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C. ALLEN.

AUTOMATIC SILT AND SAND SEPARATOR.

APPLICATION FILED JUNE 8, 1903.

NO MODEL.

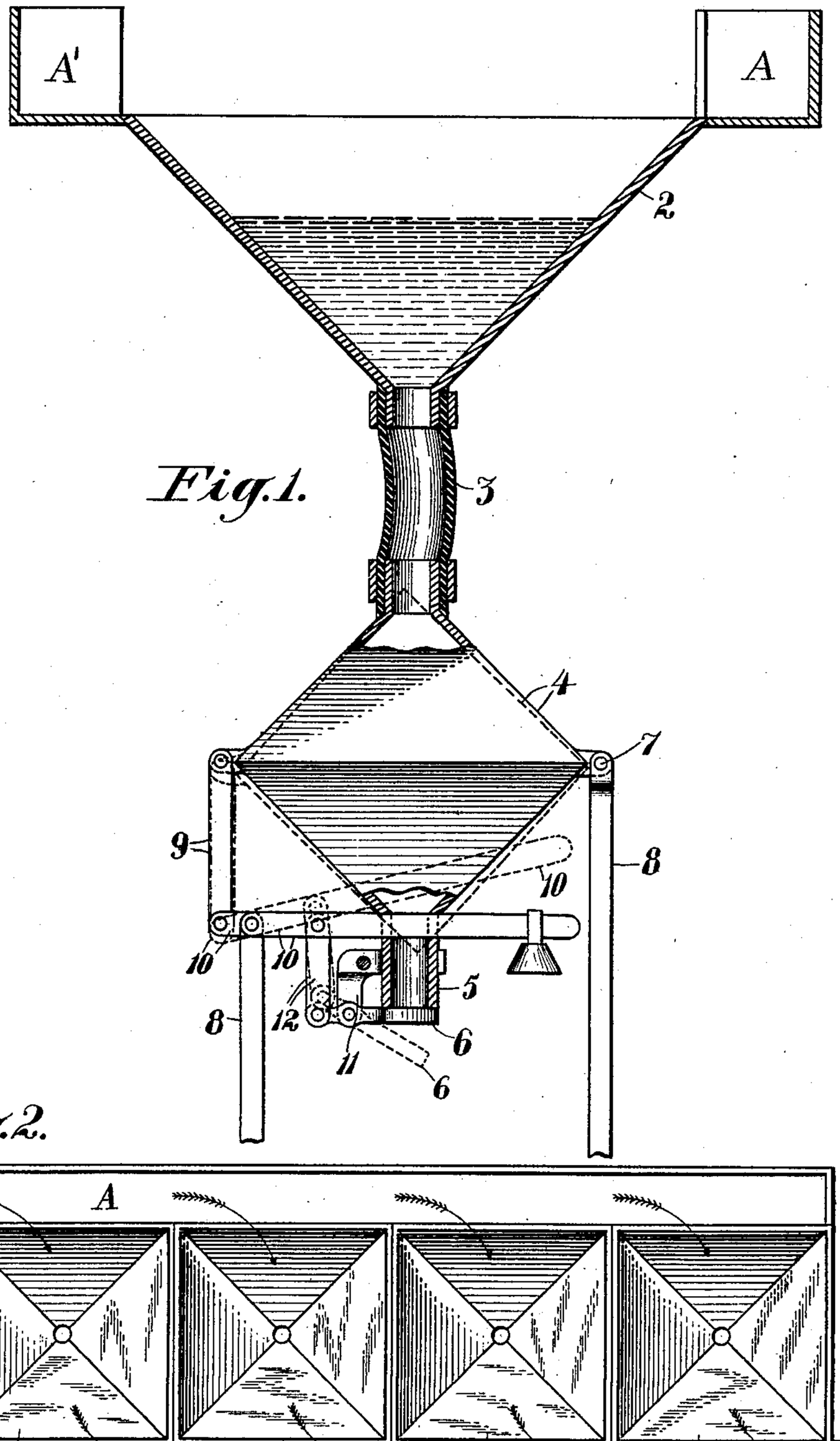

Fig. 1.

Fig. 2.

Witnesses:-
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UNITED STATES PATENT OFFICE.

CHARLES ALLEN, OF EL PASO, TEXAS.

AUTOMATIC SILT AND SAND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 754,732, dated March 15, 1904.

Application filed June 8, 1903. Serial No. 160,485. (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, county of El Paso, State of Texas, have invented an Improvement in Automatic Silt and Sand Separators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improved apparatus for settling and discharging slimes, sand, and like foreign matters carried in suspension in ditches, flumes, and other conveyers, particularly where there is a large volume of water and a swift current to contend with.

In certain localities, and particularly in that part of the country commonly known as the "Southwest," the character of the soil is such that nearly all the streams and the mining and irrigating ditches carry large quantities of sand and silt in suspension. This sand-laden water is not only unsuitable for milling and other purposes, but the ditches and storage-reservoirs gradually become filled by the deposits of mud.

The object of my invention is to provide an apparatus which may be interposed at some convenient point or points in the line of ditch, as where the ditch is flumed across a gulch or ravine, wherein the flow of water will be checked sufficiently to allow the matter held in suspension to settle, the cleared water flowing thence on through the continuation of ditch, while the sediment will be automatically discharged from time to time into the gulch or ravine to be carried away by subsequent freshets.

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 an elevation of my apparatus, partially in section. Fig. 2 is a plan of the device, showing an arrangement of settling-boxes.

A represents a section of flume or like elevated conveyer closed at its outer and lower end and open at one side. A′ represents a second and parallel section disposed on the open side of section A, closed at its outer and head end, and having an open side adjacent to section A. The settling and separating apparatus is disposed between these two sections, and the muddy water received from the ditch into section A passes transversely through the apparatus into section A′ and, purified, continues thence on its course through the flume and ditch. This apparatus comprises one or more settling-boxes 2, each having its sides converging downwardly to a central outlet. Below each settling-box 2 and connected therewith by a flexible tubing 3 is a closed separator box or tank 4, having downwardly-converging sides and a sand-discharge outlet 5, in which is a suitable controlling-valve 6. Each tank 4 is pivotally supported at one side or end, as at 7, upon a suitable frame 8, while the opposite side or end is sustained by the bars 9, attached to the counterbalanced levers 10, fulcrumed on frame 8. Valve 6 comprises a plate pivoted in a stationary bracket 11 and closable over the end of the spout forming the outlet 5. The opposite end of the valve-plate is connected with one of levers 10 by a rod 12.

When water is flowing through the ditch and sections A A′, both the settling-boxes and separator-tanks are full. The counterweights on levers 10 are adjusted so that valve 6 will normally be closed; but with the accumulation of a given quantity, by weight, of sand or other sediment in the bottom of a tank 4 the latter will sink to cause the levers to oscillate and open its valve, allowing a portion of the sediment to be discharged, for it is preferable that a certain quantity of sand should always rest upon the valve and form a seal against leakage. On each oscillation of a tank its valve automatically opens to effect a discharge and closes again as the amount of sand in the tank is reduced beyond a given point.

By making the flume-sections A A′ of considerable length and disposing them nearly horizontal, so that the water will have little or no fall at this point and by having the pointed settling-boxes 2 of sufficient width and number in order to distribute the water over as large an area as possible the current is arrested to give time for the sand and silt to settle.

The slanting bottoms of the settling-boxes and separator-tanks are steep enough to cause

the sediment to gravitate always toward the lowest point, and the flexible connections 3 permit each tank to oscillate freely.

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

1. In a settling apparatus, the combination with a conduit-section having a side opening forming a lateral discharge, a second conduit-section having a side opening presented toward the discharge of the first section said sections being separated from each other, and a fluid-container forming a transverse continuous connection between the discharge of one conduit-section and the inlet of the second section, of a subjacent tilting tank having communication with said container, and having a valve-controlled sand-discharge automatically governable in unison with the oscillations of said tank.

2. In a settling apparatus the combination with a fluid-conduit composed of overlapping sections separated from each other and having their inner sides open to divert the flow and form a lateral passage from one section to the other, and a fluid-container occupying the space between the sections and having opposite sides connecting with and forming a lateral communication between the open sides of the sections, of an inclosed subjacent tilting tank having communication with said container and having a sand-discharge outlet, and a valve in said outlet operatable automatically in unison with the tilting of the tank.

3. In a settling apparatus, an inclosed tank hinged at one end and resiliently supported at the other, and capable of a limited oscillating movement, communications between said tank and a source of water-supply, said tank having an inclined bottom and a sand-discharge outlet therein, means for counterbalancing the tank, and a valve in said outlet connected with the counterbalance connections and operatable in unison with the oscillations of the tank.

4. In a settling and separating apparatus, the combination of a box having an inclined bottom interposable in a fluid-conduit, a closed tank having an inclined bottom disposed subjacent to said box, said tank pivoted at one side and having counterbalanced connections at the opposite side, flexible fluid-conducting connections between said box and tank, and a valve-controlled sand-discharge outlet operatable by the said counterbalanced connections.

5. The combination with parallel flume-sections open on their adjacent sides and closed at their outer and opposite ends, of interposed inclined-bottomed settling-boxes, the opposite portions of which connect directly with said open sides thereby forming a continuous lateral passage from one section to the other, and a tiltable tank in relation to each box and communicating therewith, said tanks having each a valve-controlled sand-discharge outlet.

In witness whereof I have hereunto set my hand.

CHARLES ALLEN.

Witnesses:
H. E. RUERKLE,
U. G. WOLFE.