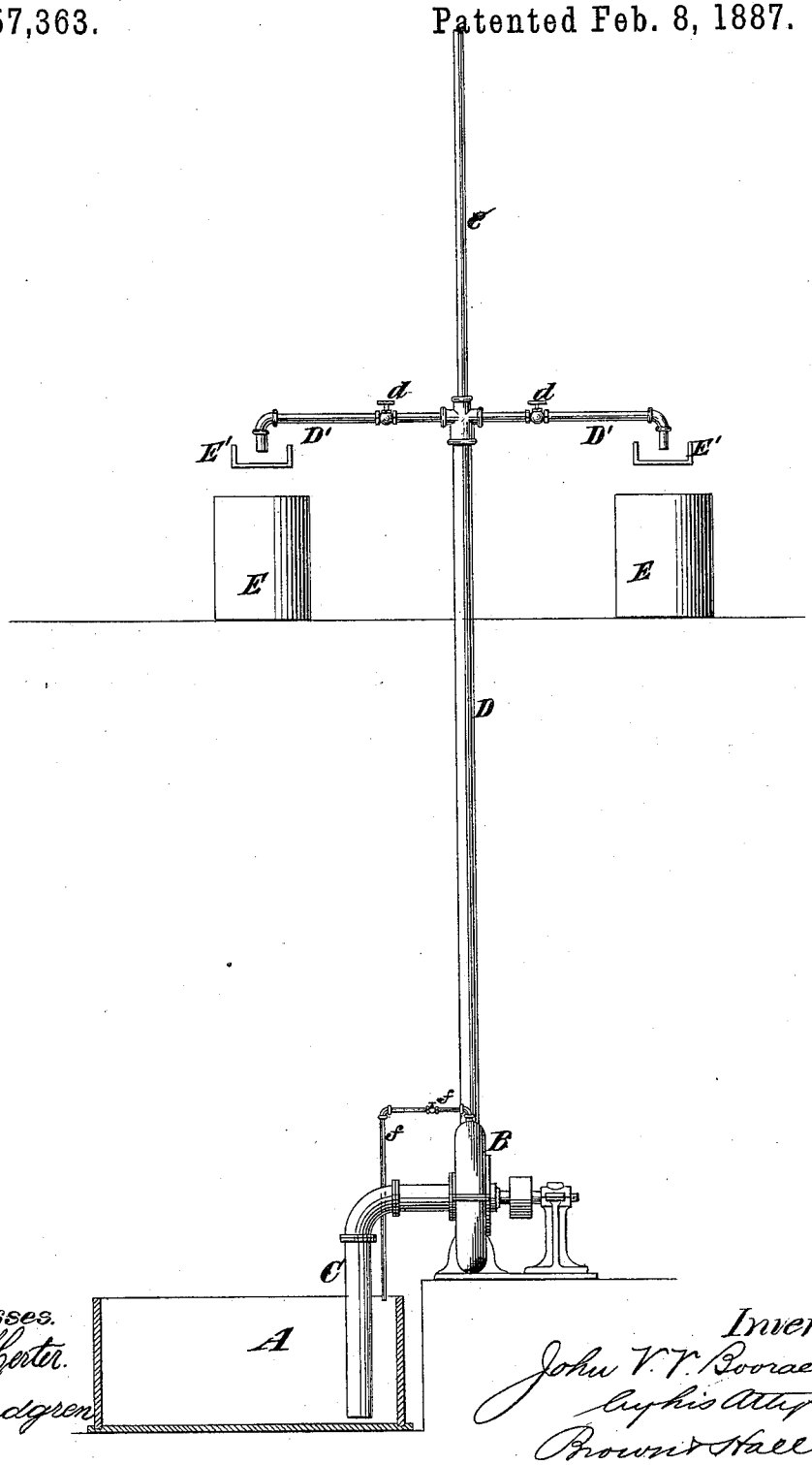
(No Model.)

J. V. V. BOORAEM.

MEANS FOR PUMPING AND DISTRIBUTING SEMI-FLUIDS OR LIQUIDS HOLDING SOLID MATTER IN SUSPENSION.

No. 357,363. Patented Feb. 8, 1887.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN V. V. BOORAEM, OF BROOKLYN, NEW YORK.

MEANS FOR PUMPING AND DISTRIBUTING SEMI-FLUIDS OR LIQUIDS HOLDING SOLID MATTER IN SUSPENSION.

SPECIFICATION forming part of Letters Patent No. 357,363, dated February 8, 1887.

Application filed June 16, 1886. Serial No. 205,315. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. V. BOORAEM, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Means for Pumping and Distributing Semi-Fluids or Liquids Holding Solid Matter in Suspension, of which the following is a specification.

Although my invention may be advantageously employed in pumping or raising liquid having solid matter of various character which is held in suspension so long as the liquid is kept in active motion, it is particularly intended to be employed in connection with centrifugal pumps for lifting water containing a large percentage of sawdust through a discharge-pipe provided with branches having valves, whereby they may be, one or more of them, closed.

In sugar-houses fine sawdust is sometimes used for filtering purposes, and such sawdust requires to be thoroughly washed and cleansed after use in order to prepare it for reuse. For raising this sawdust with water I employ a centrifugal pump provided with an ascending discharge-pipe terminating in two or more branches provided severally with valves, and through which the water, with the sawdust in suspension, may be drawn into tanks as desired. This pump is frequently stopped after the receiving-tanks have been filled and the valves in the discharge branches closed, and if the discharge-pipe be provided with no air-inlet at any point the sawdust and water will be retained therein, and the water not being in motion the sawdust will speedily deposit in the lower portion of the pipe and pump and form a solid plug in the pipe, which will interfere with or prevent the starting of the pump until it is removed.

The object of my invention is to provide for the admission of air to the discharge-pipe when all the branches therefrom are closed by the valves and the pump is stopped, so that the water and sawdust in the discharge-pipe may be perfectly free to fall or run back through the pipe and pump into the suction-tank, from which the pump takes its supply, thereby leaving the pump and discharge-pipe fully open and free from any obstruction, and enabling the pump to be readily started again as soon as desired.

My invention consists in the combination, with a centrifugal pump and a discharge-pipe ascending therefrom and terminating in discharge branches severally provided with valves, of an air-inlet to said discharge-pipe, which will permit the emptying of the discharge-pipe through the pump when the pump is stopped and the valves in the discharge branches are all closed. This air-inlet may be conveniently provided for by extending an open pipe upward above the discharge pipe and branches to a height beyond that to which liquid can be raised by the pump.

The accompanying drawing represents a partly sectional elevation of an apparatus embodying my invention, including a suction-tank and centrifugal pump taking liquid therefrom and a discharge-pipe having branches severally provided with valves.

A designates the suction-tank, and B designates a centrifugal pump, of any suitable character, employed for taking water or other liquid with sawdust or other solid matter in suspension from the tank A through a suction-pipe, C, and discharging such water and solid matter through a discharge-pipe, D, ascending from the pump to the height desired. This discharge-pipe D terminates at its upper end in branches D′, extending laterally or in any other desired direction, and severally provided with valves *d*. These branches may serve to deliver liquid and solid matter pumped directly into the tanks or vats E, to be afterward employed for any purpose or to be subjected to any treatment desired; or such branches D′ may deliver the liquid and solid matter into troughs E′, to be conducted into said tanks or vats. Any desired number of the discharge branches D′, each having a separate valve, may be provided.

It will be obvious that when both the tanks or vats E here shown are full and the valves are closed to cut off the discharge to them the pump must be stopped, and if no air-inlet were provided to the discharge-pipe D the water would remain motionless therein, and the saw-

dust or other solid matter would speedily settle to the bottom and form a solid plug in the discharge-pipe, which would render it difficult to start the pump and entail great trouble to remove it.

I have represented a pipe, *e*, which may be of small size, and which is continued upward above the discharge branches D′ to a height above that to which the pump will force liquid when running at the speed at which it is driven. This air-pipe *e* is always open, and as soon as the valves *d* are closed and the pump stopped the water or other liquid, with the sawdust or other solid matter, will run backward or fall through the discharge-pipe D and the pump into the suction-tank, because of the free air-inlet provided through the pipe *e*.

I have represented the pump B as provided with an air-vent pipe, *f*, extending from the top of the pump-casing to the suction-tank, and which is constantly open. Through this vent-pipe all air which would otherwise be trapped in the pump-casing is discharged each time the pump is started, and the quantity of water which is discharged through this small vent-pipe during the continuous running of the pump is wholly insignificant. By the employment of this vent-pipe *f*, I give the pump-casing the proper air-vent without any attention on the part of the operator, and I avoid discharging liquid around the pump and upon the floor of the building.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a centrifugal pump and a discharge-pipe ascending therefrom and terminating in discharge branches severally provided with valves, of an air-inlet to said discharge-pipe, which will permit the emptying of the discharge-pipe through the pump when the pump is stopped and the valves in the discharge branches are all closed, substantially as and for the purpose herein described.

2. The combination, with a centrifugal pump and a discharge-pipe ascending therefrom and terminating in discharge branches severally provided with valves, of an open pipe extending upward from the discharge-pipe to a height beyond that to which liquid can be raised by the pump, and serving for the inflow of air to permit the emptying of the discharge-pipe through the pump when the pump is stopped and the discharge branches are closed, substantially as and for the purpose herein described.

J. V. V. BOORAEM.

Witnesses:
C. HALL,
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