No. 659,906. Patented Oct. 16, 1900.

L. WELDON.

YARN DYEING MACHINE.

(Application filed Sept. 18, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

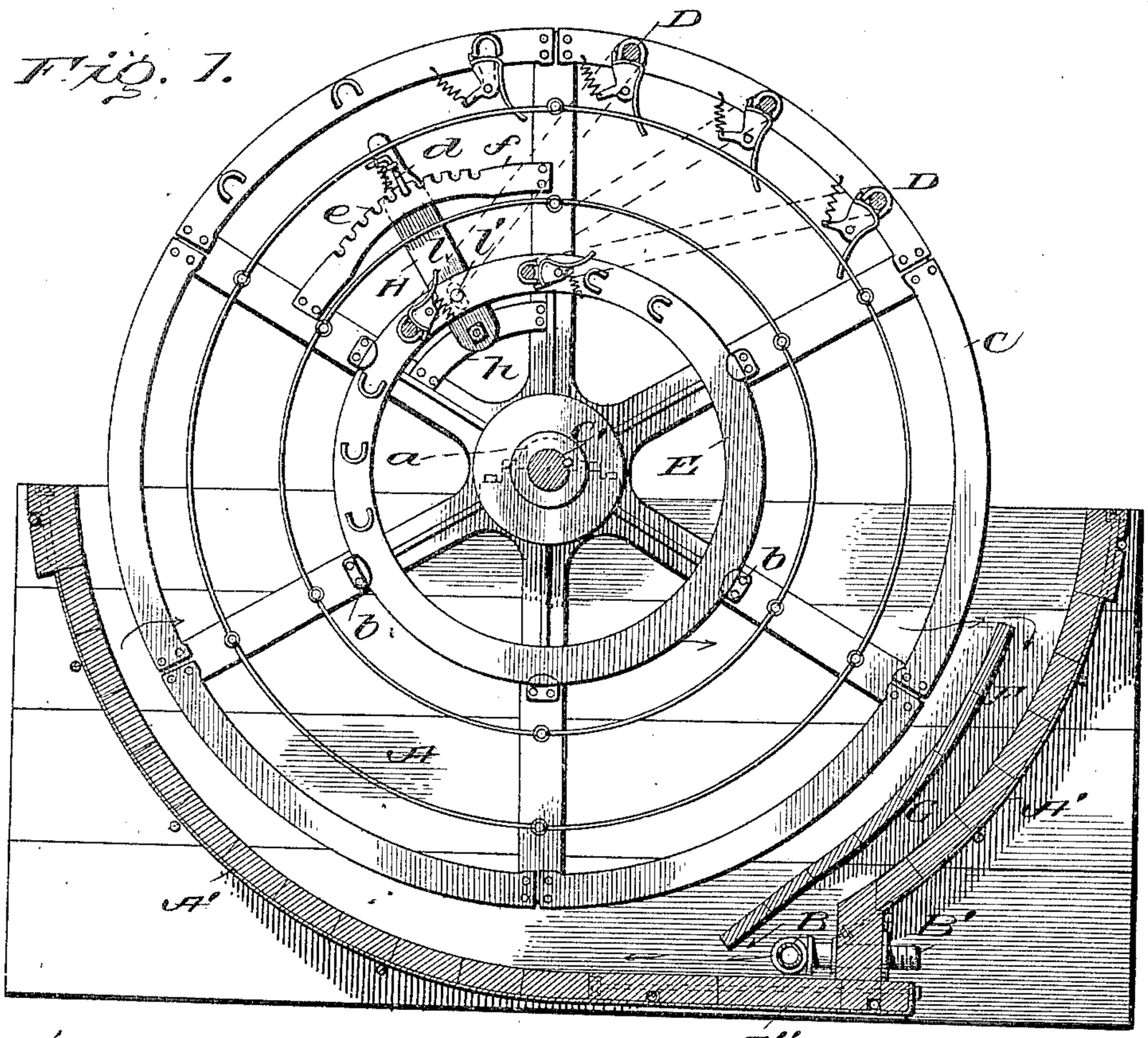


Fig. 2.

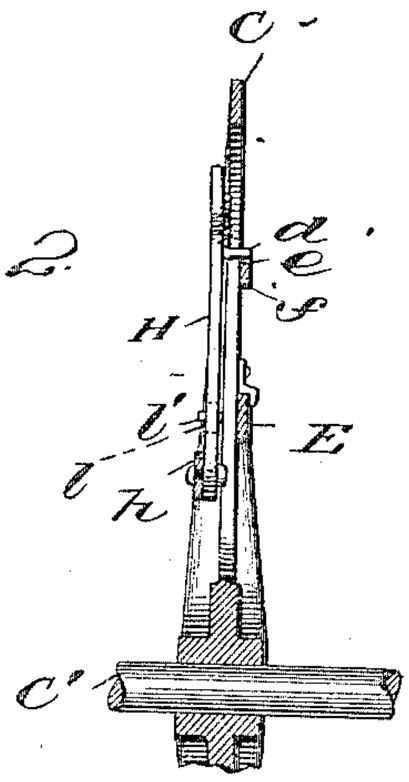
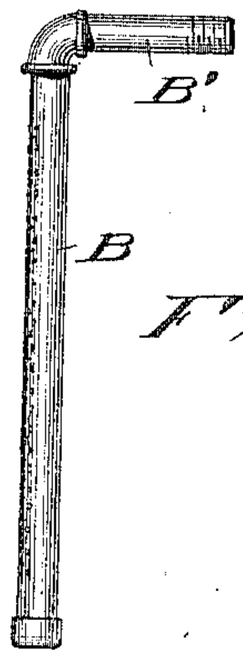


Fig. 3



Witnesses.

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Fig. 4.

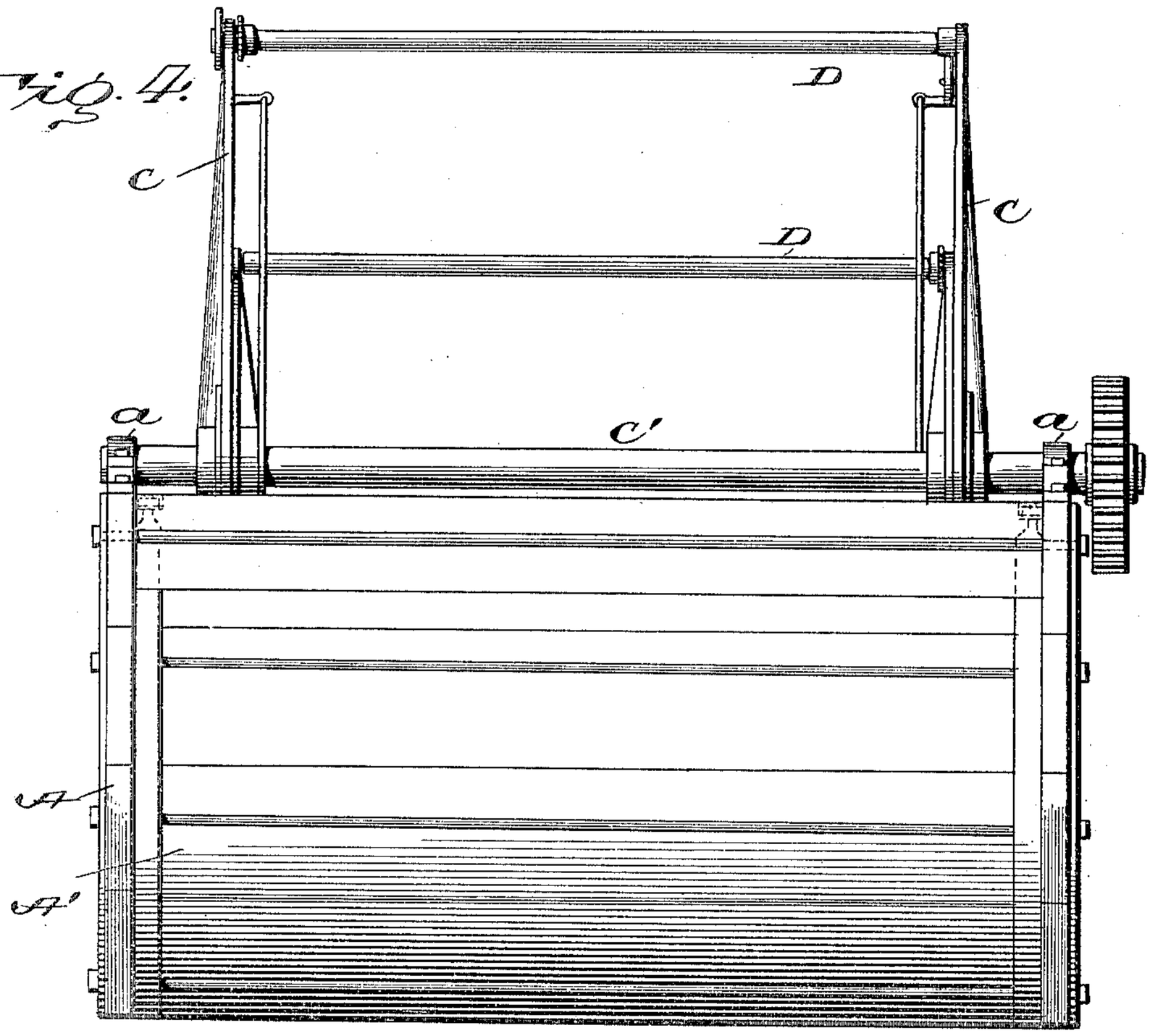
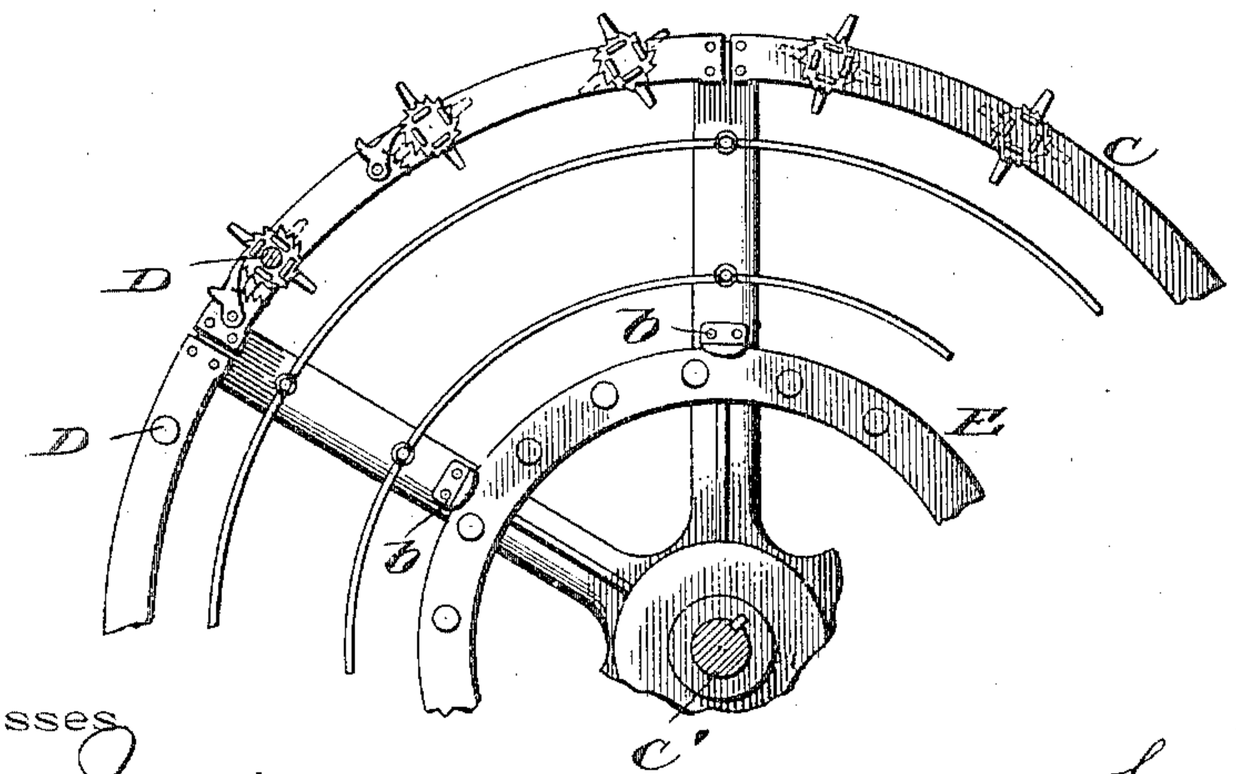


Fig. 5.



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UNITED STATES PATENT OFFICE.

LEONARD WELDON, OF AMSTERDAM, NEW YORK.

YARN-DYEING MACHINE.

SPECIFICATION forming part of Letters Patent No. 659,906, dated October 16, 1900.

Application filed September 18, 1899. Serial No. 730,836. (No model.)

To all whom it may concern:

Be it known that I, LEONARD WELDON, of Amsterdam, in the county of Montgomery, in the State of New York, have invented new and useful Improvements in Yarn-Dyeing Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to rotary dyeing-machines wherein a reel is mounted upon a tub or dye-liquor vat having a curved bottom and ends and carries the skeins or articles to to be dyed, dipping them intermittently and successively into the dye liquor.

It is well known that violent ebullition of the bath in which worsted or woolen skeins are dyed causes the fibers to mat together and greatly decreases the value of the dyed product. To avoid this effect of ebullition in the bath that a rotary dyeing apparatus revolves in and also to provide means for easily lengthening or shortening the distance between bearings of the sticks upon which the skeins of yarn are held during the dyeing process is the subject of this invention. To avoid injurious ebullition, I place the center of the reel closer to one end of the tub than to the other, and in the space left at one end I place a curved partition in proximity to the curved side of the tub, said partition reaching nearly to the water-line at the top and to within a few inches of the bottom of the tub at its lower end and forming a curved compartment or passage.

To this end my invention consists in the combination, with the tub having a curved bottom and containing the dye liquor and the revolving reel journaled to one side of the center of the tub, of a curved partition in the tub near the side farthest from the reel, said partition extending in proximity to the bottom and near the upper edge of the tub, and a steam-pipe extending transversely across the tub near the bottom and in the space between the partition and the side of the tub, said pipe having perforations on the side turned toward the space between the lower edge of the partition and the bottom of the tub; and my invention consists in certain other combinations hereinafter described, and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a vertical longitudinal sectional view of my improved dyeing-machine. Fig. 2 is a transverse sectional view of a portion of the reel shown in Fig. 1. Fig. 3 shows a plan view of the steam-pipe within the vat. Fig. 4 is a front elevation of my improved yarn-dyeing machine, and Fig. 5 is a portion of the inner face view of the left-hand wheel of the reel and adjustable ring thereon.

Referring specifically to the drawings, A is the tub or vat containing the dye liquor and having the curved or semicircular bottom and sides A′, said bottom having preferably an angular depression A″ to one side of the center, as shown, to provide more space for the perforated steam-pipe B, extending within the same and horizontally and transversely across the tub.

B′ is the steam-supply pipe passing through the vertical part of the bottom and connecting with the perforated pipe.

C C are large wheels keyed upon a shaft C′, journaled in bearings *a a* on opposite sides of the tub. Said wheels are within the tub, near the opposite vertical sides thereof, and form parts of the reel carrying the yarn-sticks D D, &c., and the adjustable rings E E. To provide more space at one side of the tub, the bearings *a a* are mounted to one side of the center of the upper edge of the tub. Between the curved side of the tub farthest removed from the peripheries of the wheels C C and said peripheries is a curved partition F, extending transversely across the tub and having its lower edge in proximity to the flat portion of the bottom A′ and its upper edge extending to a point near the top edge of the tub. Said partition has substantially the same curvature as the side of the tub and forms with the side of the tub a curved channel or passage G, extending from top to bottom of the tub. When the side of the steam-pipe B having the perforations is turned toward the space between the lower end of the partition and the bottom of the tub and the steam is admitted to it through the pipe B′, it forms a sort of steam pump or ejector, drawing the liquor out of the narrow space between the partition and the tub and sending it across the tub in the lines shown by the arrows—that is, the current takes a curved course cor-

responding to the curved side of the tub and then returns in a horizontal direction at and near the surface of the dye liquor and over the upper edge of the partition F. The liquor that is displaced is filled up from the liquor in the vat, and so a constant circulation of the dye liquor is created that is very valuable in distributing the coloring-matter equally in the bath and facilitates the even dyeing of the fibers.

It will readily be seen that should the operator put on too much steam after the bath has come to near the boiling-point as it is harder for the steam to drive through the narrow neck into the dye-bath than it is for it to back up behind the partition all excess of steam will come up that way and it is impossible to damage the fibers in the rotary machine by excessive boiling.

If it is desired to reverse this circulation of the dye liquor, I simply turn the steam-pipe around until the holes point up through the narrow space between the curved partition and the side of the tub and the pumping action of the steam is reversed, the liquid being sucked from under the compartment and discharged at the top.

To provide means for increasing or decreasing the distance between the sticks that carry the skeins to accommodate skeins varying in length or to tighten the skeins after they are placed in position upon the sticks, I place the bearings for the inner circular series of sticks upon rings E E, loosely journaled in the arms of the large wheels C C or spiders, or on wheels loosely journaled on the spider-shaft, and provide means to move or rotate these rings or wheels, and thus rotate all the bearings at once on each ring toward or from their outer mates or sticks D. Said adjustable rings are held loosely in place by small angular pieces *b b*, &c., secured upon the inner faces of the arms of the large wheels. A lever H is pivoted upon a bar *h*, extending between two spokes on each large wheel, and is provided with a small slot *l* to receive a pin *l'*. Near and upon the outer end of said lever is a spring-bolt *d*, which is adapted to engage a curved rack *e* on a bar *f*, also secured to and connecting the two spokes together. When it is desired to revolve one of the rings in either direction, it is only necessary to raise the bolt *d* and turn the lever H on its pivot to one side or the other and release the bolt to engage the rack and to hold the lever and ring in the required position.

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

1. In a rotary dyeing-machine, the combination with the dye-tub, of a pair of wheels mounted on a shaft to turn in bearings on the dye-tub, an outer and inner circular series of sticks to hold the skeins, the inner series of sticks having bearings for their ends in revoluble adjustable parts, a lever connected with each of the parts to revolve the same, a bolt on the lever, and a rack to engage the bolt secured upon each of the wheels, as set forth.

2. In a rotary dyeing-machine, the combination with the dye-tub, of a pair of wheels mounted on a shaft to turn in bearings on the dye-tub, an outer and inner series of removable, revoluble yarn-sticks, revoluble adjustable rings concentric with the rims of the wheels, a lever having a slot therein fulcrumed on each of the said wheels and provided with a spring-bolt to engage a curved rack, the curved rack secured upon each of the wheels, and a pin projecting from the ring and entering the slot, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name.

LEONARD WELDON. [L. S.]

Witnesses:
H. V. BURKE,
GEORGE G. WALDRON.