H. P. GRAY & W. GRAY, Jr.

Apparatus for Dyeing and Washing Yarn, Cloth, &c

No. 225,363. Patented Mar. 9, 1880.

Fig. 1.

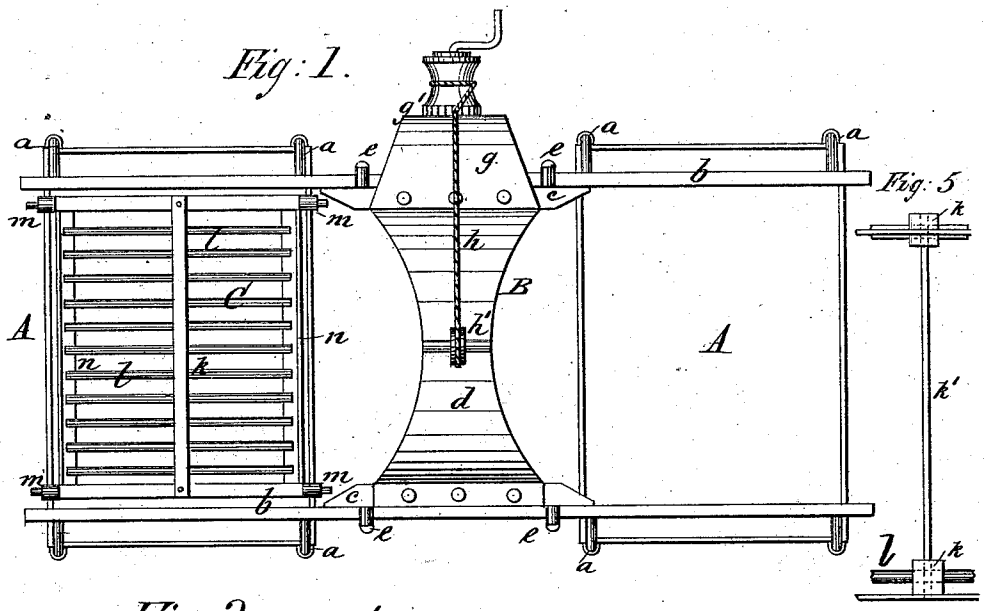


Fig. 5

Fig. 2.

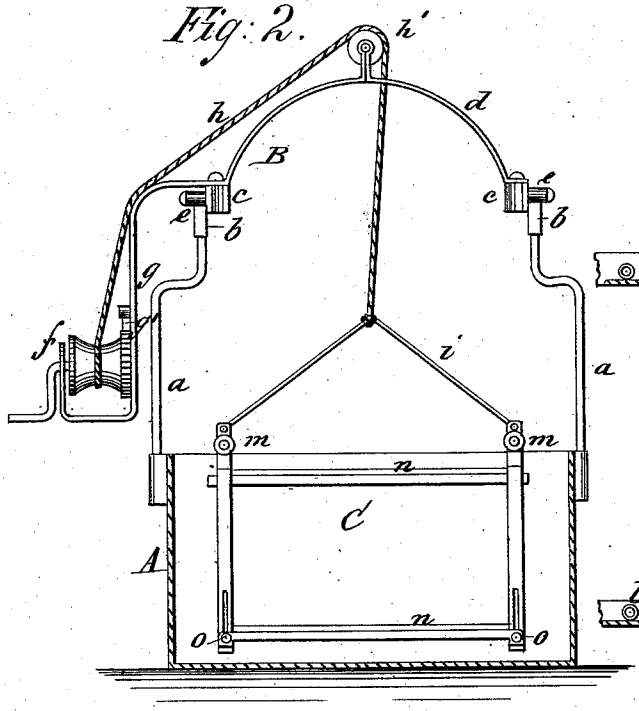


Fig. 3.

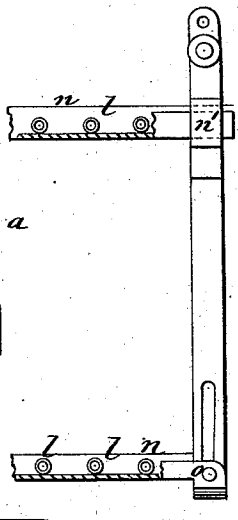
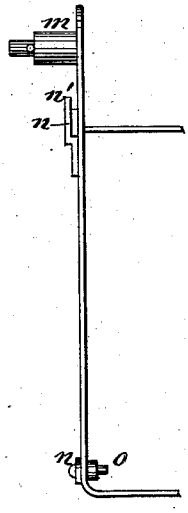


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY P. GRAY AND WILLIAM GRAY, JR., OF SOUTH MANCHESTER, CONN.

APPARATUS FOR DYEING AND WASHING YARN, CLOTH, &c.

SPECIFICATION forming part of Letters Patent No. 225,363, dated March 9, 1880.

Application filed September 24, 1879.

To all whom it may concern:

Be it known that we, HENRY P. GRAY and WM. GRAY, Jr., of South Manchester, in the county of Hartford and State of Connecticut, have invented a new and Improved Apparatus for Dyeing and Washing Yarn, Cloth, &c., of which the following is a specification.

The features of our invention we will describe more particularly with reference to the accompanying drawings, wherein—

Figure 1 is a plan view of vats fitted with our improved devices. Fig. 2 is a vertical transverse section through one vat, with the yarn-carrier in place within the vat. Figs. 3, 4, and 5 are detail views, showing the construction of the yarn-carrier.

Similar letters of reference indicate corresponding parts.

Our improvements are adapted for use in connection with any desired number of vats. As shown in the drawings, there are two vats, which are sufficient to illustrate the operations.

A A are dye or washing vats, of usual character, placed in line and at a suitable distance apart. Above the vats A, supported by solid or tubular standards *a*, are tracks *b b*, extending over both vats at a height sufficient to permit of hoisting the yarn-carriers, as hereinafter described.

The standards *a* may be supported from the floor, or as shown, or they may rise from the sides of the vats, and, as shown, will be bent inward at their upper ends, so that the tracks *b* will not interfere with the heating-pipes as usually arranged.

Upon the rails *b* the truck B is mounted. This truck consists of side bars, *c c*, which are connected by the arched cross-plate *d*, and are each fitted with two rollers or wheels, *e e*, that rest on rails *b*, the rollers *e* being placed so that the lower edges of the bars *c* are below the surface of the rails and serve to retain the truck on the track.

A windlass, *f*, is fitted in a hanger, *g*, that depends from the truck B, whereby the windlass is at a convenient height for operation by a person on the floor. The windlass-barrel is fitted with a ratchet and pawl, *g'*, for retaining the yarn-carrier when elevated, and the rope or chain *h* from the windlass passes over a friction-pulley, *h'*, at the top of the arched plate *d*, down through said plate to the forked bails *i i*, that are connected to the opposite ends of carriage C. The bails *i* are hooked to C, so that they may be readily disconnected.

The yarn-carrier C consists of a skeleton-frame of metal, made in rectangular form, of a size for entering freely within the vats A, and fitted with the upper and lower center bars, *k*, through which the yarn-carrying rods *l* are inserted.

Upon the upper part, and at opposite ends of the carrier C, there are wheels or rollers *m*, carried by studs projecting outwardly, so that the rollers *m* will rest upon the edge of the tank and support the carrier. The bars *k* extend lengthwise and centrally of the carrier, and are provided with fixed slide-rods *k'*, whereby the lower bar, *k*, is sustained, and whereon it is movable up and down, to vary the distance between bars *k*. The rods *l* pass loosely through holes in bars *k*, and rest at their outer ends on rails *n*, that are attached to the carrier-frame. These rails *n* are made of angle or grooved brass, wood, copper, or iron, so that they form both a support for rods *l* and a cover for their ends, to prevent the skeins of yarn from slipping off.

The upper rails, *n*, rest in sockets *n'*, that are fixed to the corner posts of the frame, so that the rails can be removed when the yarn is to be placed or removed and the lower rails are held by screws *o*, that pass through slots in the corner posts, and are clamped by nuts at the opposite side, so that these rails *n* may be adjusted with the bars *k* to suit the length of the skein.

In dyeing the skeins of yarn will be stretched from the upper to the lower rods, *l*, and the carrier C, loaded in that manner, lowered into the vat containing the dye-stuff. The rods *l* come below the upper edge of the vat, so that the yarn will be entirely immersed.

The carrier C is preferably made somewhat shorter than the vats, so that when immersed it may be rolled back and forth to produce uniformity in the dye-mixture by agitation and cause the thorough saturation of the yarn.

When the yarn is to be removed the carrier C will be hoisted by means of windlass *f* until it is above the tank, and the truck B, with the suspended carrier, may then be

rolled to a second tank, or beyond the tank and the carrier, with its load of yarn lowered upon a truck for removal.

The same operations are performed in washing, and the apparatus is also adapted for ribbon or cloth dyeing and washing. The cloth will be stretched upon rods *l*, so that the liquid will have free access to every portion.

It will be seen that the skeins or cloth, after being placed on the carrier, do not have to be handled until they are finally removed after dyeing. This is a great saving in time and labor, and, in addition, the work is more evenly and thoroughly done.

In coloring fine silks the apparatus is especially useful, as the loss which has heretofore resulted from tangling is entirely avoided.

A rock-shaft operated by power may be used for giving horizontal or vertical vibratory motion to the yarn-carriers while in the vats.

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

1. In an apparatus for dyeing and washing yarns, the carrier-frame provided with slots and with the supporting flanges or sockets *n'*, rods *n*, adapted to be secured in said sockets, and with slots and bolts or screws *o*, in combination with the upper and lower apertured bars, *k*, and slide-rods *k'*, as and for the purpose described.

2. In an apparatus for dyeing and washing yarns, the combination, with the supports *a* and tracks *b*, of the vat A, the carrier C, the arched plate *d*, provided with roller *e*, the hanger *g*, windlass *f*, pulley *h'*, and cord *h*, as shown and described.

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Witnesses:
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