H. B. NEWHALL.

EXPANSION BOLT ANCHOR.

APPLICATION FILED AUG. 23, 1907.

919,205.

Patented Apr. 20, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

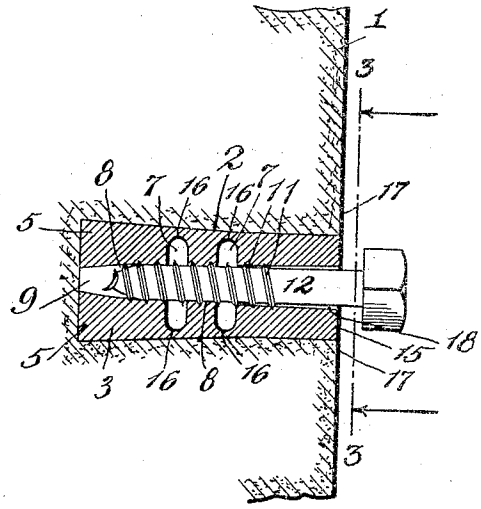


Fig. 4.

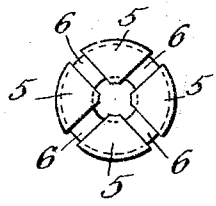


Fig. 3.

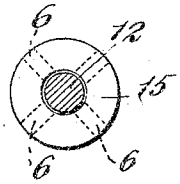


Fig. 5.

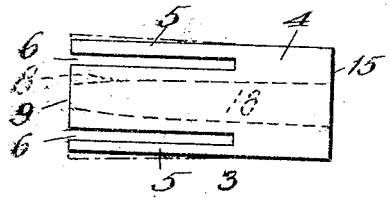


Fig. 2.

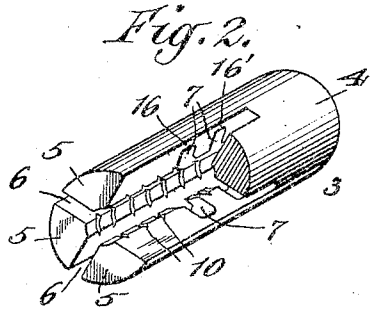


Fig. 6.

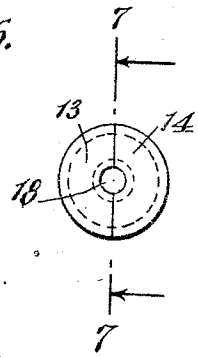
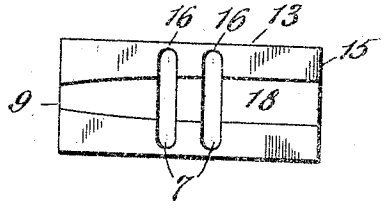


Fig. 7.



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2 SHEETS—SHEET 2.

Fig. 8.

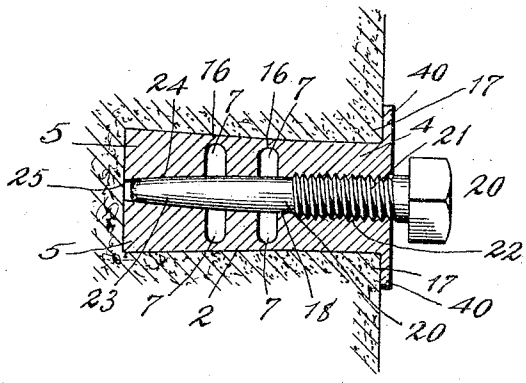


Fig. 9.

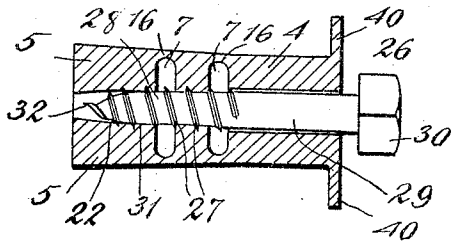


Fig. 10.

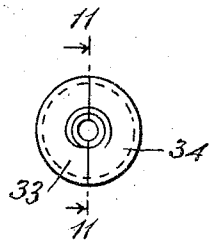
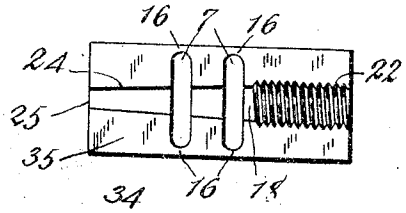


Fig. 11.



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UNITED STATES PATENT OFFICE.

HENRY B. NEWHALL, OF PLAINFIELD, NEW JERSEY.

EXPANSION BOLT-ANCHOR.

No. 919,205. Specification of Letters Patent. Patented April 20, 1909.

Application filed August 23, 1907. Serial No. 389,816.

To all whom it may concern:

Be it known that I, HENRY B. NEWHALL, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Expansion Bolt-Anchors, of which the following is a specification, taken in connection with the accompanying drawings.

This invention relates to expansion bolt anchors, and more particularly to such anchors as will not mar or deface the support in which the anchor is mounted.

In the accompanying drawings in which the same reference numerals refer to similar parts in the several figures, Figure 1 is a vertical section taken through a support of masonry or other similar material, showing the bolt anchor in operative or expanded position. Fig. 2 is a perspective view of one form of my expansion bolt anchor, a part being broken away to better illustrate the interior. Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1. Fig. 4 is a rear or end view of the expansion bolt anchor. Fig. 5 is a top or plan view of the bolt anchor. Fig. 6 is an end elevation of a modified form of expansion bolt anchor. Fig. 7 is a vertical section, taken on the line 7—7 of Fig. 6, showing a side elevation of one of the two halves of this form of bolt anchor. Fig. 8 is a central longitudinal section showing a modified form of anchor and expanding means. Fig. 9 is a central longitudinal section of a bolt anchor similar to that illustrated in Fig. 8 showing a different form of screw for expanding the prongs. Fig. 10 is an end elevation of a modified construction. Fig. 11 is a longitudinal side elevation taken on the line 11, 11 of Fig. 10 looking in the direction of the arrows.

In the illustrative embodiment of this invention shown in the drawings, 1 is a support of masonry, wood or any suitable material in which a cavity 2 has been formed in any suitable way to receive an expansible bolt anchor, 3. This expansible bolt anchor is preferably formed as shown in Figs. 1 to 5 and 8 and 9, in the form of a cylinder, having a hollow uninterrupted body portion 4, the rear portion of the cylinder 3 being formed into a plurality of prongs or tines 5, 5 by means of bisecting slots 6, 6 which extend as clearly shown in Fig. 2, approximately three-quarters of the length of the cylinder, 3, though the precise length of the slots is immaterial. Though I have shown four prongs or tines, 5, 5, (Figs. 2 and 4) it is to be of course understood that a greater or less number may be used without departing from the spirit of my invention. On the interior of one or more of the tines 5, 5, I form bending recesses 7, 7, which are preferably arranged near the junction of the tines 5, 5 with the body portion 4, for a purpose to be hereinafter described.

The interior of the expansible bolt anchor 3 is made tapering as shown at 8, the diameter of the opening 18, gradually decreasing from the body portion 4 to the ends of the tines 5, the smallest diameter 9 of the internal opening 8, being at the extreme end of the tines, 5, 5, (Fig. 1).

The interior of the expansible bolt anchor may be screw-threaded as shown at 10, (Fig. 2), or it may be left blank, (Figs. 1 and 7), the female screw-threads being formed by the male threads 11 upon the screw, 12.

In Figs. 6 and 7, I have shown an expansible bolt anchor formed of two separate members, 13 and 14, which are brought together as shown in Fig. 6, to form an expansible bolt anchor, the screw 12, being inserted between the two members to expand them laterally in the well known manner. I also arrange in the interior, of one or both of these members, 13 and 14, bending recesses, 7, 7, it of course being understood that one or more of such recesses may be used.

Instead of using a screw, such as shown in Fig. 1, to expand the anchor, I may use a screw, such as 20 (Fig. 8), having machine screw threads 21 coöperating with similar machine screw threads 22 formed in the body portion 4 of the bolt anchor. In this form of my invention, the end 23 of the screw 20 is formed tapering and without screw threads so as to have a wedging action upon the inclined opening 24 formed in the bolt anchor, this opening 24 having the smallest diameter at 25 which is the opposite end of the bolt anchor from the machine screw threads 22. In my invention as illustrated in this figure, of the drawing, the machine screw threads 21 and 22 coöperate in an obvious manner to permit the tapering end 23 of the screw 20 wedging or forcing outward the tines or prongs 5, 5 of the bolt anchor, this wedging action taking place at a point removed from the surface 17 of the support 1 so as not to mar or deface it. I may, however, use a lag screw 26 having screw threads 27 near its end 28. The por-

tion 29 of the screw nearest the head 30 is formed plain without screw threads as is the interior surface of the body portion 4 of the bolt anchor. In this form the screw threads 27 upon the lag screw 26 coöperate with the sides 31 of the tapering opening 32 running through the bolt anchor so as to expand the tines 5, 5 in the same manner as in the other figures of the drawing. I may also, to give a little neater appearance to the anchor, and to further guard the surface 17 of the support 1, cast or otherwise secure an annular flange 40 upon the body portion 4 of the bolt anchor, as shown, for instance, in Figs. 8 and 9, though it is to be distinctly understood that my invention is not limited to this additional feature.

In Figs. 10 and 11, I have illustrated a bolt anchor formed of two members, such as shown in Figs. 6 and 7, machine screw threads 22 being formed in one end of the bolt anchor to coöperate with similar machine screw threads 21 upon a screw, such as 20, shown in Fig. 8, the tapering end 23 coöperating with the inclined opening 24 to force the two members 33, 34 apart and at the same time causing the ends 35 to bend or yield at the necks 16, 16 due to the weakening slots 7, 7.

It is found in practice that where expansion bolt anchors are used, the face of the wall or other supporting member 1, is often marred, chipped or defaced by the powerful expanding action of the screw threads upon the screw, coöperating with those which are either formed in the expansible bolt anchors, or which are made by the male threads upon the screw 12, as the latter is screwed within the expansible bolt anchor, 3. To prevent this serious damage, I arrange bending recesses 7, 7 in the expansible anchor some little distance back from the front or face 15, of the expansible bolt anchors so that in the construction shown in Figs. 1 to 5, and 8, the body portion 4 of the bolt anchor will act merely as a nut for the screws 12 and 20 respectively, the expansion of the bolt anchor taking place at the bending recesses 7, 7, the necks 16, 16 readily permitting this expansion of the bolt anchor well within the cavity 2, and away from the face 17 of the support 1, thereby preventing the support being marred or broken at this point. The constructions illustrated in Figs. 8 and 9 operate in substantially the same manner, each insuring a positive and firm grip of the bolt anchor with its support without marring or chipping the face 17.

The bending recesses 7, 7 shown in the two part bolt anchor illustrated in Figs. 6, 7, 10 and 11 perform exactly the same function of permitting the bolt anchor to bend or expand well within the cavity 2 of the support 1, and removed from the surface 17 of such support.

Having thus described this invention in connection with the several 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 be secured by Letters Patent is set forth in the appended claims.

1. An expansion bolt anchor having a surface adapted to be located approximately flush with the surface of the support, a plurality of bending recesses arranged within the body of the bolt anchor and removed from the face of the anchor, and a screw or bolt to directly coöperate with the anchor to expand it.

2. An expansion bolt anchor having a solid or rigid body portion, a face on the body portion adapted to be brought approximately flush with the surface of the support, one or more tines or prongs and a plurality of bending recesses on the inner side of each tine or prong arranged at different distances from the body portion, to control and govern the angle of expansion.

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