No. 777,134. PATENTED DEC. 13, 1904.

F. C. PALMER.

BOLT ANCHOR.

APPLICATION FILED OCT. 28, 1903.

NO MODEL.

Fig. 2 Fig. 1

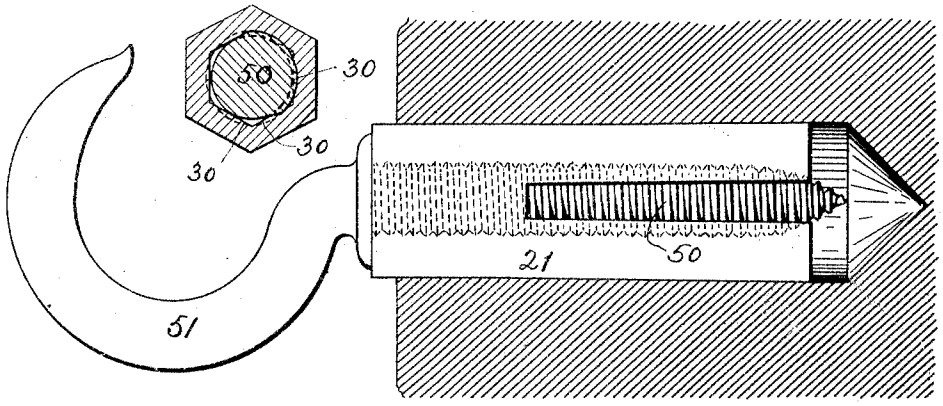


Fig. 3 Fig. 4 Fig. 5 Fig. 6

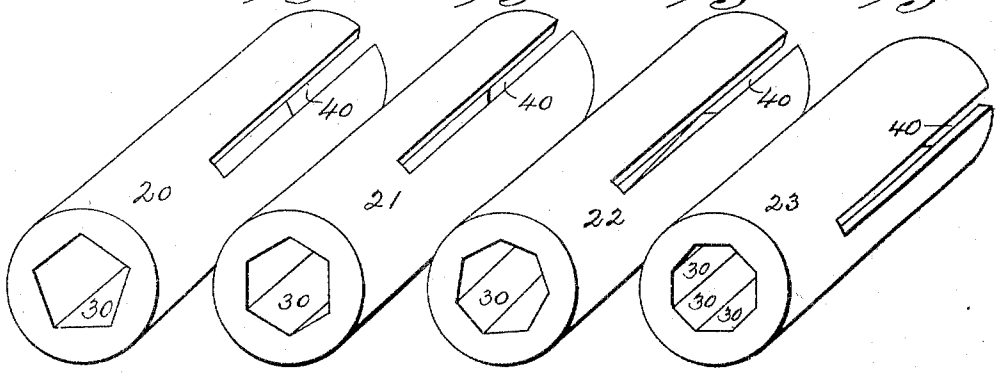
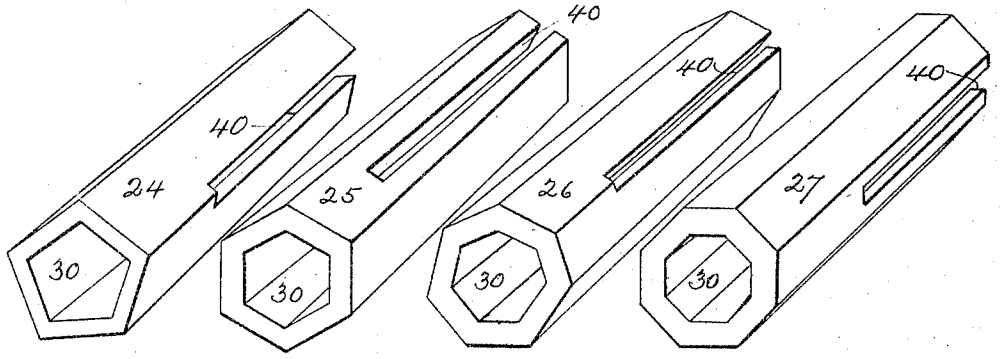


Fig. 7 Fig. 8 Fig. 9 Fig. 10



Witnesses
Estelle M. Titus.
Herman Meyer

Frederick C. Palmer Inventor
By His Attorney William R. Baird

No. 777,134. Patented December 13, 1904.

UNITED STATES PATENT OFFICE.

FREDERICK C. PALMER, OF NEW YORK, N. Y.

BOLT-ANCHOR.

SPECIFICATION forming part of Letters Patent No. 777,134, dated December 13, 1904.

Application filed October 28, 1903. Serial No. 178,920. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK C. PALMER, a citizen of the United States, and a resident of the borough of Brooklyn, New York city, in the county of Kings and 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 bolt-anchors; and its novelty consists in the construction of the parts.

Bolt-anchors have been made of many styles and usually of soft metal, such as lead or the like. A class of them is based upon the principle of interrupting the continuity of their outer surfaces by knobs or projections and by providing their inner surfaces with screw-threads and ribs in order that the outer surfaces may be made to grip the sides of the aperture into which they are to be inserted and the inner surfaces may afford proper support for the screw or bolt to be placed between them. Such constructions involve the use of molds which are relatively expensive to make and they require considerable care in their manufacture.

The purpose of my invention is to make a simple form of bolt-anchor of soft metal—one less expensive to manufacture than those referred to and one the molds for which can be readily, cheaply, and quickly constructed.

To the end referred to I make my improved bolt-anchor substantially with a hollow or bore polygonal in cross-section and the inner plane surfaces being substantially tangential to the outer edges of the screw or bolt to be inserted therein. The outer surface of the device may be made of either angular form or cylindrical without departing from the principle of my invention. For ordinary purposes I prefer the former construction, because as soon as the threads of the screw or bolt "bite" into the plane sides of the interior of the anchor its external angles are pressed closely against the sides of the containing-aperture and grip it surely and firmly; but in cases where the stone is soft and readily drilled in cylindrical holes, as is the case, for instance, with alabaster, soapstone, and the so-called "Mexican onyx," the outer cylindrical surface has the advantage of a complete and close fit. I slot the device longitudinally along a part of its length in order to permit parts of the device on each side of the slot to approach each other, and thus to secure its readier insertion into the aperture in the stone. These slots may be as long as desired provided they do not equal the length of the entire structure, because in that case the device would be divided into two sections which would not retain their relative positions. The slots may also be as numerous as circumstances may require, depending upon the size of the anchor and the nature of the surface to which it is to be put. I usually prefer, however, to make two slots about three-quarters of the length of the anchor.

The walls of the bolt-anchor are made thicker at the inner or slotted end than at the outer or unslotted end, thus producing a slightly-tapering bore within the anchor when it is in position. This construction is necessary in order to secure proper expansion at the inner end of the anchor.

In the drawings, Figure 1 is a section of wall, showing an aperture therein and a bolt-anchor embracing a bolt inserted in said aperture. Fig. 2 is a transverse section of a bolt-anchor which is hexagonal. Figs. 3, 4, 5, and 6 are perspective views of bolt-anchors which are internally polygonal in cross-section and externally cylindrical in shape. Figs. 7, 8, 9, and 10 are perspective views of bolt-anchors which are both externally and internally polygonal in cross-section.

In the drawings, 20, 21, 22, and 23 represent bolt-anchors which are externally cylindrical but which are internally polygonal, 20 having a cross-section internally of a pentagon, 21 of a hexagon, 22 of a heptagon, and 23 of an octagon. 24, 25, 26, and 27 represent bolt-anchors which are both internally and externally polygonal in cross-section, the plane faces of the internal bore being parallel to the similar faces of the exterior, 24 being in cross-section a pentagon, 25 a hexagon, 26 a heptagon, and 27 an octagon. In each of these forms of anchors 30 30 represent the plane sides of the polygonal internally. Each of the bolt-anchors is provided with longitudinal slots 40 40, extending lengthwise of the

device for a part only of its length. I prefer that these slots should not be more than about three-fourths as long as the longitudinal axis of each of the anchors; but the actual length of the slots may vary as circumstances may require without departing from the principle which dictates their use. The slots may be several in number—two, three, or four. Probably four is as many as should be employed without weakening the structure as a whole, and the number which I prefer is two, arranged on opposite sides with reference to the symmetry of the anchor.

50 represents a bolt inserted in the anchor when it has been placed in position, the bolt shown in Fig. 1 being provided with a hook 51 and this type of bolt being taken merely for purposes of illustration to show the common method of using a device of this character.

In Fig. 2 there is illustrated the manner in which the threads of the bolt 50 bite into and grip the internal sides of the structure. In each of the bolt-anchors the plane surfaces of the bore are substantially tangent to the cylindrical and conical or frusto-conical figure, which would closely circumscribe the threads of the bolt or screw. When, therefore, the bolt or screw is rotated, these threads press against the confining-surfaces of the inclosing bolt-anchor and bite into the substance of the soft metal of which it is composed, the amount of the bearing-surface for the screw-threads being substantially in any case the radial distance between the circle circumscribing the internal polygon of the bolt-anchor in cross-section and the circle which such polygon itself circumscribes. Of course if the bolt-anchor is made a little smaller than I have represented in the drawings with reference to the screw or bolt to be encircled thereby the bite of the screw-threads would be deeper and would continue until the body of the screw was brought into actual contact with the plane surfaces of the bolt-anchor walls.

A great advantage is attained by making the bore polyhedral in cross-section, for the reason that when first inserted the bolt-threads only touch the middle of the sides of the polyhedron and are much easier to start, and when screwed tight the threads only enter the metal included within the circle circumscribing the polyhedron, which metal is but very little more than half the amount penetrated by the threads in a circular bore. This makes the driving in of the bolt much easier than in a circular bore, while still giving the threads sufficient hold for all practical purposes.

The form of bolt-anchor which I have described is very readily made. The molds in which it is cast can be quickly and economically formed on account of their symmetrical outline, and the casting is usually without flaws on account of the plane or smooth surfaces against which the hot metal is forced.

What I claim is—

1. A bolt-anchor having a longitudinal bore of a polygonal form in cross-section.

2. A bolt-anchor having a longitudinal bore of a polygonal form in cross-section and of less diameter at its inner end.

3. A bolt-anchor provided with a longitudinal polyhedral bore in combination with an inserted bolt or screw, the sides of the bore being tangential to the bolt or screw.

Witness my hand, this 26th day of October, 1903, at the city of New York, in the county and State of New York.

FREDERICK C. PALMER.

Witnesses:

HERMAN MEYER,

ESTELLE M. TITUS.