

No. 744,147.

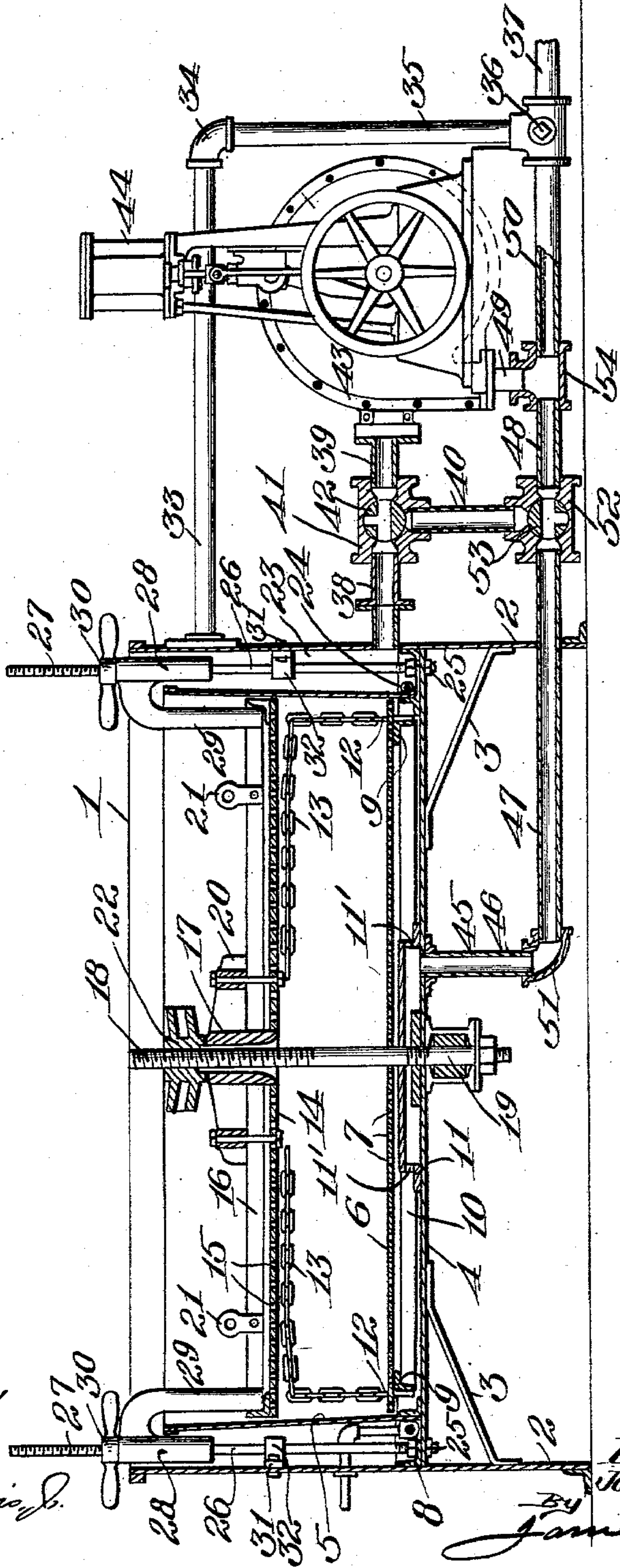
PATENTED NOV. 17, 1903.

J. A. WILLARD.
APPARATUS FOR DYEING.
APPLICATION FILED MAY 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Ed. Kesler,
James L. Norris, Jr.

Inventor:
James A. Willard
By James L. Norris,
Atty.

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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.

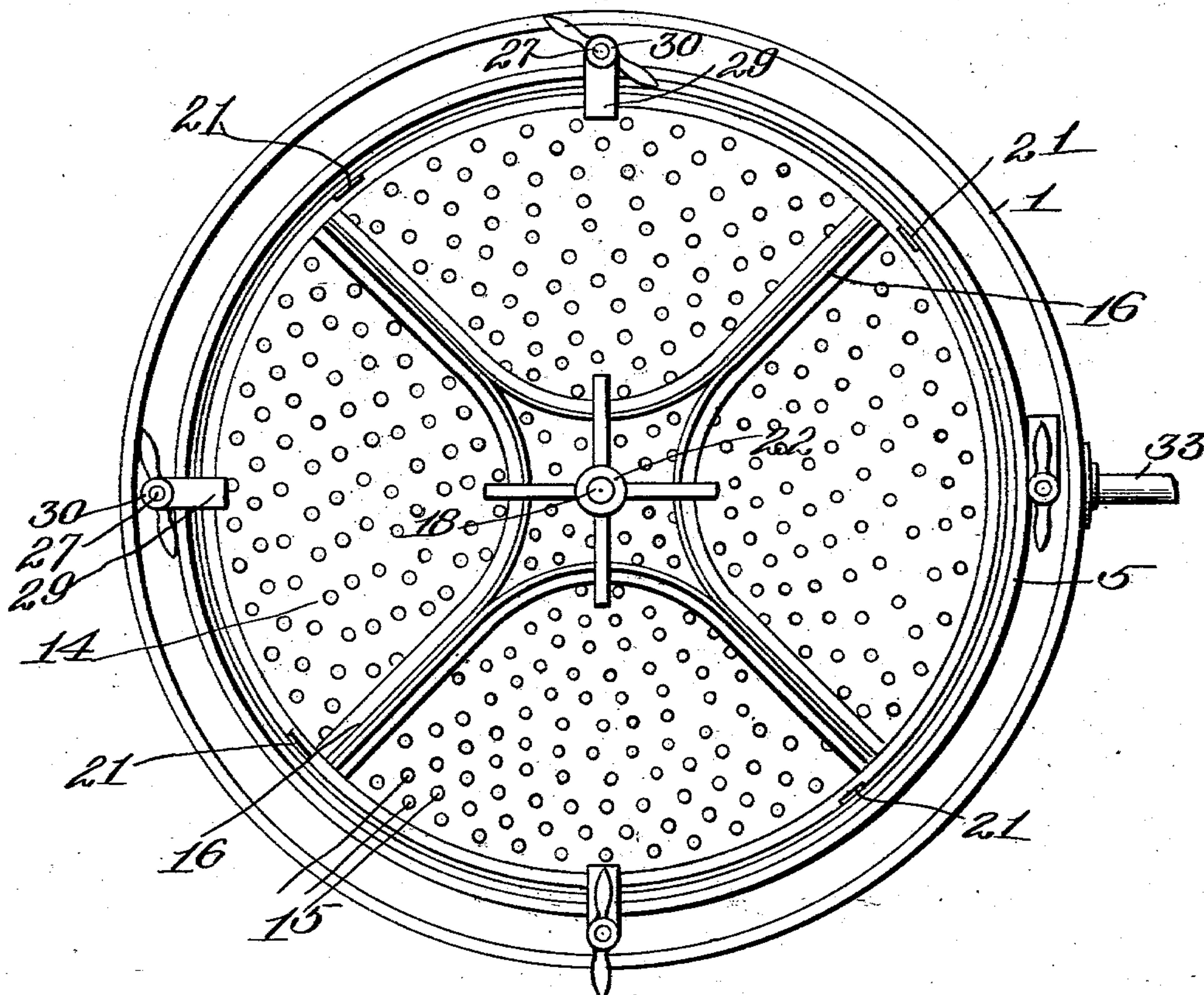
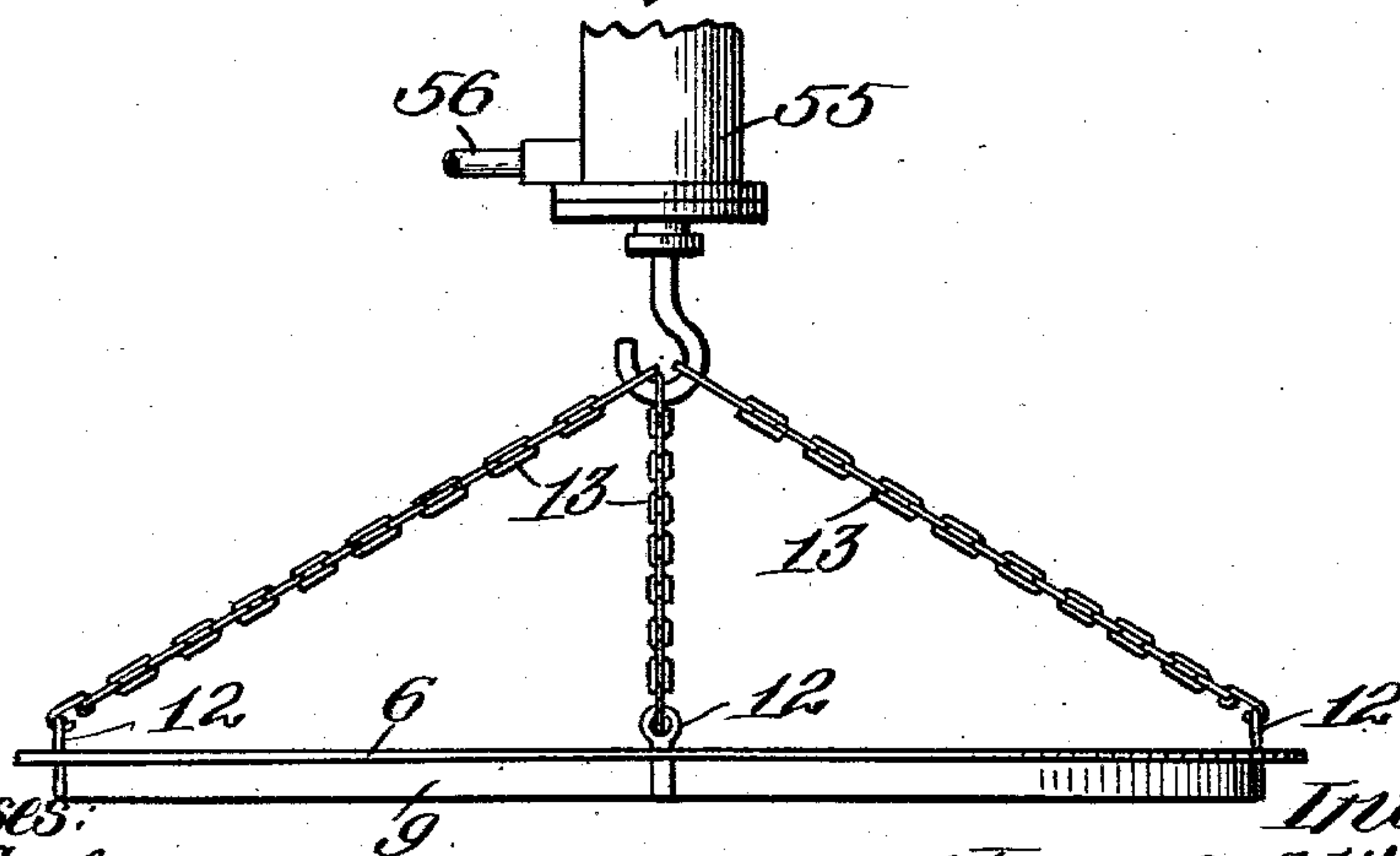


Fig. 3.



Witnesses:

C. J. Kessler,

James L. Norris, Jr.

Inventor

James A. Willard

BY *James L. Norris,*

Atty.

UNITED STATES PATENT OFFICE.

JAMES A. WILLARD, OF CHATTANOOGA, TENNESSEE, ASSIGNOR TO VACUUM DYEING MACHINE COMPANY, OF CHATTANOOGA, TENNESSEE, A CORPORATION OF TENNESSEE.

APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 744,147, dated November 17, 1903.

Application filed May 21, 1903. Serial No. 158,181. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. WILLARD, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented new and useful Improvements in Apparatus for Dyeing Raw Stock, Wool, and Similar Material, of which the following is a specification.

This invention relates to certain new and useful improvements in apparatus for dyeing raw stock, wool, and similar material.

The object of the invention is to dye, wash, and fix the dyestuffs upon the material being operated on while it is submerged at all times without coming in contact with the air and until the color has been set and made fast or permanent.

The invention further aims to construct an apparatus of the above-referred-to character which is so constructed and arranged that after the material has been operated upon it can be readily removed from the apparatus and transported to any point desired.

The invention further aims to construct an apparatus for dyeing raw stock, wool, and similar material which is so constructed that after the material has been compressed to be operated upon it will be securely held in its compressed condition.

The invention further aims to provide an apparatus adapted for use in dyeing raw cotton, raw wool, and similar materials which shall be extremely simple in its construction, strong, durable, efficient in its operation, readily and easily set up, and comparatively inexpensive to manufacture; and to this end the invention consists of the novel combination and arrangement of parts hereinafter more specifically described, illustrated in the accompanying drawings, and particularly pointed out in the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, wherein like reference characters denote corresponding parts throughout the several views, and in which—

Figure 1 illustrates a sectional elevation of the apparatus. Fig. 2 illustrates a plan of a portion of the apparatus; and Fig. 3 an ele-

vation of the removable bottom for the material-receiving receptacle, the bottom being shown as removed from the cylinder by any suitable means.

Referring to the drawings by reference characters, 1 denotes an open vat or outside tank which is mounted upon and supported by the legs or standards 2, braced by means of the stay-pieces 3. These stay-pieces 3 are connected at their upper ends to the bottom 4 of the tank 1 and at their lower ends secured to the legs or standards 2. The preferred contour of the tank 1 is cylindrical, although any other shape desired may be employed.

Within the tank 1 and resting upon the bottom thereof is a material-receiving receptacle 5 of the same contour as the tank 1. The receptacle 5 is open at its upper end and closed at its lower end by means of the removable bottom 6, provided throughout with perforations 7. The perforated bottom 6 is supported upon a ledge or shoulder at the lower end of the cylinder, said ledge or shoulder being formed by the angle-iron 8. The height of the angle-iron 8 is such that the bottom 6 when in position will be supported a suitable distance above the lower end of the receptacle 5. The bottom 6 is also reinforced by means of the angle-iron 9, attached to the lower face thereof. This angle-iron 9 can also act as a support for the bottom 6 and the angle-iron 8 dispensed with. Instead of connecting the angle-iron 8 to the lower end of the receptacle 5 the same can be secured to the bottom 4 of the tank 1 and act as a guide for the receptacle 5—that is to say, it will always retain the receptacle 5 in the same position within the tank 1. By the supporting of the bottom 6 in the manner as herein set forth a space or chamber 10 is formed between the said bottom 6 and the bottom 4 of the tank. This chamber 10 is adapted to receive the dye liquor as it leaves the deflector 11, mounted upon the bottom 4, the deflector 11 communicating with the supply-pipe for the dye liquor to be hereinafter referred to. The perforated bottom 6 of the receptacle 5 is provided with a series of ring-bolts 12, to which are connected the lifting-chains 13.

These chains are adapted after the material has been operated upon to be attached to a suitable hoisting device, so that the finished material can be lifted out of the receptacle 5 and transported to any point desired.

The reference character 14 denotes a compression-plate, which is provided throughout with perforations 15. The plate 14 also acts as a closure for the receptacle 5 and operates within the receptacle. The plate 14 is reinforced by means of angle-iron 16 and is provided centrally with a sleeve 17, which permits of the mounting of the plate 14 upon the compression-screw 18. The screw 18 is suitably connected at its lower end to the bottom 4, as at 19, and extends upwardly through the bottom 6 of the receptacle 5 and projects at its upper end above the collar 17, the latter being connected, by means of a spider 20, to the plate 14. The latter has also connected thereto a plurality of ring-bolts 21, to which is adapted to be connected a suitable lifting means, so that the plate 14 can be removed from within the receptacle 5. The plate 14 is adjusted when arranged within the receptacle 5 by means of the adjusting-nut 22, mounted upon the outer end of the screw 18. It will be evident that by moving the nut 22 down the screw 18 the plate 14 will be carried therewith, thereby compressing the material which has been previously placed upon the bottom 6. When the material to be treated is placed upon the bottom 6, the lifting-chains 13 are arranged so that they will extend up the side and on the top thereof, as shown in Fig. 1.

The diameter of the receptacle 5 is such that when the said receptacle 5 is arranged within the tank 1 it will form in connection with the tank 1 a chamber 23, which communicates with a primary supply-pipe and also a suction-pipe, to be hereinafter referred to. Arranged at the bottom of the chamber 23 is a heating-coil 24 for heating the dye liquor. To the bottom 4 of the tank 1 is connected, as at 25, the lower ends of a plurality of vertical rods 26, which extend through the chamber 23 and have their upper ends screw-threaded, as at 27. Each of these rods carries a collar 28, having formed integral therewith a downwardly-extending dog 29, which is adapted to project into the receptacle 5 and engage the plate 14 for holding the said plate 14 down after the material has been compressed. The dogs 29 prevent the bulging upwardly of the plate 14. The dogs 29 are secured in their retaining position or their engaging position with the plate 14 by means of the adjusting-nuts 30, mounted upon the screw-threaded end 27 of the bolt 26. It will be evident that when the nuts 30 are screwed downwardly they will retain the dogs 29 in engagement with the plate 14. When the nuts 30 are screwed in an opposite direction than that as stated, the dogs 29 can be elevated, owing to the fact that the collars 28 are loosely mounted on the rods 26, and after the collars 28 have been moved upwardly on the rods

26 to a suitable height the dogs 29 can be swung outwardly and clear of the receptacle 5, so that there will be nothing to prevent the lifting out of the plate 14 and the removal of the perforated bottom 6, carrying the material which has been treated. Projecting from the inner face of the tank 1, as well as being suitably secured to the tank 1, as at 31, is a series of braces 32 for the rods 26.

The tank 1, at one side near the top thereof, has communicating therewith a primary supply-pipe 33 for the dye liquor. The pipe 33 is connected by the coupling 34 to a pipe-section 35, which communicates with a suitable valve mechanism 36, which has also communicating therewith a feed-pipe 37. The latter is in communication with a suitable reservoir, so that when the valve 36 is opened the dye liquor will pass from the reservoir up through the pipe-section 35 into the primary supply-pipe 33 and be discharged into the tank 1 until the receptacle 5 is completely submerged with dye liquor. The height of the receptacle 5 is not as great as that of the tank 1. Consequently it will permit of the receptacle 5 being submerged by the dye liquor when it is supplied to the tank 1. Communicating with the chamber 23, at or near the lower end thereof, is a suction-pipe formed of three sections 38 39 40. These sections are connected together by the T-coupling 41, in which operates a three-way valve 42. The section 39 of the suction-pipe communicates with a pump 43, which is operated by any suitable prime mover, and, as shown, a steam-engine 44. Communicating with the bottom 4 of the tank 1 is the auxiliary supply-pipe 45 for the dye liquor, and the auxiliary supply-pipe is formed of the pipe-sections 46, 47, 48, 49, and 50. The section 46 communicates at its upper end with the deflector 11 and at its lower end is connected by means of the coupling 51 to one end of the section 47. The sections 47 and 48 and the section 40 of the suction-pipe are connected together by means of the T-coupling 52, in which operates a three-way valve 53. The sections 48, 49, and 50 are connected together by means of a T-coupling 54. The section 49 communicates with the pump 43 and the section 50 communicates with the valve mechanism 36 for establishing communication between the said section 50 and the sections 35 and 37 of the primary supply-pipe.

In Fig. 2 of the drawings the perforated bottom 6 of the receptacle 5 is shown connected to a suitable hoisting device 55.

The deflector 11, mounted upon the bottom 4, is adapted for evenly distributing the dye liquor when it is fed or supplied to the tank 1 by the auxiliary supply-pipe. The height of the deflector 11 is such as to leave a suitable space between the bottom 6 of the receptacle 5 and the top of the deflector. The deflector 11 is provided with the side openings 11' for the discharge of the dye liquor.

The operation of the apparatus is as fol-

lows: The plate 14 is removed and the receptacle 5 filled, say, with about five hundred pounds of raw cotton as taken from the bale without any previous opening or handling.

5 The lifting-chains 3 are then arranged in position, as shown in Fig. 1. The plate 14 is then replaced and the whole mass compressed by means of operating the adjusting-nut 22, which forces the plate 14 downwardly. This
10 operation is continued until the proper state of compression of the material to be treated is reached. At this stage the plate 14 is retained in its adjusted position by bringing into engagement therewith the dogs 29, which
15 are held in their engaging position by means of the nuts 30. The tank 1 is then supplied with dye liquor through the medium of the primary supply-pipe and the said body of dye liquor is heated to a suitable tempera-
20 ture by means of the steam-coil 24. The quantity of dye liquor is such that it will completely submerge the receptacle 5 and is of such quantity that when it is drawn off and forced through the material to dye it there
25 will always be a sufficient quantity of the dye liquor in the tank 1 to prevent the material being treated from coming into contact with the air. When the dye liquor has reached the proper degree of heat, the prime
30 mover is started, which drives the pump 43. The pump takes or draws the dye liquor from the chamber 23 through the suction-pipe, or rather through the sections 38 and 39 of the suction-pipe, as the valve 42 has been set for
35 such purpose. The pump then forces the dye liquor through the sections 49, 48, 47, and 46 of the auxiliary supply-pipe into the deflector 11. The dye liquor then passes out of the deflector 11, through the perforations in
40 the removable bottom 6, through the material which is to be dyed, into the space formed in the receptacle 5 above the plate 14, then overflowing from said space into the chamber 23, then outwardly through the suction-pipe
45 into the pump, and the operation continued as hereinbefore specified. The valve 53 has been set so that the dye liquor will be forced by the pump through the sections of the aux-
50 iliary supply-pipe in the manner as just mentioned.

It will be evident that the circulation can be reversed in a manner other than as set forth, and in which instance the auxiliary supply-pipe would form the suction-pipe and
55 the primary supply-pipe become the auxiliary supply-pipe. This operation is as follows: The valves 53 and 42 are set. The setting of the valve 53 will establish communication between the section 47 of the auxiliary
60 supply-pipe and the section 40 of the suction-pipe. The setting of the valve 42 will establish communication between the sections 39 and 40 of the suction-pipe. The valve 36 is then set to establish communication between
65 the section 50 of the auxiliary supply-pipe and the section 35 of the primary supply-pipe. The pump being operated draws the dye

liquor from inside the receptacle 5, through the deflector 11, through the sections 46 and 47 of the auxiliary supply-pipe, through the
70 sections 40 and 39 of the suction-pipe into the pump, which discharges the dye liquor through the section 49 of the auxiliary supply-pipe into the section 50 thereof and from there into the primary supply-pipe, where the
75 dye liquor is fed into the tank 1, thereby completing a perfect circulation, the dye liquor consequently having traveled in both directions—by the first operation herein described
80 from the bottom to the top, and by the secondary operation herein described from the top to the bottom.

If it be necessary to force the dye liquor in but one direction to completely dye the material, this is continued the necessary time.
85 The material is then washed, or if it be necessary to circulate the dye liquor in alternate directions to completely die the material this operation is continued the necessary time
90 and the material then washed; but in either case it is necessary that the material be washed. The circulation of the washing medium is done in the same manner as the circulation of the dye liquor. After the dyeing
95 and washing are completed the nut 22 is removed and the dogs 29 elevated and moved out of the path of the perforated plate 14. The perforated plate 14 is then removed by
100 any suitable hoisting device, and the hoisting device is then connected with the chains 13 and the bottom plate 6, with the material thereon, lifted out of the receptacle 5 and transported to any suitable point desired.

The hoisting device 55 may be connected by a pipe 56 to the engine 44, so that the lat-
105 ter will not only be employed to drive the pump, but also be the means for operating the hoisting device. It will also be evident that the hoisting device can be mounted upon suitable tracks, (not shown,) so that the plate
110 14, as well as the plate 6 and the material, can be readily transported.

It is thought the many advantages of my new and improved apparatus for dyeing raw stock, wool, and similar material can be read-
115 ily understood from the foregoing description, taken in connection with the accompanying drawings, and it will furthermore be evident that changes, variations, and modifications can be resorted to without departing from the
120 spirit of the invention or sacrificing any of its advantages, and I therefore do not wish to restrict myself to the details of construction hereinbefore described and as shown in the accompanying drawings, but reserve the
125 right to make such changes, variations, and modifications as come properly within the scope of the protection prayed.

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

1. In a dyeing apparatus, a tank, a receptacle having a removable bottom plate, a compression-plate operating within said recepta-

cle, means for retaining the compression-plate in its adjusted position, a pump, means communicating with said pump for suitably circulating dye liquor through the said receptacle and tank, a hoisting device for removing said compression-plate and the said bottom plate, and means communicating with the said pump and said hoisting device for operating them.

10 2. A dyeing apparatus comprising an outer receptacle, an inner receptacle, a removable bottom for said inner receptacle provided with means adapted to be connected to a hoisting device, a removable and an adjustable compression-plate for the said inner receptacle provided with means for attaching it to a hoisting device, means carried by the outer receptacle and adapted to engage said compression-plate for retaining it in its adjusted position, and means communicating with said outer receptacle for circulating a liquid through the said receptacle.

3. A dyeing apparatus comprising an outer receptacle, an inner receptacle, a removable bottom for said inner receptacle provided with means adapted to be connected to a hoisting device, a removable and an adjustable compression-plate for the said inner receptacle provided with means for attaching it to a hoisting device, means carried by the outer receptacle and adapted to engage said compression-plate for retaining it in its adjusted position, a deflector mounted upon the bottom of said outer receptacle, and means for circulating a liquid through the said receptacles.

4. An apparatus of the character described, comprising an outer receptacle, an inner receptacle, a removable perforated bottom for the said inner receptacle provided with means for attaching it to a hoisting device, a removable and an adjustable perforated compression-plate mounted in said inner receptacle and provided with means for attaching it to a hoisting device, adjustable means carried by the outer receptacle and adapted to engage the said compression-plate for retaining it in its adjusted position, and means communicating with the said outer receptacle for circulating a liquid through the said receptacle.

5. An apparatus of the character described, comprising an outer receptacle, an inner receptacle, a removable perforated bottom for the said inner receptacle provided with means for attaching it to a hoisting device, a removable and an adjustable perforated compression-plate mounted in said inner receptacle and provided with means for attaching it to a hoisting device, adjustable means carried by the outer receptacle and adapted to engage the said compression-plate for retaining it in its adjusted position, a deflector mounted upon the bottom of said outer receptacle, and means communicating with said outer receptacle and adapted to circulate a dye liquor through the said receptacles.

6. A dyeing apparatus comprising an outer receptacle, an inner receptacle, a removable bottom for said inner receptacle provided with means adapted to be connected to a hoisting device, a removable and an adjustable compression-plate for the said inner receptacle provided with means for attaching it to a hoisting device, means carried by the outer receptacle and adapted to engage said compression-plate for retaining it in its adjusted position, a primary dye-liquor-supply pipe communicating with said outer receptacle, a suction-pipe communicating with said outer receptacle, an auxiliary dye-liquor-supply pipe communicating with said outer receptacle, means for establishing communication between said suction-pipe and said auxiliary dye-liquor-supply pipe, means for establishing communication between said primary dye-liquor-supply pipe and said auxiliary dye-liquor-supply pipe, a pump communicating with the said pipe, and operating means for said pump.

7. A dyeing apparatus comprising an outer receptacle, an inner receptacle, a removable bottom for said inner receptacle provided with means adapted to be connected to a hoisting device, a removable and an adjustable compression-plate for the said inner receptacle provided with means for attaching it to a hoisting device, means carried by the outer receptacle and adapted to engage said compression-plate for retaining it in its adjusted position, a deflector mounted upon the bottom of said outer receptacle, a primary dye-liquor-supply pipe communicating with said outer receptacle, a suction-pipe communicating with said outer receptacle, an auxiliary dye-liquor-supply pipe communicating with said outer receptacle, means for establishing communication between said suction-pipe and said auxiliary dye-liquor-supply pipe, means for establishing communication between said primary dye-liquor-supply pipe and said auxiliary dye-liquor-supply pipe, a pump communicating with the said pipes, and operating means for said pump.

8. An apparatus of the character described, comprising an outer receptacle, an inner receptacle, a removable perforated bottom for the said inner receptacle provided with means for attaching it to a hoisting device, a removable and an adjustable perforated compression-plate mounted in said inner receptacle and provided with means for attaching it to a hoisting device, adjustable means carried by the outer receptacle and adapted to engage the said compression-plate for retaining it in its adjusted position, a primary dye-liquor-supply pipe communicating with said outer receptacle, a suction-pipe communicating with said outer receptacle, an auxiliary dye-liquor-supply pipe communicating with said outer receptacle, means for establishing communication between said suction-pipe and said auxiliary dye-liquor-supply pipe, means for establishing communication

between said primary dye-liquor-supply pipe and said auxiliary dye-liquor-supply pipe, a pump communicating with the said pipe, and operating means for said pump.

5 9. An apparatus of the character described, comprising an outer receptacle, an inner receptacle, a removable perforated bottom for the said inner receptacle provided with means for attaching it to a hoisting device, a removable and an adjustable perforated compression-plate mounted in said inner receptacle and provided with means for attaching it to a hoisting device, adjustable means carried by the outer receptacle and adapted to engage the said compression-plate for retaining it in its adjusted position, a deflector mounted upon the bottom of said outer receptacle, a primary dye-liquor-supply pipe communicating with said outer receptacle, a suction-
10 pipe communicating with said outer receptacle, an auxiliary dye-liquor-supply pipe communicating with said outer receptacle, means for establishing communication between said suction-pipe and said auxiliary dye-liquor-supply pipe, means for establishing communication between said primary dye-liquor-supply pipe and said auxiliary dye-liquor-supply pipe, a pump communicating with the said pipes, and operating means
15 for said pump.

10. A machine of the character described, comprising an outer receptacle, an inner receptacle, a removable perforated bottom for said inner receptacle, an adjustable perforated compression-plate operating in said inner receptacle and provided with lifting-hooks, means for adjusting said compression-plate, and means carried by the outer receptacle and adapted to engage the said compression-plate for retaining it in its adjusted position.
35

11. A machine of the character described, comprising an outer receptacle, an inner receptacle, a removable perforated bottom for said inner receptacle, an adjustable perforated compression-plate operating in said inner receptacle and provided with lifting-hooks, means for adjusting said compression-plate, and adjustable means carried by the outer receptacle and adapted to engage the said compression-plate for retaining it in its adjusted position.
45

12. A machine of the character described, comprising an outer receptacle, an inner receptacle, a removable perforated bottom for said inner receptacle, an adjustable perforated compression-plate operating in said inner receptacle and provided with lifting-hooks, means for adjusting said compression-plate, means carried by the outer receptacle and adapted to engage the said compression-plate for retaining it in its adjusted position, and means communicating with said outer receptacle for circulating a liquid through the said receptacle.
50

13. A machine of the character described, comprising an outer receptacle, an inner re-

ceptacle, a removable perforated bottom for said inner receptacle, an adjustable perforated compression-plate operating in said inner receptacle and provided with lifting-hooks, means for adjusting said compression-plate, adjustable means carried by the outer receptacle and adapted to engage the said compression-plate for retaining it in its adjusted position, and means communicating with said outer receptacle and adapted to circulate a liquid through the said receptacles.
70

14. A dyeing apparatus comprising an outer receptacle, an inner receptacle, a removable perforated bottom plate for said inner receptacle, means for removing said bottom plate, an adjustable and removably perforated compression-plate operating in said inner receptacle, means for removing the said compression-plate, means for retaining the said compression-plate in its adjusted position, a series of pipes for circulating a dye liquor through the said receptacles, a pump communicating with said pipes, and operating means for said pump and said means for removing the bottom and compression plates.
80

15. A dyeing apparatus comprising an outer receptacle, an inner receptacle, a perforated bottom plate for said inner receptacle, an adjustable perforated compression-plate operating in said inner receptacle, means for adjusting said compression-plate, and means carried by the outer receptacle and adapted to be swung over and into said inner receptacle to engage the said compression-plate for retaining it in its adjusted position.
85

16. A dyeing apparatus comprising an outer receptacle, an inner receptacle, a perforated bottom plate for said inner receptacle, an adjustable perforated compression-plate operating in said inner receptacle, means for adjusting said compression-plate, means carried by the outer receptacle and adapted to be swung over and into said inner receptacle to engage the said compression-plate for retaining it in its adjusted position, and means for circulating a dye liquor through the said receptacle.
90

17. A dyeing apparatus comprising an outer receptacle, an inner receptacle, a perforated bottom plate for said inner receptacle, an adjustable perforated compression-plate operating in said inner receptacle, means for adjusting said compression-plate, means carried by the outer receptacle and adapted to be swung over and into said inner receptacle to engage the said compression-plate for retaining it in its adjusted position, a deflector carried by the said outer receptacle, an auxiliary dye-liquor-supply pipe communicating with the said deflector, a suction-pipe communicating with said outer receptacle, a primary dye-liquor-supply pipe communicating with said outer receptacle, and means communicating with the said pipe for circulating dye liquor through said receptacle.
105

18. An apparatus of the character described, comprising a receptacle adapted to receive

the material to be treated, a removable perforated bottom for said receptacle upon which the material is mounted, means carried by the said bottom for attaching it to a hoisting device, an adjustable and a removable perforated compression-plate operating in the said receptacle, adjusting means for said plate, means carried by said plate for attaching it to a hoisting device, and means engaging the said compression-plate for retaining it in its adjusted position.

19. An apparatus of the character described, comprising a receptacle adapted to receive the material to be treated, a removable perforated bottom for said receptacle upon which the material is mounted, means carried by the said bottom for attaching it to a hoisting device, an adjustable and a removable perforated compression-plate operating in the said receptacle, adjusting means for said plate, means carried by said plate for attaching it to a hoisting device, an outer receptacle adapted to contain the said inner receptacle, a series of vertically-extending rods carried by said outer receptacle, and adjusting means carried by the said rods and adapted to engage the said compression-plate for retaining it in its adjusted position.

20. An apparatus of the character described, comprising a receptacle adapted to receive the material to be treated, a removable perforated bottom for said receptacle upon which the material is mounted, means carried by said bottom for attaching it to a hoisting device, an adjustable and a removable perforated compression-plate operating in the said receptacle, adjusting means for said plate, means carried by said plate for attaching it to a hoisting device, an outer receptacle adapted to contain the said inner receptacle, a series of vertically-extending rods carried by said outer receptacle, adjusting means carried by the said rods and adapted to engage the said compression-plate for retaining it in its adjusted position, and means communicating with said outer receptacle for circulating a dye liquor through the said receptacle.

21. An apparatus of the character described, comprising a receptacle adapted to receive the material to be treated, a removable perforated bottom for said receptacle upon which the material is mounted, means carried by the said bottom for attaching it to a hoisting device, an adjustable and a removable perforated compression-plate operating in the said receptacle, adjusting means for said plate, means carried by said plate for attaching it to a hoisting device, an outer receptacle adapted to contain said inner receptacle, a series of vertically-extending rods carried by said outer receptacle, collars mounted upon said rods, dogs carried by said collars, and means mounted upon the rods and adapted to cause the said dogs to engage with the said compression-plate for retaining it in its adjusted position.

22. An apparatus of the character described, comprising a receptacle adapted to receive the material to be treated, a removable perforated bottom for said receptacle upon which the material is mounted, means carried by the said bottom for attaching it to a hoisting device, an adjustable and a removable perforated compression-plate operating in the said receptacle, adjusting means for said plate, means carried by said plate for attaching it to a hoisting device, an outer receptacle adapted to contain said inner receptacle, a series of vertically-extending rods carried by said outer receptacle, collars mounted upon said rods, dogs carried by said collars, means mounted upon the rods and adapted to cause the said dogs to engage with the said compression-plate for retaining it in its adjusted position, and means communicating with the said outer receptacle for circulating a dye liquor through the said receptacles.

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

JAMES A. WILLARD.

Witnesses:

E. W. ARNOLD,
H. PEARCE.