C. S. GIRVAN.

BOLT ANCHOR.

APPLICATION FILED JULY 14, 1916.

1,396,569.

Patented Nov. 8, 1921.

Fig. 1

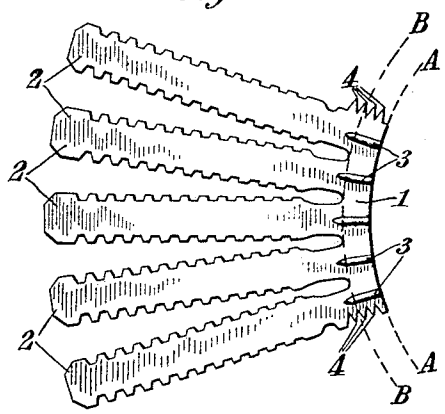


Fig. 2

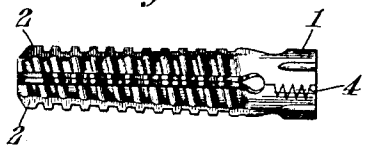


Fig. 3

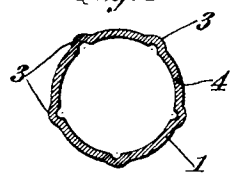
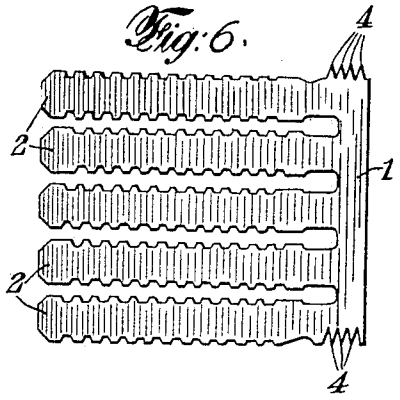


Fig. 6.



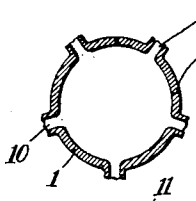


Fig. 4.

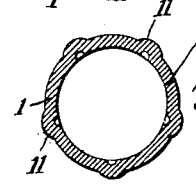


Fig. 5.

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BOLT-ANCHOR.

1,396,569. Specification of Letters Patent. Patented Nov. 8, 1921.

Application filed July 14, 1916. Serial No. 109,209.

To all whom it may concern:

Be it known that I, CHARLES S. GIRVAN, a citizen of the United States, and a resident of White Plains, county of Westchester, State of New York, have invented certain new and useful Improvements in Bolt-Anchors, of which the following is a specification.

My invention relates to expansion bolt anchors, and particularly to the type shown in Joseph Patent No. 1,066,500, but made in accordance with the process of, and from a modified form of the blanks shown in, my application, Serial No. 868,963, filed October 28, 1914. The expansion bolt anchor shown in the Joseph patent consists of an integral tubular body portion with expansion members integrally attached to said body portion and creased longitudinally so as to form a tapering interior and a substantially cylindrical exterior. These expansion members are internally screw-threaded so that a suitable bolt may be screwed into them and they are thereby expanded to grip the wall.

The process of making the anchor as set forth in my application above mentioned consists in stamping a rectangular or slightly fan-shaped blank from a piece of metal having a body portion with integral expansion members attached thereto and off-setting a portion of each of said members and bending the blank upon itself, leaving an opening therethrough, one of the blanks shown in that application being substantially the same as Figure 1 of the present application, and which will be described hereinafter.

The present invention relates particularly to the provision of means whereby the adjoining ends of the body member may be fastened or locked together and held in register with each other, and also in the provision of means on the body member of the anchor to bear against the walls of the opening into which it is placed so as to hold the ends of the body member in contact with each other and to prevent the anchor from revolving in the hole while the expanding bolt is being screwed into position.

It is found in devices of this character that in screwing the expanding bolt into position in the anchor, strain is placed upon the expanding members of the anchor which, in some instances, tends to move them from their normal median position with respect to the adjacent members. This causes the abutting ends of the body member to be displaced relatively to each other, thereby decreasing the efficiency of the device by causing an irregular expansion of the members and an irregular bearing of the members, and consequently, an irregular distribution of the pressure and gripping of the members caused by the introduction of the bolt. Furthermore, the displacement of the expansion members may be caused by carelessness in introducing the anchor into the hole.

It is one of the purposes of this invention to so arrange the body member that the ends will be held in register with each other as well as in contact with each other whatever stress or strain may be placed upon the expanding members, whereby the bad effects, above noted, are prevented.

My invention will be more fully understood by reference to the following description taken in connection with the accompanying drawings, forming a part hereof, and in which—

Fig. 1 shows the blank from which the anchor is made;

Fig. 2 shows the anchor made from the blank shown in Fig. 1;

Fig. 3 is an end view of the device shown in Fig. 2;

Figs. 4 and 5 show modifications of Fig. 3; and

Fig. 6 shows a modification of the blank.

By reference to the drawings it will be seen that the body portion of the anchor of Fig. 1 comprises a slightly curved piece of metal 1 having integrally attached thereto the expanding members 2. In Fig. 6 the body portion is rectangular but is not curved. These members may be given any desired shape, but they are preferably inset along their intermediate portions, while the edges remain substantially in alinement with the walls of the body member, thus forming an anchor of general cylindrical form having portions inset so as to form a contracted throat, which becomes smaller toward the inner end of the device.

Formed on the body member 1 are a plurality of ribs 3, as shown in Figs. 1, 2 and 3, or a series of perforations, as shown in Fig. 4, or a plurality of raised points, as shown in Fig. 6. These ribs and projections may be produced by corrugating or crimping a portion, or all, of the body member 1, as shown in Fig. 1, or by puncturing from the inside, allowing the edges 10 of the metal

to stand up, as in Fig. 4, or by indenting the metal from the inside, causing raised points 11 on the outside, as shown in Fig. 5. The shape and size of the punctures or indentations may be of any desired pattern, but I have shown them round.

The ends of the member 1 are punched or otherwise shaped in the form of saw-teeth 4. These teeth are arranged so that when the two ends are placed together they will be brought into register with each other, as shown in Fig. 2.

The angular arrangement of the sides of the saw-teeth makes it easy to bring the ends of the member 1 together, because if it happens that these edges are not in exact register when brought together the saw-teeth will throw them into register by means of this angular relation. Once the device is put in position it remains in that position, and when inserted in a suitable opening for use, the ribs 3 or edges 10 of the punctures or raised points 11, come in contact with the walls of the opening and not only prevent the device from turning when a bolt is screwed into it, but prevent the expansion of the body member 1.

The screwing of a suitable bolt into the anchor causes the ends 2 to become separated. As the screw or bolt or other expansion member is screwed into the device, the point of maximum pressure recedes from the member 1 and since, in order to get the best results, the several expanding members must be held in exact relation to each other so that the threads of the expanding members 2 register properly, the use of means to keep the ends of the member 1 in register is particularly desirable in a bolt anchor of this character.

From a practical point of view it is impossible to drill holes in concrete and similar places which will be perfectly round and smooth, and this, coupled with the shifting point of pressure, might, but for the locking means above described, cause the members 2 to shift laterally relatively to each other, causing the ends of the member 1 to which these expanding members are rigidly attached to get out of register with each other. For obvious reasons this shifting is undesirable and should be avoided where possible. The peculiar formation of the members 2 makes the distortion of the member 1 likely in cases in which the hole is not smooth and cylindrical. This peculiar formation renders the members 2 extremely rigid with regard to transverse motion so that any distortion or displacement which occurs at the inner ends of these members may be transmitted to the member 1. The peculiar formation referred to is that of the upturned edges of the members as shown in Fig. 2. It will be apparent that this formation renders these members extremely rigid. I have overcome these defects by providing means for keeping the ends of the member 1 in register with each other as above described.

One reason why the member 1 is not made from a solid piece as in the Joseph patent, thereby avoiding the possibility of displacing the ends of the member 1, is that a very decided saving in material is effected by manufacturing the device from the blank as shown in Figs. 1 and 6—that is, by bending the metal upon itself into the shape shown in Fig. 2. Another reason is that when the device is made from the blanks shown herein the metal retains its original strength because it is not, during manufacture, subjected to the strain resulting from drawing, and this makes a much stronger finished article.

Referring to the device in Fig. 6, it will be noted that the blank shown therein is of the general rectangular form but having a greater distance between the expanding members 2 adjacent the body portion 1 than is found in the blank of Fig. 1.

The process of manufacturing an anchor from the blank shown in Fig. 6 is as follows:

The blank is stamped from a suitable piece of metal and the expansion members are formed by upturning a portion thereof as above described in connection with my application. The third step consists in corrugating the body portion 1 to form the ribs 3. At the same time that these ribs are being formed the blank is bent upon itself into the shape shown in Fig. 2. The corrugating of the body member 1 forms the ribs 3 and at the same time shortens the distance between the adjacent expanding members thereby bringing them into proper relation with each other. The ribs in this case as in Fig. 1 act to prevent the rotation of the device while the expansion bolt is being screwed into place.

The ribs 3 may be applied to a blank such as that shown in the Joseph patent above mentioned, which blank is circular having integral radial expansion members, thereby producing an article such as that of Fig. 2.

I wish it to be understood that the blank shown in Fig. 1 may be cast instead of punched, and when so cast, being provided with the locking means and the ribs or other projections, this blank when rolled into cylindrical form is in substance the equivalent of the device shown in Fig. 2. This device may, of course, be made of any suitable material such as malleable cast-iron, cast lead, brass or bronze.

It is apparent that many changes may be made in the details of the device shown, and such modifications are intended to be covered as fall within the scope of the appended claims.

Having described my invention what I

claim as new and desire to secure by Letters Patent is:

1. A bolt anchor comprising a sheet metal body member with separate ends, a plurality of expansion members integral with the body member and each having a portion inset to form a tapering throat axially alined with the bore of the body portion, and tooth like projections on the ends of the body member which projections interfit to cause said ends to register.

2. A bolt anchor comprising a sheet metal body member with separate ends, a plurality of expansion members integral with said body member and each having a portion inset to form a tapering throat axially alined with the bore of the body portion, saw teeth on the ends of the body member for causing said ends to register, and projections on the body member.

In testimony whereof, I have signed my name to this specification.

CHARLES S. GIRVAN.