April 25, 1933. R. E. McINTOSH ET AL 1,905,730

BOLT ANCHOR

Filed Oct. 13, 1930

Fig. 1.

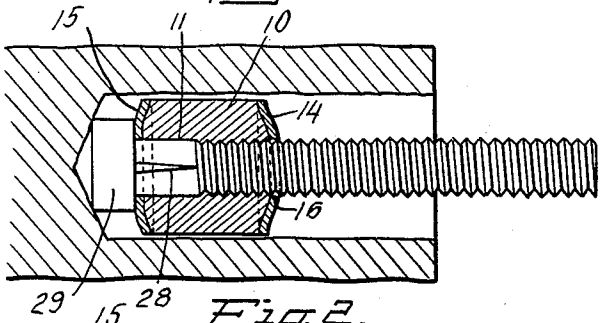


Fig. 3.



Fig. 4.

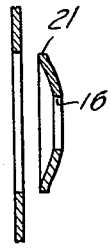


Fig. 2.

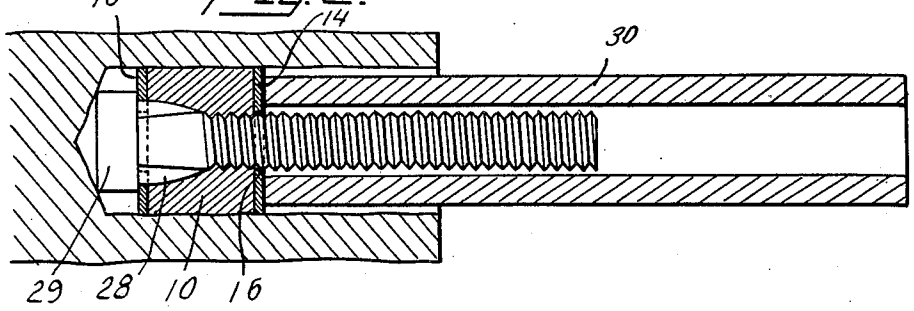


Fig. 5.

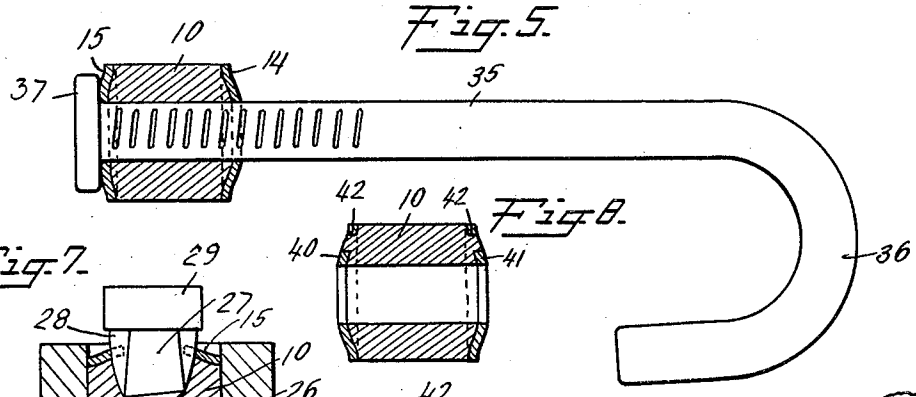


Fig. 8.

Fig. 7.

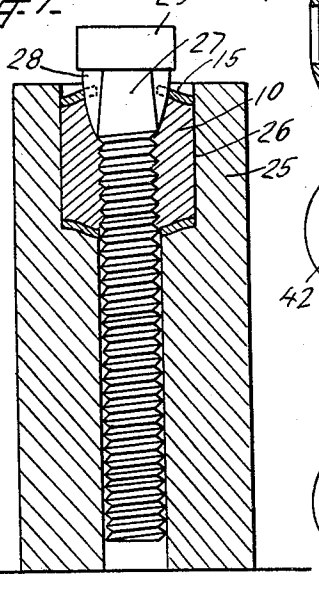


Fig. 9.

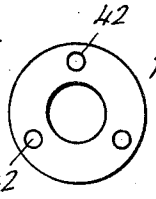


Fig. 6.

INVENTOR
Roy E. McIntosh
Thomas J. Noonan
BY
Marshall & Hawley.
ATTORNEYS

Patented Apr. 25, 1933 1,905,730

UNITED STATES PATENT OFFICE

ROY E. McINTOSH, OF NEW YORK, N. Y., AND THOMAS J. NOONAN, OF JERSEY CITY, NEW JERSEY, ASSIGNORS TO J. EDWARD OGDEN COMPANY, INC., OF EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY

BOLT ANCHOR

Application filed October 13, 1930. Serial No. 488,388.

This invention relates to bolt anchors such as those used for anchoring bolts or other supporting elements in walls of brick, stone or cementitious material.

The invention has for its salient object to provide an anchor that is simple and practical in construction, comprises few parts, and can be economically manufactured.

Another object of the invention is to provide an anchor of the character described that can be easily and quickly expanded and will form a firm and effective anchorage.

Further objects of the invention will appear from the following specification taken in connection with the drawing, which forms a part of this application, and in which

Fig. 1 is a sectional elevation showing an anchor constructed in accordance with the invention disposed in a wall opening prior to expansion;

Fig. 2 is a view similar to Fig. 1 showing the anchor expanded and illustrating the method of expanding the anchor;

Fig. 3 is a sectional elevation showing the first step in making the washers used in forming the anchor;

Fig. 4 is a sectional elevation similar to Fig. 3 but showing the washer punched out of the material;

Fig. 5 is a sectional elevation showing the anchor in position on a hook;

Fig. 6 is a perspective view showing the tool used for expanding the anchor illustrated in Fig. 5;

Fig. 7 is a sectional elevation showing the method of securing the anchor on a bolt or screw stud;

Fig. 8 is a sectional elevation of an anchor unit constructed in accordance with the invention; and

Fig. 9 is an end view of the anchor shown in Fig. 8.

The invention briefly described consists of an anchor comprising a body portion having a central bore therethrough and formed of relatively soft or ductile metal and washers disposed at the ends of the body portion and formed of relatively hard distortable metal. The anchor is placed on the element to be anchored and the two parts are then disposed in the wall opening. An expanding tool, such as a pipe tool, is then placed in the opening around the shank of the element to be anchored and pressure is exerted on the tool by means of hammer blows or in some other suitable manner. The ductile metal is then squeezed laterally between the two washers into gripping engagement with the wall opening and the washers flattened by the blows, expand diametrically to fill the hole.

Further details of the invention will appear from the following description.

In the embodiment of the invention illustrated in the drawing, the anchor comprises a body portion 10 having a central bore or opening 11 therethrough. Washers 14 and 15 are disposed at the ends of the body portion and are provided with central openings 16 which are alined with the opening through the body portion 10.

The method of forming the washers is illustrated in Figs. 3 and 4. The washers are formed of sheet metal which is dished or depressed, as shown at 20 in Fig. 3. After the depressions have been formed, the washers are punched out, as shown in Fig. 4, wherein it will be noted that the periphery 21 of the washer is cylindrical. This is accomplished by forming the dished portion with a smaller diameter than the outer diameter of the washer. In other words, the punching is formed by engaging the punch with the flat portion of the sheet and not with the dished portion. It has been found that a washer of the shape shown in Fig. 4 expands radially more effectively than a washer in which the outer edge is conical, since the outer edge in that case tends to press into the body portion 10 of the anchor.

When the washers have been formed in the manner described, the anchor is fixed on the threaded stud or bolt in the manner shown in Fig. 7. In this figure there is illustrated a block 25 having a cylindrical recess 26 therein shaped to receive the anchor. One washer is placed around the threaded element or stud 27, the body portion 10 is then placed on the stud, and the other washer is

placed at the other end of the body portion. The stud is preferably provided with radially extending webs or fins 28 adjacent the head 29 of the stud. When the parts have been assembled in the manner shown in Fig. 7, pressure is applied to the head 29, whereupon the anchor will be forced on the stud to a position in which the washer 15 will be disposed in contact with the head 29. During this process the webs 28 will cut diametrical notches in the washer 15 and will be embedded in the body portion 10.

In order to expand the anchor, the threaded element or stud and anchor are placed in the wall opening, as shown in Fig. 1. An expanding tool 30 is then disposed around the end of the shank of the stud, the tool preferably consisting of a short length of pipe. The outer end of the tool is then struck with a hammer or other implement and the body portion 10 of the anchor is forced laterally between the washers 14 and 15 and into gripping engagement with the wall opening. The washers are flattened by the blows, thus increasing their diameters so as to fill the hole, thereby restraining the body material from escaping. In holes of the proper size the contact of the washers with the sides of the holes adds to the strength of the anchorage. After the anchor is set, the webs 28 will prevent the stud or shank from turning.

In Fig. 5 the anchor is shown as mounted on a hook comprising a shank 35 having a hook 36 at the outer end thereof and a head 37 at the other end thereof. In order to expand the anchor on the hook, a tool, such as that shown in Fig. 6, is utilized. In this figure it will be seen that a portion 38 of the wall of the expanding tool is cut away.

Figs. 8 and 9 illustrate an anchor unit in which the end washers 40 and 41 are provided with perforations 42. When the washers are compressed on the body portion, the ductile metal of the body portion will fill the perforations 42, thus retaining the washers in engagement with the central or body portion 10.

The anchor unit described in the preceding paragraph can be sold separate from the bolt and, as a matter of fact, the purchaser of expansion shields often supplies his own bolts. It will be obvious that much less time will be taken to assemble the anchor unit and bolt than would be required to assemble the individual parts of the unit on the bolt.

From the foregoing description it will be seen that a simple, practical and effective anchor has been designed and that the anchor can be easily and quickly expanded into gripping relation with the inner surface of a wall opening.

Although certain specific embodiments of the invention have been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What we claim is:

1. A bolt anchor unit comprising a body portion of ductile metal having a central bore therethrough, and a dished washer at each end of the body portion said washer and body portion having interengaging portions whereby they are connected together.

2. A bolt anchor comprising a body portion of ductile metal having a central bore therethrough, and a dished washer at each end of the body portion, each washer having openings receiving portions of the ductile metal, thereby securing the washers to the body portion.

3. A bolt anchor comprising a body portion of ductile metal having a central bore therethrough, and a washer at each end of the body portion, each washer being outwardly dished and having openings receiving portions of the ductile metal, thereby securing the washers to the body portion.

4. A bolt anchor comprising a body portion of ductile metal having a central bore therethrough, and a dished washer at each end of the body portion, the outer edge portion of each washer being disposed in a plane normal to the axis of the anchor.

5. A bolt anchor comprising a body portion of ductile metal having a central bore therethrough, and a dished washer at each end of the body portion, the outer edge of each washer being substantially cylindrical.

6. A bolt anchor unit comprising a body portion of ductile metal, and an outwardly dished washer connected to each end of the body portion, said body portion and washers having interengaging parts whereby they are connected together.

7. In combination, a stud having a shank and a head at one end of the shank, said shank having laterally projecting webs adjacent the head, and an anchor having a body portion of ductile metal encircling said shank and webs, and washers disposed at the ends of said body portion.

In witness whereof, I have hereunto set my hand this 7th day of October, 1930.

ROY E. McINTOSH.

In witness whereof, I have hereunto set my hand this 7th day of October, 1930.

THOMAS J. NOONAN.