

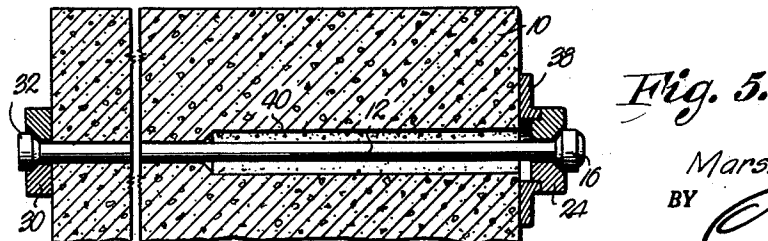
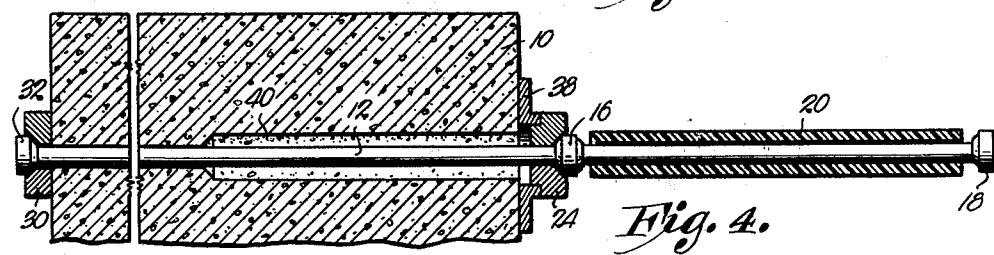
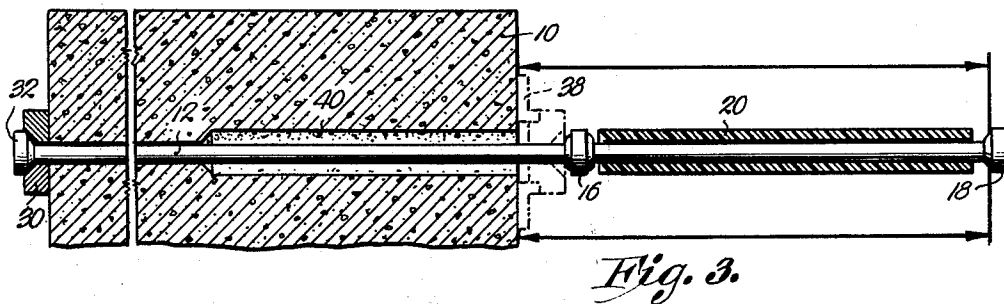
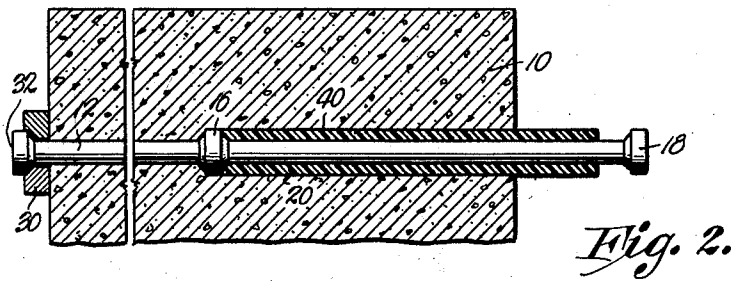
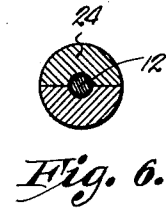
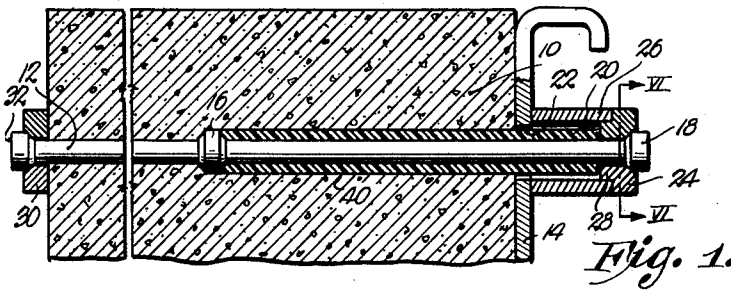
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DOUBLE HEAD REINFORCING ROD FOR PRE-STRESS CONCRETE

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DOUBLE HEAD REINFORCING ROD FOR PRE-STRESS CONCRETE

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3 Claims. (Cl. 25-154)

This invention relates to the field of building construction and particularly to reinforcement for slabs made from cementitious material and the like, the primary object being to provide a reinforcing assembly for prestressed concrete that includes an elongated, double headed rod having elements mounted thereon between the heads for facilitating the elongation of the rod and anchoring thereof following the setting of the cementitious substances.

Another object hereof is to provide a pre-stressed concrete reinforcement assembly that includes an elongated, attenuable rod having a pair of spaced heads at one end thereof, upset or otherwise formed thereon, there being a sleeve on the rod between the heads around which the concrete is poured for clearing the innermost head during the final stretching step of the rod itself.

Another object hereof is to provide an assembly as above set forth, wherein is included an anchor engageable with the outermost head of the rod exteriorly of the form or mold for the concrete wall or other structure, there being a collar between the mold and the anchor for temporarily holding the parts in place during the concrete pouring operation.

Other objects include the way in which the aforementioned collar, as well as the anchor, are both removable from the rod; the way in which the anchor also serves to bear against the initially innermost head after attenuation to hold the rod in the stretched condition and thereby, the concrete compressed; and many additional, more minor objects, all of which will be made clear as the following specification progresses.

In the drawing:

Figure 1 is a fragmentary, cross-sectional view through a cementitious wall or other building structure illustrating a double head reinforcement rod for prestressed concrete, made pursuant to the present invention and showing the position thereof following pouring of the cementitious substances.

Fig. 2 is a view similar to Fig. 1, showing the assembly after removal of the form, the collar and the anchor.

Fig. 3 illustrates the position of parts after attenuation of the reinforcement rod.

Fig. 4 is a view similar to Figs. 1 to 3 inclusive, illustrating the anchor in place after release of the rod.

Fig. 5 is a sectional view illustrating the completed reinforcement after removal of the extended end of the rod and its sleeve.

Fig. 6 is a transverse, cross-sectional view taken on line VI—VI of Fig. 1; and

Fig. 7 is a cross-sectional view similar to Fig. 6 illustrating a modified form of anchor.

The advantages of pre-stressed concrete are well known to those skilled in this field and need not herein be enumerated. It is also appreciated however, that the field of pre-stressed concrete is hampered somewhat by the absence of satisfactory means to quickly and inexpensively stretch the elongated reinforcing rods and to

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anchor the same in compressed relationship to the concrete which the same reinforces.

Many of the problems along this line heretofore encountered are eliminated through the employment of a novel reinforcement assembly illustrated in the drawings, and forming the subject matter hereof. In Figs. 1 to 5 inclusive, there is illustrated a section of a concrete wall 10, having an elongated reinforcement rod 12 traversing the same. It is to be understood at this point that while only one rod 12 has been illustrated, any number thereof may be employed in a single wall unit, and it is further obvious that a particular type of cementitious substance utilized in forming the wall 10, is of no consequence to the invention.

Furthermore, the arrangement about to be described may be duplicated on both ends of the rod 12 if desired, though only one unit is shown in the drawing. Prior to pouring the wall 10 into a suitable form 14, rod 12 is positioned where desired, extending through the form 14, the latter being constructed for ready removal from the extended portion of rod 12.

A pair of heads 16 and 18 in spaced-apart relationship, are formed on the rod 12 adjacent at least one end thereof. Innermost and outermost heads 16 and 18 respectively may be formed on the rod 12 by the well known upsetting process or in any other suitable manner, and an elongated sleeve 20 that may be made of synthetic plastic or other suitable substance, is mounted on the rod 12 between the heads 16 and 18. The inside diameter of the sleeve 20 is substantially the same as the diameter of the rod 12 between the heads 16 and 18, whereas, the outside diameter of the sleeve 20 is substantially the same or slightly greater than the greatest diameter of innermost head 16. Thus, the sleeve 20 which is shorter than the distance between heads 16 and 18, is confined between the latter and normally bears against the innermost head 16 as shown in Figs. 1 and 2. Form 14 is accordingly provided with an opening 22 sufficiently large to clear the sleeve 20.

An anchor 24 surrounding the rod 12 bears against the outermost head 18, and a collar 26 also surrounding the rod 12 is interposed between the form 14 and the anchor 24. As shown in Fig. 6 of the drawing, the anchor 24 comprises a pair of identical semi-circular sections, and it is desirable that anchor 24 have a portion 28 that is telescoped within the collar 26. The inside diameter of the collar 26 is sufficiently large to clear the head 18 for reasons hereinafter set down.

The opposite end of the rod 12 may, as above set forth, be provided with an identical assembly, but in absence thereof any suitable anchor 30 may be interposed between the wall 10 and a head 32 on the rod 12, or more appropriately, between an adjacent wall of the form 14 not shown, and head 32.

The anchors 24 and 30 may be both made as shown in Fig. 6 of the drawing, or alternately as illustrated by Fig. 7, wherein an anchor 34 has a slot 36 therein for receiving the rod 12. After the rod is positioned in the manner illustrated in Fig. 1 of the drawing, the wall 10 is poured into the form 14, whereupon after the material forming the same has set or hardened, form 14, collar 26 and anchor 24, are removed, the appearance of the assembly thereupon being as illustrated in Fig. 2 of the drawing.

The next step in the pre-stressing process is to attenuate the rod 12 in the manner shown in Fig. 3, wherein the outermost head 18 is moved outwardly away from the wall 10. Hydraulic jacks, or like apparatus, are normally employed for this purpose and the head 18 exposed as shown in Fig. 2 of the drawing, facilitates the connection of the hydraulic jack to the rod 12. If desired, prior to coupling the jack to the rod 12 adjacent the head 18

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thereof, a facing plate 38 may be threaded over the extended end of sleeve 20 against the wall 10, plate 38 thereby receiving one end of the hydraulic jack. While the rod 12 is thus held in a stretched, elongated condition, the anchor 24 or 34 is inserted between the plate 38 and the innermost head 16 now disposed exteriorly of the wall 10. It is seen that the innermost head 16 forced the sleeve 20 to the position shown in Figs. 3 and 4 of the drawing, leaving a cavity 40 within the wall 10.

After removal of the jack assembly, wall 10 is compressed between heads 32 and 16, whereupon the surplus end of the rod 12 may be cut off which also removes the sleeve 20 from the finished assembly. Manifestly, the distance between the heads 16 and 18 will vary according to the length of the rod 12 and, therefore, its elasticity. Since the last mentioned characteristic may be predetermined, users of the assembly hereof are assured of stretching the rod 12 to its full capacity without breaking the same since as soon as the innermost head 16 clears the wall 10 in the stretching operation, anchor 24 is re-inserted and no further pulling action is imparted to the rod 12.

By virtue of the provision of the innermost head 16, it is unnecessary to provide any auxiliary means of fastening the rod 12 after stretching thereof since, through re-insertion of the anchor 24, a firm, positive holding action is provided and the wall 10 is adequately compressed in the manner desired.

Many advantages will emanate from the utilization of an assembly such as herein set forth and while changes and modifications may be made, it is obvious that such alterations as fairly come within the spirit of the invention, are contemplated hereby.

Having thus described the invention is claimed as new and desired to be secured by Letters Patent is:

1. The method of building a reinforced structure of cementitious material through use of an elongated rod having a pair of spaced heads at one end thereof which comprises the steps of placing a sleeve on the rod between the heads; interconnecting a pair of spaced forms by said rod with one head disposed between the forms and the other exteriorly thereof; pouring said material between the forms; removing the form proximal to said heads after hardening of said material; pulling upon the outermost head, thereby attenuating the rod longitudinally to pull the sleeve out of the material and present a passage for the innermost head; and thereupon inserting an anchor between the hardened material and the innermost head after the latter is pulled out of the passage.

2. The method of building a reinforced structure of cementitious material through use of an elongated rod having a pair of spaced heads at one end thereof which comprises the steps of placing a sleeve on the rod between the heads; interconnecting a pair of spaced forms by said rod with one head disposed between the forms and the other exteriorly thereof; pouring said material

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between the forms; removing the form proximal to said heads after hardening of said material; pulling upon the outermost head, thereby attenuating the rod longitudinally to pull the sleeve out of the material and present a passage for the innermost head; inserting an anchor between the hardened material and the innermost head after the latter is pulled out of the passage; and thereupon severing the rod between the heads adjacent the said last mentioned head.

3. A reinforcing assembly for a structure of cementitious material comprising an elongated rod adapted for embedding in the structure; a first head on one end of the rod; a first anchor adapted for mounting on the rod between said first head and one face of the structure; a second head on the opposite end of the rod and spaced from the opposite face of the structure; a third head on the rod spaced inwardly from said second head and initially embedded in the structure; a sleeve on the rod between the second and third heads and spaced from the second head, a portion of the sleeve being initially embedded in the structure with the outermost end thereof extending outwardly beyond said opposite face; a second anchor adapted for mounting on the rod between said second head and said sleeve; and a collar adapted for mounting on the rod between the second anchor and said opposite face in surrounding relationship to said outermost end of the sleeve, the collar and the second anchor being removable from the rod after hardening of said material whereby the second head may be grasped to exert an outward pull thereon and thereby attenuate the rod longitudinally; the diameter of the third head being greater than the inside diameter of the sleeve whereby the latter is forced out of the structure by the third head during attenuation of the rod, the outside diameter of the sleeve being as great as said diameter of the third head whereby to present a clearance cavity in the structure as the sleeve is forced out of the structure for passage of the third head to a position exteriorly of the structure, said second anchor being adapted for mounting on the rod between said opposite face and the third anchor when the latter is in said position.

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