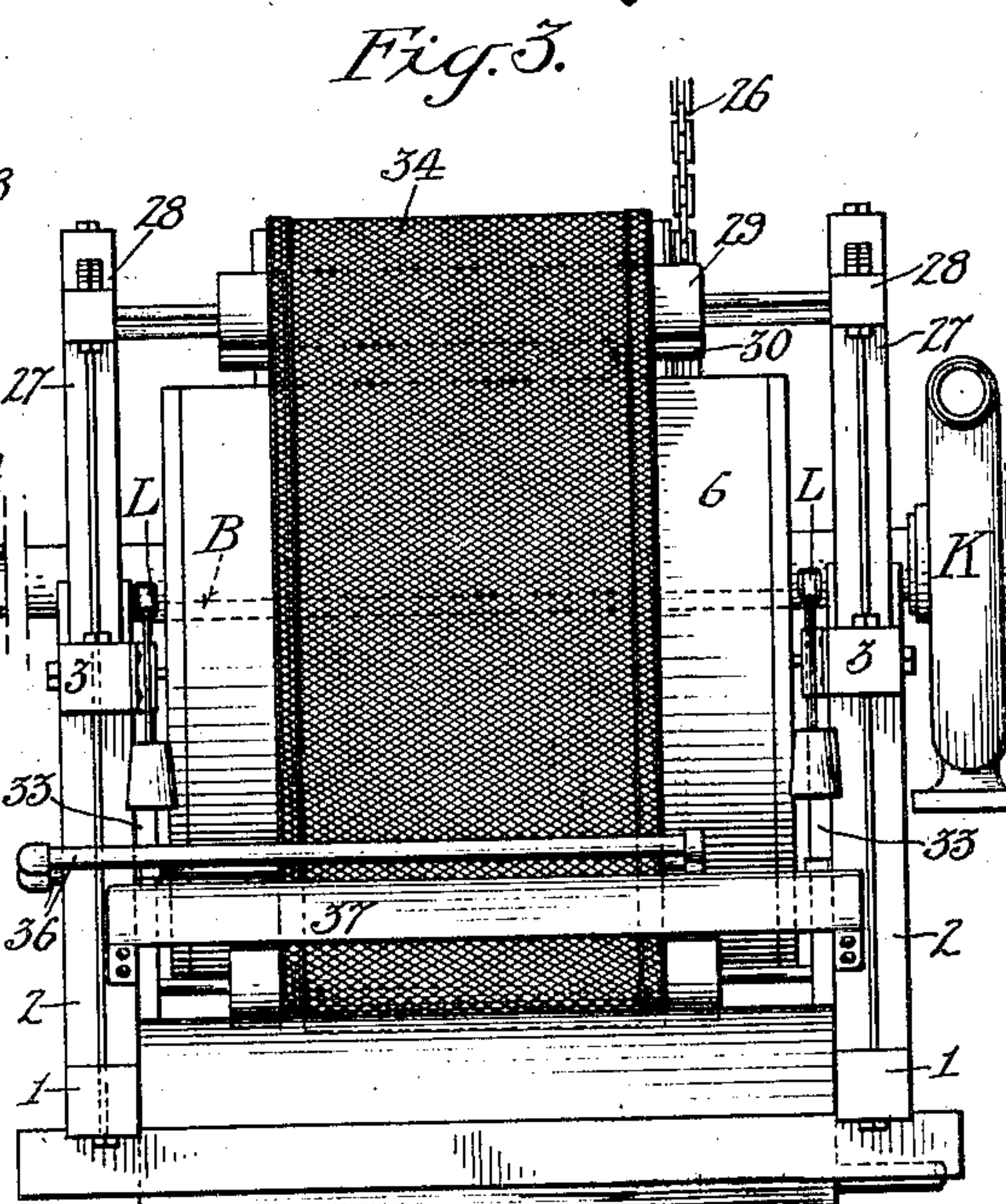
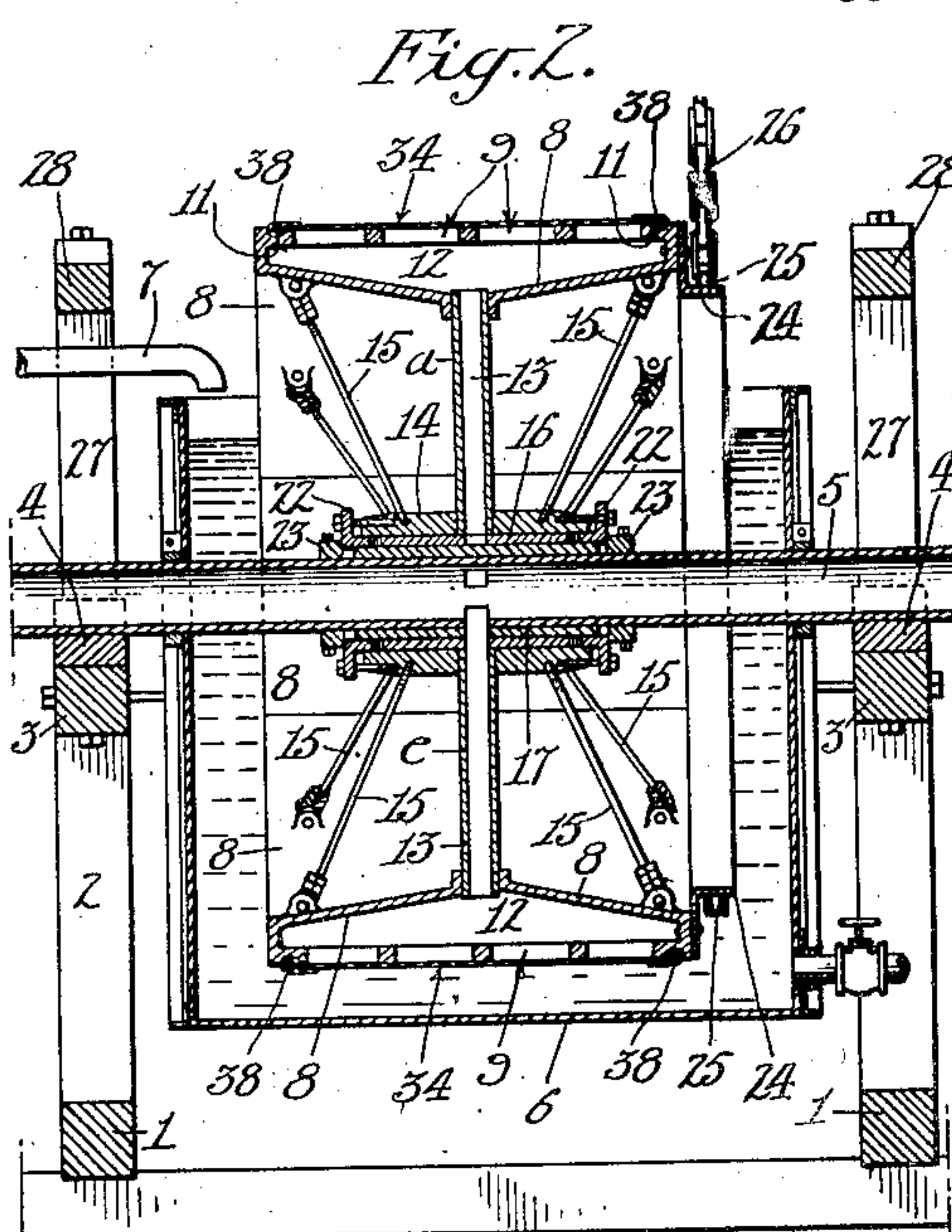
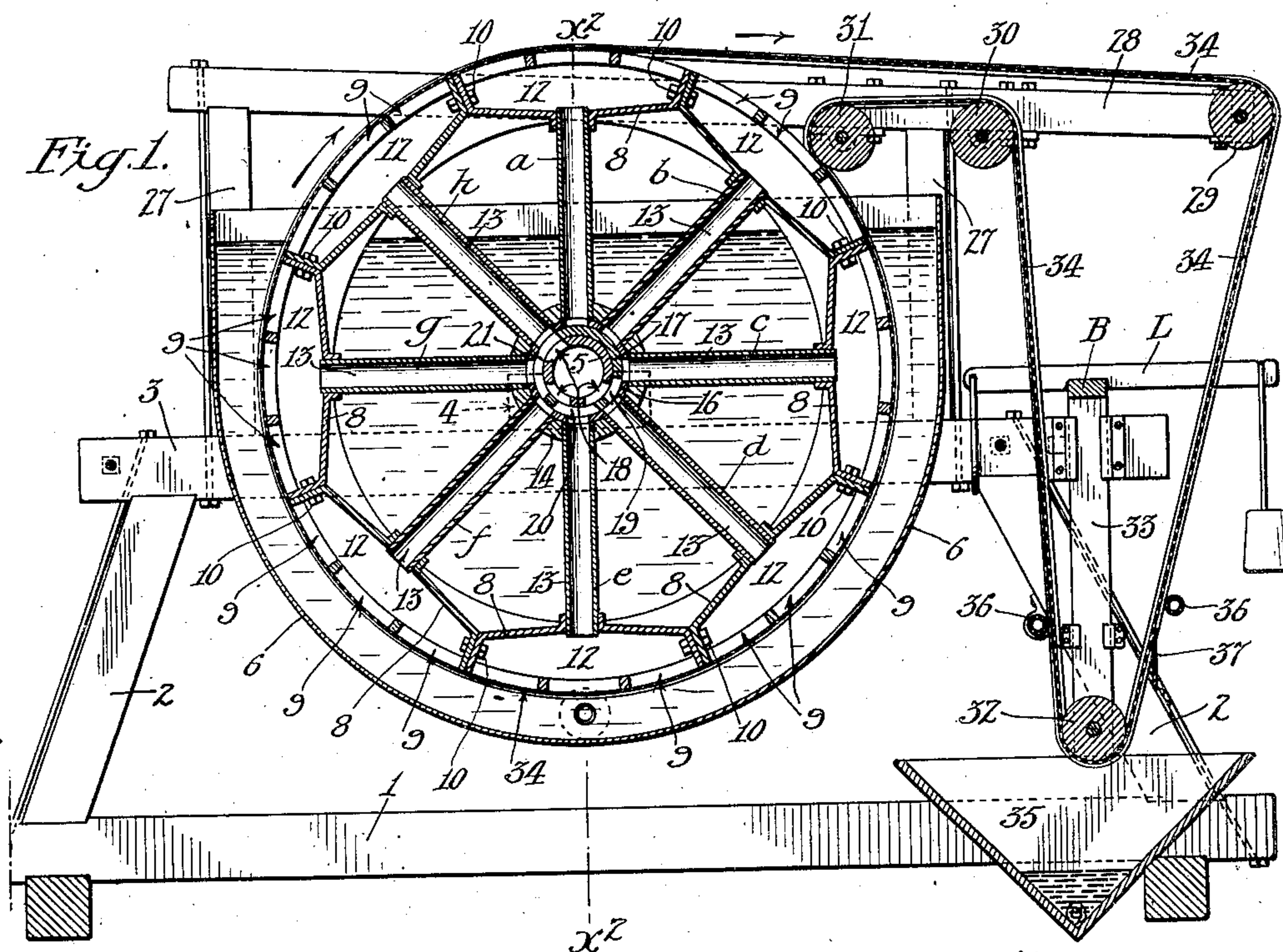


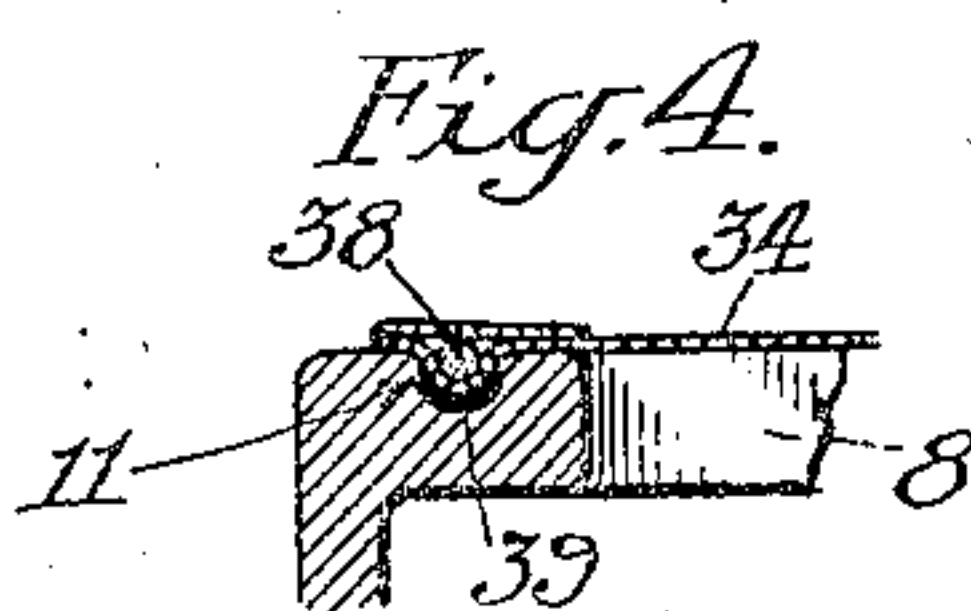
No. 877,631.

PATENTED JAN. 28, 1908.

E. M. CLARK.  
SLIMES FILTER APPARATUS.  
APPLICATION FILED MAY 6, 1907.



Witnesses:  
Frank L. Mahan.  
Louis W. Gratz.



Inventor,  
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By  
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His Attys.



# UNITED STATES PATENT OFFICE.

EDWIN M. CLARK, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO EDWIN M. CLARK  
SLIME FILTER COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF  
SOUTH DAKOTA.

## SLIMES-FILTER APPARATUS.

No. 877,631.

Specification of Letters Patent.

Patented Jan. 28, 1908.

Application filed May 6, 1907. Serial No. 372,280.

*To all whom it may concern:*

Be it known that I, EDWIN M. CLARK, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Slimes-Filter Apparatus, of which the following is a specification.

This invention relates to filtering apparatus; and has for its object to effectuate the process of filtering slimes or pulp in a continuous manner, as will be hereinafter described.

The accompanying drawings illustrate the invention, and referring thereto:—

Figure 1 is a vertical section taken longitudinally through the machine. Fig. 2 is a vertical section, on reduced scale, on line  $x-x'$  Fig. 1. Fig. 3 is an end elevation, on reduced scale, of the machine. Fig. 4 is a sectional view of the edge of the belt.

The frame comprises beams 1 which support uprights 2 which in turn support horizontal beams 3, the latter having pillow blocks 4 in which is mounted a stationary hollow shaft 5. A tank 6 having a lower portion curved concentrically with the shaft 5 is supported by the framework, and the pulp to be filtered is introduced to the tank 6 through a pipe 7.

Mounted on the hollow shaft 5 is a wheel the rim of which consists of hollow segmental sections 8, the face of each section having large orifices 9 and the sections being fastened together by bolts 10. Each section near its edge has a groove 11 whereby when the sections are assembled an annular groove is provided around the entire wheel near each edge thereof. Each section 8 thus forms a chamber 12 and each chamber 12 communicates with a hollow spoke 13. The hollow spokes 13 extend through an outer barrel 14, as shown in Fig. 2, and the several sections 8 are connected with the barrel 14 by stays 15. An outer bushing 16 is arranged just inside the barrel 14, and an inner bushing 17 is arranged inside the bushing 16, the bushing 17 forming a valve. The bushing 16 is provided with orifices which register with the openings in the hollow spokes 13, and the shaft 5 is provided in the present case with three ports 18, as clearly shown in Fig. 1. The valve 17 is provided with ports 19, 20 and 21 and is so set that a certain number of hollow spokes

when in certain position in the cycle of the wheel are shut off from communication with the hollow shaft. A stuffing box flange 22 is arranged at each end of the barrel 14 between the barrel 14 and bushing 17 with packing between each flange 22 and the bushing 16. Collars 23 on shaft 5 abut against the stuffing box flanges 22 and hold the wheel against lateral movement on the shaft. A reduced flange 24 is attached to one side of the wheel and is provided with sprocket teeth 25 over which a driving chain 26 runs for driving the apparatus. Uprights 27 support inclined bars 28 and an idle roller 29 is journaled at one end of bars 28 as shown in Fig. 1. The bars 28 also support idle rollers 30 and 31, while an idle roller 32 is supported at the lower end of slidable hangers 33 which extend down from the beams 3 and are connected at the top by a bar B. A pervious belt 34 of suitable material, for example canvas, is passed around the wheel over the perforated rim, the belt 34 running over the rollers 29, 30, 31 and 32 and being held taut by a weighted lever L which bears upon bar B. A launder 35 is arranged below the roller 32 and perforated wash pipes 36 are arranged on both runs of the belt 34 just above the roller 32, a scraper 37 being arranged below one of the wash pipes 36.

The wheel is revolved in the direction of the arrow, Fig. 1, and the tank 6 is kept filled with pulp to the level indicated at 38. The valve 17, as shown in Fig. 1, is so set that hollow spokes designated *a* and *b* are shut off from communication with the hollow shaft 5, while hollow spoke *c*, the section 8 of which is completely immersed in the pulp, is slightly opened to communication with the hollow shaft. Spokes *d*, *e*, *f*, *g*, and *h* are all in communication with the hollow shaft. A suction pump K is connected with the hollow shaft 5 and suction is thus produced in such of the sections 8 as are in communication with the hollow shaft, which suction draws the liquid through the meshes of the belt and through the orifices 9 into the sections 8, thence through the hollow spokes 13 to the hollow shaft 5 to the pump, the solids being held by suction to the belt. The belt is folded over at each edge and sewed to form a recess in each edge and a rope is run through each recess, and the ropes press the belt



down into the grooves against a strip of rubber or felt which is arranged in the bottom of each groove 11 in the wheel, and this prevents any leakage between the edges of the belt and the wheel and compels the suction to act through the meshes of the belt. The idle rollers are also provided with grooves to guide the rope. The recesses in the edge of the belt are wide so that slight swerving of the belt does not unseat the ropes from the grooves and the belt is held by the ropes against undue lateral travel. If the ropes were tightly bound in the belt the belt would be apt to jerk the ropes out of the grooves as the belt must have some individual lateral play or it will not travel well. The solids which are not drawn through the belt are carried by the belt to the trough 35, wash pipes 36 and scraper 37 removing all solids from the belt. The action is continuous, the wheel continuing to revolve in the pulp contained in the tank, and as the belt travels with the wheel the liquid is sucked through the wheel and into the hollow shaft, while the solids are carried up out of the tank by the belt. It is important that the valve be arranged to shut off suction from the hollow spokes which communicate with sections not fully immersed in the liquid or not fully covered by the belt, so that the suction is confined to a definite part of the cycle and the sections which are either fully immersed in the liquid and covered with the belt, or which are partially immersed in the liquid and fully covered by the belt. If the valve was not so arranged and the suction was allowed to act upon sections not fully immersed or not covered by the belt the suction would merely draw air through such sections and there would be little or no suction on the immersed or belt covered sections sufficient to draw the liquid through the belt and cause the solids to adhere to the belt.

What I claim is:—

1. In a slimes filter apparatus, a wheel having a perforated rim with grooves near each edge of the rim, a pervious belt traveling over said wheel, the belt having welts in each edge which closely fit the said grooves and prevent leakage between the edge of the belt and wheel, the rim of the wheel being formed in hollow sections, a tank containing the liquid to be filtered in which the wheel is immersed, means for applying suction to hollow sections of the rim to draw the liquids through the pervious belt into the hollow sections and cause the solids to adhere to the belt, and means for limiting the suction to sections which are fully immersed in the liquid or covered by the belt.

2. In a slimes filter apparatus, a wheel the rim of which comprises segmental hollow sections bolted together, each section having a perforated face, a hollow hub, hollow spokes connecting the respective rim sections with

the hollow hub, a stationary hollow shaft on which the wheel revolves, a hollow shaft having ports, means for applying suction to the hollow shaft, a bushing between the hollow shaft and hollow hub, said bushing having ports thus forming a valve adapted to shut off suction from hollow spokes and rim sections when in certain positions in their cycle of movement, a pervious belt traveling over the wheel, and a tank containing the liquid to be filtered in which the wheel is immersed.

3. In a slimes filter apparatus, a wheel, the rim of which comprises segmental hollow sections bolted together, each section having a perforated face, a hollow hub, hollow spokes connecting the respective rim sections with the hollow hub, a stationary hollow shaft on which the wheel revolves, a hollow shaft having ports, means for applying suction to the hollow shaft, a bushing between the hollow shaft and hollow hub, said bushing having ports thus forming a valve adapted to shut off suction from hollow spokes and rim sections when in certain positions in their cycle of movement, a pervious belt traveling over the wheel, a tank containing the liquid to be filtered in which the wheel is immersed, idle rollers for guiding that part of the belt away from the wheel, a wash pipe for removing solids from the belt after it has left the wheel, and a launder for receiving the washed off material.

4. In a slimes filter apparatus, a wheel having a perforated rim with grooves near each edge of the rim, a pervious belt traveling over said wheel, the belt having recesses in each edge, ropes extending loosely through the recesses and drawing the edges of the belt into tight engagement in the grooves of the wheel, strips of packing material in the bottom of the grooves against which the belt is pressed by the ropes for preventing leakage, the rim of the wheel being formed in hollow sections, a tank containing the liquid to be filtered in which the wheel is immersed, means for applying suction to hollow sections of the rim to draw the liquids through the pervious belt into the hollow sections and cause the solids to adhere to the belt, and means for limiting the suction to sections which are fully immersed in the liquid or covered by the belt.

5. In a slimes filter apparatus, a wheel having a hollow hub, a perforated rim formed of hollow sections, hollow spokes connecting the respective sections with the hollow hub, a pervious belt traveling over the wheel, the wheel being immersed in the liquid to be filtered, means for applying suction to the hollow hub, spokes and sections, valve means for limiting the suction only to such hollow sections as are fully immersed in the liquid or are covered by the belt, idle rollers for guiding that portion



of the belt not on the wheel, a pair of slidable bars supporting one of said rollers, a cross bar connecting the upper ends of the slidable bar, and a weighted lever bearing against  
5 said cross bar for depressing the slidable bars to cause the roller carried by the slidable bars to hold the belt taut.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 26th day of April, 1907.

EDWIN M. CLARK.

In presence of—

GEORGE T. HACKLEY,  
FRANK L. A. GRAHAM.