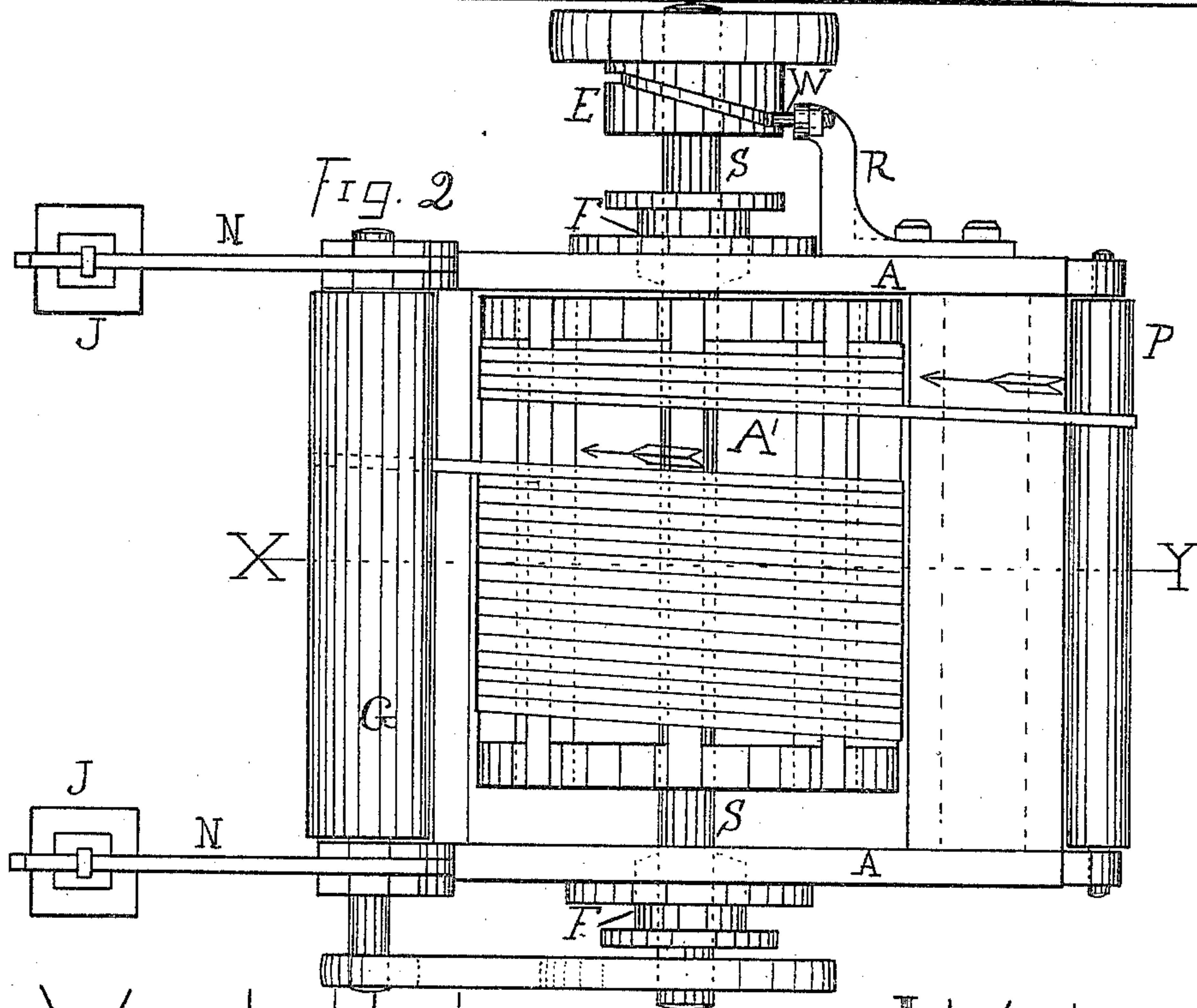
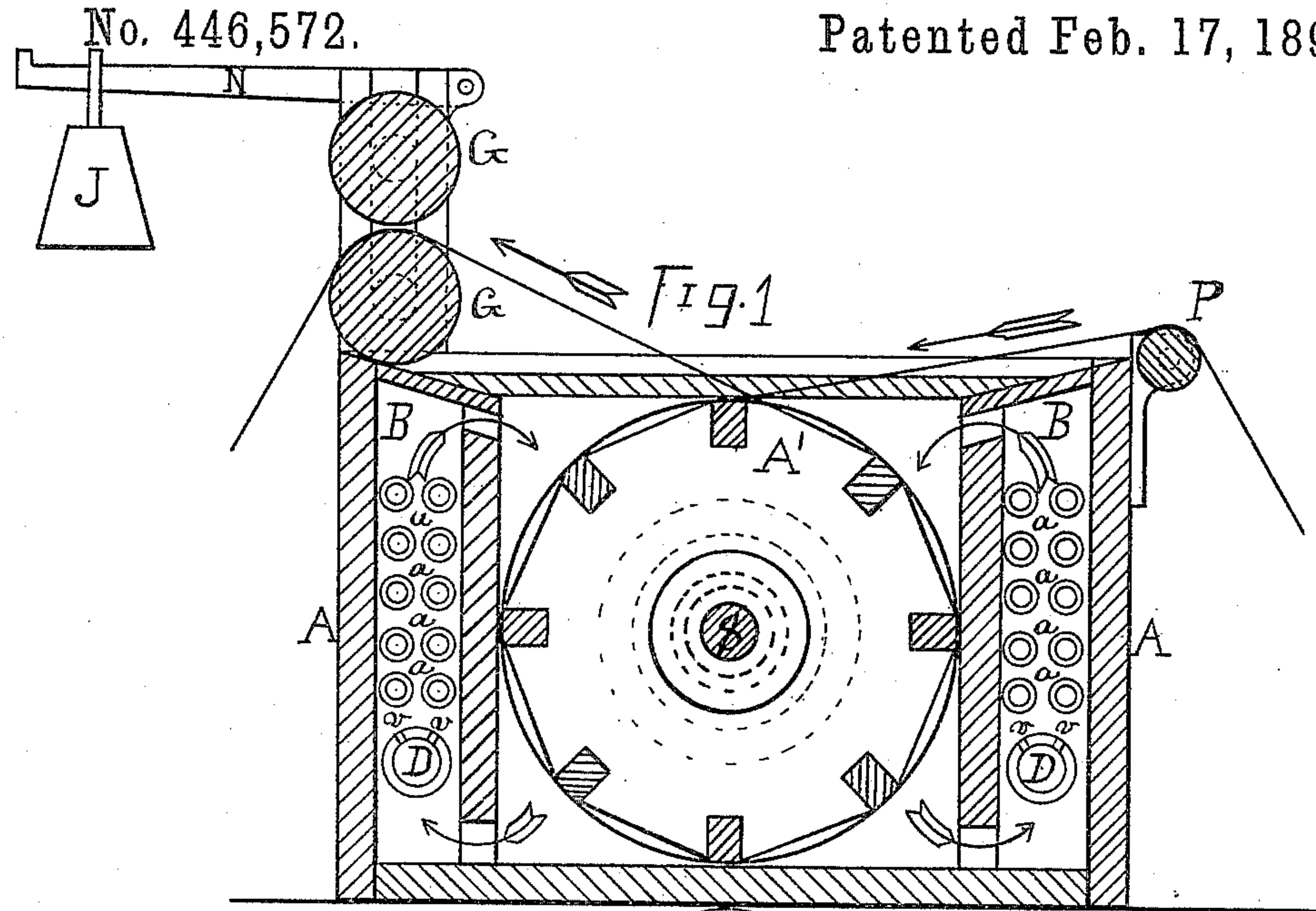


(No Model.)

J. K. PROCTOR & W. B. KEEFER.
DYEING VAT.

No. 446,572.

Patented Feb. 17, 1891.



WITNESSES.

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UNITED STATES PATENT OFFICE.

JOSIAH K. PROCTOR AND WILLIAM B. KEEFER, OF PHILADELPHIA, PENN-
SYLVANIA.

DYEING-VAT.

SPECIFICATION forming part of Letters Patent No. 446,572, dated February 17, 1891.

Application filed November 10, 1890. Serial No. 370,837. (No model.)

To all whom it may concern:

Be it known that we, JOSIAH K. PROCTOR and WILLIAM B. KEEFER, citizens of the United States, residing at Philadelphia, in the
5 county of Philadelphia and State of Pennsylvania, have jointly invented certain new and useful Improvements in Dyeing-Vats, of which the following is a specification.

Our invention relates to vats for dyeing
10 yarn in hanks or warps; and it consists in a reel wholly or partially immersed in a tank containing coloring-matter heated by steam-pipes located in side compartments of the tank having bottom outlets and top inlets
15 for the purpose of making a circulation of the liquid coloring-matter and giving the reel a revolving and side motion.

The object of our invention is the construction of a simple vat by which yarns in hank
20 or warps may with little manual labor be dyed in a very superior manner.

The mechanism by which we accomplish the above results is illustrated in the accompanying drawings, in which—

25 Figure 1 is a vertical section taken on the line X Y of Fig. 2. Fig. 2 is a top view of Fig. 1.

Similar letters refer to similar parts throughout the several views.

30 The construction of our improved dye-vat is as follows:

A represents the frame of the vat, which we construct of wood.

35 B B are side compartments, which are provided with outlets at the bottom and inlets at the top, as shown by the arrows.

40 *a a* represent a series of steam-pipes. In each compartment below the steam-pipes are pipes D. In the top of these pipes are drilled a series of holes *v v*, opening upward. The pipes D D are connected to a blower. (Not shown.)

45 A' represents the reel, which we prefer to make of wood, except the hubs, which should be of brass.

S is the shaft upon which the reel is mounted. This shaft passes through stuffing-boxes F F, fixed to the ends of the tank A. (See Fig. 2.)

50 E is a grooved cam fastened on the shaft S. The bracket R, fastened to the tank end,

carries a pin W, which works in the groove of cam E. The pin W should be connected to the bracket R, so that it may be readily shifted into and out of the groove of the cam. 55

G G are a pair of squeeze-rollers weighted by levers N and weights J. P is a guide or carrying roller. These rollers may be made of wood or metal. One or both of the squeeze-rollers should be covered with felt, cloth, or 60 rubber.

The operations are as follows: The pin W is removed from the groove of cam E and the yarns to be colored, if in hanks, are tied together end to end, forming a rope. One end 65 of this rope is fastened to the reel and wound on the rails of the reel. After the reel is covered with yarn and the ends of the rope fixed to the reel the pin W is placed in the slot of cam E. The machine is started and the reel 70 will be revolved in direction of the arrow in Fig. 2. At the same time the reel revolves the cam, by means of the pin W, will give the reel a side movement. The tank is supposed to be full or nearly full of dye-liquor. The 75 pipes *a a*, being heated by steam, and the perforated pipes D supplied by air from a blower, will cause an upward current from the bottom of the dye-vat to the top, as indicated by the arrows in Fig. 1. The air previous to being 80 forced in the vat may be heated by steam or in a furnace. It will be noticed that the reel carrying the yarn to be colored has a revolving and also a side movement through the coloring-matter, and the heat from the pipes *a a*, 85 with the current of air from the pipes D D, will cause a current in the dye-liquid from the bottom of the vat through the side compartments B B over the yarn on the reel. The side movement will in a measure open the 90 threads of the hanks as they lie on the reel. By these movements the yarn and dye are continually passing through one another, which will give the dye access to all parts of the yarn and give a uniform shade of color to all 95 parts of the yarn. After the reel has run sufficient to color the yarn, the pin W is removed from the groove of the cam E, the end of the rope of yarn on the right of Fig. 2 is detached from the reel and passed under the squeeze- 100 rollers G G, and after three or more layers are removed a fresh rope of yarn may be con-

nected to the reel and one rope wound on as the other is run off. The squeeze-rollers will press out the liquid dye and it will run back to the vat.

5 It is obvious that warp-yarn may be wound on the reel and colored in the same manner as hank-yarn made up in form of a rope.

The vat may be worked open or it may have a cover and be closed at times when the
10 yarn is not being wound on or off the reel.

Having as above fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A dye-vat having side compartments provided with openings communicating with the
15 vat at top and bottom and heating-pipes located in said compartments, in combination with a revolving reel, substantially as set forth.

20 2. A dye-vat having side compartments pro-

vided with openings communicating with the vat at top and bottom and air-pipes located in said compartments, in combination with a revolving reel, substantially as set forth.

3. A dye-vat having side compartments provided with openings communicating with the
25 vat at top and bottom, in combination with a revolving and side-moving reel, substantially as set forth.

4. A dye-vat having side compartments provided with openings communicating with the
30 vat at top and bottom, in combination with a revolving reel and a pair of squeeze-rollers, substantially as set forth.

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Witnesses:

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