

No. 671,188.

Patented Apr. 2, 1901.

F. A. FRANKLIN.  
PULP WASHING MACHINE.

(Application filed Sept. 1, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 3.

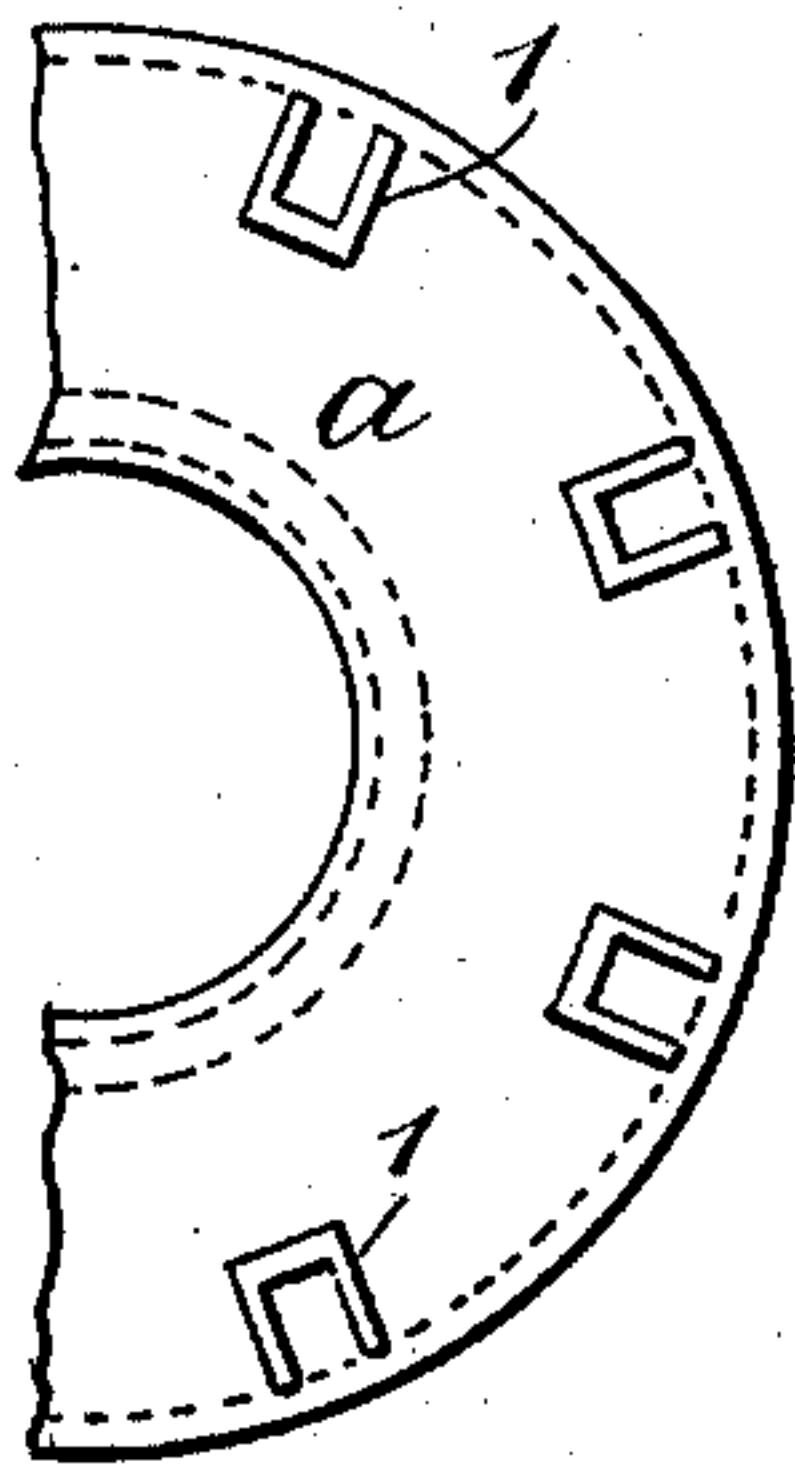


Fig. 2.

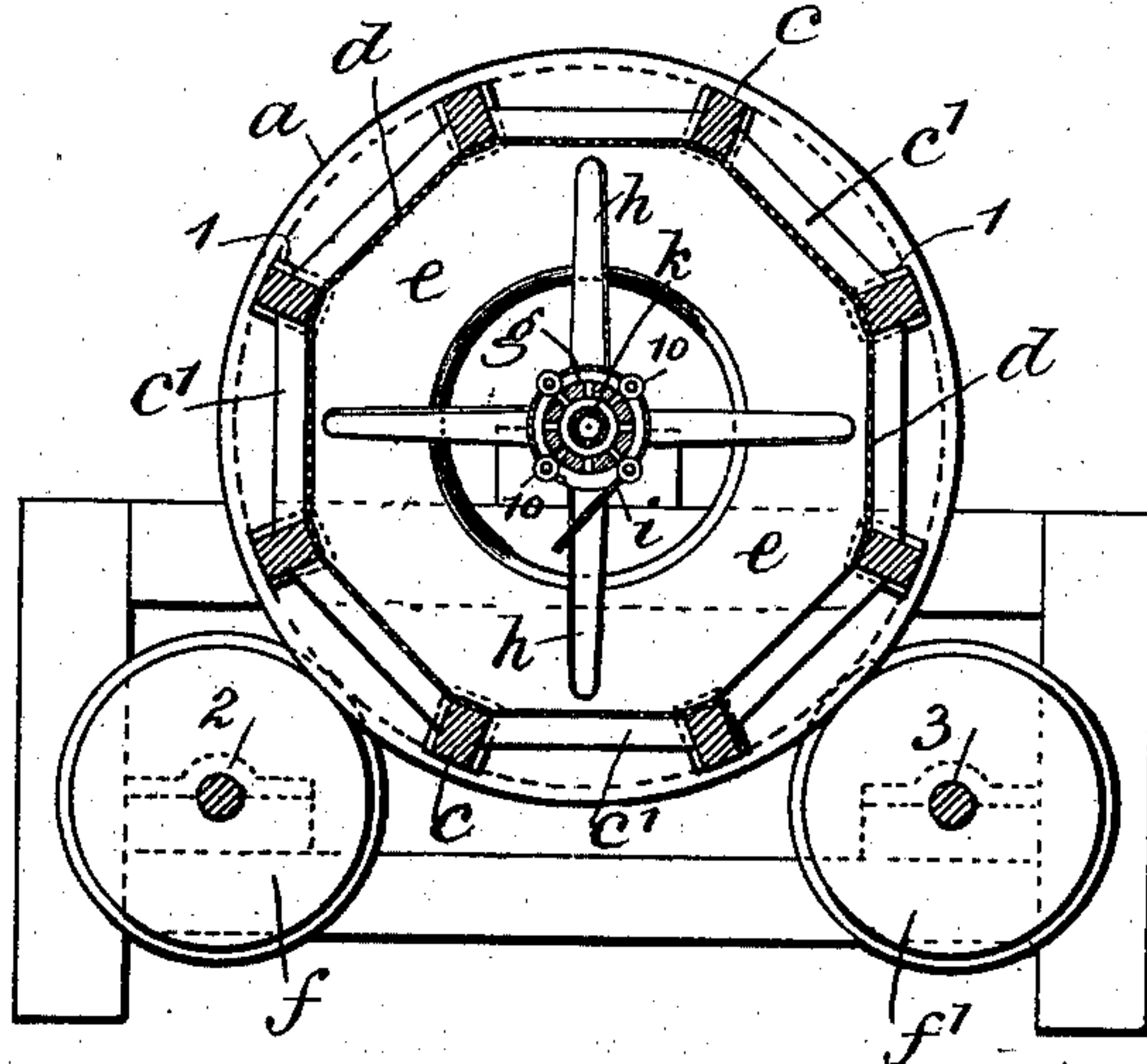


Fig. 4.

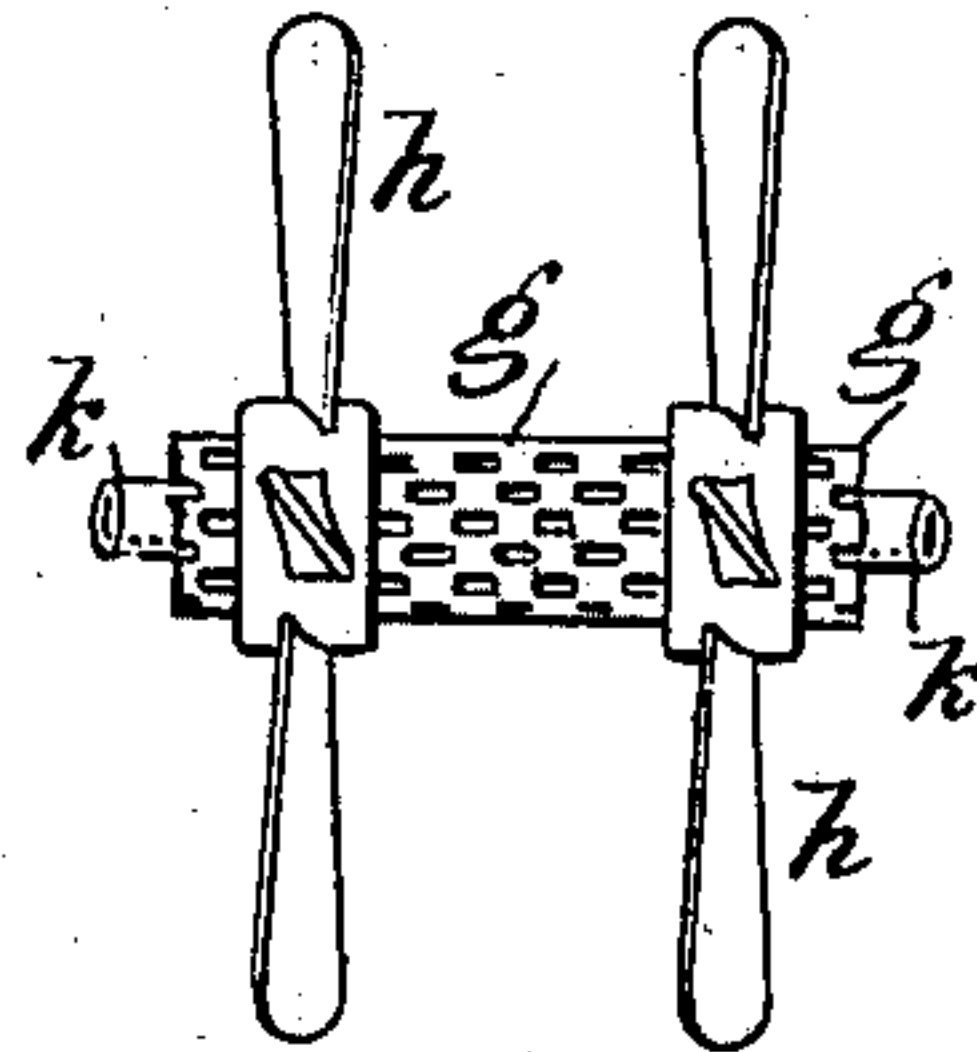
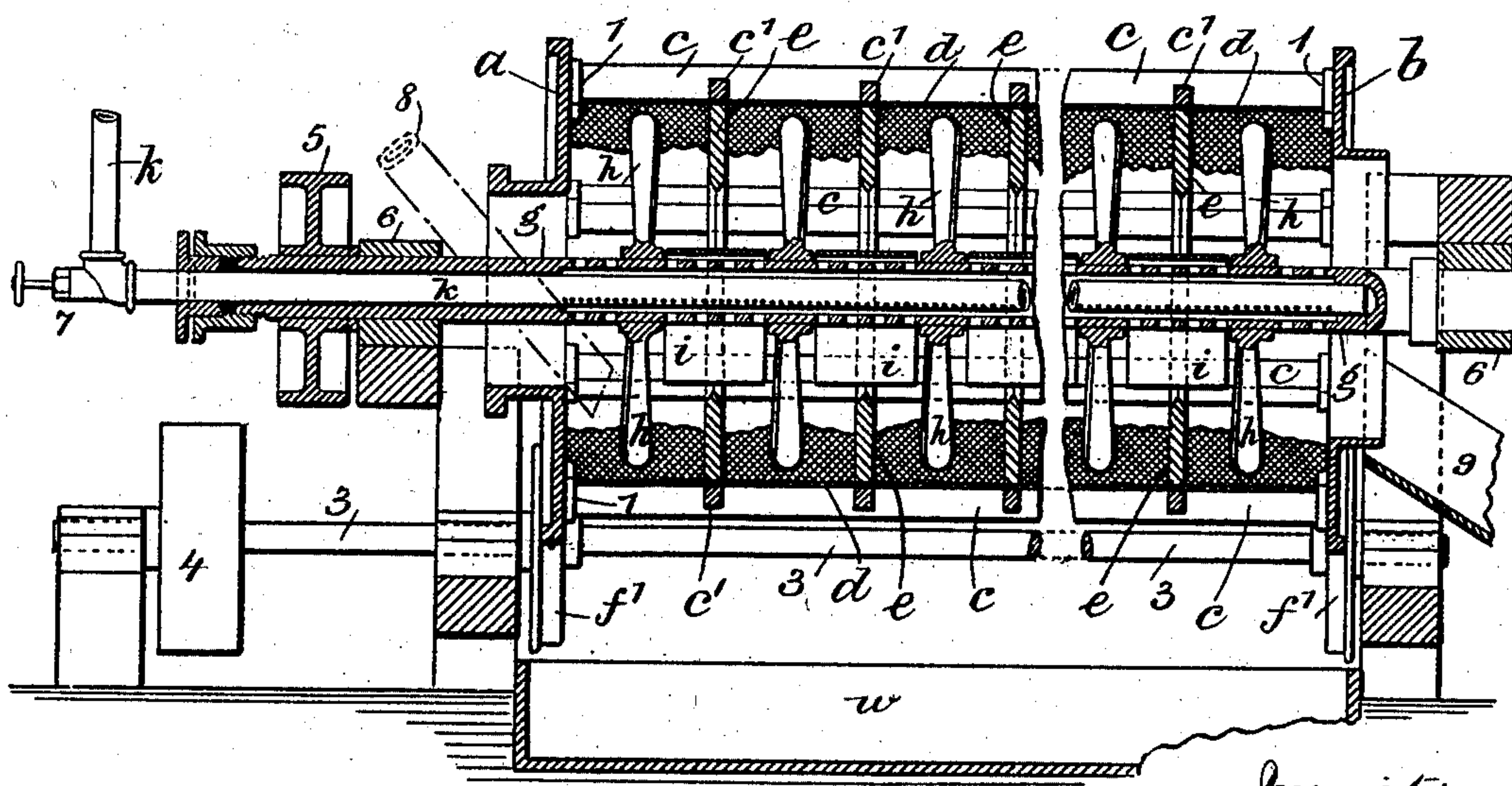


Fig. 1.



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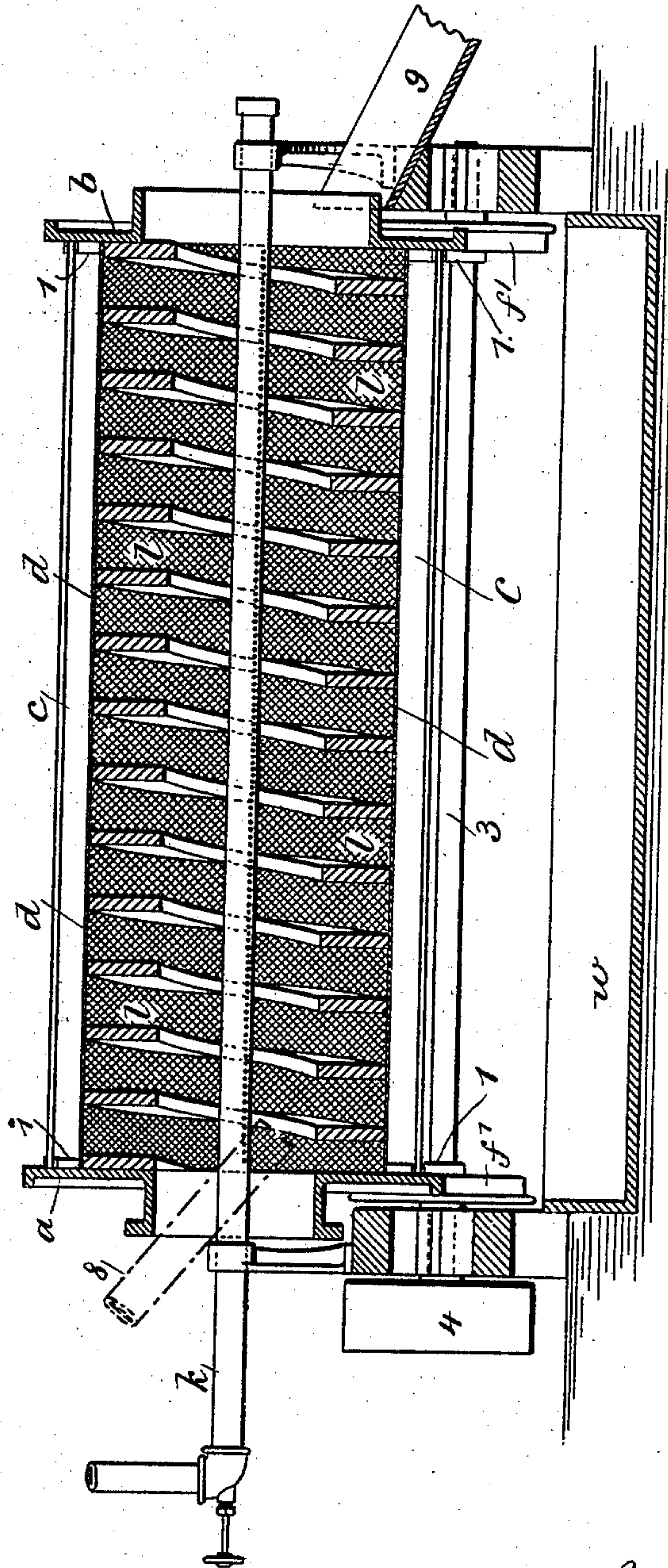
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*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

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ORRIN F. SMITH, OF JERSEY CITY, NEW JERSEY, AND GUYON MILLER,  
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## PULP-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 671,188, dated April 2, 1901.

Application filed September 1, 1900. Serial No. 28,747. (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 New Haven and State of Connecticut, have invented an Improvement in Pulp-Washing Machines, of which the following is a specification.

My invention relates to a revoluble cylindrical device for receiving paper-pulp or finely-ground paper-stock and into which the said material is fed, and in which device the said material is progressively fed along and turned over and over and washed as turned and moved along, and is finally delivered from the opposite end, the impurities meanwhile having been washed therefrom.

In carrying out my invention I provide a cylindrical device having open end heads, longitudinal bars connecting the heads, and a wire-cloth inclosure and means within the cylindrical device for receiving, agitating, turning over, and progressively moving along said material from one end of the cylindrical device to the other, and for spraying the material with water to wash therefrom the impurities, said cylindrical device being supported by wheels in pairs upon companion shafts and revolved continuously thereby, all of which devices are hereinafter more particularly set forth.

In the drawings, Figure 1 is a vertical longitudinal section broken across, the same representing the preferred form of my invention. Fig. 2 is a cross-section of the parts shown in Fig. 1. Fig. 3 is a partial elevation of one cylinder-head. Fig. 4 is an elevation of a portion of the perforated shaft and the paddles or stirrers thereon and the internal water-inlet pipe, and Fig. 5 is a vertical longitudinal section representing a modified form of my invention.

With reference to Figs. 1 to 4, inclusive, of the drawings the revoluble cylindrical device or casing comprises end heads *a b*, with open centers and flanged peripheries, the said heads being constructed upon their opposite faces with surface sockets 1, into which the longitudinal bars *c* are placed and secured in any desired manner. Between the longitudinal bars *c* there are intermediate transverse

bars *c'* spaced apart, and the wire-cloth inclosure *d* is secured to the under or inner surfaces of the bars *c* and *c'*. Within the wire-cloth inclosure of the cylinder and preferably in the same vertical plane with the bars *c'* I place ring-partitions *e*, the inner edges of which are preferably tapered in opposite directions. These ring-partitions divide the cylinder up into receptacles. Wheels *f f'* in pairs are mounted upon companion shafts 2 3 in suitable bearings on the end frames, (shown in Figs. 1 and 2,) one of the said shafts being driven by a pulley 4. The cylindrical device or casing rests upon the pairs of wheels *f f'*, and one of the said pairs being revolved with its shaft effects the rotation of the cylindrical device. I am aware that this method of supporting a revoluble cylindrical device has been employed before and that the same is not new with me. Within and extending through the revoluble cylindrical device or casing is a perforated shaft *g* in suitable bearings 6 at its respective ends and rotated by a pulley 5. A water-inlet pipe *k* passes through the perforated shaft *g*, the said pipe being stationary and provided with a packing-gland at one end to prevent water escaping except at the place provided therefor, said inlet-pipe *k* also having a valve 7 for regulating the supply of water. Upon the perforated shaft *g* within the cylindrical casing are paddles or stirrers *h*, connected to hubs secured upon the said perforated shaft *g*. These paddles or stirrers are preferably located midway between the ring-partitions *e*, and the free ends of the said paddles extend almost to the wire-cloth inclosure *d*. The paper-pulp or finely-ground paper-stock or similar material from which the impurities are to be washed is fed down a chute 8 (shown by dotted lines, Fig. 1) into the revoluble cylindrical casing, falling into the first receptacle, and the paddles or stirrers *h* are set at an inclination, so as not only to stir up the material, but to raise the same progressively from the first over into the second receptacle, and so on through the various receptacles of the cylindrical device to the last receptacle, from which the said material is delivered and discharged by a chute 9.



The water-inlet pipe *k* is provided with one or more lines of perforations, from which the water is discharged into the perforated shaft *g*, and from the perforated shaft the water is discharged into the revoluble cylindrical casing down upon the material therein to be washed, and I prefer to deliver the water onto the material at and slightly above the lower portion of the revoluble cylindrical casing as the same rises with the rotary movement of said device, and to facilitate this operation I may employ shields *i*, of sheet metal, around the perforated shaft *g* and between the hubs of the paddles and having a lower edge or lip extending in one direction, (see Fig. 2,) and in order that these shields may keep their position and properly deflect the water as delivered I prefer to mount the same on rollers 10, which bear upon the perforated shaft and reduce the friction of the supported shield to a minimum. The inner edges of the ring-partitions *e* are made tapering in both directions, so as to deliver the material within the cylindrical casing into the respective receptacles and prevent any of the same lodging upon the said partitions, and I prefer to employ some form of trough or spillway *w* beneath the revoluble cylindrical casing for conveying away the soiled water passing through the material and the wire-cloth inclosure. With this device paper-pulp, finely-ground paper-stock, or similar materials are thoroughly and effectively washed of all impurities.

In the modified form of structure shown in Fig. 5 the cylindrical casing is provided with heads *a b*, with open centers and flanged peripheries, surface sockets 1, longitudinal bars *c*, and a wire-cloth inclosure *d*, similar to the revoluble cylindrical casing hereinbefore described and shown in Figs. 1 and 2, and a water-inlet pipe *k*, with one or more lines of perforations, extends through this revoluble cylindrical casing, and the same is supported and rotated by wheels *ff'* in pairs upon companion shafts 2 3, a pulley 4 being employed for turning one of the said shafts and wheels thereon, and I have shown in connection with this device a similar trough or spillway *w* for carrying away the soiled water. In this modified form I have shown a helical partition *l* extending throughout the revoluble cylindrical casing from one end to the other, forming a helical receptacle. In this device the material as delivered into one end of the said receptacle is moved progressively over the surface of the wire-cloth inclosure slowly and gradually from one end of the cylindrical casing to the other and is turned or rolled over as fed along, and water from the water-inlet pipe is delivered thereon for washing the impurities therefrom.

I prefer to employ the structure shown in Figs. 1 to 4, inclusive, although the operations may be carried out in the modified device of Fig. 5, but probably not so thoroughly nor so successfully.

I claim as my invention—

1. A revoluble cylindrical device for receiving paper-pulp, finely-ground paper-stock, or similar material from which the impurities are washed therein, the same comprising heads with open centers and flanged peripheries, longitudinal bars connecting the said heads, a wire-cloth inclosure secured to and within the boundary of said bars, devices within the inclosure forming receptacles for the material to be washed, means for supporting and revolving the said cylindrical casing and an internal water-inlet pipe for delivering water upon the material to be washed, substantially as set forth.

2. A revoluble cylindrical device for receiving paper-pulp, finely-ground paper-stock, or similar material from which the impurities are washed therein, the same comprising heads with open centers and flanged peripheries, longitudinal bars connecting the said heads, a wire-cloth inclosure extending between said heads and secured to the inner surfaces of said longitudinal bars, partitions within the said inclosure spaced apart and dividing the same into receptacles, a chute for delivering the material into the said cylindrical casing and a second chute for delivering the materials therefrom, and means for supporting the said cylindrical casing and for revolving the same, substantially as set forth.

3. A revoluble cylindrical device for receiving paper-pulp, finely-ground paper-stock, or similar material and from which the impurities are washed therein, the same comprising heads with open centers and flanged peripheries, longitudinal bars connecting the said heads, intermediate transverse bars between the longitudinal bars and spaced apart, a wire-cloth inclosure extending between the heads and secured to the inner surfaces of the longitudinal and transverse bars, ring-partitions within the wire-cloth inclosure in the same vertical plane with the transverse bars and forming receptacles within the casing, means for supporting and revolving the said cylindrical casing, means for feeding the material to be washed into the casing and means for discharging the same therefrom, means for supplying water within the casing to wash the impurities from the material and revoluble stirring devices within the receptacles for agitating the material and for moving the same from one receptacle to another lengthwise through the cylindrical casing, substantially as set forth.

4. A revoluble cylindrical device for receiving paper-pulp, finely-ground paper-stock, or similar material and from which the impurities are washed therein, the same comprising heads with open centers and flanged peripheries, longitudinal bars connecting the said heads, intermediate transverse bars between the longitudinal bars and spaced apart, a wire-cloth inclosure extending between the heads and secured to the inner surfaces of the longitudinal and transverse bars, ring-partitions



within the wire-cloth inclosure in the same vertical plane with the transverse bars and forming receptacles within the casing, means for supporting and revolving the said cylindrical casing, devices for feeding the material to be washed into and from the casing, a longitudinal axial water-inlet pipe passing through the casing, a perforated shaft around the said water-pipe, paddles or stirrers mounted on the said perforated pipe within the receptacles and adapted to stir up the material to be washed and to progressively feed the same through the casing from one receptacle to the other, substantially as set forth.

5. A revoluble cylindrical device for receiving paper-pulp, finely-ground paper-stock, or similar material and from which the impurities are washed therein, the same comprising heads with open centers and flanged peripheries, longitudinal bars connecting the said heads, intermediate transverse bars between the longitudinal bars and spaced apart, a wire-cloth inclosure extending between the heads and secured to the inner surfaces of the longitudinal and transverse bars, ring-partitions within the wire-cloth inclosure in the same vertical plane with the transverse bars and forming receptacles within the casing, means for supporting and revolving the said cylindrical casing, devices for feeding the material to be washed into and from the casing, a longitudinal axial water-inlet pipe passing through the casing, a perforated shaft around the said water-pipe, paddles or stirrers mounted on the said perforated pipe within the receptacles and adapted to stir up the material to be washed and to progressively feed the same through the casing from one receptacle to the other, and shields surrounding the perforated shaft and adapted to direct the water

flowing from the pipe and shaft to a predetermined point in the cylindrical casing, substantially as set forth.

6. In a device for washing pulp or similar material, the combination with a revoluble cylindrical device for receiving said material and in which the same is washed to remove the impurities therefrom, of an axial longitudinally-placed water-inlet pipe perforated for supplying washing-water, a revoluble perforated shaft surrounding the water-inlet pipe, paddles or stirrers mounted on said perforated shaft and spaced apart and adapted to stir up the material to be washed and to feed the same progressively along through the cylindrical casing and deliver the same therefrom, substantially as set forth.

7. In a device for washing paper-pulp or similar material, the combination with means for supplying washing-water and for agitating the material during the washing operation, of a revoluble cylindrical casing comprising a wire-cloth inclosure and suitable supports therefor and partitions within the same, and heads at the respective ends of said casing with open centers through which the material to be washed is received and delivered, said heads having surface sockets for the devices supporting the wire-cloth inclosure, and flanged peripheries and means for supporting the cylindrical casing at the flanged peripheries and revolving the same, substantially as set forth.

Signed by me this 27th day of August, 1900.

F. A. FRANKLIN.

Witnesses:

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S. T. HAVILAND.