No. 875,553. PATENTED DEC. 31, 1907.

F. N. PATTERSON.

DYEING APPARATUS.

APPLICATION FILED MAY 15, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

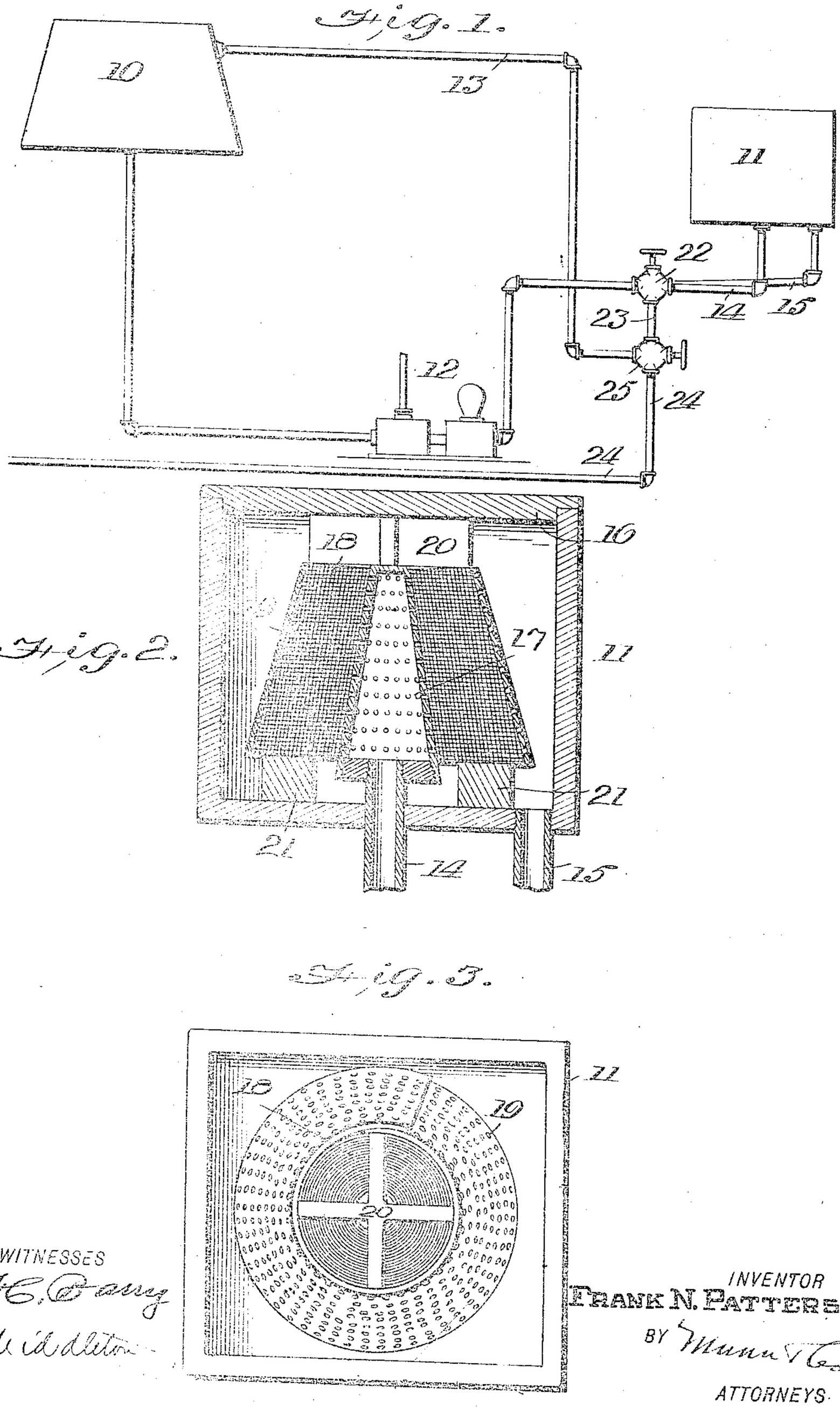

Fig. 2.

Fig. 3.

WITNESSES

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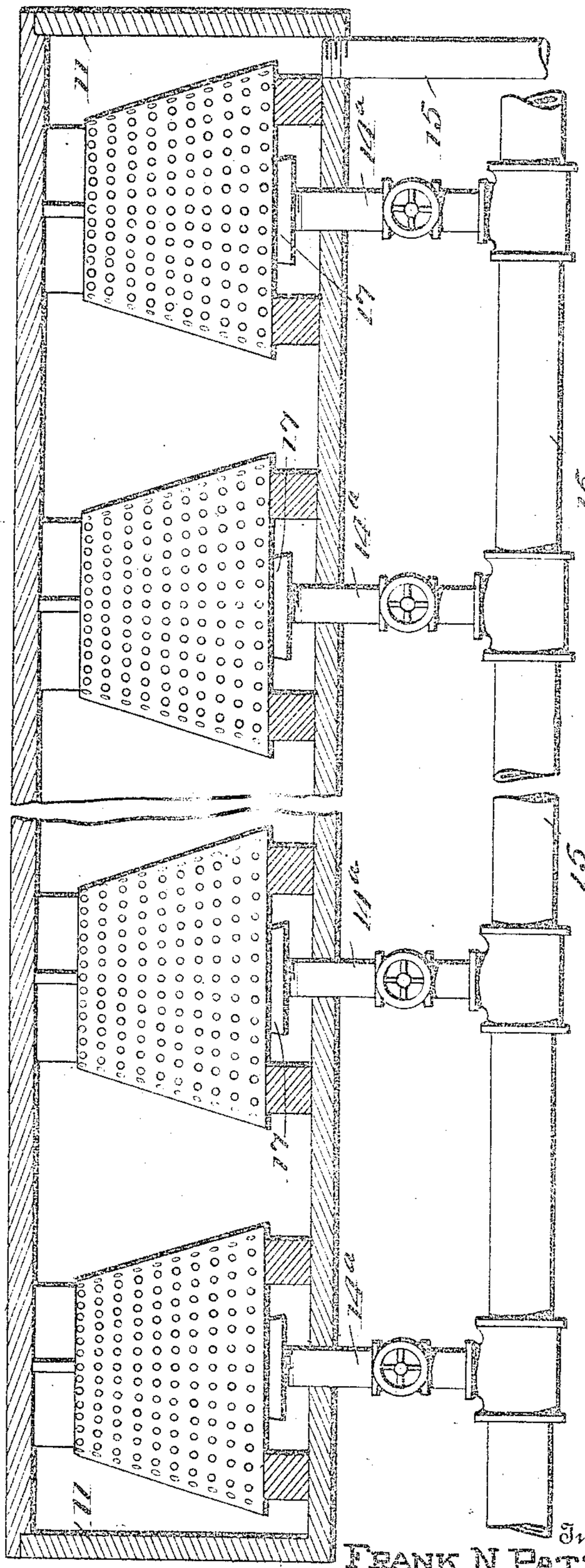

UNITED STATES PATENT OFFICE.

FRANK NEVILLE PATTERSON, OF LEXINGTON, NORTH CAROLINA.

DYEING APPARATUS.

No. 875,553. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed May 15, 1907. Serial No. 373,717.

To all whom it may concern:

Be it known that I, FRANK NEVILLE PATTERSON, a citizen of the United States, residing at Lexington, in the county of Davidson and State of North Carolina, have invented a new and useful Improvement in Dyeing Apparatus, of which the following is a specification.

This invention is a machine or apparatus for dyeing, and particularly adapted and intended for applying dyes to cotton or worsted yarns.

The object of the invention is to provide a dyeing machine or apparatus in which the dyestuff or liquid will be forced uniformly through the yarn, and then back to the supply vat for repeated use.

The apparatus includes a dye supply vat and pump, and pipe connections to a dyeing box containing cones on which the yarn is reeled, the yarn being uniformly held between the cones and surrounding perforated jackets, causing uniform resistance throughout the mass of yarn, as more fully appears hereinafter.

In the accompanying drawings, wherein the invention is illustrated, Figure 1 is a side elevation of the apparatus. Fig. 2 is a vertical section of the dye box and a cone therein. Fig. 3 is a top plan view of the parts shown in Fig. 2, the cover of the box being removed. Fig. 4 is a diagrammatic view showing a dye box provided with a plurality of cones.

Referring particularly to the drawings, 10 indicates the supply vat for the supply; 11 the dye box; 12 the pump connected to the vat and the box and adapted to pump dye from the former to the latter; and 13 the return pipe from the box to the vat. The inlet pipe from the pump enters the bottom of the box through either a branch 14 or a branch 15, controlled by a three way valve 22, and the return leads from the three way valve 22 to a drain pipe 23 which is connected to the return pipe 13, and to a waste or rinsing water pipe 24 by a three way valve at 25. In practice, the entire machine will comprise a large number of cones 17 in the same box 11, each of the cones being supplied by a branch pipe 14^a from the main pipe 14.

The dye box 11 is made of iron, with a water tight lid 16 fastened thereon in any suitable manner. The top of the inlet pipe 14, where it projects through the bottom of the box is threaded to receive a perforated hollow iron cone 17, screwed thereon. The cone has perforated sides but is closed at the top. The yarn to be dyed, indicated at 18, is wound thereon by any suitable winder, to the size desired, and around the cone of yarn is then placed a perforated jacket 19 which holds or confines the yarn in position, the whole being held in shape by a cruciform binder 20. The jacket is the full length of the yarn cone which rests upon blocks 21 on the bottom of the box. The jacket 19 is made of sheet metal and is expansible, within certain limits, to fit a cone of yarn of any ordinary size. After the yarn is put in place and fixed by the jacket and binder, and the cover fastened on the dye is pumped into the box, passing through the holes in the cone and uniformly through the mass of yarn and out at the sides and ends thereof, filling the box and overflowing through the return pipe 13 to the vat for subsequent use by the same process. After the yarn is thoroughly saturated with the dye the wash water is forced through the same way, thereby avoiding handling the material a second time. By the aid of the jacket and the cross binder the yarn cone is held in the same shape and condition during the entire process and is in the same shape after the dyeing and washing as before, thereby avoiding rewinding. The particular manner of and means for holding the yarn during the dyeing and washing is an especial feature of the invention and attended with decided practical advantages. The pressure of the jacket and binder upon the mass gives uniformity thereto and prevents the formation of decided channels or outlets and insures the penetration by the dye uniformly to all parts of the mass, from the center to the circumference, as well as thorough rinsing thereafter.

By means of the three way valve at 22 the liquid can be forced through the cone from the inside outward, in which case it enters through the pipe 14 and passes out through the pipe 15, or from the outside inward, in which event it passes in through pipe 15 and out through pipe 14; or it can be passed first one way and then the other, the overflow in either instance passing back to the vat through the three way valve 22 and the pipe 13, this passage, however, being controlled by the other three way valve 25, so that when the rinsing water is passed through it can be sent to waste pipe 24. The inlets 14 and 15 are in the bottom of the tank, so that

the cover can be removed and box loaded or unloaded without disconnecting any pipes.

I claim:

1. In a dyeing apparatus, the combination of a box, a perforated cone for receiving the material to be dyed, said cone having a pipe extending thereinto through the bottom of the box, a perforated expansible jacket surrounding the cone for confining the material thereon, a binder extending across the material at the top of the cone, and another pipe opening from the box.

2. In a dyeing apparatus, in combination, a dye box having an inlet pipe projecting through the bottom thereof, a hollow cone having perforated sides connected with the end of the pipe for supporting the yarn, an expansible jacket inclosing the yarn on the cone for confining said yarn in place and an outlet pipe for the box.

3. In a dyeing apparatus, a hollow cone having perforated sides for supporting the yarn, and an expansible jacket inclosing the yarn on the cone for confining said yarn in place, and means for supplying dyeing material to the hollow of the cone.

FRANK NEVILLE PATTERSON

Witnesses:

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