No. 754,912. PATENTED MAR. 15, 1904.

C. ALLEN.

AUTOMATIC ORE AND PULP SAMPLER.

APPLICATION FILED SEPT. 2, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

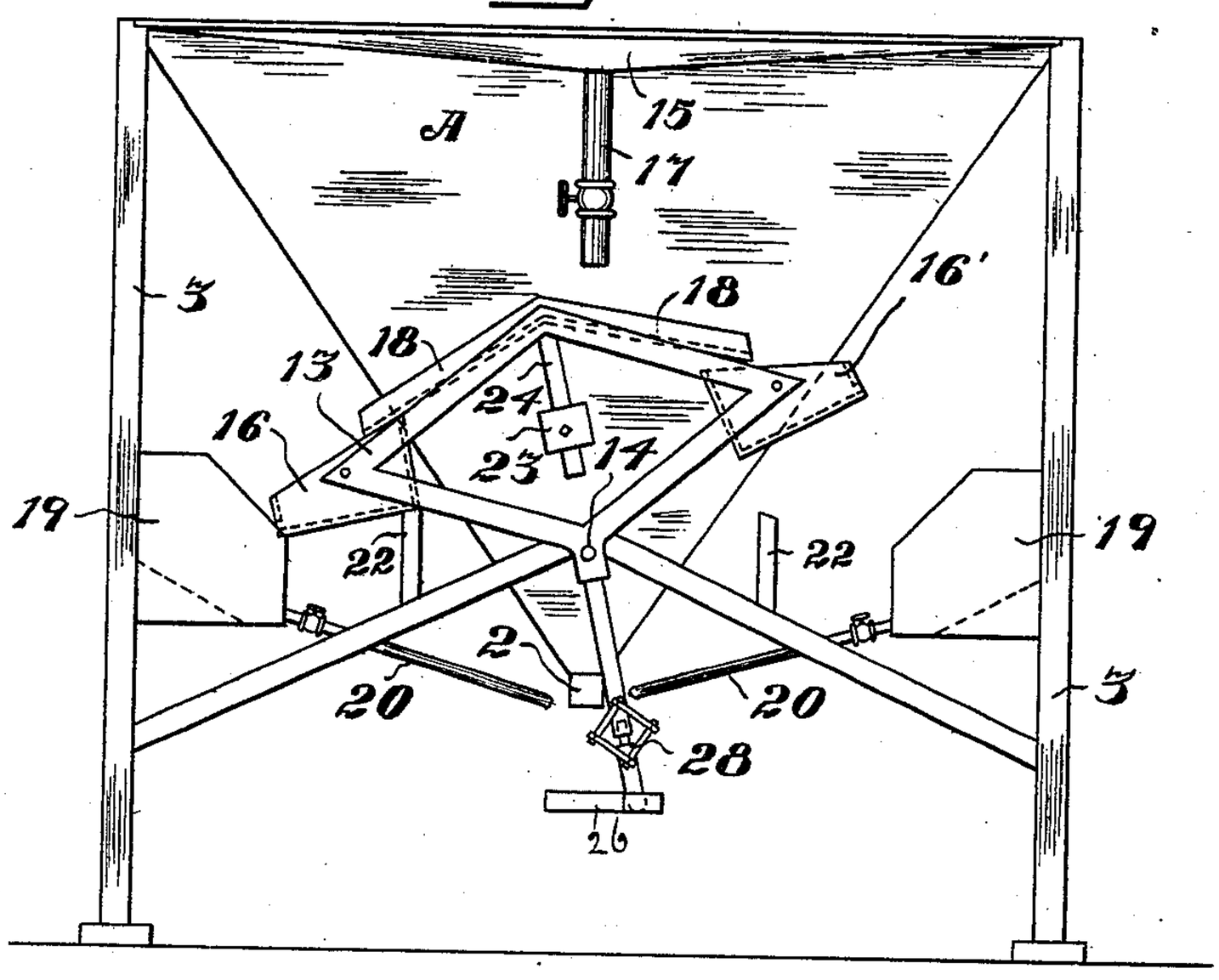
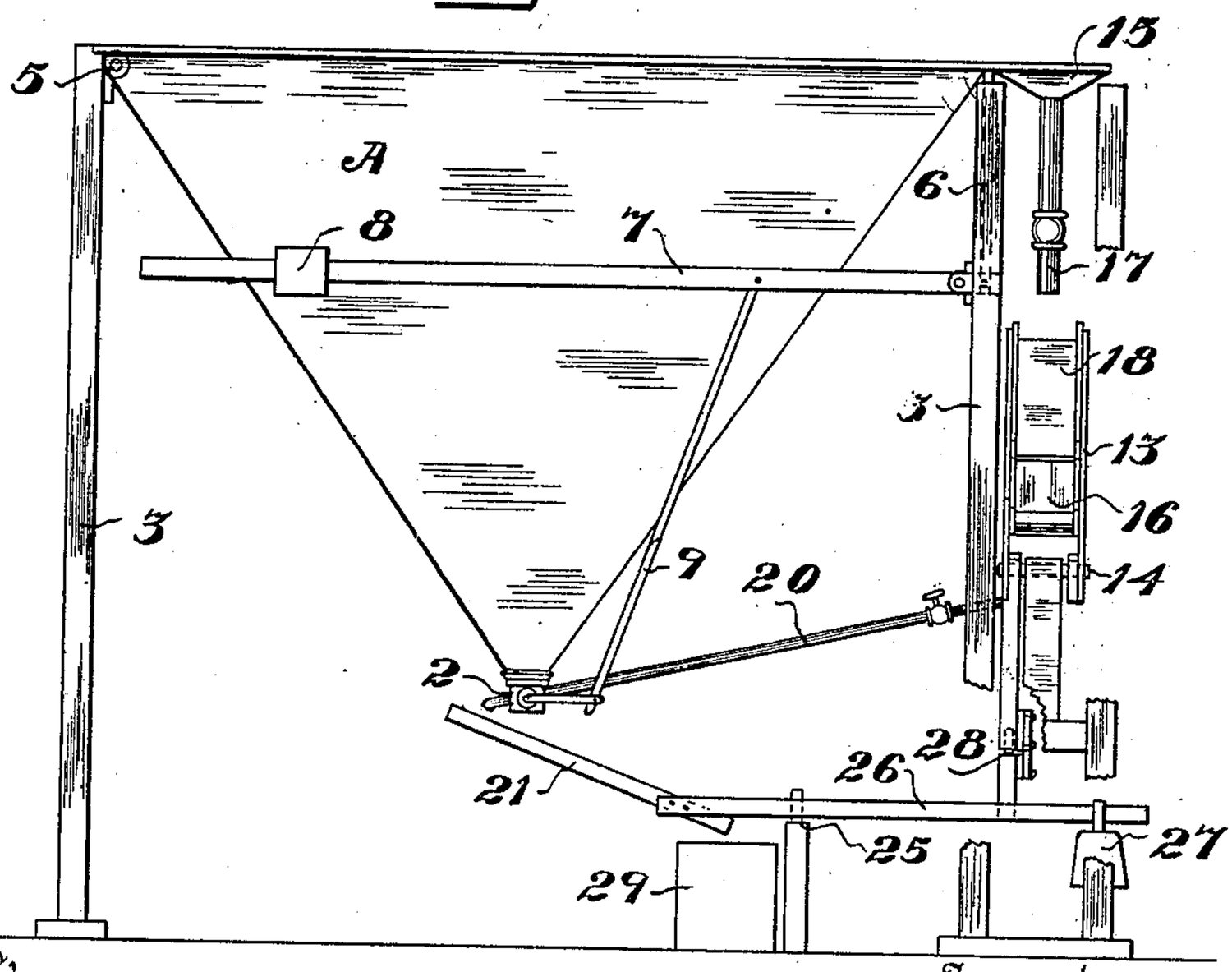


Fig. 2.



Witnesses,
J. H. Morse
Dudley Moss.

Inventor,
By Charles Allen
Geo. H. Strong. Atty

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

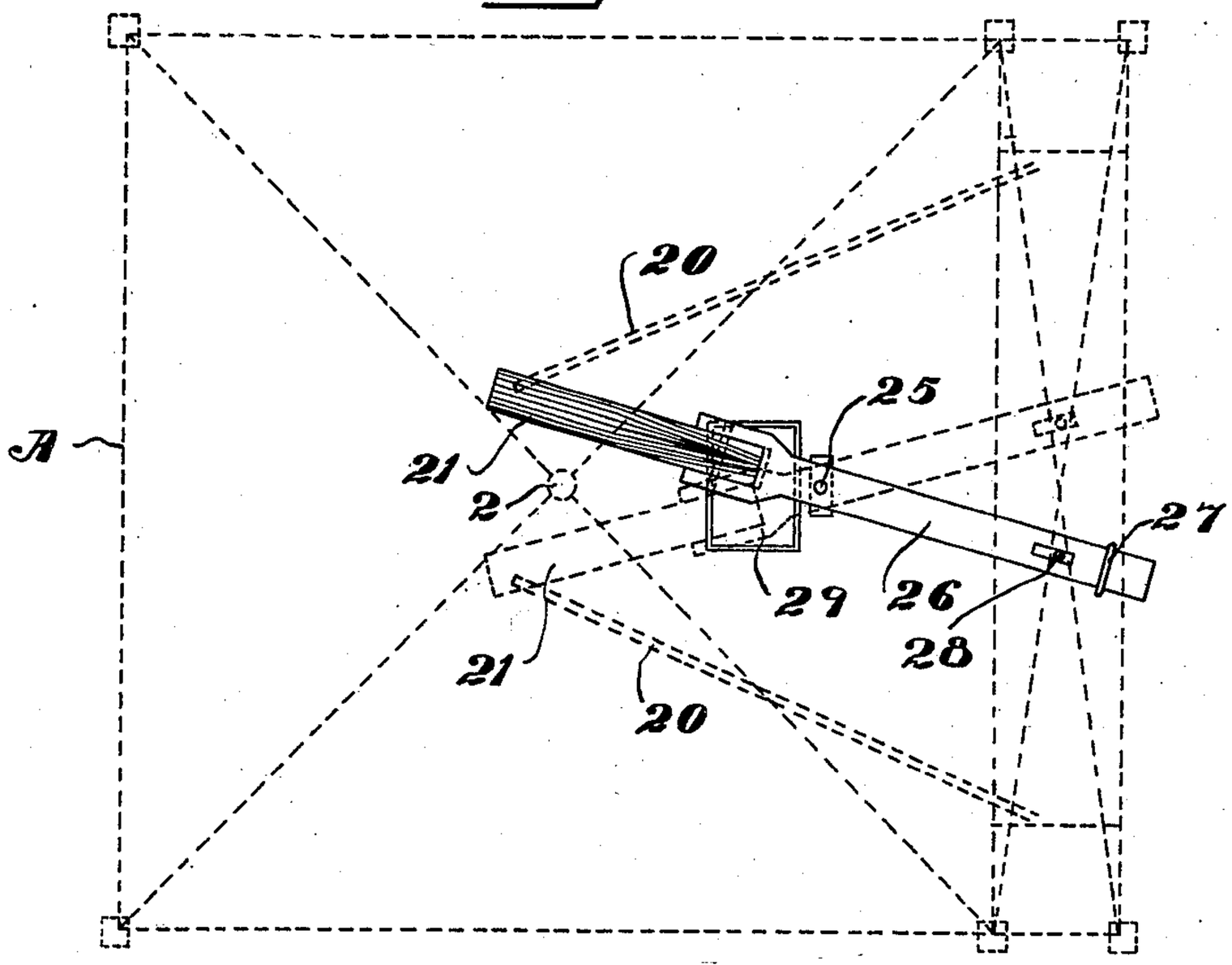


Fig. 4.

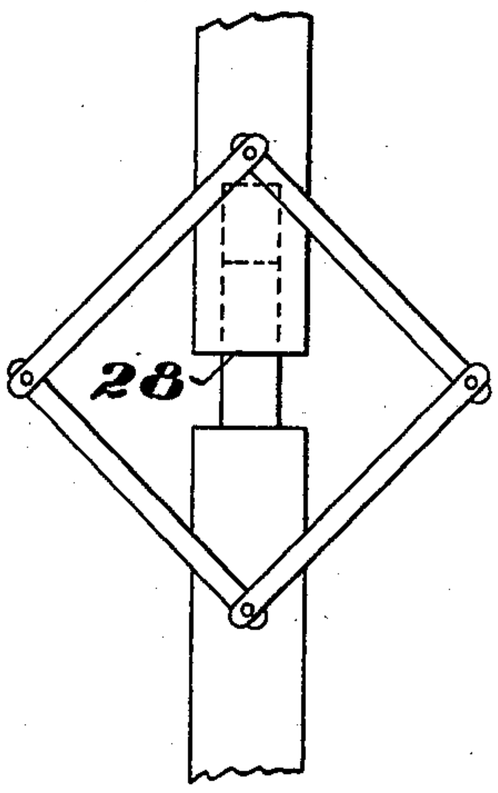
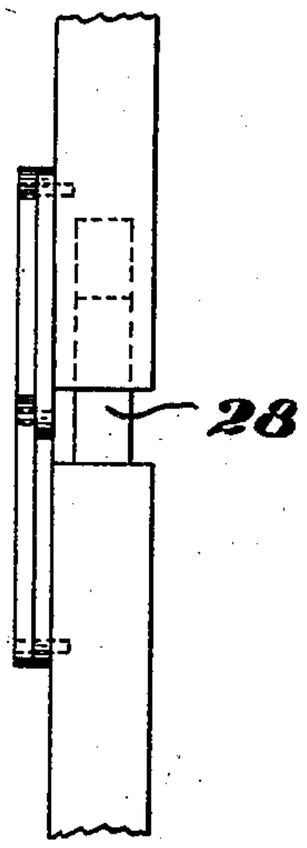


Fig. 5.



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J. B. Morse
Dudley Moss.

Inventor,
Charles Allen
By Geo. H. Strong.
Atty

No. 754,912. Patented March 15, 1904.

UNITED STATES PATENT OFFICE.

CHARLES ALLEN, OF EL PASO, TEXAS.

AUTOMATIC ORE AND PULP SAMPLER.

SPECIFICATION forming part of Letters Patent No. 754,912, dated March 15, 1904.

Original application filed January 27, 1903, Serial No. 140,735. Divided and this application filed September 2, 1903. Serial No. 171,632. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ALLEN, a citizen of the United States, residing at El Paso, in the county of El Paso and State of Texas, have invented new and useful Improvements in Automatic Ore and Pulp Samplers, of which the following is a specification, this application being a division of my application Serial No. 140,735, filed January 27, 1903.

My invention relates to improvements in mining apparatus, and particularly to that class of apparatus known as "samplers."

It consists of the parts and the construction and combination of parts, as hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of an automatic settler and my sampler attachment. Fig. 2 is an end elevation of same. Fig. 3 is a plan view of the sampling-trough with feed-water troughs shown diagrammatically. Fig. 4 is an enlarged front elevation of the telescoping joint and lazy-tongs. Fig. 5 is a side view of Fig. 4.

A represents a settling-tank having its sides and bottom inclined downwardly and converging to a common discharge-opening controlled by a suitable valve 2. The tank is supported on the frame-standards 3 in such manner that one end will have a limited up-and-down movement to actuate the valve 2 when sand or other heavy particles in excess of a predetermined quantity have accumulated in the tank. These results may be achieved in a variety of ways.

In the present instance I have shown the tank pivoted at one end, as at 5, and the other or feed end supported by connecting-rods 6 upon levers of the first class, as represented at 7, carrying the counterbalance-weights 8. One of the levers connects by a rod 9 with an arm on the valve-stem, whereby the valve will be operated on the oscillations of the tank. Pulp is delivered to the tank by any suitable means—as, for example, a trough. As the sand and other heavy particles accumulate in the bottom of the tank the volume of water is displaced, and whenever the quantity of material so settled is sufficient to overcome the weights 8 the entrance end of the tank is depressed to open valve 2 and allow a quantity of the compacted material to pass out of the tank. Should the quantity of sand entering the tank or hopper diminish and the gate or valve in the bottom discharge it faster than it is entering the hopper, the entrance side or end of the hopper rises, thereby closing the valve in proportion to its rise. By this action there is always approximately the same quantity of sand over the outlet in the bottom of the hopper, and the depth of this sand regulates the freedom from water of the sand and slime passing through the discharge gate or valve. Should the admission of sand and slime to the hopper be completely stopped, the entrance end or side of the hopper will rise until the sand-discharge gate or valve is completely closed.

The amount of sand that the tank may hold before valve 2 will be actuated is determined by adjustment of the counterweights 8 on levers 7.

It is necessary from time to time to take samples of the ore that is passing through the mill for the purpose of assay.

I have devised a means in connection with the settler by which a sample of the material discharged from the tank may be taken automatically at intervals through the medium of the settler and its contents.

13 represents a polygonal frame pivoted to a fixed support below its center, as at 14. This frame is disposed beneath a launder 15, receiving the overflow from tank A.

At opposite points of the frame on either side of pivot 14 are pivoted the water boxes or buckets 16 16′, which are adapted to be filled alternately from the launder-trough 15 on the oscillation of the frame.

The launder has a small valve-controlled discharge-pipe 17, through which water may trickle or flow in a small stream into one or the other of the oppositely-inclined troughs 18, discharging into the buckets 16 16′. The

remaining water may be discharged from the launder by a separate outlet, to be stored and used again, if desired.

The frame 13 is in unstable equilibrium, so that normally one bucket or the other will be elevated and the water from pipe 17 will flow into that bucket. When the weight of water in the bucket is sufficient to tilt the frame, the contents of the buckets will be dumped into a receptacle 19, and be delivered thence by a trough or pipe 20 into a spout 21, which has meanwhile received a sample of material passing valve 2. The buckets are each provided with a cross-piece or baffle at the outer end, so that the water will not splash out and be discharged all at once on the buckets striking the stops 22. During discharge the frame is also supported on one or the other of the stops, as shown. The shape of each bucket is such and the bottom is so inclined that the discharge end of the bucket is considerably removed from its pivot, whereby the water exerts an additional leverage to keep the bucket depressed until delivered of all its contents.

The amount of water necessary to oscillate frame 13 may be further regulated by shifting the position of weight 23 on stem 24, projecting downwardly from the apex of the troughs 18.

During the oscillation of the frame, which results from the filling of a bucket, the spout or sample-receiver 21, which oscillates in a horizontal plane, has been moved across the path of the discharging material, passing valve 2 by the following means: The spout is secured to a horizontal bar 26, pivoted intermediate of its ends at 25. The spout may be counterbalanced by a movable weight 27.

Frame 13 has a telescoping extension 28 below its pivot, which extension is pivoted to bar 26, whereby in the resulting synchronous oscillations of the frame and spout the end of extension 28 will move in a straight line rather than in an arc of a circle. The arc of movement of the spout about pivot 25 is such as to carry the spout into position beneath the end of one or the other of pipes 20.

Whatever material is received into the spout in its passage under the sand-outlet of the tank is washed away by the water from the discharging-bucket and is collected in a suitable receptacle 29. By subsequent assay of these samples the average value of the material passing through the mill is determined.

The frequency with which samples may be taken will depend on the length of time necessary to fill a bucket.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in a device of the character described, of a tilting tank or hopper having a sand-outlet in its bottom and a separate water-outlet, a valve in said first-named outlet controlled automatically by the tiltings of said hopper, a spout movable across the path of said sand-outlet and operatable intermittently by the action of the discharged water from the tank.

2. In a device of the character described, the combination with a settling tank or hopper having a sand-outlet, and a separate water-outlet, of an oscillating frame carrying buckets and operatable by the discharge-water from the tank, and a sample-receiver and means whereby it is moved across the path of the sand-outlet.

3. In a device of the character described, the combination with a settling tank or hopper having separate sand and water outlets, of an oscillating frame, tilting buckets mounted on said frame adapted to be filled alternately on successive oscillations of the frame, and a sample-receiver and means connecting it with the oscillating frame whereby it is movable across the path of the sand-outlet, into which receiver the contents of said buckets are delivered.

4. In a device of the character described, the combination with a settling tank or hopper having separate sand and water outlets, of an oscillating frame, a sample-receiver and connections between the same and the oscillating frame whereby the receiver is movable across the path of said sand-outlet in unison with the oscillations of said frame, tilting buckets carried by the latter and adapted alternately to discharge their contents into said receiver.

5. In a device of the character described, the combination with a sand-discharge passage, of a sample-receiver intermittently movable across the path of said passage, means for effecting such intermittent movement, and means for automatically delivering water to the receiver coördinately with the actuation of the receiver.

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

CHARLES ALLEN.

Witnesses:
W. S. SMALLWOOD,
C. H. JONES.