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SCREW-ANCHOR SETTING TOOL

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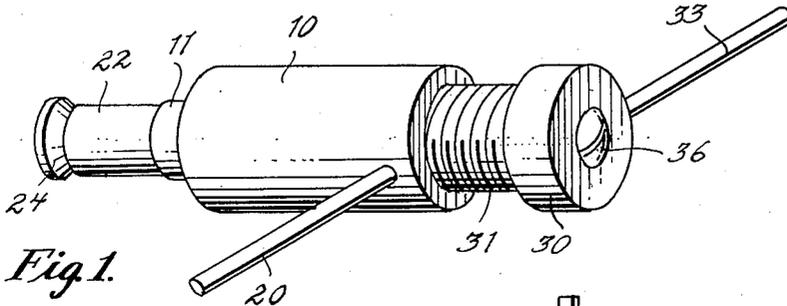


Fig. 1.

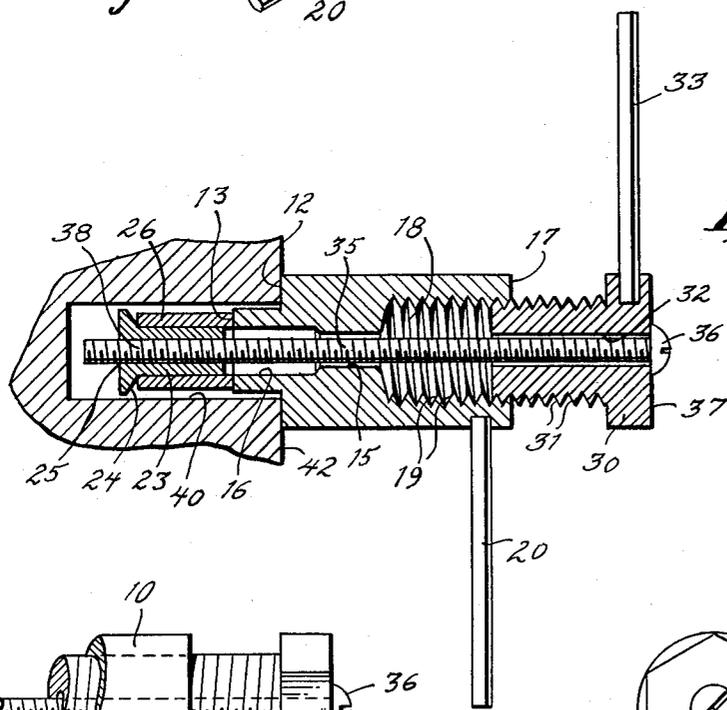


Fig. 2.

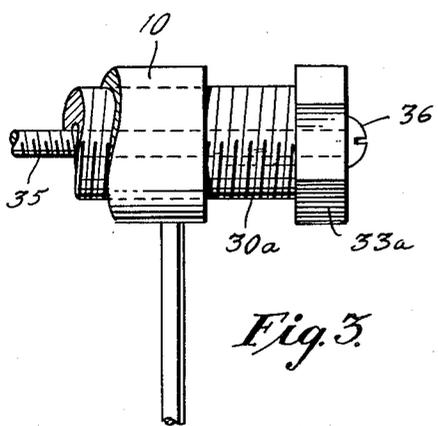


Fig. 3.

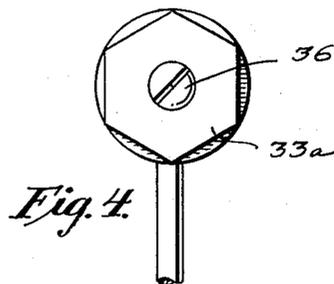


Fig. 4.

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**SCREW-ANCHOR SETTING TOOL**  
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This invention relates generally to devices for setting expansion-type screw anchors, as in tile, concrete, cinder block, and all types of masonry.

As is well known to those versed in the art, conventional expansion screw anchors include inner and outer cylindrical parts, the inner part being internally threaded and having at least a portion thereof of externally tapering configuration, whereby upon relative longitudinal movement of the inner and outer parts, the latter part expands to pass over the tapering or conical portion and thereby wedges the assembly firmly in a hole or other opening.

While there have been previous devices for expanding such screw anchors to set the same in holes, these prior anchor-setting tools were all subject to certain disadvantages, such as relative expense in construction, the tendency to easily become damaged even under normal conditions of use, requiring relatively slow and difficult operation, and the impossibility or at least inconvenience of use under certain conditions, as in small spaces. Further, in screw-anchor setting tools of the prior art, it was necessary to use a different tool for each different size of screw anchor, which of course required that a considerable number of the tools be conveniently accessible even for a single workman.

It is one object of the present invention to provide an expansion screw-anchor setting tool which overcomes the above-mentioned difficulties, is extremely quick and easy to operate, and which may be relatively small in size for convenient use even in tight locations.

It is another object of the present invention to provide a screw-anchor setting tool of the type described which is capable of use with a wide variety of different-size screw anchors. More particularly, the device of the present invention contemplates the incorporation therein of a staple and common element, namely a threaded and headed bolt, the simple replacement of which enables the tool to be employed in the setting of screw anchors of substantially all sizes and having any desired-size internal thread.

It is a further object of the present invention to provide a screw-anchor setting tool having the advantageous characteristics mentioned in the preceding paragraphs, which is extremely simple and inexpensive in construction, sturdy and durable in use, and which can be manufactured and sold at a reasonable price.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claim.

In the drawings:

FIGURE 1 is a perspective view showing a screw-anchor setting tool constructed in accordance with the present invention, and illustrating a screw anchor in assembly therewith;

FIGURE 2 is a longitudinal sectional view taken through a screw anchor of FIGURE 1 and illustrating the operative condition of use;

FIGURE 3 is a partial longitudinal view showing a screw anchor of the present invention slightly modified from the device of FIGURES 1 and 2; and

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FIGURE 4 is an end view of the modification of FIGURE 3.

Referring now more particularly to the drawings, and specifically to FIGURES 1 and 2 thereof, the embodiment of the invention illustrated therein comprises an elongate, hollow main body 10, which may be of generally cylindrical external configuration as illustrated, or have a generally polygonal external surface, if desired for nonrotative engagement with a wrench. One end portion 11 of the body 10 is preferably turned down or reduced, to define an annular, longitudinally outwardly facing shoulder 12 adjacent to and spaced inward from the end surface 13, see FIGURE 2.

The elongate main body 10 is provided with a longitudinally extending, through opening or hollow 15 which is somewhat enlarged in the region 16 extending longitudinally inward from the end surface 13. Extending longitudinally inward from the opposite end surface 17 of the body 10, the through opening 15 is substantially enlarged by a bore 18 having internal screw threads 19.

A radially projecting handle 20 may be provided on the body 10 for manually holding the latter; or, as mentioned hereinbefore, the body may be adapted for nonrotative engagement in a wrench.

An expansion screw anchor 22 is seen in FIGURE 1, and illustrated in FIGURE 2 in greater detail as comprising an inner generally cylindrical part 23 having an externally tapering or conical portion 24 and provided with internal screw threads 25. An outer generally cylindrical part or sleeve 26 is circumposed about the inner part 23 and adapted to be expanded by relative longitudinal movement of the parts to pass the sleeve over the conical portion 24. While the screw anchor 22 is conventional, its construction has been described to facilitate understanding of the instant invention.

In FIGURE 2 it is seen that the reduced end portion or neck 11 of the body 10 has its end surface 13 of a size adapted for abutting engagement with the end surface of sleeve 26, while the enlarged portion 16 of the through opening 15 is of a size to receive the adjacent end portion of the inner screw-anchor part 23, as will appear hereinafter in greater detail.

At the opposite end of the elongate body 10, adjacent to the end surface 17, is provided an auxiliary body 30 which is mounted on the main body for movement longitudinally thereof, as will appear presently. In particular, the auxiliary body 30 is provided with external screw threads 31 and insertable into the enlarged end portion 18 of through opening 15 in the manner of a threaded plug. Stated otherwise, the external screw threads 31 of the auxiliary body or plug 30 interengage with the internal screw threads 19 of the main body 10 to mount the auxiliary body for movement longitudinally inward and outward of the main body upon relative rotation of the bodies.

In substantial alignment with the through opening 15, the auxiliary body or plug 30 is formed with a through opening or bore 32. At a point longitudinally outward of the main-body end surface 17, the auxiliary body or plug 30 may be provided with a radially projecting rod or handle 33, thereby enabling the plug to be manually rotated relative to the main body.

An elongate rod or bolt 35 extends loosely through the main-body opening 15 and the auxiliary-body opening 32, and is provided on one end with a head or abutment 36 longitudinally outward of the auxiliary body and of a size to abuttingly engage with the outer end surface 37 of the auxiliary body, to resist drawing of the bolt through the auxiliary body into the main body. At least the other end region 38 of the bolt 35, remote from the head 36, is externally threaded; and, a greater portion of the bolt 35 may be externally threaded, if desired, thereby enabling a conventional threaded and headed bolt to be employed.

It is only necessary that the bolt 35 be provided with threads of a size adapted for threaded engagement in the inner part or core 23 of the anchor 22. Hence, any conventional bolt may be employed at 35 having threads conforming to those of the particular anchor 22 then being operated upon. It is, however, preferred that the interengaging threads 19 and 31 be of greater pitch than the threads of bolt 35, and as is obvious in the drawing, the threads 19 and 31 are of greater diameter than the threads of the bolt. The threads 19 and 31 are of the direction opposite to that of the threads on the bolt 35 and anchor 22 in order to eliminate any tendency of the bolt to unscrew from the anchor. That is, if the bolt and anchor threads are in the right-hand direction, as is generally the case, the threads 19 and 31 would be in the left-hand direction.

In operation, it is only necessary to threadedly engage the anchor 22 on the projecting end portion 38 of the bolt 35; and, the anchor may be screwed up to have its outer part or sleeve 26 in endwise abutment with the end surface 13 of the body 10. The assembly may then be arranged to insert the anchor 22 and neck portion 11 into a hole 40 in the wall 41, with the shoulder 12 abutting against the wall surface 42.

If the bolt 35 and anchor 22 have threads of the right-hand direction, it will be appreciated that it will be necessary to turn the bolt counterclockwise, as viewed from the right in FIGURE 2 to unscrew the bolt from the anchor. If the threads 19 and 31 are of the left-hand direction, clockwise rotation of the auxiliary body or plug 30, as seen from the right in FIGURE 2, will effect longitudinal outward movement of the plug relative to the main body against the bolthead 36. Further, the frictional force of the plug surface 37 against the underside of the bolthead 36 upon said clockwise rotation of the plug will tend to turn the bolt with the plug to screw the bolt 35 further into the anchor 22, or conversely, to screw the core 23 outward relative to the bolt and sleeve 26, and to hasten the expansion action of the anchor, and at least insure against the anchor unscrewing from the bolt. The frictional engagement between the plug surface 37 and the bolt head 36 is usually sufficient to turn the bolt relative to the anchor against the frictional resistance of the bolt and anchor threads, especially by reason of the smaller torque arm of said frictional resistance. Due to variations in condition of the frictionally engaging surfaces, which may result in manufacture and subsequent thereto, as well as variations in total frictional resistance at the bolthead and bolt threads, the frictional force at the bolthead may not be sufficient to turn the bolt with the plug 30, but if it is any rotation of the bolt 35 resulting from frictional engagement of the head 36 with the plug surface 37 will result in added longitudinal movement of the inner anchor part 23 toward the bolthead. Hence, upon relative rotation of the main body 10 and plug 30 in their threaded engagement, to withdraw the plug longitudinally outward from the main body, the bolt 35 is withdrawn longitudinally outward with the plug and carries with it the inner anchor part or core 23, which is adapted to pass into and be received within the opening portion 16. Of course, inward movement of the outer anchor part or sleeve 26 is prevented by its endwise engagement with the end surface 13 of the body 10, so that the sleeve is forced to move longitudinally relative to the core and thus expand over the enlarged core portion 24 for firmly wedging or setting the anchor in the hole 40.

Once the anchor is set in the hole, it is only necessary to rotate the plug 30 in a direction to effect longitudinal inward movement of the plug relative to the main body 10, whereupon the bolt 35 may be unscrewed from the anchor 22 and the setting tool removed from the anchor.

The embodiment of FIGURES 3 and 4 is substantially the same as that of FIGURES 1 and 2, with the exception of the auxiliary body or plug 30a. Under certain conditions it may be desirable to effect rotation of the plug or auxiliary body by means of a wrench, rather than a permanently affixed handle. Toward this end, the plug or auxiliary body 30a of FIGURES 3 and 4 is formed on its longitudinally outer end with an enlarged head 33a of a generally polygonal surface configuration, best seen in FIGURE 4, for non-rotative engagement in a wrench.

From the foregoing, it is seen that the present invention provides an expansion screw-anchor setting device which fully accomplishes its intended objects, and is well adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claim.

What is claimed is:

A device for setting screw anchors of the type having inner and outer cylindrical parts, said outer part being adapted to expand upon relative longitudinal movement of the parts, said device comprising an elongate rigid and integral body formed with a longitudinal through opening and having one end of a size to engage endwise with the outer part of said anchor and shaped to receive inwardly thereof the inner part of said anchor, an auxiliary body at the other end of said elongate body, interengaging screw threads of one direction on said elongate and auxiliary bodies mounting the latter body for movement longitudinally of said elongate body upon relative rotation of said bodies, a headed bolt having its head longitudinally outward of said auxiliary body in rotatable bearing engagement therewith and having its shank extending loosely and rotatably through said auxiliary and elongate bodies beyond said one end of the latter body, and screw threads of the other direction on the extending end of said bolt for threaded engagement in an anchor to be expanded, whereby rotation of said auxiliary body in one direction to move the latter longitudinally outward of said elongate body against said bolthead effects longitudinal movement of said outer anchor part against said one end of said elongate body and longitudinal movement of said inner anchor part into said one end of said elongate body to expand the outer anchor part, any rotation of said bolt resulting from the frictional engagement of the head thereof and the rear end of said auxiliary body resulting in added longitudinal movement of the inner part of said anchor toward said bolthead.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

1,177,843	Ackerman et al. -----	Apr. 4, 1916
2,519,693	Olin -----	Aug. 22, 1950
2,562,419	Ferris -----	July 31, 1951
2,641,378	Wilt -----	June 9, 1953