

No. 644,990.

Patented Mar. 6, 1900.

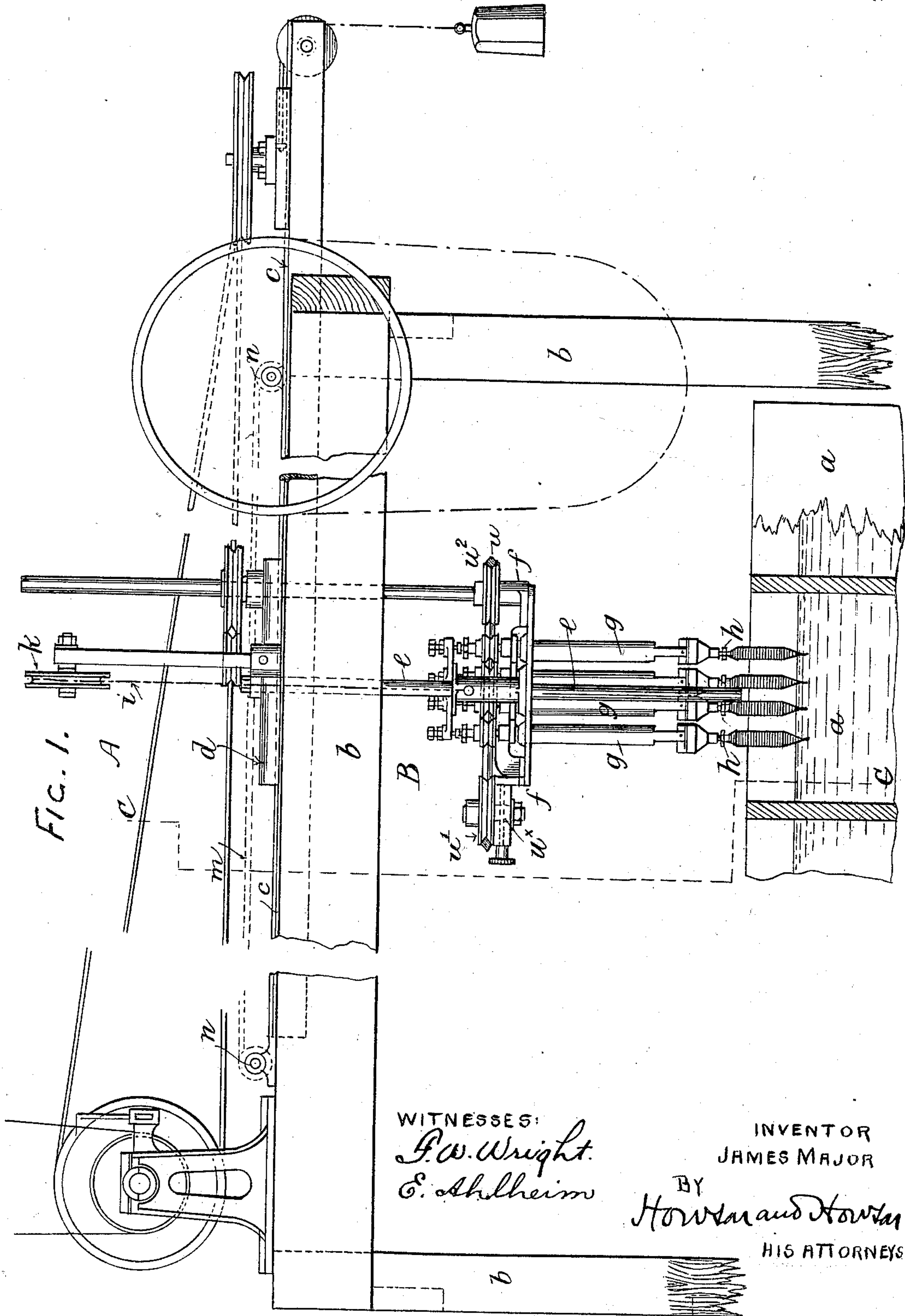
J. MAJOR.

APPARATUS FOR DYEING, &c.

(Application filed Sept. 9, 1899.)

(No Model.)

4 Sheets—Sheet 1.



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FIG. 2.

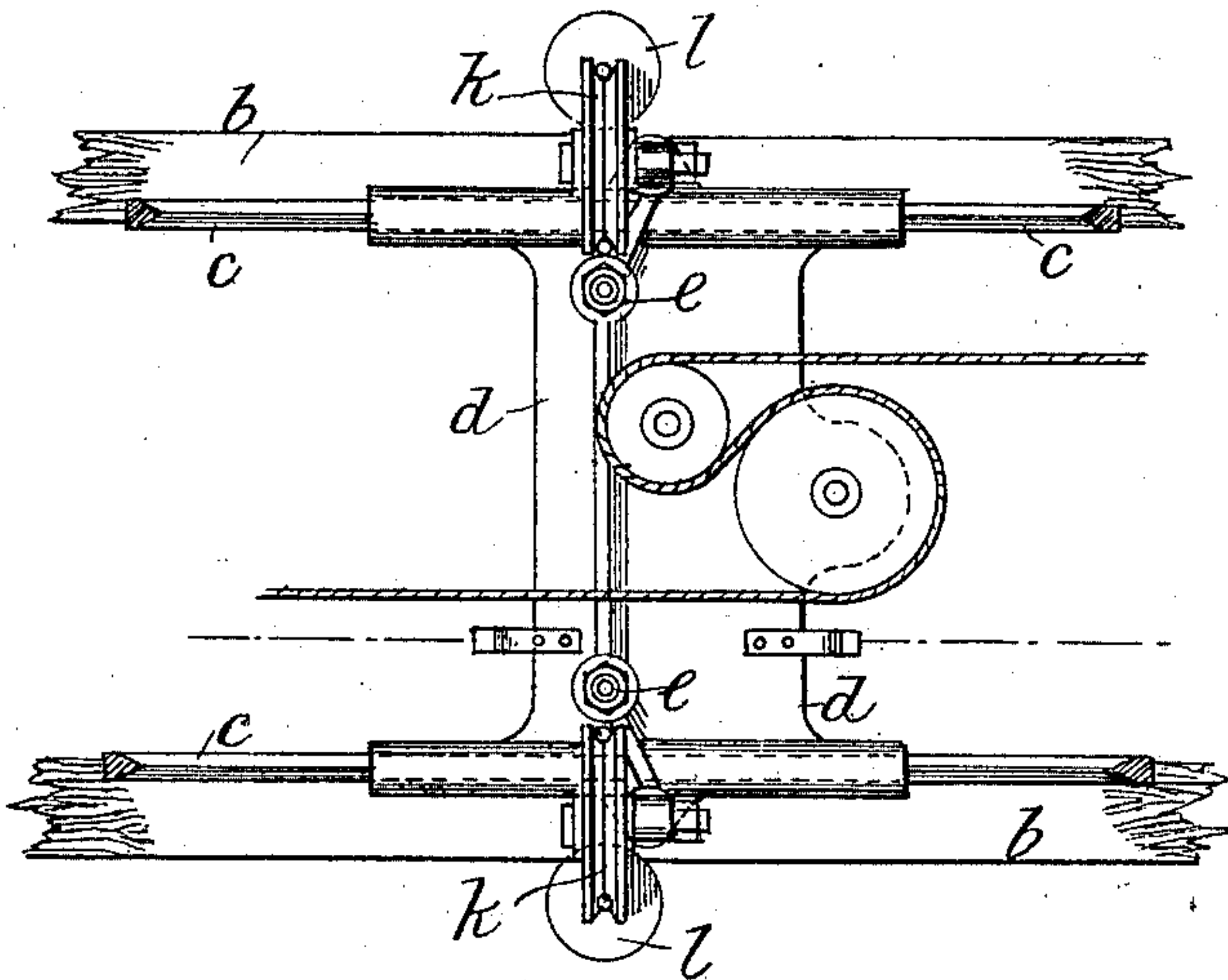
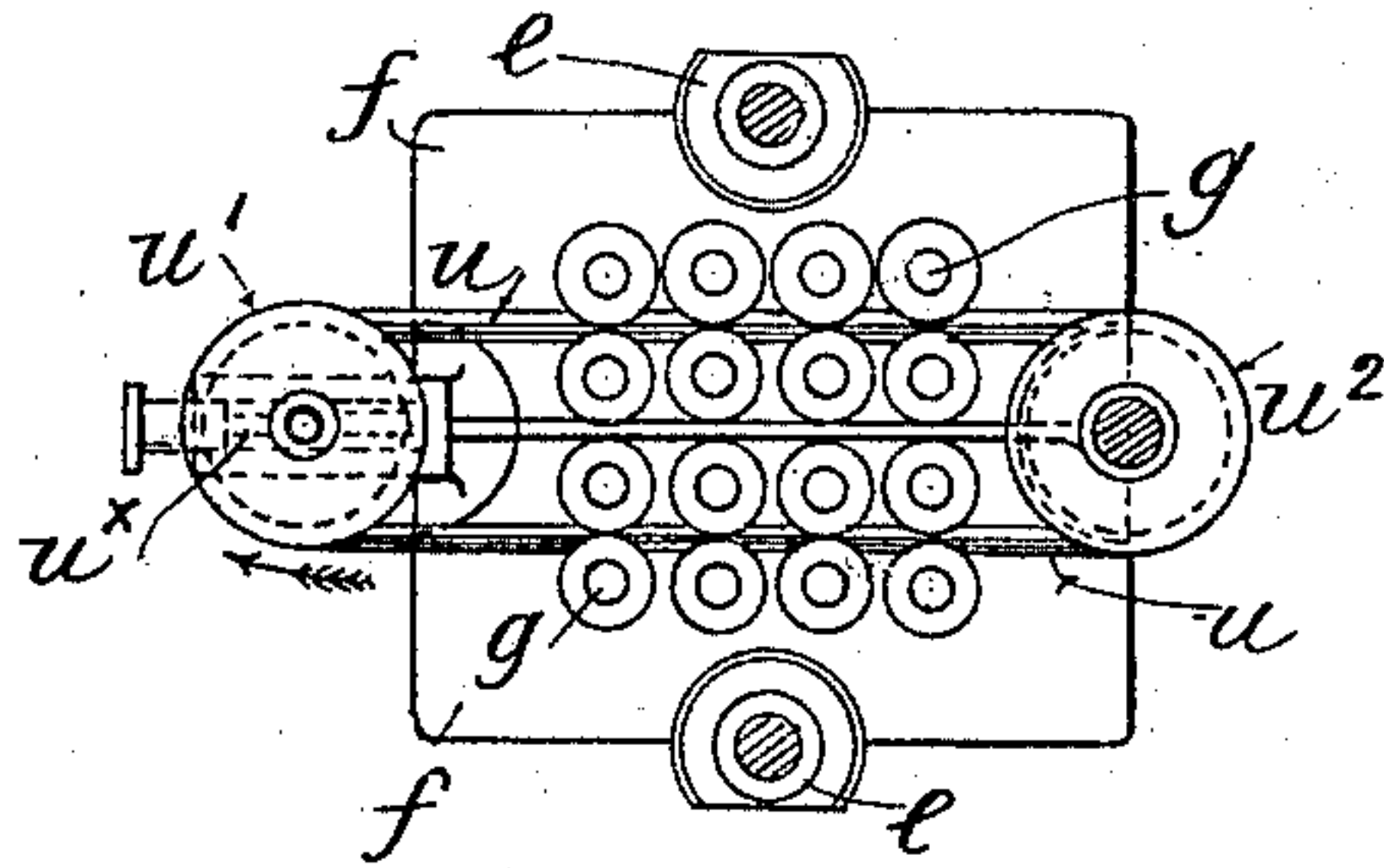


FIG. 3.



WITNESSES:

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*E. Ahlheim*

INVENTOR

JAMES MAJOR

BY

*Howman and Howman*

HIS ATTORNEYS

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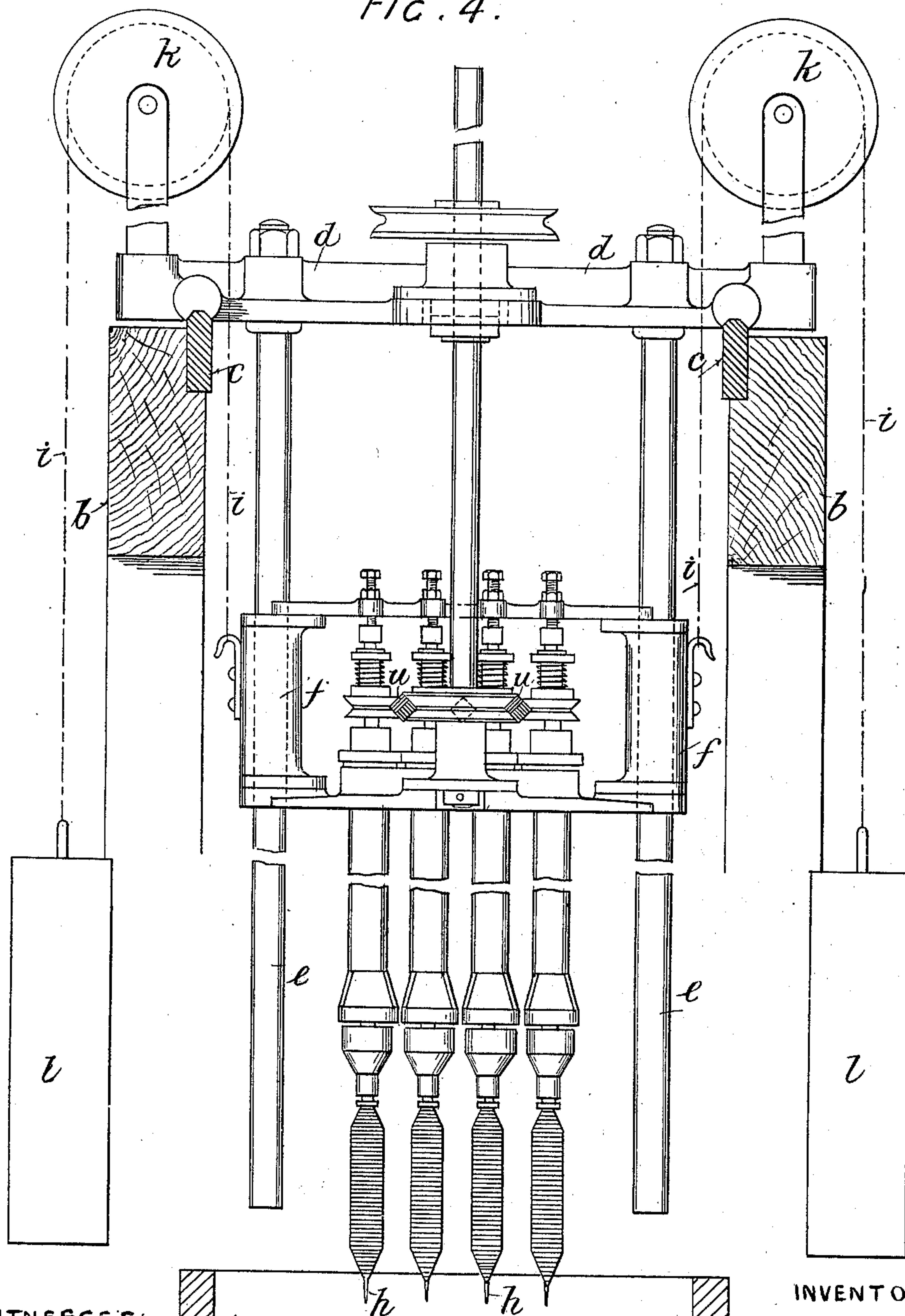
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FIG. 4.



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FIG. 5.

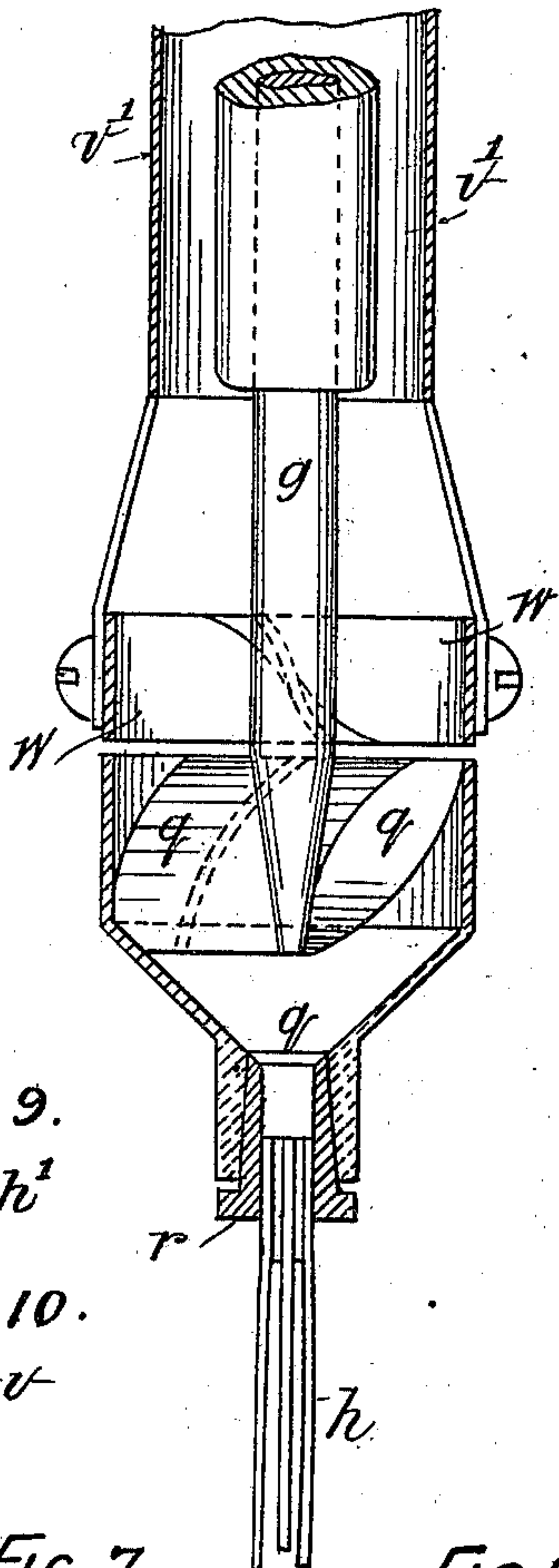


FIG. 9.  
h^1 & h^1

FIG. 10.  
v & v

FIG. 7.

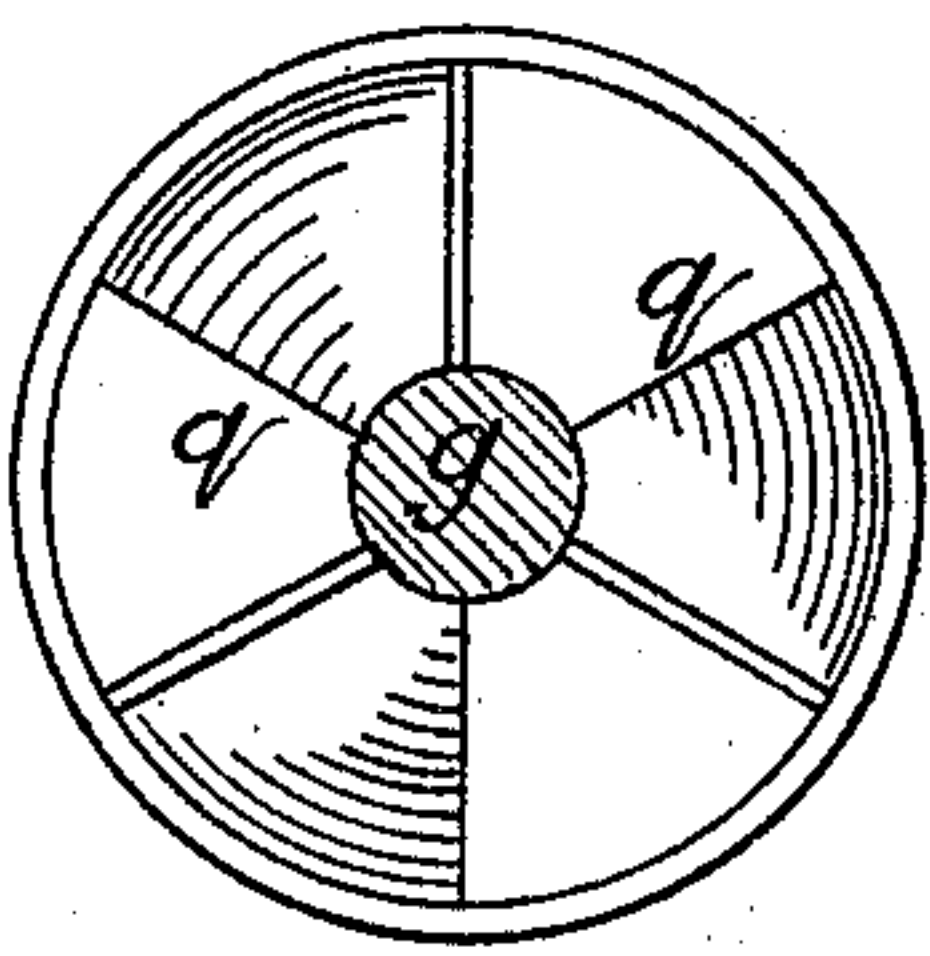
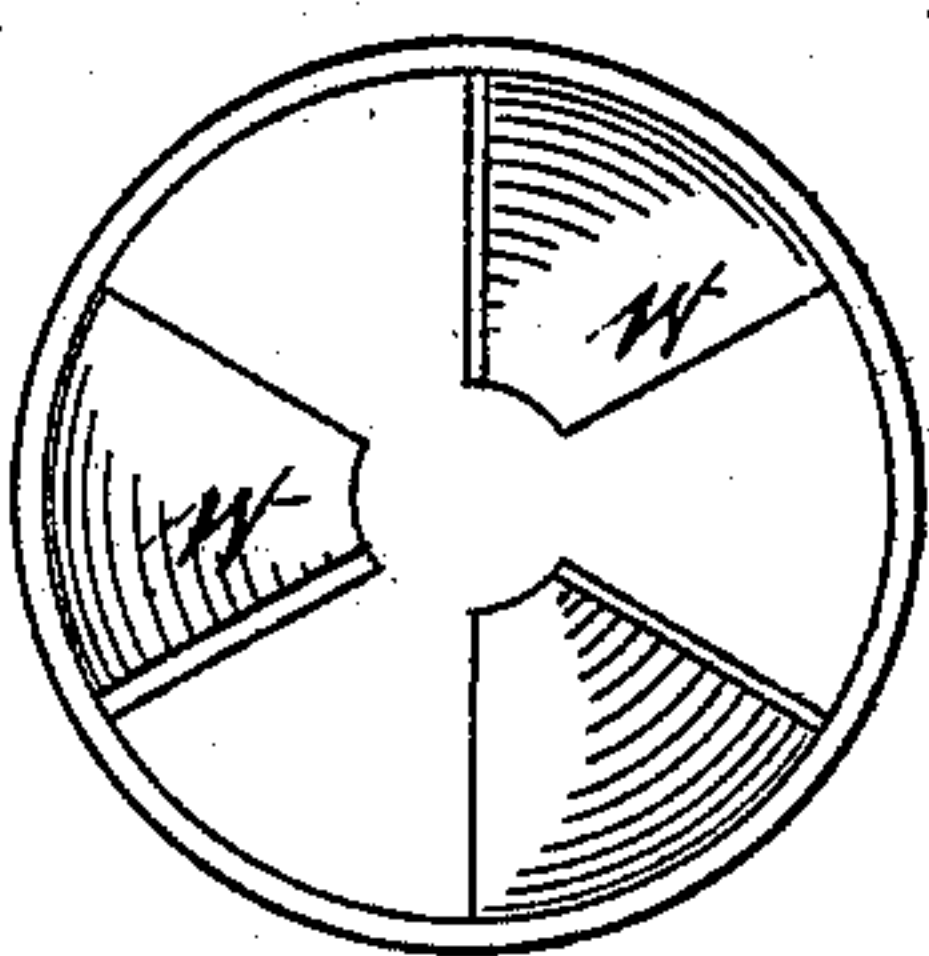


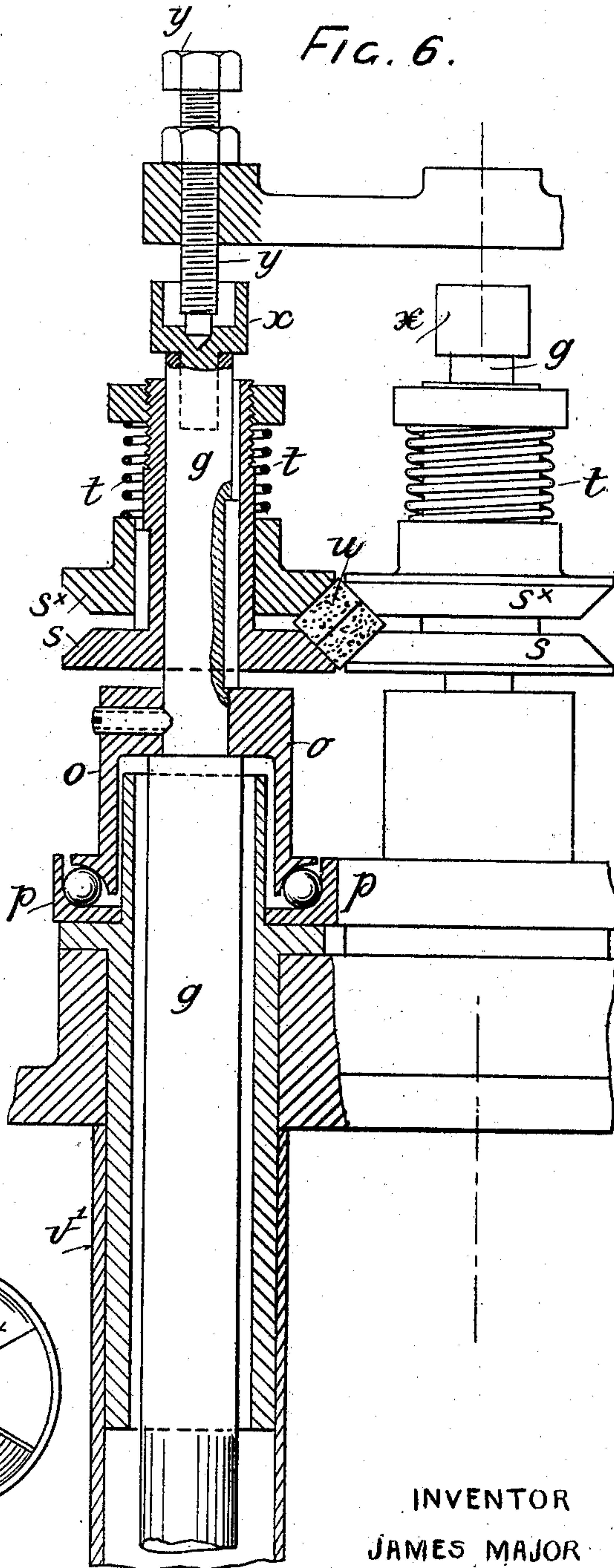
FIG. 8.



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FIG. 6.



INVENTOR

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# UNITED STATES PATENT OFFICE.

JAMES MAJOR, OF ECCLES, ENGLAND.

## APPARATUS FOR DYEING, &c.

SPECIFICATION forming part of Letters Patent No. 644,990, dated March 6, 1900.

Application filed September 9, 1899. Serial No. 729,952. (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 of Yarn, of which the following is a specification.

This invention relates to further improvements upon the apparatus, for which Letters Patent were applied for by me in the United States of America, No. 707,174, filed February 28, 1899, the object of the present invention being to facilitate the process and to improve the construction and arrangement of the apparatus employed.

In the accompanying drawings, Figure 1 is a side view of my improved apparatus. Fig. 2 is a plan view at A, and Fig. 3 a plan view at B. Fig. 4 is a part-sectional elevation on line C C, drawn to an enlarged scale. Fig. 5 is a vertical section showing end of spindle, with centripetal pump. Figs. 6 to 10 are sectional views showing spindles and means by which they are revolved.

In the drawings similar letters refer to similar parts.

According to my present invention I arrange in juxtaposition any convenient number of open vats or cisterns *a*, above which I erect a framing *b*, provided with rails *c*, upon which slides or otherwise moves a carriage *d*, provided with depending guide-rods *e*, upon which a frame *f*, carrying a group of spindles *g*, with their cop-carriers *h*, and means for revolving the same, can be raised or lowered into or out of the liquor contained in the vats *a*, each frame *f* being suspended by cords or chains *i*, passing over pulleys *k* and counter-balanced by suitable weights *l*. The carriage *d* is moved along the rails *c* by hand, as required, by means of an endless chain *m*, passing around toothed wheels *n* at each end of the rails *c*.

The spindles *g* are solid and are provided near the top with inverted cups *o*, running on ball-bearings *p*, Fig. 6. At the lower end of each spindle *g* is attached a centripetal fan or pump *q*, with curved blades, which as the spindle *g* revolves in the liquor draw the latter inward toward the center and force it downward into a tubular perforated or other

open form of cop-carrier *h*, attached to the lower part of the fan or pump *q*, and as the spindle *g*, with its centripetal fan or pump *q*, revolves rapidly the liquor is forced by the fan or pump *q* into the interior of the cop and is thrown outward through the same by the centrifugal force created by its rapid revolution.

The means for revolving the spindles *g* in this improved apparatus is as follows: Each spindle is provided near its upper end with a wharve constructed in two disks *s* and *s*<sup>x</sup>, one of which, *s*, is fixed by a long boss on the spindle *g* and the other or opposing half, *s*<sup>x</sup>, is capable of sliding up and down thereon. The opposing faces of each disk are beveled inward, so that the two together form a V-grooved pulley, the movable disk *s*<sup>x</sup> being pressed against the fast one by a spiral or other spring *t* or equivalent, which gives a certain amount of elasticity thereto, sufficient to cause the two beveled surfaces to grip the strap or belt *u*, which is of a rectangular form in section and set cornerwise.

The spindles *g* are preferably arranged in groups of, say, forty-eight or other preferred number in four parallel lines of twelve spindles each and are placed so closely together that one short endless strap or belt *u*, passing between the first and second rows, then around a grooved carrier-pulley provided with a tension device, as *u*<sup>x</sup>, and returning between the third and fourth rows and around a grooved driving-pulley at the opposite end and back again, will drive the whole group, as shown in Fig. 3.

Each cop-carrier *h* is preferably made of, say, three wires, fixed in a ferrule *r* at one end and bellied out slightly in the center to give a better hold on the inside of the cop and all united together so as to form a point at the other end. To fix the open ends of these wires in the ferrule, I employ a short boss or plug made with three longitudinal grooves on the outside *v*, Fig. 10, to receive the wires *h* and keep their ends apart, and the wires are laid in these grooves and inserted in the lower end of the ferrule *r* and fixed by soldering or otherwise. The upper end of the ferrule *r* is made slightly conical and the lower end of the fan-casing similarly conical, so that the cop-carriers can be fixed by simply



jamming them fast into the conical hole in the lower end of the fan-casing and removed therefrom by means of a small instrument in the shape of a lever inserted between the latter and a flange with which the lower end of the ferrule is provided for that purpose.

The spindle above the fan is inclosed in a fixed tube *v'*, the lower end of which carries a ring *w*, provided with fixed vanes on the inside, the lower edge of this ring nearly touching the upper edge of the revolving centripetal fan or pump *q*, so as to prevent the "swirling" of the liquor, which would otherwise take place. The upper end of this fixed tube *v'* extends through the ball-bearings *p* and inside the inverted cup *o*, before named, which is fixed on the spindle, so that there is no possibility of oil from the said bearing running down the spindle and so injuring the cops. The extreme upper end of the spindle *g* is provided with a cupped step *x* or bearing running on a diamond point at the bottom of an adjusting-screw *y*.

I claim as my invention—

25 1. An apparatus for dyeing, bleaching or otherwise treating with liquids cops of yarn, that is constructed by a combination of any convenient number of open vats or cisterns as *a* arranged in juxtaposition under a fram-

ing as *b* that is provided with rails, a movable carriage thereon as *d* with depending guide-rods supporting a frame as *f* carrying a group of spindles with their cop-carriers and means for revolving and raising or lowering the same, and a centripetal fan or pump with curved blades on each of said spindles all substantially as and for the purpose hereinbefore described.

2. In apparatus for dyeing bleaching or otherwise treating with liquids cops of yarn, the combination with a frame as *b* and carriage *d* of a frame as *f* carrying a group of spindles placed in parallel rows, whose upper ends are fitted with grooved pulleys and revolved by means of an endless band passing between said pulleys and around driving-pulleys at either end of the aforesaid parallel rows of spindles said band being provided with an adjustment to take up stretch substantially as described and shown on the drawings.

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

JAMES MAJOR.

Witnesses:

THOMAS PRESCOTT,  
JNO. HUGHES.