2 Sheets—Sheet 1.

D. ALLEN.

DYEING APPARATUS.

No. 183,360. Patented Oct. 17, 1876.

Fig. 1

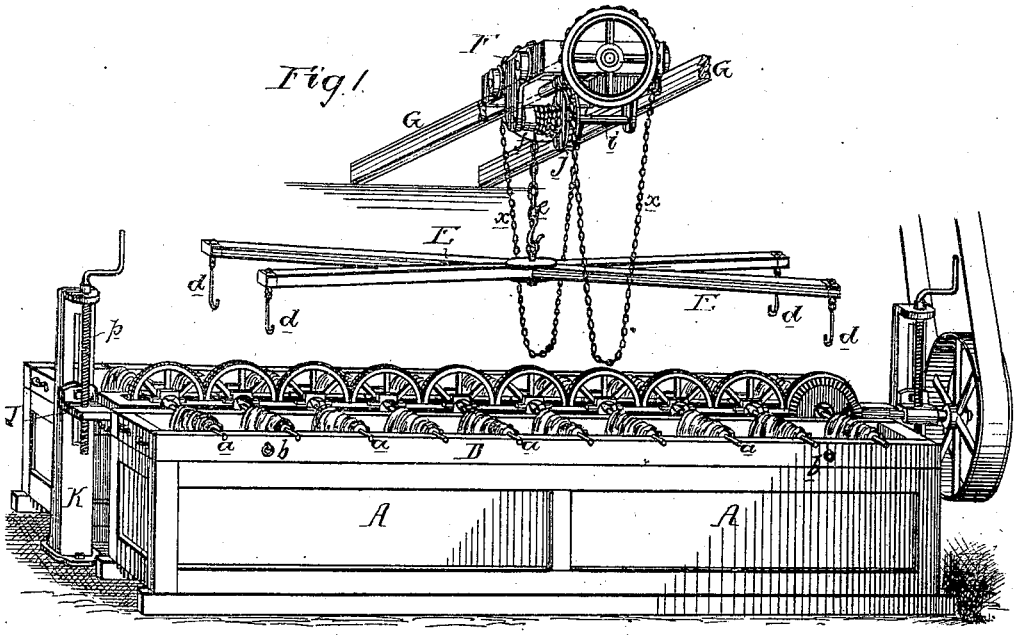
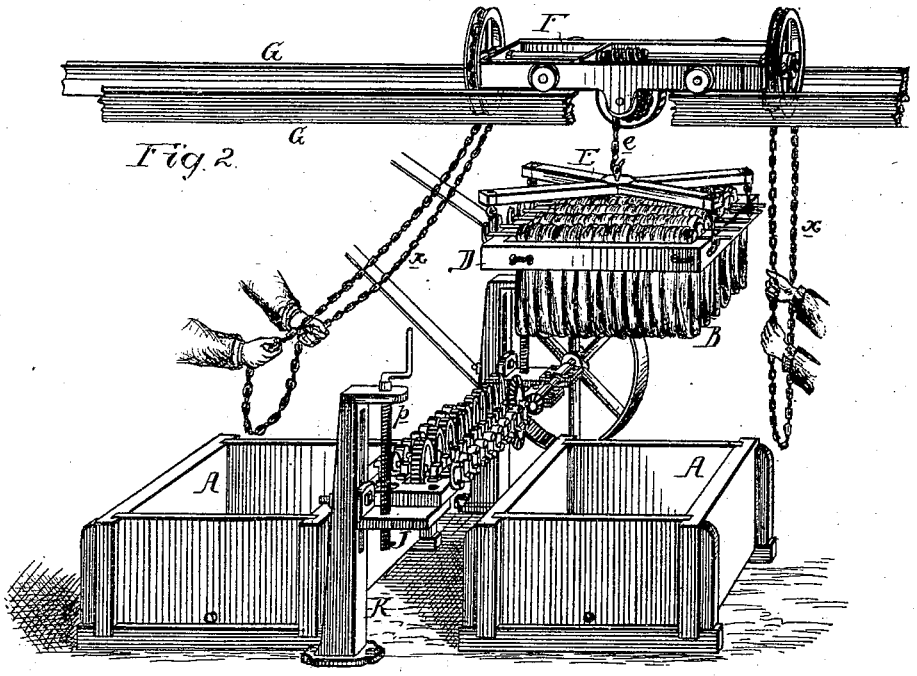


Fig. 2



Witnesses
Harry Howson Jr
Harry Smith

Daniel Allen
by his Attorneys
Howson and Sons

2 Sheets—Sheet 2.

D. ALLEN.

DYEING APPARATUS.

No. 183,360. Patented Oct. 17, 1876.

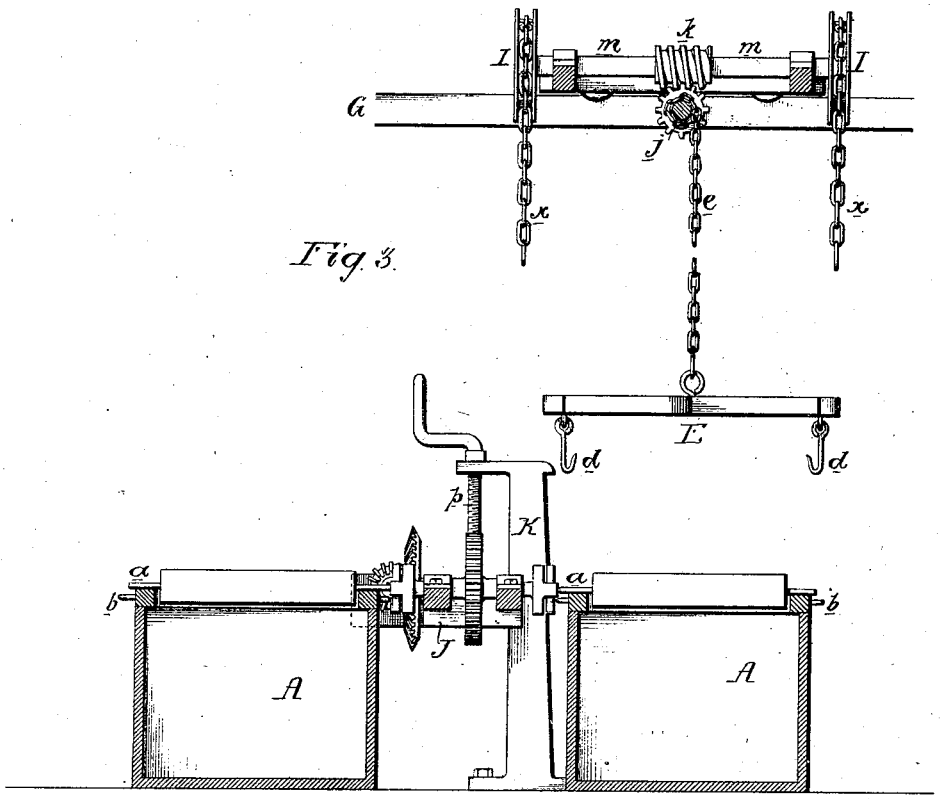


Fig. 3.

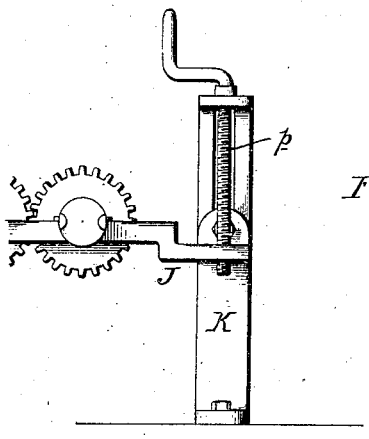


Fig. 4.

Witnesses
Harry Howson Jr
Harry Smith

Daniel Allen
by his Attorneys
Howson and Son

UNITED STATES PATENT OFFICE.

DANIEL ALLEN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN DYEING APPARATUS.

Specification forming part of Letters Patent No. **183,360**, dated October 17, 1876; application filed March 29, 1876.

To all whom it may concern:

Be it known that I, DANIEL ALLEN, of Philadelphia, Pennsylvania, have invented certain Improvements in Dyeing Apparatus, of which the following is a specification:

The object of my invention is to so construct an apparatus for dyeing hanks of yarn that while the frame carrying the hanks can be removed and replaced, and hanks of different lengths dyed, the same gear may serve to operate all the hank-shafts; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figures 1 and 2, Sheet 1, are perspective views of a dyeing apparatus having my improvement; Fig. 3, Sheet 2, a transverse vertical section of the same, and Fig. 4 a detached view of a portion of my improvement.

A A are the tubs containing the dyeing material, these tubs being arranged in sets of two, as shown, with intermediate driving-gear, which operates the hank-shafts of both tubs, as described hereafter. B are the hanks of yarn, hung upon cylinders carried by shafts *a*, which have at their inner ends lugs adapted to clutches on the ends of short transverse shafts carried by a frame between the two tubs, and revolved by means of a series of cog-wheels, secured to the shafts, and gearing into each other, the end wheel of the series being driven through the medium of a bevel-wheel and pinion from a short longitudinal shaft carrying a pulley, to which power is applied. As the shafts *a* are turned the hanks are carried round, their lower ends passing through the dyeing material in the tubs. The shafts *a* carrying the hanks of yarn have their bearings in frames D, resting upon the tops of the tubs, so as to be readily detachable from the same.

The driving mechanism, instead of being fixed as usual, has its bearings on a bench, J, which is guided at the opposite ends in slots in vertical posts K, the bench being raised or lowered, as desired, by operating screw-rods *p* at each end, and being secured in position after adjustment by suitable means.

The tubs A are made of a depth sufficient to receive the shortest hanks of yarn which have to be dyed, and when longer hanks have to be treated the frame D, carrying the same, is lowered until the lower ends of the hanks reach within a short distance of the bottom of the tub. Blocks of the proper size are then inserted between the frame D and the top of the tub, and the bench J carrying the driving mechanism is elevated by the screw-rods *p* until its clutches are on a level with the shafts *a*.

By thus having the hank-shaft operating mechanism on a vertically-adjustable bench separate from the frames, the latter can be readily adjusted to various heights to suit the length of the hanks, and can be transferred from one vat to another without transferring the driving mechanism, as usual.

I prefer to employ the following mechanism for transferring the hank-frames from one vat to another:

These frames have eyes *b* at each side, and to these eyes are adapted hooks *d* at the ends of a frame or spider, E, composed of diagonal bars united at the center, where the spider is connected to the lower end of a cord or chain, *e*, the upper end of which is attached to a windlass, *f*, on the transverse shaft *i*, having its bearings in a carriage, F, adapted to rails or ways G beneath the ceiling. The shaft *i* has a worm-wheel, *j*, adapted to a worm, *k*, on a longitudinal shaft, *m*, having its bearings in the end frames of the carriage F, and provided at each end with a chain-wheel, I, the chain *x* from which passes down so as to be within easy reach of an attendant, who, by drawing upon the chain, causes the revolution of the shaft *m* and its worm *k*, and the consequent rotation of the worm-wheel *j* and windlass *f*, thus winding up the chain *e* and lifting the frame D, as shown in Fig. 2. When sufficiently elevated, the frame may be readily transported to any desired point by drawing the carriage F along the ways G.

Other mechanism than that described for moving the frames D may, however, be employed, as this forms no part of my present application.

I wish it to be understood that I do not desire to claim, broadly, the detachable frames; but

I claim as my invention—

The combination of the vertically-adjustable frame D and its shafts *a* with the bench J, carrying the driving mechanism separate from the frames and tubs, and adjustable to different heights, as and for the purpose set forth.

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

DANIEL ALLEN.

Witnesses:

HARRY HOWSON, Jr.,

HARRY SMITH.