

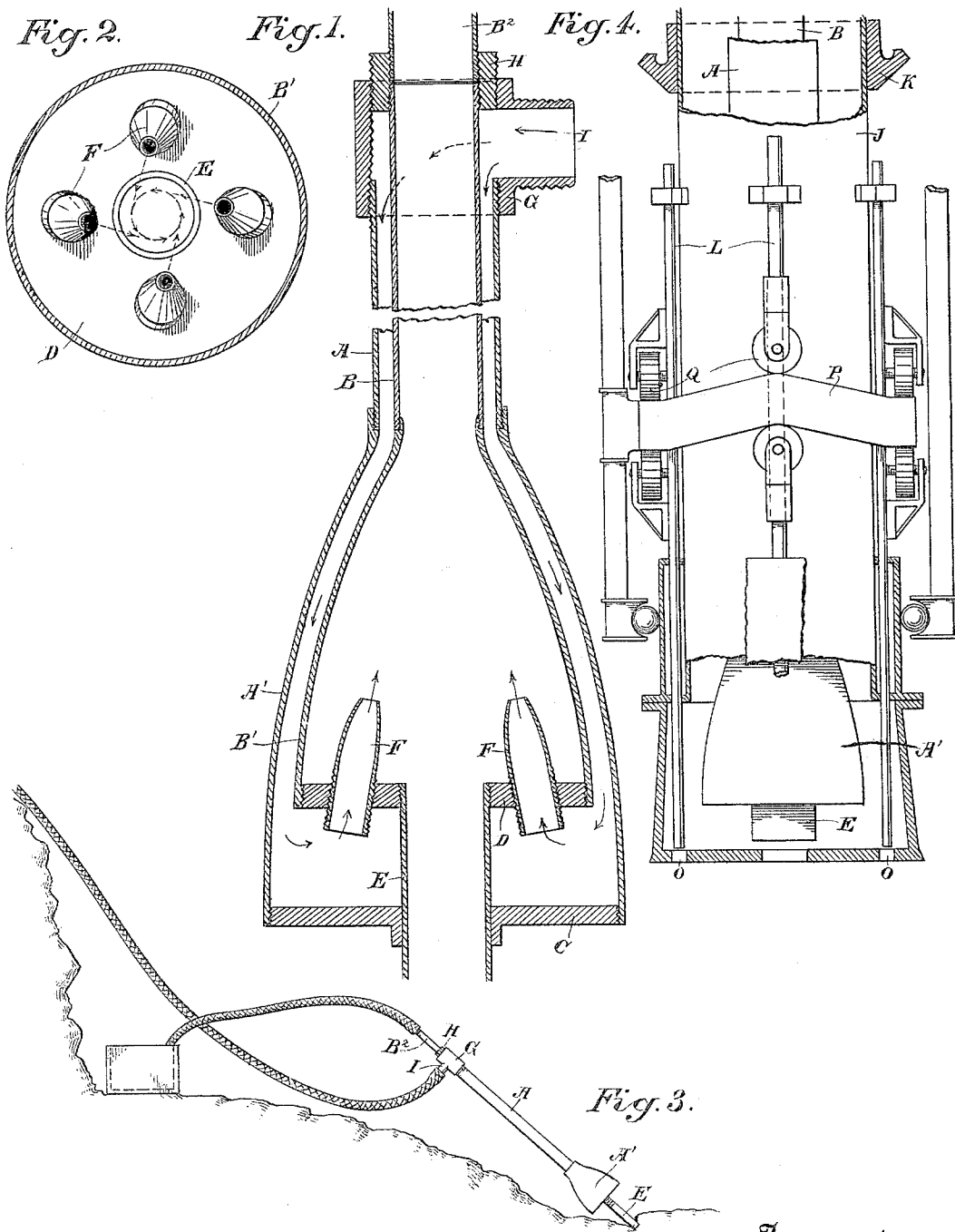
No. 640,463.

Patented Jan. 2, 1900.

P. J. GILDEA.
HYDRAULIC ELEVATOR.

(Application filed May 22, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

PETER J. GILDEA, OF SAN FRANCISCO, CALIFORNIA.

HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 640,463, dated January 2, 1900.

Application filed May 22, 1899. Serial No. 717,718. (No model.)

To all whom it may concern:

Be it known that I, PETER J. GILDEA, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Hydraulic Elevators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device which is especially designed for elevating sand and other material by the aid of jets of water introduced under pressure into the elevating-pipe.

The invention consists, essentially, in an arrangement of concentric pipes, the inner one of which serves as the conductor for the water and material to be elevated and the outer one is connected with the source of water-supply. The two pipes are enlarged to form chambers near the lower end, the inner one being shorter than the outer and having inclined jet-pipes diagonally arranged and discharging into the inner pipe, so that water from the outer chamber passing through these pipes produces a strong suction and pressure to elevate the sand.

My invention also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a sectional view of my apparatus. Fig. 2 is a top view of the nozzle-plate and nozzles. Fig. 3 shows its construction when operated by hand. Fig. 4 shows it when used in conjunction with driving power.

In the drawings, A is an outer and B the inner pipe. The diameter of these pipes is sufficiently different to form an annular chamber between the two. The lower part of the outer pipe is enlarged in any suitable manner. As at present shown it is made divergent conically and is shown at A', and the inner pipe is correspondingly diverged, as at B'.

The bottom of the outer pipe is closed, as shown at C, and the inner pipe is closed by a disk or bottom D. Through these two bottoms a suction-pipe E passes, terminating in the bottom of the inner cone B', as shown, and having a sufficiently-tight joint where it passes through the outer bottom C to prevent leakage of water which is admitted under pressure into the space between the bottoms

C and D. Through the annular bottom D holes are made, into which are secured the nozzles F. These nozzles may be of any number. I have found that six is a very convenient number, although it may be varied to suit conditions. These nozzles are so inserted as to incline toward the central line of the pipe B at or above its junction with the cone B', and they are also set on an angle with relation to the bottom D, so that the discharge ends are advanced diagonally with relation to the lower ends, and the tendency of this position is to produce a spiral and concentrated discharge of water into the pipe B, thus producing a strong suction and forcing power which first draws the sand or other material up through the suction-pipe E into the interior of the cone B', and the rotary whirling action produced by the diagonal discharge of the water from the nozzles is very effective in preventing the lodgment and packing of the material and in forcing it up through the pipe B to the proper point of discharge. The pipes A and B are continued up to any desired point, where they connect with a T-coupling G. The outer pipe A screws into one end of this coupling, and the inner pipe extends up through it and may be connected by a thimble H, fitted into the opposite end of the coupling, or by other suitable means, with a continuation of the inner pipe, as shown at B², so that the parts can be easily separated or assembled. The branch I of the T-coupling opens into the annular space between the tubes A and B, and it is connected with a source of supply through which water under high pressure or head is brought into the space between the two pipes, the water passing down between the two pipes and between the cones A and B and is delivered into the chamber between the bottoms C and D, and thence discharged upwardly through the pipes F, previously described. By this construction I am enabled to operate the device in deep water and in narrow places, between the rocks, and at points difficult of access, so as to draw up and discharge any sand or gold-bearing or other material which may be located at such points. When the device is of small diameter, it may be operated by hand, as shown in Fig. 2. If it is made large, it may be constructed as shown in Fig. 3 and used in conjunction with

an outer casing J, which is driven by power through a gear K.

Rods L extend downwardly through suitable guides and are caused to reciprocate through openings O at the bottom of the apparatus by means of a cam, as shown at P, acting upon roller or other bearings Q, which are journaled to the casing J, so that as the latter is rotated the stationary cam P acts to reciprocate the casing J, and the rods L are reciprocated through the holes O and constantly loosen up the sand or material which is being drawn in through the suction-pipe E, so as to prevent its packing and clogging.

Other devices for supplying water to the jet-pipes may be substituted without altering the character of the invention; but the general arrangement here shown has been found convenient and effective. Owing to its compact manner of construction it reduces the weight, so that it may be used in such places as wells, shafts, and sewers. The principal object of having the jets thus placed is to provide a straight and uniform carrying-pipe, and nozzles placed in such a position with relation to it will form a better vacuum and give better results for the water-power used. The manner of placing the nozzles allows the size and number to be changed at very little expense.

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

1. In a hydraulic elevator, the concentric tubes, one serving to admit water under pressure, and the other to conduct the material to be lifted, enlarged chambers at the lower ends of said tubes, a suction-pipe opening into the outer chamber, jet-pipes passing through the bottom of the inner chamber and discharging into the inner central elevating-tube.

2. In a hydraulic elevator, concentric tubes having enlarged chambers at the lower end and a space between the bottoms of the two

tubes, a suction-pipe connecting with the chamber between the two bottoms, jet-tubes fixed in the bottom of the inner chamber and converging toward the central line of the inner pipe, a connection with the outer pipe whereby water under pressure is delivered therein and forced through the jet-tubes.

3. In a hydraulic elevator, concentric pipes having enlargements at the lower end, and a chamber between the two bottoms connecting with the annular space between the pipes, a suction-pipe connecting with the bottom of the lower chamber, jet-tubes fixed in the inner bottom converging toward the center of the inner pipe and spirally disposed around its axis, a connection whereby water under pressure is admitted between the two pipes and conveyed to the chamber between the bottoms thereof, and a discharge-pipe extending in line with the inner pipe.

4. In a hydraulic elevator, concentric tubes, one of which serves to admit water under pressure and the other to conduct the material to be lifted, a suction and discharge pipe of uniform size and a plurality of jet-tubes disposed concentrically with relation to the discharge-pipe.

5. In a hydraulic elevator, concentric tubes, one of which serves to admit water under pressure and the other to conduct the material to be lifted, a suction and discharge pipe and a plurality of jet-tubes connecting with the water-supply tube and converging toward the center of the other tube, and having their discharge ends advanced diagonally with relation to the lower ends to impart substantially a rotary whirling action to the water discharged into the conducting-pipe.

In witness whereof I have hereunto set my hand.

PETER J. GILDEA.

Witnesses:

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GEO. H. STRONG.