

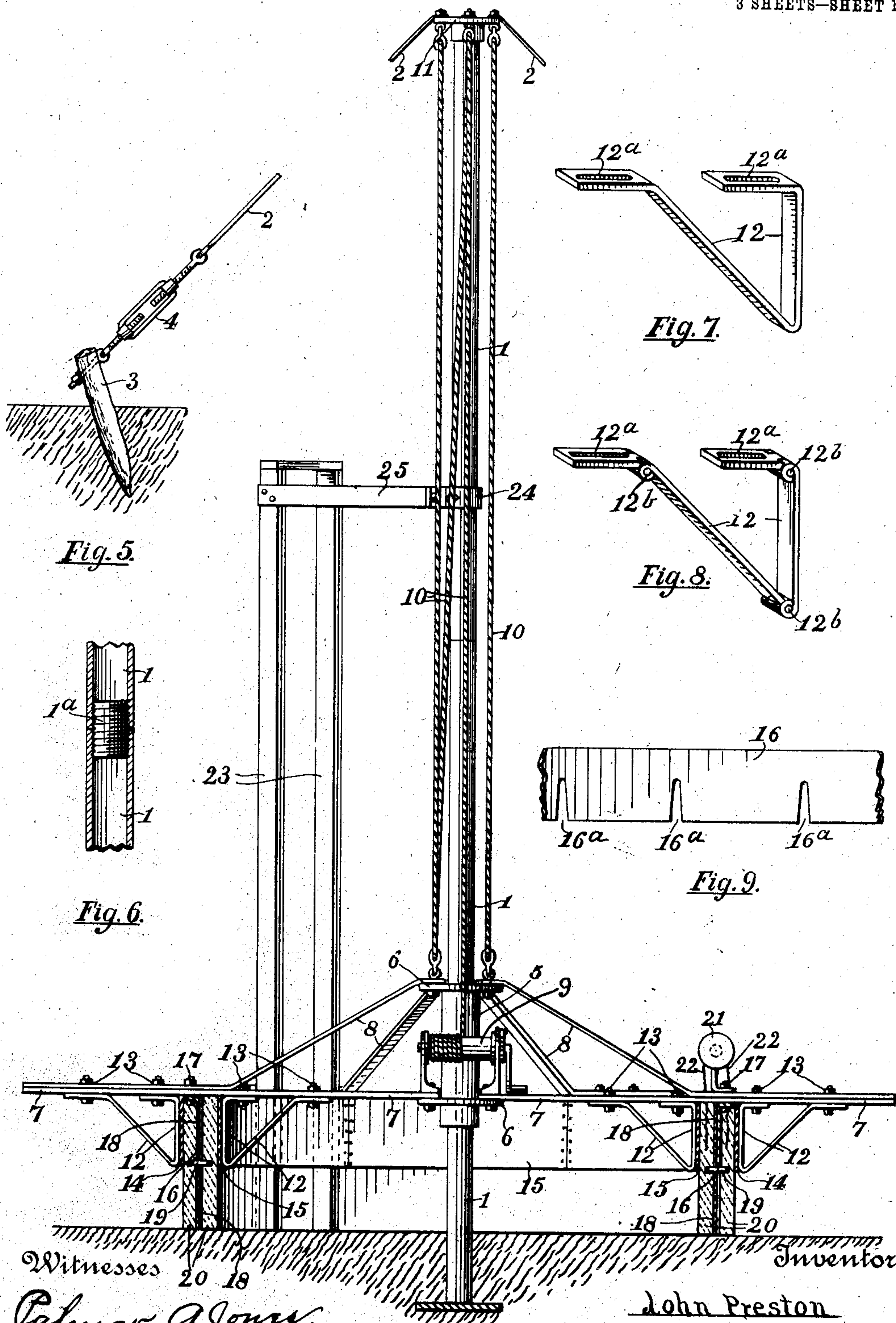
No. 833,894.

PATENTED OCT. 23, 1906.

J. PRESTON.
MOLD FOR CONCRETE STRUCTURES.

APPLICATION FILED OCT. 9, 1905.

3 SHEETS—SHEET 1.



Witnesses
Palmer Agnew.
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Fig. 1

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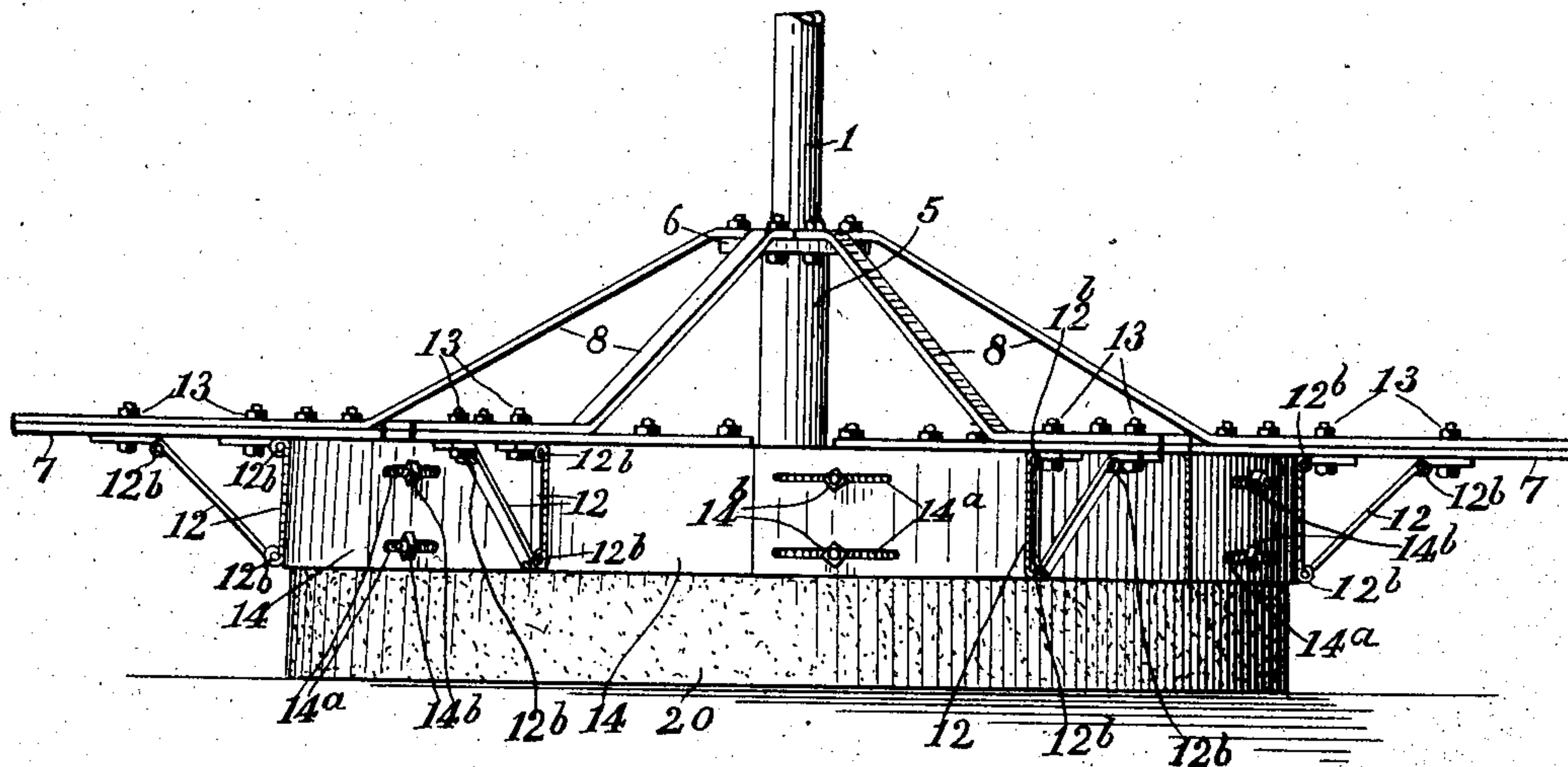


Fig. 3.

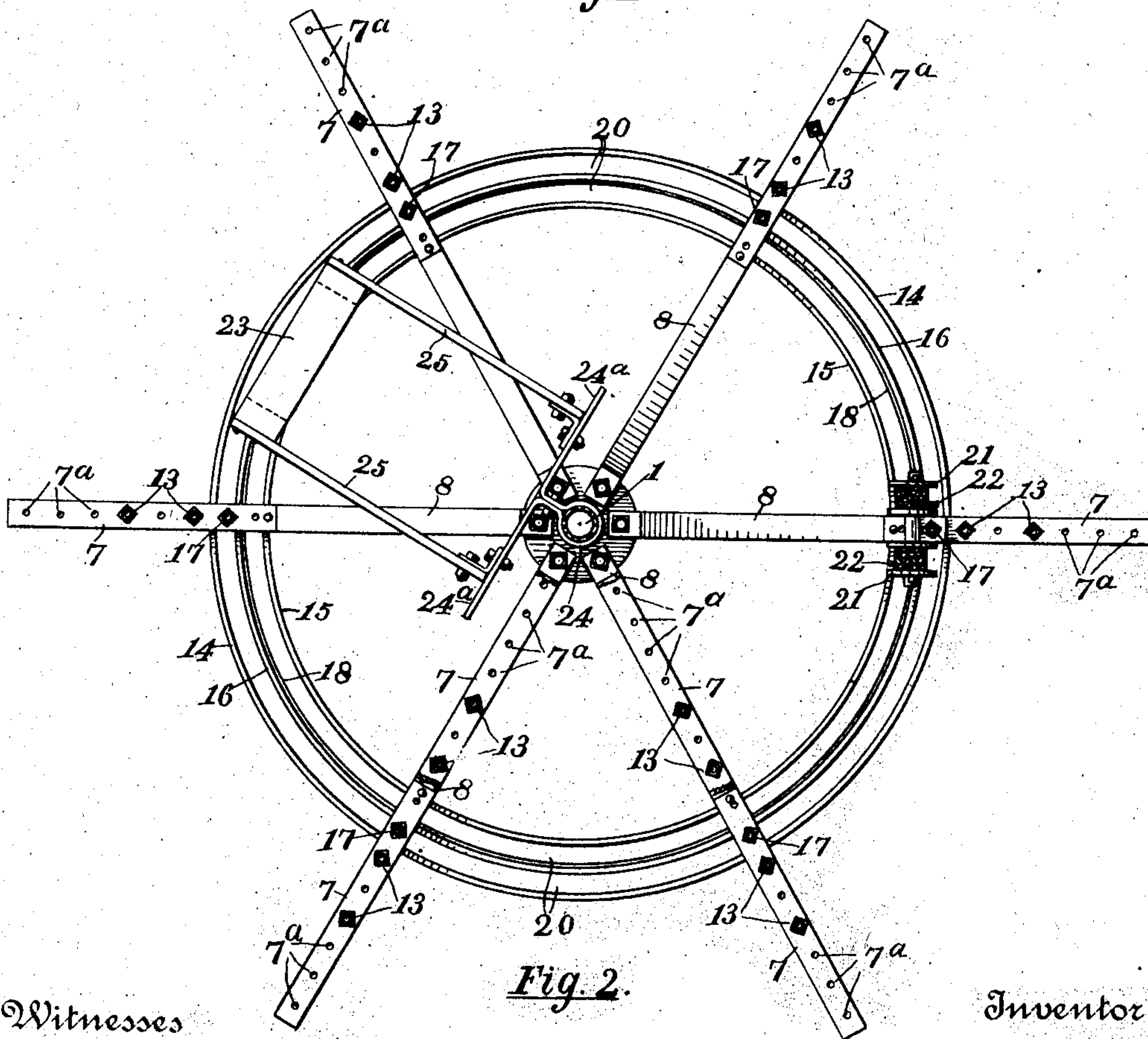


Fig. 2.

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3 SHEETS—SHEET 3.

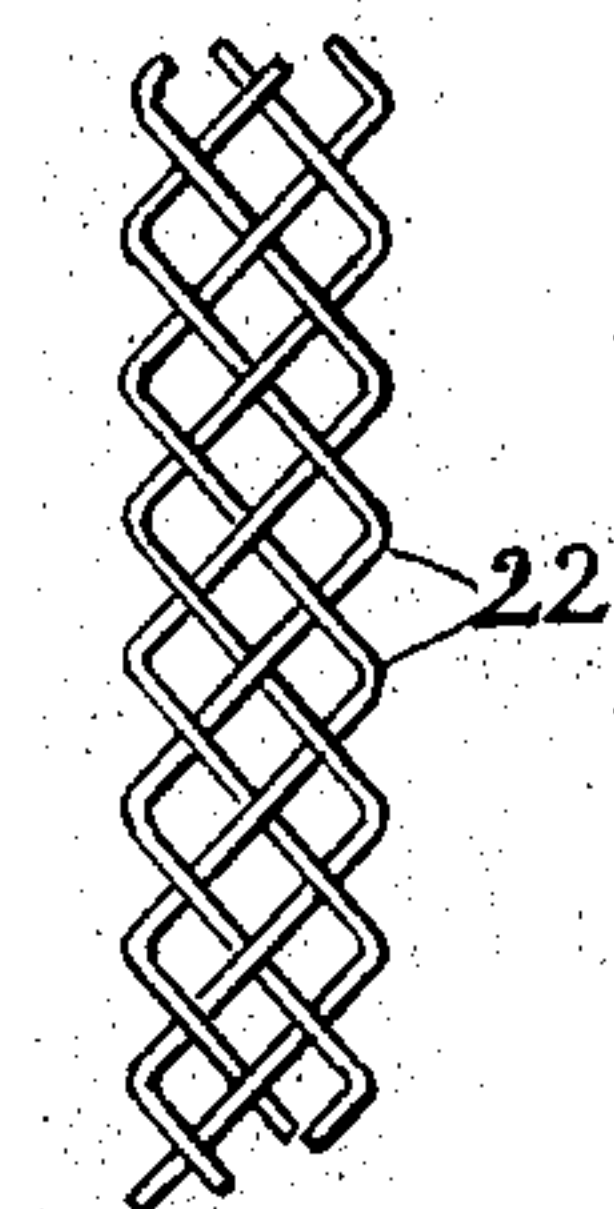


Fig. 12

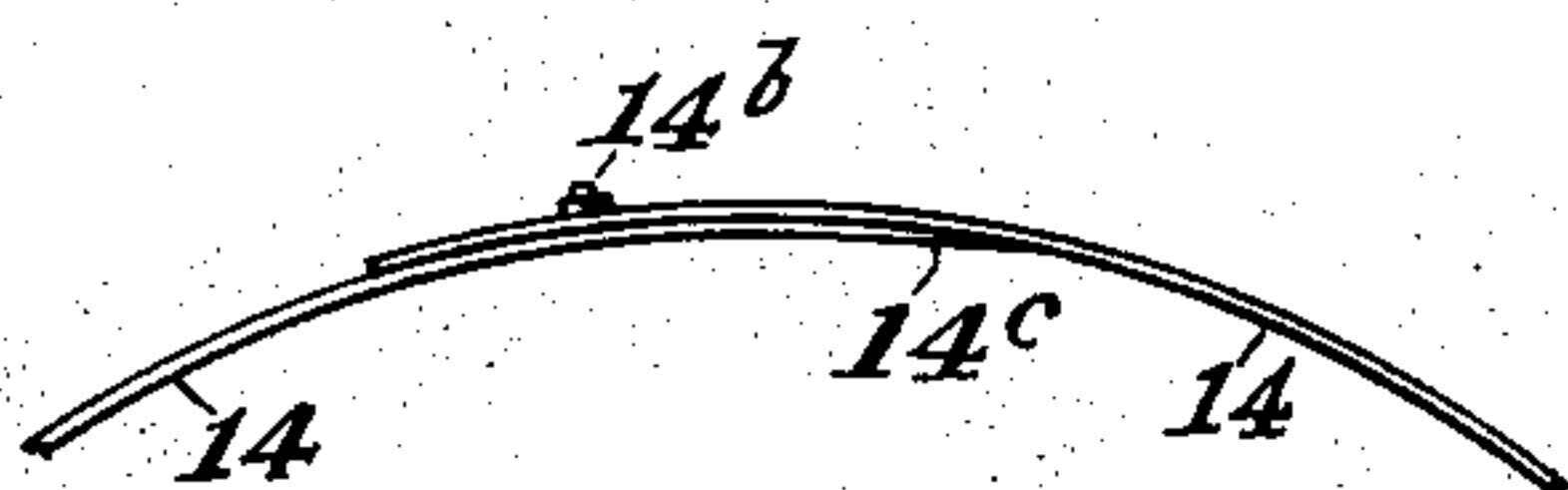


Fig. 13

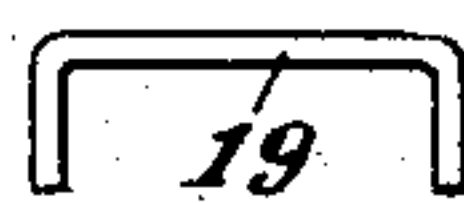


Fig. 14

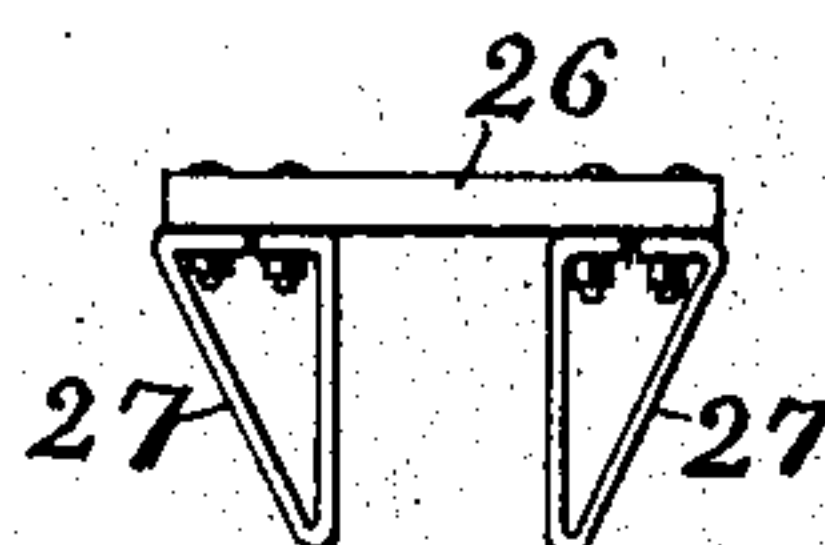


Fig. 11

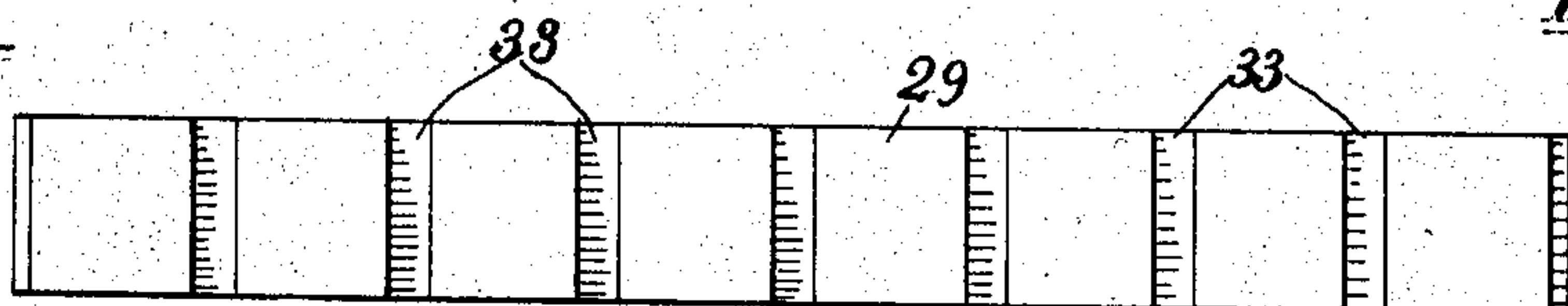


Fig. 10

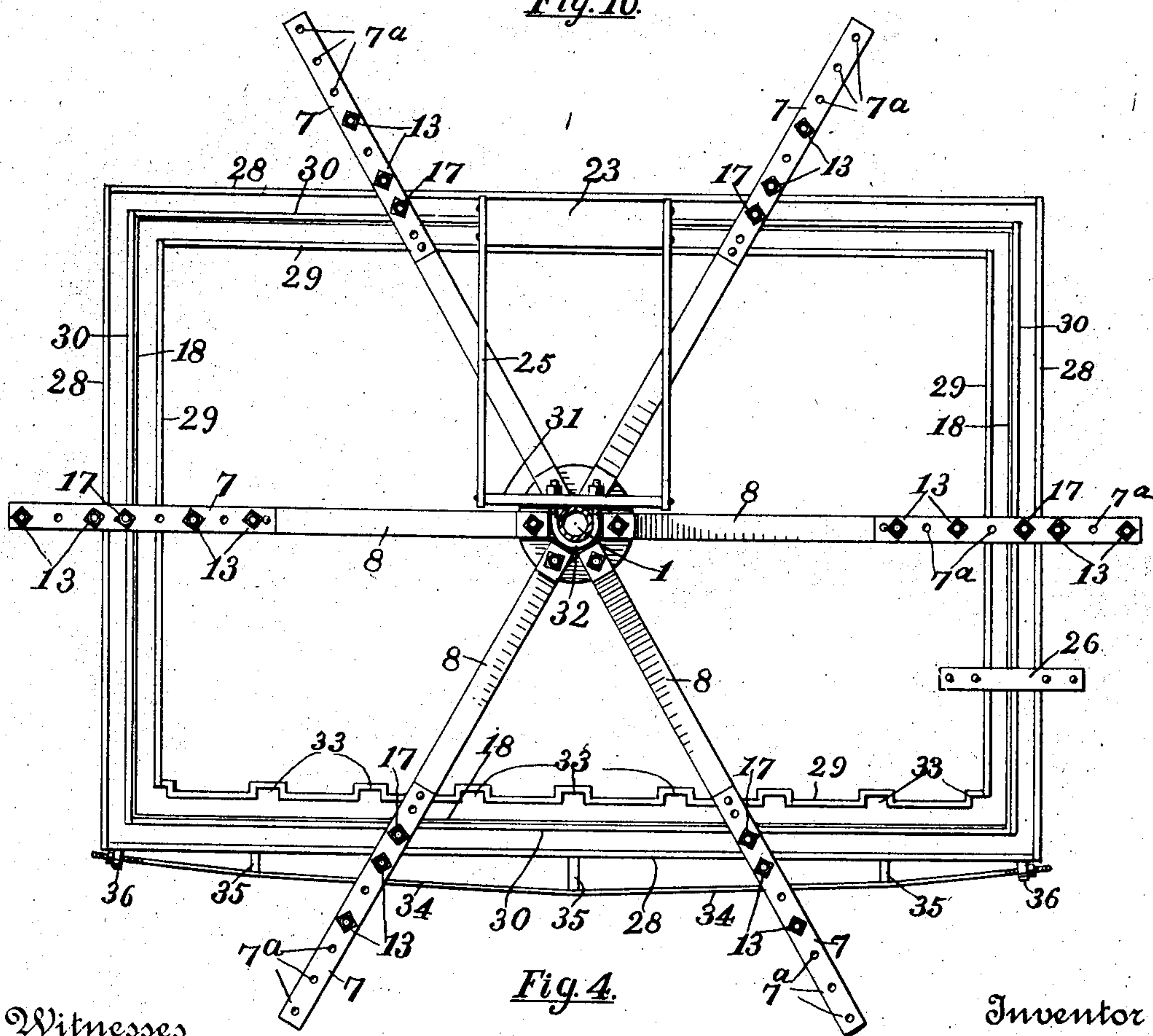


Fig. 4

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN PRESTON, OF WALKER TOWNSHIP, KENT COUNTY, MICHIGAN.

MOLD FOR CONCRETE STRUCTURES.

No. 833,894.

Specification of Letters Patent.

Patented Oct. 23, 1906.

Application filed October 9, 1905. Serial No. 281,946.

To all whom it may concern:

Be it known that I, JOHN PRESTON, a citizen of the United States, residing in the township of Walker, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Molds for Concrete Structures; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in molds for concrete structures; and its object is to provide a device adapted to form either circular or angular structures with either tapered or vertical walls and to provide the device with various new and useful features hereinafter more fully described, and particularly pointed out in the claims.

My invention consists, essentially, of the combination and arrangement of a mast supported in the axis of the structure, a sleeve vertically movable on the mast and guided thereby, arms extending outward from the sleeve and attached thereto, molds adjustably connected to the arms, means for raising and supporting the sleeve, arms, and molds step by step as the work progresses, and in various details of construction and arrangement, as hereinafter more fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention with portions in vertical section; Fig. 2, a plan view of the same with parts broken away; Fig. 3, a side elevation of a modified structure for forming tapered walls; Fig. 4, a plan view of the device adapted for square structures; Fig. 5, a detail of the anchorage and adjustment of the guys; Fig. 6, a detail of a splice or joint in the mast; Fig. 7, a detail in perspective of a bracket used in forming vertical walls; Fig. 8, the same of a bracket used in forming inclined walls; Fig. 9, a detail of the middle mold; Fig. 10, an elevation of the inner mold adapted for inserting studding in the wall; Fig. 11, a detail of a detachable clamp for holding the molds; Fig. 12, a detail of the material forming the vertical bond; Fig. 13, a detail of the lap-joint in the molds for inclined walls, and Fig. 14 a detail of one of the horizontal bonds.

Like numbers refer to like parts in all of the figures.

1 represents the mast, preferably formed of tubular sections joined by an inner coupling 1^a, screw-threaded and inserted in the abutting ends of the mast-sections. 2 represents guys connected to the upper end of the mast and extending radially outward and downward therefrom to adjust and support the mast in vertical position; 3, anchor-stakes for the guys; 4, turnbuckles for adjusting and tightening the guys whereby the mast is adjusted vertically and rigidly held in a vertical position. 5 represents a sleeve provided near its respective ends with flanges 6 and slidable on the mast; 7, radial arms, six being shown, but the number may be more or less, said arms being attached to the lower flange 6 and extending outward therefrom to any desired distance, according to the dimensions of the structure to be formed.

8 represents braces extending from the upper flange 6 to the arms 7 to hold the same securely in a horizontal plane. 9 is a windlass journaled in hangers mounted on the lower flange, upon which windlass is wound a hoisting-tackle 10, connected at its lower end to the sleeve 5 and at its upper end to a cap 11, mounted on the top of the mast, to which cap the guys 2 are attached.

Brackets 12 are adjustably attached to the under side of the arm 7 by means of bolts 13, which extend through elongated openings or slots 12^a in the brackets and through openings 7^a in the arms 7, these openings being provided at frequent intervals, whereby the brackets may be radially adjusted at any desirable position on the arm 7. For walls having vertical surfaces these brackets are preferably made rigid and rectangular, as in Fig. 7, and are adjusted with their vertical members parallel and spaced apart to embrace the molds, which for circular work consist of an outer band 14 and an inner band 15 of less radius. These are attached to and supported by brackets 12 and engage the inner and outer surfaces of the vertical wall 20, which is molded therebetween. To form a hollow wall and insert non-conducting material, a third or middle band 16 is provided and placed midway between the bands 14 and 15, flanged at the top beneath each arm 7 and secured thereto by bolts 17. This middle band supports the lining 18, preferably of some non-conducting material, such as building-paper, which lining may be placed on one or both sides of the band 16, as

preferred, and remains within the wall after the mold has been withdrawn.

Bonding-irons 19, Fig. 14, preferably consisting of short pieces of rod 19, bent at right angles near each end, are inserted to tie the walls, and to permit of such insertion the middle hoop 16 is recessed or slotted at its under side to near the middle thereof, as shown in Fig. 9 at 16^a. 20 represents a partially-constructed circular wall of concrete in process of construction. In some instances it is desirable to further strengthen the wall by inserting therein bonding material arranged vertically. For this purpose I prefer to use a flat braided wire structure 22, as shown in Fig. 12, and to insert this within the wall I provide a number of reels 21, supported by brackets mounted on the arms 7, and on each reel is wound a supply of said woven-wire material, which is automatically unwound therefrom as the molds are raised step by step to form the structure.

23 represents a casing for an opening in the side of the structure, which may be a door or window casing, as occasion may require, and as many may be inserted as deemed necessary. To support this casing, I provide a clamp 24, vertically adjustable on the mast 1 and having oppositely-extending arms 24^a, to which are attached at one end stays 25, their other ends being attached to the casing 23. For this purpose I prefer, however, to use a device such as shown in Fig. 4, in which a horizontal bar 31 is adjustably secured to the mast by a clip 32 and the stays 25, secured to the respective ends thereof and to the casing, as shown.

In Fig. 3 is illustrated a modification whereby a wall with an inclined surface may be formed, in which the brackets 12 are provided with hinge-joints 12^b at their respective angles, whereby the vertical member of each bracket may be adjusted at any desired inclination from the true vertical position. To adapt the bands to assume an inclined position and also to adjust them to different diameters as the work progresses, they are divided vertically in sections, with the ends overlapping each other, preferably one section to each arm 7, and the outer overlapping portions are provided with longitudinal slots 14^a, in which are bolts 14^b, adjustable therein and having countersunk heads within the inner overlapping portion of the band. Fig. 4 shows a modified mold to be used in connection with my device for making structures with angular walls, the form shown being adapted for a rectangular structure of parallelogram form. The respective three members of the mold represented by 28, 29, and 30 in this case are straight instead of curved and connected in any convenient manner at the corners.

For the purpose of inserting studding or strips of wood at intervals, which may be

partially embedded in the inner surface of the wall, I provide a modified inner member 29, having vertical channels or recesses 33 at regular intervals, in which said strips of wood or studding can be inserted and left partially embedded in the wall. To retain these straight molds from spreading, I may employ clamps composed of short beams 26, resting across the top of the molds and having rectangular brackets 27 attached thereto to embrace the molds and hold the same from spreading. These clamps present some obstructions in filling the mold, and in some cases I prefer to use truss-rods instead, as in Fig. 4, where 36 represents eyebolts in the respective ends of the mold member 28, through which eyebolts extends a rod 34, which engages struts or braces 35, placed at intervals between the rod and the side of the mold, whereby the mold is supported without obstructing the filling of the same. Obviously the middle members 16 and 18 may be omitted and a solid wall formed.

My device can be used for forming a great variety of structures, either angular or circular, and more particularly such structures as silos, chimneys, stand-pipes for water, various angular buildings, and other like structures.

In the event that the brackets shown in Fig. 7 are used a strictly vertical wall is insured, as the molds are guided upward accurately step by step by the mast. In case the brackets of Fig. 8 are used and the brackets adjusted to form a tapered wall the mast also insures accurate adjustment step by step, it being only necessary to move the brackets inward and adjust the overlapping portions of the mold to conform to the reduction in diameter as the structure rises.

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

1. The combination of a mast, means for supporting and adjusting the mast, a sleeve vertically movable on the mast, radial arms attached to the sleeve, molds attached to the arms, and hoisting-tackle for vertically adjusting the sleeve.

2. The combination of a mast divided transversely, internal couplings connecting the section of the mast, guys supporting the mast, turnbuckles in the guys, a sleeve vertically movable on the mast, hoisting-tackle supporting the sleeve, radial arms attached to the sleeve and supported thereby, brackets attached to the arms, and molds attached to the brackets.

3. The combination of a mast, a cap on the mast, guys attached to the cap, a sleeve movable on the mast, upper and lower flanges on the sleeve, radial arms attached to the lower flange, braces connecting the arms with the upper flange, hoisting-tackle connecting the sleeve with the cap, a windlass journaled in

the hangers mounted on the sleeve, and molds attached to the arms.

4. The combination of a mast, a cap on the mast, guys attached to the cap at one end and to anchors at the other end, turnbuckles in the guys, a sleeve vertically movable on the mast, upper and lower flanges on the sleeve, radial arms attached to the lower flanges, braces connecting the upper flange and the arms, a windlass mounted on the sleeve, hoisting-tackle connecting the sleeve and cap and wound upon the windlass, brackets attached to the arms, and molds attached to the brackets.

5. The combination of a mast, means for supporting the mast, a sleeve vertically adjustable on the mast, radial arms attached to the sleeve, inner and outer brackets radially adjustable on the arms, inner and outer molds attached to the brackets, and a middle mold attached to the arms.

6. The combination of a mast, a sleeve vertically adjustable on the mast, radial arms attached to the sleeve, inner and outer molds connected to the arms, and a middle mold also connected to the arms and having recesses in its lower edge to receive bonding-irons.

7. The combination of a mast, a sleeve vertically adjustable on the mast, radial arms attached to the sleeve, inner and outer molds connected to the arms, and reels mounted on the arms to supply vertical

bonding material to the walls formed by the molds.

8. The combination of a mast, means for supporting the mast, a sleeve vertically movable on the mast, radial arms attached to the sleeve, brackets radially adjustable on the arms and having hinges at their respective angles, and molds supported by brackets, said molds being formed of overlapping sections, slots in the outer overlapping portions of the molds, and bolts in the inner overlapping portions and adjustable in the slots.

9. The combination of a mast, means for supporting the mast, a sleeve vertically adjustable on the mast, radial arms attached to the sleeve, molds supported by the arms, a transverse bar engaging one side of the mast, a clip in the bar and oppositely engaging the mast, stays attached to the bar and extending outward to support a casing.

10. The combination of a mast, a sleeve vertically adjustable on the mast, radial arms attached to the sleeve, inner and outer molds connected to the arms, one of said molds having vertical recesses at intervals to receive studding or strips.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN PRESTON.

Witnesses:

LUTHER V. MOULTON,
PALMER A. JONES.