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PATENTED DEC. 27, 1904.

R. C. KYLE.  
FRAME FOR PLASTIC BEAMS.  
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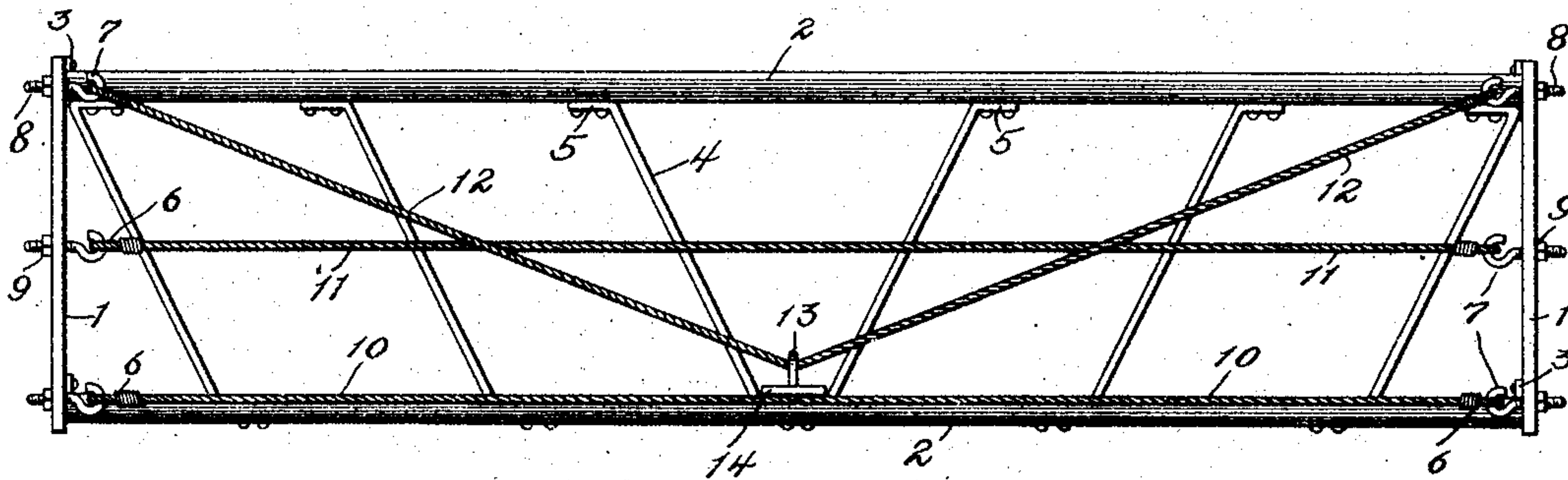


Fig. 1.

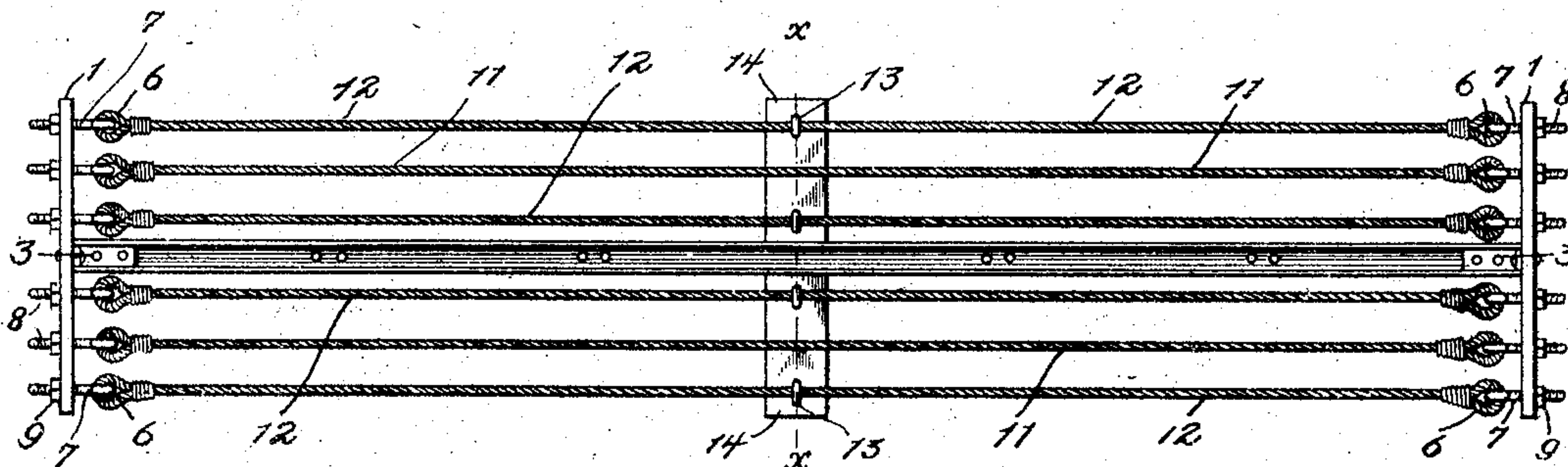


Fig. 2.

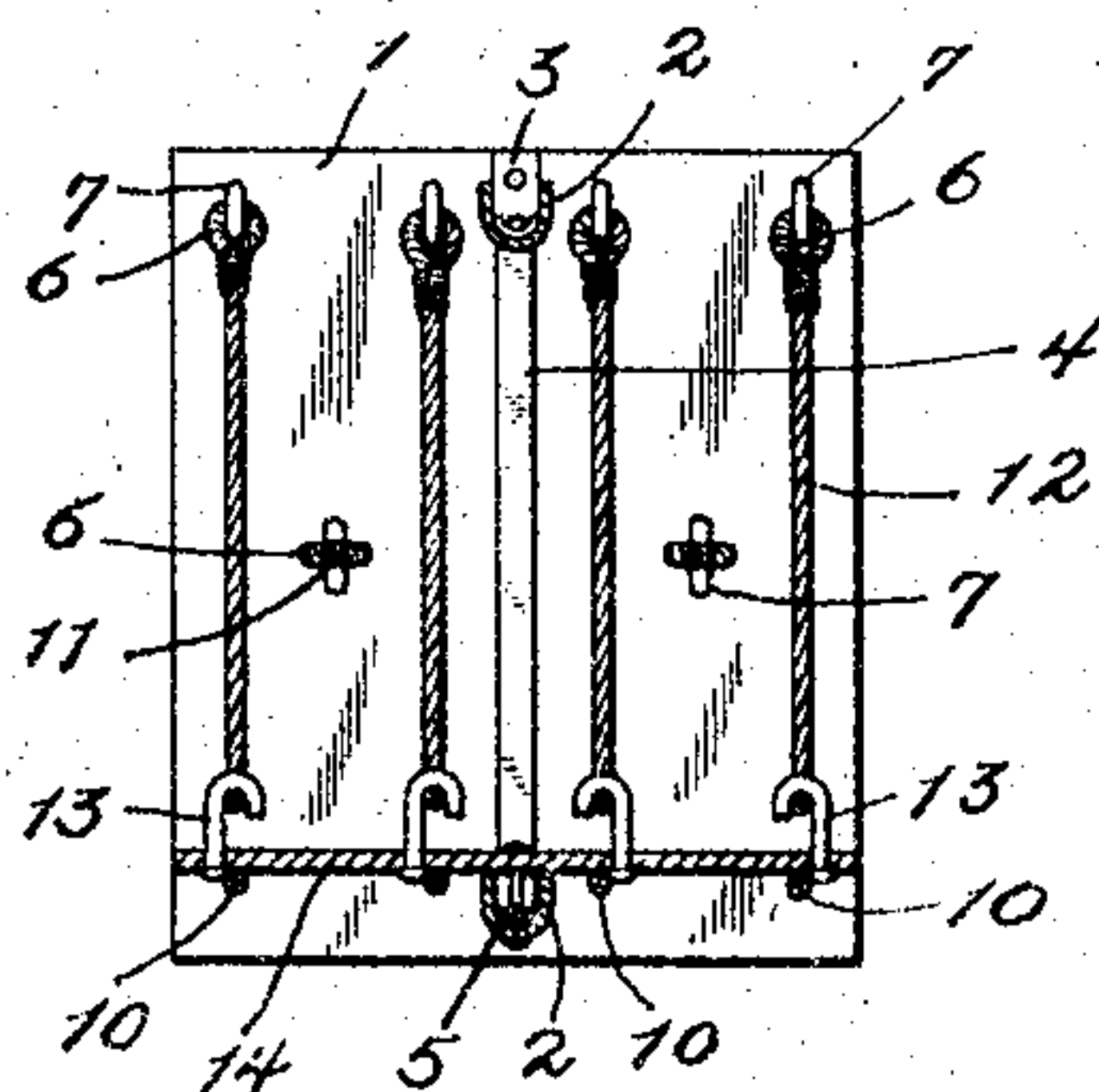


Fig. 3.

WITNESSES:

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## FRAME FOR PLASTIC BEAMS.

SPECIFICATION forming part of Letters Patent No. 778,416, dated December 27, 1904.

Application filed February 29, 1904. Serial No. 195,705.

*To all whom it may concern:*

Be it known that I, ROBERT C. KYLE, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Frames for Plastic Beams, of which the following is a specification.

My invention relates to an improvement in skeleton frames for concrete beams or stringers.

The object of my invention is to provide a frame that may be perfectly alined.

A particular novel feature resides in channel-bars in which the concrete deposits, thus securely tying itself to the frame.

Finally, the object of the invention is to provide a device of the character described which will be strong, durable, and efficient, comparatively simple and inexpensive to construct, and one in which the parts are specially designed to remain intact.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification, and illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation. Fig. 2 is a top plan view, and Fig. 3 is a transverse sectional view taken on the line  $x-x$  of Fig. 2.

In the drawings the numeral 1 designates the end plates of any suitable shape and formed, preferably, of sheet metal. The plates are connected centrally at their tops and bottoms by two longitudinal channel-bars 2 by means of angle-irons 3, which are riveted to the plates and the bars. The beams are disposed with their channel-openings upward, and thus when the concrete is molded around the frame it will fill in the channels and when set constitute a tie between itself and the bars. It is obvious that this formation will greatly stiffen the beam, especially against lateral strains. The channel-bars 2 are connected by strap-irons 4, disposed at intervals and inclined from the center of the frame. These irons 4 are bent or otherwise formed with feet 5, by which they are secured to the bars by any suitable means, such as rivets. It is to be understood that the strap-irons 4 may be disposed

at various angles and that the arrangement shown in the drawings is merely a preferable way of disposing the same. As a further means of connecting the plates 1 I employ longitudinally-disposed cables formed with eyes 6 at each end, which engage hooks 7, passed through the plates and formed with screw-threaded shanks 8, which project beyond the plate. Nuts 9 are threaded on the shanks 8 and bear against the outer surfaces of the plates 1, so that by tightening up the nuts the cables may be stretched and placed under tension. The cables are preferably arranged in three series, as indicated at 10, 11, and 12. The cables 10 are disposed along the bottom of the frame at equal distances on each side of the lower bar 2 in a horizontal plane. The second series of cables 11 extend centrally of the length of the frame and are equidistantly disposed on each side of the center thereof. The cables 12 are secured to the hooks 7, arranged along the top of the plates, and are caught under gage-hooks 13, extending upwardly from a plate 14, extending transversely across the center of the frame and secured upon the top of the lower channel-beam 2.

It is to be observed that should it be desired to curve the beam or frame that by causing suitable pressure to be exerted on the cables 12 the lower beam 2 would be bowed or curved upward through the agency of the hooks 13 and the plate 14. This might be accomplished through any suitable means.

It is apparent that the hollow frame is held stiff and rigid and that by tightening or loosening the nuts 9 any one of the cables may be relaxed or stretched.

In using my frame in connection with a molded concrete structure it is supported in a suitable mold and the concrete poured in, depositing in the channel-bars and completely covering the frame. It is obvious that the structure when set will constitute a beam or stringer capable of supporting great weights and resisting excessive strains.

I do not wish to limit my invention to the exact details of description and operation or to the specific purpose for which the device is used, as I may employ the same in various arts and construct it from several materials



without departing from the spirit thereof and wholly within the scope of my claims.

Having now fully described my invention, what I claim, and desire to secure by Letters  
5 Patent, is—

1. A skeleton frame for plastic structures, comprising longitudinal channel-bars into which the plastic material is molded, end plates supporting the channels, stiffening means dis-  
10 posed between the channels, and flexible tensioned means connecting the end plates.

2. In a frame for plastic beams, end plates, channel-bars extending one above the other between the end plates, cables connecting the  
15 end plates, and means carried by the end plates for tensioning the cables.

3. In a frame for plastic beams, end plates, longitudinal channel-bars extending from one plate to the other, stiffening means disposed  
20 between the longitudinal bars, and flexible tensioned means connecting the end plates.

4. In a frame for plastic beams, end plates,

rigid means connecting the end plates, cables extending between the end plates, adjustable means carried by the plates and engaging the  
25 cables, and means for adjusting the said adjustable means to place the cables under tension.

5. A skeleton frame for plastic structures comprising, a pair of end plates, longitudinal  
30 channel-bars connecting the upper and lower ends of the plates, strap-irons extending between the bars and connected to the same, screw-hooks carried by the plates, cables extending between the plates and engaging the  
35 hooks, gage-hooks disposed across the frame and engaging some of the cables, and means carried by the screw-hooks for placing the cables under tension.

ROBERT C. KYLE.

In presence of—

C. C. SHEPHERD,  
A. L. PHELPS.