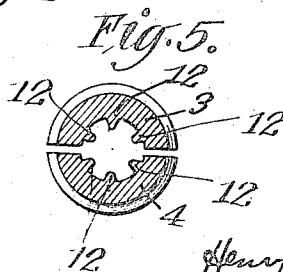
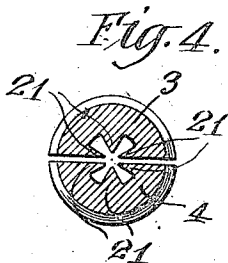
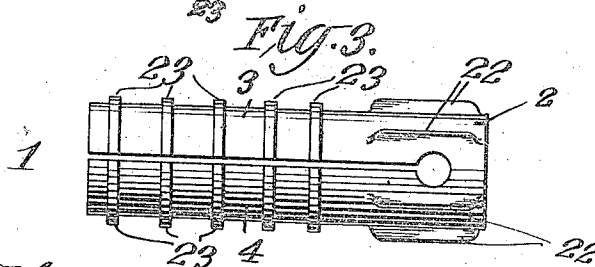
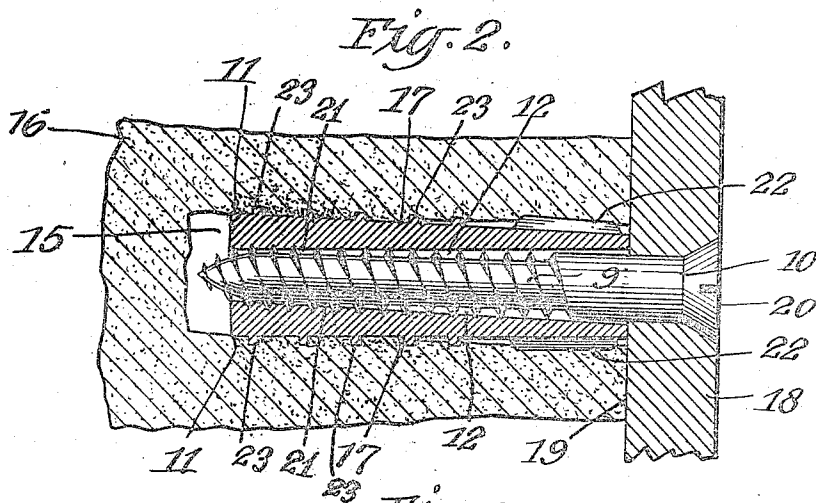
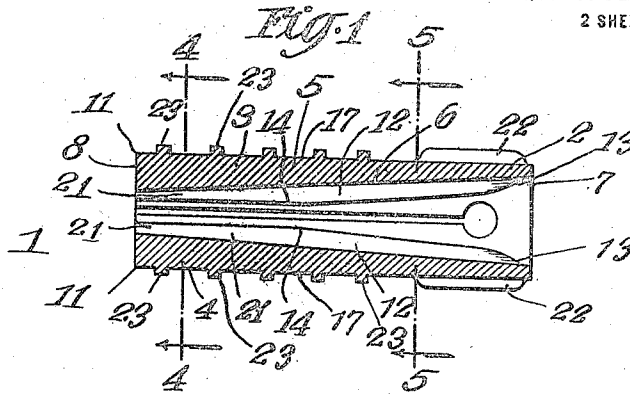


H. W. PLEISTER.
BOLT ANCHOR.
APPLICATION FILED JAN. 20, 1917.

1,248,004.

Patented Nov. 27, 1917.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 6.

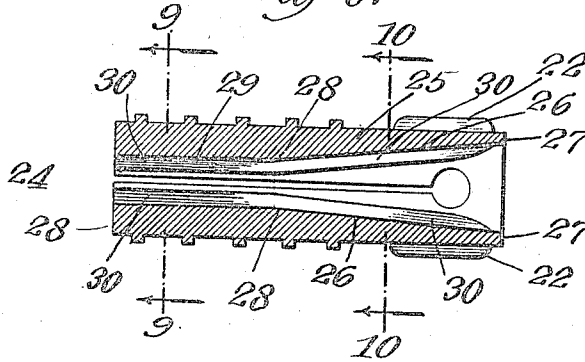


Fig. 7.

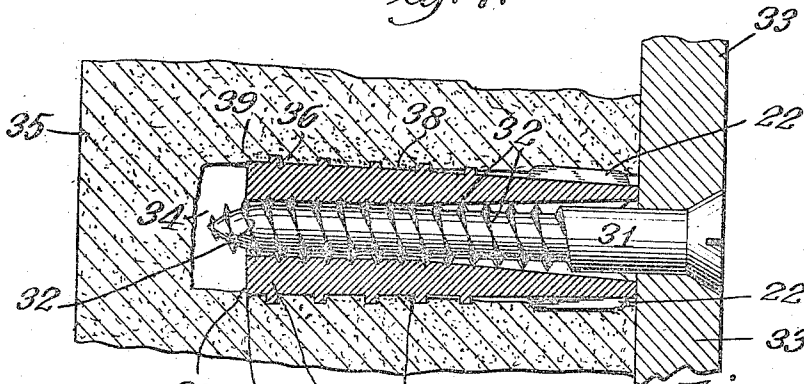


Fig. 8.

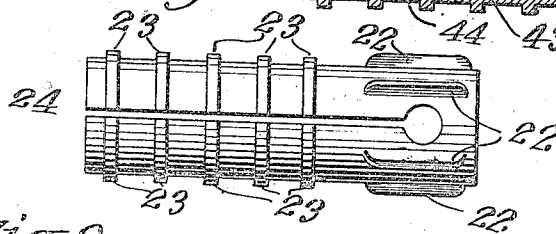


Fig. 9.

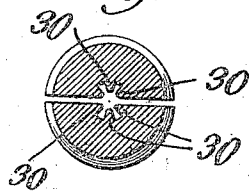
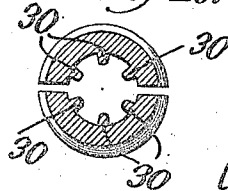


Fig. 10.



Henry W. Pleister, INVENTOR

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UNITED STATES PATENT OFFICE.

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BOLT-ANCHOR.

1,248,004.

Specification of Letters Patent.

Patented Nov. 27, 1917.

Application filed January 20, 1917. Serial No. 143,423.

To all whom it may concern:

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

10 My invention relates to bolt anchors.

More particularly my present invention relates to that class of bolt anchors known as "anchors", "lead anchors" and "screw anchors", in which the material of the anchor is formed of more or less ductile material such as an alloy of lead, in which a wood screw will cut its own cooperating female threads. Such anchors are used to hold lighter work than are lag shields.

20 In the present form of anchors the maximum expansion is approximately at the extreme inner end of the anchor. In practice this is often a serious detriment in that the wood screw having forced the anchor out to its maximum expansion binds and it is impossible to bring the head of the wood screw up flush with the work. This requires the hole to be enlarged entailing additional labor and expense, or a different size anchor has to be used.

30 By my invention I overcome this serious objection and give a longer surface of maximum contact or grip on the exterior of the anchor, thereby giving an increased frictional hold, and distributing this maximum grip over a larger area than with the present form of anchors. My invention further permits the wood screw to cooperate with the anchor with less effort than with the present forms.

40 In my present invention I provide the interior of the anchor with longitudinally extending ribs or surfaces which first engage and guide the screw as it is screwed home. The wood screw cuts its own cooperating screwthreads in these ribs or surfaces, and generally, though not necessarily, cuts entirely through the ribs into the body of the anchor.

50 I further employ an anchor in which the

interior bore of the body of the anchor is inclined substantially uniformly from near one end to the other, in which case I provide it with interior ribs or surfaces of varying height, preferably being inclined from near one end to a point intermediate the ends of the anchor where the inclination of the ribs reach the nearest approach to the axis, and from that point they continue parallel, preferably to the end of the anchor. In this form the desirable result above pointed out is obtained with the minimum amount of metal.

Or I may employ an anchor having a body formed with an axial bore, a portion of the bore being inclined from near one end to a point intermediate the ends of the anchor, and from that point merging into a substantially cylindrical surface, the inclined and cylindrical bore being provided with internal ribs.

My invention further relates to certain details of construction which will be described in the specification and pointed out in the claims.

I have shown in the accompanying drawings, different illustrative embodiments of my invention but of course it is to be understood that my invention is not to be confined simply to the forms illustrated except as required by the scope of the accompanying claims. In these drawings the same reference numerals refer to similar parts.

Figure 1 is a longitudinal vertical section of one form of my improved anchor in which the body of the lead anchor has a uniformly tapering surface beginning substantially at one end and continuing to the other end and provided with inclined ribs of varying height reaching the nearest approach to the axis at a point intermediate the ends of the anchor;

Fig. 2 is a vertical section of the lead anchor shown in Fig. 1 mounted in a support and cooperating with a wood screw;

Fig. 3 is a plan view of the lead anchor shown in Fig. 1;

Fig. 4 is a transverse vertical section substantially on the line 4—4 of Fig. 1, looking in the direction of the arrows;

Fig. 5 is a transverse vertical section substantially on the line 5—5 of Fig. 1, looking in the direction of the arrows;

Fig. 6 is a longitudinal vertical section of a modified form of my invention in which the body of the anchor is provided with an internal inclined surface extending from near one end to a point intermediate the length of the anchor and there merging into a cylindrical surface, the said internal inclined and cylindrical surfaces of the anchor being provided with longitudinally extending ribs of substantially the same height throughout their length;

Fig. 7 is a vertical section of the bolt anchor shown in Fig. 6 located within a wall or other support and cooperating with a wood screw;

Fig. 8 is a plan view of the anchor shown in Fig. 6;

Fig. 9 is a transverse vertical section substantially on the line 9—9 of Fig. 6, looking in the direction of the arrows;

Fig. 10 is a transverse vertical section substantially on the line 10—10 of Fig. 6, looking in the direction of the arrows;

Fig. 11 is a further modification in which the ribs are provided only upon the interior inclined surface of the anchor.

In the illustrative embodiments of my invention 1, Fig. 1, is an anchor having a collar 2 and tines 3 and 4. This anchor has a body portion 5 which has an interior inclined surface 6 of substantially uniform taper from the end 7 to the inner end 8.

In such an anchor, if the screwthreads 9 of the wood screw 10 are made to cut their own cooperating screwthreads directly in this uniform tapering surface 6, the maximum expansion of the anchor will be at points equivalent to 11, 11. This has many objections for the reasons hereinafter more fully pointed out.

I, therefore, in this form of my invention, provide the uniformly tapering surface 6 of the body member 5 with a rib or ribs 12 of varying thickness. In the preferred construction, illustrated in Figs. 1 to 5 inclusive, I use a plurality of these interior ribs 12 which are inclined from approximately the point 13, reaching the nearest approach to the axis at points 14, 14. From these points the ribs continue of the same height or thickness forming parallel ribs and an interrupted cylindrical engaging surface for the wood screw 10, from the points 14, 14 to the end 8, even though the body portion of the anchor may be tapering as illustrated in Fig. 1.

These ribs 12, 12 serve the function of not only guiding the entering screw 10 but also forming an engaging surface having a relatively steep incline which terminates at a point which is nearest the axis and intermediate the ends of the anchor and from that

point presenting a substantially interrupted cylindrical surface to be engaged by the screw. In my invention, by having the ribs 12, 12 reach their nearest approach to the axis at the points 14, 14, the maximum grip of the anchor in the hole 15 of the support 16 extends from substantially the points 17, 17 to the points 11, 11, thus giving a long surface of contact and increased frictional hold and distributing the maximum grip over a larger area than in the old form of lead anchors now on the market. These old forms employ a uniformly tapering axial bore in which the maximum grip is at the extreme inner end of the anchor at points equivalent to the points 11, 11.

Not only is it easier to position the wood screw 10 and to obtain a stronger and more lasting grip upon the wall of the hole 15, but when the support 16 happens to be material which may be damaged, as for example a thin slab of marble or plaster, or any other material, the maximum expansion or grip being distributed over a larger area prevents any damage of the support 16.

In Fig. 2 I have shown the work 18 of a certain thickness held to the face 19 of the support. The same size anchor 1 and wood screw 10 will support different thicknesses of work and permit in all cases the head 20 of the wood screw to be brought up flush with the work without the screw jamming in the anchor in a position where its head cannot be brought snugly against the work.

This is due to the fact that the point of maximum expansion is extended over a relatively large surface of the anchor, so that the end of the screw 10 can be brought anywhere along that portion 21, 21 of the ribs 12, 12 which run parallel to each other, or past the end of the anchor as may be found necessary to bring the head 18 flush against the work and at the same time obtain the requisite maximum expansion of the anchor. In the old form, where the maximum expansion is at the end of the anchor, at points equivalent to the points 11, 11, the screw would often jam at this point before its head could be brought flush with the work 18, whatever its thickness may be, requiring the removal of the anchor and the enlargement of the hole, or the use of a different size anchor.

My anchor may be formed of any exterior configuration. I have shown it provided with longitudinal extending ribs 22, 22 on the collar extending slightly above the transverse ribs 23, 23.

By forming the ribs 12 of varying depth or thickness as in Fig. 1 to permit them to approach the axis, a considerable saving in metal is obtained.

In some cases, as for example in Fig. 6, I may use an anchor 24 having a body portion 25, which body portion is provided with

an inclined surface 26 extending from one end 27 to a point 28 the nearest approach to the axis lying at some point between the end 27 and the end 28. Of course the particular location may be varied from that illustrated. On the interior surfaces 26 and 29 I form longitudinally extending ribs 30 of substantially the same height throughout their length. In this form the points 28, 28 which are nearest to the axis are formed by the body portion 25 itself rather than in the first form, that illustrated in Figs. 1 to 5 inclusive, wherein the point of nearest approach to the axis is formed by varying the depth of the ribs. In the present form, that shown in Fig. 6, the ribs 30 serve to guide the entering wood screw 31 and permit its easy passage into the anchor, its male threads 32, cutting their own cooperating female threads in the ribs 30, and usually in the body 25 of the anchor. It is of course to be understood that the depth of the screw-threads cut by the screw depends upon the relative size of the anchor and the screw, the size of the hole and of the weight of the work or load 33.

When this anchor is placed in a hole 34 of the support 35 its tines 36, 36 will be expanded in the same manner as that previously described, the maximum expansion being distributed over comparatively a wide portion of the wall 37 of the hole lying between the points 38, 38 and 39, 39, though this distance may be varied as desired.

In some cases I may provide a bolt anchor 40 Fig. 11, having the body member 41 provided with an inclined interior surface 42 reaching the nearest approach to the axis at 43, 43, and there merging into the cylindrical surface 44. From the end 45 to the points 43, 43, I provide longitudinally extending internal ribs 46, 46, which in this particular form, terminate at the points 43, 43.

Preferably the combined thickness of the wall of the anchor and the ribs is least at the outer end of the anchor, said combined thickness increasing to a maximum at a point intermediate the ends of the anchor and then continuing at a substantially uniform combined thickness to the other end of the anchor.

It will be further noted that preferably the aperture or bore left between the points of the ribs reaches its minimum diameter at a point between the ends of the anchor, and then merge into a cylindrical ribbed aperture or bore.

It will be seen that when the expanding means cooperate with the axial bore, said bore is distorted into a substantially true cylindrical bore, thereby distorting the forward exterior cylindrical surface of the bolt anchor into a frustum of a cone, which

merges into the cylindrical exterior of the outer end of the bolt anchor.

In the different figures of the drawings, for purpose of illustration, I have somewhat exaggerated the preferred angle of the inclined portion of the axial bore.

Having thus described this invention in connection with 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 secure by Letters Patent is set forth in the appended claims:

1. An article of manufacture comprising a ductile anchor having an axial opening provided with ribs whose edges are inclined from the outer end of the anchor to a point intermediate its ends, and which edges are in a cylindrical surface from said point to the opposite end of the anchor.

2. An article of manufacture comprising a ductile anchor having an internal bore with inclined ribbed surface, the aperture left between the points of the ribs reaching its minimum diameter between the ends of the anchor and merging into a cylindrical ribbed bore.

3. An article of manufacture comprising a ductile anchor having an internal ribbed surface, the ribs varying in height to vary the cross-section of the axial bore.

4. An article of manufacture comprising a ductile anchor having internal ribs inclined from near one end to a point removed from the other end of the anchor and there merging into a cylindrical bore.

5. An article of manufacture comprising a ductile anchor having internal ribs inclined from near one end to a point removed from the other end of the anchor and then merging into parallel ribs.

6. An article of manufacture comprising a ductile anchor having an inclined substantially uniform interior tapering bore extending from near one end to the other and provided with interior ribs of varying height to vary the pitch of the bore.

7. An article of manufacture comprising a ductile anchor having an inclined substantially uniform interior tapering bore extending from near one end to the other and provided with interior ribs inclined from near one end to a point intermediate the ends of the anchor and parallel from that point to the other end of the anchor.

8. An article of manufacture comprising a ductile anchor in the form of a hollow cylinder provided with ribs on its tapered interior bore, the combined thickness of the wall and the ribs being least at its outer end, said combined thickness increasing to a maximum at a point intermediate the ends and thence continuing at a substantially uniform combined thickness to the opposite end.

9. An article of manufacture comprising a ductile anchor cylindrical in exterior provided with an interior bore tapered throughout its length, said bore provided with a plurality of ribs, each rib varying in height at different points, the aperture left between the points of the ribs forming at the outer end of the anchor a frustum of a cone and at the inner end of the anchor a cylinder.

HENRY W. PLEISTER.

Witnesses:

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A. M. WILLIAMS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."