C. WEBER.

ROPE SECURING DEVICE.

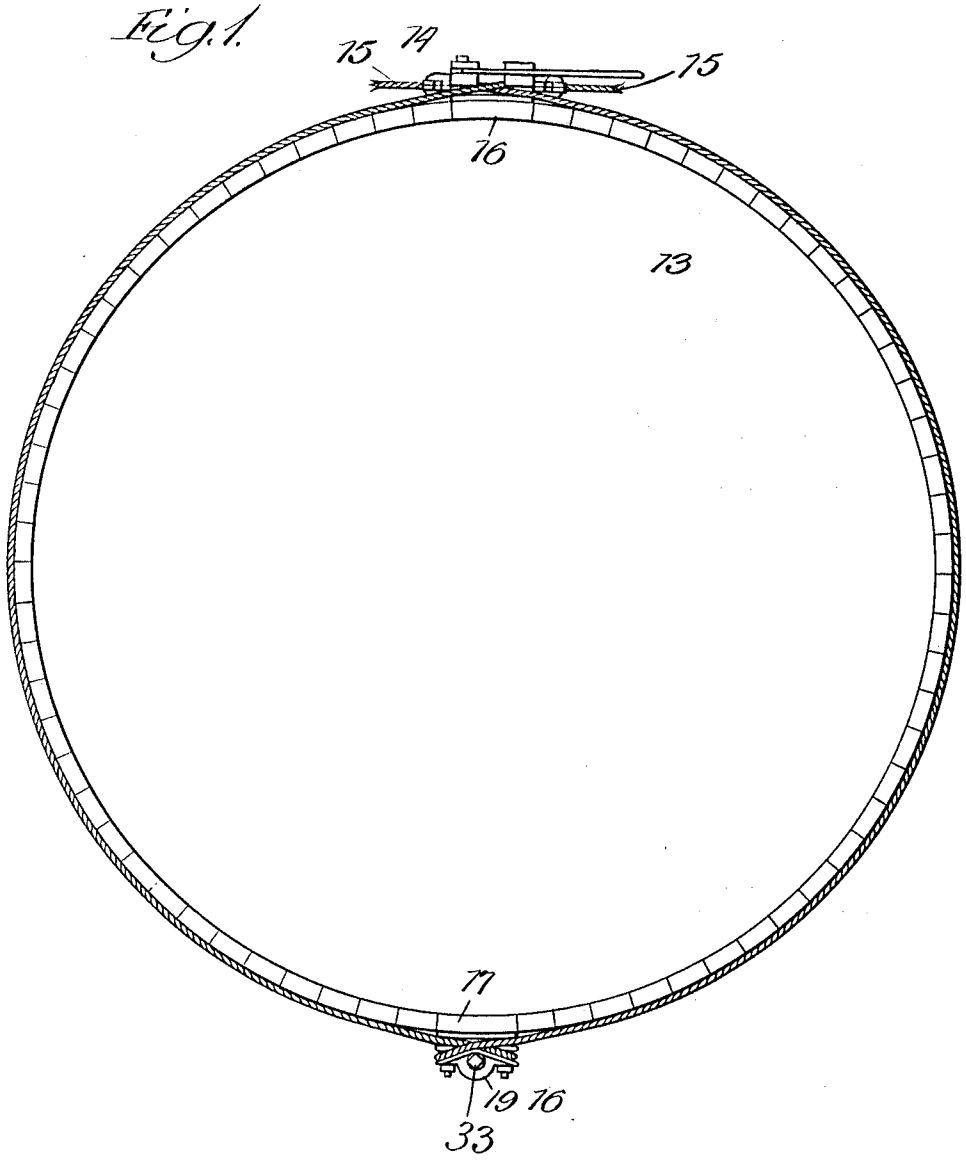
APPLICATION FILED APR. 15, 1912.

1,055,246.

Patented Mar. 4, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



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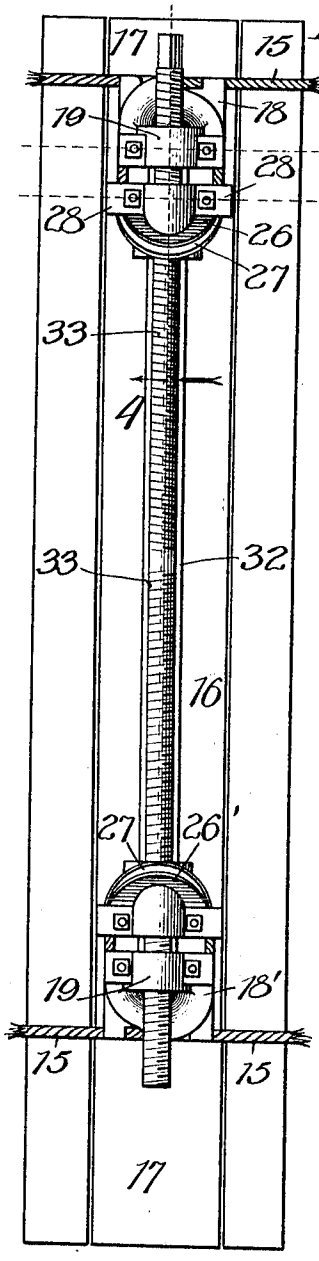

Fig. 2.

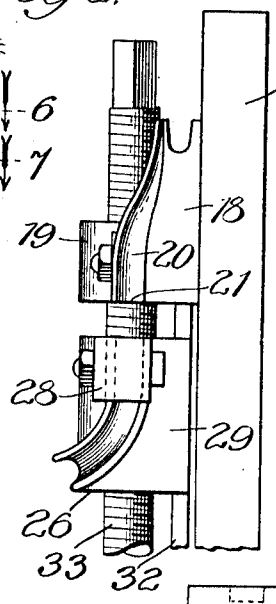

Fig. 3.

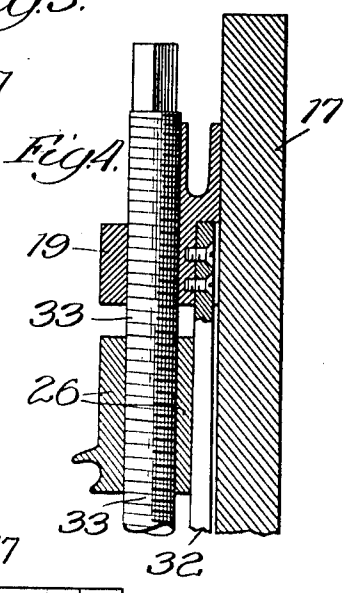

Fig. 4.

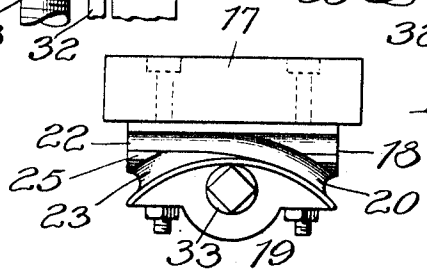

Fig. 5.

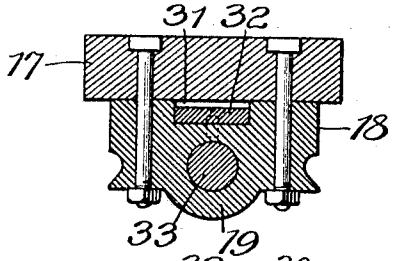

Fig. 6.

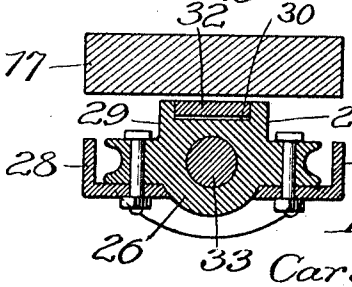

Fig. 7.

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UNITED STATES PATENT OFFICE.

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ROPE-SECURING DEVICE.

1,055,246. Specification of Letters Patent. **Patented Mar. 4, 1913.**

Application filed April 15, 1912. Serial No. 691,027.

To all whom it may concern:

Be it known that I, CARL WEBER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Rope-Securing Devices, of which the following is a specification.

My invention relates to an improvement in the means for securing, by tightening, the ropes about the form or mold employed in erecting concrete, and more especially reinforced-concrete, structures, particularly chimneys, bins, tanks, and the like. In the erection of such a structure, usually by molding the concrete in sections one upon the other, the staves or sections of which the flexible surrounding mold or form employed is constructed are ordinarily secured together in their mold-forming relation by ropes adjusted about the form near its upper and lower ends. In thus adjusting the form it is necessary that the strain exerted on both ropes shall render them correspondingly taut, since otherwise unequal distribution of the stresses of the green concrete will ensue and is liable to result in rupture of the lower portion of the concrete section of the structure, which begins to set while the upper portion thereof is being molded. Hitherto it has been the practice to rely for even tautness of the ropes on the mere observation of the workmen, which, however, is unreliable.

The primary object of my invention is to provide means for securing these ropes which shall operate infallibly to tighten them correspondingly about the form.

In the accompanying drawings, Figure 1 is a plan view of a form equipped with my improved rope-securing means; Fig. 2 shows the rope-tightening device by a view in front elevation applied to a section of the mold; Fig. 3 is a broken enlarged view in side elevation showing the two upper members and the upper portion of the screw cooperating therewith, of the tightening device; Fig. 4 is an enlarged section on line 4, Fig. 2; Fig. 5 is an upper-end view of the showing in Fig. 3, and Figs. 6 and 7 are enlarged sections taken respectively on lines 6 and 7, Fig. 2.

A form 13, on which to use my improved rope-securing means, may be composed, as to its body-portion, of a plurality of staves, as represented, flexibly joined together by any known or suitable means (not shown), with a clamp 14 for the ends of each rope 15 supported on one stave or section 14′ of the form and the rope-tightening device 16 supported on a stave or section 17 diametrically opposite the one carrying the clamps.

Following is the description of the preferred construction, in detail, of the tightening device 16: A solid metal head 18 of general rectangular shape is securely bolted to the face of the stave 17 near its upper end. On the face of this head is formed a guide-sleeve 19 for the screw-shaft hereinafter described, and behind the sleeve is formed in the head a rope-guiding groove 20 extending from one lower corner of the head, at 21, to the diagonally-opposite corner thereof at 22 (Fig. 5), another rope-guiding groove 23 extending upwardly from the corner of the head opposite the point 21 and crossing the groove 20 between the ends of the latter. Thus, with one section of a rope laid in the groove 20 and an opposite section thereof laid in the groove 23, where the sections cross each other they are separated by the wall 25 between the grooves, and in working the rope-sections they do not saw against each other, and are therefore saved from the wear of such sawing because the groove 20 is deeper, to the extent, at least, of the thickness of the rope, than the groove 23, as will be apparent on inspection of Fig. 5, showing the groove 23 to be cut through the groove 20. Another head 18′, which is the exact counterpart of the head 18, is bolted, in position the reverse of the latter, or upside-down, to the face of the stave 17 near its lower end, with its sleeve 19′ alining with the sleeve 19. With the head-member 18 coöperates a nut-member 26 having a straight upper end to conform to the lower end of the head and a rounded edge containing a rope-guiding groove 27, about the opposite ends of which extend rectangular clips 28 bolted to the face of the nut. This nut has a back 29 of rectangular cross-section containing a recess 30, to aline with a recess 31 in the back of each head-member. Another nut-member 26′, the exact counterpart of the nut-member 26, occupies a position the reverse of the latter to coöperate with the head 18′. A straight-edged guide-bar 32 is fastened at its opposite ends in the recesses 31 in the backs of the heads 18, 18′, and it is embraced by

the recesses 30 in the backs of the nut-members for guiding the latter in their movements. A screw-shaft 33, having a right-hand thread about one section of its length and a left-hand thread about the other section thereof, and a squared upper end for the application of a wrench, extends guidingly through the sleeves 19 and 19′ and works in the two nuts.

A suitable device, such as the clamping-device represented at 14, is required to be provided to coöperate with the rope-tightener for securing each rope at its ends. To use my improved rope-tightener on a form 13 employed say, in the erection of an upwardly-tapering chimney of reinforced concrete, the form is placed in position, with the ropes 15 passed in slack condition about it and having the end-portions of each held by a clamp 14. At the tightener, the upper rope is crossed to form a loop passed about the nut in its groove 27, and the clips 28 are bolted in place to tend to prevent kinking of the rope; and the remainder of the loop is laid in the opposite grooves 20 and 23 of the head 18. The lower rope, similarly secured at its end-portions by a clamping-device, is looped in the same way about the nut 26′ in its groove 27 and the head 18′ in its grooves corresponding with the grooves 20 and 23. By then turning the screw-shaft 33 toward the right, the nut 26 is depressed to tighten the upper rope and the nut 26′ is raised to tighten the lower one, the two nuts moving at uniform speed. Should either rope become stretched to the limit of tautness before the other attains that condition, the nut stretching to that limit will be held by the taut rope against further movement, or be stationary, by continuing to turn the screw, while the other nut will continue to move for exerting its tightening action. But then the screw will work in the stationary nut and thus move longitudinally, carrying with it the other, still movable nut, while the working of the screw in the latter will also move it, so that the speed of movement of the last-named nut is doubled, and the adjustment of the ropes is accordingly expedited. As will be readily apparent, moreover, any difference in the stretching quality of the two ropes, or give in either, is automatically taken care of, or compensated for, by the action of the tightener.

Obviously, reversing the turning of the screw-shaft will effect slackening of the ropes and permit them to be taken off the tightener; but it is more desirable to depend for releasing the ropes, as when it is desired to free the form from the work preparatory to raising it for a new section of the structure under erection, or to remove it, upon unclamping the rope ends at the clamp 16.

I realize that considerable variation is possible in the details of construction herein specifically shown and described, and I do not intend by illustrating a single specific or preferred form to limit my invention thereto; my intention being in the following claims to claim protection for all the novelty there may be in my rope-securing means as broadly as the state of the art will permit.

What I claim as new and desire to secure by Letters Patent is—

1. A rope-tightening device comprising, in combination, a support, heads stationarily secured to said support in alinement with each other and provided with rope-guiding grooves, a right-and-left screw-shaft loosely confined at its ends in said heads to be freely movable lengthwise therein, and similar nuts in relatively-reverse position on said threads to coöperate each with one of said heads and provided with rope-guiding grooves.

2. A rope-tightening device comprising, in combination, a support, similar heads stationarily secured to said support in alinement with each other and in relatively-reverse position and provided with rope-guiding grooves and guide-sleeves, a guide-bar extending between the heads, a right-and-left screw-shaft loosely confined at its ends in said sleeves to be freely movable lengthwise therein, and similar nuts in relatively-reverse position on said shaft to coöperate each with one of said heads and provided with rope-guiding grooves and with guide-recesses in their backs engaging said bar.

3. A rope-tightening device comprising, in combination, a support, similar heads stationarily secured to said support in alinement with each other and in relatively-reverse position, each head having a sleeve on its face and curved rope-guiding grooves at opposite sides of the sleeve and crossing each other beyond one end thereof, a guide-bar extending between the heads, a right-and-left screw-shaft loosely confined at its ends in said sleeves to be freely movable lengthwise therein, and similar nuts in relatively-reverse position on said shaft to coöperate each with one of said heads and having curved rope-guiding grooves about their edge-portions and guide-recesses in their backs engaging said bar.

CARL WEBER.

In presence of—
NELLIE B. DEARBORN,
RALPH A. SCHAEFER.