J. RICHARDSON & J. F. NEEF.

DYEING MACHINE.

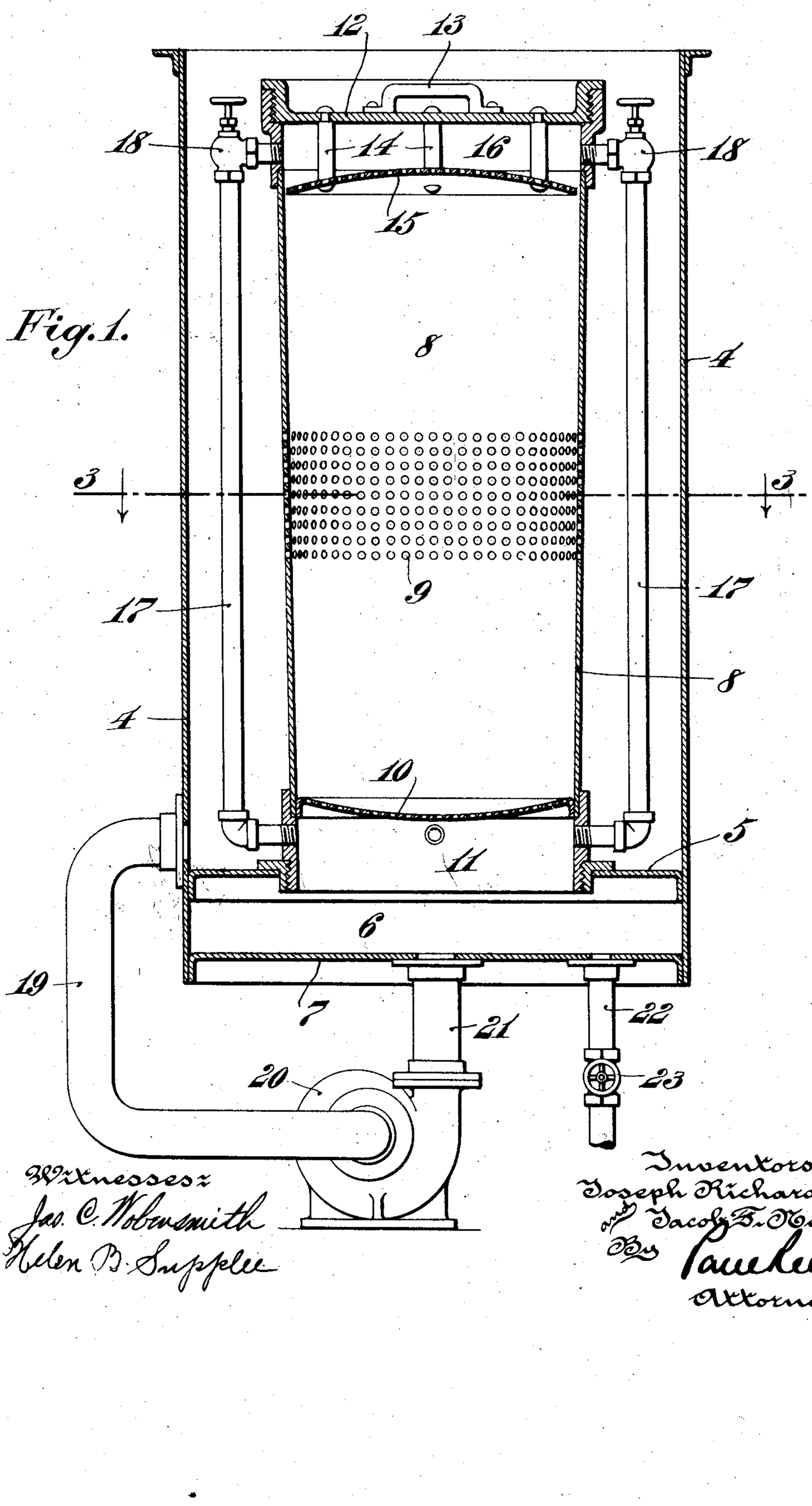
APPLICATION FILED JAN. 27, 1911.

989,644.

Patented Apr. 18, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

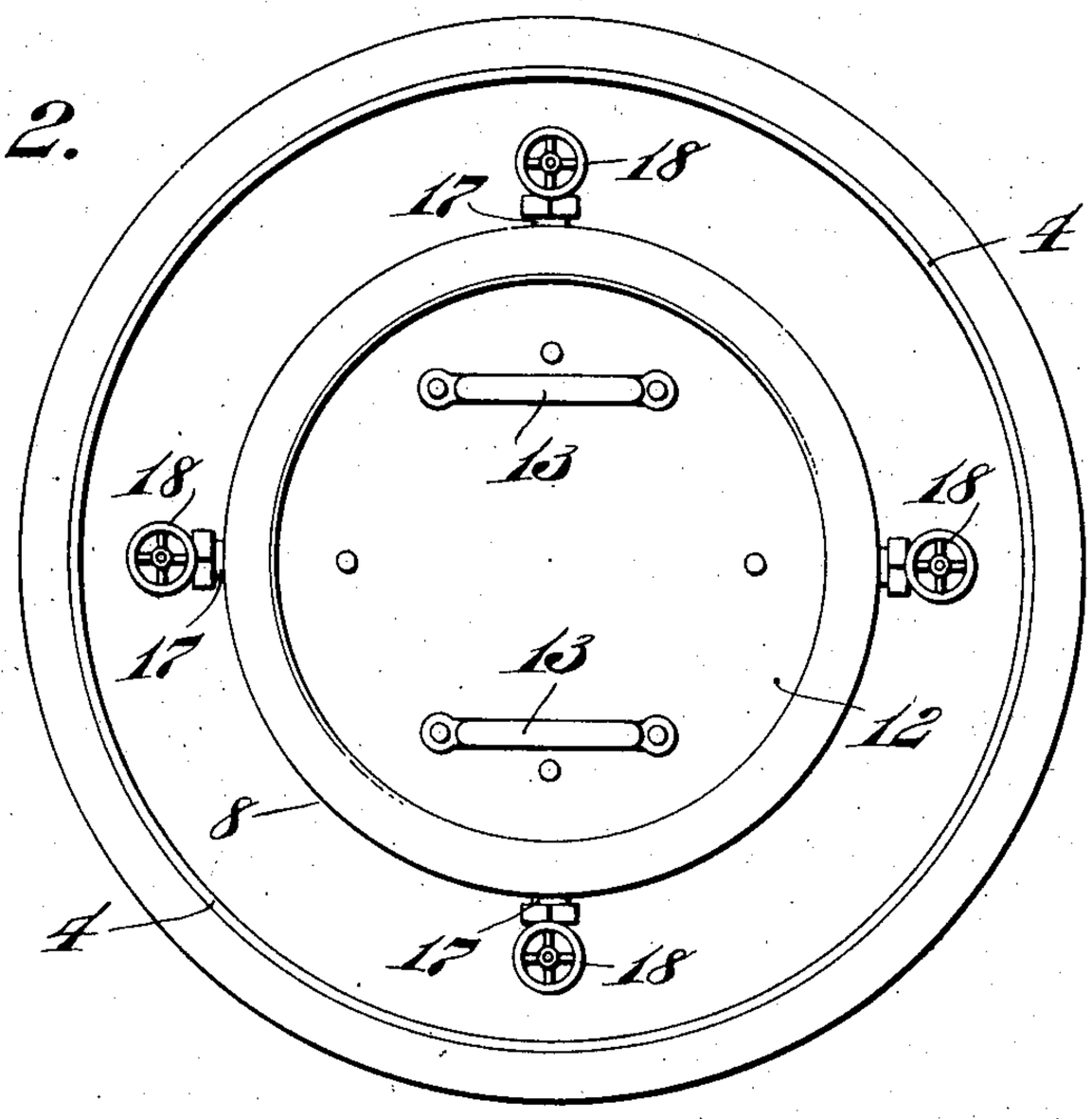
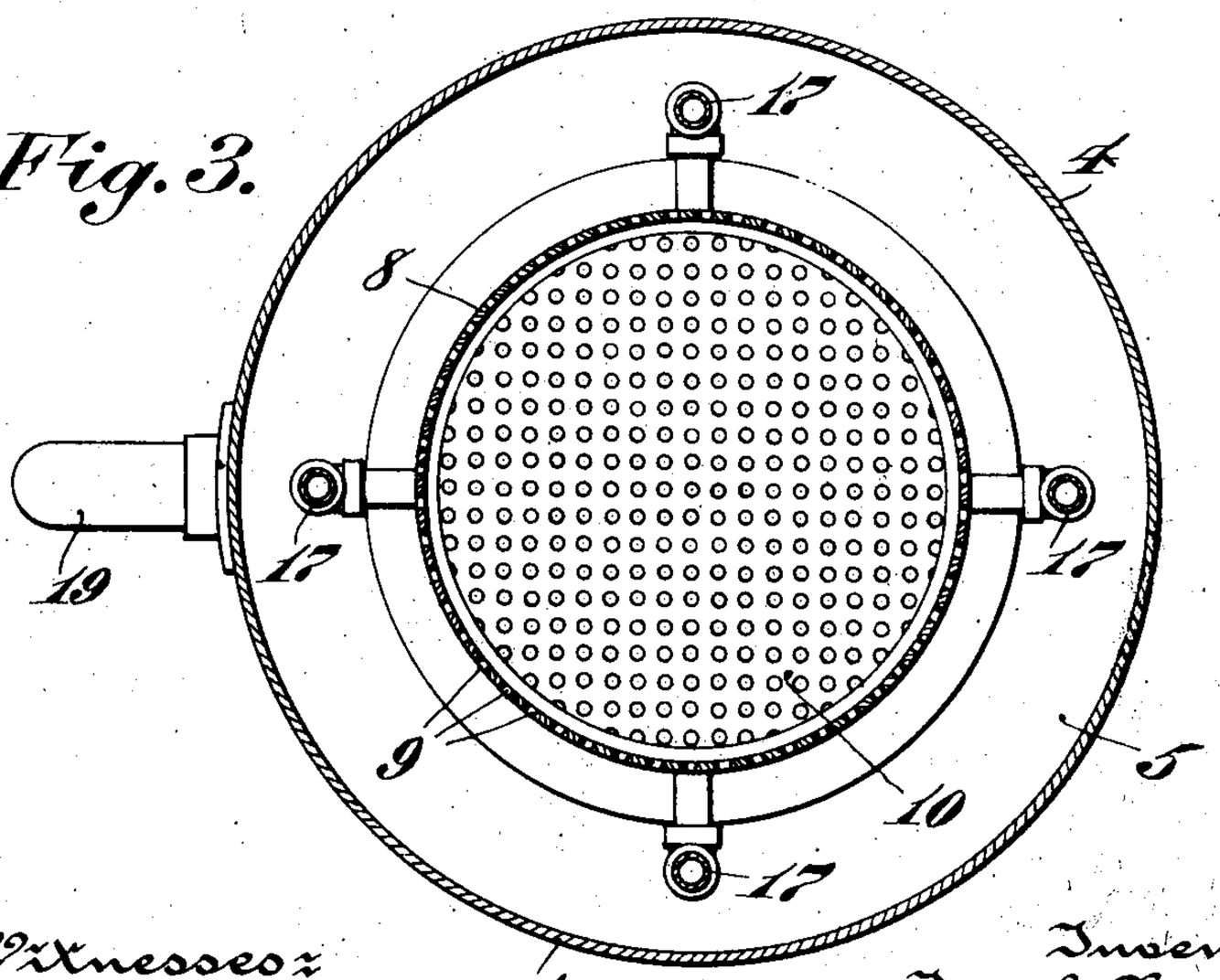


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH RICHARDSON AND JACOB F. NEEF, OF PHILADELPHIA, PENNSYLVANIA.

DYEING-MACHINE.

989,644. Specification of Letters Patent. Patented Apr. 18, 1911.

Application filed January 27, 1911. Serial No. 604,933.

To all whom it may concern:

Be it known that we, JOSEPH RICHARDSON, a subject of the King of Great Britain, (who has declared his intention of becoming a citizen of the United States,) and JACOB F. NEEF, a citizen of the United States, both residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have jointly invented certain new and useful Improvements in Dyeing-Machines, of which the following is a specification.

Our invention relates to dyeing machines, and it has particular relation to the construction and arrangement of a machine for dyeing raw stock such as ramie, jute in cones, raw wool, raw cotton and worsted tops.

The principal object of our invention is to provide a machine for dyeing textile materials in which the dye liquor will thoroughly permeate the material, to the end that all parts thereof will be uniformly dyed.

The nature and characteristic features of our invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part hereof, in which—

Figure 1 is a vertical central section, partly in elevation, of a machine embodying the main features of our present invention; Fig. 2 is a top plan view thereof, and Fig. 3 is a horizontal section thereof taken approximately on the line 3—3 of Fig. 1.

Referring to the drawings, in the particular embodiment of our invention there shown, 4 is a tank adapted to contain the dye liquor, which tank may be provided near the bottom thereof with a horizontal diaphragm 5, forming a compartment 6 between the same and the bottom 7 of the tank 4. Removably mounted in the diaphragm 5 is a material containing receptacle 8, which is provided with a zone of perforations 9 mid-way between the respective upper and lower ends thereof for a purpose to be hereinafter more fully set forth. The lower end of the material containing receptacle 8 is provided with a perforated bottom 10, which is preferably arranged a slight distance above the lower end of said receptacle 8 to thereby form a space 11. The upper end of the material containing receptacle 8 is closed by means of a cover or lid 12 which may be threaded or otherwise removably secured thereto as clearly shown in Fig. 1 of the drawings. The cover or lid 12 of the receptacle 8 may be provided with handles 13 to facilitate the removal thereof. Depending downwardly from the cover or lid 12 is a series of studs 14 which serve to support a perforated diaphragm 15 so as to form a space 16 between said diaphragm and the cover or lid 12 proper. A series of pipes 17 form a communication between the space 11 below the perforated bottom 10 of the receptacle 8 and the upper chamber 16 above the perforated diaphragm 15 which is supported by the cover 12. Each of the pipes 17 is preferably provided with a valve 18 in such position as to be readily accessible from the top of the tank 4. A pipe 19 communicates with the interior of the tank 4 above the horizontal diaphragm 5 which supports the material containing receptacle 8, and this pipe 19 extends to a circulating pump 20 which is in communication with the chamber 6 in the bottom of the tank 4 by means of a pipe 21. A drain pipe 22 may also be provided to remove the dye liquor from the machine and this drain pipe 22 may be controlled by means of a valve 23.

In the operation of the device the material is placed within the receptacle 8 and the cover or lid 12 secured in place, the perforated diaphragm 15 serving to maintain the space 16 at the upper end of receptacle 8 free from the material. A sufficient quantity of dye liquor having been placed in the machine, the pump 20 will cause the same to circulate from the outer tank 4 into the compartment 6, thence into the space 11 at the lower end of receptacle 8, from whence a portion of the dye liquor will pass through the perforated bottom 10, and another portion thereof will pass through the pipes 17 into the upper chamber 16 above the perforated diaphragm 15 and thence into the interior of the receptacle 8. It will be seen that the dye liquor will be forced from both ends of the tank toward the center thereof, and will pass through the zone of perforations 9. It has been found that the opposing streams of dye liquor passing into the material containing receptacle 8 will cause the material to be thoroughly permeated and uniformly subjected to the action of the dye and this has been found to be true even with the materials in a partly manufactured condition in which the fibers are closely compacted. The valves 18 in the pipe 17 will serve to control the relative flow from the two ends of the material containing recepta-

cle 8. It will of course be understood that the outer tank 4 may be made larger and a plurality of material containing receptacles 8 may be mounted in the diaphragm 5 if desired.

Having thus described the nature and characteristic features of our invention what we claim as new and desire to secure by Letters Patent is—

1. A dyeing apparatus comprising a material containing receptacle, means for introducing dye liquor to both ends of said receptacle, and means for discharging the dye liquor from the center of said receptacle.

2. A dyeing apparatus comprising a material containing receptacle, a communication between both ends of said receptacle and a zone of perforations centrally located in the walls of said receptacle.

3. A dyeing apparatus comprising a material containing receptacle, a tank in which said receptacle is mounted, means for circulating dye liquor from said tank to the interior of said material containing receptacle at both ends thereof, and said receptacle having a centrally arranged discharge means into the tank in which the same is mounted.

4. A dyeing apparatus comprising a tank, a material containing receptacle mounted therein, means for circulating dye liquor from the tank to one end of the material containing receptacle, a communication between the end of the receptacle to which the dye liquor is delivered and the other end thereof, and said receptacle having a centrally arranged discharge means into the tank in which the same is mounted.

5. A dyeing apparatus comprising a material containing receptacle, means for delivering dye liquor to one end thereof, a series of pipes forming a communication whereby the dye liquor is delivered to the other end of said receptacle, and said receptacle having a centrally arranged discharge means.

6. A dyeing apparatus comprising a material containing receptacle, means for delivering dye liquor to one end of said receptacle, a series of pipes forming a communication whereby the dye liquor is delivered to the other end of said receptacle said pipes provided with valves to control the relative flow of dye liquor to the other end of said receptacle, and said receptacle having a centrally arranged discharge means.

7. A dyeing apparatus comprising a material containing receptacle, a perforated diaphragm mounted therein some distance from each end thereof to form chambers, a series of pipes extending between said chambers to permit the dye liquor to be delivered to both ends of the receptacle, and said receptacle having a zone of perforations centrally disposed for the discharge of the dye liquor.

8. A dyeing apparatus consisting of a tank, a horizontal diaphragm arranged to divide said tank into two compartments means for circulating dye liquor from the upper to the lower compartment of said tank, a material containing receptacle mounted in said diaphragm and being in open ended communication with the lower compartment of the tank, two perforated diaphragms mounted in the material containing receptacle forming chambers at each end thereof, a series of pipes extending between said chambers to permit the dye liquor to be delivered to both ends of the receptacle, and the receptacle being provided with a centrally disposed zone of perforations for the discharge of the dye liquor to the upper compartment of the tank.

In testimony whereof, we have hereunto signed our names in the presence of two witnesses.

JOSEPH RICHARDSON.
JACOB F. NEEF.

Witnesses:
LULU TRAUTVETTER,
JOSEPH J. FAY.