(No Model.) 2 Sheets—Sheet 1.

A. WHITTALL.

APPARATUS FOR DYEING.

No. 535,519. Patented Mar. 12, 1895.

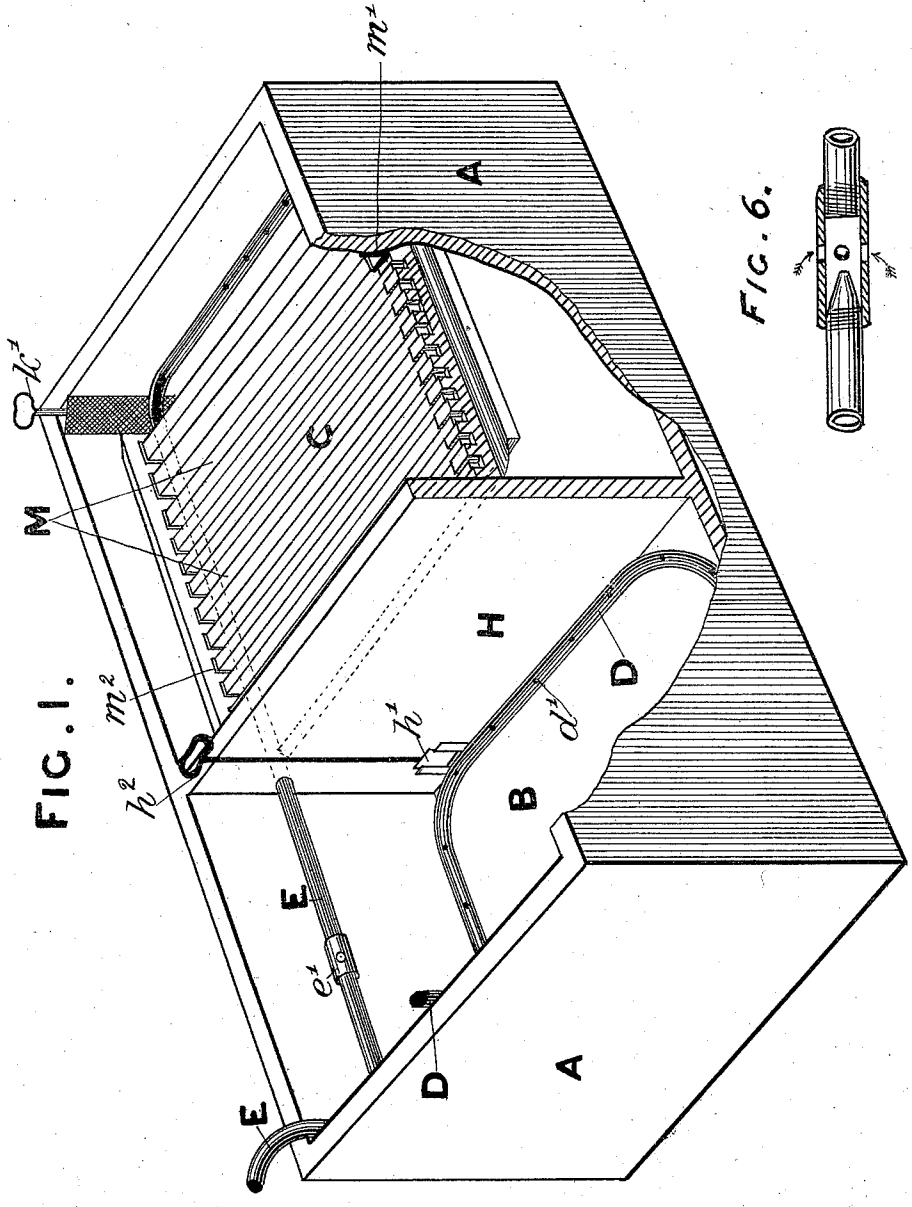

FIG. 1.

FIG. 6.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

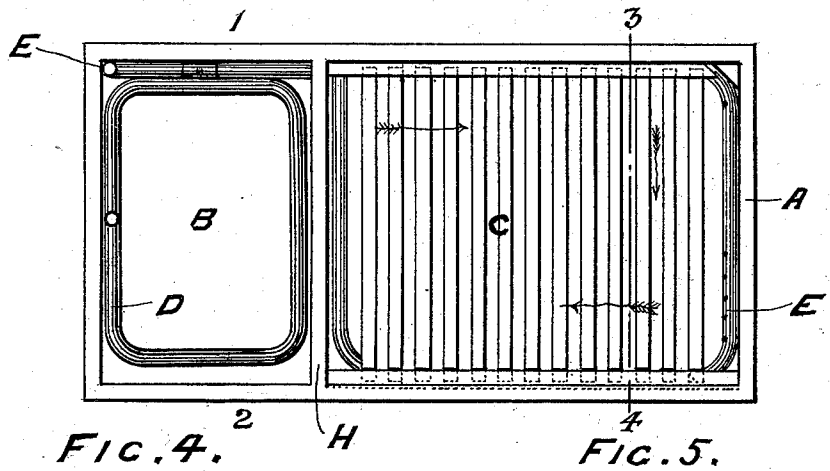


FIG. 4.

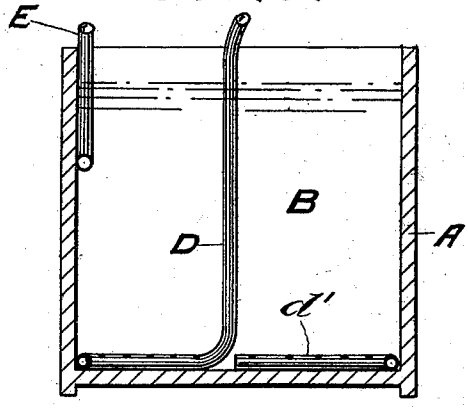


FIG. 5.

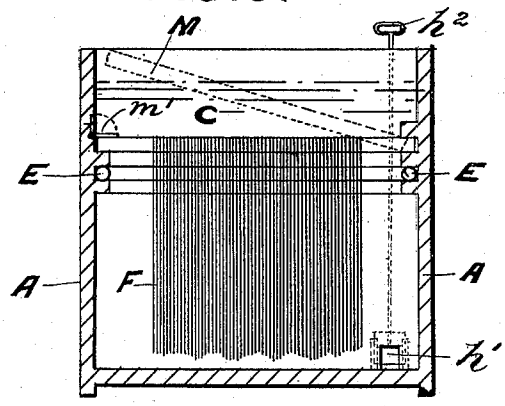
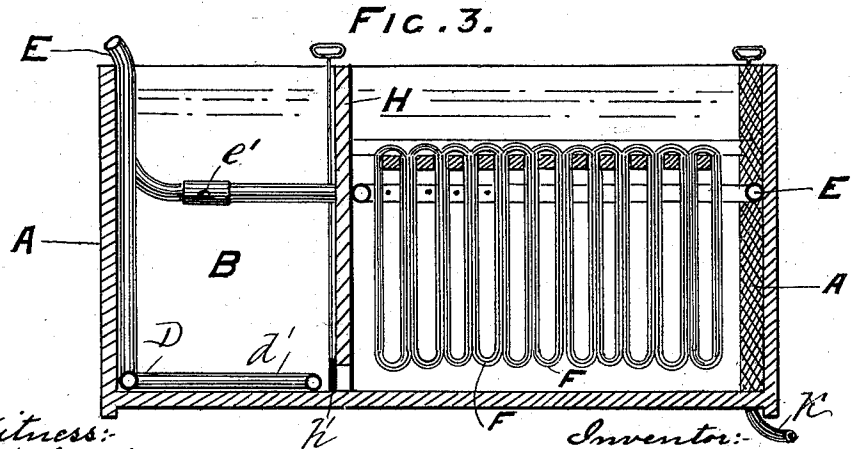


FIG. 3.



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UNITED STATES PATENT OFFICE.

ARTHUR WHITTALL, OF BEWDLEY, ENGLAND.

APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 535,519, dated March 12, 1895.

Application filed May 25, 1894. Serial No. 512,426. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR WHITTALL, manufacturer, a subject of the Queen of Great Britain, residing at The Crumdals, Bewdley, in the county of Worcester, England, have invented certain new and useful Improvements in Apparatus for Dyeing Yarn, of which the following is a specification.

My invention has for its object improvements in apparatus for dyeing yarn by which the yarn is entirely immersed in the liquid from the time it is inserted in the vat until finished, the color being fixed upon the yarn by a gradual process and the yarn left in one position during the whole process, thus preventing the entanglement which often takes place when the yarns have to be picked up and turned. The yarn is thus dyed all over automatically, the only labor required being to insert the yarn and remove it when finished. It is also dyed in much less time by reason of the whole of the skein being immersed, as under the old process the skeins required to be turned before they were finished, this continued handling being also the cause of more waste in winding.

In order that my invention may be clearly understood and more easily carried into practice I have appended hereunto two sheets of drawings upon which I have fully illustrated the nature of my said improvements.

Figure 1 is a perspective view of my vat broken away to show part of the interior. Fig. 2 is a plan. Fig. 3 is a longitudinal section. Fig. 4 is a cross section on the line 1—2. Fig. 5 is cross section on the line 3—4. Fig. 6 is a sectional view of the injector.

In carrying my invention into effect I use a vat A of a convenient size for dyeing the quantity of yarn usual at one time which vat A is divided into two parts or compartments B and C, the one, B, being used for mixing and heating the liquid and the other, C, for containing and dyeing the yarn F. The liquid in the compartment B is heated by any suitable steam arrangement such as the steam pipe D coiled about and having a number of perforations d' for the emission of steam into the liquid.

The compartment C I use for the suspension of the yarn from poles which I so mount that their position is below the top level of the liquid for which purpose suitable slots are provided at one side of the vat to receive the ends of the poles M the other ends resting on a suitable ledge and are kept down and prevented from floating by means of any suitable arrangement such as the hinged flap m'.

The two compartments B and C are connected together by the steam pipe E which is fitted at e' with any suitable form of injector so that the contents of the mixing compartment B are conveyed to the dyeing vat compartment C. This pipe passes round the compartment C under the level of the liquid and is provided with the emission holes shown in Figs. 1 and 2 which are so arranged as to give the liquid in the emersion compartment a whirling movement and thus thoroughly mix with the yarn. At the bottom of the dividing partition H a hole h' having a sliding door h^2 is formed so that as the dye is gradually transferred to the dyeing vat side the same level is retained in both compartments by the liquid passing back into the compartment B. The dyeing vat C is fitted with the pipe and opening K with sliding door k' so as to allow the level of the liquor to be lowered for taking out the poles M bearing the skeins or for examining the yarn. A constant interchanging and mixing of the liquid is thus kept up and the water on the emersion side B is gradually changed to the same consistency and color of the liquor in the mixing side and the yarn is thus dyed without the usual manual operation of turning the yarn on the poles and consequently much time and labor are saved.

The relative size of the two compartments may be varied to any required extent to suit the particular quantity of yarn to be dyed. By these means the dye is gradually distributed and drawn through the yarn instead of the yarn being drawn through the dye.

The action is as follows: Both compartments are first filled with water the dye being placed in B and the skeins of yarn immersed in C after which the steam pipe E is put in operation and the door h' opened, the circulation then proceeding as before described.

What I claim, then, is—

1. In combination in an apparatus for dyeing yarns, the tank having a partition dividing it into a mixing and a dyeing compart-

ment the opening between the compartments, the racks in the dyeing compartment, the steam pipe passing through the mixing compartment and around the dyeing compartment said pipe having an injector *e'* in the mixing compartment and outlet openings into the dyeing compartment, substantially as described.

2. In combination, the tank having a partition dividing it into two compartments, the opening between the compartments, the steam pipe D extending into the mixing compartment B and a second steam pipe C extending through the compartment B and about the compartment C and having an injector in the compartment B and openings into the compartment C, substantially as described.

In testimony that I claim the foregoing as my own I affix my name in the presence of two witnesses.

ARTHUR WHITTALL.

Witnesses:
GEORGE WATKIN,
REGINALD LEW MORGAN.