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METHOD OF POSITIONING MAGNETICALLY RESPONSIVE
SLEEVES WITHIN A MASS OF MOLDABLE MATERIAL
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Fig. 1.

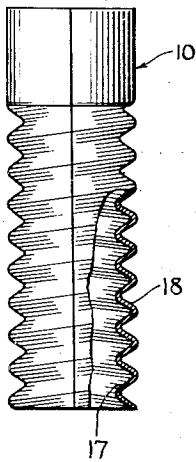


Fig. 2.

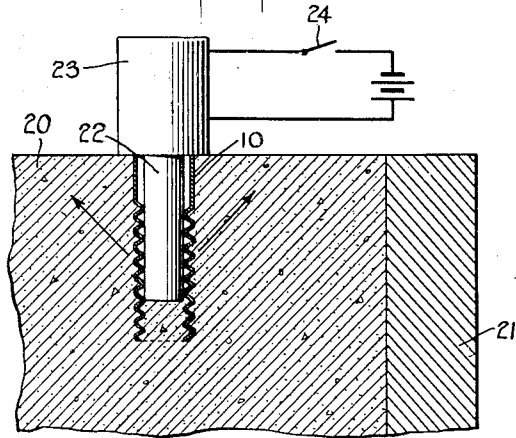


Fig. 3.

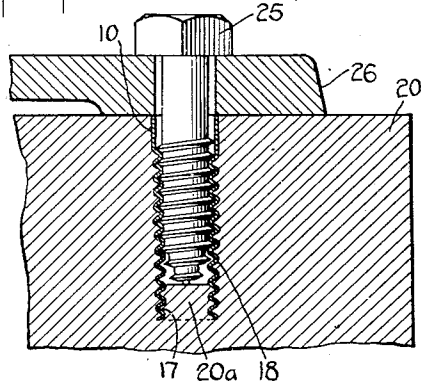
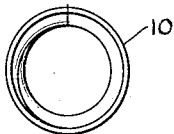


Fig. 4.



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METHOD OF POSITIONING MAGNETICALLY RESPONSIVE SLEEVES WITHIN A MASS OF MOLDABLE MATERIAL

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3 Claims. (Cl. 25—154)

This invention relates to anchorage devices and to methods of positioning the same.

More particularly, this invention relates to an improved method for pre-positioning sockets or liners adapted for employment with structures formed from concrete or other moldable, hard-setting material, to form anchorage means for male-threaded elements.

The present invention contemplates the use of a magnetic metallic shell wall insert having an open end. The wall structure of such insert is formed with deep-shouldered threading, whereby upon pouring concrete about the insert, a portion of said concrete fills the lower portion of the insert and supplements the engagement of the concrete with the external threading, to secure the insert against withdrawal or substantial separation from the hardened concrete or like material.

By the employment of magnetic materials for the anchorage device, means are afforded whereby said anchorage devices may be magnetically held on a suitable jig or other supporting means during the stage of pouring the concrete or like material, and the holding devices readily removed therefrom after the concrete has hardened.

It is a feature of the invention that the holding power of the insert is derived by means other than a distortion of the walls thereof, outward expansion against the walls of a drilled opening within the holding structure, or by external wings, fins, or the like. It is an additional feature that the lag screw may be removed and re-inserted, without damaging the sleeve or adversely affecting its holding power.

This application is a continuation in part of our presently copending application Serial No. 156,699, filed July 31, 1937, entitled Anchorage device.

Other features and advantages will hereinafter appear.

In the accompanying drawing:

Figure 1 is an elevation, partly in section, of a screw-threaded liner pursuant to the present invention;

Figure 2 illustrates a preferred method of positioning the liner and holding the same during the molding of the concrete mass;

Figure 3 is illustrative of the application of the liner and the engagement of concrete with the internal and external threading thereof;

Figure 4 is a plan view of the liner.

The anchoring device or liner 10, Fig. 1, comprises a helically configurated, open ended cylinder, preferably of steel, sheet iron, or like sheet

metal, advantageously formed by die-embossing thread-forming corrugations on a flat metal blank, and shaping said blank around a mandrel to form a cylinder, the extremities of the corrugations being brought into register to form a continuous thread.

It will be understood that materials other than steel or sheet iron may be used for manufacturing our anchoring devices; magnetic materials, however, lend themselves advantageously to desirable means of positioning and holding the liners during the pouring and compacting of the cementitious mass, as later described.

As illustrated in Figure 1, the liner 10 has a deep shouldered female threading 17, and a male thread provided with sloping, collapse-resistant shoulders or abutments 18.

The liner may advantageously be used with any moldable material which, although possessing desirable structural qualities in mass, is of a friable nature in that corner-surfaces or thread-like configurations crumble under abrasion combined with tensile or compressive stresses, such friable characteristic making it impracticable to tap or otherwise form a screw-thread in the material per se.

Fig. 2 illustrates a preferred method of positioning a liner or anchorage device 10 during the stage of pouring and compacting a cement slab 20. A liner 10 may be inserted over a mandrel 22 of soft iron or like magnetic material, said mandrel forming the core of an electromagnetic holding device 23 connected, as shown, to any suitable source of electric current.

Any suitable switch means, as 24, may be provided in the circuit.

When it is desired to position a plurality of anchorages 10 in one operation, a suitable jig having such plurality of electromagnetic devices 23 may be employed, each of the cores 22 of which receive an anchorage 10.

Closing the switch 24 energizes the electromagnet 23, retaining the anchorage 10 for suitable positioning with respect to a mold, one wall, 21, of which is shown.

As appears in Fig. 2, the core 22 is shorter than the anchorage device 10, to maintain a substantial portion of the end of the anchorage in open status.

The cementitious mass may then be introduced into the mold, whereupon it flows into engagement with the shoulders 18 of the external wall of the anchorage device, and enters the bottom of the anchorage to the extent permitted by the core 22, to fill the pockets provided by the deep

shoulders of the internal corrugation 17. Desirably, the concrete mass is jarred or compacted to densify the mass and to insure the intimate engagement of the concrete with the corrugations of the anchorage device 10.

Upon the opening of the electric circuit the electromagnetic holding means 22, 23 may be removed.

As is shown in Fig. 3, the anchorage 10 is secured within the cement slab 20 by the engagement of hardened concrete with the external shoulders 18, and by the coincident engagement of a concrete slug 20a, integral with the main body 20, with several of the lowermost internal corrugations 17. The anchorage device is, therefore, characterized by the absence of external projections; the maximum external diameter of the anchorage device being only slightly greater than the maximum external diameter of the lag screw 25, said device is adaptable for use in restricted locations. It is thus possible to position said devices in corners or like locations where the proximity of a plurality of wall surfaces may preclude the use of anchorages having wing-like extensions serving to anchor the structure within the concrete.

Additionally, the regularity and smoothness of the internal configuration insures the intimate engagement of the concrete therewith, and the homogeneity of such concrete slug 20a.

In its application, the liner may receive a cooperatively male-threaded element, such as the lag screw 25, Figure 3, which is illustrated as securing a structural member 26 on the concrete slab 20. The screw 25 is held within the liner 10 by the cooperation of the female threading of the liner, and the male threading of the lag screw. The metal of the liner is substantially unmutated by the lag screw 25, and, therefore, the stated screw can be removed and re-inserted without damaging the liner or detracting from its holding power.

Desirably, the length of the anchorage device or liner 10 affords full threaded engagement with the threads of the lag screw or the like, and additionally provides a length of engagement of the concrete with the internal threading 17 of the order of one-quarter of the total threaded length of the liner.

It will be observed that the sleeve 10 is not held within the slab 20 by expansion or other pressure-induced distortion. The sloping shoulders 18 resist tensile pull on the sleeve 10 along frusto-conical surfaces established within the mass, and normal to the said shoulders, as indicated by the arrowed lines in Fig. 3.

The liner 10 may be provided with a suitable rust-resistant coating, such as tin or zinc. The close bond between the concrete of the slab 20 and the liner 10 precludes the penetration of water around the liner, and plastic cement may be utilized to seal the space between the shank of the lag screw and the inner wall of the liner to prevent the percolation of water therein.

Whereas a specific form of our invention has been described, it will be understood that many changes and modifications may be made without departing from the spirit of the invention.

We claim:

1. The method of securing a screw anchor having an open end and a screw-thread provided internal and external wall within a mass of hard-setting moldable material, comprising inserting an electromagnetic core into said anchor to plug all but the lower portion thereof against the entry of said moldable material, energizing said electromagnetic core to retain said anchor thereon, causing said hard-setting moldable material to flow about the external wall of said anchor and to flow into the said open end of said anchor to engage the screw-threading thereof, de-energizing said electromagnetic core after said moldable material has set, and removing said core therefrom.

2. The method of positioning an open-ended sleeve within a mass of hard-setting moldable material, comprising magnetically retaining said sleeve on a core disposed internally thereof, inserting the thus mounted and magnetically held sleeve into a mass of such material, whereby said material enters the open end of said sleeve to an extent permitted by said core, and withdrawing said core from said sleeve after the said moldable material has rigidified sufficiently to preclude any further substantial entry of said material into said open-ended sleeve.

3. The method of positioning a magnetically responsive open ended tubular sleeve within a mass of hard-setting moldable material, comprising the steps of plugging said sleeve over all but a desired portion of its length, magnetically holding such plugged sleeve in desired position, causing said mass of moldable material to flow about said sleeve and into the open end thereof, permitting said moldable material to solidify, and releasing said magnetic holding means and removing the plug means from said sleeve.

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