

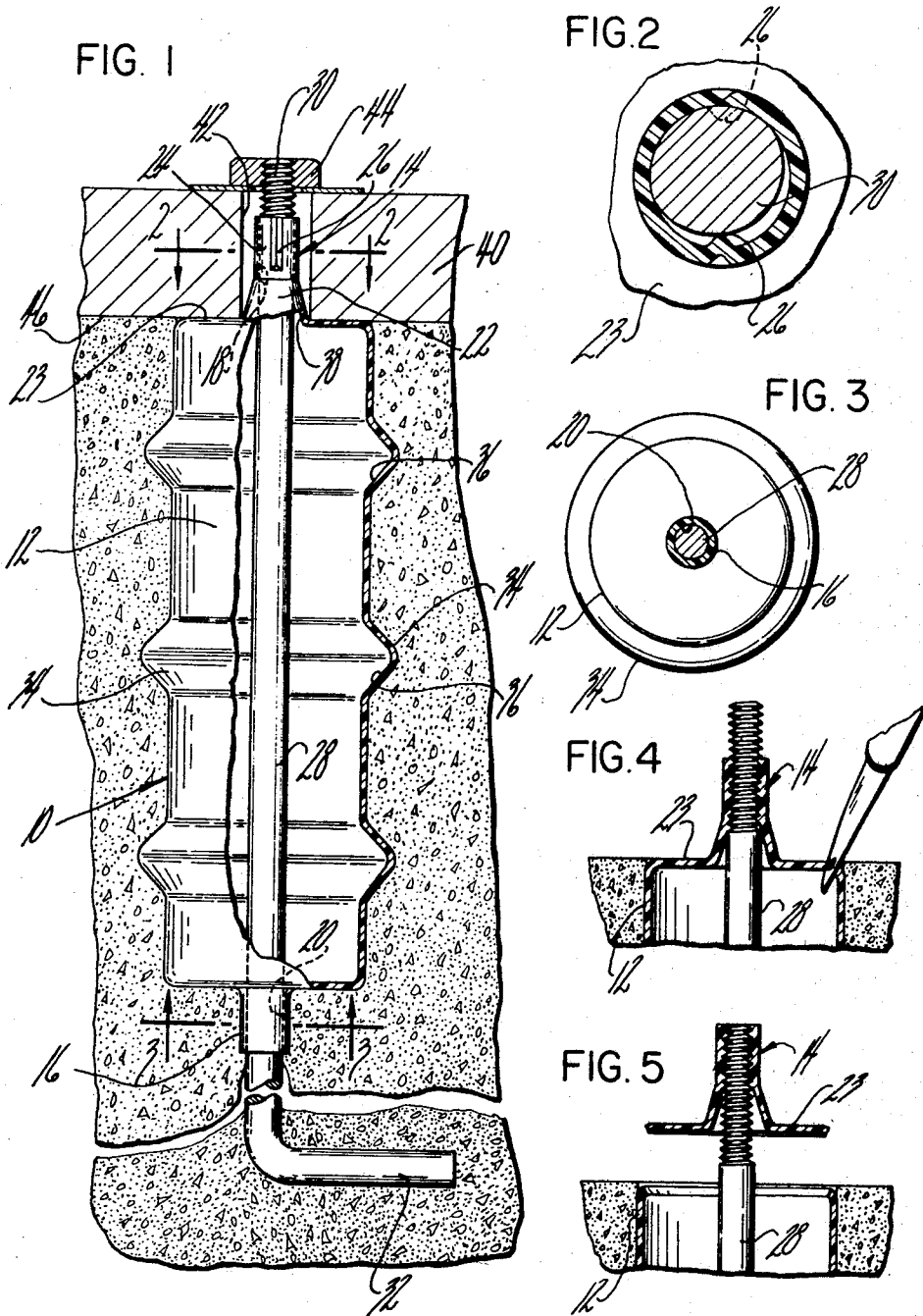
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ANCHOR BOLT FORM

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13 Claims

ABSTRACT OF THE DISCLOSURE

An apparatus for use in setting an anchor bolt which spaces the upper portion of the bolt from the surrounding concrete when the bolt is embedded in a concrete foundation to permit lateral adjustment of the bolt without damaging the concrete to facilitate alignment thereof with a superstructure to be secured thereto, including spaced apart, bolt engaging means formed integrally with, and at opposite ends of an elongated body portion which permit relative axial adjustment of the body portion upon the bolt by relative rotation therebetween.

This invention relates generally to anchor bolts of the type used to secure a superstructure such as machines, structural members and the like, in place upon a concrete foundation and is directed particularly to means for setting an anchor bolt in concrete to permit limited lateral adjustment of the bolt after the concrete has been set without damaging either the bolt or the concrete.

In construction and allied fields it is a common practice to embed anchor bolts in a concrete floor, wall, footing or the like for the purpose of securing a machine, structural member or other superstructure in position thereon. Obviously, the anchor bolt must be correctly located and positioned prior to pouring the concrete so that it may be properly in place when the concrete has set. Those familiar with the art are well aware of the importance of correctly locating anchor bolts. For example, if a machine is to be secured to a factory floor, the anchor bolts must first be located in the floor, positioned for alignment with cooperating holes in the machine base. If the bolts are slightly out of position, obviously the holes in the base of the machine will not be in register to receive the bolts therethrough. Therefore, to permit some adjustment of the bolts to bring them into alignment with the holes in the machine base, various devices have been used to space the concrete from the upper portion of the bolts to permit limited lateral adjustment thereof into alignment or register with the holes in the machine base.

A primary object of the invention is to provide an elongated form or shield for an anchor bolt which functions to space a portion of the bolt from the concrete within which it is embedded; which is provided with end portions which are adapted to receive the anchor bolt to adjustably position the form thereon coaxially relative to the bolt and to cooperate with the bolt in substantially closing the form to keep foreign matter from entering the void between the bolt and the concrete; and which is provided with means to protect the threaded end of the anchor bolt until the bolt is ready for use.

A further object of the present invention is to provide a device of the foregoing character which includes means to permit relative longitudinal adjustment of the form upon the bolt; which is provided with rib means to insure secure placement of the form in the concrete; which is molded of easily severable, plastic material to permit ready access to the void surrounding the bolt and provided by the form; and which includes recess means on the inside wall of the form to lock in the grout used to fill the void after lateral alignment of the anchor bolt.

A still further object is to provide a device of the fore-

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going character which is versatile and practical in use, requiring no welding, forming, bending, or packing, and which is also inexpensive to produce.

Other objects and advantages of the invention will be apparent from the foregoing description and from the drawing forming a part hereof.

The drawing shows a preferred embodiment of the invention and such embodiment will be described, but it will be understood that various changes may be made from the construction disclosed and that the drawing and description are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

In the drawing:

FIG. 1 is a vertical view in partial cross section illustrating my novel anchor bolt form positioned upon a conventional anchor bolt (broken away to show indeterminate length) embedded in a concrete floor and showing the bolt and form as associated with a locating templet.

FIG. 2 is an enlarged fragmentary view taken on the line 2—2 of FIG. 1.

FIG. 3 is a view taken on line 3—3 of FIG. 1.

FIG. 4 is a fragmentary view, partially in section, illustrating the removal of the upper end and neck portion of the anchor bolt form of the present invention.

FIG. 5 is a fragmentary view, partially in section, illustrating the upper neck in thread protecting position on the bolt.

While the anchor bolt form of the present invention may be made of many different materials, it is preferably molded of a substantially rigid, soft plastic material such as rigid polyethylene, which may be readily cut with a knife or the like.

As shown in FIG. 1 my novel anchor bolt form 10 preferably comprises a hollow shell of substantially uniform wall thickness having an elongated body or sleeve portion 12 of generally cylindrical configuration and closed at its opposite ends except for centrally located, outwardly extending cylindrical neck portions projecting axially therefrom. The upper and lower neck portions 14 and 16, respectively, are of reduced diameter and are each provided with coaxially aligned bores 18 and 20, respectively, extending therethrough and communicating with the interior of the sleeve. The upper neck portion 14 includes a downwardly diverging guide section 22 of frusto-conical configuration adjacent to and intermediate the upper end 23 of the sleeve and terminal portion 24 of the neck. The terminal portion 24 is peripherally continuous forming an uninterrupted annular band for surrounding an associated portion of a bolt. It is preferably provided with a pair of opposed, longitudinally extending ribs 26, 26 on the inner wall of the bore 18. While the drawing shows two such ribs 26, it is to be understood that the number of ribs may vary as required. The bores 18 and 20 are dimensioned to receive an associated anchor bolt 28 therethrough. The bore 20 is formed with an inside diameter slightly greater than the outside diameter of the bolt to permit the bolt's insertion therethrough for an easy sliding fit while the diameter of the upper bore 18 is dimensioned to provide a snug, sliding fit. It is therefore obvious that the distance between the opposed ribs will be less than the diameters of both the bore and the bolt.

The threaded free end portion 30 of the bolt is therefore readily guided into the neck 14 by the funnel-shaped portion or guide section 22 thereof and into engagement with the inwardly directed ribs 26. As the diameter of the bore 18 is only slightly larger than the outside diameter of the bolt, the ribs 26 act as abutments to effectively prevent the bolt from entering the terminal portion 24 of the form 10. Relative rotation between the form 10 and the bolt 28 effects a thread cutting action between the

threaded portion 30 of the bolt and the softer thread-engaging ribs 26 permitting the form to be threaded upon the bolt 28. It can be seen that the form 10 may therefore be adjustably positioned longitudinally upon the bolt 28 by rotating the form in either a clockwise or counter-clockwise direction as may be required.

For purposes of illustration, I have shown an anchor bolt of the characteristic L-shape type provided with a lower portion or head 32 which extends substantially normal to the axis of the bolt to provide anchoring means to prevent withdrawal of the bolt from the concrete after it has hardened. It is to be understood, however, that my novel anchor bolt form is adaptable for use with anchor bolts employing other means for preventing withdrawal from the concrete, as for example an enlarged washer and/or head at the lower or embedded terminal end portion. It should be noted that the radial extent of the lower neck portion 16 is substantially less than the radial extent of the head 32. The neck portion 16 serves to assure spaced relationship between the head 32 and the sleeve portion 12 so that the head will be adequately imbedded in the concrete.

A plurality of longitudinally spaced annular ribs 34, 34 are formed on the body or the sleeve portion 12 which function to hold the form 10 within the surrounding concrete and to provide recesses 36, 36 in the inner wall of the sleeve 12 for a purpose to be described.

In use my novel anchor bolt form is positioned upon the bolt 28 surrounding the upper portion thereof which extends substantially coaxially through the lower neck 16, the sleeve 12, and upper neck 14. The funnel-shaped interior wall surface 38 of the guide portion 22 facilitates positioning of the form by guiding the threaded end 30 through the enlarged lower mouth of the guide section 22 toward and into the reduced portion 24 of the upper neck. After preliminary adjustment of the form upon the bolt, the bolt and form are suspended in a conventional manner from a templet 40, constructed and arranged to position one or more anchor bolts in preliminary alignment for use in holding or securing a superstructure in position thereon. For purposes of illustration, I have shown a preferred means of securing the form and bolt to the templet 40. Pre-drilled holes 42 are adapted to receive the threaded portion 30 of the bolt and upper neck 14 of the form including the guide portion 22 thereof. A conventional nut and washer assembly 44 threaded to the end 30 of the bolt prevents withdrawal of the bolt as the form 10 is threaded into engagement with the lower or bearing surface 46 of the templet 40.

It can be seen that abutting engagement of the surface 46 of the templet with the outer surface of the end 23 of the sleeve 12 will position the bolt in a substantially normal relationship with respect to the supporting templet and effectively reduce or eliminate lateral movement of the bolt as concrete is poured around the bolt and form, embedding both therein.

After the concrete has hardened and the templet 40 removed, the end 23 of the form can be readily severed from the sleeve 12 by cutting it with a knife, as shown in FIG. 4, exposing the interior of the sleeve and permitting access to the void between the bolt and the sleeve walls. It is apparent that the upper portion of the bolt may be bent laterally in any direction within the limits of the upper end of the sleeve a sufficient distance as may be required to bring it into proper alignment with cooperating apertures in the superstructure to be secured hereby without damaging either the concrete or the outer or upper end of the bolt. Thereafter filling the void or interior of the sleeve with concrete will secure the bolt in permanent, adjusted alignment to receive the superstructure. The concrete within the void will be firmly "locked in" by flowing into the recesses 36 which function to prevent withdrawal of the set concrete from the void.

A particular advantage of the molded, unitary form of the present invention is the sealing effect provided by the

structure of the upper end 23 and neck 14 when positioned upon the anchor bolt. Foreign matter is prevented from falling into the void during the stripping of the form or templet 40. Likewise, surface water is effectively prevented from draining into the void, and possibly freezing prior to final alignment of the bolts with the associated superstructure. An especially advantageous feature is utilization of the end 23 and neck 14, as shown in FIG. 5, to protect the threads of the bolt 28 after severing the end 23 from the sleeve 12, whereby accidental thread damage may be prevented by merely screwing the severed end and neck outwardly until the end of the neck is flush with the free end of the bolt.

While I have shown my improved anchor bolt form molded as a unitary structure, it may also be formed of mating, snap-together sections each formed with conventional, registrable snap-fastening means associated with the abutting edge portions of mating sections. It may also be formed with the ribs 34 disposed as a continuous spiral, or width downwardly and outwardly diverging side walls should a particular application require greater locking capability than that provided by the ribs 34, as shown.

I claim:

1. A form for an anchor bolt of the type adapted to be embedded in a concrete foundation and having a head at one end and its other end portion threaded to secure machinery and the like in position upon the concrete foundation, said form comprising a hollow unitary shell having an axially elongated sleeve portion and reduced neck portions extending axially outwardly from opposite ends of said sleeve portion, each of said neck portions having a coaxial bore communicating with the interior of said sleeve portion for receiving an associated portion of the bolt, said neck portions cooperating with the bolt to retain said sleeve portion in radially spaced relation to the bolt, one of said neck portions being peripherally continuous and including thread-engaging means projecting into the bore thereof to coact with the threaded end portion of the bolt permitting axial adjustment of the form upon the bolt upon relative rotation therebetween, the other of said neck portions being of substantially lesser radial extent than the head of the bolt, said form being adapted to be embedded in the concrete foundation with the bolt to space the concrete from the other end portion of the bolt permitting limited lateral adjustment of the threaded portion of the bolt.

2. A form for an anchor bolt as defined in claim 1 wherein the said form is made of plastic material which is softer than the material of which the bolt is made.

3. A form for an anchor bolt as defined in claim 1 wherein the cross-sectional area of the bore of said one neck portion is less than the cross-sectional area of the bolt taken at the threaded portion thereof.

4. A form for an anchor bolt as defined in claim 2 wherein said thread-engaging means comprises a pair of opposed, longitudinally extending, inwardly directed ribs on the interior wall of said one neck portion projecting radially inwardly of the bore thereof and arranged and constructed to be engaged and deformed by the threaded end portion of the bolt which cuts its own threads through the ribs upon relative rotation therebetween.

5. A form for an anchor bolt as defined in claim 1 including bolt-guiding means associated with said one neck portion and constructed and arranged to receive the threaded end portion of the bolt and guide it into engagement with the said thread-engaging means.

6. A form for an anchor bolt as defined in claim 5 wherein said bolt-guiding means comprises a frusto-conical section of the bore of said one portion intermediate said sleeve portion and the said thread-engaging means, said frusto-conical section converging axially toward said thread-engaging means for cooperation with the threaded end of the bolt to guide it to the thread-engaging means.

7. A form for an anchor bolt as defined in claim 1 including rib means projecting radially outwardly from said

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sleeve portion to prevent withdrawal of the form from the concrete foundation.

8. A form for an anchor bolt as defined in claim 1 wherein the said form is made of severable plastic material permitting ready severance of said one neck portion and the associated end of said sleeve portion permitting access to the interior of said sleeve portion to receive grout therein to fill the void between the bolt and the walls of said sleeve portion and including recess means associated with said sleeve portion and opening inwardly to the interior thereof to lock said grout in said sleeve portion.

9. A form for an anchor bolt as set forth in claim 1 wherein said shell has a substantially uniform wall thickness.

10. A form for an anchor bolt comprising a hollow unitary shell of substantially uniform wall thickness made of plastic material which is softer than the material form which the bolt is made and including an axially elongated generally cylindrical body portion having radially disposed end walls providing closures for the opposite ends thereof, said shell having at least one annular rib extending radially outwardly therefrom, said annular rib defining an annular recess opening radially inwardly to the interior of said sleeve portion, said shell having a generally cylindrical lower neck portion of reduced diameter and substantially lesser radial extent than the head of the bolt extending coaxially outwardly from one of said end walls, said lower neck portion including a generally cylindrical bore extending coaxially therethrough communicating with said interior and having a diameter at least equal to the diameter of said bolt, said shell including a peripherally continuous upper neck portion of reduced diameter extending coaxially outwardly from the other of said end walls and having a bore extending coaxially therethrough communicating with said interior, said upper neck bore including a generally cylindrical section and an inwardly diverging frusto-conical guide section intermediate said cylindrical section and said body portion, said cylindrical section including thread-engaging means projecting into the bore thereof to coact with a threaded end portion of the bolt.

11. An anchor bolt form as set forth in claim 10 wherein said thread-engaging means comprises at least one axially extending rib.

12. A form for an anchor bolt as set forth in claim 1 and adapted to be secured to a templet having a hole there-through adapted to receive said one neck portion and a bearing surface surrounding said opening wherein said sleeve portion includes a radially disposed end wall sur-

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rounding said one neck portion for abutting engagement with the bearing surface to retain the bolt in axially normal position relative to the bearing surface when said form and the bolt are secured to the templet by a nut threadably engaging the bolt.

13. In combination, a bolt adapted to be embedded in a concrete foundation and having a head at one end and a threaded portion at its other end to secure an article in position upon the foundation, and a form for said bolt comprising a hollow unitary shell having an axially elongated sleeve portion and reduced neck portions extending axially outwardly from opposite ends of said sleeve portion, each of said neck portions having a coaxial bore communicating with the interior of said sleeve portion and receiving an associated portion of said bolt, said neck portions cooperating with said bolt to retain said sleeve portion in radially spaced relation to said bolt, one of said neck portions being peripherally continuous and including thread-engaging means projecting into the bore thereof and engaging the threaded portion of said bolt permitting axial adjustment of said form upon said bolt upon relative rotation therebetween, the other of said neck portions being of substantially lesser radial extent than the head of said bolt, said form being adapted to be embedded in the concrete foundation with said bolt to space the concrete from said other end of said bolt permitting limited lateral adjustment of said threaded end portion.

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