

No. 685,594.

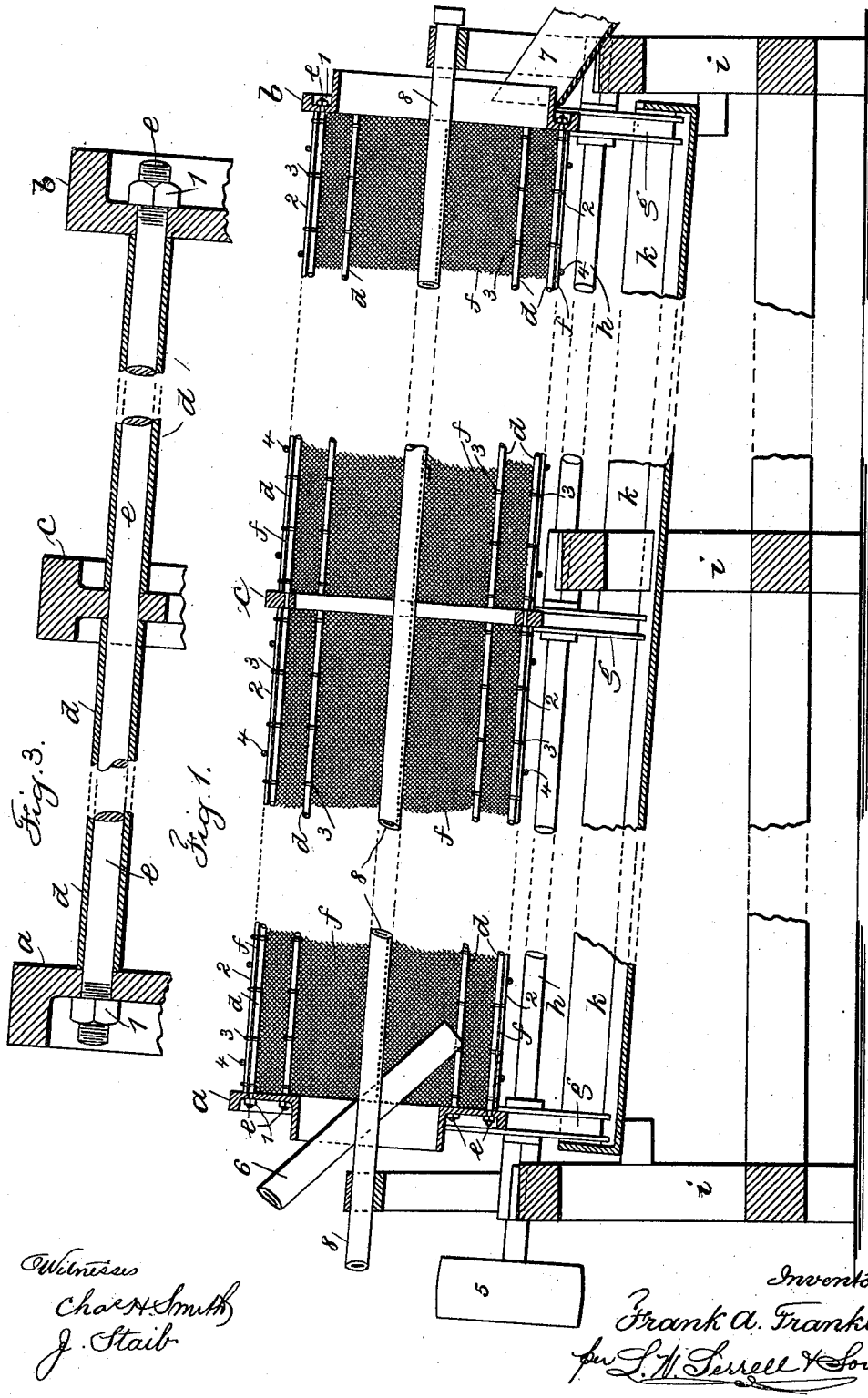
Patented Oct. 29, 1901.

F. A. FRANKLIN.
PULP WASHING MACHINE.

(Application filed Apr. 19, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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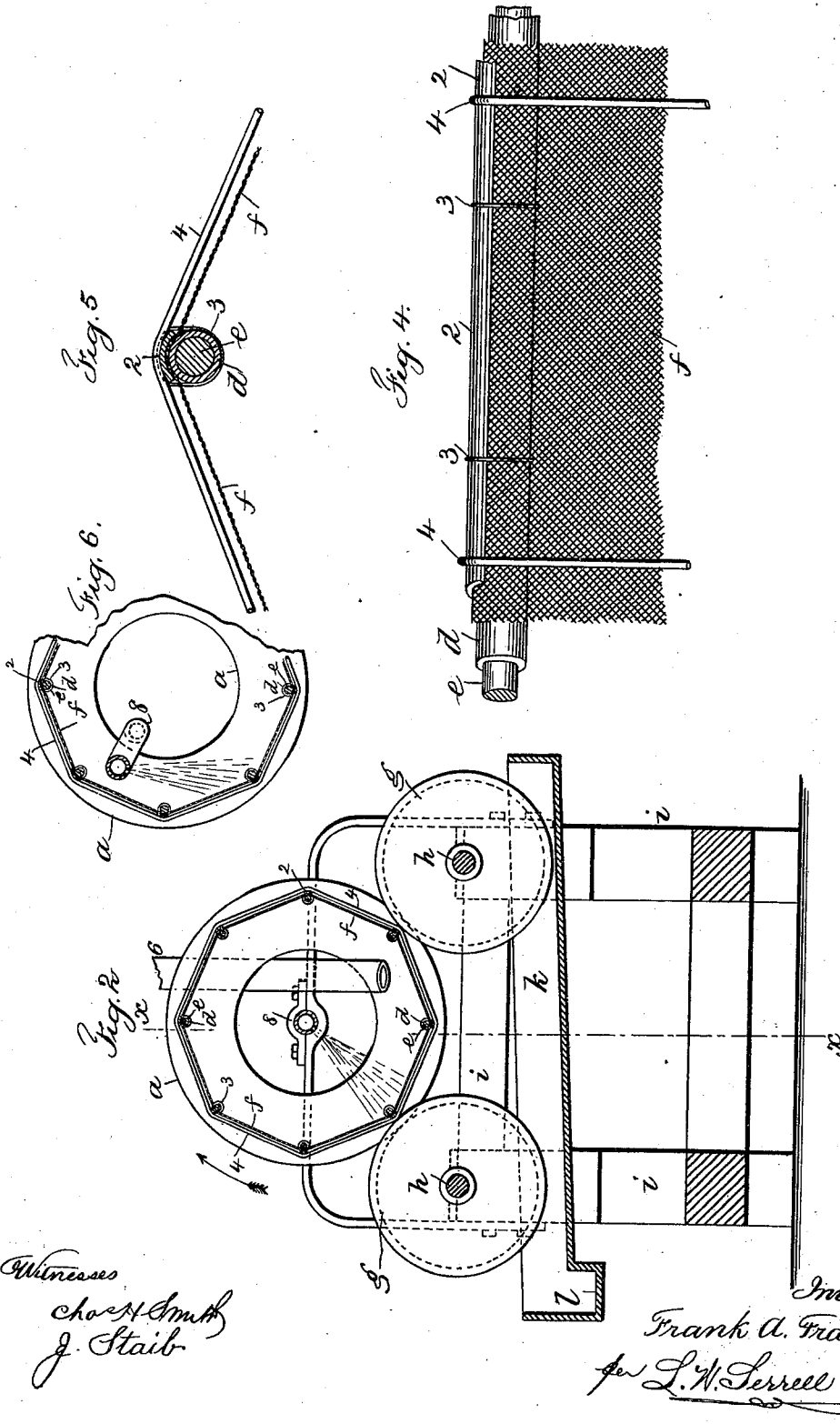
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

FRANK A. FRANKLIN, OF SHELTON, CONNECTICUT.

PULP-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 685,594, dated October 29, 1901.

Application filed April 19, 1901. Serial No. 56,539. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. FRANKLIN, a citizen of the United States, residing at Shelton, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Pulp-Washing Machines, of which the following is a specification.

My invention relates to a revoluble cylindrical device adapted for receiving pulp-stock or finely-ground paper-stock for the purpose of washing therefrom impurities. The material is fed into this revoluble cylindrical device and is repeatedly turned over and over with the rotation of the said device, and water is delivered upon the comminuted pulp or finely-ground paper-stock as the same is turned over and when the said material reaches the delivery end of the said cylindrical device the impurities are presumably completely washed from the said paper-pulp or paper-stock.

In my present invention I provide the revoluble cylindrical device with ring-like heads supported on pairs of wheels on companion shafts, to one of which shafts power is applied for rotating the cylindrical casing. I also prefer to employ one or more intermediate rings, and the said casing is built up of the ring-like heads and the intermediate ring or rings, together with spacing-apart devices, longitudinal tie-rods, a wire-cloth inclosure, tying-wires for connecting the inclosure to the spacing devices, and supporting-wires surrounding the entire cylindrical casing. The casing is set at an inclination, and a stationary water-supply pipe passes longitudinally through the same. The material is delivered into the higher end and finds an exit from the opposite or lower end, and as the cylindrical casing revolves the material is turned over and over and water is delivered thereon to wash therefrom the impurities.

In the drawings, Figure 1 is a vertical longitudinal section broken across at two points, so as to show the respective ends and the central portion. Fig. 2 is a cross-section of the same, the section Fig. 1 being taken on the dotted line *x x* of Fig. 2. Fig. 3 is an enlarged sectional view through the ring-like heads and the intermediate ring to show

the spacing-tubes and tie-rods connecting the parts. Fig. 4 is an enlarged elevation of a portion of a spacing-tube and tie-rod with a part of the wire-cloth inclosure and showing the tying-wires and supporting-wires. Fig. 5 is a cross-section of the parts shown in Fig. 4 and on the same scale, and Fig. 6 is a cross-section showing a portion of the revoluble cylindrical casing with a modified disposition of the water-supply pipe.

With reference to Figs. 1 to 5, inclusive, of the drawings, the revoluble cylindrical device or casing comprises the end ring-like heads *a b*, having flat peripheries and flanged open centers.

c represents an intermediate ring of corresponding diameter to the ring-like heads *a b*. Between the respective heads *a b* and intermediate ring *c* I employ spacing-tubes *d*, circumferentially equidistant and in groups of corresponding length between the head *a* and ring *c* and the head *b* and ring *c*, and tie-rods *e* pass through the spacing-tubes, the heads *a b*, and ring *c*, with nuts 1 on the ends of the tie-rods against the outer faces of the ring-heads *a b*, by means of which tension is applied to the tie-rods to draw the heads toward one another and hold the spacing-tubes firmly against the opposite faces of the ring-like heads and intermediate ring, as shown in the enlarged Fig. 3, whereby the said parts are firmly connected.

Wire-cloth *f* extends around outside of the spacing-tubes *d*, between the respective heads and ring, forming a complete cylindrical inclosure, and I prefer to employ arc-plates 2, extending along the outer surface of the wire-cloth and over the spacing-tubes, and tying-wires 3, passing through the wire-cloth around the tie-rods *e* and over the arc-plates 2 at intervals, so as to hold the wire-cloth inclosure firmly to the spacing-tubes. To prevent the wire-cloth inclosure sagging in the use of the machine, I prefer to make use of circumferential supporting-wires 4, that extend entirely around outside of the wire-cloth and the arc-plates at desired intervals, so as to support the cloth between the tubes *d* and prevent the same sagging under the weight of material within being treated.

Wheels *g g g* in pairs are supported upon companion shafts *h h h* in suitable bearings at the end and central supporting-frames *i i i*, and one of said shafts is driven by the pulley 5 5 to rotate the cylindrical device. These wheels are preferably flanged to receive the ring-like heads *a b* and intermediate ring *c*, and the cylindrical casing and the shafts *h* are placed at an inclination, so as to cause 10 the material to feed by gravity, and I employ an inclined trough *k* beneath the shafts and wheels and the cylindrical casing, so as to catch the washing-water falling from the cylindrical casing as the pulp-stock or finely-ground paper-stock is being washed, and a 15 gutter *l*, running along one side of the inclined trough, serves to collect and deliver the waste-water.

The supply-pipe 6 extends into the higher 20 ring-like head *a* for delivering the pulp-stock or finely-ground paper-stock within the casing, and a discharge-way 7 comes up to and beneath the edge of the ring-like head *b* at the lower end to receive and deliver the pulp-stock or finely-ground paper-stock as it passes 25 out of the cylindrical casing. A water-pipe 8, suitably supported, passes through the casing and is perforated on the under side for its entire length within the casing for delivering water upon the pulp-stock or paper-stock for the purposes of washing therefrom the impurities during the gravity transit of 30 said material through the casing. This pulp-stock with the rotation of the cylindrical casing in the direction of the arrow turns over and over, and the agitation caused thereby comminutes the material into small masses, which remain largely upon one side, and the perforations in the pipe 8 are so placed (see 35 Fig. 2) as to deliver the water directly upon the material. This pipe is suitably supported at its ends, and instead of passing directly through the center of the casing, as shown in Figs. 1 and 2, it may pass in and be bent into 40 the position shown in the modification, Fig. 6, and from the pipe in this position the water will fall directly upon the material instead of at an inclination, as will be the case where the pipe is central.

My improvement comprises a strong, substantial, yet very simple and efficient structure and one capable of fully and completely carrying out the objects intended.

I claim as my invention—

55 1. A revoluble cylindrical device for receiving pulp-stock, finely-ground paper-stock or similar material from which the impurities are to be washed therein, the same comprising ring-like heads and an intermediate ring, 60 spacing-tubes between the said heads and intermediate ring circumferentially equidistant and in groups of corresponding length, tie-rods passing through the spacing-tubes, the heads and the rings, with end nuts thereon to connect the said parts into an integral 65

structure, a wire-cloth inclosure extending around the spacing-tubes between the heads and rings, tying-wires connecting the wire-cloth inclosure to the spacing-tubes, means 70 extending completely around the wire-cloth inclosure at spaced-apart intervals for supporting the same, and an internal water-pipe extending longitudinally of the cylindrical device for delivering the water upon the material to be washed, means for supplying and 75 for removing the material, and a delivery for the waste water, substantially as set forth.

2. A revoluble cylindrical device for receiving pulp-stock, finely-ground paper-stock or similar material from which the impurities 80 are to be washed therein, the same comprising ring-like heads and an intermediate ring, spacing-tubes between the said heads and intermediate ring circumferentially equidistant and in groups of corresponding length, tie-rods 85 passing through the spacing-tubes the heads and the rings, with end nuts thereon to connect the said parts into an integral structure, a wire-cloth inclosure extending around the spacing-tubes between the heads and ring, 90 and tying-wires connecting the wire-cloth inclosure to the spacing-tubes and means extending completely around the wire-cloth inclosure at spaced-apart intervals for supporting the same, substantially as set forth. 95

3. A revoluble cylindrical device for receiving pulp-stock, finely-ground paper-stock or similar material from which the impurities are to be washed therein, the same comprising ring-like heads and an intermediate ring, 100 spacing-tubes between the said heads and intermediate ring circumferentially equidistant and in groups of corresponding length, tie-rods passing through the spacing-tubes the heads and the rings, with end nuts thereon 105 to connect the said parts into an integral structure, a wire-cloth inclosure extending around the spacing-tubes between the heads and ring, arc-plates extending over the spacing-tubes outside and upon the wire-cloth inclosure, tying-wires passing through the wire-cloth around the spacing-tubes and the arc-plates for tying the parts together and circumferential wires 4 at intervals and completely 110 surrounding the wire-cloth inclosure, substantially as set forth. 115

4. A revoluble cylindrical device for receiving pulp-stock, finely-ground paper-stock or similar material from which the impurities are to be washed therein, the same comprising ring-like heads and an intermediate ring, 120 spacing-tubes between the said heads and intermediate ring circumferentially equidistant and in groups of corresponding length, tie-rods passing through the spacing-tubes the heads and the rings, with end nuts thereon 125 to connect the said parts into an integral structure, a wire-cloth inclosure extending around the spacing-tubes between the heads and ring, and means for connecting the wire- 130

cloth inclosure to the spacing-tubes, and a stationary water-supply pipe passing longitudinally through the said revoluble device, companion shafts in bearings upon suitable frames and wheels thereon receiving the ring-heads and intermediate ring of the revoluble device and supporting the same, an inclined trough beneath the revoluble device and its supporting wheels and shafts and a gutter to the trough, substantially as and for the purposes set forth. 18

Signed by me this 11th day of April, 1901.

FRANK A. FRANKLIN.

Witnesses:

GEO. T. PINCKNEY,
S. T. HAVILAND.