No. 780,402. PATENTED JAN. 17, 1905.

J. A. WILLARD.

VAT FOR DYEING, &c.

APPLICATION FILED SEPT. 9, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

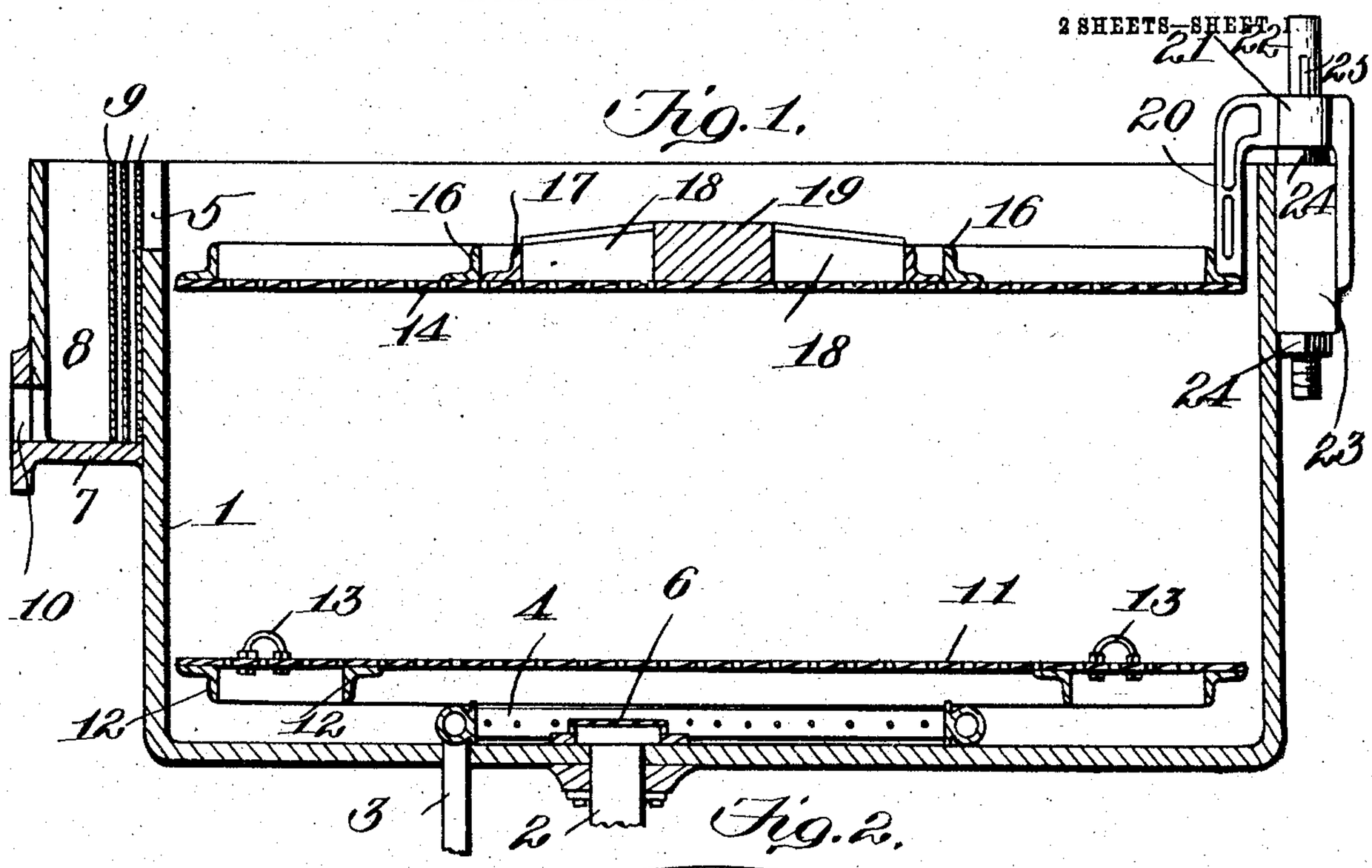
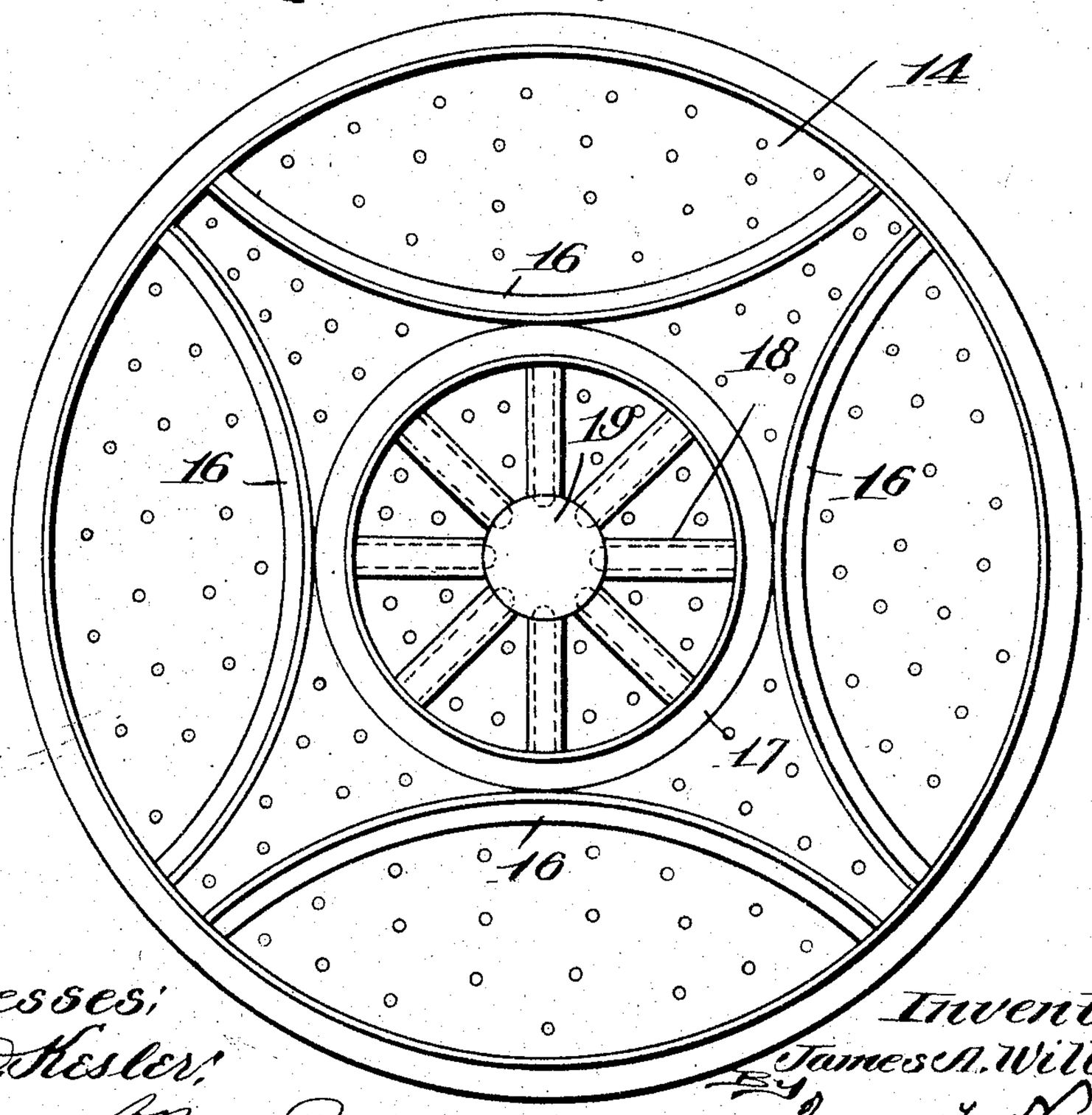


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

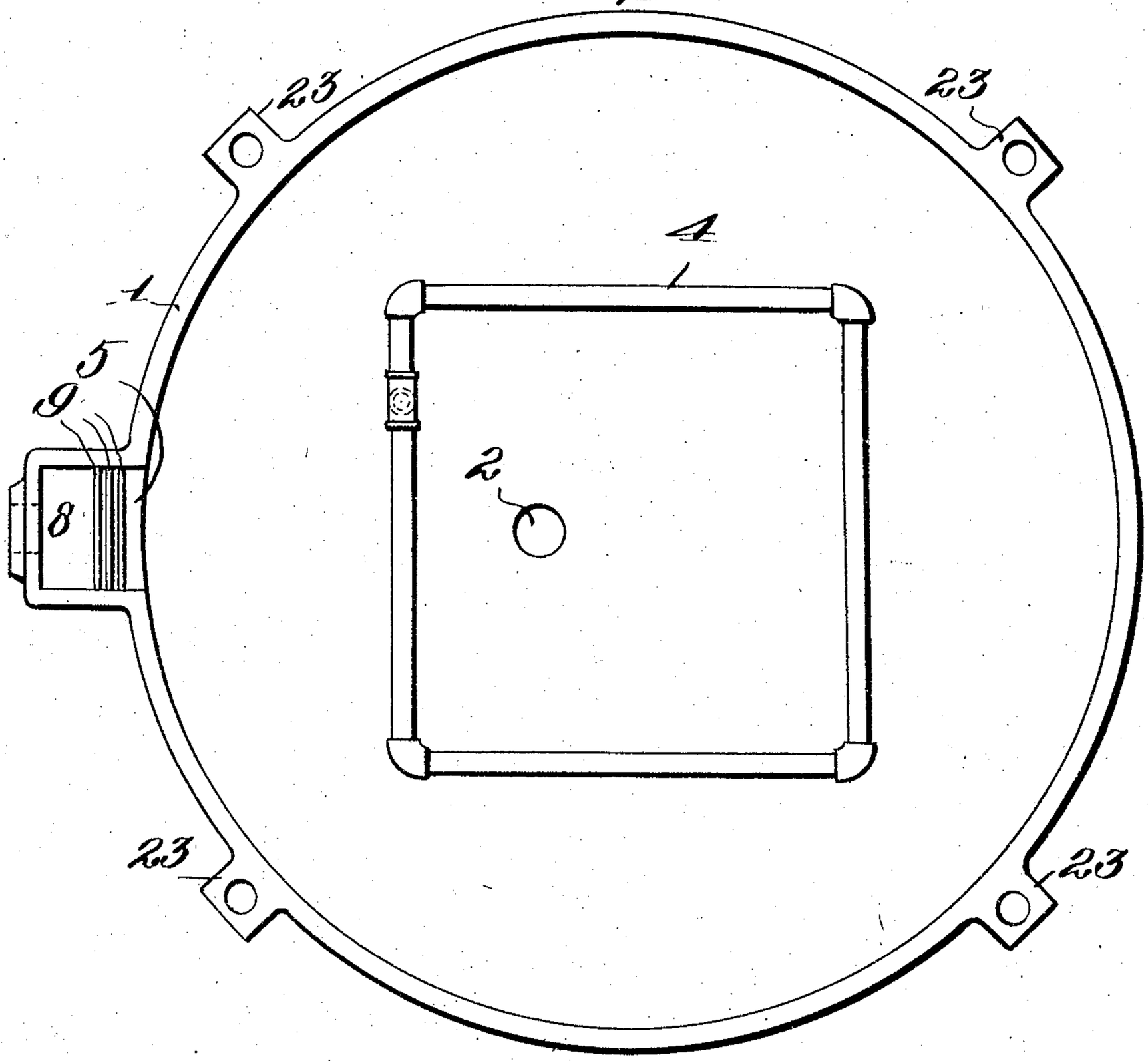


Fig. 4.

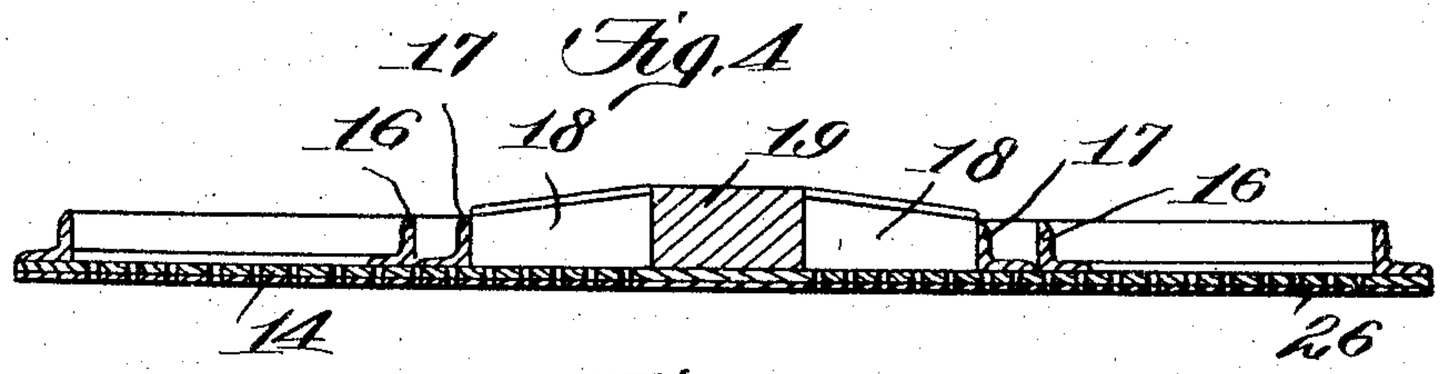
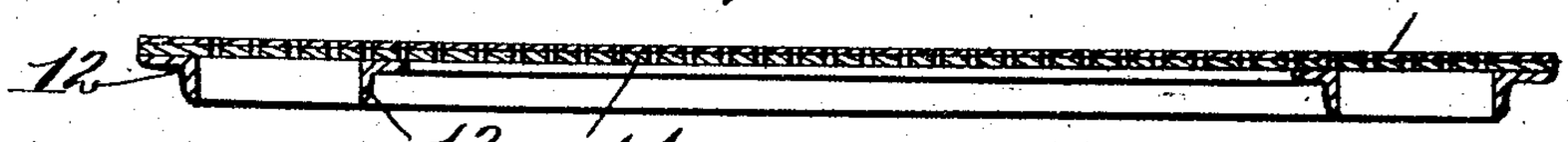


Fig. 5.



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No. 780,402. Patented January 17, 1905.

UNITED STATES PATENT OFFICE.

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

VAT FOR DYEING, &c.

SPECIFICATION forming part of Letters Patent No. 780,402, dated January 17, 1905.

Application filed September 9, 1904. Serial No. 223,890.

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 Dyeing or Bleaching Vats, of which the following is a specification.

This invention relates to vats particularly adapted for dyeing and bleaching, and aims to construct a vat for such purpose which shall be simple in its construction, strong, durable, and efficient in its use, and comparatively inexpensive to manufacture.

With the foregoing and other objects in view the invention consists in 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, wherein like characters of reference denote corresponding parts throughout the several views, and in which—

Figure 1 is a sectional elevation of a vat constructed in accordance with this invention. Fig. 2 is a plan view of the top or cover plate for the vat. Fig. 3 is a top plan view of the vat with the top plate removed. Fig. 4 is a longitudinal sectional view of the top plate when used for bleaching purposes, and Fig. 5 is a longitudinal sectional view of the bottom plate when used for bleaching purposes.

A vat constructed in accordance with this invention for bleaching or dyeing purposes involves a receptacle, a perforated removable bottom plate which forms a supplemental bottom for the receptacle and upon which the material to be treated is placed, a compression top or cover plate for the receptacle, means for retaining the cover-plate in position, and a casing connected with the receptacle, near the top thereof, to form an overflow-chamber for the dyeing or bleaching medium.

Referring to the drawings by reference characters, 1 denotes the receptacle, through which circulates the bleaching or dyeing medium, and said receptacle may be of any suitable contour and is provided in its bottom with an opening into which extends a dyeing or bleaching medium supply pipe 2. The bottom of the receptacle 1 is also provided with an opening into which extends a steam-supply pipe 3, and upon the bottom of said receptacle is arranged a perforated steam-pipe 4, which communicates with the steam-supply pipe 3. The function of the steam-pipes 3 and 4 is to supply steam to the bottom of the vat, so as to heat the bleaching or dyeing medium when occasion requires. The receptacle 1 in the side thereof and at the top is formed with an outlet 5, said outlet 5 being always above the perforated top or cover plate to be hereinafter referred to.

Arranged above the mouth of the supply-pipe 2 and within the receptacle 1 is a deflector 6, which is adapted to deflect the medium supplied by the pipe 2, so that said medium will properly pass through the mass of material being treated, which would not be the case if the deflector was dispensed with.

Connected to or formed integral with the receptacle 1 in suitable relation with respect to the outlet 5 is a casing 7, forming an overflow-chamber 8 and in which is arranged a filtering medium 9 in close proximity to the outlet 5, said filtering medium 9 preferably being a plurality of wire screens. The function of the filtering medium 9 is to arrest the outflow of any foreign bodies from the receptacle 1, such bodies tending to clog the suction-pipe 10, which communicates with the chamber 8.

The supplemental bottom, carrying the material to be treated, is supported within the receptacle 1 and consists of a plate corresponding in contour to said receptacle 1 and which is indicated by the reference character 11 and suitably perforated throughout. Projecting from the bottom of the plate 1 are a pair of annular supporting members 12, which are angular in cross-section, and said members 12 support the plate 11 a suitable distance above the bottom of the receptacle, forming thereby an auxiliary chamber for the reception of

the dyeing or bleaching medium. The plate 12 is further provided with a plurality of eyes or other equivalent devices 13 to permit of attaching said supplemental bottom with a suitable hoisting device of any description, so that said supplemental bottom can be removed from the machine after the material has been treated, carrying the material therewith, and which will also permit of the transporting of said supplemental bottom with the material to any suitable point desired. Through the medium of the eyes 13 and the hoisting device the supplemental bottom can be replaced in position within the receptacle 1. The receptacle 1 is further provided with a removable top or closure and which consists of a plate 14, conforming in contour to the receptacle 1 and which is perforated throughout. Upon the upper face of the plate 14, at the edge thereof, a reinforcing brace member is secured, which extends entirely around the margin of said plate 14 and which is angular in cross-section. Secured to the upper face of the plate 14 is a series of segmental-shaped reinforcing members 16, which are also angular in cross-section, and, further, secured to the upper face of the plate 14 is a circular reinforcing member 17, which is also angular in cross-section and which surrounds a spider 18, connected by suitable holdfast devices to the center of the plate 14. The central portion of the spider is reinforced by the plate 19, attached to the spider and the plate 14. The closure is further provided with a plurality of eyes or other equivalent devices to permit of connecting therewith a hoisting device, so that said closure can be removed from within the receptacle 1. The closure also acts as a compression-plate for the material. Said closure is somewhat heavy and when placed upon the material and held down in a manner as hereinafter referred to the material carried by the supplemental bottom is compressed to substantially a solid mass. The means for retaining the closure in position consists of a plurality of locking-dogs 20, which are adapted to engage the reinforcing member 15 of the closure, and said dogs are so constructed and mounted that they can be swung into and out of the receptacle 1. The dogs 20 are each provided with a hollow sleeve 21 to permit of the mounting of said dogs 20 upon a plurality of vertically-extending slotted rods 22, which are secured at their lower ends to the heavy apertured lugs 23, connected with or formed integral with the outer face of the receptacle 1. The rods 22 are secured to said lugs 23 through the medium of the nuts 24. The locking-dogs 20 are retained in their locking position through the medium of the wedges 25, which extend through the slots of the rods 22, and when said wedges 25 are driven home they securely retain the locking-dogs in their engaging position with the closure.

When the vat is used for bleaching purposes, the lower face of the closure and the upper face of the supplemental bottom are covered, coated, or sheathed with copper, lead, or other suitable metals not affected by alkali or chemicals, as indicated by the reference character 26.

From the foregoing construction of vat adapted for bleaching and dyeing purposes a vat is set up which is unusually strong and durable, and a closure for the vat is set up which is so constructed as to resist the immense pressure necessary when circulating a liquid through the solid mass of material being treated. The constructing of the closure in the manner set forth prevents the bulging at the center thereof during the circulation of the liquid and the engaging of the locking-dogs with the margin of the closure, also prevents the closure from bulging at its edges. The closure when in position is always below the outlet of the receptacle, so that during the bleaching or dyeing operation the material remains submerged at all times, which is due to the fact that the quantity of liquid supplied to the vat is such that the level of the medium will never fall below the closure.

It is thought the many advantages of a vat for dyeing or bleaching purposes constructed in accordance with the foregoing description, taken in connection with the accompanying drawings, can be thoroughly understood, and it will furthermore be evident that changes, variations, and modifications can be resorted to without departing from the spirit of the invention or sacrificing any of its advantages, and I therefore do not wish to restrict myself to the details of construction as hereinbefore shown and described, but reserve the 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 Letters Patent, is—

1. A vat for the purpose set forth involving a closure-plate comprising a perforated body portion, a reinforcing member extending entirely around the margin of the upper face thereof, a plurality of segment-shaped reinforcing members secured to the upper face of the body portion and abutting against said first-mentioned reinforcing member, a circular reinforcing member secured to the upper face of the body portion and abutting against said segment-shaped reinforcing members and a spider secured to the upper face of the body portion centrally thereof and abutting against said circular reinforcing member.

2. A vat for the purpose set forth involving a receptacle having an inlet in its bottom and an outlet in its side at the top thereof, a perforated supplemental bottom for said vat, lugs projecting from the outer face of said receptacle and provided with vertically-extending

openings, rods extending through the openings in and secured to the lugs, a perforated closure for said receptacle arranged below the outlet thereof, locking-dogs mounted upon the rods and adapted to engage the lugs and the closure for retaining the latter in position, and removable means extending through the rods for securing the locking-dogs in position.

3. A vat for the purpose described, involving a receptacle having an outlet near the top thereof, a removable supplemental and perforated bottom for said receptacle having its upper face coated with a metallic substance, a removable closure for said receptacle having its lower face coated with a metallic substance, a casing communicating with the interior of said receptacle through the outlet thereof and forming an overflow-chamber, supply-pipes communicating with the said receptacle through the bottom thereof, a suction-pipe communicating with said overflow-chamber, filtering devices arranged in said overflow-chamber, vertically-extending lugs projecting from the said receptacle and provided with vertically-extending openings, rods extending through the openings in and secured to the said lugs, and means mounted upon the rods and adapted to engage the closure for securing it in position.

4. A vat of the character described, involving the combination with a receptacle having an inlet and an outlet and a perforated closure for said receptacle, of locking means for said closure, said means consisting of a plurality of lugs projecting from said receptacle exterior thereof and provided with vertically-extending openings, a plurality of slotted rods extending through the openings in the lugs and projecting above the top of the receptacle, nuts mounted upon the rods above and below the lugs for securing the rods to the lugs, locking-dogs carried by the rods and adapted to engage the lugs and said closure, and means extending through the slots of the rods for securing the locking-dogs in engaging position with the closure.

5. A vat of the character described, involving a receptacle provided with a series of lugs having vertically-extending openings, said lugs arranged upon the outer face of the receptacle, said receptacle further provided at its top with an outlet and at its bottom with an inlet, a casing forming an overflow-chamber arranged at the outlet of said receptacle and projecting from and supported by said receptacle, a filtering medium arranged in said overflow-chamber, a removable perforated supplemental bottom arranged in said receptacle and having its upper face coated with a metallic substance not affected by alkaline chemicals, a removable perforated closure operating in said receptacle and having its lower face coated with a metallic substance not affected by alkaline chemicals, rods extending through the openings in the lugs, means for securing the rods to the lugs, and means mounted upon the rods and engaging the lugs and closure for retaining the latter in position within the receptacle.

6. A vat for the purpose set forth involving a receptacle having a plurality of lugs projecting from the outer face thereof, said lugs provided with vertically-extending openings, said receptacle further provided at its top with an outlet and at its bottom with an inlet, a removable perforated supplemental bottom arranged in said receptacle, a removable perforated closure operating in said receptacle and adapted to be positioned below the outlet, a casing carried by said receptacle and communicating therewith through said outlet, said casing forming an overflow-chamber, a filtering medium arranged in said chamber, a deflector arranged above said inlet, a heating-medium-supply pipe mounted upon the bottom of said receptacle and communicating with a heating-medium supply, a plurality of vertical rods extending through the openings in and secured to said lugs, said rods being slotted, locking-dogs mounted upon said rods and adapted to engage said lugs and said closure for retaining the latter within said receptacle, and means extending through the slots of the rods and engaging the locking-dogs for securing them in position.

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

JAMES A. WILLARD.

Witnesses:
L. B. LOCKWOOD,
S. M. POSTLETHWAITE.