

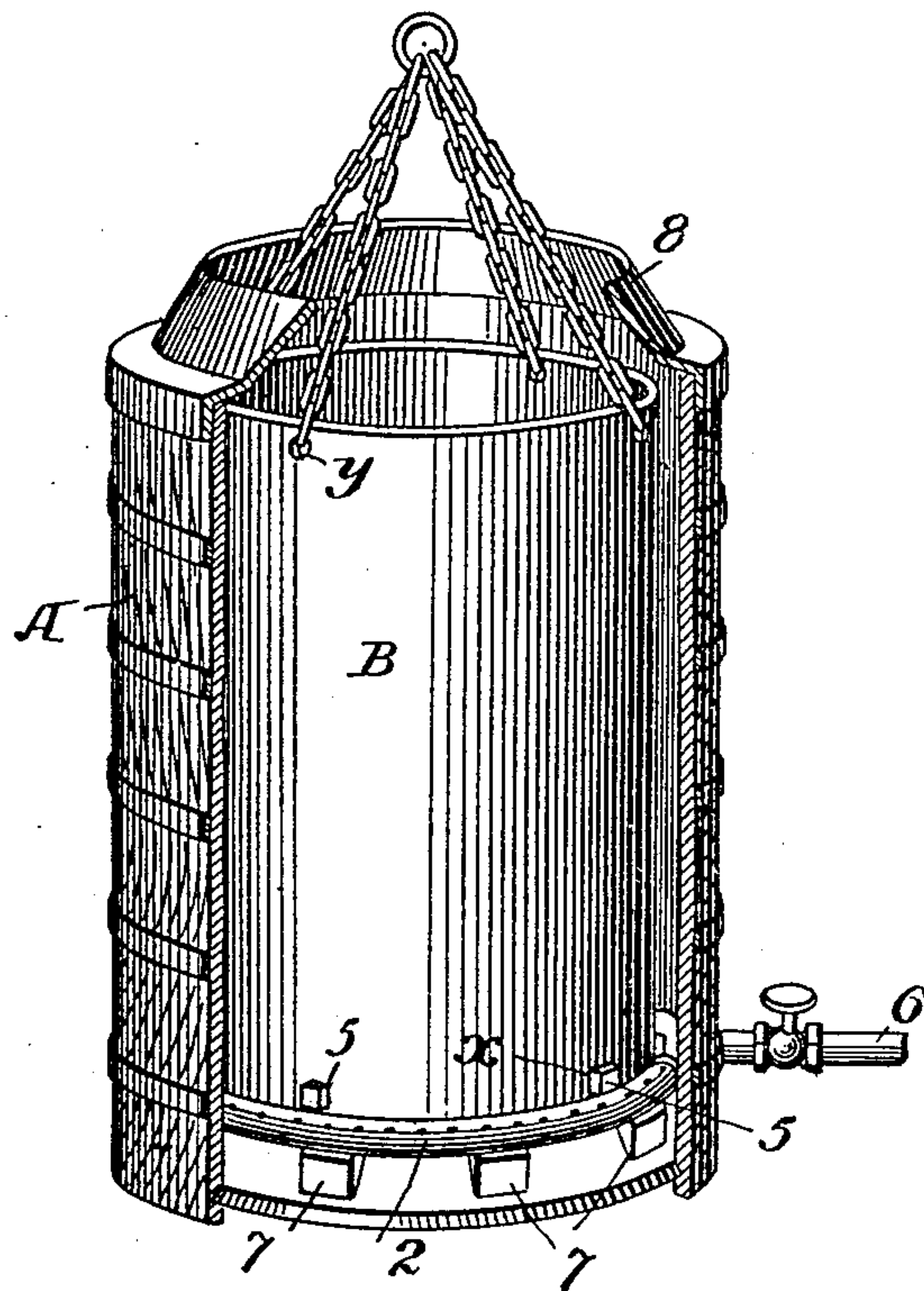
No. 814,173.

PATENTED MAR. 6, 1906.

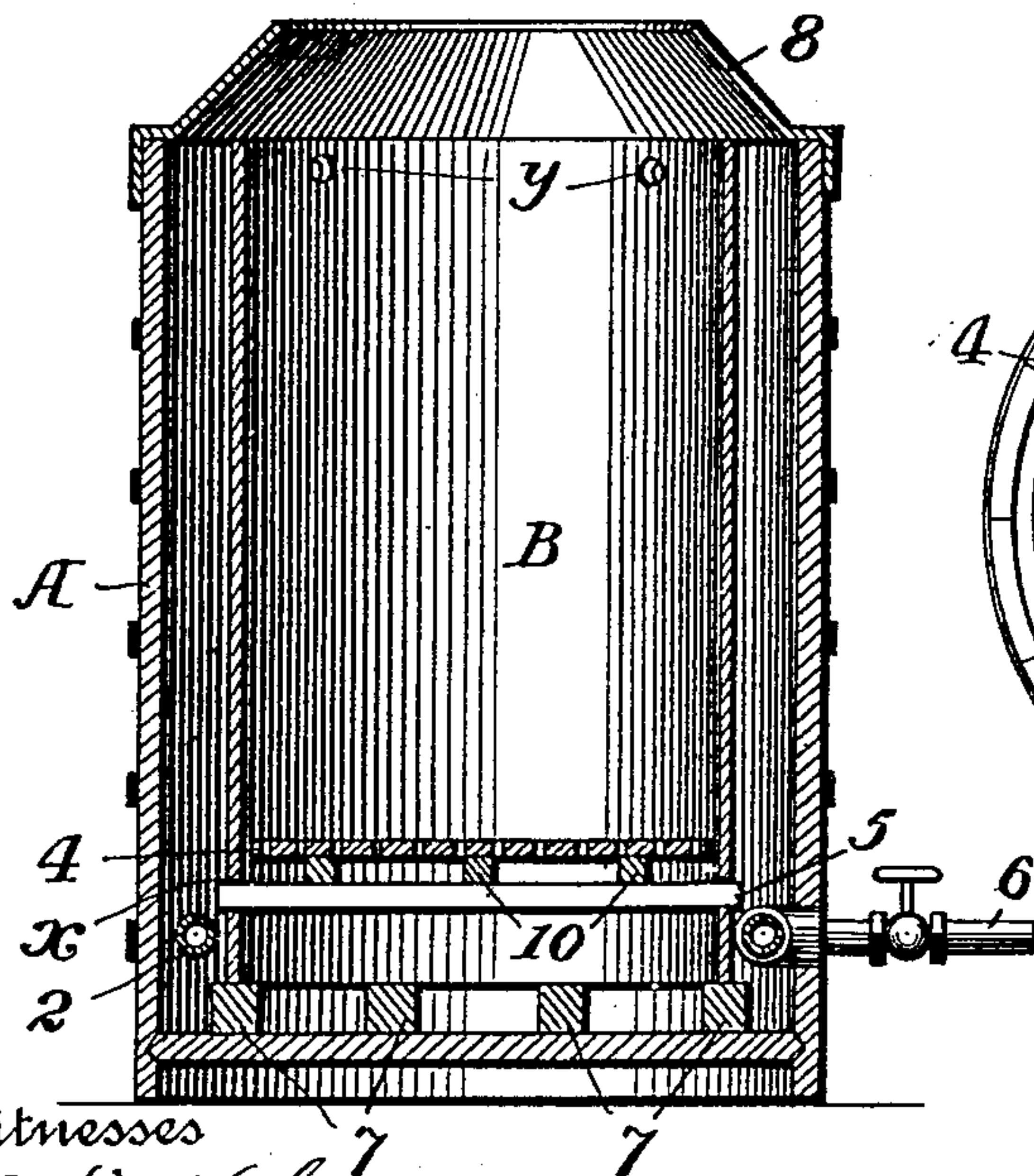
F. I. STONE.  
DYE VAT.

APPLICATION FILED NOV. 8, 1905.

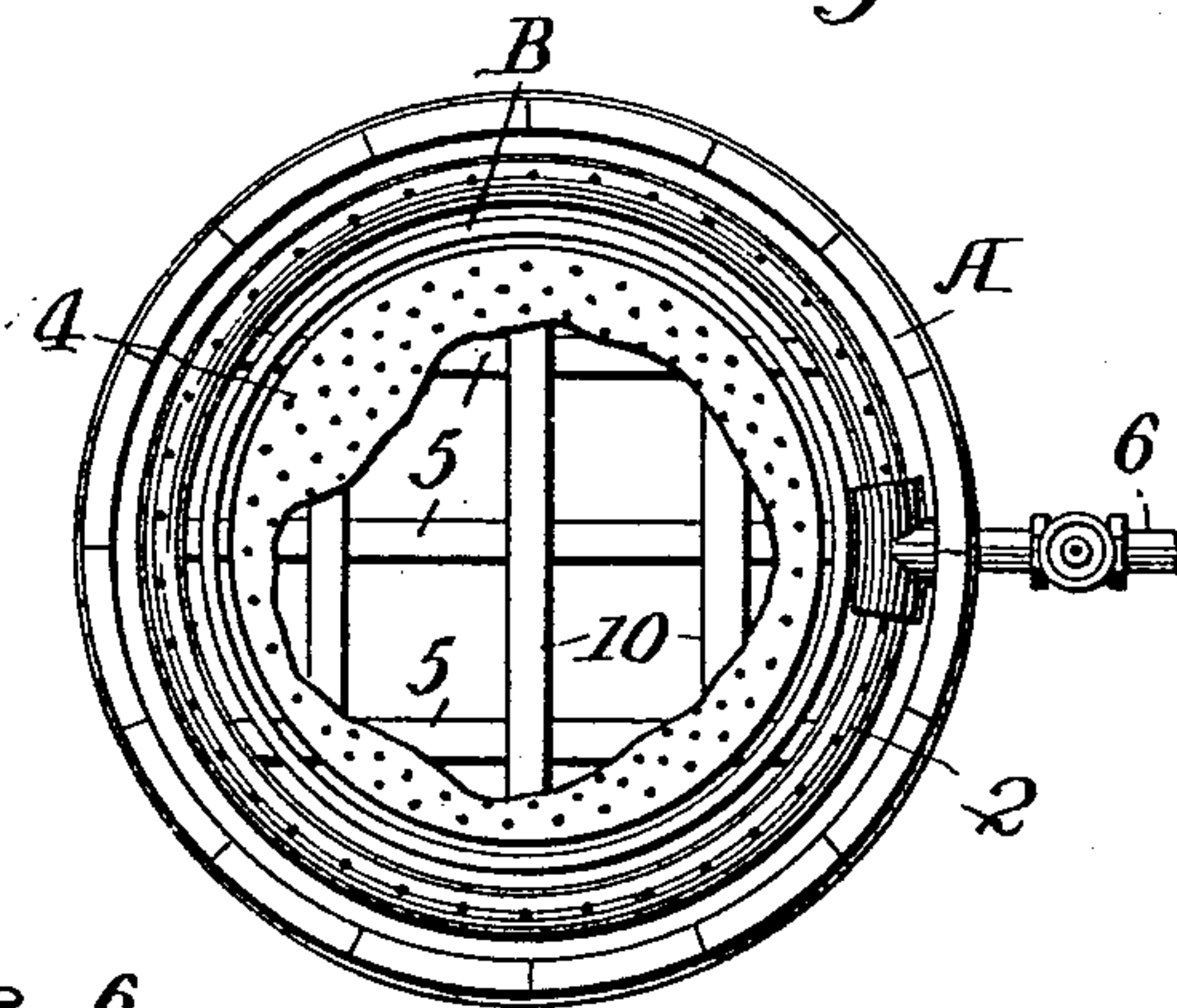
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses  
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# UNITED STATES PATENT OFFICE.

FRANCIS I. STONE, OF ATLANTA, GEORGIA, ASSIGNOR OF ONE-FOURTH  
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## DYE-VAT.

No. 814,173.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed November 8, 1905. Serial No. 286,410.

*To all whom it may concern:*

Be it known that I, FRANCIS I. STONE, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Dye Tubs or Vats, of which the following is a specification.

My invention relates to dyeing apparatus; and it consists of certain vessels constructed and provided with means for heating and circulating a dye liquor and for facilitating the discharge of the contents of the inner vessel, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of dyeing apparatus embodying my improvement; Fig. 2, a sectional elevation. Fig. 3 is a plan, the flanged ring of the outer vessel being removed.

The apparatus comprises, essentially, two vessels A B, the larger vessel A closed at the bottom, near which is a coil 2 of steam-pipe perforated at the top and communicating with the supply-pipe 6, and the vessel B consists of a cylinder open at both ends, the lower end resting upon supports 7 or being otherwise supported to permit the passage of liquor from the vessel B downward to the coil of the vessel A.

The vessel A is provided at the upper end with a flange 8, projecting inward above, but across, the upper edge of the vessel B, and the latter has a detachable perforated bottom 4. The bottom 4 is suitably supported, so that when the said bottom rests upon a proper support the vessel B may be lifted vertically away from said bottom. As shown, the sides of the vessel have openings x, through which pass cross-bars 5, and on the latter rest cross-bars 10, upon which the bottom 4 bears. The flange 8 is upon a ring C, fitting detachably the upper end of the vessel A, so that the ring, with its flange, may be removed in order to insert and withdraw the vessel B.

The parts being in the position shown in Fig. 2, the vessel A is filled to a proper extent with the dye liquor and the material to be dyed is thrown into the vessel B and rests upon the bottom thereof, after which the steam is turned into the coil 2. It will be seen that the coil 2 is so placed that the steam jets are discharged upward into the space

(generally about two inches in width) between the walls of the two vessels. As there is but a comparatively small amount of dye liquor between these walls, a boiling heat is quickly imparted to the same, causing such a wide difference between the temperature of the liquor between the walls and that within the vessel B that there will be a rapid circulation, the hotter portion moving upward between the vessels and the cooler portion downward through the material and through the bottom of the vessel B and below the lower edge of the latter to the steam-pipe. This action is further facilitated by the fact that the volume of steam acting upon the small volume of water between the walls and forcing it upward tends to produce a partial vacuum. The flange 8 effects an important result in this operation, as it serves to deflect inward the liquor thrown upward by the steam jets, carrying it toward the center of the vat and around the entire circumference and causing its discharge into the vessel B, and it will be noted that owing to the disposition of the steam jets there can be no possible discharge of the steam upward through the material in the vessel B, and thus I avoid that injury to the contents of the vessel which has heretofore been sustained in apparatus of the usual character, where the steam is projected upward through the inner vessel.

The construction above described results in saving a large amount of labor in discharging the dye stock at any point desired. This is accomplished by lifting the vessel B vertically from the vessel A by means of grapples or chains engaging openings y at the top of the vessel B and carrying the vessel to any desired point and then lowering it upon a floor provided with blocks so arranged that as the vessel B approaches the floor the bottom 4 or the bars 5 will be brought onto the upper faces of said blocks before the lower edge of the vessel B touches the floor. This will carry the bottom 4 away from the cross-bars 5, which may then be drawn out through the openings x, after which the vessel B may be lifted, leaving the entire dyed contents resting upon the detached bottom 4, supported by the blocks upon the platform. Suitable duplicate bottoms 4 are provided to replace those which are in use in supporting the contents upon the platform.



Without limiting myself to the construction and arrangement shown, I claim—

1. The within-described dyer's vat consisting of an outer casing closed at the bottom and with a ring at the top having an inward-inclined flange, a smaller casing within the outer casing open at both ends and provided with a support for the contents, detachable to permit the contents to pass bodily out of the bottom of the casing, means for supporting the inner casing with its bottom above that of the outer casing, and a perforated steam-pipe arranged to discharge steam upward between the two casings, substantially as set forth.

2. The combination in the receiving vessel

of a dyeing apparatus, of a loose bottom within said vessel, and laterally-detachable supports for said bottom, substantially as set forth.

3. The combination in the receiving vessel of a dyeing apparatus, of a loose bottom within said vessel, and detachable cross-bars supporting said bottom and extending through the vessel so as to be withdrawn therefrom to release the bottom, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS I. STONE.

Witnesses:

S. DWIGHT WINN,

F. W. STONE.