

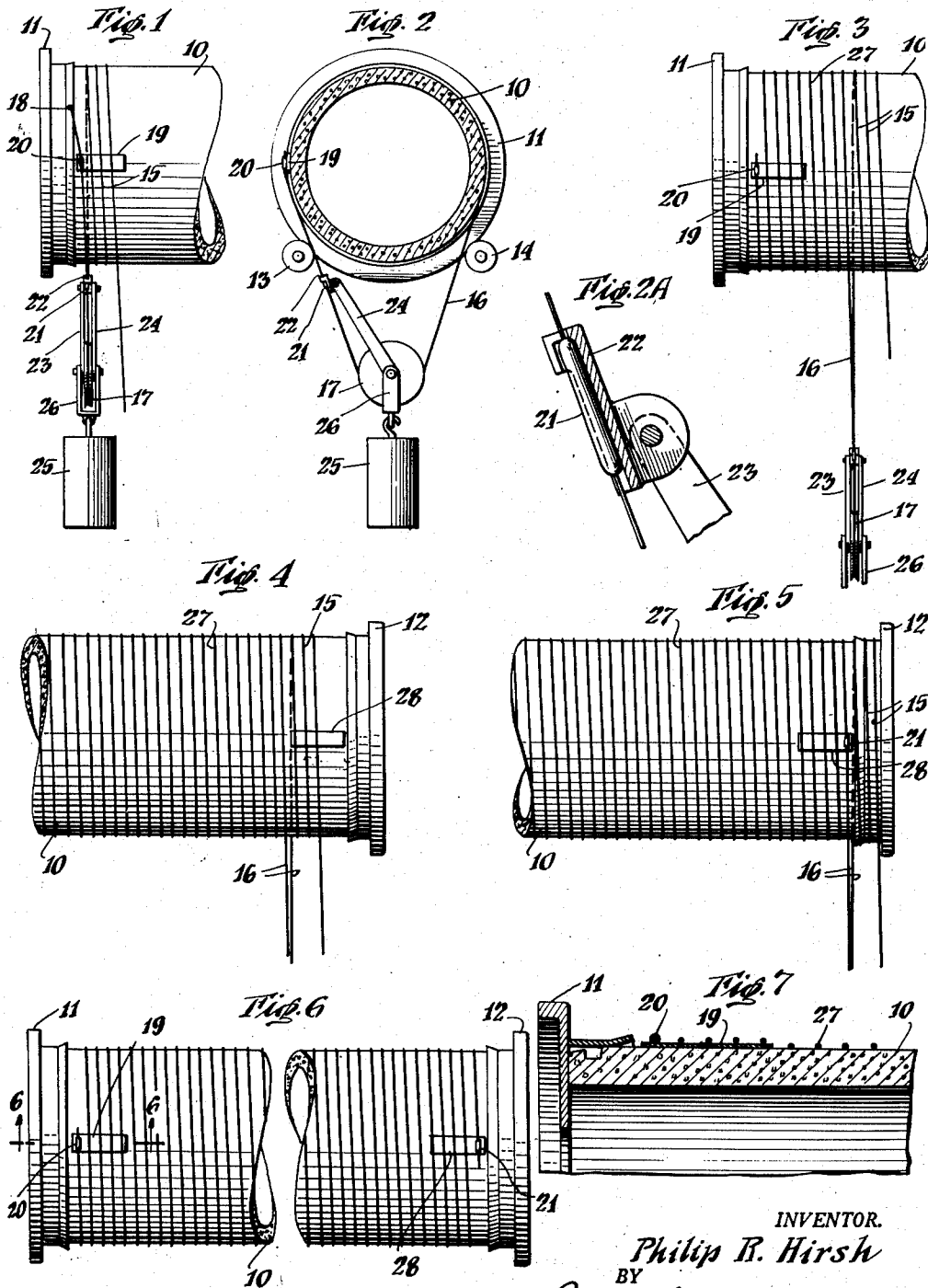
Feb. 3, 1953

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2,627,378

METHOD FOR SECURING A TENSIONED WIRE AROUND CORES

Filed June 16, 1949



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2,627,378

METHOD FOR SECURING A TENSIONED
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Application June 16, 1949, Serial No. 99,460

2 Claims. (Cl. 242—11)

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This invention relates to a method for securing a tensioned line around a core, and more particularly to producing a prestressed concrete body such as a pipe, pile, post or the like, having a plain concrete exterior wrapped with a tensioned wire winding.

Among the objects of the invention is to fasten or bind a wrapping of tensioned wire about a core having no metallic parts accessible to which the wire may be anchored. According to the invention, loose turns of a wire are passed around a core to form a snubbing. The free end of the wire and a portion of the wire between the free end and the snubbing turns are fastened, respectively, to a portion of the machine by which the core is rotated and to a loose plate of metal. The loose plate is located against the core and under the snubbing turns. The wire is tensioned by a pull exerted upon a loop of the wire between the plate and the snubbing. The applied tension is transmitted to the snubbing turns which are tightened about the core and bear upon and stabilize the plate in fixed position against the core. The wire is then wound about the core in a helix by relatively rotating and translating the core and the tensioned loop of wire with respect to each other. Before the intended length of the winding is completed a second plate is located against the core in advance of the snubbing so that the snubbing and following turns of wire will travel over the second plate. When the wire being wound has advanced onto the second plate and the second plate is firmly secured in place against the core by the wire, the wire is fastened to the second plate. Thereafter, the tension on the loop of wire between the point of fastening to the second plate and the snubbing is relieved and the snubbing is removed by cutting the wire. The wire winding is held in its tensioned condition solely by its fastenings to the plates which are held secure and immovable by the winding.

Other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and demonstrated by the drawings which show by way of illustration a preferred embodiment of the principle of the invention and the best mode which is contemplated for applying that principle.

In the drawings:

Fig. 1 illustrates the manner in which the first end of the wire winding is secured in place at the beginning of the winding operation;

Fig. 2 is a section transverse of the core as viewed from the right of Fig. 1;

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Fig. 2A is a detail of a connector-restraining device;

Fig. 3 illustrates an intermediate stage of the winding operation;

Fig. 4 illustrates a stage following the placement of a second plate against the exterior of the core;

Fig. 5 illustrates the stage of operation reached when the winding has been completed and the wire is fastened to the second plate;

Fig. 6 illustrates a prestressed core having a wire winding secured in accordance with the present invention; and

Fig. 7 is a longitudinal section of a portion of an end of a concrete pipe about which the wire winding has been placed.

The concrete body or core illustrated in the drawing is in the form of a pipe 10 having no appurtenances to which a tensioned wire winding may be connected. The ends of the pipe are engaged in and by the rings 11 and 12 which are adapted to be mounted in a machine for rotation. The pipe and the rings are rotated under power and it is indifferent as to the form of the apparatus by which they are rotated, suitable machines for this purpose being well-known.

The rings, together with the pipe or other form of core, are rotated on their axis, and for this purpose the rings may be supported on pairs of rollers 13 and 14, as best shown in Fig. 2.

In initially applying the wire about the core, a few turns of the wire are wrapped around one end of the core to provide a snubbing 15. A loop 16 of the wire is left rearward of the snubbing and the loop is caused to engage a pulley 17 of a tensioning device. The end of the wire may be temporarily fastened by a clamp or by welding 18, or in any other suitable manner, to a part of the machine which is rotatable with the core, such as the ring 11, and a portion of the wire adjacent the fastened end is secured to a steel plate 19 or other suitable metallic member, which is located under the snubbing turns 15. The order of attachment of the wire to the machine part or to the plate is immaterial.

Since high tensile steel wire is commonly used for making a prestressed concrete pipe, it is not desirable that any part of the wire which is to constitute a permanent part of the wire wrapping may be excessively heated, as by temperatures incident to welding, or that the wire be secured in any manner which could weaken the wire. While ordinarily any suitable fastening means may be employed, it is preferable to secure high tensile steel wire to the plate by a device

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of such nature as not to affect the strength of the wire at this location. A steel compression sleeve having hard granular particles lining its bore, when compressed upon a wire, is serviceable for use as a connecting device. A connecting device of this kind is described in the United States Patent No. 2,375,921, and if such a device is used it is necessary to initially thread the wire through the several sleeves which are to be used before the end of the wire is secured to the rotating part of the machine. Such sleeves 20 and 21 are illustrated in the drawing. The sleeve 20 has been compressed upon the wire and has been fastened to the plate 19 by welding. The sleeve 21 is loosely supported on the wire (Figs. 1, 2 and 2A) and the wire is permitted to slide therethrough during the winding operation and until it is to be compressed to seize upon the wire (Fig. 5).

At the beginning and during the winding operation, the sleeve 21 is held in reserve by a guide which is translated axially of the core at the rate of operation at which the winding progresses. This guide may take the form of a socket member 22, pivotally supported from links 23 and 24 which are pivotally attached to the hubs or axles of the pulley 17. The sleeve 21 is manually relieved from the socket 22 whenever it is desired to compress the sleeve and secure it to the wire.

When the end of the wire has been attached to a rotating portion of the machine and also to the plate 19, which is located under the snubbing, the desired force is applied to the pulley 17 and the core is rotated as the pulley is caused to travel axially of the core. This relative rotation and axial movement of the core and the pulley 17 with respect to each other may be accomplished with any of several machines well known in the art, such, for example, as the one described in the United States Patent No. 2,375,921, and, therefore, it suffices for the purposes of the present disclosure, to illustrate the pull upon the pulley as being supplied by a weight 25 supported from the pulley by a clevis 26. The weight 25 represents the application of a constant pull upon the wire loop 16. As the winding operation continues, the wire is drawn from the source of supply and wound about the core and into the snubbing turns 15 and the permanent winding 27 (Fig. 3). The permanent winding securely holds the plate 19 in a fixed position.

Just prior to the advance of the snubbing 15 to a position where the second attachment of the winding to the core is to be made, a second plate 28 is placed against the exterior of the core and the winding operation is continued with the snubbing 15 and the permanent winding 27 advancing over the plate (Fig. 4). The tensioned winding secures the plate in fixed position.

When the plate 28 has been traversed by several turns of the permanent winding, the rotation of the pipe is stopped and the last coil of the winding is secured to the plate. This may be accomplished by any suitable type of anchoring device. In the accompanying drawing a compressible steel gripping sleeve 21, simi-

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lar to the sleeve 20, is illustrated. The sleeve 21 is released from the retaining device 22 and fastened to the wire in such a position as to locate the sleeve opposite the fixed plate 28, as illustrated in Fig. 5, by rotating the pipe sufficiently for that purpose. The sleeve 21 or other fastening device may be secured to the plate by welding, and when secured, the tension developed by the pulley is released and the wire is severed between the fastening device and the snubbing turns. The snubbing turns are subsequently removed. The appearance of the wrapped core is illustrated in Fig. 6, and a detail of a prestressed concrete pipe having a tensioned winding fastened in the manner described is illustrated in Fig. 7.

What is claimed is:

1. In a method for securing a tensioned wire around a core, the steps comprising passing several turns of a wire around a core to form a snubbing, fastening the end of the wire and a portion of the wire between the end and the snubbing turns, respectively, to a portion of the machine by which the core is rotated and to a loose plate of metal, stabilizing the loose plate against the core by tensioning a loop of the wire forward of the fastening to the plate and rearward of the snubbing turns, relatively rotating and translating the core and the tensioned loop of wire and thereby winding the wire about the core and over a second plate located against the core in advance of the snubbing turns, and fastening the wire to the second plate before relieving the tension in the wire.

2. In a method for securing a tensioned wire around a core, the steps comprising passing several turns of a wire around a core to form a snubbing, threading two compression sleeves onto the wire, fastening the end of the wire to a portion of the machine by which the core is rotated and fastening the first of the compression sleeves to the wire and the said first compression sleeve to a loose plate of metal, holding the plate against the core by tensioning a loop of the wire forward of the plate and rearward of the snubbing turns, relatively rotating and translating the core and the tensioned loop of wire and thereby winding the wire about the core and over a second plate located against the core in advance of the snubbing turns and fastening the second of the compression sleeves to the wire and to the second plate while maintaining the tension in the wire.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,236,107	Miller	Mar. 25, 1941
2,371,805	Cooper	Mar. 20, 1945
2,375,921	Hirsh	May 15, 1945
2,426,631	Mapes	Sept. 2, 1947
2,498,681	Hirsh	Feb. 23, 1950

FOREIGN PATENTS

Number	Country	Date
586,794	Great Britain	Apr. 1, 1947