

(No Model.)

3 Sheets—Sheet 1.

W. M. ROBERTSON.
MACHINE FOR DYEING FABRICS.

No. 468,579.

Patented Feb. 9, 1892.

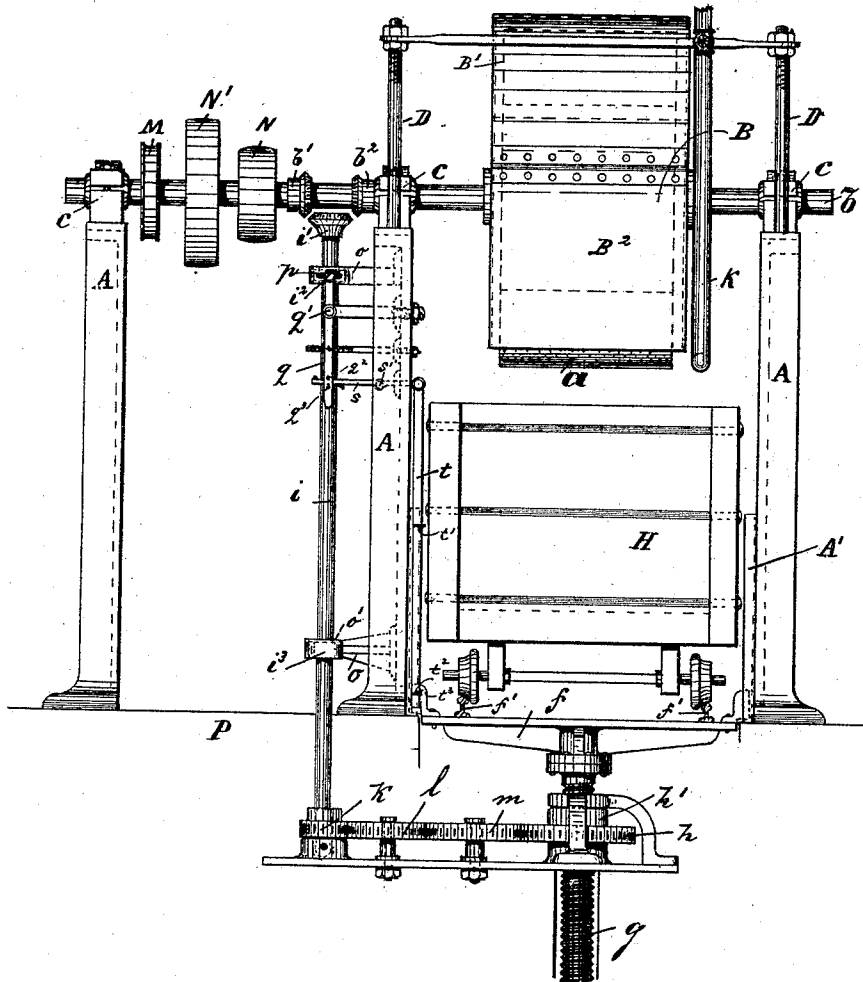


Fig. 1.

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E. L. Sherman

INVENTOR :

William M. Robertson

BY

Cartner & Co.
ATTORNEYS

3 Sheets—Sheet 2.

Patented Feb. 9, 1892.

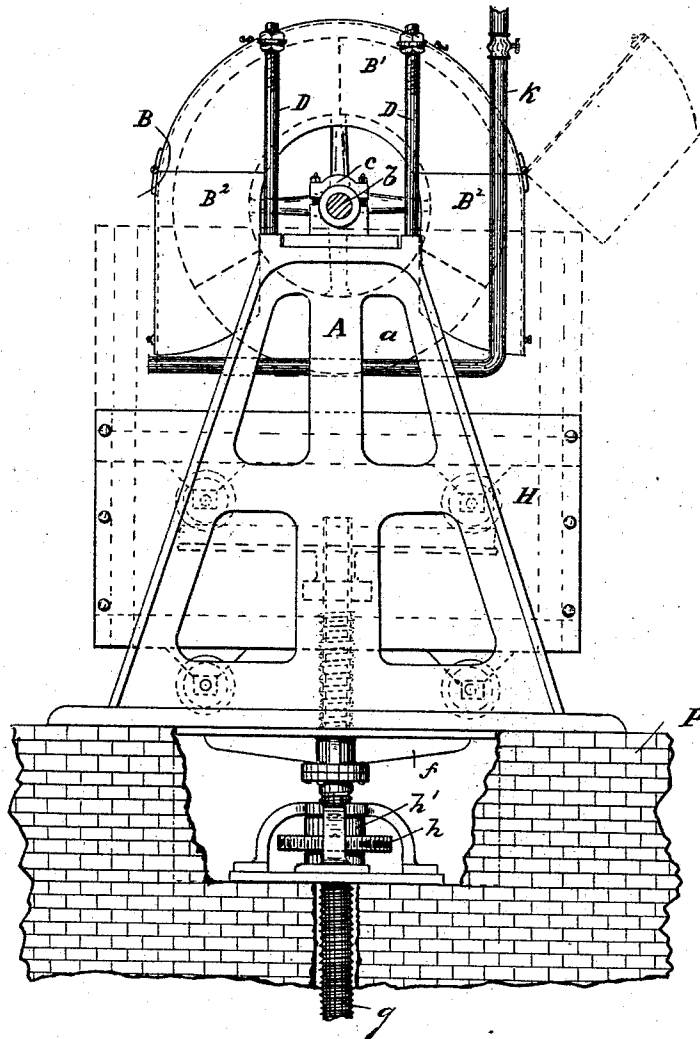


Fig. 2.

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(No Model.)

3 Sheets—Sheet 3.

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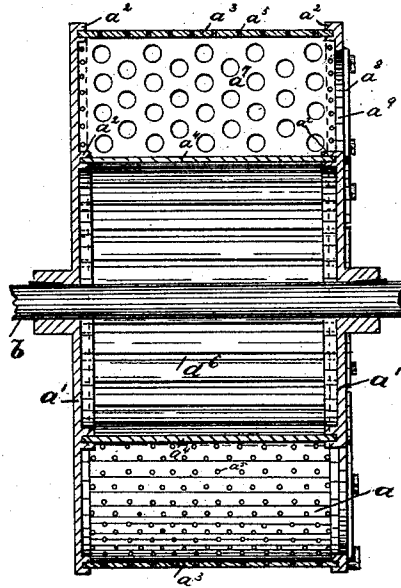
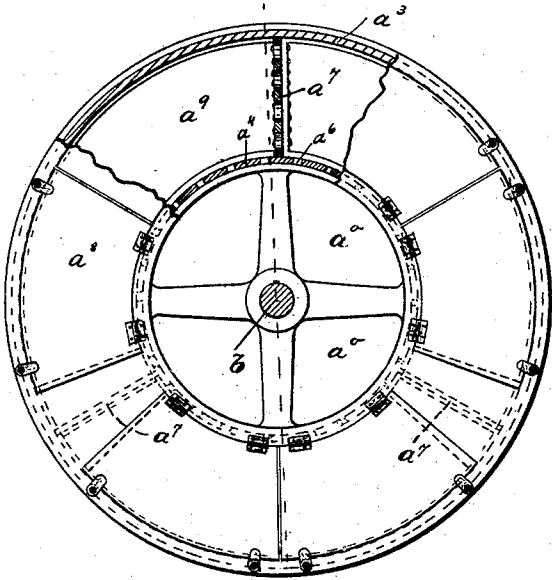


Fig. 3.

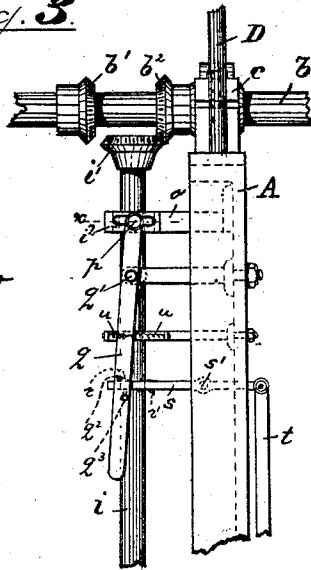


Fig. 4.

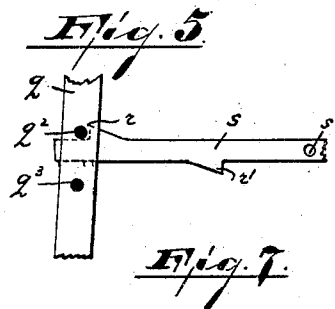


Fig. 6.

Fig. 6.

WITNESSES:-

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UNITED STATES PATENT OFFICE.

WILLIAM M. ROBERTSON, OF NEWARK, NEW JERSEY.

MACHINE FOR DYEING FABRICS.

SPECIFICATION forming part of Letters Patent No. 468,579, dated February 9, 1892.

Application filed August 3, 1891. Serial No. 401,469. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. ROBERTSON, a subject of the Queen of Great Britain, residing at Newark, Essex county, and State of New Jersey, have invented certain new and useful Improvements in Machines for Dyeing Fabrics; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a simple and reliable dyeing and bleaching apparatus, cheap in construction, and easily handled and operated.

The invention consists of the improved dyeing apparatus, generally applicable for dyeing, scouring, bleaching, mordanting, steaming, washing, or otherwise treating yarns of cotton, wool, silk, or any animal or vegetable fiber; a perforated drum divided into three or more compartments or sections and adapted to be revolved; of a dye-tank and means for raising or lowering said dye-tank, and of the arrangement and combination of the various parts thereof, substantially as will be hereinafter more fully described, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a front elevation of my improved dyeing apparatus. Fig. 2 is a side elevation thereof. Figs. 3 and 4 are enlarged detail views of the dyeing-drum. Fig. 5 is an enlarged detail view of the elevator-shifting mechanism. Fig. 6 is a sectional view on line *x*, Fig. 5 and Fig. 7 is a detail view of the elevator-stopping mechanism.

In said drawings, *a* represents the dyeing-drum, adapted to revolve with shaft *b*, said shaft resting in bearings *c c* on top of framework *A A*, the latter being secured to the floor or to any suitable foundation *P*. The dyeing-drum consists of the two side plates *a' a'* with openings *a⁰ a⁰*, having on their inner sides circular grooved projections *a² a²*, in which fit metallic rings *a³ a⁴*. The outer

ring *a³* is provided with a great number of small openings *a⁵ a⁵* and the inner ring *a⁴* with slots *a⁶*, running parallel or diagonal with the shaft. The space between the two rings or cylinders is divided by perforated plates *a⁷ a⁷* into three or more compartments, each of these compartments having one or more doors *a⁸* secured to one of the side plates *a'*, and thus covering openings *a⁹ a⁹* in said side plate.

A drum or cover *B* is arranged around the dyeing-drum to prevent the escape and consequent waste of the dyeing-liquid. This cover consists of three sections *B' B² B²*, and is held in position by rods *D D*, secured to the frame *A A*. The sections *B² B²* are secured by hinges to section *B'* and are adapted to be turned on said hinges, thus giving room for the doors *a⁸* to be opened.

Between the frame *A A* and underneath the dyeing-drum is arranged the tank carrier or table *f*, provided with rails *f' f'* and adapted to be raised and lowered by screw *g* in guides *A' A'*. Said screw *g* works in a threaded hub *h'* of gear-wheel *h*, which latter is operated by connecting-shaft *i* through transmitting gear-wheels *k l m*. The connecting-shaft *i* is provided on its top end with a beveled gear-wheel *i'*, adapted to mesh into beveled gear-wheels *b' or b²*, which are secured to shaft *b*. This shaft *i* revolves in bearings *i² i²*, adapted to slide in elongated slots *o' o'* in brackets *o o*. The upper bearing *i²* is provided with a pin *p*, working in a slot *o²* of bracket *o*. To said pin *p* is secured a hand-lever *q*, pivoted at *q'* and provided on its free end with pins *q² q³*. (Shown in Figs. 1, 5, and 7.) When the lever *q* is moved to the right or left, the pins *q² q³* catch on projections *r r'* on lever *s*. Said lever *s* is pivoted at *s'* to frame *A*, Figs. 1 and 5, and is, with the shorter arm, pivotally connected to rod *t* with stops *t'* and *t²*. The springs *u u* hold the lever *q* in normal position. To the table *f* is also secured a pin *t³*, adapted to engage with stops *t'* and *t²* when the table is raised to its extreme height or lowered to its normal position. The tank or vat *H* holds the dyeing-liquid and steam-pipe *K* heats the said liquid when the apparatus is in operation. The power is transmitted to the shaft

through pulleys N and N' and is regulated by a brake-wheel M.

The operation of the machine is as follows: The yarn or cotton is placed in the dyeing-drum *a*, the doors *a*⁸ *a*⁸ are closed, and the covers B' B' brought into normal position. Power is then applied to the large pulley N' and the lever *q* is moved to the right, thus bringing the beveled gear-wheel *i*' of connecting-shaft *i* into mesh with beveled gear-wheel *b*' on shaft *b*. By the gear-wheels *k*, *l*, *m*, and *h* the table carrying the tank or vat is raised until pin *t*³ of table *f* engages pin *t*' of rod *t*, which releases the pin *q*² of lever *q* from projection *r* of lever *s*, and by the action of the springs *u u* the lever *q* is brought back to its normal position, as shown in Fig. 1, thus disconnecting the beveled gear-wheels *i*' and *b*'. By the screw *g* the table and the tank or vat are brought up to the position as shown in dotted lines in Fig. 2. The dyeing-drum is slowly revolved, with about one-third of its diameter immersed in the dyeing-liquid, until the yarn or cotton is thoroughly saturated. Then the lever *q* is moved to the left, thereby connecting beveled gear-wheels *i*' with *b*², and by means of the screw *g* the table, with its tank or vat, is lowered until pin *t*³ engages with pin *t*² of rod *t*, which releases the lever *q*, with its pin *q*³, from projection *r*', thus disconnecting the beveled gears *i*' and *b*² and bringing the table with its tank or vat to rest. The belt is then shifted to the smaller pulley N, which revolves shaft *b* with dyeing-drum *a* at a high speed, and all the surplus dyeing-liquid is thereby thrown through the perforations of the outer ring of drum *a* against the inner wall of cover B and drops back into the tank or vat. When the tank or vat is at its extreme height, steam is applied to steam-pipe *k*, thus heating the dyeing-liquid to any degree desired. After sufficient time has elapsed the drum is stopped and the yarn or cotton removed, which by the centrifugal force exerted is thoroughly dyed and perfectly dry.

I do not intend to limit myself to the exact construction shown and described, as various changes can be made without changing the scope of my invention.

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

1. A dyeing apparatus consisting of a drum secured to a shaft, said drum having an outer perforated and an inner slotted ring, side plates holding said rings together, perforated partition-plates between said rings forming compartments for the fabric, a tank or vat for the dyeing-liquid, a table carrying said tank or vat, and a mechanism for raising and lowering said table, all said parts being combined and adapted to operate sub-

stantially as described, and for the purposes set forth.

2. A dyeing apparatus consisting of a drum secured to a shaft, said drum being provided with an outer perforated and an inner slotted ring and with a series of perforated partition-plates, side plates holding said rings together and adapted to form with said rings and with the said partition-plates compartments for the fabric, a tank or vat for the dyeing-liquid, a table carrying said tank or vat, an elevating mechanism adapted to be operated by the drum-driving shaft, and a cover or cap surrounding said drum and adapted to restrain the surplus liquid and to conduct said liquid back into the tank or vat, all said parts being arranged and combined substantially as described, and for the purposes set forth.

3. A dyeing apparatus consisting of a revolving perforated drum divided into sections, a driving-shaft carrying said drum, a tank or vat for holding the dyeing-liquid, a table to support said tank or vat, an elevator-screw for raising or lowering said table, gear-wheels adapted to operate said screw, a geared connecting-shaft for transmitting the power of the drum-driving shaft to said gear-wheels, and a shifting-lever for operating said connecting-shaft, all said parts being combined substantially as described and set forth.

4. A dyeing apparatus consisting of a revolving perforated drum divided into sections, a driving-shaft carrying said drum, a tank or vat for holding the dyeing-liquid, a table to support said tank or vat, an elevator-screw for raising or lowering said table, a geared connecting-shaft, intermediate gear-wheels connecting said shaft and screw, a lever for shifting said connecting-shaft, and a mechanism for automatically operating said shifting-lever, all said parts being arranged and combined to operate substantially as described, and for the purposes set forth.

5. In a dyeing apparatus, the combination, with a perforated revolving drum and a shaft carrying said drum, of a tank or vat for holding the dyeing-liquid, a table carrying said tank, a geared driving-shaft, an elevator-screw secured to said table, a geared connecting-shaft, gear-wheels connecting said shaft and screw, and a mechanism for automatically stopping said table at its extreme height or its normal position, all said parts being arranged and combined substantially as described, and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 28th day of May, 1891.

WILLIAM M. ROBERTSON.

Witnesses:

E. L. SHERMAN,
WM. D. BELL.