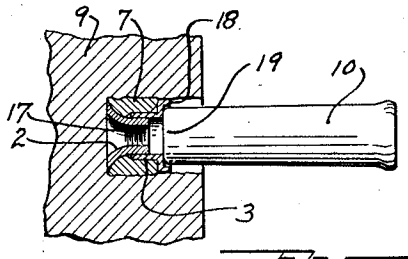


Fig 9

James E. Goewey INVENTOR.

BY Cravath Johnson ATTORNEYS.

Patented Dec. 20, 1927. 1,653,359

UNITED STATES PATENT OFFICE.

JAMES EDWARD GOEWEY, OF NEWARK, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HENRY B. NEWHALL CORPORATION, OF GARWOOD, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BOLT ANCHOR.

Application filed July 8, 1926. Serial No. 121,100.

This invention relates to expansion bolts, and more particularly to an expansion bolt which is expanded in a wall or other suitable support by a compression tool, which is withdrawn after the bolt is expanded.

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

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

Fig. 1 is a longitudinal vertical section through one form of my bolt anchor;

Fig. 2 is a rear elevation;

Fig. 3 is a front elevation;

Fig. 4 is a vertical section through a wall or other suitable support, showing the bolt anchor in vertical section and about to be expanded;

Fig. 5 is a vertical section, similar to Fig. 4, showing the bolt anchor being expanded by a compression tool;

Fig. 6 is a vertical section, similar to Fig. 5, showing the compression tool withdrawn, and the bolt anchor supporting a bracket;

Fig. 7 is a vertical section of a modification wherein the compression ferrule is provided with centering means to center the end of the compression tool;

Fig. 8 is a front elevation of the modification shown in Fig. 7;

Fig. 9 is a vertical section through the bolt anchor of Fig. 7, and a wall or other suitable support, showing the compression tool centered by the centering means carried by the ferrule.

In some forms of bolt anchors it is desirable to expand them in a wall, or other suitable support, by a compression tool, or other suitable means, the tool being withdrawn before the work is supported by a bolt or screw cooperating with the previously set bolt anchor. It is found in practice that the compressible material of such bolt anchors is not equally compressed, resulting in a poor bond or grip with the surface of the hole in which it is mounted thereby giving less than the maximum expansion. It is also found in practice that the maximum expansion is not obtained unless the compression tool is properly centered so as to equally compress the compressible material and prevent the longitudinal axis of the bolt anchor becoming set at an angle to the longitudinal axis of the hole in which it is seated. If the bolt anchor becomes seated at an angle to the longitudinal axis of the hole, a poor job results because it is difficult to properly attach the work and bring it up flush and smooth against the face of the wall or other suitable support.

By my invention I overcome these objections and insure that the maximum grip or bond will be obtained, with any given size bolt anchor, and that the expanding pressure will be equally distributed throughout the mass of the compressible material, insuring the maximum grip or bond with the wall or other suitable support. If the centering means are employed, as in the preferred form, the compression tool will always be centered, thereby insuring that the longitudinal axis of the bolt anchor will coincide with the longitudinal axis of the hole.

My invention may be carried out with the different forms of construction. I have shown in Fig. 1, by way of example, a bolt anchor 1, having a bell nut 2, and a compression member or ferrule 3, provided with a shoulder 4, the ferrule being mounted upon the cylindrical portion 5 of the bell nut 2 and adapted to slide thereon. Between the shoulder 4 of the ferrule and the bell 6 of the bell nut 2, I mount a ring of any suitable compressible material 7, preferably, though not necessarily, ductile material, such as lead or alloy. After the parts are assembled, sufficient pressure is exerted on the ferrule 3 to frictionally hold the parts together for handling and shipment, but not to expand the expansible material 7.

In use a hole 8 of the required diameter for the particular size bolt anchor to be employed is drilled or otherwise formed in a wall or other suitable support 9 of masonry, brick, terra cotta, concrete, or other suitable material, and the expansion bolt 1 is placed in the bottom of the hole, as shown in Fig. 4. The compression tool 10 is then brought in contact with the shoulder 4 of the ferrule 3 and caused to exert pressure upon the bolt anchor, being actuated in any suitable man-

ner as by a hammer (not shown) or other tool. This causes the ferrule 3, with its shoulder 4 (Fig. 5), to slide upon the cylindrical portion 5 of the bell nut 2, and in doing so causes the shoulder 4 to exert equal pressure around the ring 7 of compressible material so that it will be expanded uniformly and make a uniform and firm bond or grip between the surface 11 of the hole 8 and the compressible material 7. After this compressible material 7 has been expanded by the compression tool 10, the tool is withdrawn, leaving the expansion bolt 1 within the hole. It is then ready to cooperate with the member which is to be screwed to it. I have shown in Fig. 6 the work 12 in the form of a bracket secured flush to the surface 13 of the wall or other suitable support by means of the bolt 14 passing through the hole 15, its screw-threaded end 16 cooperating with the threads 17 in the bell nut 2.

To further insure the equal expansion of the compressible material 7 and to prevent the bolt anchor becoming expanded in the hole 8 at an angle to the longitudinal axis of the hole, I preferably provide the shoulder 4 with centering means 18 to center the end 19 of the compression tool 10. In the form shown in Figs. 7, 8 and 9 this centering means is a flange 18 which cooperates with the preferably beveled end 19 of the compression tool 10 to insure that the tool will be centered while it is employed to drive the ferrule 3 toward the bell 6 of the bell nut 2 to uniformly compress the compressible material 7.

In this form of device, the work whatever it may be, as for example 12, may be removed by simply unscrewing the bolt 14 without removing the bolt anchor from the wall or other suitable support thereby permitting any other suitable work to be supported by the same bolt anchor.

It will be noted that in all forms of my invention I preferably make the shoulder 4 of the same diameter as the compressible material so that any size tool may be used to expand the bolt anchor without any of the lead or other compressible material escaping around the sides of the setting tool. Should any of the compressible material escape the expansion bolt would lose some of its expansive force. The shoulder 4, therefore, insures not only that any size setting tool, which can be gotten into the hole, may be used, but also that the maximum grip or bond will be had with any given size bolt anchor.

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. In an expansion bolt the combination of a nut, a rigid compression ferrule mounted on the nut and provided with means to center a compression tool, and compressible material mounted on the ferrule and adapted to be compressed and expanded by pressure of the compression tool.

2. In an expansion bolt the combination of a bell nut, a rigid compression ferrule mounted on the nut and provided with means to center a compression tool, and ductile material mounted on the ferrule and adapted to be compressed and expanded by pressure of the compression tool.

3. In an expansion bolt the combination of a nut, a rigid compression ferrule mounted on the nut and provided with a shoulder having means to center a compression tool, and compressible material mounted on the ferrule and adapted to be compressed and expanded by pressure of the compression tool.

4. In an expansion bolt the combination of a nut, a rigid compression ferrule mounted on the nut and provided with a shoulder to compress compressible material, said shoulder being provided with a flange to center a compression tool, and compressible material mounted on the ferrule and adapted to be compressed and expanded by pressure of the compression tool.

JAMES EDWARD GOEWEY