

No. 669,192.

Patented Mar. 5, 1901.

J. C. WHISLER.
DREDGING APPARATUS.

(Application filed May 2, 1898. Renewed June 4, 1900.)

(No Model.)

Fig. 1.

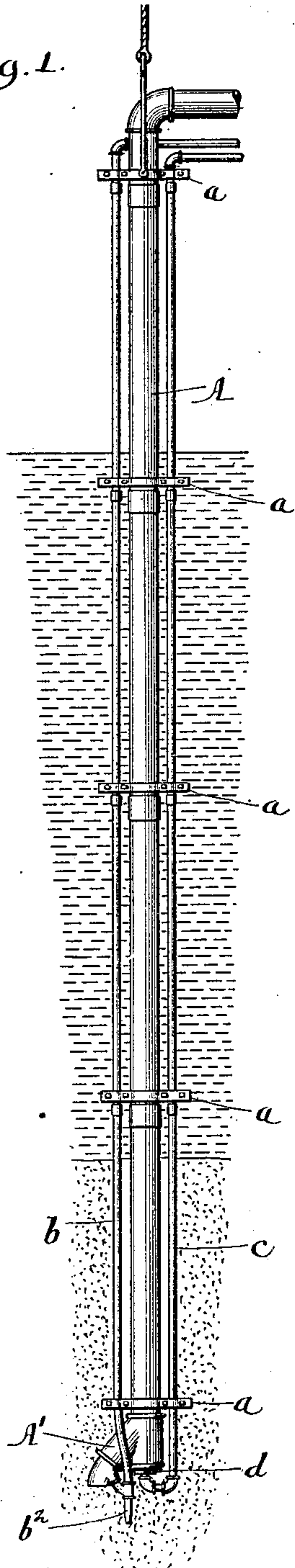
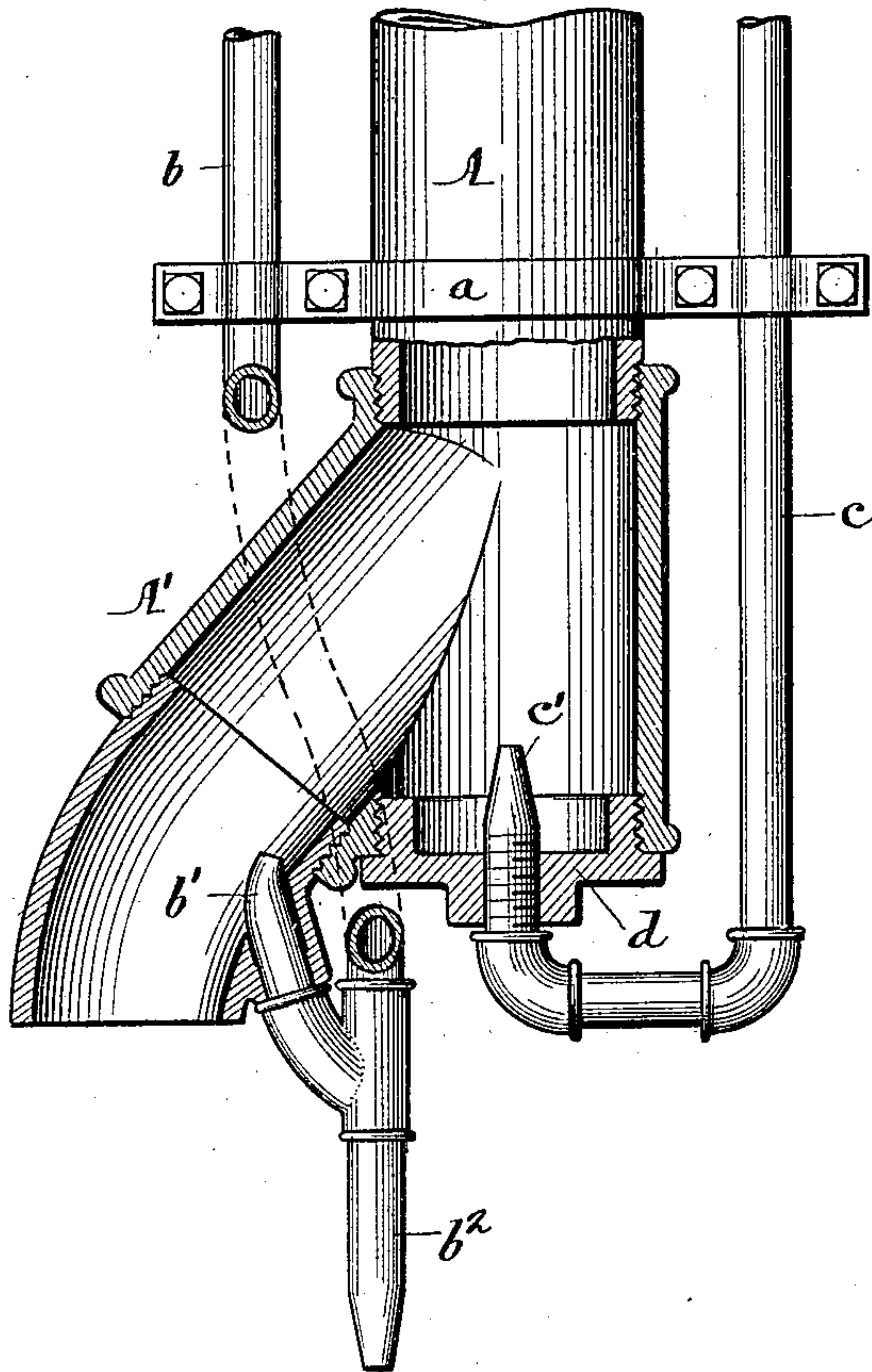


Fig. 2.



Witnesses:

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JOHN C. WHISLER, OF CHICAGO, ILLINOIS, ASSIGNOR TO JAMES P. COLE AND
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DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 669,192, dated March 5, 1901.

Application filed May 2, 1898. Renewed June 4, 1900. Serial No. 19,194. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. WHISLER, a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dredging Apparatus, of which I do declare the following to be a full, clear, and exact description, sufficient to enable others skilled in the art to make and use the same.

10 The invention relates to apparatus used for dredging submerged beds of alluvial silt, sand, or gravel, and it can be employed to advantage in penetrating several successive layers of deposit, as in working beneath placer-
15 streams, &c., until bed-rock is reached.

The invention designs to employ an upright main gangue-tube and in conjunction therewith a water-jet passage to dislodge and stir the silt from its bed, while a separate air-jet
20 passage is in action to draw the commingled water and solid materials into the gangue-tube at the mouth near its lower end and thereupon forcibly lift the mixture up through the main tube and out at the top.

25 On the drawings like parts bear like designation throughout.

Figure 1 is an elevation view of the improved device suitably suspended in position, as by rope and tackle, from the swinging boom
30 of a boat; Fig. 2, a central longitudinal section at the foot of this gangue-tube.

Gangue-tube A consists of several sections threaded or otherwise fastened to constitute a closed passage leading from the bed of de-
35 posit to an outlet-point overhead, above the surface of the water. As the apparatus penetrates farther and farther into the bed additional sections can be united to tube A, if necessary, to allow for the increased depth.

40 Semicircular clamps *a* embrace the tube A at convenient distance apart and on bolting together serve to clasp by opposite terminals the water-pipe *b* and air-pipe *c*. The pipes afford passage external to gangue-tube A, and, as heretofore shown, said pipes extend
45 the length of the gangue-tube and by suitable connections are united overhead with the sources of supply, the air being stored in a reservoir under desired pressure—*e. g.*,
50 seventy to one hundred and fifty pounds—

while the water is in general delivered directly from a force-pump into pipe *b*.

Through a nipple *d* on the lower end of tube A extends the jet-terminal *c'* for air-pipe *c*. The jet opens into tube A and acts
55 in ejector-like fashion against the body of water and suspended stuff to force the mixed material up the gangue-tube A and out at the top. The jet also serves to draw into tube A by lateral branch A' additional sup-
60 plies of water and solid material derived from the adjacent bed.

Water-pipe *b* has companion jet-terminals *b'* *b''*. One of these, as at *b*, projects through the branch A' for the gangue-tube and sup-
65 plements the delivery of the water, sand, &c., so that the mixture is directed into position to encounter the air-jet. The water-supply which issues at jet *b'* is discharged at rapid
70 intervals—*e. g.*, at one hundred to two hundred pounds pressure—under influence of the force-pump, and thus serves to impact the air into successive portions alternating in measure with the detritus. The water being
75 projected from jet *b'* in energetic streams at quick succession prevents the air from downward expansion and by its hammer-like effect compels the air to rise somewhat as a piston, carrying the detritus along with it in watery
80 suspension.

By trapping the air in manner detailed, through the medium of a force-pump water-jet, the frictional resistance along the gangue-tube is markedly lessened owing to the
85 elasticity of the confined air. Something of the same effect ensues if the water at jet B' proceeds from a storage-tank rather than from the direct-acting pump; but the result is distinctly inferior and the use of the storage-tank is not to be preferred. The other
90 terminal *b''* of the water-jet extends beneath the main gangue-tube A and serves as a "teaser" or leader jet to loosen and scatter the deposit in advance of the progressive descent of the main tube. If the descent be
95 arrested at any position, it is obvious that leader-jet *b''* soon clears a space, and by swinging the suspension-boom overhead from time to time the dredge can be advanced against
100 new portions of the deposit existing at like

depth. On the other hand, with the teaser-jet b^2 in action the dredge can be driven directly through successive beds from depth to depth, as may often be requisite in prospecting along submerged bottoms.

Should the pipes or tubes become clogged, an increase in pressure at the sources of supply will generally suffice to clear out the obstruction.

Obviously the details can be varied by the mechanic's skill without departure from essentials of the advance.

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

1. In dredging apparatus, the combination with the main tube, of the upward air-jet discharging therein to near its lower end and a separate water-jet suitably projected to impact the air at rapid intervals within the tube against downward expansion and compel it to rise with the suspended gangue through the main tube, substantially as described.

2. In dredging apparatus, the combination with the suspended gangue-tube projecting

into the submerged deposits, of the air pipe or passage having an upward discharge-jet near the lower end thereof and a separate water pipe or passage opening jet-like into said tube beneath the air-discharge to impact the air and force it upward together with the water and suspended solids, substantially as described.

3. In dredging apparatus, the combination with the suspended gangue-tube projecting into the submerged deposits, of the air pipe or passage having an upward discharge-jet near the lower end thereof, and a separate water pipe or passage furnished with a leader-jet beneath the gangue-tube and with an impact-jet emerging into said tube below the air-inlet to confine the air against downward expansion and force it toward the mouth of the tube along with the water and suspended solids, substantially as described.

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Witnesses:

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