G. S. MUMFORD.

CONCRETE CONSTRUCTION APPARATUS.

APPLICATION FILED APR. 6, 1915.

1,143,429. Patented June 15, 1915.

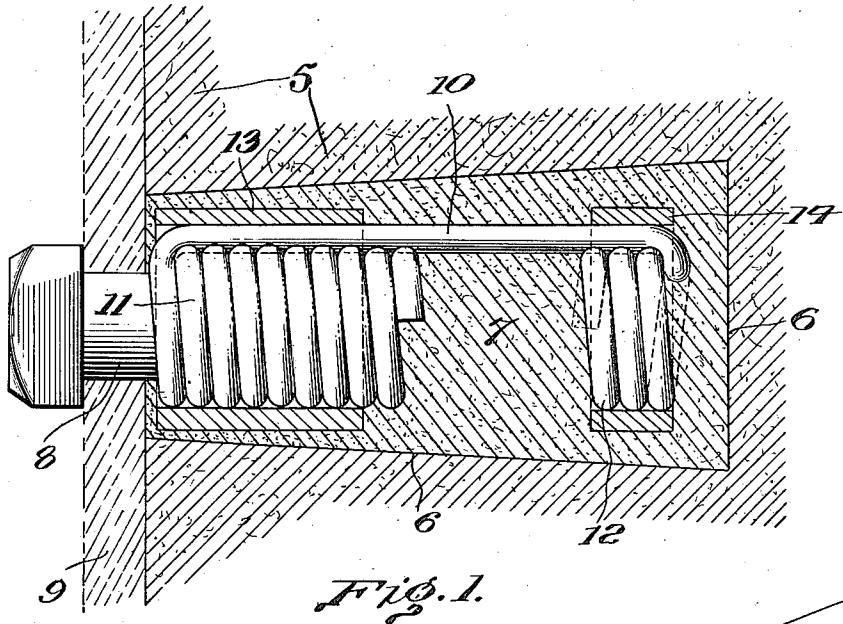


Fig. 1.

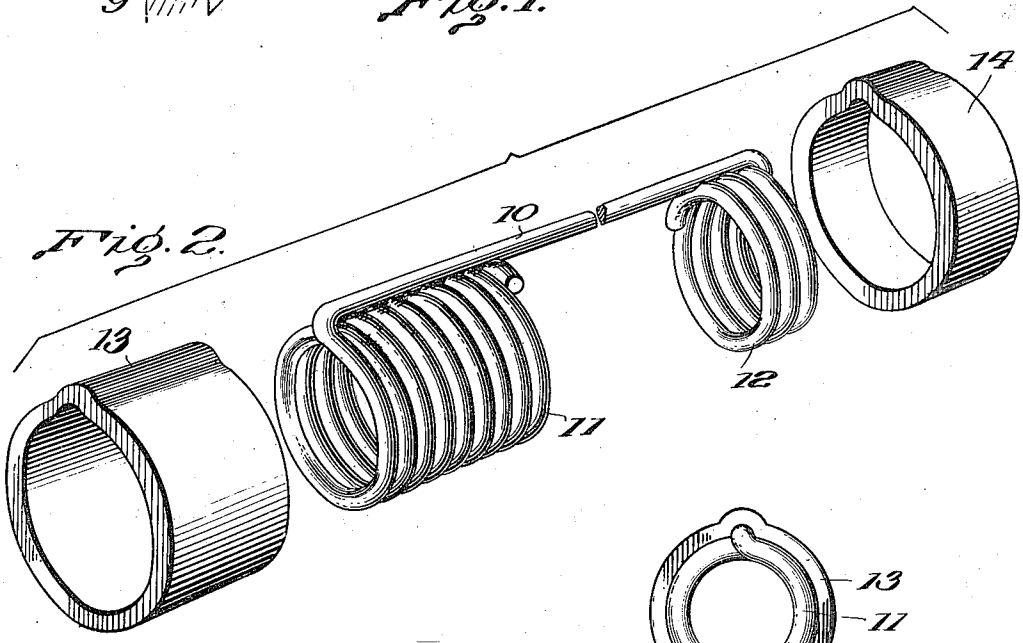


Fig. 2.

Fig. 3.

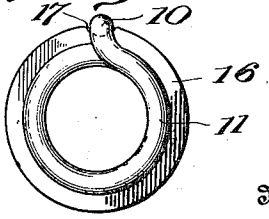


Fig. 4.

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CONCRETE-CONSTRUCTION APPARATUS.

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To all whom it may concern:

Be it known that I, GURDON S. MUMFORD, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Concrete-Construction Apparatus, of which the following is a specification.

This invention relates to concrete construction apparatus, and in its more intense aspect to securing or supporting means adapted to be positioned within a concrete structure or surface either before or after the erection of said structure.

One of the objects of the present invention is to provide a simple, practical and inexpensive means or member of the above character adapted to perform numerous functions according to the use to which it is put.

Another object is to provide a device of the above general character which may be easily applied to a finished concrete surface to act as a firm anchoring socket for the reception of coacting supporting members.

A further object is to provide a device of the first above-mentioned character capable of use as a tie member for holding two or more mold members together during the process of casting a concrete structure.

A further object is to provide a device of the above mentioned character adapted to receive a supporting device and provided with effective anchoring means adapted to prevent a removal of the supporting device under the most severe strains yet permitting intentional removal thereof when desired with a minimum effort.

Other objects will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof, all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a preferred form have been annexed as a part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all the views, in which:

Figure 1 is a sectional elevational view of the complete apparatus in position within a finished concrete surface showing one application of the invention; Fig. 2 is a perspective view of certain parts of the apparatus shown disassembled; Fig. 3 is an end view of the socket part of the apparatus; and Fig. 4 is an end view of the socket part and shield of a modified form.

The invention will be hereinafter described with relation to its application as a socket member for the reception of a coactingly threaded supporting or fastening member, such as bracket bolts on a side wall, eye-bolts, shaft hangers, or attaching members in general.

In a concrete apparatus of this character in which a spirally wound member is adapted to receive a threaded member when embedded in a finished concrete wall the objection may have arisen that the device had insufficient anchorage surface of a depth and length for efficiently performing the desired results. For instance, in an ordinary spiral or helical coil embedded in concrete for the reception of an eye bolt or hook there would be insufficient area about the helical socket to eliminate the possibility of a crumbling of the concrete about the socket thus causing a loosening of the member entirely. While it may have been attempted to overcome this objection by providing radial projections from the body of the socket relatively close to the concrete surface it has never been successfully done so far as applicant is aware, for in cases of severe strains, the points of anchorage have been so close to the surface of the wall as to cause a loosening and falling out of the socket.

Referring now to the accompanying drawing in detail, and more particularly to Fig. 1, 5 denotes a finished concrete structure into which a hole or recess, indicated by the lines 6, is tapped having a tapering, frustro-conical or wedge shape. This hole is then partially filled with a relatively soft pasty concrete mixture or grouting, and the anchor socket pressed firmly therein to the desired

depth. During the setting of the soft grouting 7 the anchorage device is provided with a threaded member or bolt 8 passing through a mold board 9, or the member to be secured by the bolt if desired, thereby to prevent the concrete from filling the interior of the anchor socket and squeezing out through the front of the opening before the concrete 7 has solidified. This socket member is preferably formed from a single integral piece of wire of any desired diameter, according to the use and strain to which it is to be put and the size of the member to be supported thereby. This member itself may for convenience of description, be divided into three parts, that is, a body part 10, a socket member or shield 11, and an anchor member 12. Both the socket and the anchor member are made from a plurality of turns of the wire forming a helix which is bent back upon the body portion with the free or inner ends toward each other, and their axes lying substantially parallel to the body member. These coils when viewed from the same end will be seen to turn in opposite directions, whereby they may both receive ordinary right-hand threaded bolts when inserted in either end should it be used as a tie for two mold members, or the like. The socket member is also preferably longer than the anchor member, although it could be of the same length and size. These coils 11 and 12 will be considered as having free inner or adjacent ends and as being secured at their outer ends to the body portion. A straight groove may be cut through coils 11 and 12 as shown in Fig. 3 to permit of body portion 10 fitting snugly in the groove for purposes more specifically hereinafter stated.

It is preferred to make the hole or recess 6 substantially of the shape above stated for the reason that the socket, besides having the usual frictional adhesion between the cement and the walls of the opening, will also be provided with a correspondingly shaped block of solidified grouting adapted to prevent the socket being drawn out through the smaller entrance to the hole. By constructing the device and hole in this way a tension pull on the supported member will also put the socket and anchor under compression so far as the coils are concerned, and if the hole is slightly enlarged inwardly the concrete wedge in front of the anchor member is also placed under compression which develops the greatest efficiency.

Most anchorage devices of this character are inserted in a finished wall substantially as above stated, although it is, of course, to be understood that the anchor socket could be put in place during the casting of the wall. There are, however, certain objections to such procedure, inasmuch as it is difficult to determine the exact position in advance, due to the absence of available points for measurement. With this device, if desired, there may be used either or both auxiliary collars 13 and 14, of a size and shape adapted to fit snugly over the ends to coact in an interlocking manner with the helices and body portion as may be desired. They may be of the same length as the socket and anchor, although it is preferable to have them slightly shorter in order that the grouting 7 may coact one or more turns of the helix. This attachment is particularly desirable where the device is used in connecting two spaced apart mold members, in which case the tie is subjected to a longitudinal strain before the concrete has set. The collars 13 and 14 conforming closely to the outside lines of the coils holds the coils of the helix in rigid position and prevents unwinding or stripping of the turns of the helix over the threaded surface of the coacting threaded member. The instant the outer wire coil starts to strip it jams itself inside of the incasing collar for it has no room to expand over the maximum diameter of the threads of the bolts and if the body portion 10 is held firmly in the groove 15 in the helices there is no possibility of the body portion 10 and collars 13 and 14 rotating around the helices due to their interlocking engagement. Such a construction effectively prevents an initial longitudinal stretching of the tie member, as might occur to a threaded tie member in which the outer coils were permitted some silght expansion or movement out of their original shape.

It is, of course, to be understood that other rigid encircling devices may be substituted for collars 13 and 14 to have an incasing effect in such a manner as to confine the helices 11 and 12 and hold body member 10 rigidly in place such as shown in Fig. 4 where a collar 16 is slipped over the coil between the body portion and the coil and provided with a groove 17 on its outer surface and notched at its end to receive the body portion in an interlocking manner.

It is thus seen that this invention provides a simple and practical device capable of various uses and functions, and adapted to accomplish, among others, all of the objects and advantages above set forth.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptation should and are intended to be comprehended within the meaning range of equivalency of the following claims.

I claim:

1. A device of the character described

comprising an elongated body portion having anchorage means at one end, and a helical coil at the other end, said body member extending along the side of the helix and connected therewith at the outer end thereof.

2. A device of the character described comprising an elongated body portion, and a helix at one end thereof substantially parallel with said body portion and having an interlocking engagement throughout its length with said body portion.

3. A device of the character described comprising an elongated body portion having a helix at each end substantially coaxial with each other and connected at their outer extremities with said body portion.

4. A device of the character described comprising an elongated body portion having a helix at each end connected at their outer extremities with said body portion, said helices being wound in opposite directions when viewed from one end whereby either end may receive an ordinary right-hand threaded member.

5. A device of the character described comprising an elongated body portion having an anchor device and a helical coil integrally formed with the body portion at one end, said coil being bent back into a position substantially parallel with said body portion.

6. A device of the character described comprising an elongated body portion having an anchor device and a helical coil integrally formed therewith at one end, said coil being bent back into a position substantially parallel with said body portion and being provided with a groove in which said body portion rests.

7. A device of the character described comprising an elongated body portion having an anchor device near one end and a helical coil at its opposite end, said coil being bent back into a position substantially parallel with said body portion, and a collar adapted to fit snugly over said helix and hold the body portion in fixed relation thereto.

8. A device of the character described comprising an elongated body portion having an anchor device adapted to be inserted in an outwardly tapering recess comprising a body portion, a helix at one end thereof, and means surrounding said helix adapted to prevent an unwinding thereof to cause a stripping of the helix over the threads of a bolt when inserted therein.

9. A device of the character described comprising an elongated body portion having an anchoring device at one end and a socket adapted to receive a threaded bolt at the other, and a collar surrounding said socket.

10. A device of the character described comprising an elongated body portion, a helix at one end extending in the same general direction as the body portion, and means holding the body portion and helix in fixed relation and adapted to prevent relative expansion of the helix whereby it could strip over the threads of a coacting bolt when inserted in said helix.

11. A device of the character described comprising an elongated body portion, a helix at one end extending in the same general direction as the body portion, and means holding the body portion and helix in fixed relation and adapted to prevent relative expansion of the helix whereby it could strip over the threads of a coacting bolt, said means including a groove in the outer surface of the helix into which the body portion rests.

12. A device of the character described comprising an elongated body portion having an anchoring device at one end, a helix at its opposite end extending in the same general direction as the body portion, means binding the body portion and helix in fixed relation and adapted to prevent relative expansion of the helix whereby it could strip over the threads of a coacting bolt, said last mentioned means comprising a generally cylindrical sleeve surrounding a portion of the helix and adjacent body portion.

13. A device of the character described comprising an elongated body portion having an anchoring device adapted to be inserted in an outwardly tapering recess, a helix connected with the body portion adapted to receive a threaded member, and means adapted to prevent an expansion of said helix, said anchoring device being of a diameter substantially equal to that of the entrance to the tapering recess.

14. A device of the character described comprising an elongated body portion having a helix adapted to receive a threaded member, and a collar surrounding said helix adapted to prevent expansion thereof and consequent slipping over the threads of the coacting threaded member.

15. A device of the character described comprising an elongated body portion having a helix at each end substantially coaxial with each other and connected at their outer extremities with said body portion, and means for holding the body portion and helices in fixed relation.

16. A device of the character described comprising an elongated body portion equal to the total length of said device, and substantially coaxial helices connected at their outer ends with said body portion adapted to receive threaded members whereby said helices are compressed when subjected to a tensional strain.

17. A device of the character described comprising an elongated body portion substantially equal to the total length of said

device, and helices connected at their outer ends with said body portion adapted to receive threaded members whereby said helices are compressed when subjected to a tensional strain, and means adapted to cause a jamming of the turns of the coils when subjected to such strain.

18. A device of the character described comprising an elongated body portion and helices connected at their outer ends with said body portion for receiving threaded members whereby they are compressed when subjected to a tensional strain exerted in the direction of the length of said body portion, and means adapted to cause a jamming of the turns of the coils when subjected to such strain, said last means comprising approximately cylindrical collars closely fitting over said helices and coacting with the body portion.

19. A device of the character described comprising an elongated body portion having a helix at each end substantially coaxial with each other and connected at their outer extremities with said body portion, and means for holding the body portion and helices in fixed relation, said means including a collar adapted to be slipped over the helix and coact on its outer surface with said body portion.

In testimony whereof I affix my signature in presence of two witnesses.

GURDON S. MUMFORD.

Witnesses:
VALENTINE WARTH,
THERESA WAUGH.