

No. 618,399.

Patented Jan. 31, 1899.

H. DAVID.

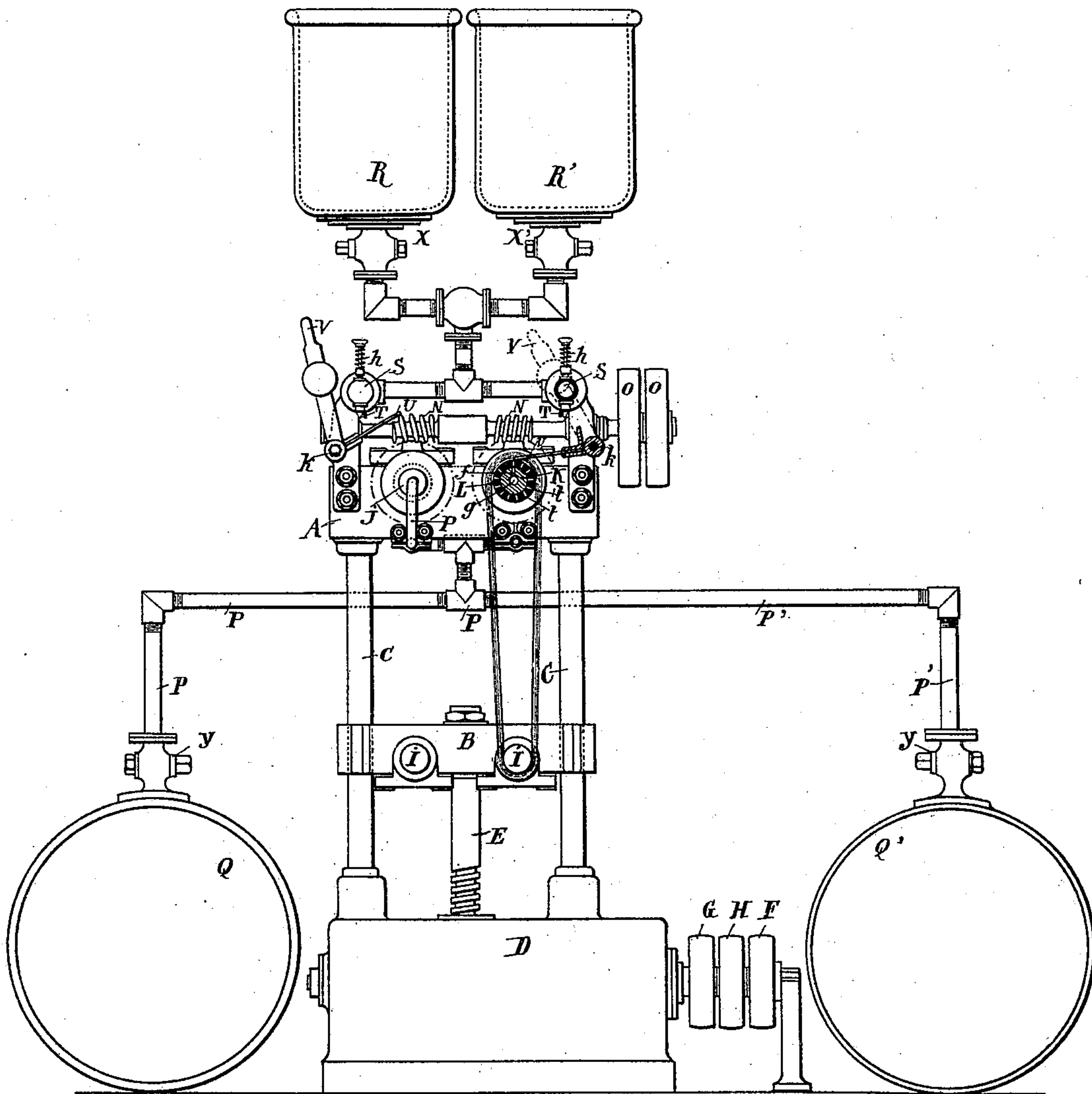
APPARATUS FOR MERCERIZING.

(Application filed June 7, 1898.)

(No. Model.)

3 Sheets—Sheet 1.

FIG. 1.



WITNESSES

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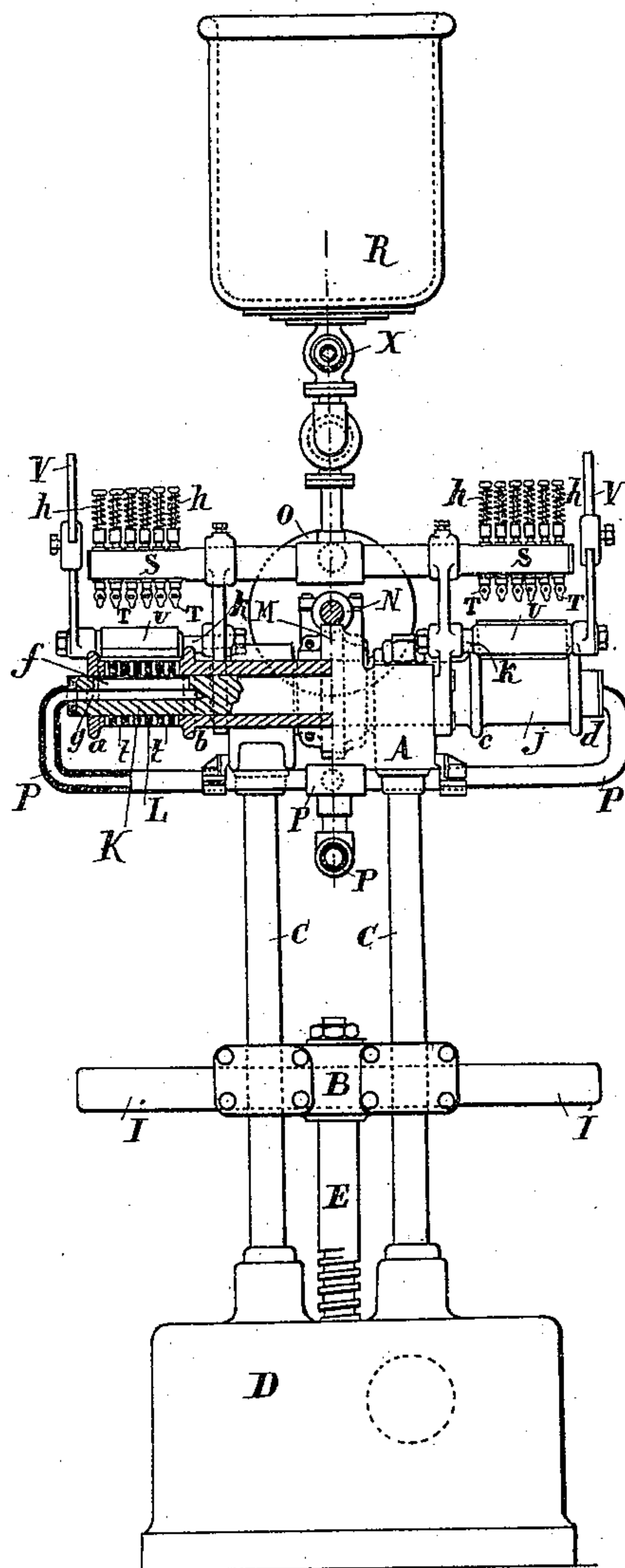
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3 Sheets—Sheet 2.

FIG. 2.



WITNESSES

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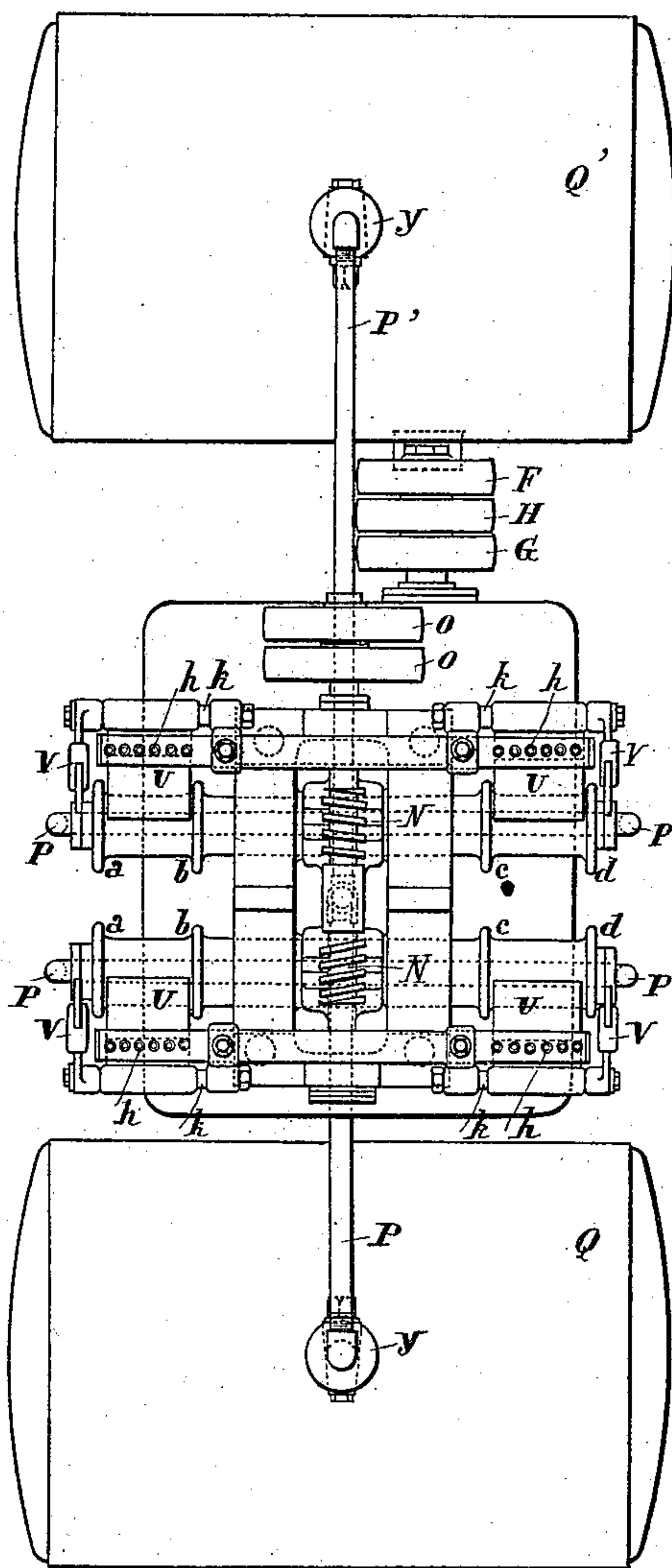
APPARATUS FOR MERCERIZING.

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(No Model.)

3 Sheets—Sheet 3.

FIG. 3.



WITNESSES

W. B. Crown
Gales Moore

INVENTOR

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 My Joe, Whiskey
 and

UNITED STATES PATENT OFFICE.

HENRI DAVID, OF PARIS, FRANCE.

APPARATUS FOR MERCERIZING.

SPECIFICATION forming part of Letters Patent No. 618,399, dated January 31, 1899.

Application filed June 7, 1898. Serial No. 682,824. (No model.)

To all whom it may concern:

Be it known that I, HENRI DAVID, a citizen of the French Republic, residing at Paris, in the Department of the Seine, France, have
5 invented certain new and useful Improvements in Mercerizing Hanks of Yarn and Thread, of which the following is a full, clear, and exact description.

Hanks and skeins of yarn and thread are
10 mercerized in the stretched condition for the purpose of producing a silky or lustrous effect. The operation includes treatment with the mercerizing liquid and a subsequent washing or treatment to remove or neutralize the
15 mercerizing liquid, the yarn being stretched until the operation is complete. According to my present invention I arrange that the fluids used in the operation shall pass through the thickness of the yarn or threads by aspiration, as hereinafter described.

The hanks or skeins are arranged upon pairs of rollers, between which they are stretched, and they are kept in motion by means of gearing which drives one of the rollers. The wall
25 of one of the rollers is pierced, and its interior communicates with a chamber or chambers in which a more or less complete vacuum can be produced. Above that roller is a system of jets through which the mercerizing
30 liquid, and subsequently the washing or neutralizing fluid, can be supplied to the surface of the yarn or thread upon the roller. The fluid is sucked through the material to be treated and then passes to the vacuum-chamber, whence it may be removed for reuse.

I will more particularly describe my said invention with reference to the accompanying drawings, in which—

Figure 1 indicates a front elevation, partly
40 in section. Fig. 2 shows a side elevation, also partly in section; and Fig. 3, a plan view.

The more prominent parts of the machine constructed to carry out this invention are two frames A B, the upper one of which is
45 supported and the lower of which is guided by the four columns C C, fixed upon the base D of the apparatus. The lower frame B may be moved vertically, so as to produce the necessary stretching and relaxation of the yarn or
50 thread. This motion is obtained by carrying the frame B upon the upper end of a vertical screw E, mounted in the base D and rotated

by gearing also contained within the base. This gearing is driven from a shaft on which the pulleys F G H are mounted. H is a loose
55 pulley. F is a fast pulley, and when the belt is on it the screw is rotated thereby to raise the frame B, and G also is a fast pulley which similarly serves to lower the frame. The construction of the necessary gearing is com-
60 monly used for other purposes and is well understood. The strap fork may be arranged so as to be brought into action when the frame B reaches certain points, which may be varied.

The lower rollers of each pair each consists
65 of a plain metal shaft I I, mounted and running freely in the frame B. The upper rollers J J are provided with end flanges c d and are formed upon a hollow shaft running upon the fixed shaft K K. The ends of this shaft are
70 bored and fitted with the inlet-pipes P P. The hollow roller-shafts are rotated by means of worms and worm-wheels M N, the worms N N being fixed upon the shaft upon which the pulleys O O are fixed. One of these pul-
75 leys is fast and the other loose upon the shaft. The worms and worm-wheels are so constructed that in the case of two pairs of rollers the upper roller of one pair is driven in an opposite direction to that of the similar
80 roller of the next pair. Each of these rollers rotates in a direction over toward the next roller, as indicated by the angles of the worms, Fig. 1.

The treatment of the yarn or thread is ef-
85 fected upon the upper arcs of the upper rollers. For this purpose the walls of the rollers between the end flanges are pierced with a number of holes, which are preferably arranged in quincunxes—that is to say, so that
90 the holes in one circle alternate with the holes in the next circles, so that a moderately thin plane parallel with and cutting the axis of the shaft K will include some of the holes. When any of these holes arrive in the high-
95 est point of the revolution of the roller, they come in line with a slot through which they communicate with the bored ends g g in the shaft K K. The canals g g in turn communicate by means of the system of pipes P P
100 with the reservoir Q, in which a more or less complete vacuum is produced and maintained by an ejector, pump, or other known means. The same canals g g also communicate

through the pipe system P' P' with a second vacuum-chamber Q', in which a vacuum can also be produced and maintained, as required, as in the chamber Q. Either system of pipes 5 may be put into or out of communication with its respective chamber by the valves Y Y. The mercerizing liquid is contained in a tank R and the water or neutralizing liquid in the tank R', each of which communicates with a 10 horizontal pipe on which the series of jets s s is arranged and either of which can have its communication opened or closed by the valves X X. Below the jets s s there are scrapers U U, which are normally nearly horizontal, 15 with a slight downward inclination toward the rollers J J, which they may touch. Above the jets, each of which can be controlled by a small cock, there is arranged a series of corresponding clearing-rods h h, held up, as 20 shown, by spiral springs. In the event of any jet becoming choked it may be cleared by depressing the corresponding rod. The scrapers U U are each mounted upon a fulcrum k, which also carries the counterweighted lever 25 V, adapted to hold the scrapers up and out of contact with its roller, as indicated to the left of Fig. 1, when the hanks are being removed or replaced. The hanks being stretched upon their rollers and the apparatus being put in 30 motion, the valves X and Y on the mercerizing system are opened and mercerization takes place. This being completed, the same valves are closed and the corresponding valves of the washing or neutralizing system are opened. 35 The stretching of the yarn or thread is maintained until the mercerizing liquid has been removed or neutralized, as is well understood.

It will be seen that the liquid falling through the jets s s falls upon the scrapers and de- 40 scends upon the material upon the rollers, through which it is sucked by the vacuum, more or less complete, in the chamber Q or Q'.

Having now particularly described and as- 45 certain the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In apparatus for treating yarn and thread in hanks or skeins, the combination with a 50 rotatable tubular perforated roller, of a stationary pipe fitting inside of said roller and having a slot, means for feeding liquid upon said roller, and means for producing a vacuum in the pipe, substantially as described.

2. In apparatus for treating yarn and thread

in hanks or skeins, the combination with a 55 rotatable tubular roller having perforations arranged in quincunxes, of a stationary pipe fitting inside of said roller and having a longitudinal slot in its upper side, means for feeding liquid upon the top of the roller, and 60 means for producing a vacuum in the pipe, substantially as described.

3. In apparatus for treating yarn and thread in hanks or skeins, the combination with a 65 tubular perforated roller, of means for producing a vacuum therein, a scraper having its edge adjacent to the roller, and a series of jets for feeding liquid upon the scraper, substantially as described.

4. In apparatus for treating yarn and thread 70 in hanks or skeins, the combination with a perforated roller and means for producing a vacuum therein, of a hinged scraper having its edge adjacent to said roller, a counterweight- 75 ed lever connected with said scraper, and means for feeding liquid upon said scraper, substantially as described.

5. In apparatus for treating yarn and thread in hanks or skeins, the combination with 80 means for supporting the material to be treated, of a series of jets for feeding liquid upon said material, and a spring-retracted clearing-rod in each jet, substantially as described.

6. In apparatus for treating yarn and thread in hanks or skeins, the combination with 85 means for supporting the material to be treated, of a series of jets for feeding liquid upon the material, two or more tanks connected with said jets, and valves for controlling the flow of liquid from said tanks, substantially 90 as described.

7. In apparatus for treating yarn and thread in hanks or skeins, the combination with per- 95 forated tubular rollers, of vacuum-chambers, pipes connecting said chambers with said rollers, a movable frame carrying shafts running freely in the axial planes of the rollers, means for adjusting said frame toward and away from said rollers, a series of jets for feeding 100 liquid upon the rollers, and tanks for supplying different liquids at will to said jets, substantially as described.

In witness whereof I subscribe my signature in presence of two witnesses.

HENRI DAVID.

Witnesses:

HENRY DANZER,

EDWARD P. MACLEAN.