Dec. 18, 1928. 1,695,303

C. C. TOMKINSON

ANCHOR

Filed Feb. 11, 1926

Fig. 2.

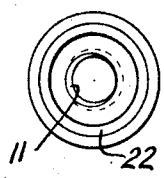



Fig. 1.

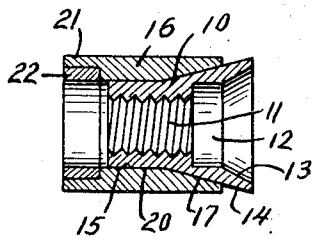



Fig. 3.

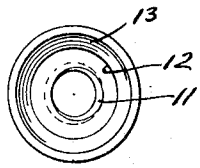



Fig. 4.

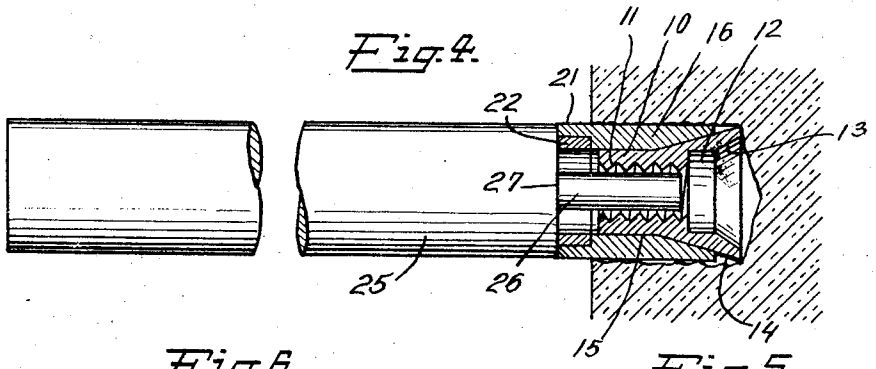



Fig. 6.

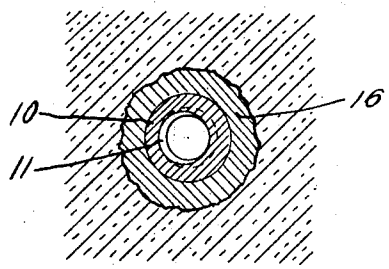



Fig. 5.

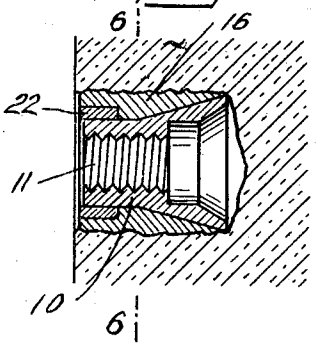
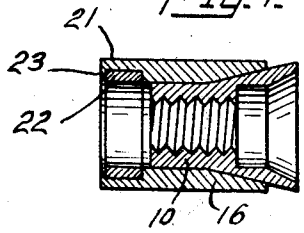



Fig. 7.




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# UNITED STATES PATENT OFFICE.

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## ANCHOR.

Application filed February 11, 1926. Serial No. 87,550.

This invention relates to expansion shields employed for obtaining anchorage in walls of brick or stone or cementitious material not adapted to directly receive a threaded element or bolt.

This invention has for its salient object to provide an anchor so constructed and arranged that it can be easily and quickly secured in a wall opening and when secured will provide a rigid and firm anchorage.

Another object of the invention is to provide an anchor comprising an expanding member of relatively hard metal, and an expansion member of relatively soft metal mounted thereon, and having means for preventing the soft metal from projecting inwardly into the path of the expanding member as the expanding member is driven or forced into the expansion member.

Another object of the invention is to provide an anchor of the character described that is simple in construction, efficient in operation and can be economically manufactured.

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

Fig. 1 is a longitudinal sectional elevation of a device constructed in accordance with the invention.

Fig. 2 is an end view of one end of the anchor shown in Fig. 1.

Fig. 3 is an end view of the other end of the anchor shown in Fig. 1.

Fig. 4 is an elevational view partly in section showing the anchor illustrated in Fig. 1 and one form of tool for forcing the expanding member into the expansion member.

Fig. 5 is a sectional elevation showing the anchor expanded in a wall opening.

Fig. 6 is a transverse sectional elevation taken substantially on line 6—6 of Fig. 5; and

Fig. 7 is a sectional view similar to Fig. 1 but showing a slight modification of the invention.

The invention briefly described consists of an anchor comprising an expanding member having an opening extending longitudinally therethrough, one end of the opening being screw threaded and the other end being enlarged to form an annular shoulder. A portion of the outer surface of the expanding member is tapered or conical and the outer portion is preferably substantially cylindrical. An expansible member in the form of a sleeve of relatively soft or ductile metal is mounted on the expanding member and preferably has a portion of its inner surface tapered or conical to conform to the tapered or conical portion of the expanding member. The sleeve extends beyond the screw threaded end of the expanding member and has mounted in the extending portion thereof a ring of relatively hard metal preferably having an internal diameter substantially the same as or slightly greater than the external diameter of the substantially cylindrical portion of the outer surface of the expanding member. The purpose of this ring is to prevent the soft metal of the sleeve from being forced inwardly as the sleeve is driven on the expanding member and obstructing the path of the expanding member and of the screw holding member which is inserted after the anchor has been expanded in place. If desired the sleeve can be extended slightly over the outer end of the ring, as shown in Fig. 7, to retain the ring in position prior to expansion of the sleeve.

One form of tool for expanding the anchor has shoulders adapted to abut against the outer end of the expansible member and a shank or guiding portion adapted to enter the expanding member and guide the tool.

Further details of the invention will be clear from the following description.

In the embodiment of the invention illustrated, the anchor comprises an expanding member 10 having a longitudinal opening therethrough, the outer end of this opening being screw threaded as shown at 11 and the inner end being enlarged or recessed as shown at 12 and having a flaring end as shown at 13.

The outer surface of the inner end of the expanding member 10 is tapered or conical as shown at 14 and the outer surface of the outer end of the expanding member is substantially cylindrical as shown at 15.

In the particular form of the invention illustrated the expansion member or expansible portion of the anchor consists of a sleeve 16 of relatively soft or ductile metal. The sleeve is mounted on the expanding member 10 and has a conical inner surface

17 substantially conforming in shape to the conical surface 14 of the expanding member. The sleeve 16 also has a substantially cylindrical inner surface 20 and the outer end 21 of the sleeve extends beyond the outer end 15 of the expanding member 10 and has mounted therein a ring 22 of relatively hard metal having an internal diameter preferably slightly greater than the external diameter of the expanding member. The purpose of the ring 22 is to prevent the soft metal of the sleeve from being forced inwardly into the path of the expanding member as the sleeve is expanded by the expanding member. The sleeve 16, however, need not necessarily conform in shape to the shape of the member 10.

In Fig. 4 the anchor is shown in a wall opening and one form of tool is illustrated by means of which the sleeve can be driven on the expanding member. The tool comprises a body portion 25 and a shank or spindle 26. The shank 26 is adapted to enter the ring 22 and the opening in the expanding member and form a guide for properly positioning and guiding the tool. The annular shoulder 27 formed at the junction of the shank 26 with the body 25 is adapted to abut against the outer end of the expansion member or sleeve and as the body portion 25 of the tool is driven by hammer or other siutable implement the sleeve will be forced into the expanding member and will be expanded thereby.

Fig. 7 shows a slight modification of the invention in that the ductile sleeve extends over the ring 22 as shown at 23, to hold the ring in the sleeve.

From the illustration in Fig. 5 it will be clear that as the sleeve is driven on the expanding member the metal of the sleeve is forced into firm gripping engagement with the wall opening and will be prevented from being forced inwardly into the path of the expanding member by the ring 22.

Although certain specific embodiments of the invention have been shown and described, it will be understood that the invention is capable of modification and that further 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. An anchor comprising an expanding member having a tapered outer surface, a sleeve of ductile metal mounted on said member and extending beyond the outer end thereof, and a ring of relatively hard metal disposed in the extending portion of said sleeve and adapted to encircle the expanding member when the sleeve is expanded on the expanding member.

2. An anchor comprising an expanding member having a tapered outer surface and a substantially cylindrical outer surface, a sleeve of relatively soft metal mounted on said member having a ring of relatively hard metal mounted in its outer end, said ring having an internal diameter greater than the external diameter of the substantially cylindrical surface of the expanding member.

3. An anchor comprising an internally threaded expanding member having a tapered outer surface and a substantially cylindrical outer surface, a sleeve of relatively soft metal mounted on said member and having inner surfaces conforming to the outer surfaces of the expanding member and having a ring of relatively hard metal mounted in its outer end, said ring being adapted to fit over the expanding member when the ductile sleeve is expanded.

4. An anchor comprising an internally threaded expanding member having a conical outer surface and a substantially cylindrical outer surface, a sleeve of relatively soft metal mounted on said member having a ring of relatively hard metal mounted in its outer end, said ring having an internal diameter greater than the external diameter of the substantially cylindrical surface of the expanding member.

5. An anchor comprising an expanding member having a threaded opening therein extending to one end thereof, and a sleeve of relatively soft metal mounted on said member and extending beyond the threaded end thereof, said extending portion having a ring of relatively hard metal disposed therein.

6. An anchor comprising an expanding member, a ductile sleeve mounted thereon and extending beyond one end thereof. and means within said extended portion of the sleeve for preventing the intrusion of the metal thereof when the sleeve is expanded.

7. An anchor comprising an expanding member, a ductile sleeve mounted thereon and extending beyond one end thereof, and a ring within the extended portion of the sleeve for preventing the intrusion of the metal thereof when the sleeve is explained.

8. An anchor comprising a relatively hard metallic member, a ductile sleeve mounted thereon and extending beyond one end thereof, and means within said extended portion of the sleeve for preventing the intrusion of the metal thereof when the sleeve is expanded.

9. An anchor comprising an expanding member having a tapered outer surface, a sleeve of ductile metal mounted on said member and extending beyond the outer end thereof, and a rigid ring of relatively hard metal disposed in the extending portion of said sleeve and adapted to encircle the expanding member when the sleeve is expanded on the expanding member.

10. An anchor comprising an expanding member, a ductile sleeve mounted thereon and extending beyond one end thereof, and a substantially cylindrical band within the extended portion of the sleeve for preventing the intrusion of the metal thereof when the sleeve is expanded.

11. An anchor comprising a relatively hard metallic member, a ductile sleeve mounted thereon and extending beyond one end thereof, and a substantially cylindrical band in said extended portion of the sleeve for preventing the intrusion of the metal thereof when the sleeve is expanded.

12. An anchor comprising an expanding member having a threaded opening therein extending to one end thereof, and a sleeve of relatively soft metal mounted on said member and extending beyond the threaded end thereof, said extending portion having a rigid ring of relatively hard metal disposed therein.

13. An anchor comprising an expanding member, a ductile sleeve mounted thereon and extending beyond one end thereof, and a ring disposed entirely within the extended portion of the sleeve for preventing the intrusion of the metal thereof when the sleeve is expanded.

14. An anchor comprising an expanding member, a ductile sleeve mounted thereon and extending beyond one end thereof, and a rigid ring disposed entirely within the extended portion of the sleeve for preventing the intrusion of the metal thereof when the sleeve is expanded.

In witness whereof, I have hereunto set my hand this 2nd day of February, 1926.

CHARLES C. TOMKINSON.