J. KENNEDY.

EXPANSION ANCHOR.

APPLICATION FILED JUNE 16, 1917.

1,320,622. Patented Nov. 4, 1919.

Fig. 1

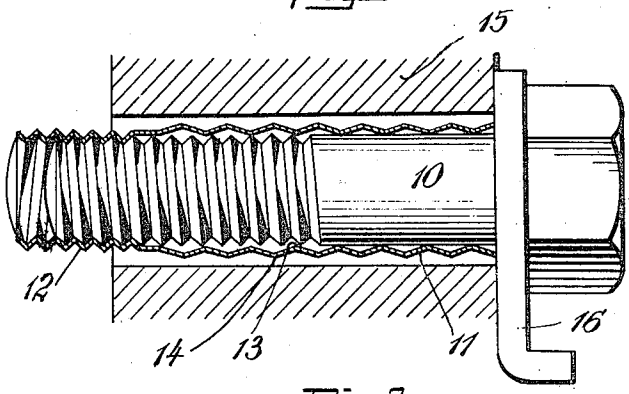


Fig. 2.

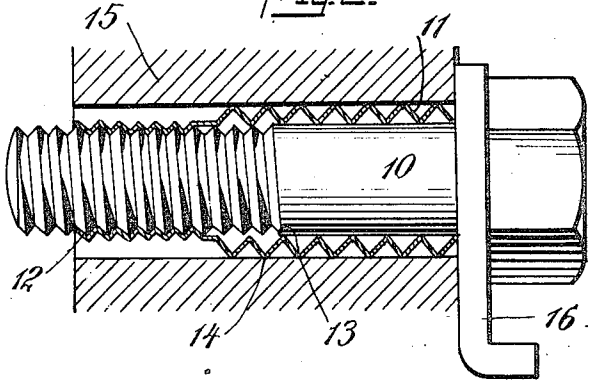


Fig. 3.

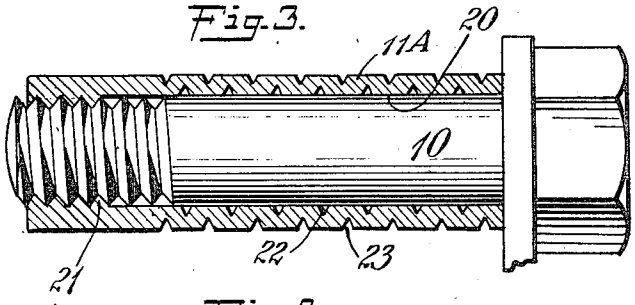


Fig. 4.

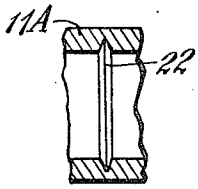


Fig. 5.

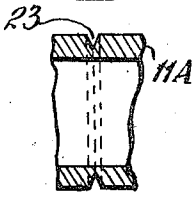


Fig. 8.

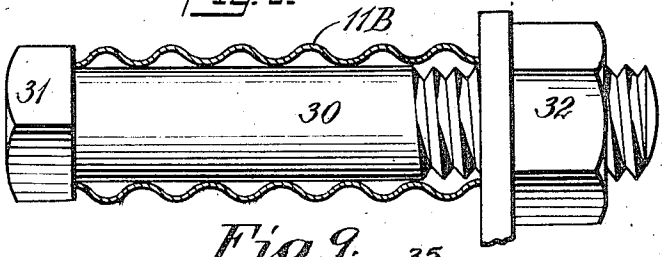


Fig. 6.

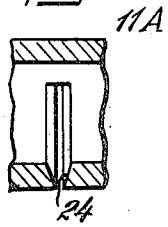


Fig. 7.

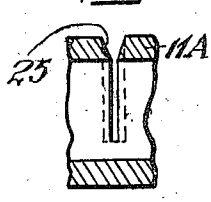
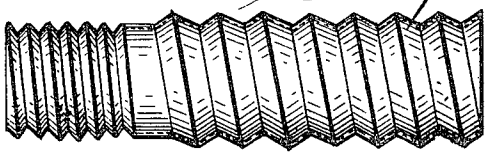


Fig. 9.



Inventor

Joseph Kennedy

By his Attorneys

Marshall & Dearborn

UNITED STATES PATENT OFFICE.

JOSEPH KENNEDY, OF NEW YORK, N. Y., ASSIGNOR TO J. EDWARD OGDEN, OF MOUNTAINVILLE, NEW YORK.

EXPANSION-ANCHOR.

1,320,622. Specification of Letters Patent. Patented Nov. 4, 1919.

Application filed June 16, 1917. Serial No. 175,058.

To all whom it may concern:

Be it known that I, JOSEPH KENNEDY, a citizen of the United States of America, and a resident of New York, county and State of New York, have invented certain new and useful Improvements in Expansion-Anchors, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to expansion anchors for bolts and its object is to provide a simple and inexpensive structure by means of which bolts may be securely fastened to material of such character that their threads will not satisfactorily engage therewith. More specifically, its object is to provide a structure which under longitudinal pressure will collapse longitudinally along predetermined transverse lines to thereby expand outwardly against the wall of a hole in which it is placed and contract inwardly against the bolt it is designed to hold.

In order that my invention may be thoroughly understood I will now proceed to describe the same in the following specification, and then point out the novel features thereof in appended claims.

Referring to the drawings:

Figure 1 is a sectional longitudinal elevation of an expansion anchor made according to and embodying my invention shown inserted in a hole before expansion and with a bolt in position.

Fig. 2 is a similar view of the same parts in the positions they assume after expansion.

Fig. 3 is a sectional elevation of a modified form of my invention.

Figs. 4, 5, 6 and 7 are fragmentary sectional elevations illustrating modifications of construction of a bolt anchor of the type shown in Fig. 3.

Fig. 8 is a sectional elevation of a still further modification of structure.

Fig. 9 is an elevation of an anchor which constitutes an embodiment of my invention and is a modification of those shown in Figs. 1 and 2.

Like characters of reference designate corresponding parts in all the figures.

10 designates a bolt. In Figs. 1 and 2, 11 is a metallic tube surrounding this bolt circumferentially, that is, the metal of the tube is continuous and unbroken by longitudinal slots. The tube has an internal diameter slightly larger than the diameter of the bolt. At the inner end of the tube threads 12 are rolled into tube in such a way as to reduce the diameter of the tube at this part and of such size and pitch as to fit the threads of the bolt.

The rest of the tube is creased and crimped inwardly at preferably equally spaced distances as at 13 but these crimps are not deep enough to interfere with the insertion of the bolt. Between the lines 13 the tube is creased and crimped outwardly as at 14.

Before describing specifically the structure illustrated in the other figures of the drawings, I will point out the manner in which this device is used. A hole is drilled in a wall 15, for example, of sufficient depth and diameter to receive the tube as shown in Fig. 1. 16 is an object which is to be fastened to the wall. The bolt 10 is passed through the object and through the tube into the threads 12. Tightening the bolt will put longitudinal pressure upon the tube which will collapse under this pressure along lines predetermined by the creases 13 and 14. This will increase the crimps in the metal which will thus have a tendency to fold up like an accordion. The inward displacement of the metal at the lines 13 is of course limited by the shank of the bolt, and this limitation will assist in forcing the metal of the tube at the lines 14 into the wall of the hole. Thus a firm anchorage with the wall is formed and at the same time the tube is crushed in against the bolt so that the latter has no clearance and is incapable of lateral movement which might in time loosen the anchorage. The parts will have assumed some such positions as those illustrated in Fig. 2.

In the structure shown in Fig. 3, the tube 11^A is made of thicker metal. It is constructed with a clearance hole 20 for the bolt 10. Its inner end is of smaller diameter and is provided with cast or cut threads 21. At spaced intervals grooves 22 are cut transversely through the inner surface of the bore 20. Between these grooves others designated 23 are cut in the outer surface. These grooves 22 and 23 are of sufficient depth, dependent upon the kind of metal of which the tube is made to insure its buckling in and out when subjected to longitudinal pressure produced by turning the bolt in the threads 21.

It is not necessary to have both inner and

outer grooves. The inner grooves 22 may be used alone as shown in Fig. 4 or the outer grooves 23 may be used alone as shown in Fig. 5.

The specific means for insuring the crimping of the metal at desired transverse lines is not an essential part of this invention. For example, the tube 11^A may have inwardly tapered transverse slots such as 24 in Fig. 6, cut through its surface on the desired lines, or the slots may taper outwardly as at 25 in Fig. 7, if desired. These transverse slots do not interrupt the circumferential continuity of the metal.

Fig. 8 shows a transversely corrugated tube 11^B of comparatively thin metal. In this case a bolt and nut are illustrated to show that the invention is not necessarily limited to a structure with threads to be engaged by the threads of the bolt. In this Fig. 8, the bolt is designated by 30, its head by 31 and its nut by 32. It may be seen that with this structure screwing the nut onto the bolt or screwing the bolt into the nut will produce longitudinal pressure on the tube, and that this pressure will cause the tube to collapse to displace its metal both inwardly and outwardly.

The transverse crimps are not necessarily annular in form and may, for example, be made in the form of a helix as shown in Fig. 9 and designated 35. In fact, they may be unevenly spaced and irregular in form if desired.

I have illustrated and described several structures which embody this invention in order to show that it is capable of wide structural variation and to show that I do not intend to limit myself to any specific form or construction. In fact I intend no limitations other than those imposed by the following claims.

What I claim is:

1. A circumferentially continuous tube adapted to receive a bolt and provided with means to cause the tube to fold on a plurality of spaced transverse lines when subjected to a longitudinal pressure.

2. A circumferentially continuous tube adapted to receive a bolt, and equally spaced means thereon for causing said tube to become crimped at equally spaced transverse lines when subjected to longitudinal pressure.

3. A circumferentially continuous tube adapted to receive a bolt provided with spaced laterally contracted and expanded portions, and adapted to be crimped onto a bolt and against the walls of a hole in which it is inserted, when subjected to longitudinal pressure.

4. A circumferentially continuous tube provided near one end with threads adapted to receive the threads of a bolt inserted through the tube, the unthreaded part of the tube being provided with spaced laterally contracted and expanded portions, and adapted to be crimped onto a bolt and against the walls of a hole in which it is inserted, when subjected to longitudinal pressure.

5. A circumferentially continuous tube provided near one end with a contracted portion constructed with threads for receiving the threads of a bolt inserted through the tube, the unthreaded part of the tube being creased and crimped inwardly and outwardly and adapted to be crushed and folded by longitudinal pressure produced thereon by turning a bolt in said threads to thereby force the metal of said tube at the inwardly crimped parts thereof onto the bolt and to force the metal thereof at the outwardly crimped parts against the wall of a hole in which it is inserted.

6. A bolt anchor comprising a circumferentially continuous tubular member embodying means to cause the member to collapse longitudinally and expand laterally when subjected to longitudinal pressure.

In witness whereof I have hereunto set my hand this 8th day of June, 1917.

JOSEPH KENNEDY.

Witnesses:

WILLIAM G. DALTON,

I. B. MOORE.