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[54] **ANCHORING DEVICE**
2 Claims, 6 Drawing Figs.

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85/73
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ABSTRACT: An improved anchor is provided by a single piece that is preshaped to define both an expander and sleeve positioned in endwise relation to each other and interconnected through a connection that is shearable upon bottoming the sleeve on the bottom wall of an aperture and then sharply striking the distal end of the expander to shear said connection and simultaneously telescope the expander into the sleeve. The portion of the sleeve adjacent the shearable connection may be thinned for easier rupture and a portion of the sleeve may be slotted for ease in expansion.

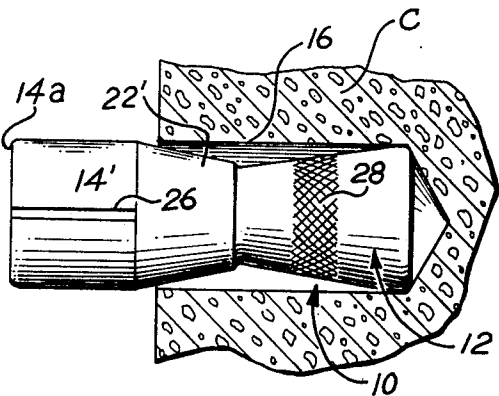


Fig. 1

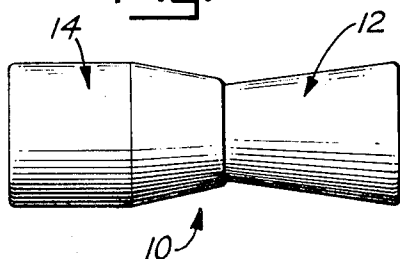


Fig. 2

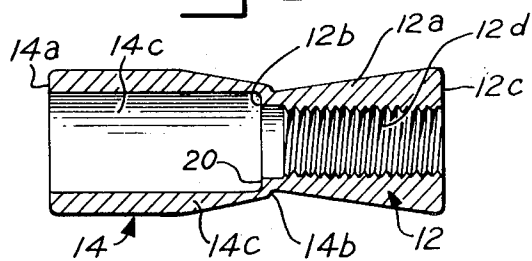


Fig. 3

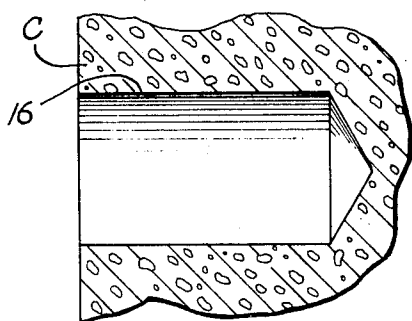


Fig. 4

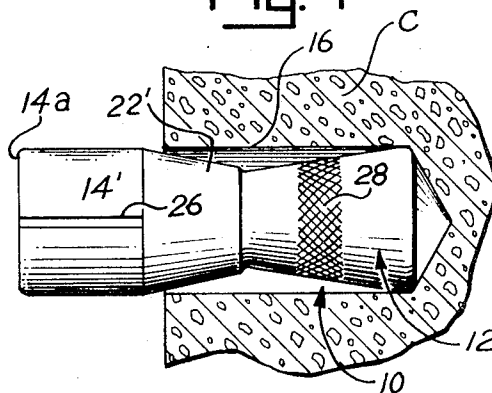


Fig. 5

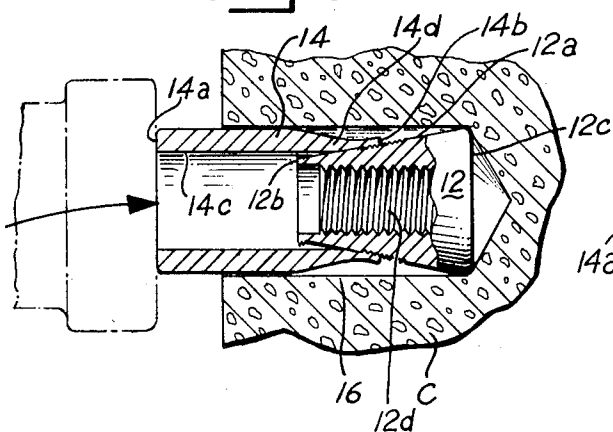
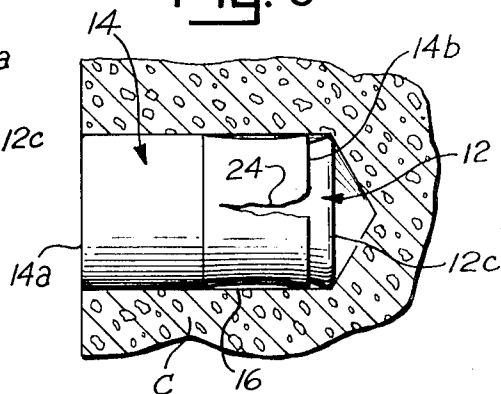


Fig. 6



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ANCHORING DEVICE

BACKGROUND OF THE INVENTION

This invention relates to an improved anchor for blind holes.

An object of this invention is to provide in a single piece, and as a convenience for storage and use, both the expander and sleeve parts of an expander type anchor, and to interconnect those parts through a shearable connection, so that upon positioning of the device in a bottomed blind hold and by striking the exposed end of the device, the two portions of the device telescope with the expander positioned in the sleeve.

Another object of this invention is to provide an improved anchor, and more particularly an improved sleeve for an anchor, for use in blind holes.

A further object is to provide an improved anchor for blind holes that is characterized by inexpensiveness and simplicity of construction and by improved convenience in use.

Further objects and advantages of this invention will become apparent as the following description proceeds and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

A preferred embodiment of the invention is shown in the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevation view of an anchor device embodying the invention;

FIG. 2 is a longitudinal cross section of the device of FIG. 1;

FIG. 3 is a fragmentary longitudinal cross section view of a blind hole in concrete showing the environment where the invention is to be used;

FIG. 4 is similar to FIG. 3 but shows a modified form of the device of FIG. 1 positioned in the blind hole;

FIG. 5 illustrates in cross section how the sections of the device of FIG. 1 are telescoped after first being positioned as illustrated in FIG. 4; and

FIG. 6 illustrates the anchor of FIG. 1 when its sleeve is fully expanded in the environment seen in FIGS. 3-5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, one form of the invention herein is shown in FIGS. 1 and 2 as a combination device illustrated generally at 10 and consisting of an elongated expander 12 and an elongated sleeve 14 spaced longitudinally of each other at an axially aligned attitude. As best seen in FIG. 2, the expander 12 is annular and has a frustoconical exterior 12a that tapers along the length of expander 12 from a reduced entry tip 12b to an enlarged end 12c located at one terminus of the device 10. The bore of expander 12 is threaded at 12d to provide for the customary connection thereto. The sleeve 14 has one end 14a at one terminus of the device 10, a second end 14b intermediate the ends of device 10, and a cylindrical bore 14c longitudinally therethrough. The bore 14c has a diameter that is intermediate in size between the diameter dimensions of ends 12a and 12b of the expander.

FIGS. 3 and 4 illustrate generally the environment in which a combination device 10 of the type in FIGS. 1 and 2 is to be used. There is shown a concrete body C with a blind hole 16 therein. FIG. 4 shows that the length and diameter of blind hole 16 are each slightly greater than the corresponding dimensions of the sleeve 14, so that when the connector device of FIGS. 1 and 2 is inserted in the blind hole 16 of FIG. 3, the parts will be generally in the position as seen in FIG. 4, with the end 12c of the expander 12 in contact with the innermost end of the hole 16 and with a portion of sleeve 14 entering the outer end of hole 16, but with the greater portion of sleeve 14 located generally outwardly of body C.

The expander 12 and the sleeve 14 are formed integrally as seen in FIGS. 1 and are maintained in that condition, for con-

venience in storage and for sale, by means of a shearable connection 20 at the juxtaposed ends of the two sections. The shearable connection 20 is a thin annular wall that is formed integrally with and extends between the tip 12b of the expander and the end 14b of the sleeve, i.e., radially outwardly of tip 12b and radially inwardly of end 14b with the wedging end of the expander immediately adjacent one end of the sleeve so that the small diameter end 12b of the expander is positioned immediately adjacent the larger diameter bore 14c of the sleeve.

The shearable connection is a very thin piece of metal such that when the combination device 10 is positioned as in FIG. 4, then by simply striking end 14a of the sleeve sharply with a hammer, as illustrated in FIG. 5, the connection 20 readily shears to permit telescoping entry of the wedging tip 12b of the expander into the sleeve 14. Further driving action by the hammer moves the sleeve 14 into the hole 16 causing the sleeve 14 to move over the expander 12, while simultaneously expanding the sleeve 14 outwardly into tightly gripping engagement with the interior cylindrical periphery of the bore 16.

To facilitate the ready expansion of the sleeve 14 into gripping engagement, the portion of the sleeve immediately adjacent the shearable connection 20 is formed with a frustoconical exterior portion 14d, thereby thinning the annular wall of the sleeve adjacent the end 14b. As the expander 12 moves relatively further into the sleeve 14, the thinned wall portion, adjacent said end of the sleeve, stretches and even ruptures as indicated at 24. The telescoping movement of sleeve 14 relative to expander 12 continues until the end 14a of the sleeve is located at a position substantially coplanar with surface of the body C, as seen for example in FIG. 6.

In a modified form of device as shown in FIG. 4, the cylindrical portion of the sleeve 14', from whence the thinned or tapered portion 22' extends and which is distal from the expander 12, is provided with a longitudinal slot 26 therein completely through the wall so that as further telescoping occurs between sleeve 14 and expander 12, the said cylindrical portion 14' is more easily expanded into gripping engagement with the cylindrical wall of the bore 16.

In both forms of device, as in FIGS. 1 and 2 and in FIG. 4, the expander 12, sleeve 14 and shearable connection 20 are formed integrally of any appropriate material such as selected steels that permits all of the actions demanded. The arrangement of parts insures that there is always one sleeve for each expander and telescoping is insured by the axial alignment of the parts.

It will be understood that a device such as at 10 in FIGS. 1 and 2 may be readily produced by automatic machines and that, too, is a desirable feature. Where a slot is to be added as at 26 in the form of device of FIG. 4, the device is first formed on automatic machines without the slot, and the devices may then be fed automatically by hopper so as to be aligned and slotted. As an additional feature, a portion of the frustoconical wall 12a of either form of device may be provided with a knurl as indicated in the position of 28 in FIG. 4 which will engage the inner cylindrical wall 14c of the sleeve for preventing relative rotation of the expander 12 when a bolt is being rotated in the threads 12d of the expander.

It will be obvious to those skilled in the art that other changes and modifications may be made in the invention without departing therefrom and, therefore, it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. In an elongated anchor device of the type including an expander portion, having a circumferentially continuous and uninterrupted frustoconical exterior for telescoping into an end of a sleeve and secured at its reduced end by a shearable connection to an expandable sleeve member; the improvement comprising the said sleeve member having an inner cylindrical surface and being shaped exteriorly to provide a cylindrical section spaced from the said reduced end of the ex-

pander by an intervening frustoconical, thinned, section, said frustoconical, thinned section having a circumferentially continuous and uninterrupted inner cylindrical periphery and a circumferentially continuous and uninterrupted frustoconical outer periphery, and said cylindrical section of the sleeve being slotted along its length through the thickness of the sleeve wall to provide for ease of expansion of said cylindrical portion of the sleeve member.

2. In an elongated anchor device of the type including an expander portion, having a circumferentially continuous and uninterrupted frustoconical exterior for telescoping into an end of a sleeve and secured at its reduced end by a shearable connection to an expandable sleeve member; the improvement comprising the said sleeve member having an inner cylindrical surface and being shaped exteriorly to provide a cylindrical section spaced from the said reduced end of the ex-

pander by an intervening frustoconical, thinned, section, said frustoconical, thinned section having a circumferentially continuous and uninterrupted inner cylindrical periphery and a circumferentially continuous and uninterrupted frustoconical outer periphery, and said cylindrical section of the sleeve being slotted along its length through the thickness of the sleeve wall to provide for ease of expansion of said cylindrical portion of the sleeve member, and the frustoconical exterior of the expander portion providing two bands of circumferentially continuous and uninterrupted surface spaced apart by a circumferentially continuous band of knurling that is adapted for increased gripping engagement with the inner surface of the sleeve member, when the expander portion is telescoped into the sleeve, to prevent relative rotation between the expander and the sleeve.

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