Aug. 9, 1927.

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N. D. CONNORS

STRAND TIGHTENER

Filed Oct. 26, 1922

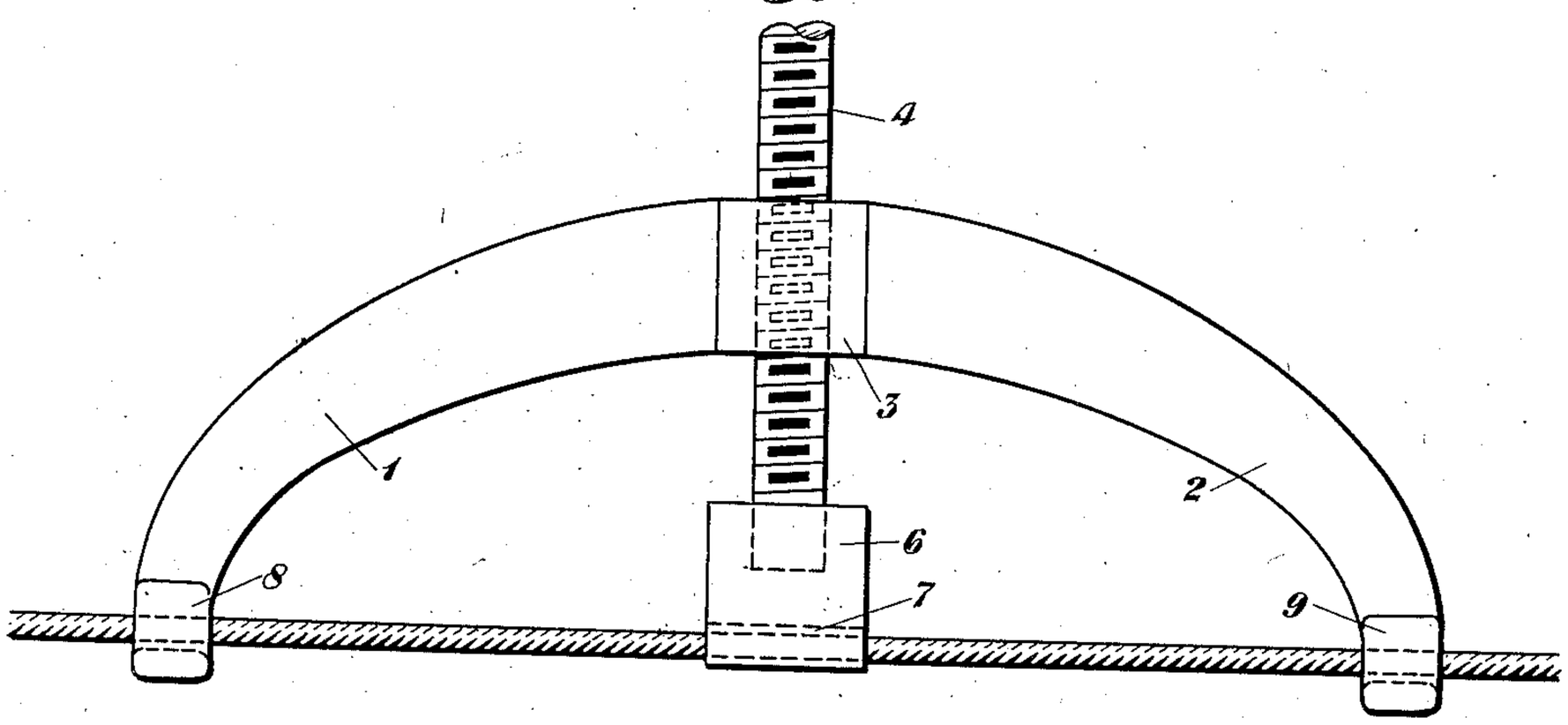

Fig. 1

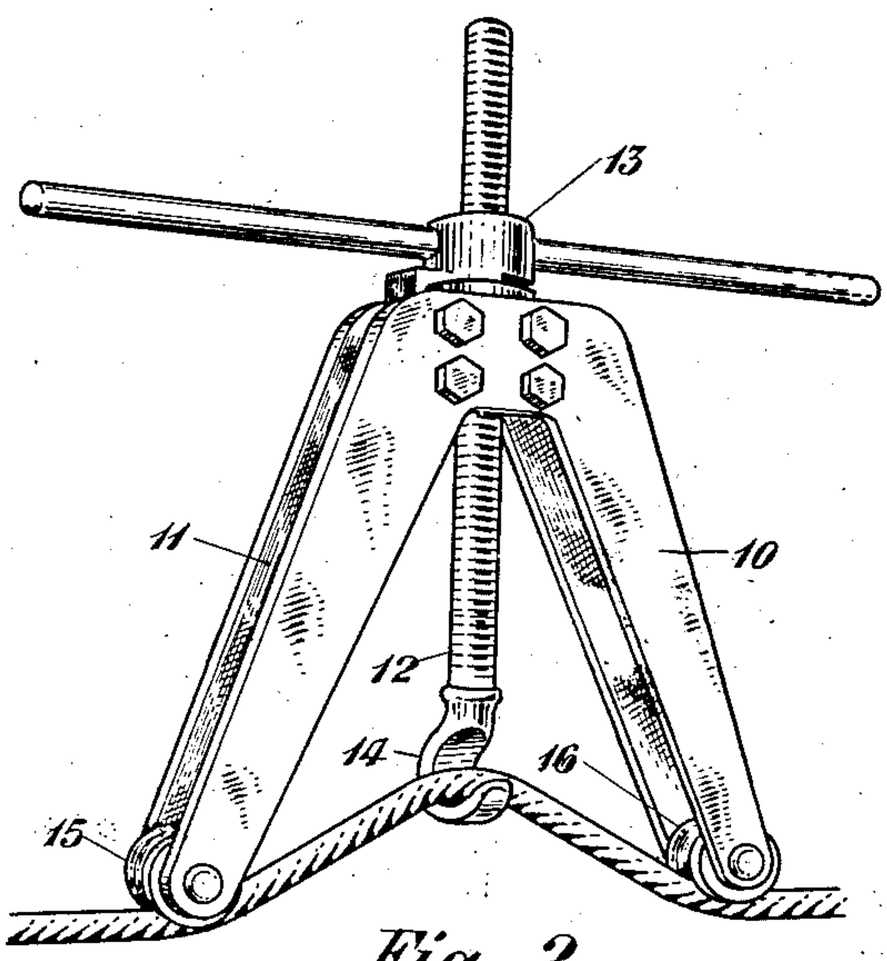

Fig. 2

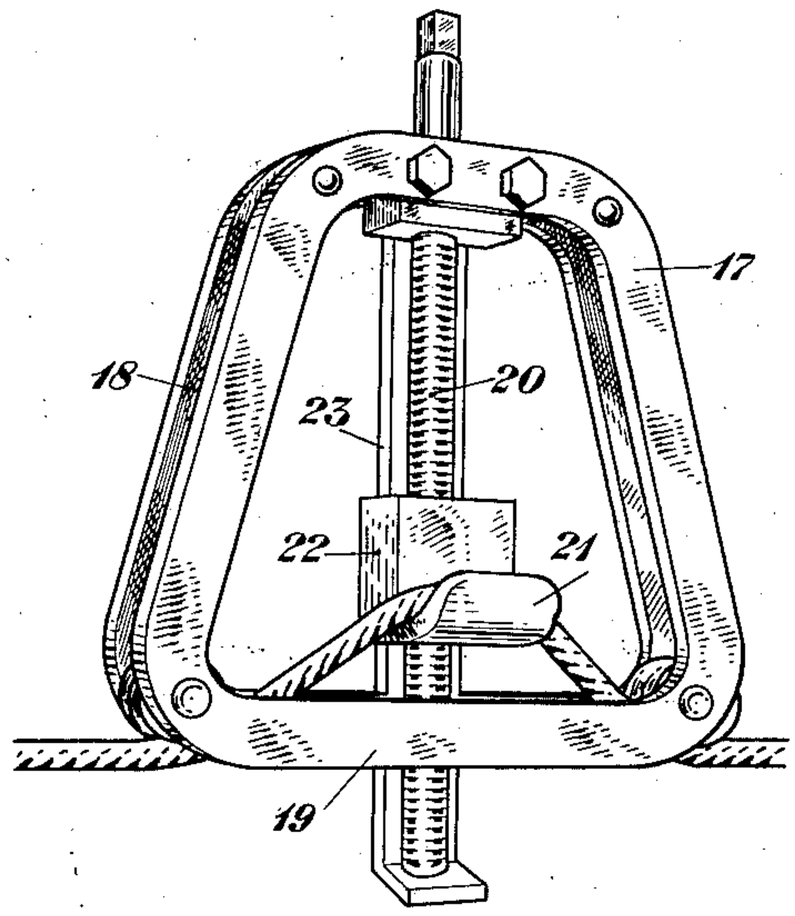

Fig. 3

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UNITED STATES PATENT OFFICE.

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STRAND TIGHTENER.

Application filed October 26, 1922. Serial No. 597,185.

This invention relates to tools for use in removing slack in guys or in tightening the so-called "dead ends" in suspension strand. The object of the invention is to provide a simple means of tightening lengths of strand or rope, such as those referred to above, thus doing away with the necessity of employing sets of blocks for this purpose.

Applicant's tool operates on the principle of removing slack by thrusting or pulling out of line a short section of the length of strand, etc., to be tightened. Such a length is passed through the eye of an anchor-rod, for example, and the free end is attached to the guy a few feet from the rod by means of clamps. The tool is then applied to this section between the rod and the clamps and the desired tension is obtained by the operation of the tool, as hereinafter fully explained. Permanent attachment of the strand or rope is then made with clamps such as three-bolt clamps at a point between the tool and the rod. The strand having been thus secured at the desired tension, the tool is removed, and the length of strand beyond the permanently placed clamps is cut off.

In general, applicant's device has a curved or V-shaped framework carrying a threaded rod, the rod being actuated in any suitable manner, as for instance, by a wrench. A grooved head or a hook, travelling with the rod, but so attached as not to turn with the rod, or internally threaded and travelling on the rod, pushes or pulls out of line a section of strand lying between the legs of the framework, in contact with which members the strand is made to pass by means of hooks or rollers properly placed. Several different designs of tightener will be specifically described below. All designs operate on the principle outlined above, the distinctions being found in the structure of the framework, in the means employed for causing the strand or rope to pass in contact with the leg members, in the relative arrangement of the rod and the hook, or in the specific manner in which the strand is displaced from line. It is understood that the invention may be embodied in many other forms which do not depart from the principle or from the general form of device broadly claimed below.

In the accompanying drawing, Figures 1, 2 and 3 show different desirable embodiments of applicant's invention. In the device shown in side elevation in Fig. 1, a section of strand is thrust or pushed out of line. In the tools of Figs. 2 and 3, shown in perspective, the section of strand is pulled out of line.

With reference to the details of Fig. 1, the framework comprises the two curved legs 1 and 2 and a middle portion 3. Through this middle portion passes the threaded rod 4, which is actuated by a hand wrench 5. At its lower extremity the threaded rod 4 carries a pivoted head 6, grooved at 7 on its lower surface to receive the strand or rope. The strand or rope passes over upwardly pointed hooks 8 and 9 placed near the extremities of the legs 1 and 2, respectively. A section of strand thus held in place between the hooks 8 and 9 will be thrust downwardly out of line upon the actuation of the threaded rod 4, the strand sliding over the hooks as it is displaced by the rod head 6.

Fig. 2 shows a second tool operating on the same principle as the first but distinguished from the first in several particulars. The framework comprises two side members 10 and 11, each an inverted V in shape, held in separated relation by bolts. A threaded rod 12 passes downward between the two side members and is actuated by a hand wrench 13. The rod 12 carries pivoted at its lower extremity a hook 14, over which the strand passes. Fitted between the extremities of the side members 10 and 11 are two rollers 15 and 16. These rollers are placed on the given length of strand, which lies below them. When the rod 12 is raised by the turning of the wrench 13, the hook 14 pulls the strand upward, the sections on either side of the tool being drawn under the rollers.

The tool shown in Fig. 3, like that of Fig. 2, has a framework composed of two side members, 17 and 18, each of the general shape of an inverted V; but the lower portions of these side members are joined by two cross-bars, the nearer one being shown as 19 in the drawing. The threaded rod 20 extends downward to a point below the cross-bars and has no vertical movement upon the operation of the device. The upwardly pointed hook 21 is carried on a rectangular block 22, which is internally threaded and travels upward or downward

upon the threaded rod 20 when the latter is actuated. A vertical member 23 joins the top portion of the side member 18 with the corresponding cross-bar and extends downward as far as the lower extremity of the threaded rod 20. The lower end of this member 23 is bent at right angles with the body of the member, and forms the lower support for the threaded rod 20. The rod 20 passes through this end of the member 23 and is held in place by riveting or by any other suitable means of attachment. This member 23, in addition to supporting the lower end of the threaded rod 20, adds strength to the framework and serves as a guide for the hook 21 by preventing any considerable turning of the block 22 which carries the hook. The point of the hook, as shown in the drawing, is away from the vertical member 23. For purposes of clear illustration, the degree to which the hook extends outward from the block is exaggerated. It is understood that the block and hook will pass freely between the cross-bar 19 and the corresponding opposite cross-bar. It is obvious that the tool shown in Fig. 3, with its arrangement of rod and hook and its reinforced frame, has far greater displacing power than the tools shown in the other two figures of the drawing.

It is to be understood that any suitable actuating device may be used in connection with the threaded rod of applicant's tightener in any of its forms. As indicated above, the figures of the drawing show certain desirable embodiments of applicant's invention but do not limit it to the forms therein described, serving merely as specific illustrations of the invention, which is claimed below.

What is claimed is:

1. A tool of the class described, comprising a framework consisting of two side members, fixed in separated relation, each of said side members being of the shape of an inverted V with the bottom closed by a cross-bar; a roller at each of the lower corners of said framework designed to bear downward against a given length of strand; a threaded rod passing through the upper portion of said framework between the two side members and extending between the two cross-bars to a point below said cross-bars; and an internally threaded block designed to travel vertically on the threaded rod and carrying an upwardly pointed hook, said hook being designed to grip and pull upward and out of line a given length of strand upon actuation of said rod.

2. A tool of the class described, comprising a framework consisting of two side members, fixed in separated relation, each of said side members being of the shape of an inverted V with the bottom closed by a cross-bar; a roller at each of the lower corners of said framework, between the two side members, designed to bear downward against a given length of strand; a threaded rod passing through the upper portion of said framework between the two side members and extending downward to a point below the cross-bars; a rectangular and internally threaded block travelling vertically upon the threaded rod upon actuation of said threaded rod and carrying an upwardly pointed hook designed to grip and pull upward and out of line said length of strand; and a vertical bar joining the upward portion of that side member away from the point of the hook with the middle section of the corresponding cross-bar, said vertical bar being extended below said cross-bar as far as the lower extremity of the threaded rod and being bent at right angles to form a support for the lower end of the threaded rod, said vertical bar serving in addition as a guide to prevent turning of said hook.

In testimony whereof, I have signed my name to this specification this twentieth day of October, 1922.

NEILSON D. CONNORS.