(No Model.) 2 Sheets—Sheet 1.

C. CORRON.

APPARATUS FOR DYEING.

No. 563,569. Patented July 7, 1896.

Fig. 1.

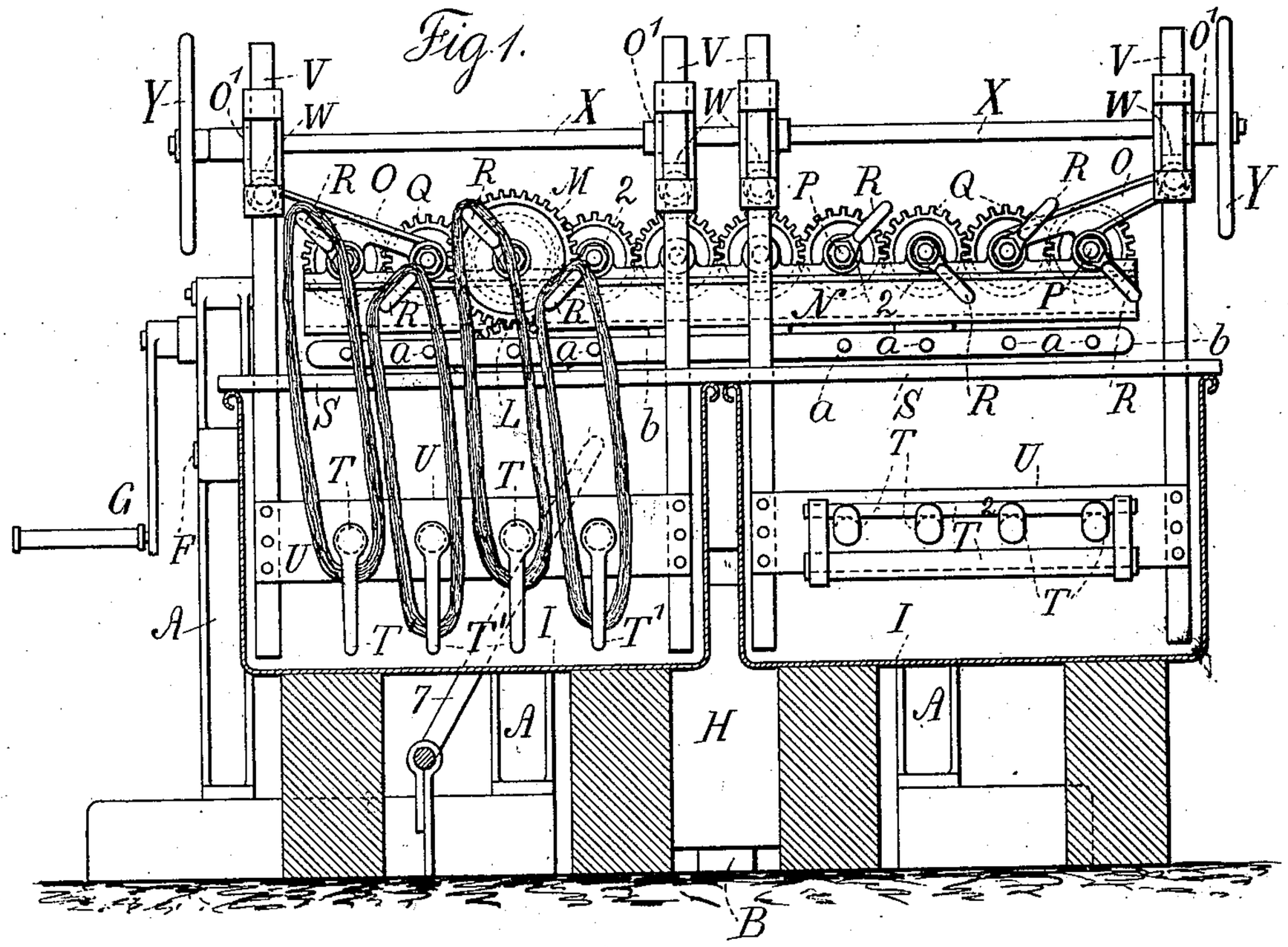
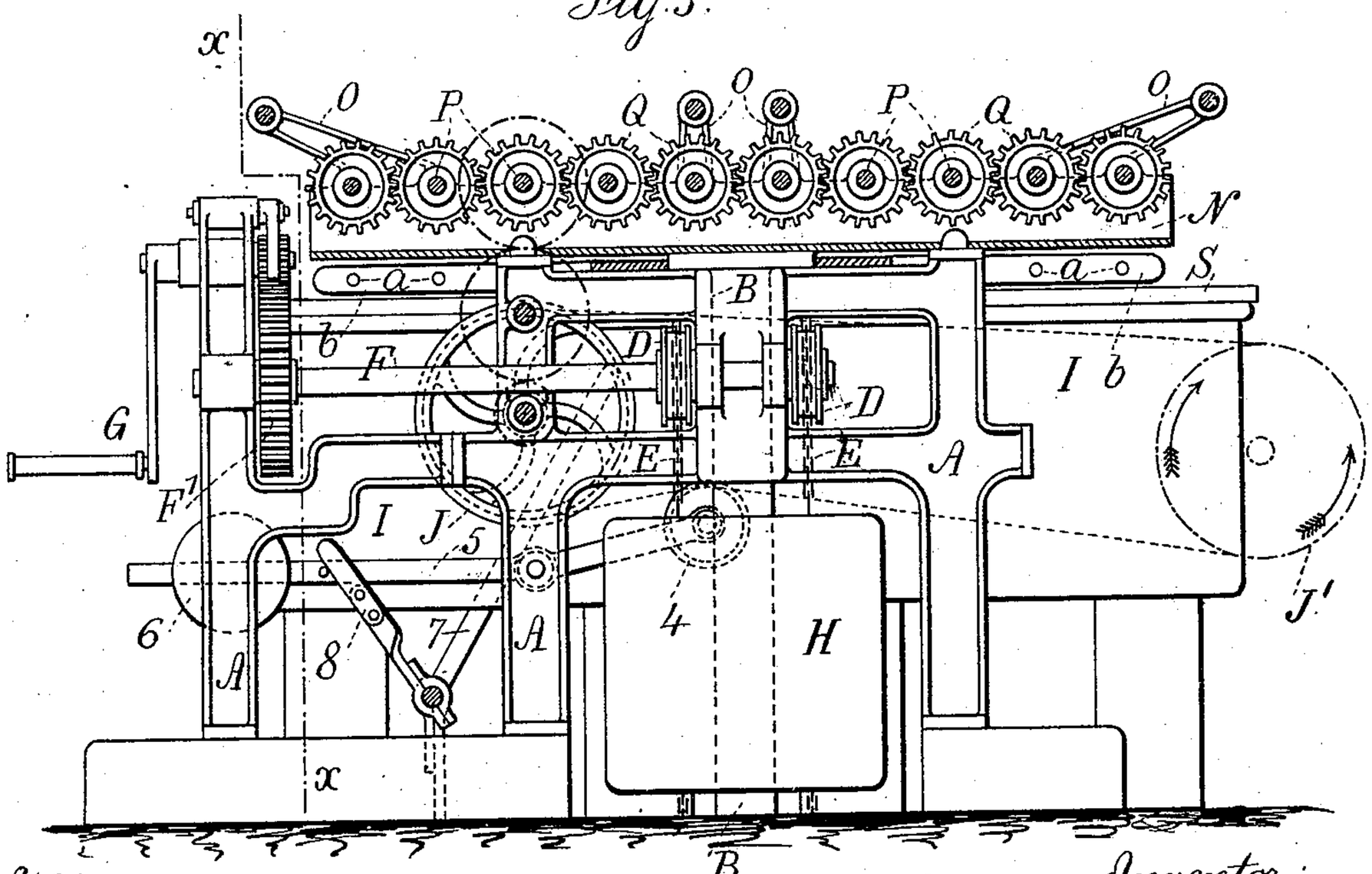


Fig. 3.



Witnesses:
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Chas. A. Smith

Inventor:
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per Lemuel W. Serrell
Atty.

(No Model.) 2 Sheets—Sheet 2.

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APPARATUS FOR DYEING.

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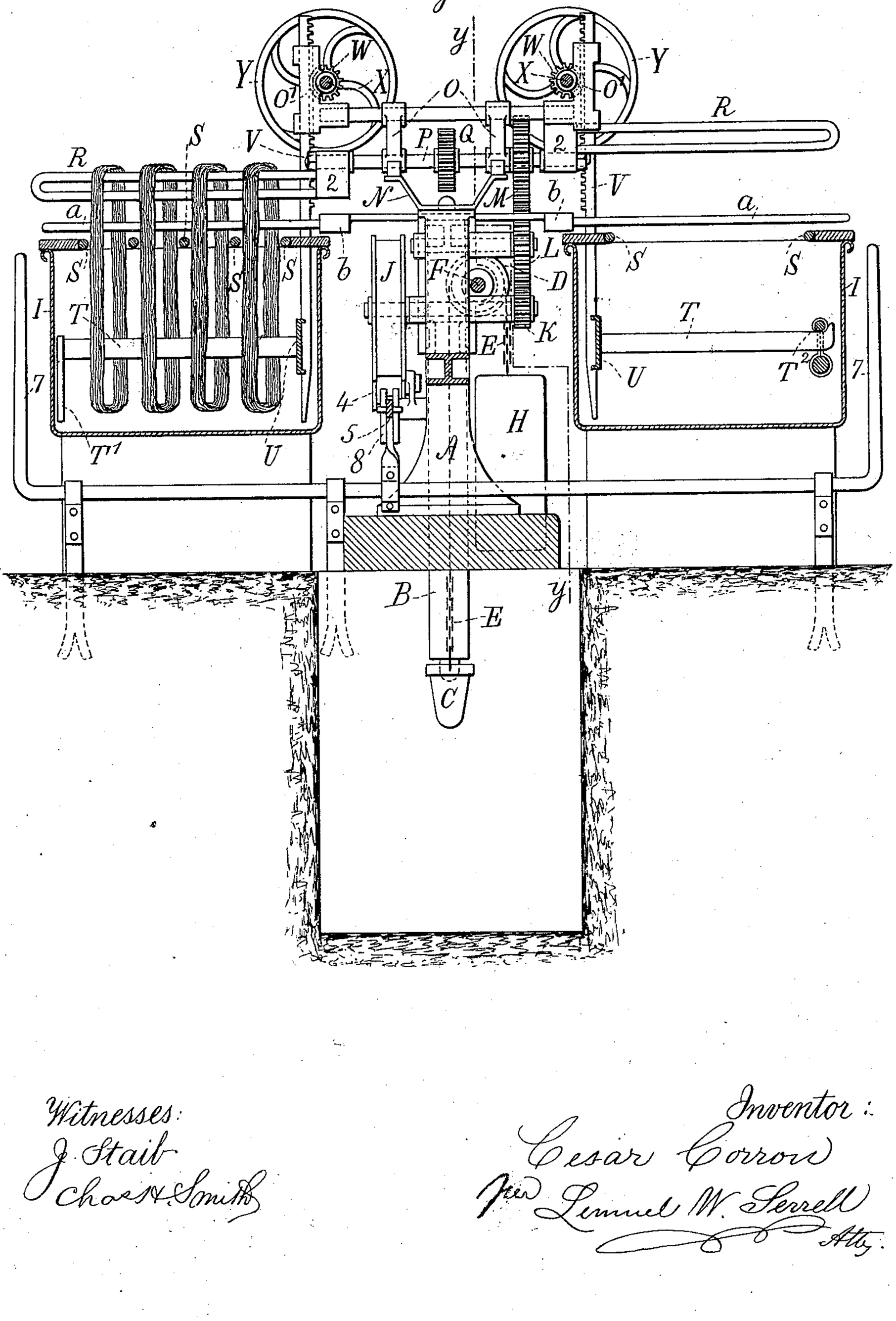
Fig. 2.



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Inventor:
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UNITED STATES PATENT OFFICE.

CESAR CORRON, OF LYONS, FRANCE.

APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 563,569, dated July 7, 1896.

Application filed April 19, 1894. Serial No. 508,067. (No model.) Patented in France February 11, 1893, No. 227,792, and in Switzerland July 20, 1893, No. 7,033.

To all whom it may concern:

Be it known that I, CESAR CORRON, a citizen of the Republic of France, residing at Lyons, Department of the Rhone, France, have invented an Improvement in Machinery for Dyeing Threads, of which the following is a specification.

This invention was patented in France February 11, 1893, No. 227,792, and in Switzerland July 20, 1893, No. 7,033.

This apparatus is applicable to dyeing all kinds of filaments or threads with uniformity, and it is also available in weighting such filaments or in washing them, and it may be used with dye vats or baths of larger or smaller size and in which the skeins of threads are more or less submerged. The skeins are suspended by rotary pallets, which constantly move the skeins of thread along, so that such skeins descend into the dye at one side and are drawn up at the other side, and by this operation the threads of the skeins are kept sufficiently loose and separate to allow for the escape of any bubbles of air, so that the dye has opportunity to come into contact with all of the surfaces of the threads, and by this improvement the risk of breaking the threads is lessened and their elasticity and tenacity are not impaired. The skeins pass beneath a submerged stretcher, so that the skeins are kept down in their proper positions within the dye, and the threads are kept from adhering to each other and becoming twisted. This apparatus is very simple and efficient, and I am enabled to provide for different lengths of skeins, and the skein carriers and stretchers are mounted on a frame that can be raised or lowered, so that the skeins can be immersed into the vat or lifted out of the same and transferred from one vat to another.

In the drawings, Figure 1 is an elevation with the dye-vats in section. Fig. 2 is a cross-section near the line *x x*. Fig. 3 is a longitudinal section near the line *y y*.

A suitable framework is provided, as shown at A, and the vats I are of any desired size or material, such, for instance, as glass or metal suitably coated, or wood with a waterproof lining, and I have shown four vats in the drawings as grouped together, and it is to be understood that any desired number of vats may be employed and that they may hold the dye for coloring the threads or any suitable material for weighting or coating the threads, or they may contain the water or other liquid for washing the skeins.

I have represented the pallets R as in groups of four for each vat, but there may be a greater or less number of these pallets. Each pallet R is made of two parallel parts, preferably in the form of a bent rod, to separate the loops of the skeins, the two parallel parts of which pass at their ends into the head 2, and this head is connected at one end with the end of the revolving shaft P, so that the pallets are parallel with the said shaft and at one side of the axis of rotation, and it is advantageous to fit the head 2 upon the shaft removably, so that the head and connected pallets can be separated for conveying the skeins to or from the vat or for taking the skeins to a centrifugal or other wringer or drier without handling the same, and I have represented nuts at the ends of the shaft P for securing the heads of the pallets. These parallel pallets R, being thus connected to the shafts at one side of the axis of rotation travel, in circular paths concentric with said shafts P, and impart to the skeins the motion hereinafter described.

In the lower part of the vat stretchers T are provided, such stretchers being in the form of bars projecting from the traverse or frame U, and at the end of each stretcher a finger is provided for preventing the skeins slipping off the end of the stretchers. At T′ the finger is represented as hanging down from the end of the stretcher, and at T^2 rings or short tubes are represented as applied upon the ends of the stretchers for keeping the skeins in their proper positions. These stretchers T and the traverse or frame U can be raised or lowered, as hereinafter described, and it is now to be understood that as the shafts P revolve the pallets are also rotated, and the skeins which lie over the pallets and beneath the stretchers are partially within the liquid in the vat, and the rotation of the pallets causes the skeins to rise and fall in the dye, giving to such skeins a dipping

action, and at the same time the skein is caused to progress, one side descending and the other side ascending, and by this movement all parts of the skeins are progressively exposed to the same dyeing, weighting, or washing operation, and the threads of the skeins are shaken, so as to separate from each other and allow the liquid to pass in between the respective threads, and the stretchers within the lower loops of the skeins keep the two sides of the skein from coming into contact and thereby keep the skein open and prevent the threads adhering together or becoming broken or twisted, and the operation performed upon the skeins by the movements of the pallets approximates the operation performed by hand in dipping the skeins into and out of the liquid and in keeping the sides of the skeins separate and the threads sufficiently open for the liquid to penetrate and act equally upon all of the threads. Hence the dyeing, washing, or weighting is performed by this apparatus in the most perfect, efficient, and expeditious manner.

In order to make this dyeing apparatus compact and easily operated, I support the shafts P upon a carrying-frame N and apply the pallets and their heads at both ends of the shafts P, so as to project beyond and be parallel with the respective shafts P, and I apply upon the top edges of the vats I the guide-bars S, which are passed in between the respective skeins, so as to keep them separate and prevent one skein lapping upon another skein as the pallets are rotated, and these guide-bars S may be of wood, metal, or glass, and either solid or tubular, and they may be received into notches upon the top edges of the vats I, so as to be retained thereby in their proper places.

The frame N is secured upon the top end of a vertical carrying-bar B, which passes through a guide-tube on the frame A, and there is a longitudinal shaft F, that can be rotated by a crank G and pinion acting upon the gear-wheel F′, and upon this shaft F there are chain-wheels D, over which pass the chains E to the counterweight H, and such chains descend to the bottom of the carrying-bar B, and they are connected with such carrying-bar by a yoke or pivot-piece C, and the counterweight H is sufficient to nearly balance the parts that are carried by the bar B and frame N, so that the frame N may be raised or lowered bodily by the crank G, and as a convenient manner of connecting the shafts P and driving them I provide a train of gearing Q upon the respective shafts P and between the bearings for such shafts P, which bearings are upon the edges of the frame N.

The supporting-arms O upon the frame N carry cross-bars and bearings O′ for the longitudinal shafts X, upon the ends of which are hand-wheels Y, and there are pinions adjacent to the racks V, that descend and are connected with the traverse-bars U, so that by turning the hand-wheels Y the traverse-bars and stretchers may be raised or lowered in the dye-vats, so as to act in the proper manner in keeping the lower portions of the skeins distended during the dyeing or washing operation, and it will now be understood that the frame N and the parts carried by it, including the pallets R and stretchers T, can be raised or lowered bodily by the action of the crank G, so as to lift the skeins out of the vats or to immerse them in such vats, and when the parts are raised opportunity is given for removing the skeins from the pallets or for placing the skeins over the pallets and beneath the stretchers, and, as before mentioned, either pallet can be separated from its shaft for removing the skeins that are thereon bodily or for applying the skeins with the pallets in their proper position.

I remark that any suitable means may be made use of in place of the racks V and pinions W for raising and lowering the traverse-bars U and stretchers T.

The separator-rods *a* are represented as connected to the bars *b*, that are supported by the frame A, such separator-rods *a* being passed through the rows of skeins as they hang upon the revolving pallets.

In driving machines of this character it is advantageous to employ a line-shaft adapted to supply power to a number of machines, and upon such line-shaft and in position for each machine is a pulley J′, from which a band passes to the driving-pulley J upon the machine, the shaft of which pulley is supported by the frame A, and there is a train of gearing composed of the pinion K, intermediate gear L, and gear M for rotating one of the shafts P and thereby driving the train of gearing Q and all of the shafts P; and it will be observed that the gear M separates from the intermediate gear L when the carrying-frame N is raised and the gears engage each other when the frame N is lowered, and it is advantageous to employ a tightening-pulley 4 for the belt that drives the pulley J, and the tightening-pulley is upon a lever 5 with a weight 6, and the stop-levers 7 are upon a cross-shaft with an arm 8, that is adapted to raise the lever 5 and withdraw the tightening-pulley from the belt, so that the belt will slip and the machine stop, or the machine will be started by moving either lever 7 in the opposite direction, and I find that it is advantageous to rotate the shaft and pulleys J′ first in one direction and then in the other direction by any suitable mechanism, so that the pallets carrying the skeins will be turned first one way and then the other way, thereby insuring greater uniformity in the dyeing operation by causing the threads of the skeins to travel through the liquid first in one direction and then in the other.

I claim as my invention—

1. The combination with a vat for holding dye or other liquid, of pallets upon which the skeins are hung, shafts for rotating the pal-

lets and a submerged stretcher within the vat and passing through the skeins for keeping the lower portions of the skeins open and separated while the rotation of the pallets causes the skeins to progress gradually through the liquid, one side of the skein descending and the other side of the skein ascending, the pallets by their rotation raising and lowering the skeins bodily in the liquid, substantially as set forth.

2. The combination with a vat for holding dye or other liquid, of pallets upon which the skeins are hung, shafts for rotating the pallets and a submerged stretcher within the vat and passing through the skeins for keeping the lower portions of the skeins open and separated while the rotation of the pallets causes the skeins to progress gradually through the liquid, one side of the skein descending and the other side of the skein ascending, the pallets by their rotation raising and lowering the skeins bodily in the liquid, and means for raising and lowering the frame bodily to lift the skeins out of the liquid in the vat or to immerse such skeins, substantially as set forth.

3. The combination with the vat, of shafts and a frame for supporting and gearing for rotating the same, removable heads connected at one end with the shafts and pallets carried by such heads and parallel with but at one side of the axis of rotation of the shafts to raise and lower the skeins and cause them to progress through the liquid and separator-bars through the skeins below the pallets and guide-bars between the skeins, substantially as specified.

4. The combination with the vat, of shafts and a frame for supporting and gearing for rotating the same, removable heads connected at one end with the shafts and pallets carried by such heads and parallel with but at one side of the axis of rotation of the shafts to raise and lower the skeins and cause them to progress through the liquid, separator-bars through the skeins below the pallets and guide-bars between the skeins, stretchers passing through the lower portions of the skeins, a traverse carrying such stretchers and mechanism for raising and lowering the traverse and stretchers within the skeins, substantially as specified.

5. The combination with the vat and the pallets upon which the skeins are hung, of shafts supporting the pallets, means for rotating the shafts, stretchers passing through the lower portions of the skeins, fingers at the ends of the stretchers for preventing the skeins slipping off the stretchers, a traverse with which the stretchers are connected, racks, pinions, a shaft and hand-wheel for raising and lowering the stretchers, substantially as set forth.

Signed by me this 17th day of February, 1894.

CESAR CORRON.

Witnesses:
OLE GUIDEE,
C. DE LA GARDETTE.