

No. 768,425.

PATENTED AUG. 23, 1904.

C. CORRON.  
MACHINE FOR DYEING AND WASHING.

APPLICATION FILED JUNE 25, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

FIG-1

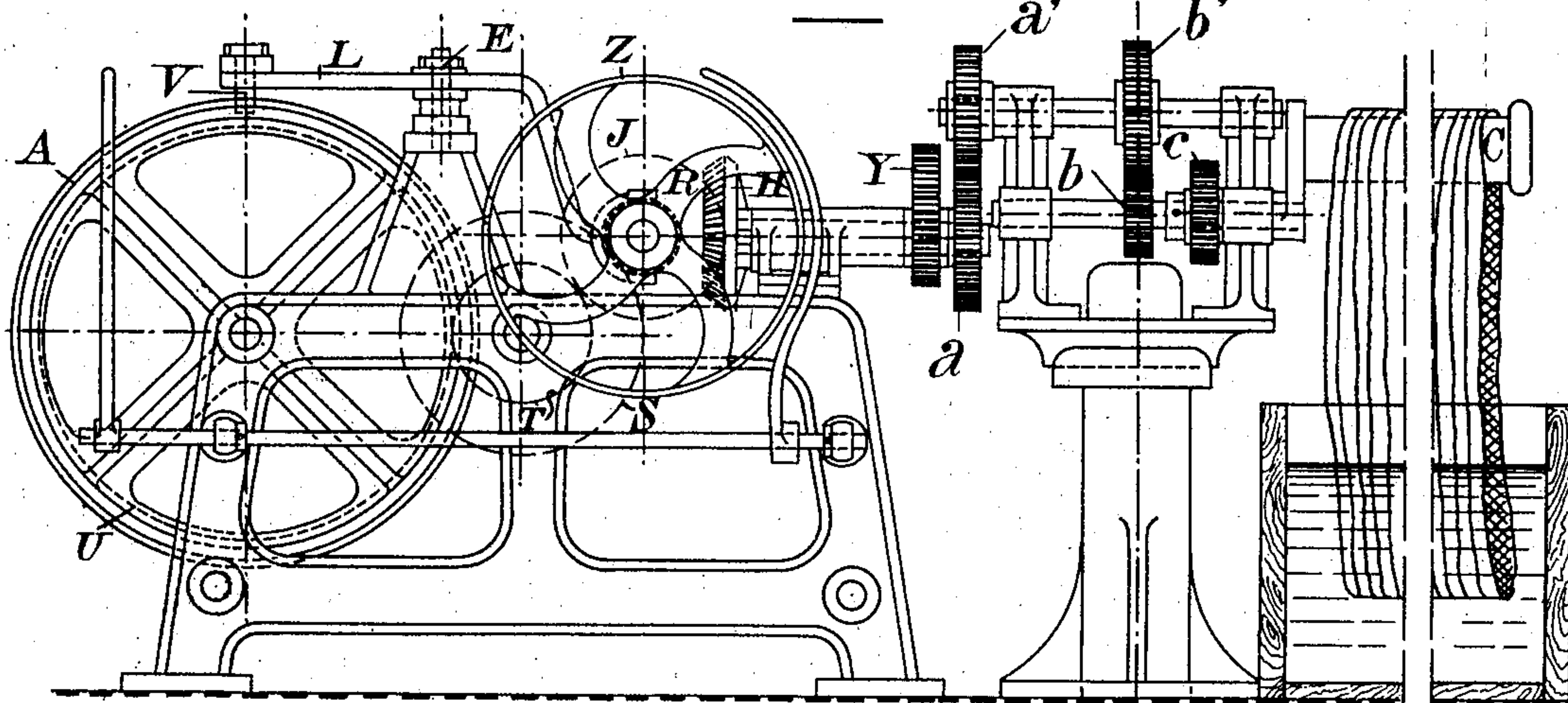
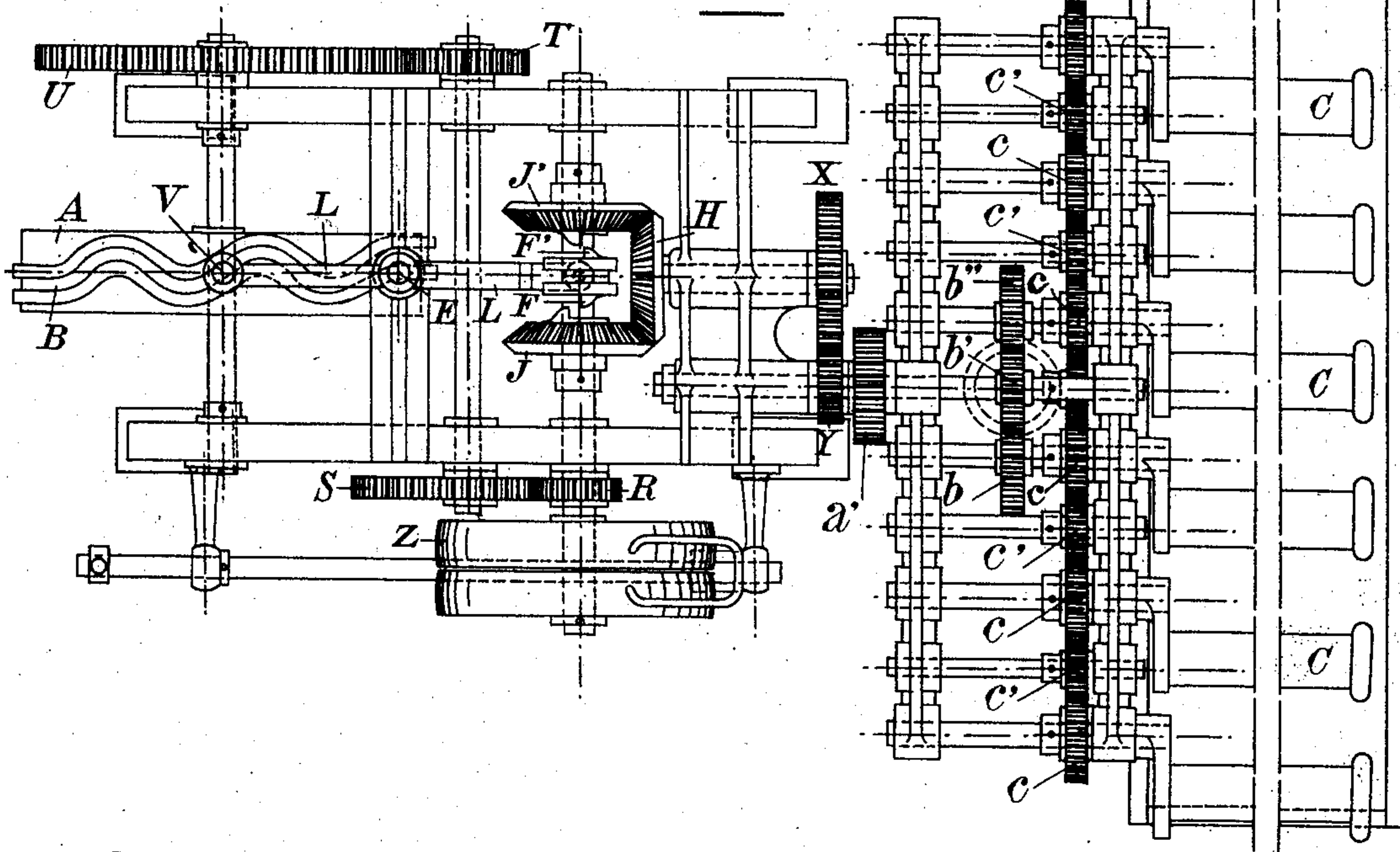


FIG-2



Witnesses

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By his attorney,  
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2 SHEETS—SHEET 2.

FIG-3

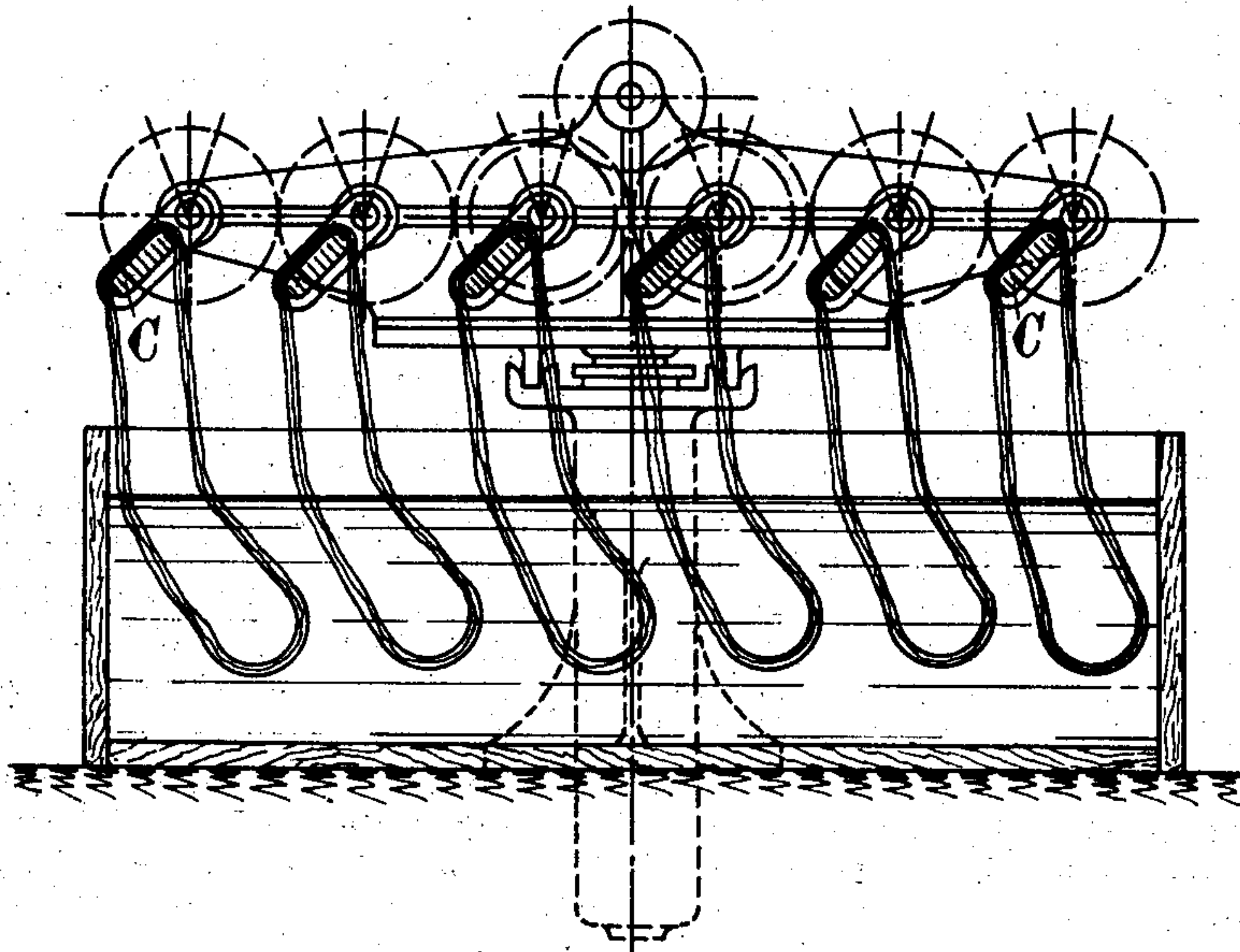


FIG-4

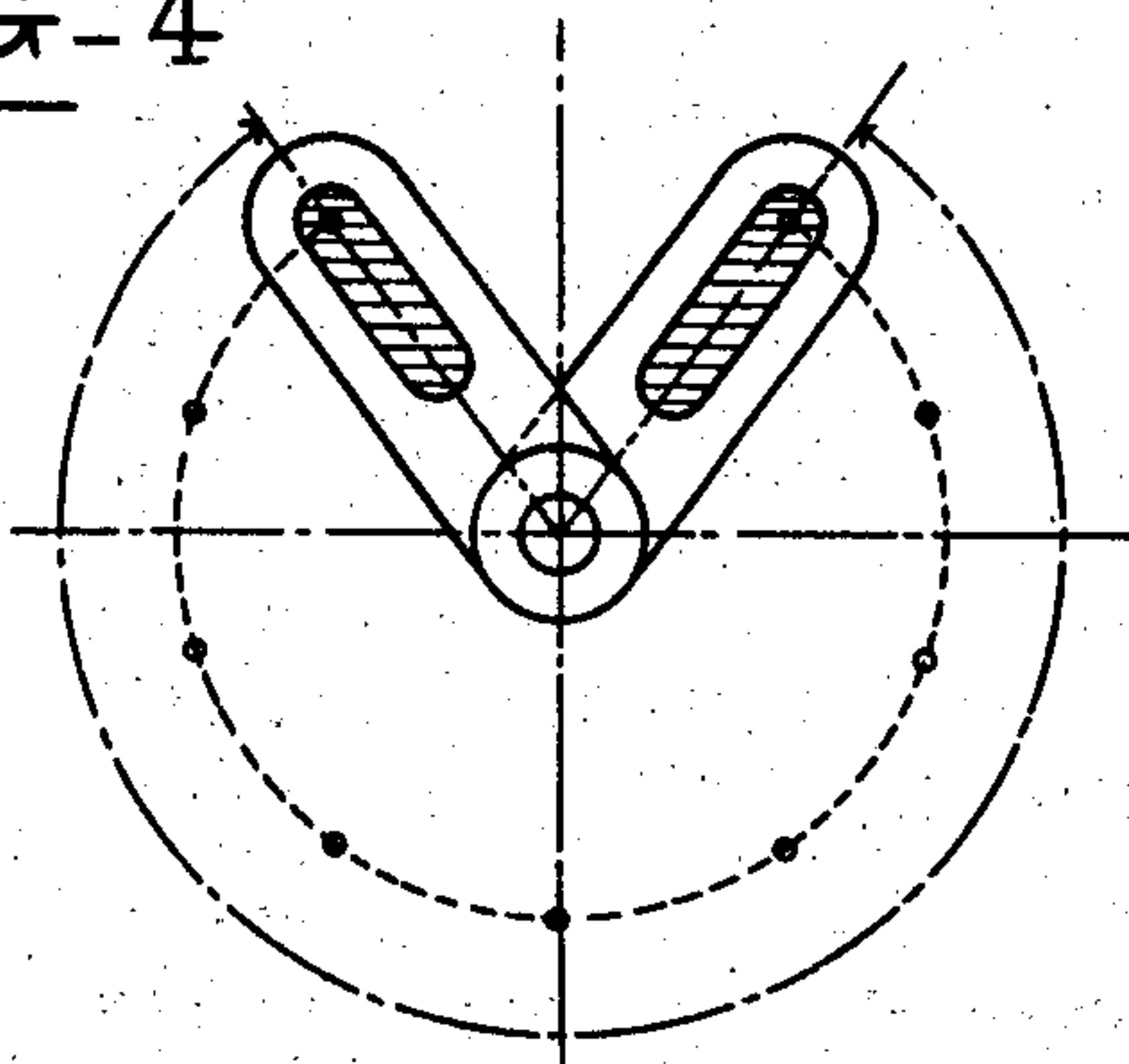
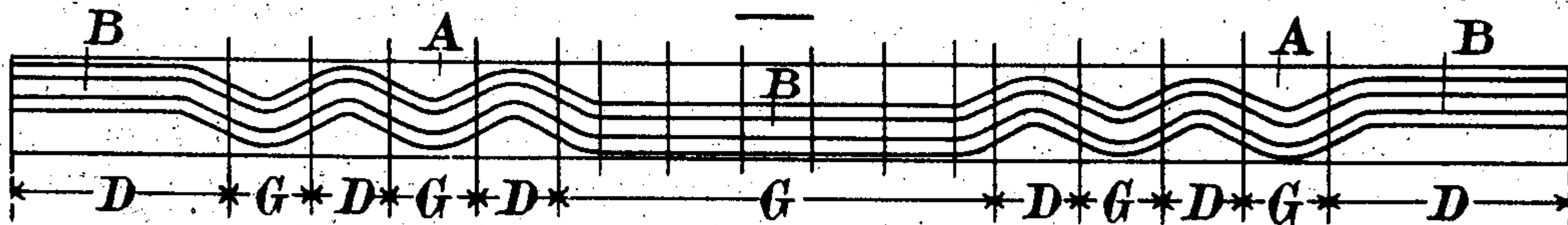


FIG-5



Witnesses

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Catherine C. Cullen

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By his attorney, César Corron  
Edward P. Thompson



# UNITED STATES PATENT OFFICE.

CÉSAR CORRON, OF LYONS, FRANCE.

## MACHINE FOR DYEING AND WASHING.

SPECIFICATION forming part of Letters Patent No. 768,425, dated August 23, 1904.

Application filed June 25, 1902. Serial No. 113,186. (No model.)

*To all whom it may concern:*

Be it known that I, CÉSAR CORRON, a citizen of the Republic of France, residing in Lyons, in the Republic of France, (whose full postal address is 8 Rue Tronchet, Lyons, aforesaid,) have invented certain new and useful Improvements in Apparatus for Dyeing, (for which application for patent has been made in France, dated March 3, 1902; in Germany, dated April 1, 1902; in Italy, dated June 7, 1902, and in Switzerland, dated June 9, 1902,) of which the following is a specification.

In machines as at present employed in dyeing, washing, mordanting, soaping, and otherwise treating textile materials the actions of steeping and dashing are effected in a continuous revoluble manner. I have found, however, that it is advantageous to produce these actions in an alternating manner under different conditions. For this purpose I divide the movements to which the material is subjected in the following manner: first, into a number of only partial rotations of the material in order to admit of a steeping action; second, into a similar number or approximately similar number of virtually horizontal reciprocatory movements of the material without rotation of the said material for producing the dashing action. The dashing is the ancient operation which the working dyer produced by hand when he individually washed each hank of silk in a washing-trough, and it is this operation which best divides and separates the threads of silk in the liquids, and it is the best and most active of the operations for dyeing, washing, and soaping when combined with a rotation of the material for giving the steeping or rinsing action. This double movement is obtained according to my invention by means of a wheel having a wavy groove or guide forming a cam, which imparts such movements alternately and automatically to the means for operating the skein-carriers as will cause them to produce successively the double action hereinbefore mentioned under the conditions hereinbefore indicated.

The invention will now be described with reference to the accompanying drawings, which show as an example the application of

such a wheel to a machine for dyeing, washing, and the like and operating according to my invention.

In the drawings, Figure 1 is a side elevation of the machine; Fig. 2, a plan view of same. Fig. 3 is a side view of the vat and part of the machinery; Fig. 4, a diagram of the rinsing or dashing movement of the skein-holder; Fig. 5, a diagram showing the action produced by an undulated cam-wheel for producing the alternate dashing and steeping action.

The term "steeping" as used herein refers to an operation by means of which the hanks of silk supported by the steeping-rods are caused to be dipped and withdrawn rapidly in the dye-vat, (the ends of these rods being placed on the edges of the vat containing the dye-bath.) This is, in fact, a steeping, being intended to imitate the usual action in dyeing by hand, where the dyer alternately dips the hanks of yarn into the dye and then withdraws them, gradually turning the hank round, so that a fresh portion is dyed. By "dashing" is intended an operation consisting in agitating the hank or coil of silk in the bath in order that the part of the said hank which dabbles in the liquid may undergo a more rapid and vigorous action from the dye. This imitates a to-and-fro movement by the hand of the dyer which evidently would produce a reciprocatory movement and will cause more of the dye liquor to encounter the fiber.

By referring to Fig. 5 of the drawings it will be seen that the rectilinear parts of the groove B are the ones which produce the steeping movement and the undulated parts which produce the alternate to-and-fro or reciprocating movement—or, in other words, the dashing, (rinsing.) The operations correspond somewhat to soaking and washing; but as a rule "washing" means a rubbing action, which does not here take place. Concerning the clause "reciprocatory movements," the machine has two combined movements, the one the steeping action, consisting in turning the silk round on the hank-carriers, so that each part of the hank is successively immersed in the bath. The second movement, which is the dashing action, consists in agitating from



right to left, and vice versa, for a given time the part of the hank which is immersed in the bath. This agitation is produced by the undulated parts shown in Fig. 5, while the movement of continuous displacement (steeping) is produced by the rectilinear part. This action is more powerful, and consequently the penetration of the tinctorial products into the silk is more active and more rapid. This operation dispenses with fifty per cent. of the rotations, which is a great advantage for the good treatment of the silk.

In this machine a wheel A, having an undulating cam-groove B, is mounted at the head of the machine. A guide V on the front end of a lever L, pivoted at E, engages in the cam-groove of the wheel A. This lever L has its rear end formed as a shipper-fork, which engages the peripheral groove of an axially-slidable clutch-wheel F F'. The movements imparted to the lever L by the cam-wheel A shift the clutch-wheel F F' alternately into engagement with one or other of two loosely-revoluble bevel-wheels J J', thereby causing a bevel-wheel H, which is in gear with both wheels J and J', to revolve in one direction or the other, according to the position of the lever L. As, however, it is this wheel H which transmits the movement to the whole of the other parts of the machine, including the skein-carriers C, it follows that the skein-carriers which revolve together in the same direction are actuated alternately in different directions to right and left, according to which of the gears J J' is at the moment engaged by the corresponding clutch side of the clutch-wheel F F' under the action of the lever L. The hereinbefore-described connection by clutch-gearing between the lever L and the bevel-wheels J J', respectively, could also be attained by friction-gear or any other suitable mechanical arrangement.

The gear X, which is operated by the gear H, transmits its motion to the gear Y. The latter operates a gear *a*, keyed on its shaft, which in turn operates a gear *a'*. A gear *b'* operates pinions *b b''*, which consequently revolve in the same direction as each other, the said gear *b'* being keyed on the shaft of the gear *a'*. The shafts of these pinions *b b''* operate toothed wheels *c*, and with the object of causing all these wheels *c* to revolve in the same direction they respectively gear with intermediate pinions *c'*. In this manner all the skein-holders are operated simultaneously and revolve in the same direction. The movement obtained is as follows: six complete rotations in the same direction followed by four partial rotations corresponding to a reciprocating movement resembling the movements which a workman makes in hand-dyeing by the ordinary process. In this machine the rotation of the skein-carriers is therefore not always complete. In order to produce a better dashing, the amplitude of the movement of the

skein-carriers is only, for instance, four-fifths of a revolution, as indicated in Fig. 4, which shows the extreme positions in each direction which it is most advantageous to impart to these skein-carriers for the dashing or rinsing.

As will be evident from a simple examination of the drawings, the driving-pulley Z of the machine has a continuous movement in one direction, and this movement is transmitted, by means of the spur-wheels R S T U, to the wavy cam-wheel A.

In order to impart the improved series of movements to the skein-carriers, the cam-wheel A has an undulating groove corresponding, on the one hand, to the number and extent of the dashing movements which it is desired to give to the said skein-carriers and, on the other hand, to the steeping movement. A pulley with a wavy groove, as shown, for example, diagrammatically in Fig. 5, may be employed for producing successively two movements composed of four dashing and four steeping or rinsing movements, these movements alternating one with another. The phases of rotation of this wheel in which the skein-carriers receive a displacement to the right are indicated by the letter D, and those in which they receive a displacement to the left are indicated by the letter G. Any other suitable combinations of undulations might, however, be employed, according to the number of revolutions and the alternative changes of motion which it is desired to impart to the skein-carriers in order to obtain the dashing or rinsing and the steeping actions. The undulated cam-wheel may also be of different equivalent constructions—such, for instance, as instead of having the two movements on the same wheel a double wheel might be arranged, one part of which effects the steeping and the other the rinsing or dashing movement. Finally, a third movement might be combined with the two distinct movements hereinbefore mentioned, said third movement being adapted for producing a partial rotation of the skein in an irregular manner in order to produce a whipping by inserting for this object between the oscillating gear at the head of the machine (gear-wheel H) and the wheels of the machine proper a pair of elliptical or eccentric wheels, such as X Y, or any other equivalent arrangement of wheels having a variable movement. In this machine there may also be employed either rectilinear skein-carriers or concave or convex ones formed either with copper tubes or with wood poles. The general arrangement of the head may be such as to drive the machine either at its center, as is the case in Figs. 1, 2, and 3 of the accompanying drawings, or at any suitable part of its width. Finally, if it be desired the submersion of the threads or skeins could be effected by alternately raising and lowering the dye-bath by means of a hydraulic piston.

I declare that what I claim is—



1. In a machine for dyeing and rinsing textile materials, the combination of skein-holders and means for imparting to said skein-holders a swinging motion of less than a complete revolution, the middle point of said motion being situated directly beneath the center of revolution in regard to each said skein-holder, and said means being adapted to cause said swinging motion to alternate with complete revolutions, first in one direction and then in the other, on the part of said skein-holders.

2. In a machine for dyeing and rinsing textile materials, the combination of skein-holders and means for imparting to said skein-holders a swinging motion of less than a complete revolution, and for alternating said swinging motion with a completely-revolving motion which is first in one direction and then in the other.

3. In a machine for dyeing and rinsing textile materials, the combination of a shaft, a skein-holder rigidly carried on the end of said shaft and disposed parallel and eccentric thereto, a cam-wheel, a track for said cam-wheel, for operating the said reversing-clutch, said track consisting of straight portions arranged zigzag to each other and undulating portions alternating with the said straight portions, whereby a number of complete rotations in one direction, alternating with a series of oscillations of less than a complete rotation, then a number of complete rotations in the opposite direction, followed by another series of oscillations like the first named, and so on, are imparted to the said skein-holder shaft.

4. In a machine for dyeing and rinsing textile materials, the combination of a shaft, a skein-holder carried on the end of said shaft, a power-shaft and intermediate gears for driving said skein-holder shaft, a reversing-clutch mechanism intermediate to said power-shaft and said skein-holder shaft, and a revolving cam-wheel for operating said reversing-clutch, said cam-wheel having a track of such shape, as to impart to said skein-holder shaft a number of complete rotations in one direction, alternating with a series of oscillations of less than a complete rotation, then a number of complete rotations in the opposite direction, followed by another series of oscillations like the first, and so on.

5. In a machine for dyeing and rinsing textile materials, the combination of a cam-wheel, an undulating track therefor, a driving-shaft, two loosely-revoluble bevel-wheels thereon, gearing, skein-holder shafts connected by said gearing to both of said bevel-wheels, an axially-slidable clutch-wheel mounted on said driving-shaft between the said bevel-wheels, a lever having a shipper-fork at one end engaging the clutch-wheel, a guide at its other end engaged in the track of the cam-wheel, said cam-wheel track consisting of straight portions arranged zigzag to each other and undulating portions alternating with the said straight portions, whereby a number of complete rotations in one direction, alternating with a series of oscillations of less than a complete rotation, then a number of complete rotations in the opposite direction, followed by another series of oscillations like the first named, and so on, are imparted to the said skein-holder shaft.

6. In a machine for dyeing and rinsing textile materials, the combination of a shaft, a skein-holder rigidly carried on the end of said shaft and disposed parallel and eccentric thereto, means for driving said shaft, and a device for causing said shaft to alternately partake of a number of complete rotations and of a series of oscillations whose amplitude is less than a complete rotation.

7. In a machine for dyeing and rinsing textile materials, the combination of a shaft, a skein-holder rigidly carried on the end of said shaft and disposed parallel and eccentric thereto, and means for giving said shaft an interrupted rotary motion, said motion consisting of a number of complete rotations in one direction, followed by a series of partial rotations in alternately opposite directions, then a number of complete rotations in the opposite direction from the first, followed by another series of alternating partial rotations, and so on.

In witness whereof I have hereunto signed my name, this 9th day of June, 1902, in the presence of two subscribing witnesses.

CÉSAR CORRON.

Witnesses:

JEAN GERMAIN,  
FRANCIS GULLIET.