

(No Model.)

2 Sheets—Sheet 1.

J. HANSON. DYEING MACHINE.

No. 354,901.

Patented Dec. 28, 1886.

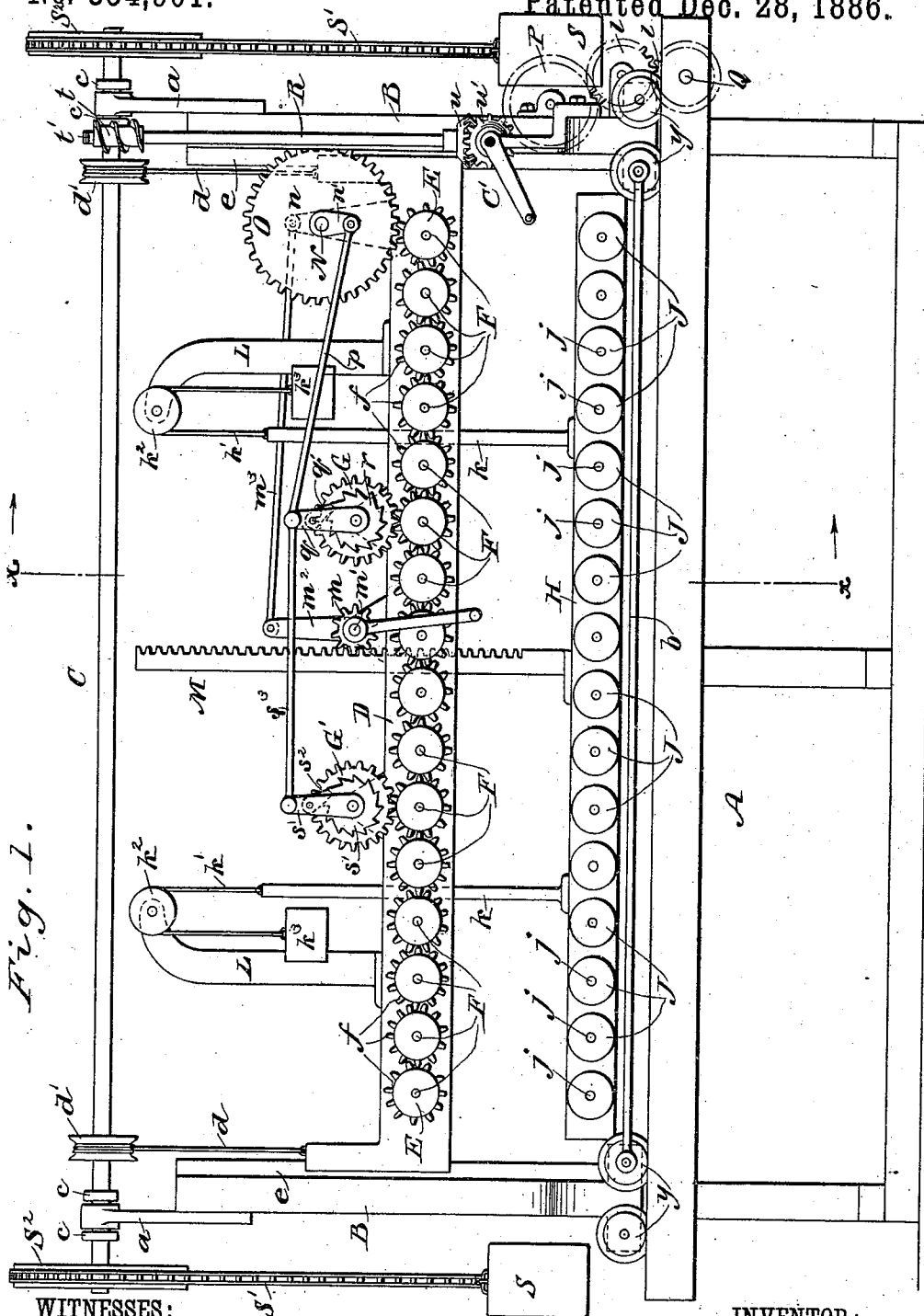


Fig. 1.

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John M. Deemer
W. Sedgwick

INVENTOR:

J. Hanson
BY *Munn & Co.*
ATTORNEYS.

(No Model.)

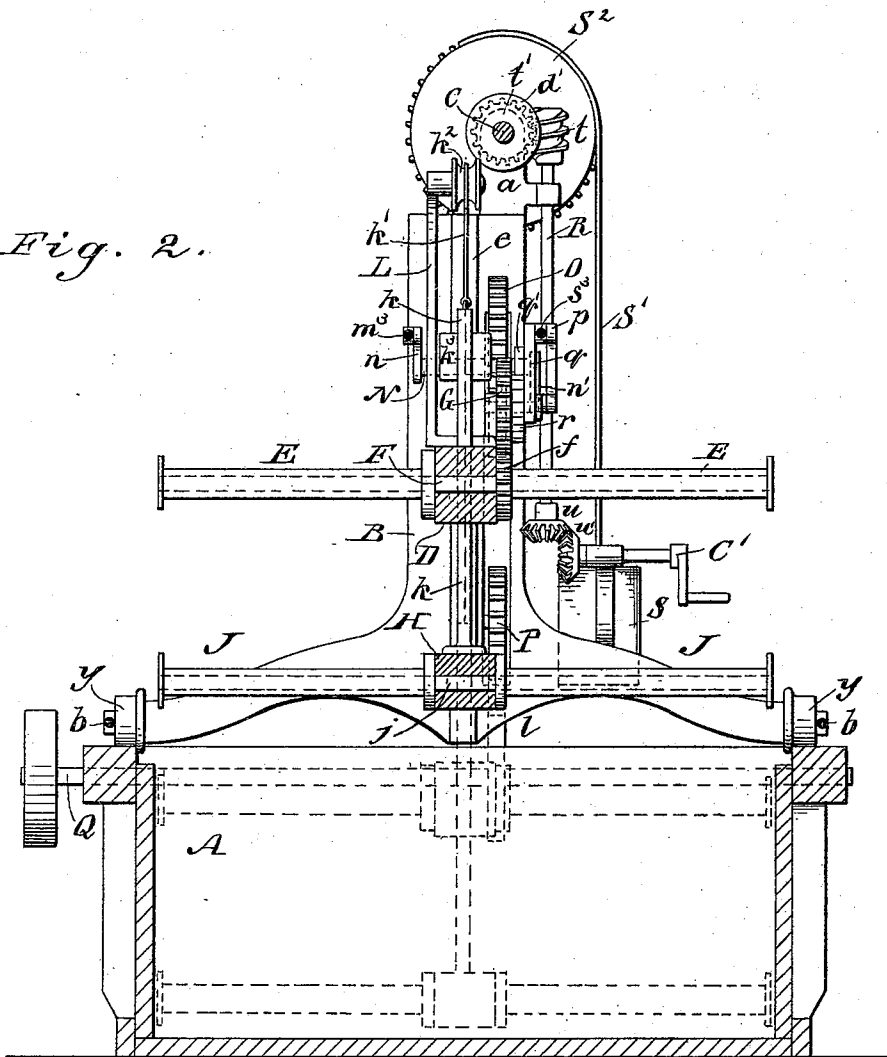
2 Sheets—Sheet 2.

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Fig. 2.



WITNESSES:

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INVENTOR:

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH HANSON, OF PHILADELPHIA, PENNSYLVANIA.

DYEING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 354,901, dated December 28, 1886.

Application filed April 19, 1886. Serial No. 199,344. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HANSON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Dyeing-Machine, of which the following is a full, clear, and exact description.

My invention relates to certain improvements on the machine for which Letters Patent No. 338,839 were granted to me March 30, 1886; and the present invention consists, principally, in a double construction or duplicate arrangement of the swifts and rods or reels, with a central arrangement of main bars, ways, and operating mechanism, whereby the capacity of the machine is doubled and a desirable equipoise of parts effected.

The invention also consists of the details of the machine, and the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a side elevation of the dyeing-machine placed upon an ordinary dye-tub, the swifts and skein bars or rods being shown in elevated position, and Fig. 2 is a transverse sectional elevation of the same, taken on the line *xx* of Fig. 1, the swifts and skein-bars being shown in dotted lines lowered into the color vat or tub.

A represents the vat, upon the upper edges of which the dyeing apparatus is supported upon the small wheels *y y*, so the apparatus may be easily moved along the vat as circumstances or the exigencies of the work require.

The dyeing apparatus consists of a strong main frame composed of two uprights, B B, connected together by bars *b* at the axles of the wheels *y y*, and the top shaft, C, which is journaled in the short uprights *a a* and held from endwise movement by the collars *c c*, secured to the shaft each side of the short uprights *a*, so the shaft acts also as a top tie-rod to the main frame. Between the main uprights B B hangs a bar, D, the same being suspended from the top shaft, C, by the ropes or chains *dd*, connected to the pulleys *d' d'*, secured upon the shaft C, so that by turning the shaft C the bar D may be raised and lowered, the move-

ment being guided by the flanges *e*, formed upon the inner faces of the uprights B, entering grooves formed at the ends of the bar. The bar D is situated over the middle of the tub A, and is provided upon either side with a series of swifts, E E, which take the place of the sticks used in the ordinary work by hand. The swifts E are adapted to be revolved for slowly turning skeins of yarn placed upon them, and for this purpose I place the swifts upon spindles or shafts F, centrally journaled in the bar D, and employ the intermeshing pinions *f*—one placed upon each shaft F—so that by one or more cog-wheels, G G', and mechanism hereinafter described, motion may be imparted to all of the swifts E upon both sides of the bar D.

Below the bar D, suspended from the uprights L, which rise from the bar D, is another bar, H, upon either side of which are held the lower skein rods or reels, J J, equal in number to the swifts E. The reels J are supported by and are adapted to turn upon the rods or shafts *j*, passed through the bar H, and the said bar H, with its reels J and rods *j*, is adapted to be adjusted to and from the bar D to suit skeins of different lengths. This adjustment is effected by the rack M, secured to the bar H, and the pinion *m* and crank-shaft *m'*, on which the pinion is secured to mesh with the rack, so that by turning the crank-shaft *m'* the bar H may be raised or lowered, as desired. To facilitate this movement or adjustment of the bar H, the same is counterweighted by the weights *k³ k³*, attached to the suspending ropes or chains *k'*, which pass over the pulleys *k²*, and are attached to the upright rods *k*, rising from the bar H. The counterbalance-weights *k³* also facilitate the up-and-down motion which is given to the bar H in the operation of the machine, for giving motion to the lower parts of the skeins in the coloring-liquid, and this up-and-down motion of the bar H is produced by the rack M, pinion *m*, shaft *m'*, lever or arm *m²*, attached to the shaft *m'*, and the connecting-rod *m³*, connected to the said rod *m²*, and the crank *n* of the crank-shaft N, the same being operated as next described.

The shaft N is journaled in uprights secured upon the bar D, and upon said shaft is secured the large cog-wheel O, which is arranged to mesh with the cog-wheel P, when the bar D is

lowered to the position shown in dotted lines in Fig. 2 to submerge the skeins in the coloring-liquid in the vat. The cog-wheel P is revolved from the drive-shaft Q through the medium of the cog-wheels *l l*, (shown in Fig. 1,) so that continuous rotary motion is imparted to the cog-wheel O, which revolves the shaft N and its two cranks, *n n'*. The crank *n* is connected, as above described, by connecting-rod *m³* to the arm *m²* on the shaft *m'*, and the crank *n* is shorter than the arm *m²*, so the revolution of the crank *n* rocks or rotarily reciprocates the shaft *m'*, which motion, through the pinion *m* and the rack M, vertically reciprocates the lower bar, H, and the reels J attached thereto.

The crank *n'* is connected by the connecting-rod *p* to the pawl-lever *q*, for reciprocating the same. To one side of the lever *q* is pivoted the pawl *q'*, arranged to engage with the ratchet-wheel *r*, secured to the cog-wheel G, so the reciprocation of the lever *q* will intermittently revolve the wheel G, which in turn will intermittently revolve the whole series or pinions *f* and swifts E.

To prevent binding and unnecessary friction among the pinions *f* of the swifts, I employ the wheel G', which is revolved in unison with the wheel G by the ratchet *s'*, pawl *s²*, and pawl-lever *s*, which is connected to the pawl-lever *q* by the connecting-rod *s³*, as shown clearly in Fig. 1, so the reciprocation of the lever *q* imparts a like motion to the lever *s*, causing the wheels G & G' to move exactly at the same time.

The bars D H and the parts connected thereto are, as above described, suspended from the top shaft, C, by chains *d*, that are attached to the pulleys *d'*, so that by revolving the shaft C the said bars and connected parts may be raised from and lowered into the vat A. For revolving the shaft C for this purpose, I employ the vertical worm-shaft R, the worm *t* of which meshes with the worm-pinion *t'*, secured upon the shaft C, and I adapt the shaft R to be revolved by the crank-shaft C' and the intermeshing beveled gear-wheels *u u'*, secured, respectively, upon the shafts R and C'; and to facilitate the raising and lowering of the bars D H, I counterweight the same by the heavy weights S S, attached to the chains S' S', attached to the pulleys S² S², secured upon the shaft C, as shown clearly in the drawings.

The operation of the machine is as follows: The apparatus being raised above the tub A, the swifts E are drawn off from the spindles or shafts F, filled one by one with yarn, and placed back upon the spindles, the corresponding rods

or reels, J, being removed and passed through the skeins, and the distance of the bar H being so adjusted to the bar D that the skeins will not be stretched taut, but left to play easily around the swifts and reels; or the bar H can be raised close up to the bar D, in which case the swifts are not drawn off the spindles, but charged by slipping the skeins simultaneously over the swifts and the corresponding reels below, whereupon, all the swifts and reels being charged, the bar H is lowered the proper distance. Then the whole is lowered into the tub A and the machine put in motion. By the rotation of the swifts all the skeins upon them are given an intermittent turning motion, which gives the coloring-liquid a better chance to penetrate the skeins than by a continuous motion. By the simultaneous up-and-down motion of the lower reels the coloring-liquid is kept continually agitated, and the skeins are given a swinging motion, keeping them open, and at the same time sufficiently stretched to prevent entangling.

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

1. The central bar, D, having swifts upon either side, and the bar H, having reels or arms upon either side, in combination with means for raising and lowering the bars, substantially as described.

2. The bar D, provided with uprights L, in combination with the lower bar, H, suspended from the pulleys *k²*, attached to the uprights L, substantially as described.

3. The top shaft, C, provided with pulleys *d'* and S², in combination with the bar D and suspending-ropes *d*, and the counterbalance-weights S and chains S', substantially as and for the purposes set forth.

4. The top shaft, C, provided with pulleys *d'*, and worm-pinion *t'*, in combination with the bar D, suspending ropes or chains *d*, worm-shaft R and crank-shaft C', and gear-wheels for turning the worm-shaft, substantially as and for the purposes set forth.

5. The vat A, and a main frame supported thereupon, and a central bar, D, carrying swifts upon either side, and a bar, H, carrying reels or rods upon either side, in combination with means, substantially as described, for lowering the bars D H into the vat, substantially as described.

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Witnesses:

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FRANK S. CHRISTIAN.