

(No Model.)

3 Sheets—Sheet 1.

M. J. ROACH.  
PULP WASHING MACHINE.

No. 556,867.

Patented Mar. 24, 1896.

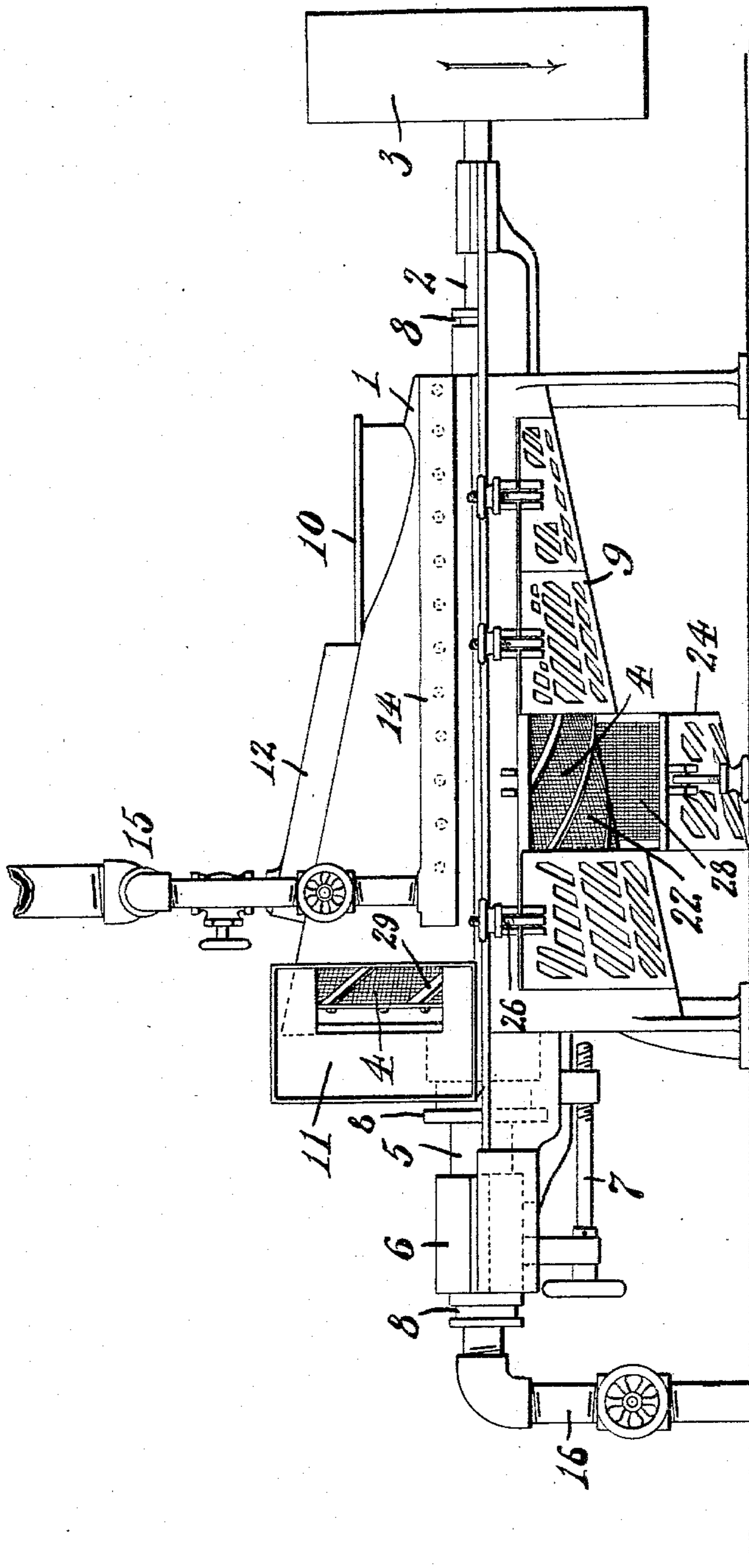


Fig. 1.

Witnesses:  
*E. R. Shipley.*  
*C. M. Shuman.*

Michael J. Roach  
by James M. See  
Inventor  
Attorney

(No Model.)

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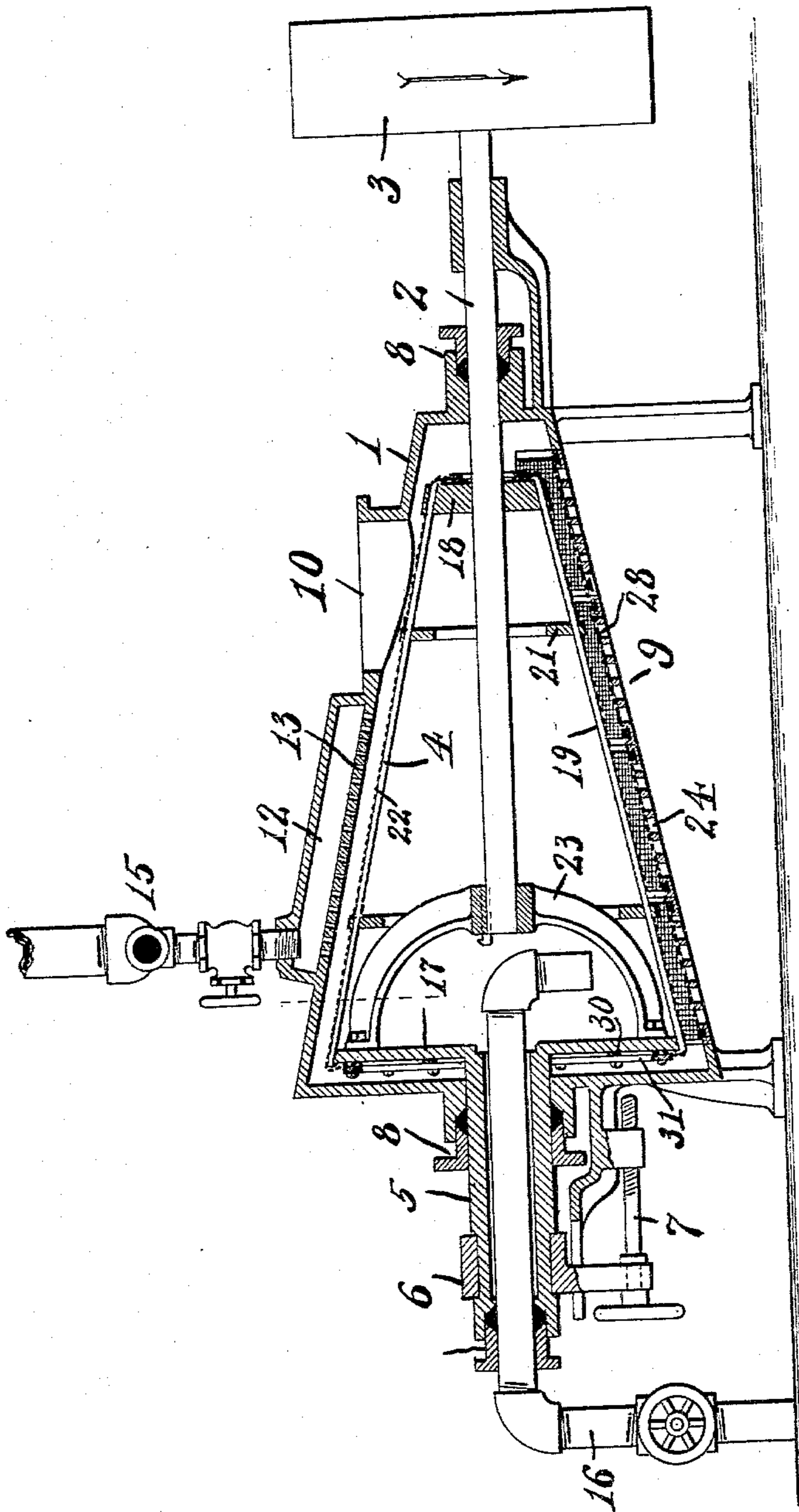


Fig. 2.

Witnesses:  
*E. R. Shipley*  
*C. M. Shuman*

*Michael J. Roach* Inventor  
by *James M. See* Attorney

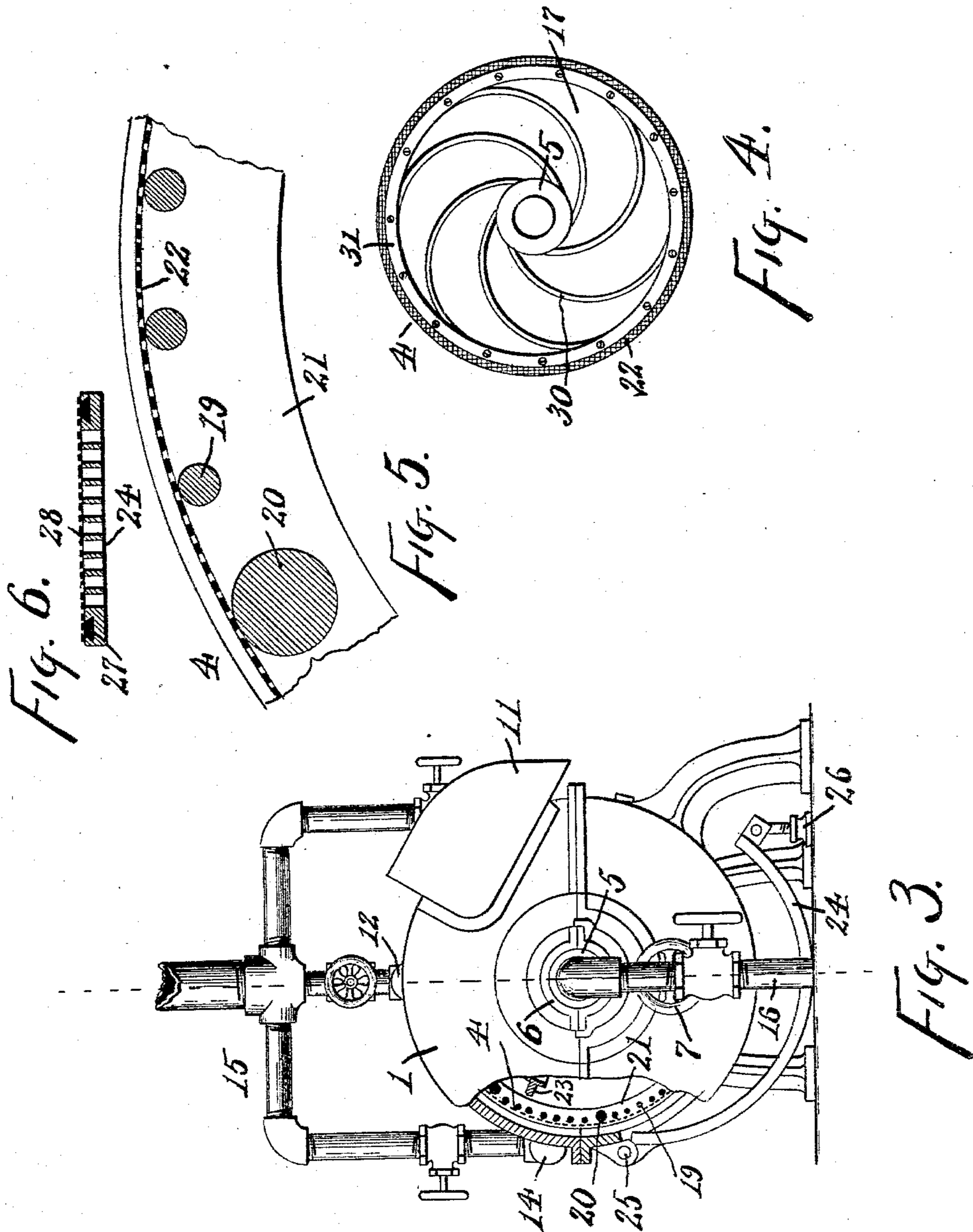
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Witnesses:  
*E. R. Shipley*  
*C. M. Shuman*

*Michael J. Roach* Inventor  
by *James W. See* Attorney

# UNITED STATES PATENT OFFICE.

MICHAEL J. ROACH, OF ANDERSON, INDIANA.

## PULP-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 556,867, dated March 24, 1896.

Application filed April 6, 1895. Serial No. 544,699. (No model.)

*To all whom it may concern:*

Be it known that I, MICHAEL J. ROACH, of Anderson, Madison county, Indiana, have invented certain new and useful Improvements in Pulp-Washing Machines, of which the following is a specification.

This invention pertains to improvements in machines for washing paper-makers' pulp, particularly the pulp made from straw.

My improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a pulp-washing machine exemplifying my invention, one of the bottom sections of the casing being shown in open position; Fig. 2, a vertical longitudinal section of the machine; Fig. 3, an end elevation of the machine, as at the left-hand end of Fig. 1, portions appearing in vertical transverse section; Fig. 4, an end elevation of the revolver as viewed at the left-hand end of Fig. 2; Fig. 5, a vertical transverse section, on an enlarged scale, of a portion of the periphery of the revolver; and Fig. 6, a vertical section, longitudinal as to the general machine, transversely through one of the bottom sections of the casing.

In the drawings, 1 indicates a conical casing with its axis horizontal and formed in upper and lower halves secured together by joint-bolts; 2, a shaft axially journaled therein and projecting out at the right; 3, a driving-pulley on the outer end of the shaft; 4, a conical revolver fast on the shaft and somewhat smaller than the interior of the casing; its periphery being foraminous; 5, a journal at the large end of the revolver projecting out from the large end of the casing; 6, a bearing engaging the journal 5 between shoulders and arranged to slide in an axial line in guides supported by the main casing of the machine; 7, an adjusting-screw by means of which this bearing can be moved endwise in order to adjust the lengthwise position of the revolver within the casing and thus control the transverse dimension of the pulp-space between the outer surface of the revolver and the inner surface of the casing; 8, stuffing-boxes to prevent undesired escape of water; 9, the lower wall of the casing made foraminous and in sections; 10, pulp-inlet

opening at the top of the casing near its small end; 11, pulp-outlet opening at the large end of the casing at one side near the top, this opening having a spout form for the discharge of the washed pulp; 12, a top tube formed longitudinally along the upper side of the casing; 13, a row of holes placing this top tube in communication with the interior of the casing; 14, similarly arranged and provided tubes along the sides of the casing; 15, injection-pipe, for washing-water, leading to the top and side tubes 12 and 14, respectively, each branch of the pipe having a controlling-valve, and 16 a section-pipe leading from a low point within the revolver out axially through the journal 5 and then to any source of partial vacuum—as, for instance, a suction-pump or a dip-pipe of sufficient downward length to secure suction by gravity.

The periphery of the revolver and the floor of the casing are made foraminous preferably by the use of wire-cloth, as hereinafter explained. The revolver being in rotation in the direction of the arrow, the pulp to be washed is freely admitted at the opening 10, from whence it flows to and fills the annular space between the revolver and casing, centrifugal force urging the pulp toward the larger end of the casing, where it discharges at the spout 11. Washing-water in regulated quantities is continuously admitted from pipe 15 under pressure and becomes injected into the pulp in the machine. The pulp thus thoroughly drenched with water is subjected to the action of the foraminous revolver and to the interior of the casing, including the foraminous floor of the casing, most of the excessive water following out through the floor of the casing and carrying with it impurities washed from the pulp. A portion of the water finds its way inwardly through the foraminous wall of the revolver and is withdrawn from the revolver by the suction-pipe 16, which will prevent more than a given quantity of water from remaining at any time within the interior of the revolver.

The capacity of the machine, both as to quantity of pulp which it will wash and the perfection with which the pulp will be washed, is dependent somewhat upon the thickness of the space occupied by the pulp between the surface of the casing, and the dimension of

this space may be adjusted by shifting the revolver endwise in the casing by means of the adjusting-screw 7. The stuffing-boxes 8 are designed to prevent the spouting of water from the joints. The dirty washing-water flows, however, in large quantities from the floor of the casing, and should of course be provided for by suitable catching and draining devices. The machine thus being of a somewhat wet and sloppy character the stuffing-boxes 8 may, if desired, be dispensed with, and the joints guarded by them be permitted to leak water without special detriment to the working of the machine.

Unclean pulp fed to the machine at opening 10 discharges continually at spout 11 well washed, and the capacity of the machine is far in excess of that of any other pulp-washing machine of which I have knowledge.

Certain features of construction will now be more fully explained.

Referring again to the drawings, 17 indicates the larger head of the revolver, being a disk formed with or rigidly secured to the journal 5; 18, the smaller head for the revolver, being a disk fast on shaft 2; 19, wires or rods riveted into the two heads of the revolver and forming the skeleton wall of the revolver; 20, Fig. 5, large rods extending between the heads of the revolver and taking the place of a few equally-distributed ones of the rods 19, these larger rods giving greater strength to the revolver structure; 21, rings distributed along the length of the revolver and perforated for the rods and giving intermediate support for the rods; 22, a jacket of wire-cloth lying exterior to the rods and completely covering the periphery of the revolver; 23, a spider with its hub fast to the inner end of shaft 2, its arms being rigidly secured near the periphery of head 17, this spider thus forming a rigid connection between the shaft and the large end of the revolver and furnishing a space for the dependent receiving end of suction-pipe 16; 24, sections of the floor of the casing, the same being grated or perforated, these sections being segments of the lower portion of the casing and extending from near the front to near the rear of the lower half of the casing; 25, hinges uniting the rear ends of these sections to the lower half of the casing; 26, tie-bolts locking the forward ends of the floor-sections to the lower half of the casing, the construction thus permitting the ready opening of one or more of the floor-sections; 27, Fig. 6, strips of wood held in dovetails in the inner surface of the margins of the floor-sections 24; 28, wire-cloth forming inner linings for the floor-sections 24, this cloth being secured to the floor-sections by being tacked to the strips 27, the grated or perforated character of the floor-sections giving good support underneath the wire-cloth and at the same time permitting the free escape of water; 29, ribs arranged spirally upon the outer surface of the revolver, the direction of spirality being such that as the revolver turns the tendency of the ribs

will be to feed the stock toward the larger end of the machine, these ribs being intended to supplement the feeding action due to the centrifugal force of the stock; 30, spiral ribs upon the outer surface of the larger head of the revolver, arranged in such direction that as the revolver turns the ribs will tend to urge or keep the stock outwardly and thus prevent the space between the larger end of the revolver and the casing from becoming filled and choked with stock, and 31 a ring secured by screws against the outer face of the larger end of the revolver, this ring serving to clamp the wire-cloth jacket of the revolver, which cloth is turned inwardly over the revolver-head and clamped against by the ring.

I claim as my invention—

1. In a pulp-washing machine, the combination, substantially as set forth, of a lower case portion open at its bottom, a closed top case portion secured thereto, a ribbed revolver mounted with the case, a foraminous floor secured in the open bottom of said lower case portion and removable downwardly therefrom, said casing being provided with inlets and outlets for stock and water.

2. In a pulp-washing machine, the combination, substantially as set forth, of a casing having an inlet and an outlet and a foraminous wall portion, a circular revolver mounted to turn in said casing and having a foraminous periphery, and water-injecting devices arranged to distribute water in the annular space between said casing and revolver.

3. In a pulp-washing machine, the combination, substantially as set forth, of a conical lower case portion open at its bottom, a closed top case portion secured thereto, a ribbed conical revolver mounted within the case, a foraminous floor secured in the open bottom of said conical lower case portion and removable downwardly therefrom, said casing being provided with inlets and outlets for stock and water.

4. In a pulp-washing machine, the combination, substantially as set forth, of a conical casing having an inlet and an outlet and a foraminous wall portion, a circular conical revolver mounted to turn in said casing and having a foraminous periphery, and water-injecting devices arranged to distribute water in the annular space between said casing and revolver.

5. In a pulp-washing machine, the combination, substantially as set forth, of a circular casing open below and closed above, a revolver mounted in said casing, and a longitudinal series of abutting floor-sections secured at said opening in the bottom of the casing and removable downwardly therefrom, said casing having inlets and outlets for stock and water.

6. In a machine for washing pulp, the combination, substantially as set forth, of a conical casing having at the smaller end an inlet-opening for stock and at the larger end an outlet-opening for stock and having a longi-

5 tudinal row of jet-holes through its wall, a  
ribbed conical revolver mounted in said cas-  
ing, a water connection for said jet-holes in  
common, and a water-outlet having a forami-  
nous guard.

10 7. In a machine for washing pulp, the com-  
bination, substantially as set forth, of a coni-  
cal casing closed above and open at its bottom,  
a ribbed revolver mounted in said casing,  
downwardly-removable grated floor-sections  
secured at said bottom opening and having  
dovetail grooves in the margins of their up-  
per surfaces, dovetail strips held in said  
grooves, and thin foraminous metal secured  
15 to said dovetail strips and resting on said  
grated floor-sections.

20 8. In a pulp-washing machine, the combi-  
nation, substantially as set forth, of a casing  
having an inlet and an outlet and a forami-  
nous wall portion and rows of jet-holes along  
its sides and top, a circular revolver mounted  
to turn in said casing, and an injection-pipe  
connected with said jet-holes.

25 9. In a pulp-washing machine, the combi-  
nation, substantially as set forth, of a casing  
having an inlet and an outlet, hinged forami-  
nous sections forming the floor thereof, a cir-  
cular revolver mounted to turn in said casing,  
and water-injecting devices arranged to dis-  
30 tribute water in the annular space between  
said casing and revolver.

10. In a pulp-washing machine, the combi-

nation, substantially as set forth, of a casing  
having an inlet and an outlet and a forami-  
nous wall portion, a circular revolver mounted 35  
to turn in said casing and having a forami-  
nous periphery, water-injecting devices ar-  
ranged to distribute water in the annular  
space between said casing and revolver, and  
a suction-pipe leading from the interior of the 40  
revolver.

11. In a pulp-washing machine, the combi-  
nation, substantially as set forth, of a casing  
having an inlet and an outlet and a forami-  
nous wall portion, a circular revolver mounted 45  
to turn in said casing, water-injecting devices  
arranged to distribute water in the annular  
space between said casing and revolver, and  
spiral ribs upon one end face of said revolver.

12. In a pulp-washing machine, the combi- 50  
nation, substantially as set forth, of a casing  
having an outlet, a circular revolver therein,  
a journal projecting outwardly from one end  
of the revolver, an inwardly-reaching spider  
secured to the inner surface of the head at 55  
such journaled end of the revolver, and a  
shaft journaled in said casing and secured in  
such spider and in the opposite head of the  
revolver.

MICHAEL J. ROACH.

Witnesses:

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EDWARD D. REARDON.