

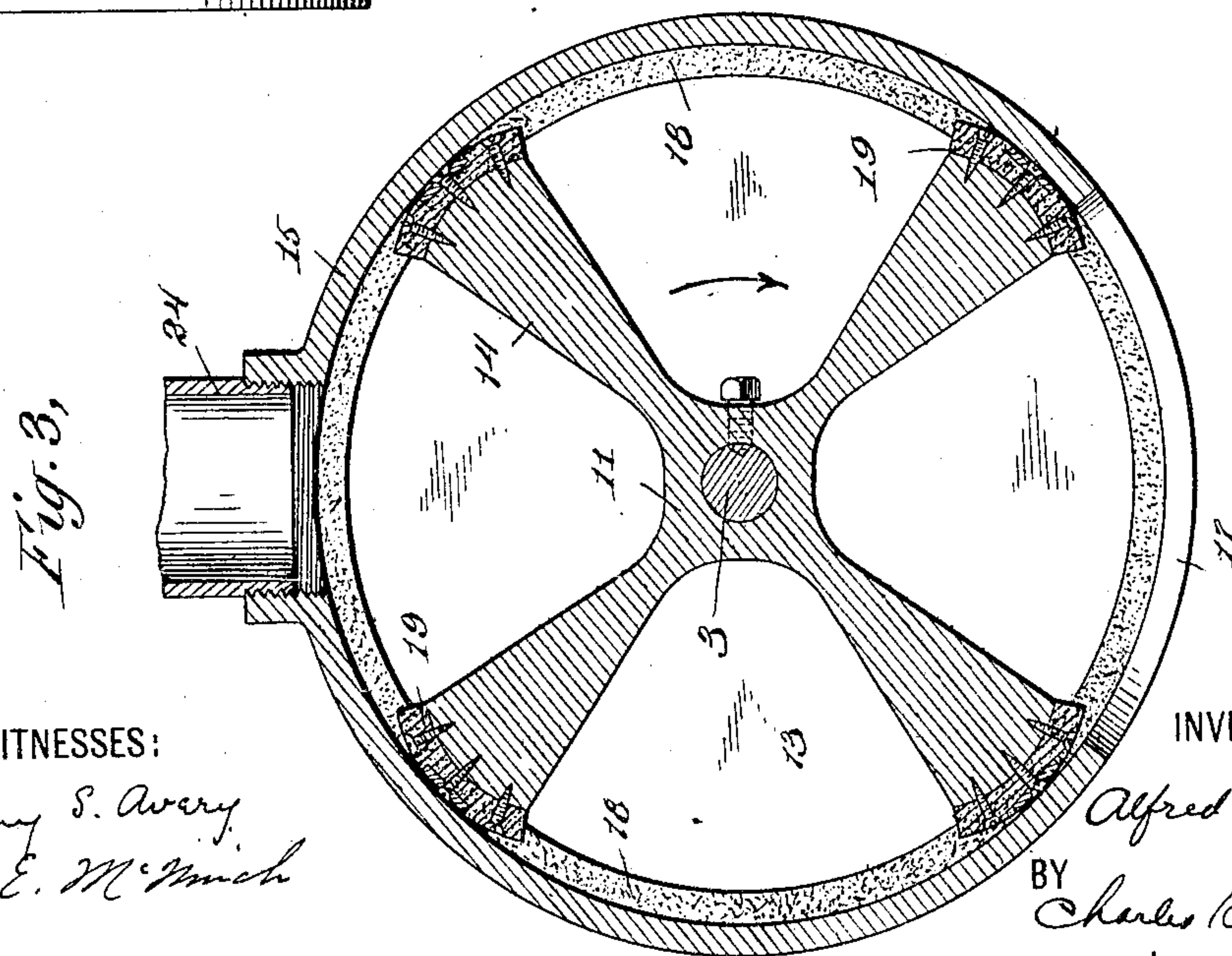
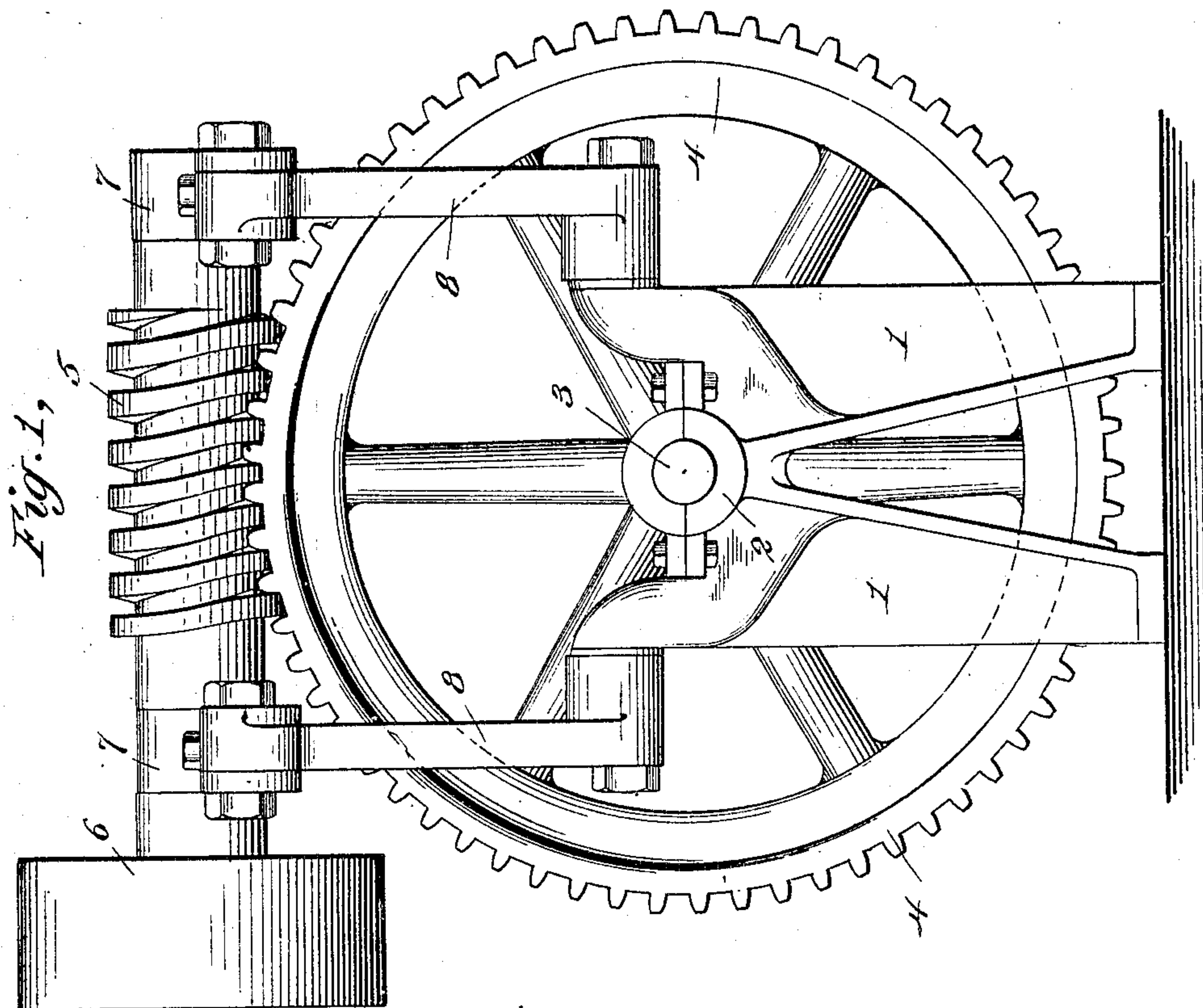
No. 871,299.

PATENTED NOV. 19, 1907.

A. SCHWARZ.
TAILINGS DISCHARGE VALVE.

APPLICATION FILED FEB. 1, 1906.

2 SHEETS—SHEET 1.



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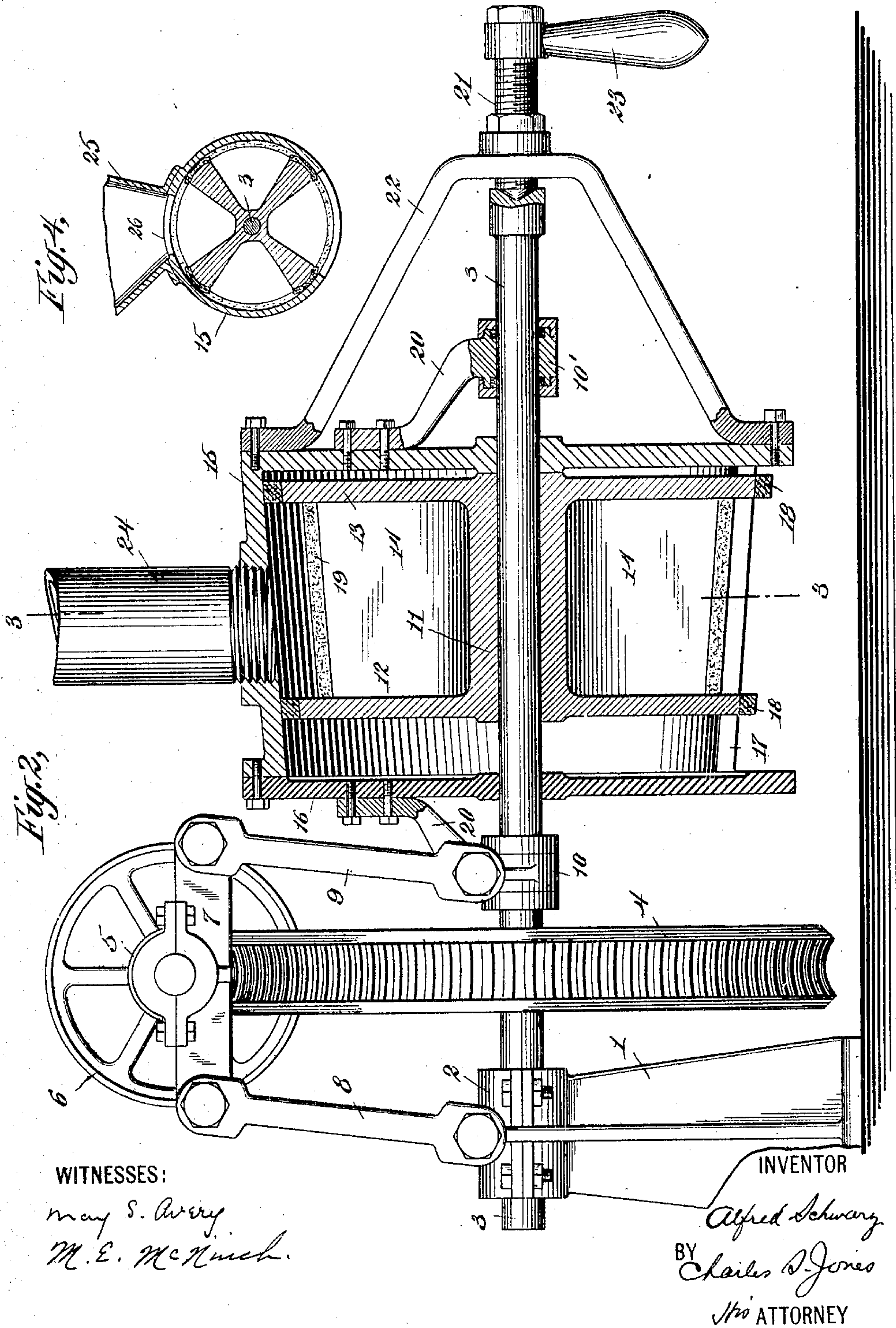
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

ALFRED SCHWARZ, OF NEW YORK, N. Y., ASSIGNOR TO SCHWARZ ENGINEERING COMPANY,
OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TAILINGS-DISCHARGE VALVE.

No. 871,299.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed February 1, 1906. Serial No. 298,980.

To all whom it may concern:

Be it known that I, ALFRED SCHWARZ, a subject of the Emperor of Germany, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Tailings-Discharge Valves, of which the following is a specification.

In my Patents Nos. 807,503, 807,504, 807,505, 807,506, dated December 19, 1905, I have described several methods of concentrating ores by mixing the pulverized ore with a selective agent and then running the mass into a vat containing water to effect a separation of the selective agent with its entrapped values from the tailings. Also in my Patent No. 825,080, dated July 3, 1906, I have described an apparatus in which this separation is effected such apparatus constituting a part of the complete concentrating plant. In carrying out my methods of concentrating ores the tailings are discharged through an outlet at the bottom of the separating tank or vat and it is advantageous that this discharge should be continuous without however at the same time permitting the escape of the water from the vat, or at least reducing the loss of water to a minimum.

The present invention relates to an apparatus designed to be attached or connected to the separating tank or vat of the character above described although it is not limited to such use and is capable of general application to tanks or vats in which it is desired to draw off settlings, slimes or tailings while at the same time preventing the escape of water or solution from the tank or vat. Reference to an ore concentrating plant is given merely as an illustration of one adaptation of the invention.

The invention will be understood by reference to the accompanying drawings in which

Figure 1 is an end view looking in the direction of the arrow in Fig. 3; Fig. 2 is a side view partly in section; Fig. 3 is a sectional view on the plane of the line 3—3 of Fig. 2; and Fig. 4 is a view intended to illustrate the manner of connecting the discharge valve directly to the separating tank or vat.

Similar reference numerals indicate similar parts in the several views.

Referring to the drawings the numeral 1 designates a suitable standard which carries

a bearing 2 for a shaft 3 upon which shaft the valve hereafter described is mounted. Keyed to the shaft 3 is a worm-wheel 4 which meshes with and is rotated by a worm 5 on the shaft of which is a driving pulley 6. The worm 5 is supported in bearings in cross-heads 7 which are pivotally supported on studs carried at the upper ends of two pairs of links 8 and 9. The lower ends of the links 8 are pivoted on studs carried by the standard 1, and the lower ends of links 9 are pivoted on a stud carried by a bearing 10 on shaft 3. The purpose in mounting the worm 5 on the pivoted frame above described is to permit of its adjustment with a longitudinal movement of shaft 3, presently to be described.

The valve comprises a hub 11 by which it is keyed or otherwise secured to shaft 3, and extending from said hub at right angles thereto are two walls 12 and 13, as indicated in Fig. 2. Projecting radially from the hub 11 and extending between the walls 12 and 13 are any convenient number of webs 14, four being shown in the drawings, the construction providing chambers or pockets adapted to receive the tailings. The valve just described may be made in a single casting, and is inclosed in a casing 15 having a removable end plate 16. Supporting stays 20 are bolted to the casing 15 and end wall 16, said stays terminating in the bearings 10 and 10'. The lower part of casing 15 is provided with an opening 17 through which the valve discharges. To secure a tight joint between the valve and its casing strips of felt 18, or other suitable packing, are secured to the perimeters of walls 12 and 13 and strips 19 of similar material are secured to the ends of webs 14.

As indicated in Fig. 2 the side wall of casing 15 is inclined so as to provide a conical chamber, the wall 12 of the valve being of less diameter than the wall 13 by reason of such inclination. Similarly the webs 14 have their outer ends inclined to correspond with the degree of inclination of the wall of casing 15. The construction permits the valve to be shifted longitudinally of its casing to take up the wear of the packing rings 18 and of the packing 19 on the outer ends of webs 14. To effect such shifting I provide an adjusting screw 21 having a seat in the end of shaft 3. Said screw is carried by a yoke 22 bolted to casing 15 and has a handle 23 by which it

may be turned to cause it to bear against the shaft. As the shaft 3 is slidably supported in the bearings 2, 10 and 10', and in the end walls of casing 15, the longitudinal movement imparted to it will also move the valve, thus insuring at all times a tight joint between the valve and its casing. Such movement of shaft 3 will also shift the position of worm-wheel 4, and as the worm 5 is supported on blocks 7 carried by the pivoted links 8 and 9 as before described, said worm will also be shifted so as to always remain in mesh with wheel 4.

The valve casing may be attached by any suitable means to the tank or vat from which the tailings are received. In Fig. 2 I have shown a pipe 24 threaded into an opening in the upper part of the casing of said pipe leading from the tank or vat. In Fig. 4, 25 designates the lower wall of the tank or vat having an opening 26 therein. The casing 15 in this instance may be secured to the tank or vat directly under said opening so that the valve may receive the tailings without the necessity of carrying same through a pipe 24 as in Fig. 2.

The separator of my before referred to Patent 825,080 is filled with heated water and a continuous discharge of the tailings effected. These tailings will be received into that compartment of the valve herein described which is then uppermost and as the valve is rotated very slowly, as for example about one rotation per minute, the compartment will be gradually filled so as to force back into the separator the water or solution which may pass out with the tailings. As one compartment is filled with tailings the next succeeding will take its place and the operation repeated, the tailings being finally discharged through the opening 17 into a suitable vat or tank, such, for instance, as the settler which constitutes the subject-matter of an application filed by me February 1, 1906, Serial No. 298,979. The discharge of the tailings from the separating vessel is thus effected with a minimum loss of water or solution.

The present invention is of particular advantage in districts where water is scarce and economy in its use necessary; also the maintenance of the original bulk of water is desirable as it obviates the necessity of adding a fresh supply which would require heating. It is to be understood, of course, that the tailings are saturated with water and that a small quantity of water will necessarily pass off with them. The present valve, however,

effects the desired discharge with a minimum loss of water.

The packing strips 18 and 19 maintain a water-tight joint between the valve and its casing and when they become worn the valve may be shifted to the left so as to cause the packing strips to be wedged against the side of the casing sufficiently for the purpose, by turning the adjusting screw 21. This adjustment is very slight, the valve being so disposed relative to the opening from the separating tank as to permit the adjustment without taking the valve out of alinement with said opening. The maintenance of the relation between the gear wheel 4 and its driving worm 5 is effected through the pivotally supported bearing blocks 7, as above described.

What I claim and desire to secure by Letters Patent is:—

1. In a tailings discharge valve the combination of a casing having an opening therein at its lower side, a shaft passing longitudinally through said casing, a valve secured to said shaft, said valve comprising a plurality of compartments formed by transverse end walls joined by intermediate webs, means for charging material into said compartments, and means for rotating the valve to discharge the contents thereof through said opening, said rotating means comprising a worm wheel keyed on said shaft and a worm meshing with said wheel, and a pivotal support for said worm.

2. In a tailings discharge valve the combination of a casing having an opening therein at its lower side, a shaft passing longitudinally through said casing, a valve secured to said shaft, said valve comprising a plurality of compartments formed by transverse end walls joined by intermediate webs, said walls and webs having packing strips secured thereto, means for shifting said valve longitudinally of the casing, means for charging the material into said compartments, and means for rotating the valve to discharge the contents thereof through said opening, said rotating means comprising a worm wheel keyed on said shaft and a worm meshing with said wheel, and a pivotal support for said worm.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED SCHWARZ.

Witnesses:

OLIN A. FOSTER,
M. E. MCNINCH.