

No. 670,884.

Patented Mar. 26, 1901.

M. L. KNAPP.

MECHANISM FOR CONVERTING MOTION.

(Application filed Dec. 22, 1900.)

(No Model.)

2 Sheets- Sheet 1.

Fig. 1.

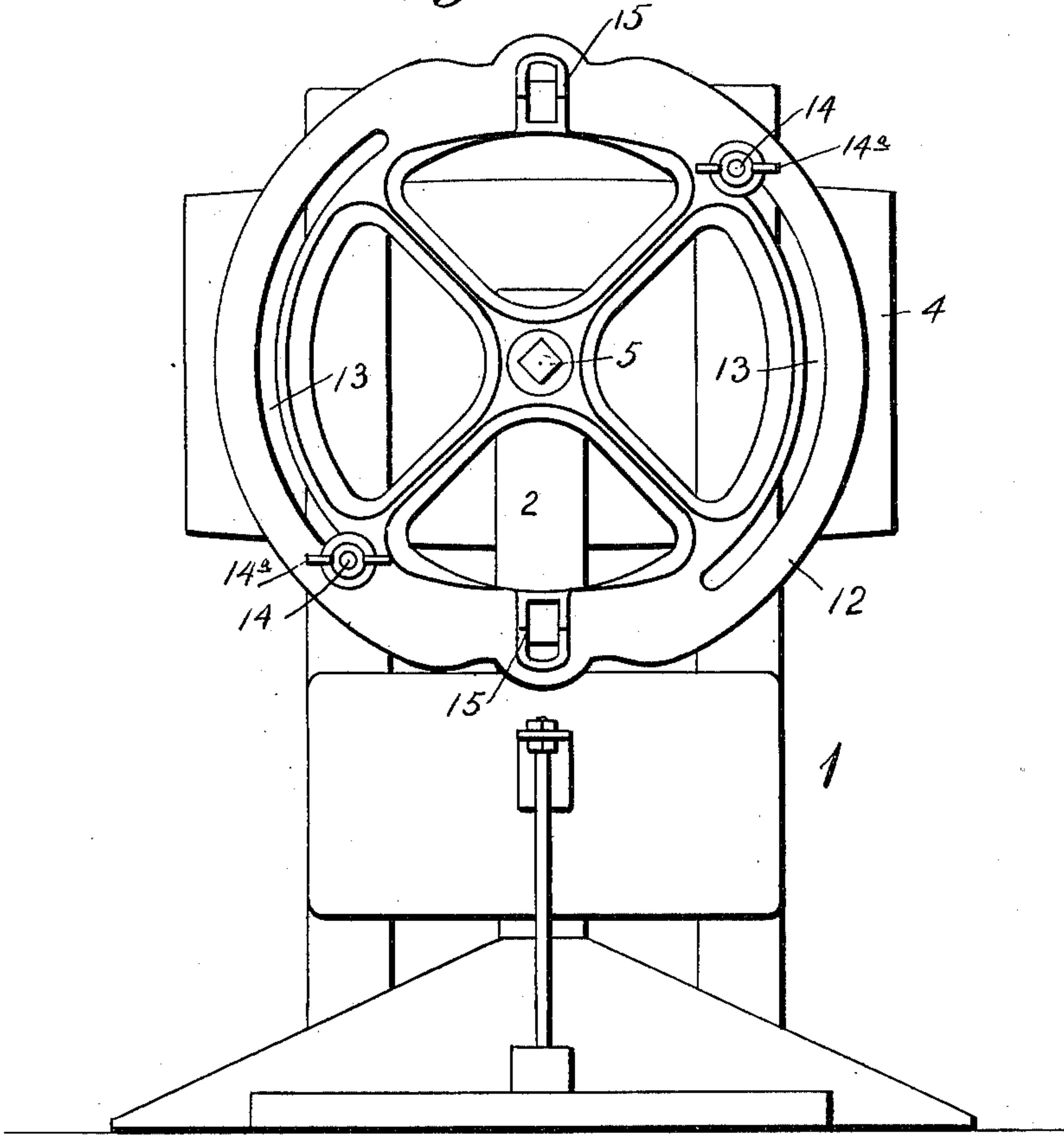


Fig. 5.

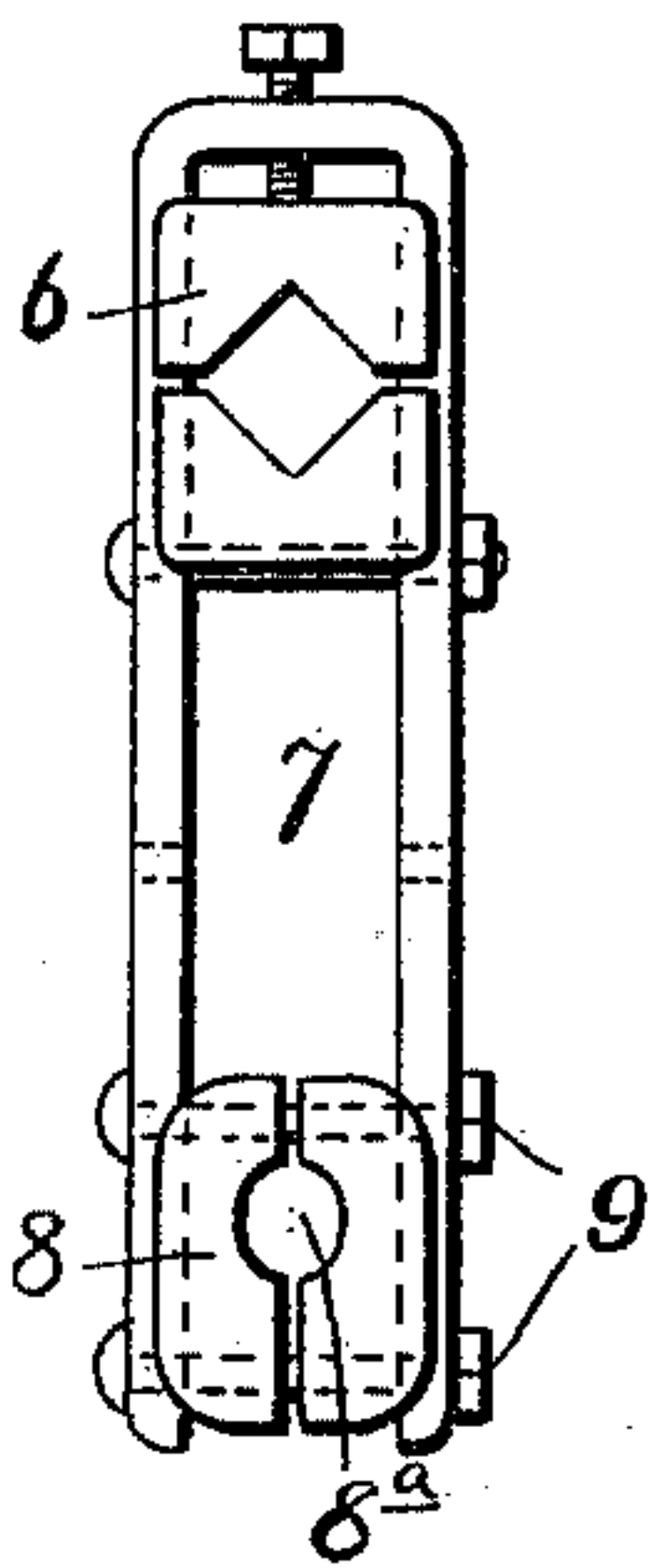


Fig. 4.

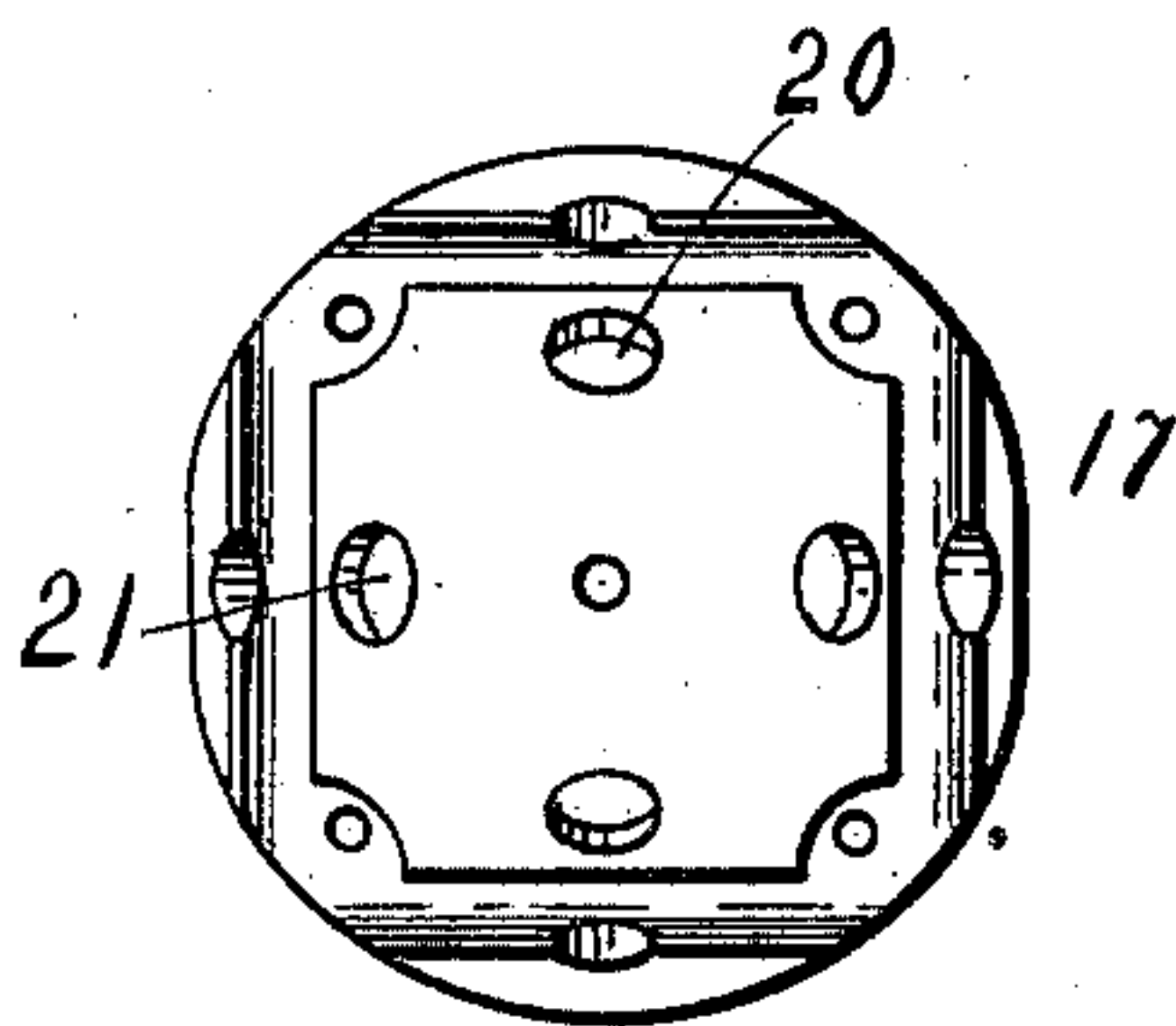


Fig. 7.

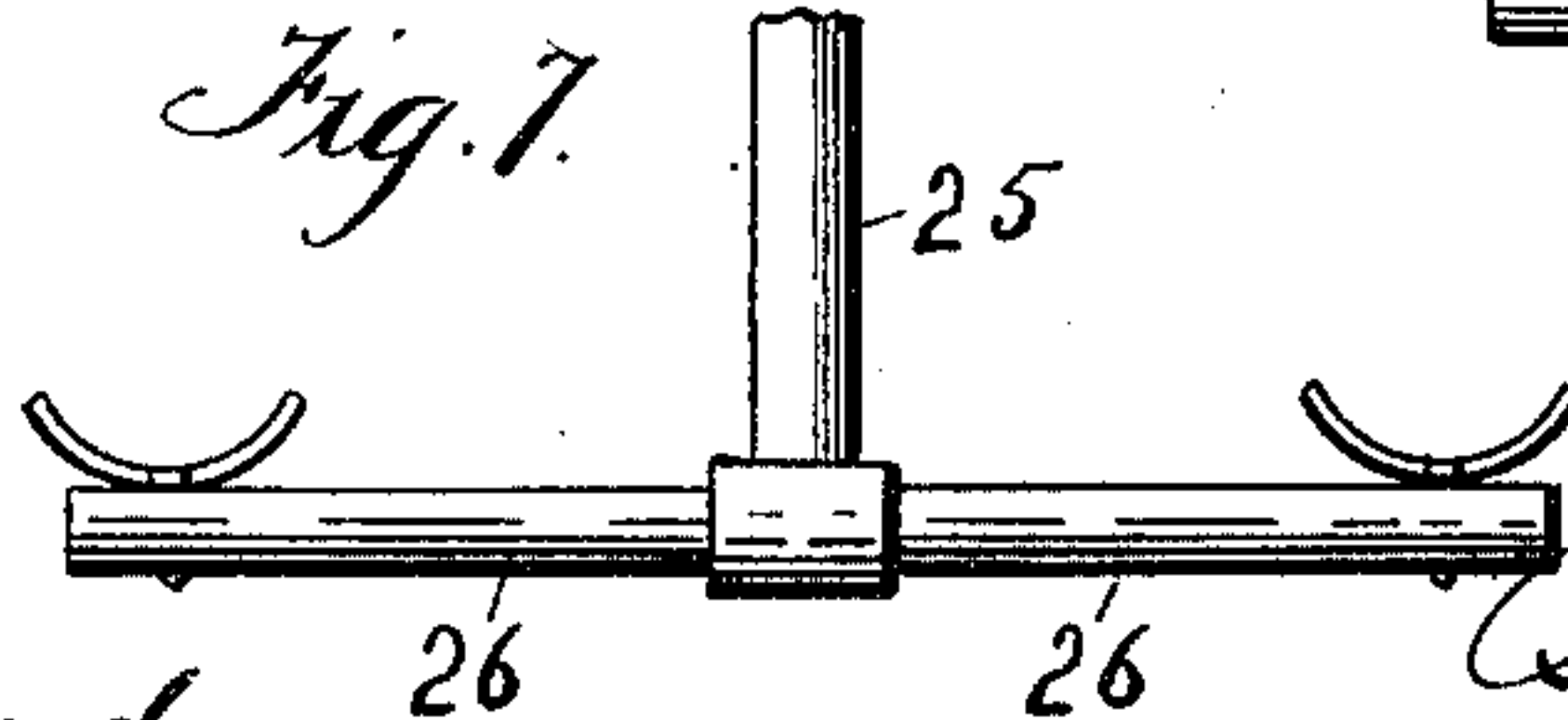
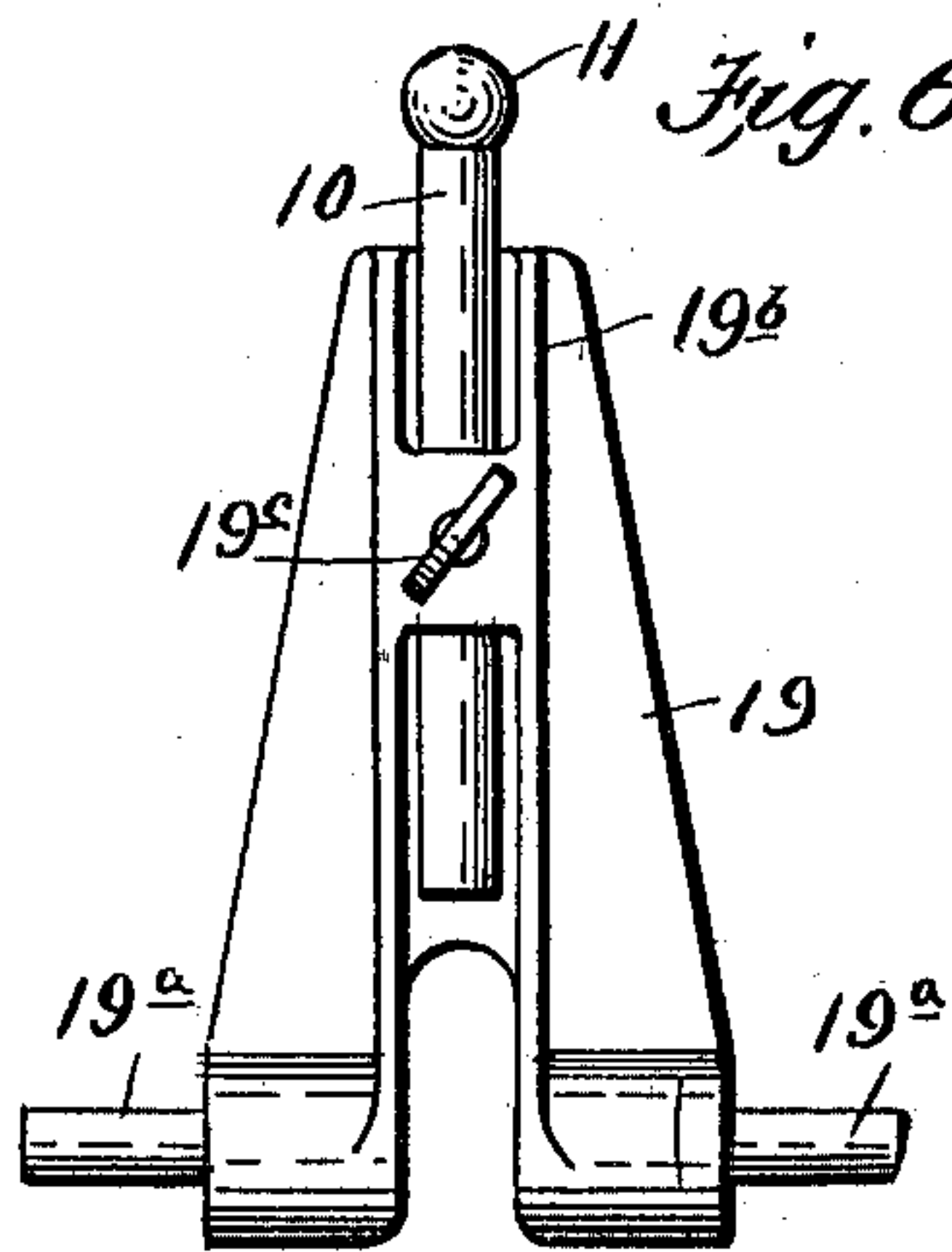


Fig. 6.



Witnesses:  
Frank L. Ourand,  
St. G. Radelfinger.

Inventor:  
Merton L. Knapp,  
By Law. Saggitt & Co.,  
Attorneys.

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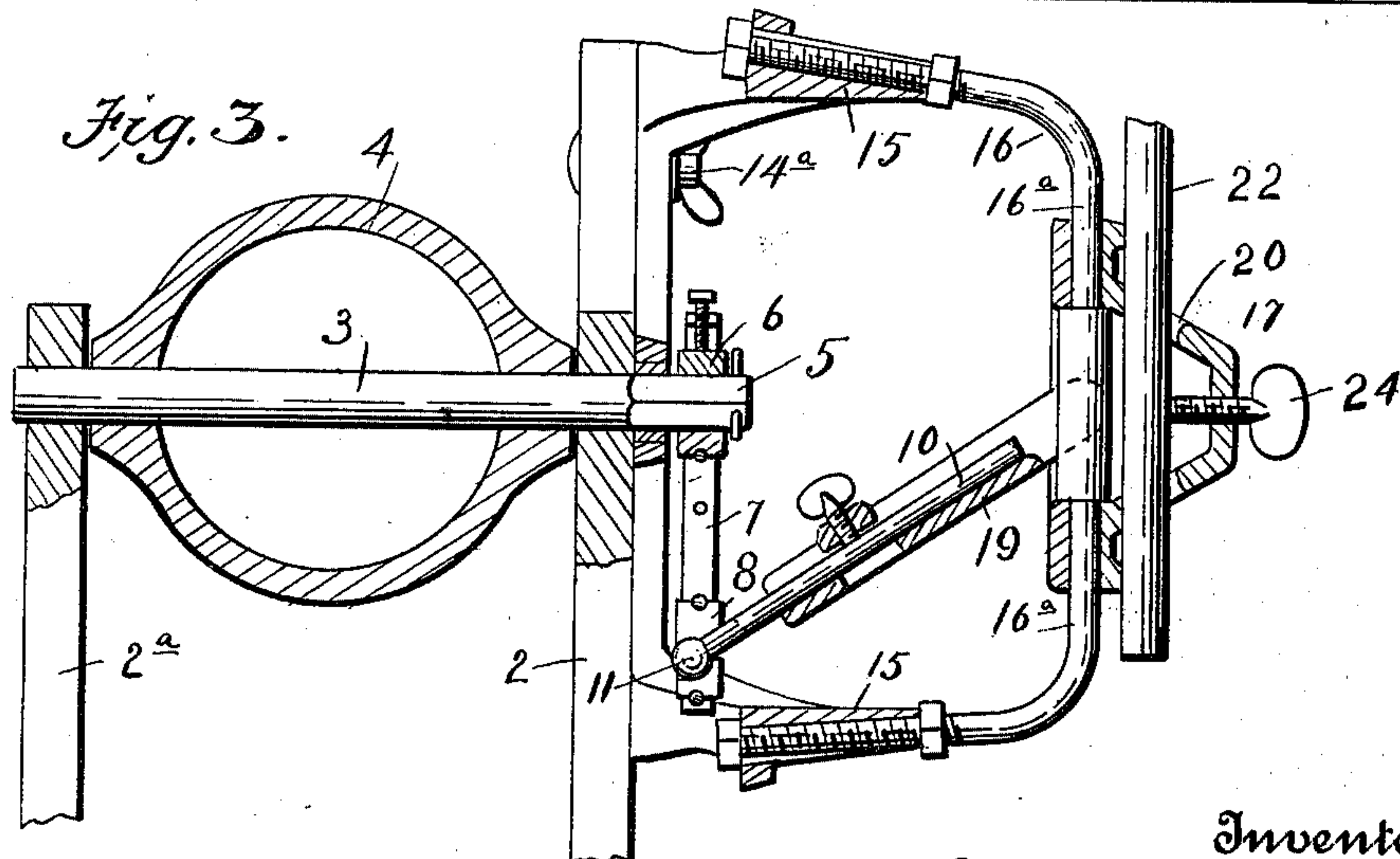
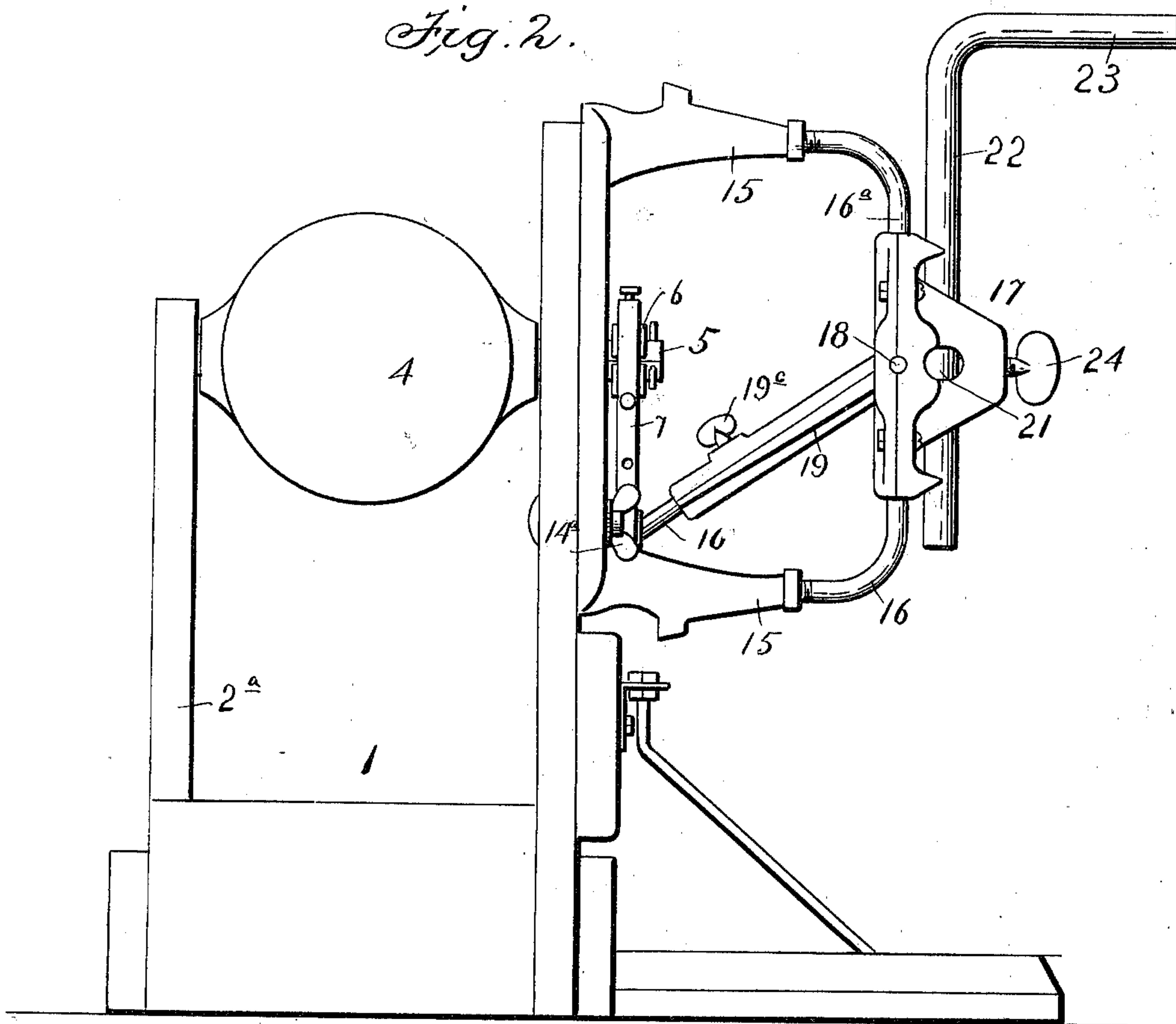
**M. L. KNAPP.**

## MECHANISM FOR CONVERTING MOTION.

(Application filed Dec. 22, 1900.)

(No Model.)

**2 Sheets—Sheet 2.**



Witnesses:  
Frank L. Orvand  
H. G. Radelfinger.

Inventor:  
Merton L. Knapp  
By Law Suggs & Co.,  
Attorneys



# UNITED STATES PATENT OFFICE.

MERTON L. KNAPP, OF VALPARAISO, INDIANA.

## MECHANISM FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 670,884, dated March 26, 1901.

Application filed December 22, 1900. Serial No. 40,709. (No model.)

*To all whom it may concern:*

Be it known that I, MERTON L. KNAPP, a citizen of the United States, residing at Valparaiso, in the county of Porter and State of Indiana, have invented new and useful Improvements in Mechanisms for Converting Motion, of which the following is a specification.

My invention relates to motion-converting mechanism; and the objects of the same are to provide simple and inexpensive mechanism for converting a reciprocating motion into a rotary motion and to provide means for changing the plane of the operating-lever from a horizontal to a vertical position and to give either a long arm to the lever or two short arms, one on each side of its fulcrum.

Another object is to provide convenient and efficient mechanism for operating a churn, grindstone, honey-extractor, or other machine of like character by hand and to provide means whereby the operating handle or lever may be readily changed to occupy a different plane of movement and to be adjustable in length, so that a person operating the machine may either sit or stand and may use either one or both hands and may change the direction of movement necessary to operate the machine.

I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a mechanism made in accordance with my invention with parts removed. Fig. 2 is a side elevation of the complete machine. Fig. 3 is a sectional view taken through the lever-support, oscillator, and crank. Fig. 4 is a detail of the oscillating disk for the operating-lever. Fig. 5 is a detail of the crank. Fig. 6 is a detail of the T member and connecting-rod. Fig. 7 is a fragmentary detail of the treadle.

Like numerals designate like parts wherever they occur in the different views.

The numeral 1 designates a frame for supporting a churn or similar device, and 2 2<sup>a</sup> are the standards or uprights in which the main shaft 3 is journaled.

The numeral 4 designates a rotary churn; but it will be understood that any device to which a rotary motion is to be imparted may be substituted for the churn shown. The

shaft 3 extends beyond the standard 2 and is squared on its end at 5. A sliding clamp 6, which is mounted in a frame 7, grips the end of the shaft 3. The frame 7 forms the crank for operating the churn or other device. This frame is U-shaped and has a segmental socket member 8 slidingly mounted between its parallel arms. Means for clamping the member 8 in place is provided by two transversely-extending bolts 9, and by setting these bolts in different positions the length of the crank, and therefore the leverage of the machine, is regulated. A connecting-rod 10, which has a ball 11 formed integral with the end thereof, extends through the socket 8<sup>a</sup> in the member 8, which socket is rounded out on its under side to accommodate this ball 11. This combination of the rounded socket 8<sup>a</sup> and ball 11 forms a universal joint, which may be taken apart by removing the bolts 9.

Supported on the uprights 2 of the motor-frame is a circular frame 12, which is cut by two circular slots 13. Projecting through these slots 13 are two bolts 14, which are secured in the uprights 2 2<sup>a</sup> and are fitted with thumb-screws 14<sup>a</sup>. It will be noted that this construction renders the adjustment of the frame 12 possible after loosening the thumb-screws 14<sup>a</sup>. Two longitudinally-apertured arms 15 are formed integral with the frame 12, which arms support a yoke 16, which in turn supports an oscillating disk 17, which I shall term for convenience an "oscillator." This oscillator 17 is pivoted on the cross-bar 16<sup>a</sup> of the yoke, and is thereby constrained to turn about this for an axle. Pivotaly mounted in apertures 18, extending at right angles to the cross-bar 16<sup>a</sup>, is a T-shaped member 19, the arms 19<sup>a</sup> of which fit the aperture 18, while the stem 19<sup>b</sup> is longitudinally bored, and thus serves to accommodate the connecting-rod 10, which traverses this bore and is adjustably secured therein by a set-screw 19<sup>c</sup>, seated in the stem 19<sup>b</sup>. The oscillator 17 is pierced by two apertures 20 and 21, which extend parallel to and at right angles, respectively, to the cross-bar 16<sup>a</sup>. A handle 22, provided with an arm 23, can be inserted in either of the apertures 20 or 21 and clamped by a set-screw 24. By employing this handle 23 the oscillator can be actuated and the mo-



tor operated. By making use of the thumb-screws 14<sup>a</sup> the frame 12 can be adjusted and the handle made to assume any position. Instead of a handle I may use a treadle, Fig. 7, which is nothing more than a straight bar 25 with two oppositely-extending arms 26 at the lower end. Each of the arms 26 is provided with a foothold or stirrup. By inserting this bar 25 in the aperture 20, clamping it tight by means of the screw 24, the motor may be operated by placing one foot in each stirrup and then pushing first on one foot and then on the other.

It is pertinent to remark that for efficient operation the point of intersection of the stem 19<sup>b</sup> with the arms 16<sup>a</sup> must be in the prolongation of the shaft 3. A very little deviation from this position would cause the motion to be irregular and the mechanism to bind. Another way of stating it is that the stem 16<sup>b</sup> must describe a right cone and the dead-center must be at the vertex of said cone and in line with the line of zero rotation of the shaft 3—that is, the geometrical axis of the cylinder forming the shaft 3.

In operating my motor the handle is grasped by the arm 23, which is then rocked back and forth in a horizontal plane. This motion is communicated to the oscillator 17, which turns about the axis formed by the cross-bar 16<sup>a</sup> of the yoke. The reciprocating motion of the oscillator is then communicated to the crank-arm 7 through the medium of the T-shaped member 19, which serves as a connecting-rod, and the shaft 3 is rotated in either direction, as desired.

From the foregoing it will be obvious that a motor made in accordance with my invention is simple in construction, inexpensive to manufacture, and is very convenient and ef-

ficient in use, permitting many changes in direction of movement of the lever, and thus relieving the monotony of a constant rotary movement of the hand of the operator.

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

1. In a motion-converting mechanism, the combination of a yoke having a cross-bar, an oscillator pivoted on the cross-bar of said yoke, a shaft provided with a crank, a connecting-rod pivoted at one end to said oscillator on pintles placed at right angles to the said cross-bar, and attached at the other end to said crank by a universal joint, substantially as described.

2. In a motion-converter, the combination, substantially as described, of an oscillator, a shaft provided with a crank, a T-shaped member pivoted by its arms in said oscillator, a connecting-rod mounted in the stem of said T and connected at one end to said crank by a universal joint.

3. In a motion-converting mechanism, the combination, of a shaft provided with a crank, an oscillator mounted to turn about a fixed axis, a connecting-rod connected to said crank by a universal joint and pivoted to said oscillator on pintles extending at right angles to the said axis of said oscillator, and means whereby the said oscillator may be rocked to give a movement of rotations to said shaft, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MERTON L. KNAPP.

Witnesses:

JACOB BREYFOGLE,  
F. B. PARKS.