Dec. 20, 1938. J. C. MUSHET 2,140,919

BOLT ANCHOR

Filed Feb. 18, 1937

Fig. 1.

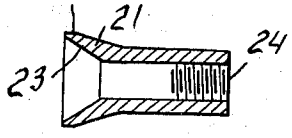



Fig. 2.

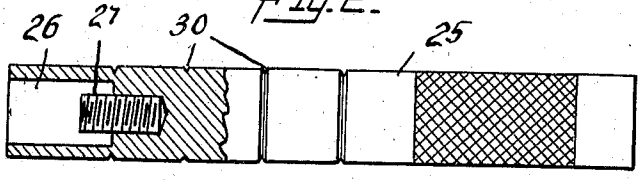



Fig. 3.

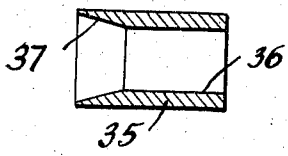



Fig. 4.

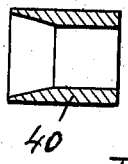



Fig. 5.

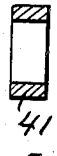



Fig. 7.

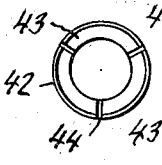



Fig. 6.

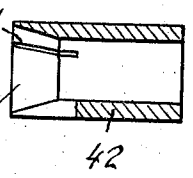



Fig. 8.

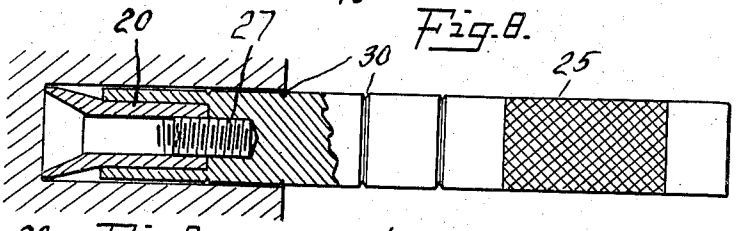



Fig. 9.

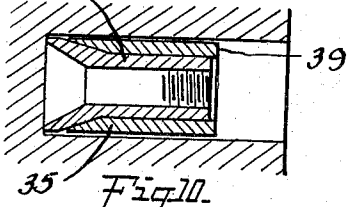



Fig. 11.

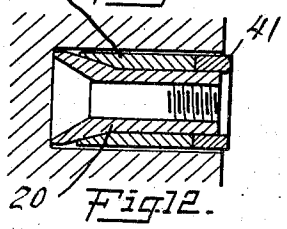



Fig. 13.

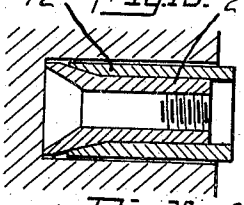



Fig. 10.

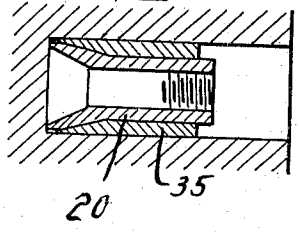



Fig. 12.

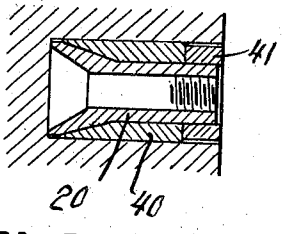



Fig. 14.

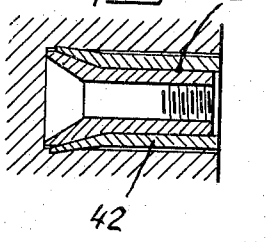



Fig. 15.

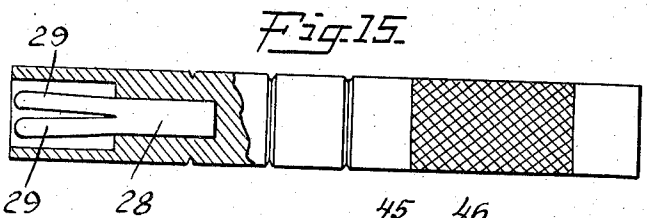
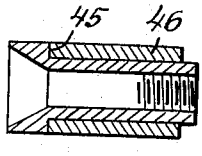



Fig. 16.




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# UNITED STATES PATENT OFFICE

2,140,919

## BOLT ANCHOR

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Application February 18, 1937, Serial No. 126,369

8 Claims. (Cl. 72—105)

This invention relates to bolt anchors.

Bolt anchors are used for anchoring bolts in walls of concrete, brick, stone or other cementitious material not adapted to directly receive and anchor threaded elements. When such anchors are to be used a hole must first be drilled or bored into the wall to receive the anchor.

This invention relates to an anchor preferably of the "tamp in" type, comprising an inner member and an outer member or sleeve adapted to be forced longitudinally on the inner member and to be thereby forced laterally into gripping engagement with the wall opening. This is usually accomplished by providing a conical or tapered outer surface on a portion of the inner or expanding member or element.

The invention has for its salient object to provide a bolt anchor element so constructed and arranged that the element can be used to bore or drill the hole in which the anchor is to be used and can thereafter be used as the inner or expanding element of the anchor.

Another object of the invention is to provide an anchor element and a tool for use therewith, so relatively constructed and arranged that the tool and anchor can be connected together and used to bore a hole in which the anchor is to be used.

Another object of the invention is to provide an anchor element and the tool for use therewith, so constructed and arranged that the tool and element can be used in conjunction with each other to bore the hole and thereafter the tool can be used to tamp the outer element of the anchor, thus setting the anchor in the hole.

Another object of the invention is to provide a tool of the character described having means thereon for gauging the depth of the hole bored by the use of the tool and anchor element.

Further objects of the invention will appear from the following specification taken in connection with the drawing which forms a part of this application, and in which

Fig. 1 is a longitudinal sectional elevation of an inner anchor element constructed in accordance with the invention;

Fig. 2 is an elevational view partly in section of a tool constructed for use with the anchor element shown in Fig. 1;

Fig. 3 is a longitudinal sectional elevation of an outer anchor element adapted for use with the inner element shown in Fig. 1;

Fig. 4 is a view similar to Fig. 3 but showing a shorter outer anchor element;

Fig. 5 is a sectional elevation showing a collar for use with the element shown in Fig. 4;

Fig. 6 is a longitudinal sectional elevation similar to Fig. 3 but showing another form of outer or expansible anchor element;

Fig. 7 is an end elevation of the element shown in Fig. 6;

Fig. 8 is an elevational view partly in section, showing the inner anchor element and tool connected together and disposed in a hole which has been bored thereby;

Fig. 9 is a sectional elevation showing an anchor inserted in the hole prior to the expansion of the outer sleeve or element to set the anchor;

Fig. 10 is a view similar to Fig. 9 but showing the outer anchor element forced laterally into gripping engagement with the wall opening;

Fig. 11 is a view similar to Fig. 9 but showing a shorter outer anchor element or sleeve and a collar mounted on the outer surface of the inner element and engaging the outer end of the sleeve;

Fig. 12 is a view similar to Fig. 11 but showing the collar forced inwardly on the inner element, thereby forcing the sleeve laterally into gripping engagement with the wall opening;

Fig. 13 is a view similar to Figs. 9 and 11 but showing the outer anchor element or sleeve constructed in the manner shown in Figs. 6 and 7;

Fig. 14 is a view similar to Fig. 13 but showing the outer element expanded or forced laterally into gripping engagement with the wall opening;

Fig. 15 is a view similar to Fig. 2 but showing a modified form of tool; and

Fig. 16 is a sectional elevation of a modified form of anchor embodying the invention.

The invention briefly described consists of an inner anchor element having a longitudinal bore therethrough and having the inner end portion thereof tapered or flared outwardly, or having an abutment formed thereon, the inner end of the element having a cutting edge formed thereon. The outer end of the bore is threaded and a tool is provided for use with the anchor having a recess to receive a portion of the outer surface of the anchor element and having a threaded pin or stud therein adapted to receive the threaded portion of the bore of the anchor element. When the tool and anchor element are assembled the anchor element will form a drill and can be used to bore a hole in the wall of concrete, brick, stone or other material, to receive the anchor.

After the hole has been bored the tool and anchor element are separated and an outer expansible sleeve is placed on the inner anchor ele-

ment and the anchor is inserted on the hole. The tool can then be used to engage the outer end of the expansible sleeve and force this sleeve longitudinally on the inner element and laterally into gripping engagement with the wall opening.

If the wall opening has a depth substantially equal to the length of the anchor, a short outer sleeve can be assembled on the inner anchor element and a collar can be placed around the outer end of this element. Thereafter the collar can be driven inwardly by blows of a hammer, thus expanding the sleeve.

Furthermore, if desired, the outer element can be formed with a split inner end which upon engagement with the tapered outer surface of the inner element will expand laterally as the sleeve is forced inwardly on the inner anchor element.

Further details of the invention will appear from the following description.

In the embodiment of the invention shown in the drawing, the inner anchor element comprises a hollow body portion **20**, preferably cylindrical on its outer surface, and an inner flared or tapered portion **21**. The inner end of the anchor is preferably cylindrical, as shown at **22**, on its outer surface and is tapered, as shown at **23**, on its inner surface, forming a V-shaped cutting edge on the inner end of the anchor element. The outer end of the bore is threaded, as shown at **24**.

The anchor element above described is preferably formed of hard metal, such as hardened steel, in order to serve as a cutting member or drill.

One form of tool adapted for use with the anchor element in Fig. 1 is illustrated in Fig. 2 and comprises a holder or rod **25** having a recess **26** at one end thereof. A threaded stud or pin **27** is mounted in the end of the rod or holder and extends centrally into the recess **26**. The tool shown in Fig. 15 is similar to that shown in Fig. 2, but in the former the central stud **28** is split to provide resilient prongs or tines **29** adapted to enter the threaded bore **24** of the inner anchor element.

The recess **26** is so dimensioned as to receive the cylindrical portion of the body **20** of the anchor element and this element is threaded on the pin **27**, as shown in Fig. 8. The recess **26** is of such a depth as to receive the full length of the cylindrical outer portion of the anchor element and when these parts are assembled the tapered outer surface **21** is disposed outside of the recess and beyond the end of the holder. When the parts are so assembled the combination tool and anchor can be used as a drill to bore a hole in the wall in the manner shown in Fig. 8 and in order to gauge the depth of the hole the tool has formed thereon at spaced intervals circumferential grooves **30**.

The groove nearest the inner end of the tool indicates the depth to drill the hole for the anchor to be set flush in the hole. By means of the depth gauge the holes can be all drilled to the desired depth and anchors of a group can all be drilled to the same depth to accommodate bolts of the same length. The markings can be spaced to accord with variations in length of standard commercial bolts as, for instance, one-half inch.

When the hole has been bored to the desired depth the tool and anchor element are removed from the hole and the anchor element is rotated in the proper direction to separate the threaded bore from the pin or stud **27**. Thereupon, the outer anchor element is assembled on the inner element in the manner shown in Fig. 9. The outer element consists of a sleeve **35** having a cylindrical bore **36** adapted to fit over the cylindrical outer portion of the inner element and having a tapered inner end **37** adapted to surround and fit the tapered inner portion **21** of the inner element. After the anchor has been inserted in the hole in the manner shown in Fig. 9, the tool is again used and in this instance the inner end **38** of the tool engages the outer end **38** of the sleeve **35** which is preferably formed of soft or ductile metal and as the outer end of the tool is tapped with a hammer the sleeve will be forced longitudinally on the inner anchor element and because of the engagement of the inner end of the sleeve with the tapered outer surface of the inner anchor element the metal of the sleeve will be forced laterally into firm gripping engagement with the wall opening and the anchor will be set.

If the hole in the wall is bored only to a depth corresponding substantially to the length of the anchor, a relatively short sleeve **40**, such as is shown in Fig. 4, can be used. This sleeve is assembled on the inner anchor element and thereafter a collar **41** is placed on the outer end of the inner element in engagement with the outer end of the sleeve. The outer end of the collar is then tapped with a hammer which will force the collar inwardly on the inner anchor element and will force the sleeve laterally into gripping engagement with the wall opening.

If desired, a sleeve such as that shown in Figs. 6 and 7 may be used in conjunction with the inner anchor element. This sleeve **42** has its inner tapered portion **43** split, as shown at **44**, the sleeve in this instance being formed of relatively hard metal. When the sleeve and inner element are assembled as shown in Fig. 13 and inserted in the wall opening, the outer end of the sleeve can be engaged by a hammer and can thus be forced inwardly to the position shown in Fig. 14, in which it will be seen that the inner end of the sleeve has been expanded into gripping engagement with the wall opening.

If desired, the inner anchor element may be formed as shown in Fig. 16, with an annular abutment **45** on its outer surface. The sleeve **46** abuts against the abutment **45**.

Although certain specific embodiments of the invention have been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

1. In combination, a combination anchor element and hollow drill having a threaded bore and an outwardly flared end portion provided with a cutting edge and a tool having a recess to receive the outer portion of the anchor element and a threaded stud therein to engage the threaded bore.

2. In combination, a hollow drill having a threaded bore, a cylindrical body portion and an outwardly flared end portion provided with a cutting edge and a tool having a cylindrical recess to receive the cylindrical portion of the drill and a threaded stud therein to engage the threaded bore.

3. In combination, a hollow drill having a threaded bore, a smooth outer portion and an

outwardly flared end portion provided with a cutting edge and a tool having a centrally disposed threaded portion engageable with the threaded bore of the anchor element and a recess with a smooth inner surface to receive the smooth outer portion of the drill.

4. In combination, a combination anchor element and hollow drill having a threaded bore, a cylindrical body portion and an outwardly flared end portion provided with a cutting edge and a tool having a cylindrical recess to receive the cylindrical portion of the anchor element and a centrally disposed stud therein arranged to enter said threaded bore.

5. A tool for use with an internally threaded boring element, having a recess for receiving a portion of the element and having a centrally disposed stud arranged to enter the threaded portion of the element, said stud having means for engaging the wall of the bore of said boring element to retain the stud therein.

6. A tool for use with a threaded boring element, having a recess for receiving a portion of the element and having a centrally disposed stud, said stud having resilient tines arranged to enter the threaded portion of the element.

7. A tool for use with a threaded boring element, having a recess for receiving a portion of the element and having a centrally disposed stud arranged to enter the threaded portion of the element, said tool having depth gauge markings on the outer surface thereof, including a marking opposite the inner end of the recess to indicate the depth to be drilled to receive an anchor flush with the outer end of the hole.

8. A combination drill handle and tamping tool for use with a combination anchor element and hollow drill having a threaded bore, said anchor element being combined with an outer soft metal sleeve to form an anchor unit, the combination anchor element and drill having an outwardly flared end portion provided with a cutting edge having a diameter as great as the outside diameter of the soft metal sleeve, said combination handle and tamping tool having a recess to receive the outer end of the anchor element and a stud therein to enter the threaded bore, the wall surrounding the recess being adapted for use with the anchor unit to tamp the outer end of the sleeve.

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