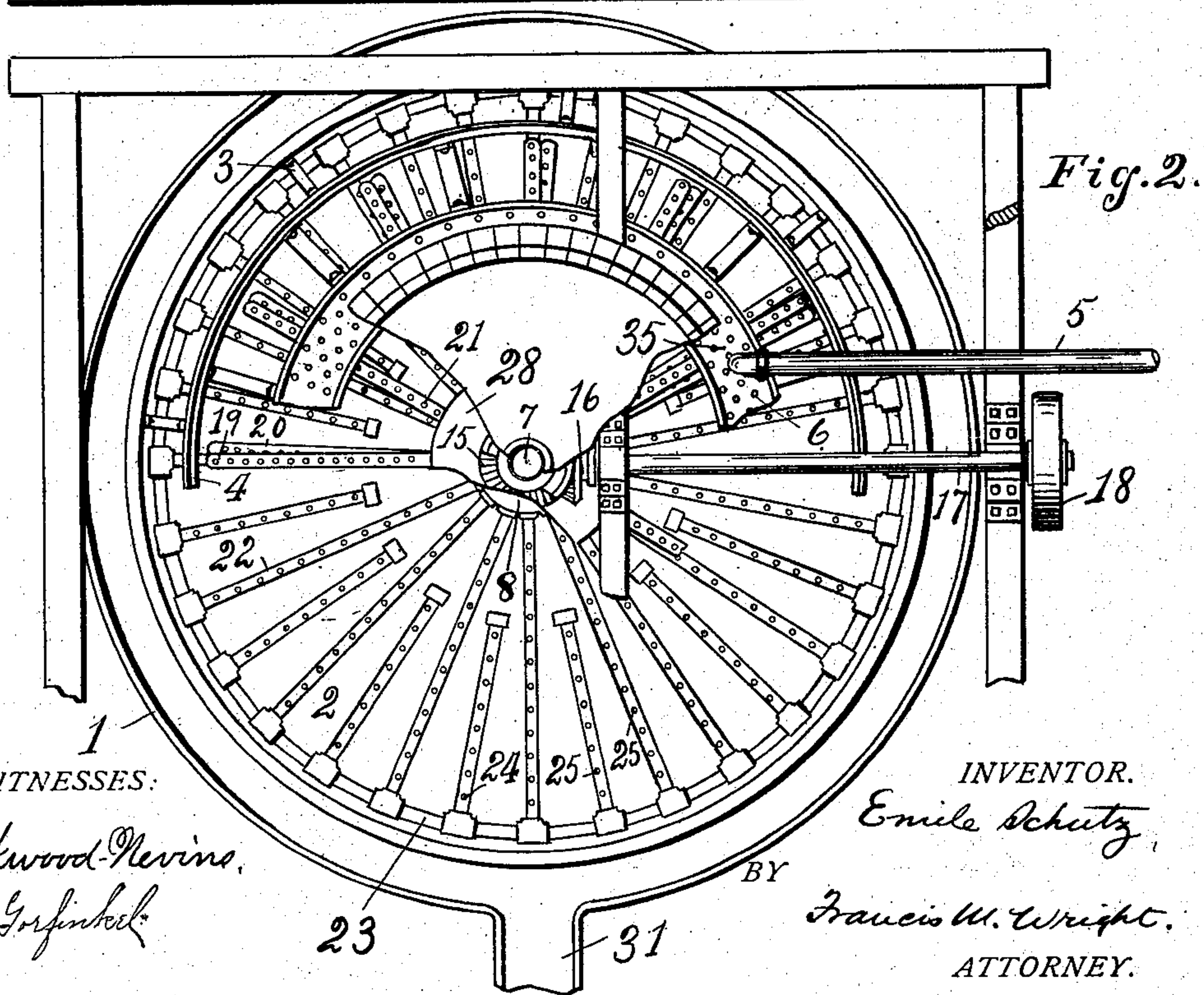
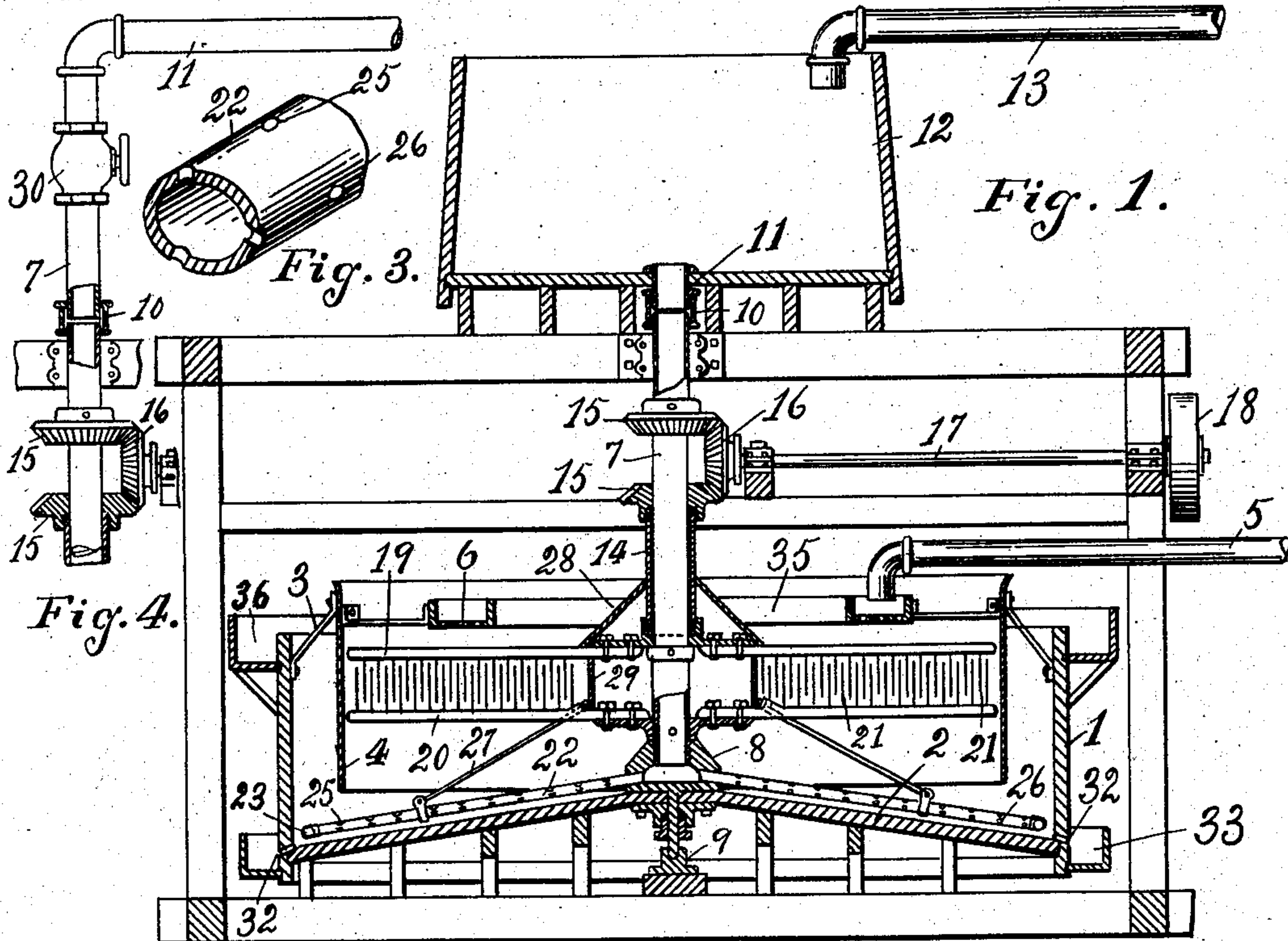


E. SCHUTZ.  
CONCENTRATOR.

APPLICATION FILED MAY 1, 1903.

NO MODEL.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EMILE SCHUTZ, OF SAN FRANCISCO, CALIFORNIA.

## CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 741,725, dated October 20, 1903.

Application filed May 1, 1903. Serial No. 155,096. (No model.)

*To all whom it may concern:*

Be it known that I, EMILE SCHUTZ, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Concentrators, of which the following is a specification.

My invention relates to improvements in concentrators, the object of my invention being to provide an apparatus of this character which shall be more effective than those heretofore used.

My invention therefore resides in the novel construction, combination, and arrangement of parts for the above ends hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of the apparatus. Fig. 2 is a broken plan view thereof. Fig. 3 is an enlarged detail of a portion of one of the water-discharge pipes. Fig. 4 is a detail showing a modification of the apparatus as to the delivery of the water.

Referring to the drawings, 1 represents a tank having a slightly-conical bottom 2. Within said tank is secured by arms or brackets 3 a cylindrical shell 4, the upper edge of which is at a higher level than the upper edge of the tank and the lower edge of which comes near to the bottom of the tank. The pulp of sand or material to be concentrated is fed with water by a pipe 5 into an annular trough 35, the bottom of which is perforated, as shown at 6, and thereby the material is evenly distributed from said trough into the tank within the shell. At the center of the tank is a vertical rotating pipe 7, secured to a casting 8, the latter having a step-bearing 9, as shown. The upper end of said pipe is connected by a union 10 with a short stationary pipe 11, extending from the bottom of a water-tank 12, fed by a pipe 13. Around the pipe 7 is a sleeve 14, and said pipe and sleeve have secured thereto bevel-wheels 15, meshing with a bevel-wheel 16 on a shaft 17, adapted to be driven by means of a pulley 18 from any suitable source of power. The rotation of said shaft 17 evidently causes said vertical pipe 7 and sleeve 14 to rotate in opposite directions. To said pipe and sleeve are secured a number of radial arms 19 20,

respectively, each of said arms having iron fingers 21, the fingers of the upper arms 19 extending downward and those of the lower arms 20 extending upward, the fingers of the two sets of arms passing between each other. By this means the material is kept constantly stirred within the shell. The effect of this stirring is to completely clean and separate the particles of the material.

From the casting at the lower end of the vertical pipe and revolving therewith extend discharge-pipes 22, which are connected at their ends with a circular pipe 23, from which circular pipe extend inward short pipes 24. The pipes 22 and 24 are perforated at the top, as shown at 25, and also at the lower part of the sides, as shown at 26, the perforations 26 discharging downward at an angle of about forty-five degrees with the vertical. Said pipes are additionally supported by means of ties 27, connected with the lower arms 20. A cone 28, secured upon the shell, and a cylinder 29 divert the material from the center into contact with said revolving fingers.

In the modification shown in Fig. 4 the tank is omitted and the clear water is supplied direct to the vertical pipe 11, a valve 30 being interposed to vary the pressure in said pipe.

As the pulp of sand or material to be concentrated is passed through the agitator, consisting of oppositely-revolving fingers, the heavy particles are constantly separated and cleansed from the lighter particles in their downward course. Every particle of pulp in order to escape must sink below the lower edge of the shell and come into proximity with the revolving pipes discharging clear water through the small perforations. The clean heavy material of value will continue to sink to the conical bottom, while the lighter and base material will be forced upward by the pressure of the streams of clear water ejected from said revolving pipes. The lighter or base material will have a continuous flow over the upper edge of the tank into a circular trough 36, discharging, by means of a spout 31, onto a waste-dump.

The object of making the bottom conical is to assist the heavy concentrates to gravitate to the outer edge of the conical bottom, they



having this tendency owing to the force of the clear water ejected through the small jets from the bottom of the revolving pipes. The concentrates escape from the main tank through small holes 32 in the sides of the tank into a circular sluice 33, built around the tank.

I claim—

1. In combination, the tank having a conical bottom sloping outward and having in its side at the juncture with the bottom a small hole for the escape of concentrates, rotating pipes also sloping downwardly outward in close proximity to the bottom of the tank, and having perforations for discharging water therefrom at the bottom of the tank, means for feeding water to said pipes and a shell within the tank having its lower edge raised above the bottom of the tank whereby the lighter material in escaping from the tank is compelled to pass below the lower edge of the shell and in close proximity to the bottom, substantially as described.

2. In combination, the tank having a conical bottom sloping downwardly outward and having in its side at the juncture with the bottom a small hole for the escape of concentrates, rotating pipes also sloping downwardly outward in close proximity to the bottom of the tank, and having downwardly-directed perforations for discharging water therefrom at the bottom of the tank, means for feeding water to said pipes, and a shell within the tank having its lower edge raised above the bottom of the tank whereby the lighter material in escaping from the tank is compelled to pass below the lower edge of the shell and in close proximity to the bottom, substantially as described.

3. In combination, the tank having a conical bottom sloping downwardly outward and having in its side at the juncture with the bottom a small hole for the escape of concentrates, rotating pipes also sloping downwardly outward in close proximity to the bottom of the tank, and having perforations for discharging water therefrom at the bottom of the tank, said pipes consisting of a radial series extending from substantially the center to the circumference, a circular pipe connecting the outer ends of the pipes of said series

and short pipes extending inwardly from said circular pipe, means for feeding water to said pipes, and a shell within the tank having its lower edge raised above the bottom of the tank whereby the lighter material in escaping from the tank is compelled to pass below the lower edge of the shell and in close proximity to the bottom, substantially as described.

4. In combination, the tank having a conical bottom sloping downwardly outward and having in its side at the juncture with the bottom a small hole for the escape of concentrates, rotating pipes also sloping downwardly outward in close proximity to the bottom of the tank, and having perforations for discharging water therefrom at the bottom of the tank, means for feeding water to said pipes, means auxiliary to the pipes for agitating the material in the tank, and a shell within the tank having its lower edge raised above the bottom of the tank whereby the lighter material in escaping from the tank is compelled to pass below the lower edge of the shell and in close proximity to the bottom, substantially as described.

5. In combination, the tank having a conical bottom sloping downwardly outward and having in its side at the juncture with the bottom a small hole for the escape of concentrates, rotating pipes also sloping downwardly outward in close proximity to the bottom of the tank, and having perforations for discharging water therefrom at the bottom of the tank, means for feeding water to said pipes, means auxiliary to the pipes for agitating the material in the tank, said agitating means being wholly within the shell, and a shell within the tank having its lower edge raised above the bottom of the tank whereby the lighter material in escaping from the tank is compelled to pass below the lower edge of the shell and in close proximity to the bottom, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EMILE SCHUTZ.

Witnesses:

FRANCIS M. WRIGHT,  
BESSIE GORFINKEL.