

L. M. SPEER.
SAND WASHING APPARATUS.
APPLICATION FILED MAY 14, 1910.

1,021,009.

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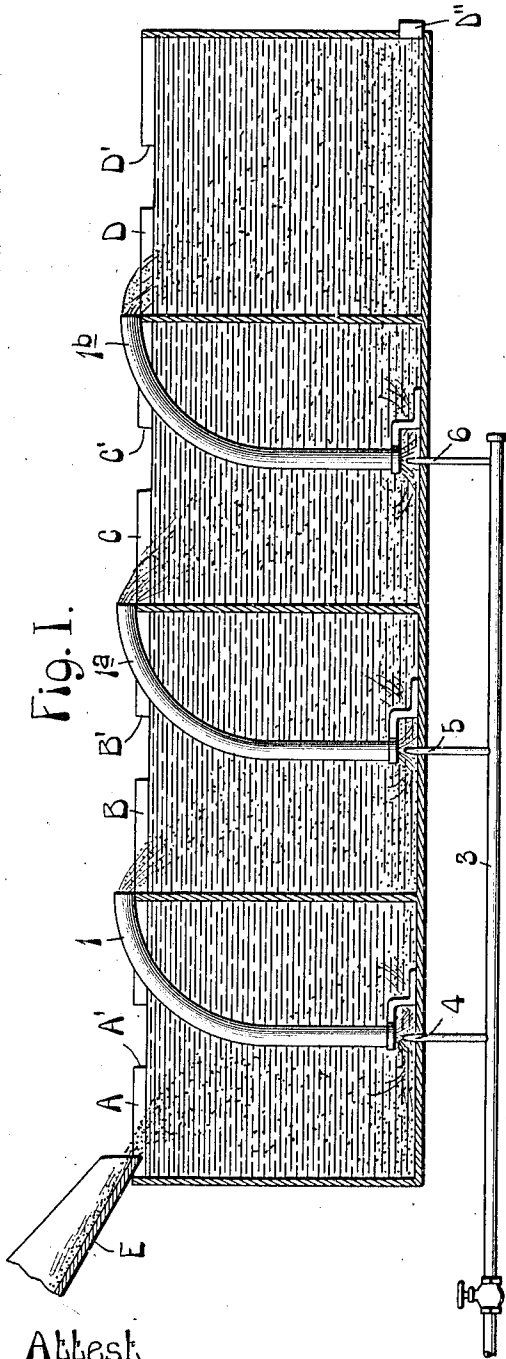


Fig. I.

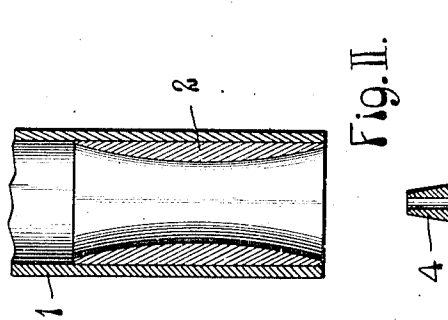


Fig. II.

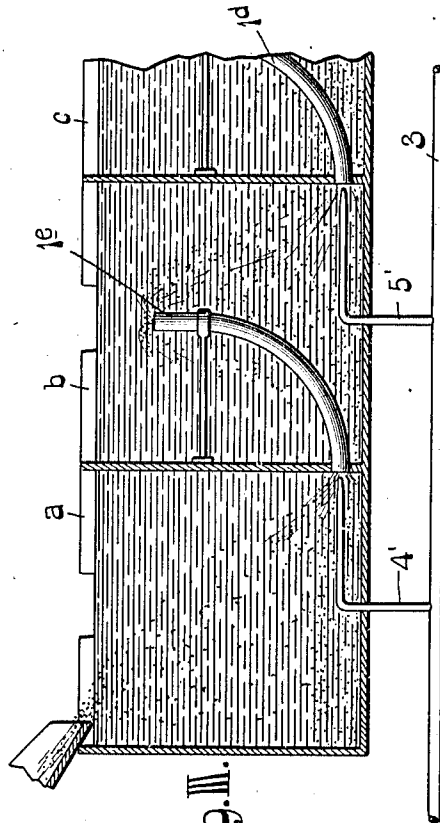


Fig. III.

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UNITED STATES PATENT OFFICE.

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SAND-WASHING APPARATUS.

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To all whom it may concern:

Be it known that I, LOUIS M. SPEER, of Pacific, in the county of Franklin and State of Missouri, one of the United States of America, have invented certain new and useful Improvements in Sand-Washing Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a sand washing apparatus through the medium of which sand may be cleansed by delivering it into bodies of water, and by the application of water power in such manner as to cause the sand to be transferred from a basin in which it is originally deposited to one or more succeeding basins, the dirt present with the sand being partly eliminated by overflow at the top of each basin into which the sand enters, while the sand, due to its greater specific gravity, becomes deposited in each basin into which it enters, and is discharged therefrom by water power into the next succeeding basin to be relieved of further dirt by overflow from the basin.

Figure I is a view partly in longitudinal section, and partly in elevation of my sand washing apparatus. Fig. II is an enlarged vertical section of the inlet end of one of the conduits used in my apparatus and the end of one of the nozzles by which water is injected into said conduits. Fig. III is a view similar to Fig. I of part of a modified apparatus.

In the accompanying drawings, I have shown four sand receiving basins A, B, C and D arranged in series. While I prefer to use this number of sand receiving basins, the number may be either increased or diminished, as may be found desirable. These basins are shown in the drawings (Fig. I) as being arranged in continuous series, as in the use of a tank having partitions that separate it into basins; but it is obvious that the basins may be made separate from each other without departing from my invention. The basins are so constructed as to prevent intercommunication between them that will permit of overflow from one basin to another, and while this overflow from one basin to another might be permitted notwithstanding the overflow from each basin, as contemplated by my improvement, I pre-

fer to provide for such overflow by producing overflow outlets A', B', C', and D' located in the walls of the basins aside from the partitions separating them. In the apparatus shown in the drawings, A is the receiving basin, and the sand to be washed is delivered into such basin by flushing it thereinto from a chute E so that as the sand enters the basin, additional supply of water is constantly maintained in the receiving basin. It is obvious, however, that the sand might be introduced into the receiving basin without flushing it thereinto, and in such event an additional supply of water may be maintained in the receiving basin by delivering water thereto aside from the chute.

As the sand enters the receiving basin, it settles therein, due to its specific gravity, and a large percentage of the dirt that is present with the sand, being of less specific gravity than the sand, overflows from the receiving basin, such overflow being accomplished without its taking place in such manner as to permit of any of the overflow passing into the next succeeding basin B.

1 designates the conduit arranged in the receiving basin, and which is preferably in the end of the pipe. This conduit is open at both ends and so supported in the receiving basin that its lower end is elevated above the bottom of the basin to provide for free ingress of sand in the basin thereinto. The lower portion of the conduit is vertically disposed, while the upper portion extends backwardly to the top of the basin B, in order that sand delivered into the conduit at its lower end may be conducted by the conduit to the top of the basin B.

1^a and 1^b are conduits, similar to the conduit A, that are located, respectively, in the basins B and C, and through which sand may be conducted from the basin B to the basin C; and from the basin C to the basin D, the latter of which is, in the apparatus shown in the drawings, intended to serve as a final basin that receives the sand in its cleansed condition, and from which the sand may be taken in any suitable manner, such, for instance, as by flushing it from the basin through a discharge opening normally closed by a stopper D''. Each of the conduits 1, 1^a and 1^b is provided at its lower or inlet end with a reducer 2 that serves to facilitate the ejection of water and sand into and

through the conduit by the use of water power, as will presently be more fully explained.

3 designates a water conducting pipe through which water may be forcibly delivered by the use of any suitable pump. This water conducting pipe is provided with jet pipes 4, 5 and 6 that terminate in jet nozzles which extend into the basins A, B and C, and through which jets of water are discharged through the conducting pipe 3 into the conduits 1, 1^a and 1^b. It will be readily appreciated that the jets of water discharged from the jet pipes into the conduits at their open lower ends produce ejecting action upon the sand that is present in each basin occupied by a conduit, and that, consequently, the sand is drawn from the basin into the conduit therein and carried with the water delivered from the pipe 3 through the conduit to emerge therefrom at its upper or outlet end, and be deposited in the next succeeding basin. It will be readily appreciated that the delivery of water with the sand that is emptied into each succeeding basin through the conduit leading thereto causes the basin into which delivery is made to overflow while the sand settles to the bottom of the basin, and that consequently, dirt that is present in the sand after it has left the preceding basin passes out of the basin into which delivery is made with the overflow of water, and that after a succession of transfers of the sand from one basin to another, the sand is completely ridden of dirt, and reaches the final basin thoroughly cleansed.

In the modification shown in Fig. III, the basins *a*, *b*, *c* are similar to the basins A, B and C in the apparatus as shown in Fig. I, and this modification differs from the appa-

ratus shown in Fig. I only in so far as the arrangement of the conduits 1^a and 1^b and the arrangement of the jet pipes 4' and 5' are concerned. The conduits are, in this modification, arranged in the basins to which delivery of sand is made and they extend into communication with the basins immediately preceding them in position; the inlet ends of the conduits being approximately horizontally arranged and the upper or outlet portions of the conduits being substantially vertical. The jet pipes are arranged horizontally within the basins so that they are properly directed toward the inlet ends of the pipes to deliver jets of water thereinto.

While I have shown the basins of my apparatus as arranged in a plane common to all of them, it is obvious that this arrangement might be varied and the basins arranged in different planes, or in such relation relative to each other that, if desired, the clean sand would be delivered at a higher level than that at which the sand enters the apparatus.

I claim:

A sand washing apparatus comprising contiguous basins with a common partition wall, a ninety degree bend conduit having an inlet opening on a horizontal axis through said partitions into one basin, and an outlet on a vertical axis approximately at the center of the other basin, and below the surface of the liquid therein, and means for injecting water and sand in a horizontal direction into said inlet opening.

LOUIS M. SPEER.

In the presence of—

E. B. LINN,
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