

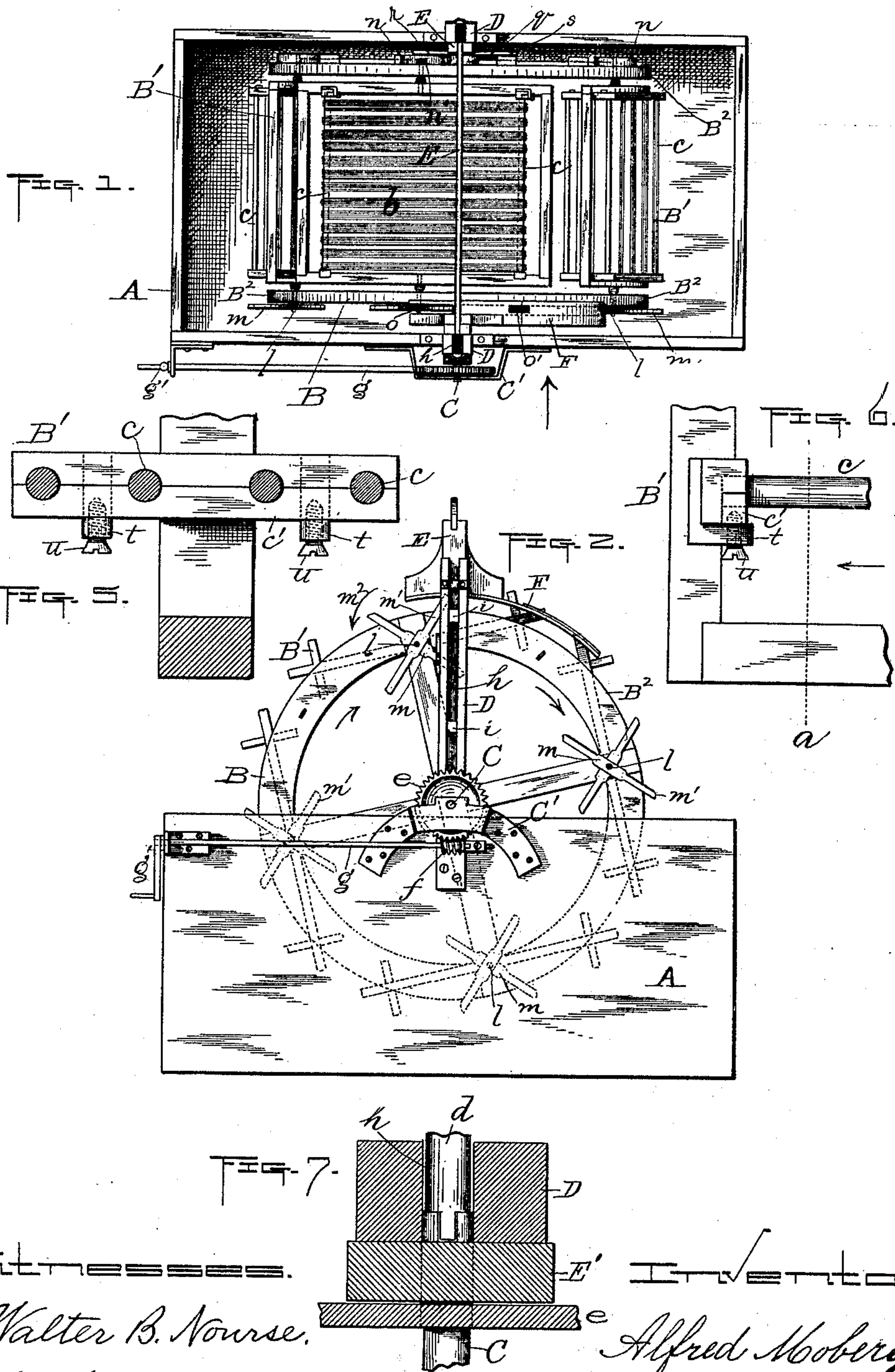
(No Model.)

2 Sheets—Sheet 1.

A. MOBERG.  
MACHINE FOR DYEING FABRICS.

No. 466,921.

Patented Jan. 12, 1892.



Witnesses.

Walter B. Nourse.

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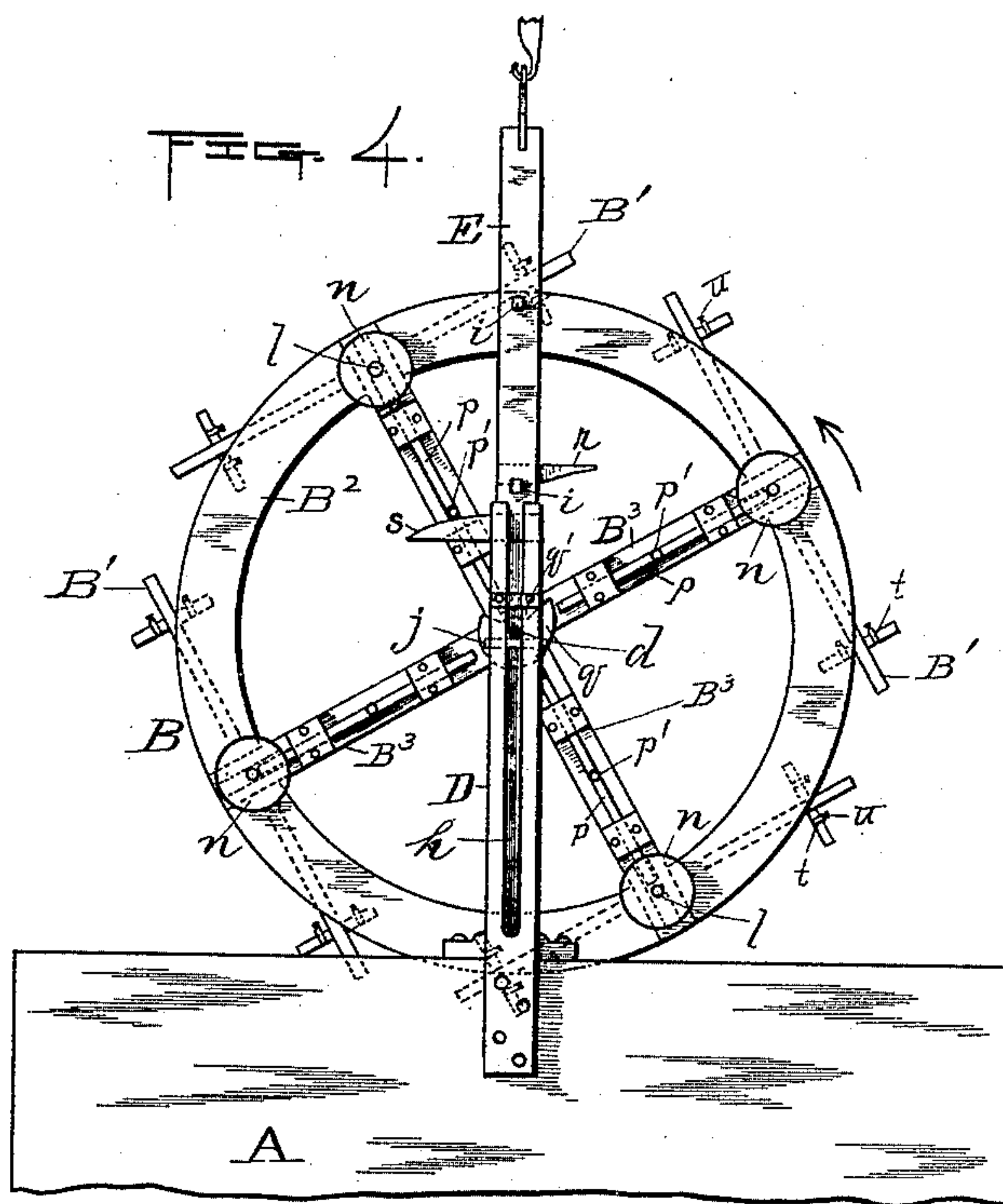
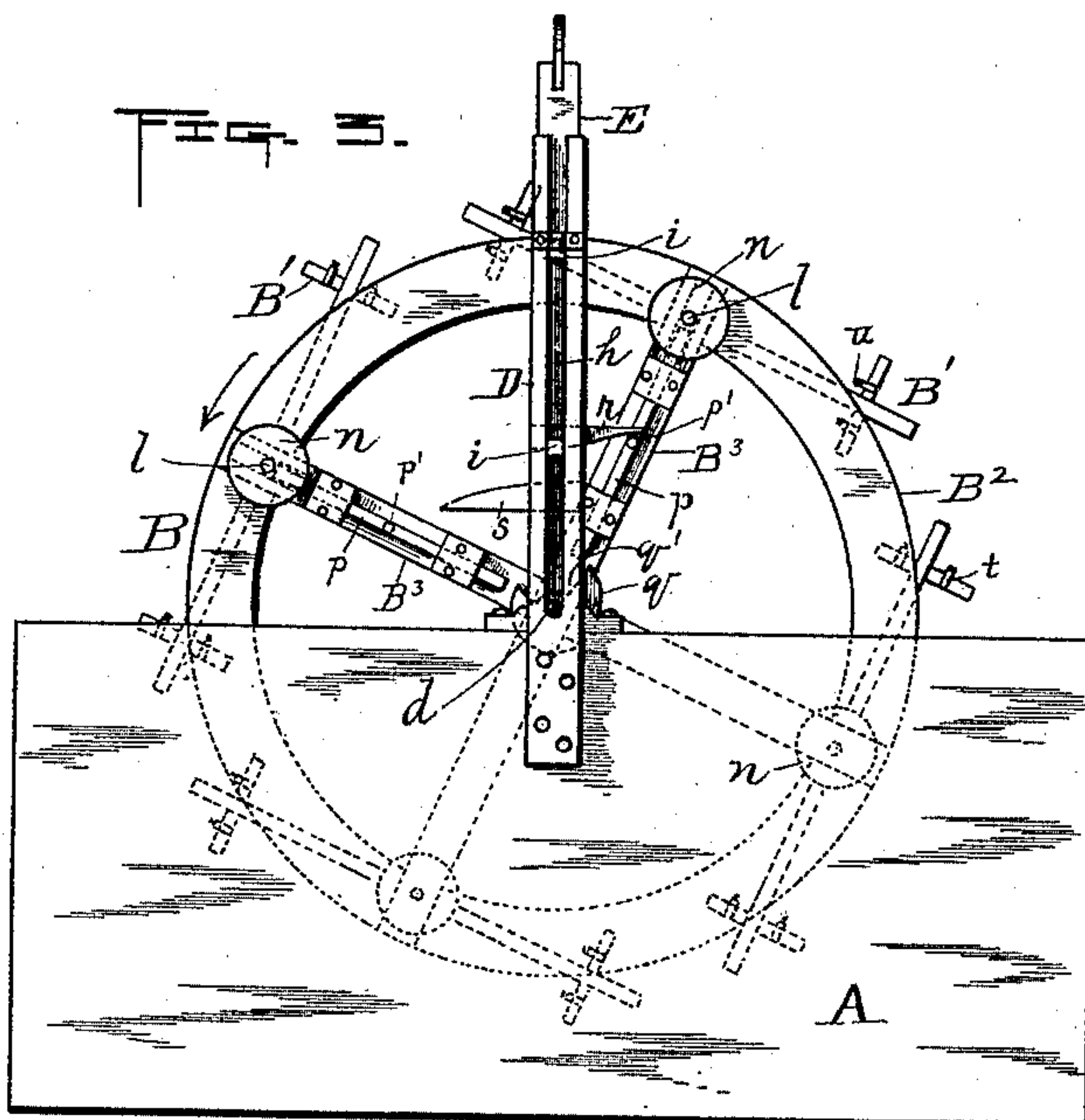
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Walter B. Nourse,  
C. Forrest Wilson,

INVENTOR.  
Alfred Moberg.  
By A. A. Barker. Att'y



# UNITED STATES PATENT OFFICE.

ALFRED MOBERG, OF CLINTON, MASSACHUSETTS.

## MACHINE FOR DYEING FABRICS.

SPECIFICATION forming part of Letters Patent No. 466,921, dated January 12, 1892.

Application filed November 6, 1890. Serial No. 370,531. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED MOBERG, of Clinton, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Dyeing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a plan of my improved dyeing-machine. Fig. 2 is a side view thereof looking in the direction indicated by the arrow in Fig. 1. Fig. 3 is an opposite side view of said machine. Fig. 4 is a similar view to Fig. 3, showing the yarn-reel elevated, as and for the purpose hereinafter described. Figs. 5, 6, and 7 are details, upon an enlarged scale, of parts of the machine also hereinafter described, Fig. 5 being a section on line *a*, Fig. 6, and Fig. 7 a horizontal section through one of the yarn-reel bearings.

My invention consists of certain improvements in the construction of the mechanism for supporting and immersing the yarn in the dyeing-fluid, as will be hereinafter more fully set forth.

To enable others skilled in the art to which my said invention appertains to better understand the nature and purpose thereof, I will now proceed to describe it more in detail.

In the drawings, A represents a tank or kettle for holding the dyeing-fluid, which in practice is provided with steam-pipes, as usual, for heating said fluid during the dyeing operation. As said heating appliances have nothing to do with my present improvements, I have not shown the same in the drawings.

B represents the reel for supporting the yarn, which is placed in skeins *b* (see Fig. 1) over the spindles *c* of the various transverse auxiliary reels or spools *B'*, which are arranged between the circular side frames *B<sup>2</sup>* of the main reel just inside of their peripheries and at or about equal distances apart around the circumference thereof. Said reel B is fitted to turn in bearings at each side of the kettle or tank A, which are so constructed as to permit the reel, with the yarn thereon, being lifted bodily out of the dyeing-fluid, while the auxiliary reels *B'* are

fitted to turn independently in the side frames *B<sup>2</sup>* of said reel B and have intermittent rotary movements imparted thereto at each revolution of the main reel. Said main reel is constructed so as to be operated and elevated as aforesaid in the following manner: The reel is in practice secured to its central shaft *d*, which projects at each end thereof a sufficient distance to rest and turn in the bearings of the kettle. One end of said shaft is made with a detachable section or short shaft C, which may be clutched and unclutched to and from said main shaft, and to which is secured a worm-wheel *e*. The outer end of said short shaft is fitted to turn in a suitable bearing *C'*, secured to the kettle, while its inner end turns in the bearing *E'*. (See Figs. 1, 2, and 7.) In this instance one shaft is shown detachable from the other by forming a tongue on the end of the reel-shaft and a transverse slot in the inner end of the short shaft, as shown in Fig. 7; but I do not limit myself thereto, as the same result may be obtained in various ways.

Any suitable driving mechanism may be combined with worm-wheel *e* for imparting to the reel B a slow continuous rotary motion. As an illustration of one way I have shown a worm *f* on a rotary shaft *g*, said shaft *g* being turned by a crank *g'*. Outside of each end of reel B a vertical stationary standard D extends up from the kettle A over the bearings in which the reel turns, and said standards are each provided with a vertical slot *h*, a little wider than the diameter of the reel-shaft *d*, which extends from said reel-shaft to the upper ends of the standards, so as to permit the reel being elevated as aforesaid when unclutched from the short shaft C. The reel may be thus elevated by means of a lifting-frame E, which extends transversely over the top of the reel and down at each end between the outer ends of said reel and standards D D, the same being provided with projections *i*, which fit in the slots of said standards to guide it in its vertical movements. The reel-shaft *d* passes through the lower ends of said lifting-frame and is fitted to turn therein.

By the above construction it is obvious that when said frame E is elevated the reel is lifted with it. They may be held in said ele-



vated position during the removal of the dyed yarn and the application of the next lot of yarn to be dyed by passing pins *j* transversely through the side standards and their slots under the reel-shaft, as is shown in Fig. 4. Said lifting and lowering operation may be performed by means of any suitable mechanism adapted to engage with the frame.

At each revolution of reel B the auxiliary reels or spools B' are turned one-half of a revolution, then locked to hold the same from turning while passing around the circuit of the wheel, and then unlocked when it again arrives at the turning-point in the following manner: The shaft *l* of each auxiliary reel is provided outside of the frames B<sup>2</sup> B<sup>2</sup> with the skeleton wheels *m* at one end and with the slotted disks *n* at their opposite ends, (see Fig. 1,) both of which are secured to said spindles, so as to turn with the reels. To one side of the frame E, over one of the side frames B<sup>2</sup> and in line vertically with the series of skeleton wheels *m*, is secured a segment-piece F, arranged at a short distance above the periphery of said frame and parallel thereto, as shown in Fig. 2. Said segment-piece is provided with vertical slots *o o'* to allow the arms *m'* of wheels *m* to pass up through as they are carried around by the reel B. In said rotary movement when one of the skeleton wheels *m* arrives at the segment-piece its forwardly-projecting arm *m'* passes up into the first slot *o* in the segment-piece, and, striking in the front end thereof, the wheel, and in consequence the auxiliary reel to which it is attached, are turned backward until the arm passes by said shoulder or stop, being thus turned one-half of a revolution, the next arm of the wheel in the meantime, as the reel B continues to rotate, being permitted to pass up through the second slot *o'* without striking, and therefore not impeding the forward movement of reel B, the purpose of said slot *o'* being not to assist in turning the skeleton wheels, but to allow them to turn freely after passing by the slot *o*, as aforesaid.

In Figs. 1 and 2 I have shown the machine turned so as to bring one of the arms *m'* in the slot *o* just preparatory to being turned backward, as shown by arrow *m<sup>2</sup>*, by striking against the segment-piece at the front end of said slot. In practice the various parts are constructed so as to turn the auxiliary reels one-half a revolution, as previously stated, at each engagement with the segment-piece, each reel being turned successively as it comes in contact therewith and remaining in said position until it again strikes against said segment-piece as the main reel is slowly rotated in the manner previously described. It will of course be understood that the apparatus may be made and adjusted so as to obtain more or less than one-half a revolution, if desired. It is preferable, however, as described. The purpose of thus turning said auxiliary

reels, upon which are placed the skeins of yarn, is that both sides of said skeins may be acted upon alike by the dyeing material, and consequently causing the same to be dyed uniformly throughout.

The mechanism for locking the auxiliary reels after each half-revolution is arranged at the opposite end of the machine from the skeleton wheels *m* (see Figs. 3 and 4) and is constructed as follows: A slide-rod *p*, fitted to slide in suitable bearings, is arranged on the outside of each arm B<sup>3</sup> of reel B between the slotted disks *n* and a cam *q* on the lifting-frame E, and each slide-rod is provided at about the center with a pin *P'*, projecting outward. To said lifting-frame E are also secured two cams *r s*, which act reversely on the slide-rods *p* when the pins thereof come in contact therewith. For instance, as the main reel B rotates and the pin of one of the rods strikes the cam *r* said rod is pushed inward toward the reel-shaft *d* and outward when it comes in contact with the other cam *s* after having passed by said cam *r*. When in their outer positions the outer ends of the rods each fit in a radial opening *n'* in the disks *n* and are held therein by the inner ends of the rods coming against the peripheral surface of the cam *q*, which is provided with a recessed portion *q'* to permit said rods being forced inward by the cam *r*, as aforesaid. During the interval that the rod is disengaged from the disk *n* the auxiliary reel is turned the one-half revolution, as previously described, and directly following said partial rotation the cam *s* forces out the rod into the opening in the disk to relock said auxiliary reel, where it is held by the circular portion of cam *q*, as aforesaid, during the next revolution of reel B, and so on continuously as each successive auxiliary reel arrives in line to be thus operated upon by the rotation of said reel B.

The auxiliary reels are constructed so that their spindles *c* may be conveniently removed and replaced to change the yarn thereon by making one side *c'* of their bearings removable and holding the same by means of adjusting-screws *u*, passed through angle-plates *t*, secured to the frames of said reels, as is fully shown in Figs. 5 and 6 of the drawings.

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

1. In a yarn-dyeing machine, the combination of kettle A, having the slotted standards D D at each side thereof, and reel B with the auxiliary reels B', fitted to turn independently in said reel B, lifting-frame E, having the segment-piece F thereon, short shaft C, gear *e*, and means for turning the same, substantially as and for the purpose set forth.

2. In a yarn-dyeing machine, the combination of reel B, having the auxiliary reels B', fitted to turn independently thereon, said auxiliary reels in turn being provided with the



skeleton wheels *m*, with frame E, having the bearing-piece F thereon, substantially as and for the purpose set forth.

3. In a yarn-dyeing machine, the combination of kettle A, having the slotted standards D D at each side thereof, with lifting-frame E, having the cams *q*, *r*, and *s* secured thereto, reel B, having the auxiliary reels B', fitted to turn independently therein, said auxiliary reels in turn being provided with the slotted disks *n*, and slide-rods *p* on said reel B, provided with pins *p'*, the rods being adapted to engage with the disks and cam *q* and the pins with cams *r s*, substantially as and for the purpose set forth.

4. In a yarn-dyeing machine, the combination of kettle A, having the slotted standards

D D at each side thereof, and short shaft C with lifting-frame E, having the bearing-piece F and cams *q r s* thereon, reel B, having the auxiliary reels B', fitted to turn independently therein, said auxiliary reels in turn being provided with the skeleton wheels *m* at one end and the slotted disks *n* at the other end, and slide-rods *p* on said reel B, provided with pins *p'*, the wheels *m* being adapted to engage with bearing-piece F, the rods with disks *n* and cam *q*, and the pins with cams *r s*, substantially as and for the purpose set forth.

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Witnesses:

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