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S. L. BERRY.

HYDRAULIC ELEVATING MACHINE.

(Application filed Jan. 16, 1899.)

(No Model.)

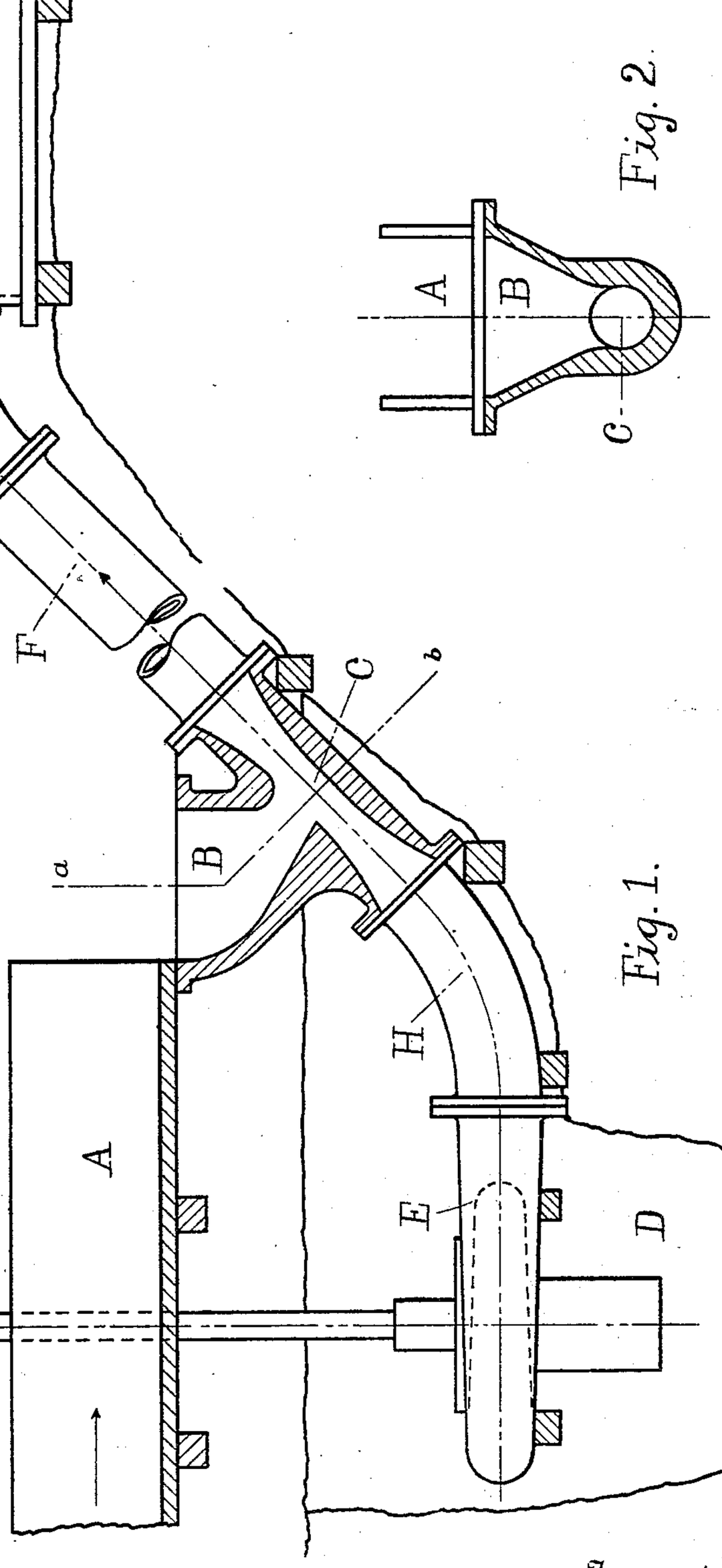

Fig. 1.

Fig. 2.

Witnesses
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HYDRAULIC ELEVATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 632,829, dated September 12, 1899.

Application filed January 16, 1899. Serial No. 702,360. (No model.)

To all whom it may concern.

Be it known that I, SENECA LUCIEN BERRY, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Hydraulic Elevating-Machines, of which the following is a specification.

My invention relates to that class of machines used in hydraulicking in which a stream of high-pressure water is employed to raise to a sufficient height for sluicing and dumping the gravel which has been washed down by the giant or monitor.

It has heretofore been the practice to raise to the sluices both the gravel and the hydraulicking-water by a jet of high-pressure water. This is an inefficient practice on account of the loss of energy accompanying the impact of the high-pressure water on the water to be raised. My invention comprises means for converting the whole of the water to be raised into high-pressure water before impinging it upon the gravel. In other words, the solids and liquids from the hydraulicking operation are now completely separated, the liquid going in one direction through a pump into a pipe and being given thereby high pressure and the solids being conveyed separately into said pipe at a point where the liquid therein has attained a high velocity.

Referring to the accompanying drawings, Figure 1 is a vertical elevation and section showing the machine assembled. Fig. 2 is a section through the throat-piece on the line *a b*, Fig. 1.

Similar letters refer to similar parts in both figures.

A is a flume or sluice used for conveying the material to be elevated.

B is a hopper of sufficient size at the top to receive the material deposited by the flume A and converging to the width of the throat C.

C is a passage or throat of such proprotion as to produce the condition hereinafter described. The pit D forms a sump or receptacle for the collection of the water to be raised by the pump E. The upraise-pipe F carries the water and other material to the sluice or flume G, which conveys them to the dumps.

H is a pipe connecting the pump E with the throat C.

The pump E is preferably a centrifugal pump, but may be of any kind suitable to the work and may be driven in any convenient manner.

The passage C is what is called a "Venturi tube"—that is, one in which the cross-section varies along the tube, so that at a certain point therein, which may be called the "neutral" point, there is neither outward pressure on the walls of the tube nor inward suction. To produce this effect, the tube must have a slight convergence toward and divergence from said point. At this point an opening may be made in the side of the tube without in any way affecting the flow of water therein. If then the hopper B be placed above said opening and filled with gravel and water, the gravel will force its way into the throat C by reason of its superior specific gravity, while the water will be excluded.

In operation the water in the flume A reaches the elevator and fills the pump E, pipe H, throat C, hopper B, and pit D. The pump E is started and forces the water through the throat and up the pipe F. When the gravel or other material to be elevated reaches the machine, it falls into the hopper and is carried up by the ascending stream, the water going to the pit D to be raised by the pump. A screen is placed in the flume A to stop any material which may be too large to pass through the throat C. The superior weight of the solid, the height of the fall, and the shape of the entrance to the throat are such as to enable the solid to enter the stream passing through the throat C.

The diameter of the throat C may vary from a fraction of an inch to the diameter of the pipe and is determined by the height to which the materials are to be elevated and the quantity of such materials.

While I believe that a hopper discharging into the narrow portion of a Venturi tube in the upraise-pipe furnishes the most convenient though an unusual means of separating

the water from the solids, I do not limit myself to this particular means of separation; but the ordinary means of separating water from solids may be used without departing from the spirit of my invention.

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

1. The combination of a flume adapted to carry the solids and water from hydraulicking, an upraise-pipe, a tube therein, a hopper arranged to receive said solids from said flume and discharge them into said tube, said hopper opening into said tube at a point of substantially neutral pressure therein, whereby air and water are excluded, while the solids pass through said opening by reason of their superior specific gravity, a receptacle receiving the water brought down by the flume but prevented from passing through said opening, and a pump receiving the water from said receptacle and delivering the same to the upraise-pipe, substantially as described.

2. The combination of a flume adapted to carry the solids and water from hydraulicking and deliver them to a hopper, said hopper being adapted to settle the solids and deliver them through a narrow exit to the narrow throat of a hydraulic elevator, a receptacle receiving water by overflow from the hopper, and a pump receiving the water from said receptacle and delivering the same to the hydraulic elevator, substantially as described.

3. The combination of a flume adapted to carry the solids and water from hydraulicking, an upraise-pipe, a receptacle, means for separating the solids from the water and causing the former to enter the pipe direct while the latter is first carried into the receptacle, and means for imparting a high velocity to said water so separated and forcing it into the upraise-pipe at a point before the entry of the solids thereinto, substantially as described.

4. The combination of a flume adapted to carry the solids and water from hydraulicking, an upraise-pipe, a receptacle, means for separating the solids from the water and causing the former to enter the pipe direct while the latter is first carried into the receptacle, and a centrifugal pump receiving the water from the receptacle and forcing it into the upraise-pipe at a point before the entry of the solids thereinto, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

SENECA LUCIEN BERRY.

Witnesses:
FRANK EVERETT SAWYER,
EDWARD EARL SAWYER.