

No. 770,920.

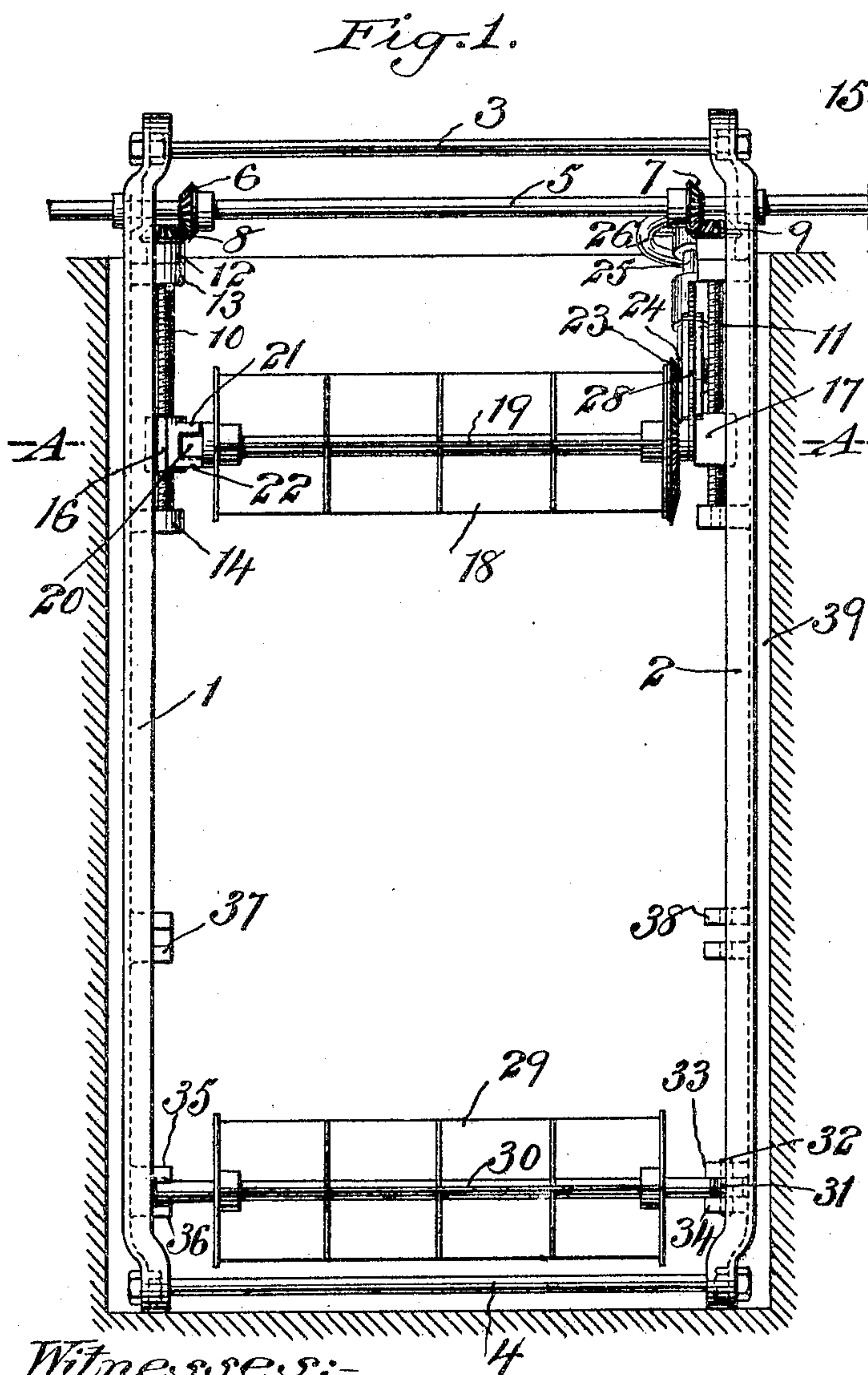
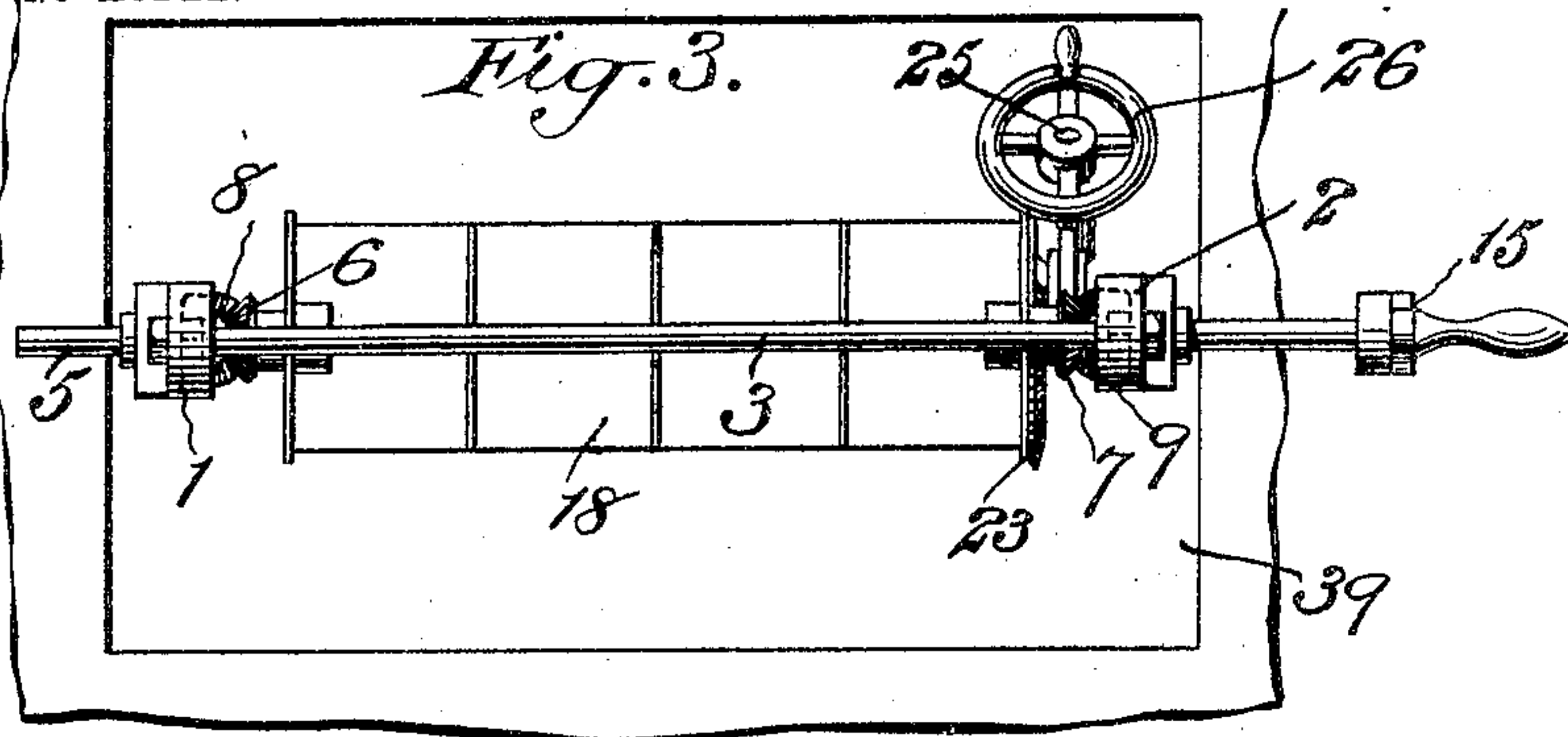
PATENTED SEPT. 27, 1904.

I. E. PALMER.  
APPARATUS FOR MERCERIZING YARN.

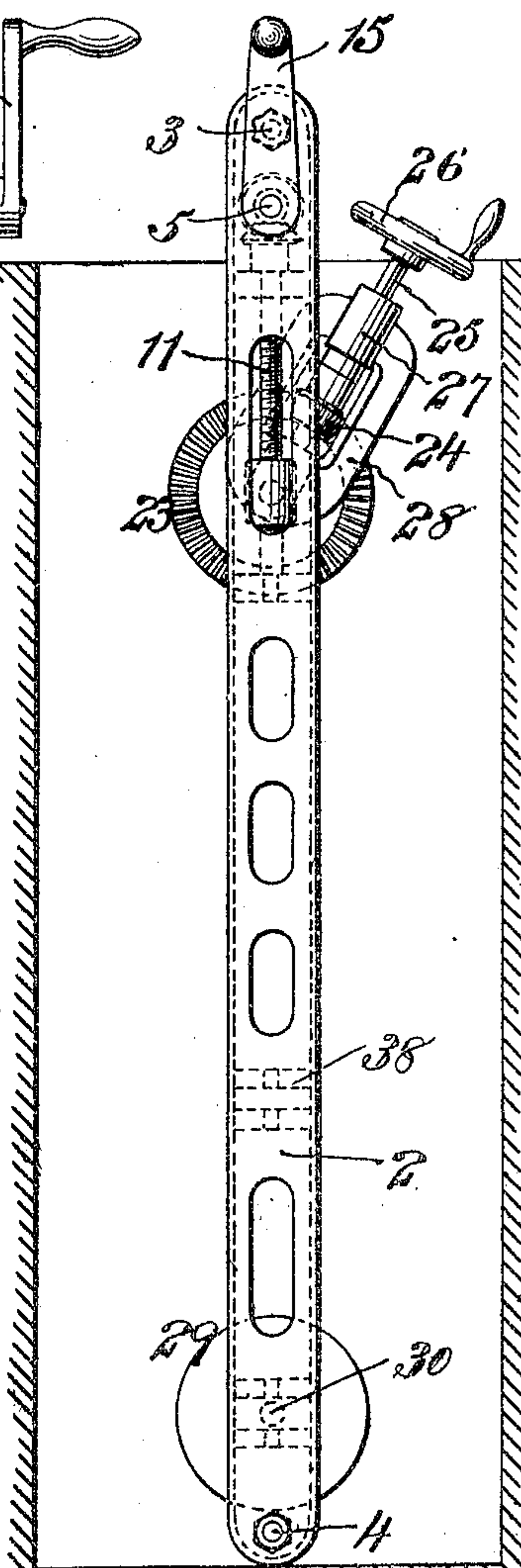
APPLICATION FILED NOV. 28, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



*Fig. 2.*



Witnesses:  
George Barry  
Henry Thiele

Inventor:  
Isaac E. Palmer  
By Brown & Dewar  
his Attorneys

No. 770,920.

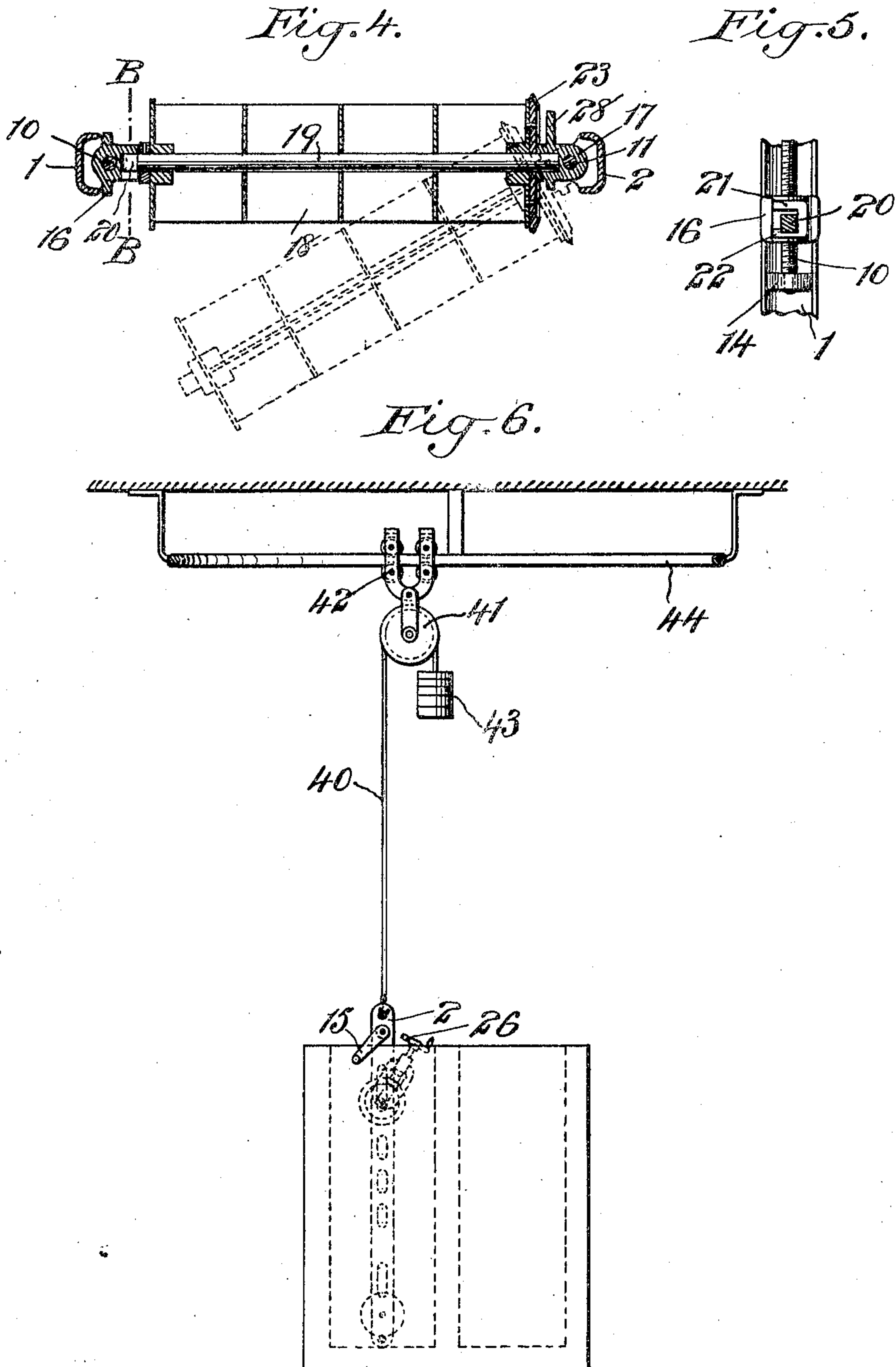
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APPARATUS FOR MERCERIZING YARN.

APPLICATION FILED NOV. 28, 1903.

NO MODEL.

3 SHEETS—SHEET 2.



Witnesses:-  
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No. 770,920.

PATENTED SEPT. 27, 1904.

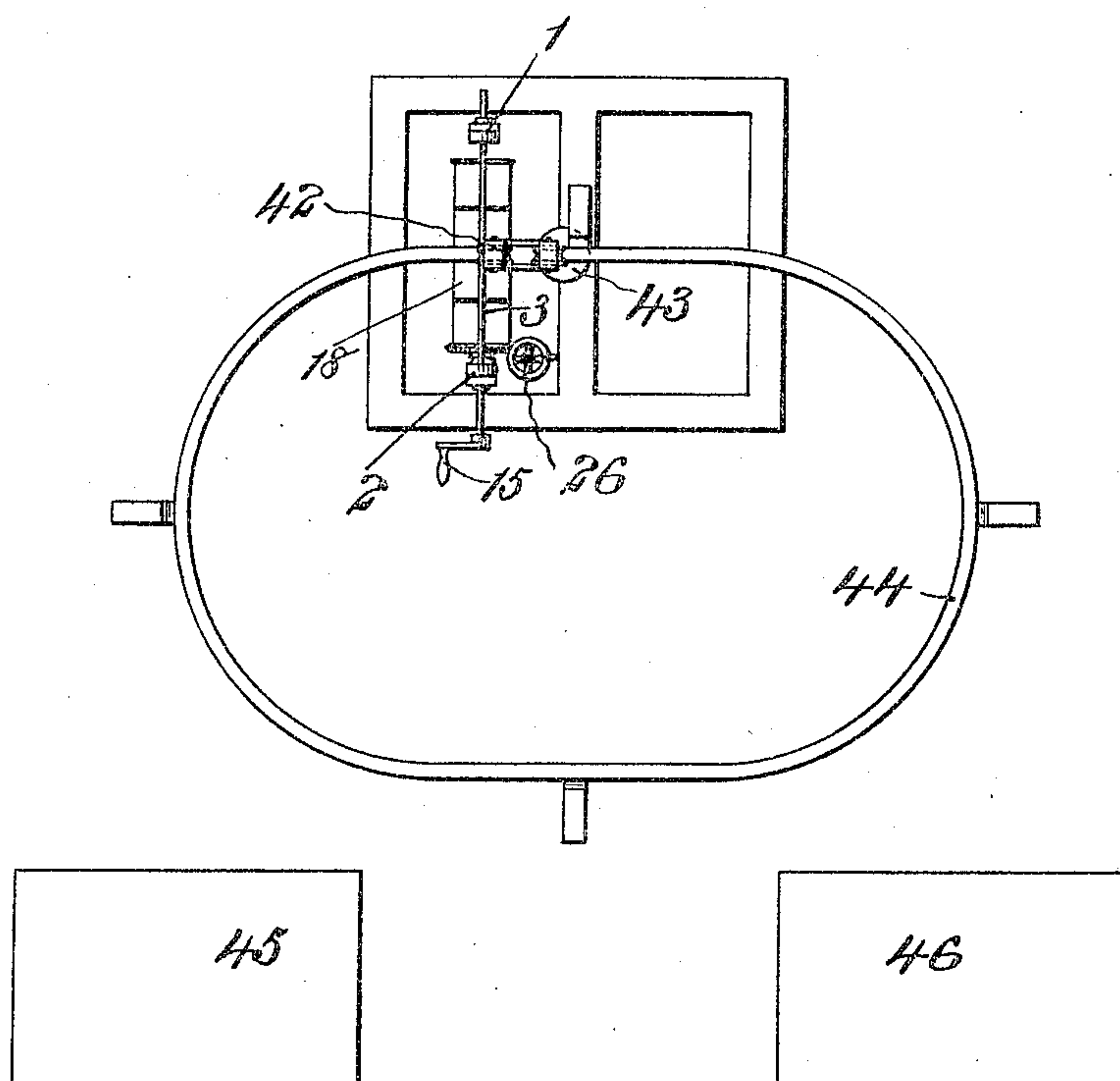
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APPLICATION FILED NOV. 28, 1903.

NO MODEL.

3 SHEETS—SHEET 3.

*Fig. 7.*



*Witnesses:*  
*F. George Barry.*  
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*Isaac E. Palmer*  
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# UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

## APPARATUS FOR MERCERIZING YARN.

SPECIFICATION forming part of Letters Patent No. 770,920, dated September 27, 1904.

Application filed November 28, 1903. Serial No. 182,978. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC E. PALMER, a citizen of the United States, and a resident of Middletown, in the county of Middlesex and State of Connecticut, have invented a new and useful Apparatus for Mercerizing Yarn, of which the following is a specification.

My invention relates to apparatus for mercerizing yarn, and more particularly to the frame for stretching and moving yarn during its dipping process and for supporting and conveying the stretching-frame.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the yarn-stretching frame in side elevation in the position which it assumes when inserted in a vat, the vat being indicated in section. Fig. 2 is an edge view of the same. Fig. 3 is a top plan view of the same. Fig. 4 is a horizontal section in the plane of the line A A of Fig. 1, showing in dotted lines one of the reels swung out into position to receive a skein of yarn. Fig. 5 is a view in detail, showing a partial vertical section in the plane of the line B B of Fig. 4. Fig. 6 represents in elevation, on a small scale, the means for counterbalancing the yarn-frame during the dipping; and Fig. 7 is a top plan view of the means for conveying the frame into and out of position over the vat.

The yarn-frame consists of a pair of vertical side bars 1 and 2, preferably made of U shape or channel form in cross-section and set with their outer faces toward each other, and top and bottom bars 3 4 for holding the side bars at the proper distance apart. A shaft 5 is journaled in the side bars near the upper ends of the same and is provided with bevel gear-pinions 6 and 7, which mesh with bevel gear-pinions 8 and 9 on screws 10 and 11, respectively. The screws 10 and 11 are swiveled in lugs fast to the faces of the side bars 1 and 2, as follows: The larger part of the screw-stem in proximity to the bevel-gear 8 passes through a lug 12, and the stem of the screw is then reduced, forming a shoulder which rests on the lug 13, through which the stem passes, the lower end of the screw being

reduced still further and working in a lug 14. In like manner the screw 11 is swiveled to the bar 2. The shaft 5 is provided with a crank 15 for rotating it, and thereby simultaneously rotating the screws 10 and 11. On the screw 10 there is a vertically-traveling nut 16, and on the screw 11 there is a vertically-traveling nut 17.

The upper reel (denoted by 18) is mounted to rotate on a spindle 19, the latter being secured at one end to the nut 17 and at its opposite end being adapted to removably engage the nut 16, so that the end of the spindle 19 with the reel thereon, which is engaged with the nut 16, may be swung away from the nut on the screw 11 as a hinge into the position shown in dotted lines in Fig. 4 to remove the skein or hank of yarn already treated and place another skein or hank of yarn on to be treated. I preferably square the end of the shaft 19 and permit it to swing between a pair of jaws or lips 21 22 on the nut 16, the face of the jaw 22 being slightly recessed to prevent the spindle from unintentional displacement. The end of the reel toward the nut 17 is provided with a bevel gear-wheel 23, which is engaged by a pinion 24, carried by a shaft 25, provided with a hand-wheel 26 for operating it and mounted in a sleeve 27, fixed to a bracket 28, carried by the nut 17.

The lower reel is denoted by 29 and is mounted to rotate on the spindle 30, hinged at one end by means of an eye 31 and pin 32 between a pair of lugs 33 34, fixed to the face of the reel 2, and at its opposite end is adapted to enter between a pair of lugs 35 36, one or both of them having their faces slightly recessed to prevent the unintentional removal of the spindle, while at the same time permitting it to be swung on its hinged connection outwardly into the position similar to that shown in dotted lines in Fig. 4. I further find it convenient to provide the side bars of the frame with one or more additional sets of lugs, in the present instance one additional set of lugs being shown (denoted by 37 38) located a distance above the set with which the lower spindle 30 is shown engaged to adapt the machine to varying sizes of skeins or hanks.



In operation the reels 18 and 29 having been swung at one end outwardly into position, such as denoted in dotted lines, Fig. 4, the skein may be placed thereon, and then the reels may be swung back into the position shown in Figs. 1 and 2, and the stretching of the skein or hank may be accomplished by turning the crank 15, which will simultaneously turn the screws 10 11, and thereby cause the nuts 16 17 to travel in a direction to move the reel 18 away from the reel 29, or, if it is desired to remove the skein, turning the crank in the reverse direction will cause the reel 18 to approach the reel 29 and permit the ready removal of the skein. While the frame is in the vat denoted by 39 the reels may be caused to travel with the yarn thereon by turning the wheel 26, which by the engagement of its pinion 24 with the bevel-gear 28 will cause the reel 18 to rotate, and this will through the yarn stretched thereon cause the reel 29 to rotate.

For convenience in lowering the yarn-frame into the vat and removing it therefrom I support it by means of a cord, rope, or chain 40, (see Fig. 6,) which may pass over the pulley 41, depending from a carriage 42, and be provided on its opposite end with a counterbalance-weight 43. It is intended that the weight shall be such as to nearly counterbalance the weight of the frame, so that it may be handled with great ease. For removing the frame from over the vat to recharge it I provide a curved track 44, preferably an endless curved track, so that the carriage 42 may follow from a position over the vat around into position over the same vat without retracing its course. In Fig. 7 I have represented this endless track in connection with two vats placed side by side and have shown two platforms 45 46, which are intended to be substantially on a level with the top of the vat shown in Fig. 6 for resting the frame either for purposes of draining or for recharging. For example, the frame as it comes directly from the vat may be left on the platform 45 to drain, while a previous frame may be receiving its charge of yarn on the platform 46 to be moved along the track in position over the vat for immersing it, and the platform 45 may be subsequently moved to platform 46 for recharging, while the frame fresh from the vat may be moved into position for drainage on the platform 45.

The apparatus hereinabove described provides for the ready placing of the skein or hank onto the reels without handling the reels other than to swing one end clear of the side bar and saves a great deal of time and labor while effecting the change from a treated skein to a skein to be treated in a neat and systematic manner. The curved track and counterbalance arrangement is also an advantage in that it requires but a single carriage mov-

ing in one direction along the track to bring the skein-frames into and out of their proper positions over one or more vats and into the desired relation to the platforms for removing and putting on skeins at a desired distance from the vats.

What I claim is—

1. Apparatus for mercerizing consisting of a vat and means for supporting yarn in the vat, comprising a frame and yarn-supporting reels mounted in the frame and arranged at one end to swing away from the frame to receive and deliver the yarn.

2. Apparatus for mercerizing consisting of a vat and means for supporting yarn in the vat, comprising a frame, yarn-supporting reels mounted in the frame and arranged at one end to swing away from the frame to receive and deliver the yarn and means for varying the distance between the reels to stretch and slacken the yarn thereon.

3. Apparatus for mercerizing consisting of a vat and means for supporting yarn in the vat, comprising a frame, yarn-supporting reels mounted in the frame, one of said reels being removable away from and toward the other, and means for rotating the said movable reel whatever be its adjustment with respect to the companion reel.

4. Apparatus for mercerizing consisting of a vat and means for supporting yarn in the vat, comprising a frame, yarn-supporting reels mounted in the frame, screws swiveled to the frame and traveling nuts engaged with the screws and forming supports for the spindle of one of the reels and reel-rotating mechanism carried by the spindle-support.

5. Apparatus for mercerizing consisting of a vat and means for supporting yarn in the vat, comprising a frame, reel-supporting spindles hinged at one end to the frame and free to swing away from the frame at the opposite end, rotary reels mounted on the spindles, traveling nuts forming a support for one of the spindles, screws for operating the nuts, a shaft and connecting-gear for operating the screws and gear carried by one of the traveling nuts for rotating the reel.

6. Apparatus for mercerizing consisting of a vat and means for supporting yarn in the vat, comprising a frame, means for hinging a reel-supporting spindle to the frame at different distances from the bottom thereof, means for supporting a companion reel in different bodily adjustments toward and away from the first-named reel and means for rotating the bodily-adjustable reel whatever its adjustment may be.

7. Apparatus for mercerizing consisting of a vat and means for supporting yarn in the vat, comprising a suitable frame, a reel-supporting spindle, yarn-supporting reels mounted in the frame, traveling nuts forming a support for the spindle of one of the reels, means

for operating the nuts, a bracket carried by  
one of the traveling nuts, a rotary shaft mount-  
ed in the bracket, a bevel-gear connection be-  
tween said shaft and reel and means for rotat-  
5 ing the shaft and thereby the reel whatever  
may be the adjustment of the traveling nuts.  
In testimony that I claim the foregoing as

my invention I have signed my name, in pres-  
ence of two witnesses, this 16th day of Novem-  
ber, 1903.

ISAAC E. PALMER.

Witnesses:

CHAS. M. SAUER,  
PAUL S. CARRIER.