United States Patent [19]

Wilson

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[54] **ANCHOR BOLT FORM**

[76] Inventor: **Herbert S. Wilson,** 86 Woolson St., Watertown, Conn. 06795

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[52] **U.S. Cl.** **52/699,** 52/99, 52/704

[51] **Int. Cl.** **E04b 1/41,** E04c 5/12, E04b 5/12

[58] **Field of Search** 52/577, 576, 704, 699, 52/698, 295, 99, 98

[56] **References Cited**

UNITED STATES PATENTS

1,573,151	2/1926	Fishel	52/698
1,639,495	8/1927	Frame	52/20
3,276,176	10/1966	Jonsson	52/704
3,500,607	3/1970	Wilson	52/295

FOREIGN PATENTS OR APPLICATIONS

526,523	8/1954	Belgium	52/576

Primary Examiner—John E. Murtagh

Attorney, Agent, or Firm—McCormick, Paulding & Huber

[57] **ABSTRACT**

An anchor bolt form made from severable material comprises a unitary shell of substantially uniform thickness which includes a generally cylindrical sleeve portion and reduced neck portions at axially opposite ends thereof for receiving an anchor bolt coaxially therethrough. The lower end portion of the sleeve has an outside diameter substantially equal to the inside diameter of the remaining portion thereof. The lower end portion of the sleeve associated with one form may be telescopically assembled with the sleeve portion of another form from which at least the upper end portion has been severed whereby the effective length of said one form may be extended by telescopic joinder with said other form.

1 Claim, 6 Drawing Figures

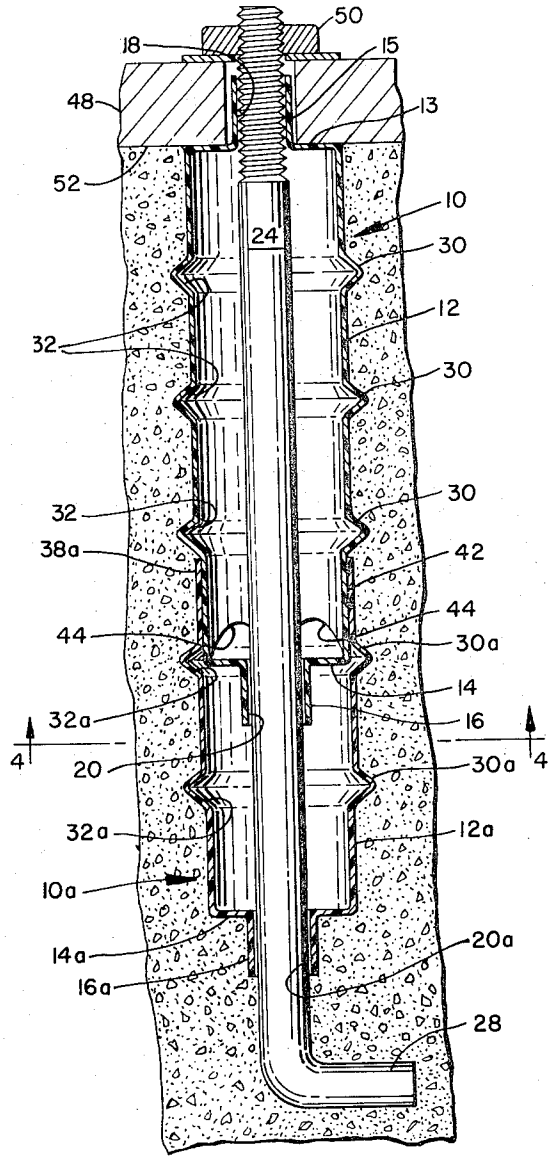


FIG. 1

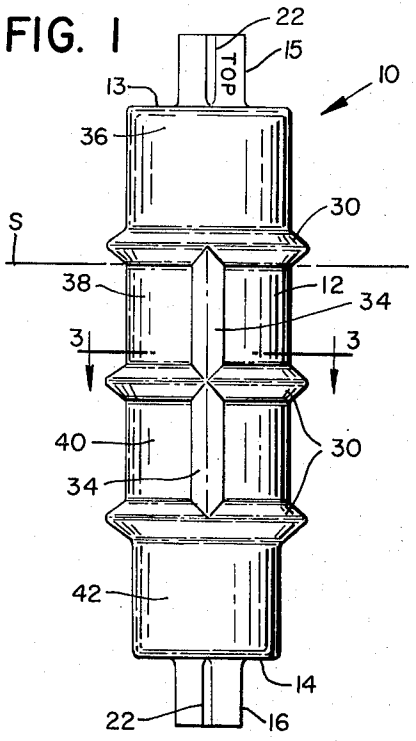


FIG. 3

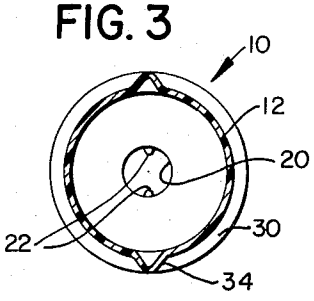


FIG. 4

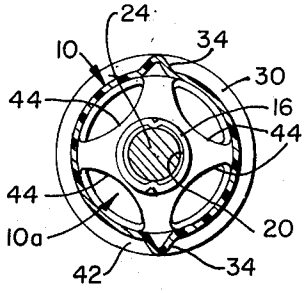


FIG. 2

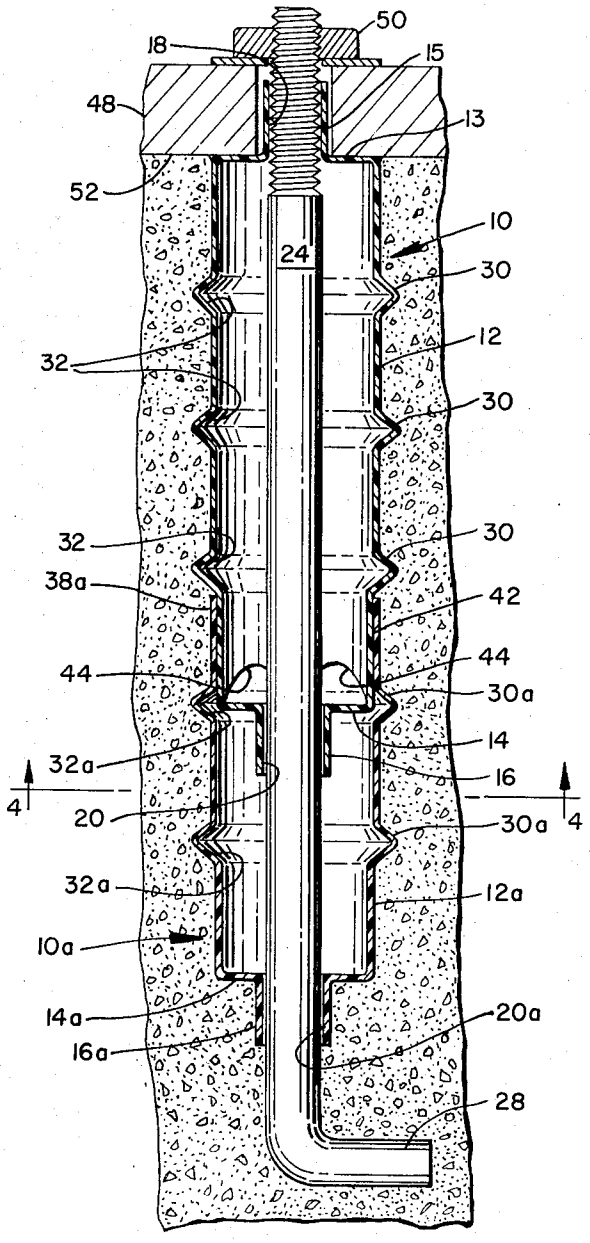


FIG. 5

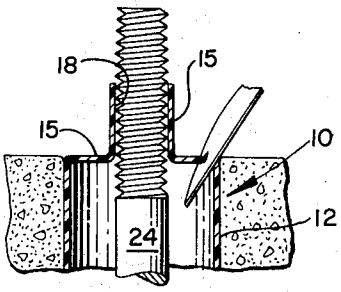
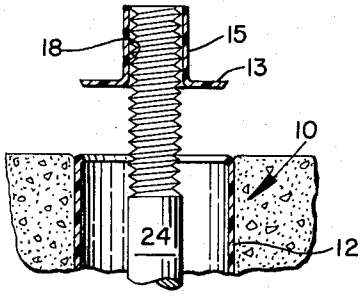


FIG. 6



ANCHOR BOLT FORM

BACKGROUND OF THE INVENTION

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 an improved anchor bolt form of the type illustrated and described in my U.S. Pat. No. 3,500,607 for "Anchor Bolt Form," issued Mar. 17, 1970. Such a form permits limited lateral adjustment of a bolt after it has been set in concrete without damage to 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. The anchor bolt form illustrated and described in my aforementioned U.S. patent comprises an elongated form or shield for an anchor bolt which functions to space a portion of the bolt from concrete within which it is embedded. The bolt form is provided with end portions adapted to receive an anchor bolt coaxially therethrough and to adjustably position the bolt relative to the form. The latter end portions cooperate with the bolt to substantially close the form to keep foreign matter from entering the void between the bolt and the wall of the form. One of the end portions has means to protect the threaded end of the anchor bolt until the bolt is ready for use.

The bolt form of my aforesaid patent is molded of easily severable, plastic material to permit ready across to the void surrounding the bolt and provided by the form and includes means to insure secure placement of the form in concrete and recess means on the inside wall of the form to lock in grout used to fill the void after the anchor bolt has been laterally aligned.

The anchor bolt form of my aforementioned patent has gained wide acceptance, however, heretofore it has been necessary to provide the form in a variety of sizes to accommodate various bolt requirements. The present invention is directed to a universal bolt form of the aforedescribed type adapted for use with one or more like forms to accommodate a wide range of anchor bolts.

SUMMARY OF THE INVENTION

In accordance with the present invention an anchor bolt form is provided which comprises a thin-walled shell of readily severable material having a hollow body portion and reduced neck portions at axially opposite ends thereof adapted to receive an anchor bolt therethrough and to retain the body portion in axially spaced relation to the bolt. The form is adapted to be telescopically assembled with another form of like kind from which an end portion has been severed whereby the effective length of the form may be increased.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a side elevational view of a universal anchor bolt form embodying the present invention.

FIG. **2** is a vertical sectional view of the bolt form of FIG. **1** shown in use in combination with a portion of another bolt form of like kind and positioned upon a conventional anchor bolted embedded in a concrete floor and shows the bolt and form as associated with a locating templet.

FIG. **3** is a fragmentary sectional view taken along the line **3—3** of FIG. **1.**

FIG. **4** is a fragmentary sectional view taken along the line **4—4** of FIG. **2.**

FIG. **5** 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. **6** is a fragmentary view, partially in section, illustrating the upper neck in thread protecting position on the bolt.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

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 polyetheline, which may be readily cut with a knife or the like to permit a portion of one form to be telescopically connected to another form of like kind to increase the effective length thereof as will be hereinafter further discussed.

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 by upper and lower end walls respectively, indicated at **13** and **14.** Upper and lower generally cylindrical neck portions **15** and **16** project axially outwardly from the upper and lower neck portions **15** and **16,** respectively. The neck portions are of reduced diameter and are each provided with coaxially aligned bores **18** and **20,** respectively, which extend therethrough and communicate with the interior of the sleeve **12.** The neck portions **15** and **16** are peripherally continuous forming uninterrupted annular bands for surrounding associated portions of a bolt. Suitable indicia is provided to distinguish the upper neck **15** from the lower neck **16** and in the illustrated case, the word "top" is imprinted on the upper neck **15.** At least the upper neck portion **15** is preferably provided with a pair of opposed, longitudinally extending ribs **22, 22** on the inner wall of the bore **18.** However, the illustrated bolt form **10** has longitudinally extending ribs **22, 22** on the inner walls of both the upper and the lower bores **18** and **20.** While the drawing shows two such ribs **22,** 22 associated with each bore, 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 **24** therethrough. The lower 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 **22, 22** associated with the upper bore will be less than the diameters of both the bore **18** and the bolt. As the diameter of the bore **18** is only slightly larger than the outside diameter of the bolt, the ribs **22, 22** therein act as abutments to effectively prevent the bolt from entering the upper neck portion **15** of the form **10.** Relative rotation between the form **10** and the bolt **24** effects a thread cutting action between a threaded end portion of the bolt indicated at **26** and the softer thread engaging ribs **22, 22** which permit the form **10** to be threaded onto the bolt **24.** It can be seen that the form **10** may therefore be adjustably positioned longitudinally upon the bolt **24** by rotating the form in either a clockwise or counterclockwise direction as may be required.

For purposes of illustration, the anchor bolt **24** is shown to be of the characteristic L-shape type provided with a lower portion or head **28** 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 **28.** The lower neck portion **16** serves to assure spaced relationship between the head **28** and the sleeve portion **12** so that the head will be adequately embedded in the concrete.

A plurality of longitudinally spaced annular ribs **30,** 30 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 **32, 32** in the inner wall of the sleeve **12** for a purpose to be hereinafter described. A plurality of angularly spaced ribs **34,** 34 are also formed on the sleeve portion **12** and extend longitudinally thereof between adjacent ribs **30, 30** substantially as shown. The ribs **34, 34** may vary in number and may be arranged in various manners, but as shown, the latter ribs are diametrically opposed.

In accordance with the present invention, the sleeve portion of the form includes at least one end portion which has an internal cross-sectional configuration which generally complements the external cross-sectional configuration of the other end portion thereof. In the illustrated case, the sleeve portion **12** has a plurality of generally cylindrical portions designated **36, 38, 40** and **42** separated from each other by ribs **30, 30.** Each of the upper portions **36, 38** and **40** has an inside diameter substantially equal to the outside diameter of the lower end portion **42.**

It will be apparent that the previously described form **10** may be assembled with an anchor bolt of appropriate length; however, if the length of the bolt is substantially greater than the length of the form **10,** the effective length of the latter form may be extended by joining it with a portion of another form of like kind. Referring now particularly to FIG. **2,** the bolt form **10** is shown to be extended by joinder to a portion of another identical bolt form which, for convenience of description, is designated **10***a*.

Preparatory to extending the length of the form **10,** a plurality of openings **44, 44** are cut in the lower end wall thereof substantially as shown to permit passage of grout therethrough. The form **10***a* is cut to appropriate length for joinder to form **10** and in the illustrated case is cut or severed through the section **38** or along the line S as shown in FIG. **1.** Since the inside diameter of the section **38** is substantially equal to the outside diameter of the lower end section **42,** the section **42** of the form **10** may be telescopically assembled with the section **38***a* of the form **10***a*, as shown in FIG. **2.**

The extended form which includes the form **10** and the form portion **10***a* is assembled on the bolt **24** which extends substantially coaxially through the lower neck **16***a*, the lower sleeve portion **12***a*, the lower neck **16,** the sleeve portion **12** and the upper neck **15** which is threaded onto the bolt threaded end portion.

After preliminary adjustment of the extended form upon the bolt, the bolt and the extended form are suspended in a conventional manner from a templet **48,** 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, there is shown a preferred means of securing the form and bolt to the templet **48.** Pre-drilled holes **42** are adapted to receive the threaded portion **28** of the bolt and upper neck **15** of the form **10.** A conventional nut and washer assembly **50** threaded onto the end of the bolt draws the bolt and the form **10** into engagement with a lower or bearing surface **52** of the templet **48.** It can be seen that abutting engagement of the surface **52** with the outer surface of the form end **13** will position the bolt in a substantially normal relationship with respect to the supporting templet to effectively reduce or eliminate lateral movement of the bolt as concrete is poured around the bolt and form to embed both therein.

After the concrete has hardened and the templet **48** is removed and the end **13** of the form **10** can be readily severed from the sleeve **12** by cutting it with a knife, as shown in FIG. **5,** to expose the interior of the sleeve and permit 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 thereby without damaging either the concrete or the outer or upper end of the bolt. Thereafter, the void or interior of the extended form is filled with concrete grout to secure the bolt **24** in permanent, adjusted alignment to receive the superstructure. When grout is poured into the form **10,** it will flow through the openings **44, 44** into the form portion **10***a* therebelow. The grout within the void will be firmly "locked in" by flowing into the recesses **32** and **32***a* which function to prevent withdrawal of the set grout 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 wall **13** and neck **15** when positioned upon the anchor bolt. Foreign matter is prevented from falling into the void within the forms **10** and **10***a* during the stripping of the templet **48.** Likewise, surface water is effectively prevented from drain-

ing 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 wall **13** and neck **15,** as shown in FIG. **6,** to protect the bolt threads **28** after severing the end **13** 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 **15** is flush with the free end of the bolt **24,** as shown in FIG. **6.**

I claim:

1. In combination with an anchor bolt of the type adapted to be embedded in a concrete foundation and having a shank of substantially uniform diameter throughout its length including a head at its lower end and a threaded portion at its upper end for securing machinery and the like in position on the concrete foundation a plurality of forms, each of said forms comprising an axially elongated hollow shell of severable plastic material including an integral axially elongated sleeve portion having a plurality of generally cylindrical sections including a lower end section and a plurality of upper sections, said lower end section having an outside diameter substantially equal to the inside diameter of each of said upper sections, said sleeve including a plurality of axially spaced coaxial annular ribs, each of said ribs being disposed intermediate an associated one and another of said sections, each of said ribs projecting radially outwardly beyond said sections, said sleeve portion having upper and lower end walls, said shell having coaxial upper and lower neck portions, each of said neck portions extending axially outwardly from an associated one of said end walls and having a coaxial bore therethrough communicating with the interior of said shell, said lower neck portion having a diameter substantially equal to the diameter of said bolt, said shell having thread engaging means on said upper neck portion for coacting with the threaded upper end portion of said bolt to permit axial adjustment of said shell relative to said bolt upon relative rotation therebetween, one of said forms receiving said bolt therethrough and having its thread engaging means in engagement with said threaded upper end portion and its lower neck portion in surrounding engagement with an associated portion of said shank, another of said forms having an upper portion severed therefrom below said upper end wall thereof and receiving said bolt therethrough, said other form having at least a portion of one of said upper sections thereof in surrounding engagement with said lower section of said one form and having its lower neck portion in surrounding engagement with an associated portion of said shank below said one form whereby to extend the effective operative length of said one form relative to said bolt.

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