No. 644,989. Patented Mar. 6, 1900.

J. MAJOR.

APPARATUS FOR DYEING, &c.

(Application filed June 20, 1899.)

(No Model.)

FIG. 1.

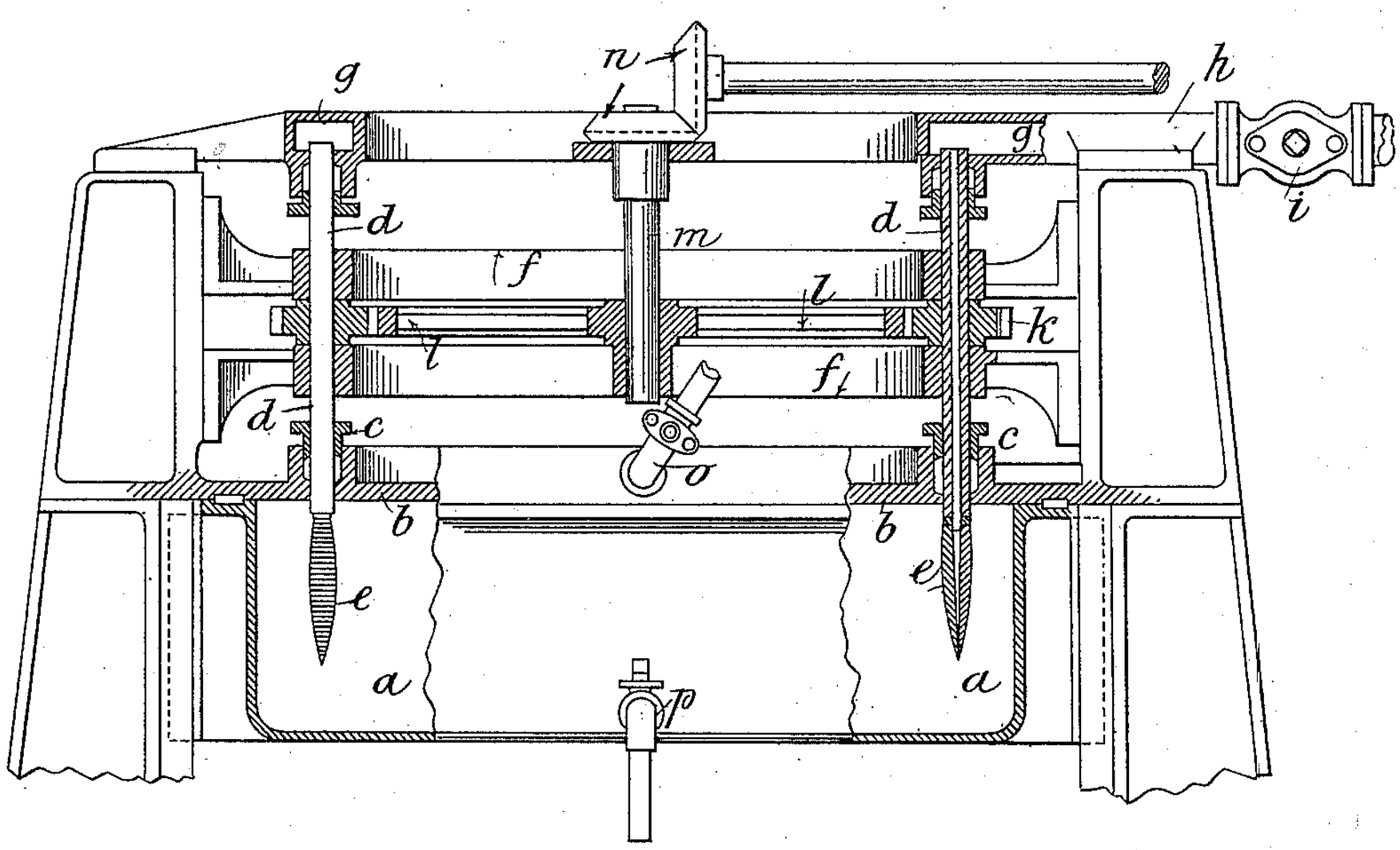
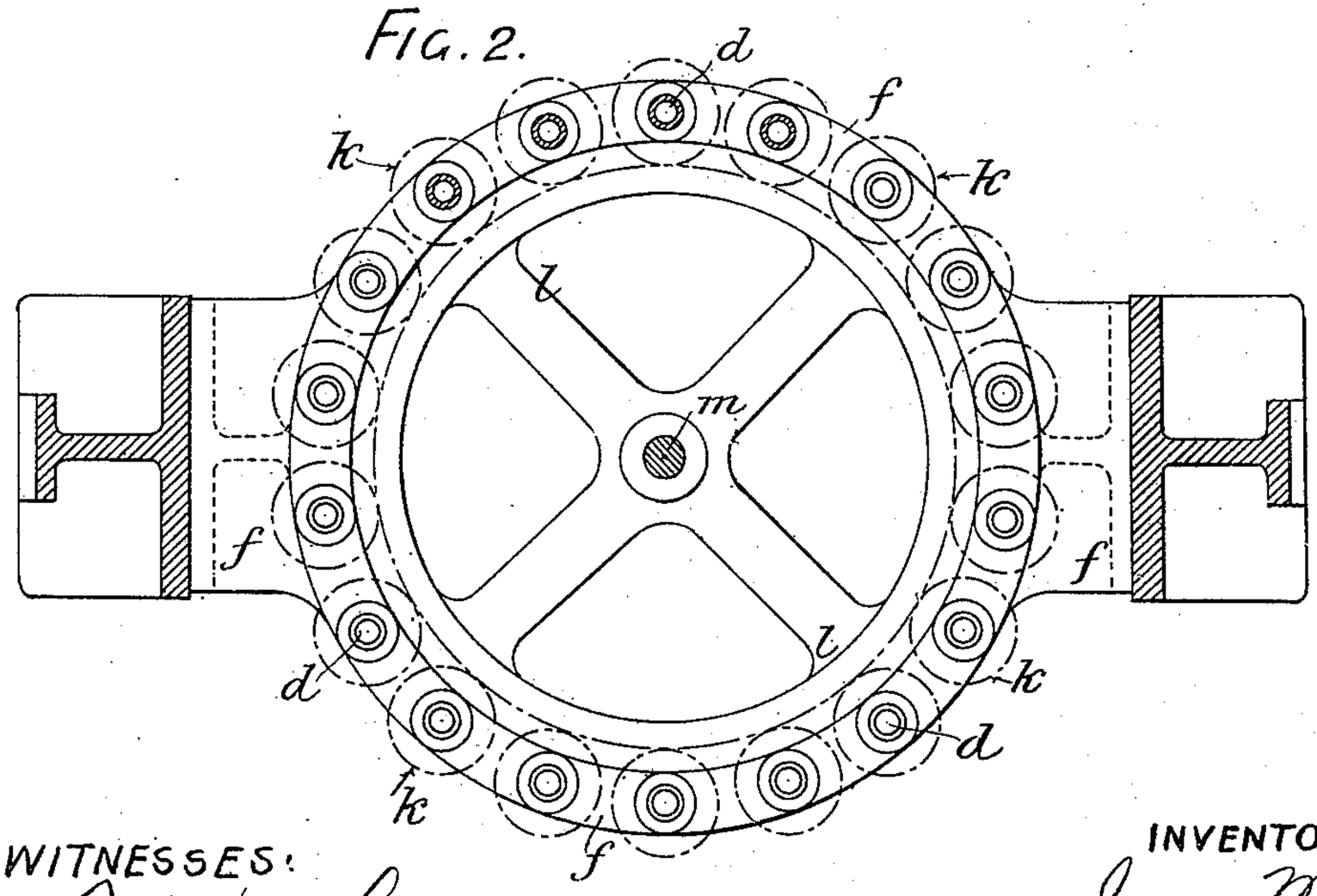


FIG. 2.



WITNESSES:
F. W. Wright.
S. C. Connor

INVENTOR
James Major.
By
Howson and Howson
HIS ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES MAJOR, OF ECCLES, ENGLAND.

APPARATUS FOR DYEING, &c.

SPECIFICATION forming part of Letters Patent No. 644,989, dated March 6, 1900.

Application filed June 20, 1899. Serial No. 721,269. (No model.)

To all whom it may concern:

Be it known that I, JAMES MAJOR, a subject of the Queen of Great Britain, residing at Eccles, in the county of Lancaster, England, have invented new and useful Improvements in Apparatus for Dyeing, Bleaching, or otherwise Treating with Liquids Cops or Spools of Spun Yarn, of which the following is a specification.

This invention relates to that class of apparatus for the above purposes wherein a number of cops or spools of spun yarn are each individually mounted upon a corresponding number of spindles, each spindle passing vertically through a stuffing-box formed in the lid of an air-tight tank and provided with means for causing the said spindles to be revolved rapidly, the lower end of each spindle being provided with a perforated or open cop-carrier to the interior of which the dye or other liquor is admitted and is driven outward from the center by centrifugal force through the spun yarn which is wound from the cops or spools.

My invention will be readily understood on reference to the sheet of drawings hereunto annexed and the following explanation thereof.

Figure 1 on the drawings is a partial vertical section, and Fig. 2 a partial plan view or horizontal section of an arrangement of apparatus which I have invented for this purpose.

a is a tank or vessel provided with an air-tight cover *b*, in which are fitted a series of stuffing-boxes *c*, through each of which passes vertically a hollow spindle *d*, provided at its lower end with a cop-carrier *e*, which is either perforated or made of open wirework or otherwise, so that dye or other liquid being introduced into the hollow spindle *d* will have free access to the interior of the cop or spool. The central portion of each spindle is carried in suitable bearings in a fixed frame *f*, and the whole of the said tubes or spindles *d* are fed with dye or liquor from a circular trough or pipe *g*, which is supplied through the main pipe *h*, which is provided with a tap *i* for that purpose.

The particular arrangement of the spindles which is here shown is circular, and each spindle or tube is provided with a spur-pinion *k*, all of which are driven by one large spur-wheel *l* on a central shaft *m*, driven by bevel-gear *n*; but I wish it to be understood that I do not confine my invention to this particular arrangement, as it will be evident that the spindles could quite as conveniently be arranged in parallel lines or otherwise and be provided with band-pulleys (instead of spur-pinions) driven by endless bands.

The upper part of the apparatus, including the air-tight cover *b* of the tank, is all carried by fixed framing; but the tank *a* is mounted in vertical slides and provided with means whereby it can be raised and fixed in the position shown at Fig. 1 or lowered down away from the cover *b*, so as to allow for the placement and removal of the cops to be treated. The tank *a* is fitted with an exhaust-pipe *o* for exhausting the air therefrom and a draw-off tap *p* for removing the liquid.

The method of using the apparatus is as follows: A cop or spool of spun yarn being fitted on the lower end of each hollow spindle *d*, the tank *a* is raised and the joint between it and the cover *b* is made air-tight by means of an india-rubber or other suitable elastic medium. Then exhaust the air from the tank or chamber *a* through the pipe *o* by a suitable pump or other means and admit the dye, mordant, bleaching liquor, or water into the circular trough *g* by opening the tap *i* and at the same time set all the hollow spindles *d* revolving rapidly, and the dye or other liquor will descend through the said spindles or tubes *d* into the center of the cops or spools of yarn and will by the centrifugal force developed by their rapid revolution be thrown outward and caused to penetrate through the fibers of the material without interfering in any way with the arrangement of the threads, so that they will not become entangled, but can be wound off without any difficulty whatever.

I claim as my invention—

1. The combination with an air-tight tank of a series of hollow vertical spindles such as *d* passing through stuffing-boxes in the cover of such tank, such spindles being fed with the dye or other liquid through a trough or channel such as *g* at the top and means for rapidly revolving the spindles on their indi-

vidual axes, the lower ends of the said spindles below the cover being each provided with a perforated or other open cop-carrier such as *e* for passing the dye or other liquor into the interior of the cop or spool, the tank being so arranged that it can be raised up and lowered as required and provided with means for exhausting the air and drawing off the liquor.

2. Apparatus for dyeing or otherwise treating cops of yarn, consisting of vertical spindles carrying cops of yarn, means for revolving the several spindles on their individual axes, and a tank in which said cops are suspended, in combination with a cover and means for separating the cover and spindles from the tank to allow of removing or replacing cops of yarn upon said spindles.

3. Apparatus for dyeing or otherwise treating cops of yarn, having a tank, hollow spindles adapted to have the cops mounted thereon, a source of dye-liquor supply connected to the spindles, and means to revolve the spindles on their individual axes, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES MAJOR.

Witnesses:
JNO. HUGHES,
J. ERNEST HUGHES.