No. 658,922. Patented Oct. 2, 1900.

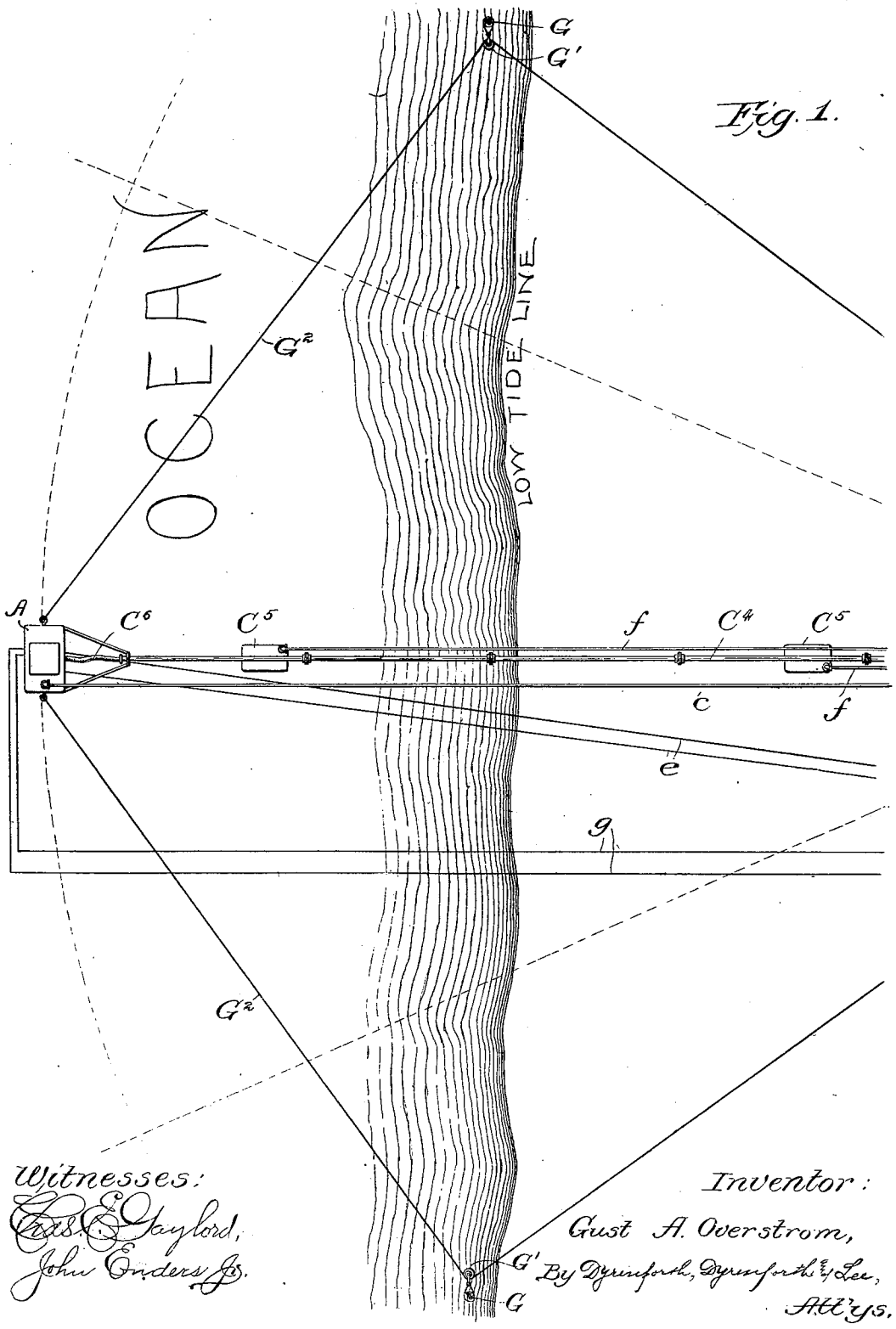
G. A. OVERSTROM.

SUBMARINE DREDGE.

(Application filed Apr. 21, 1900.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



Witnesses:
Chas. E. Gaylord,
John Enders, Jr.

Inventor:
Gust A. Overstrom,
By Dyrenforth, Dyrenforth & Lee,
Att'ys.

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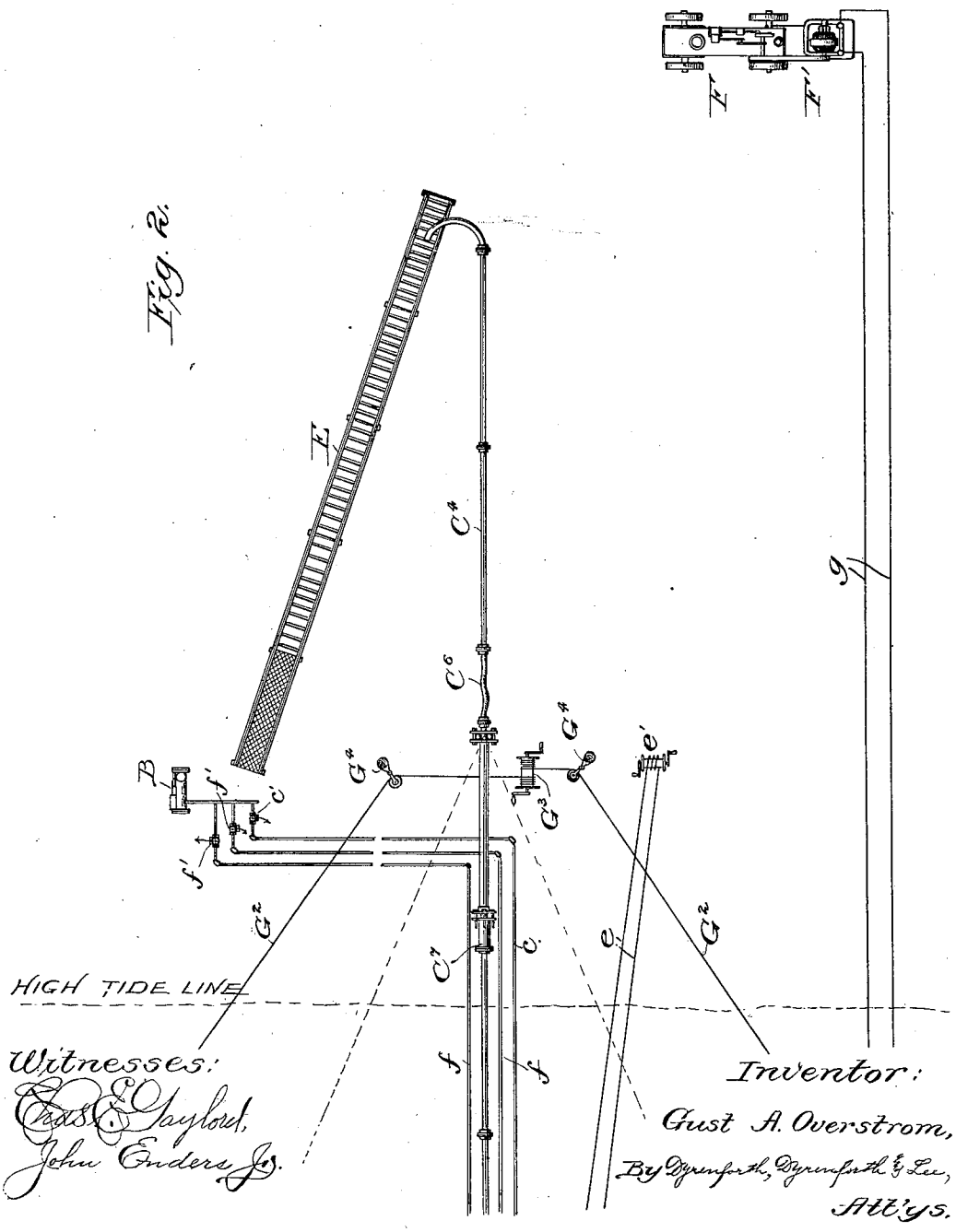
SUBMARINE DREDGE.

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Fig. 2.



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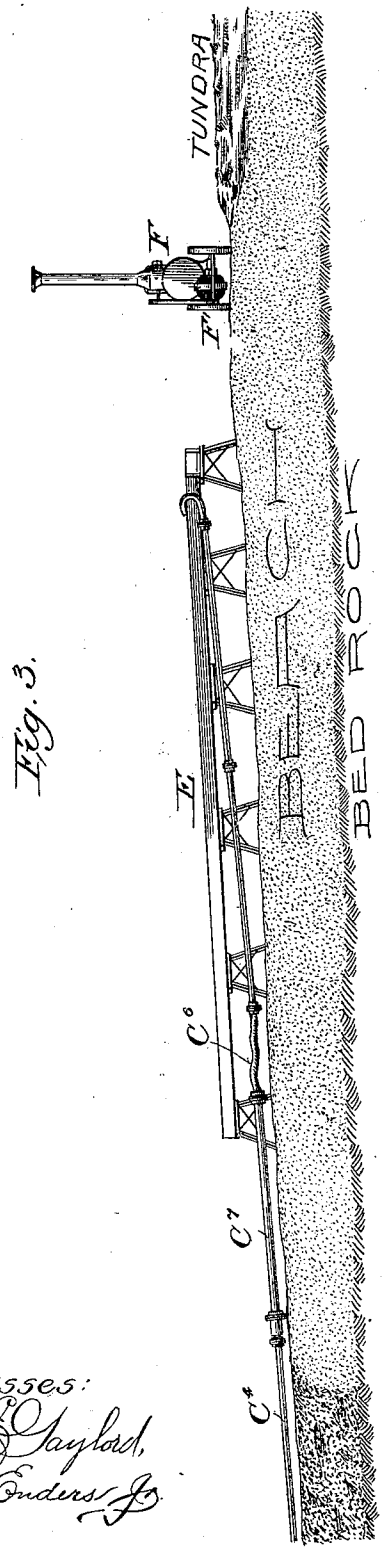


Fig. 3.

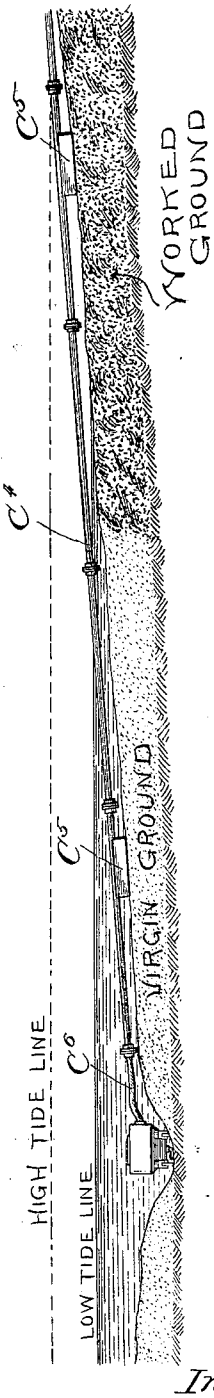


Fig. 4.

Witnesses:
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(No Model.) 4 Sheets—Sheet 4.

Fig. 5.

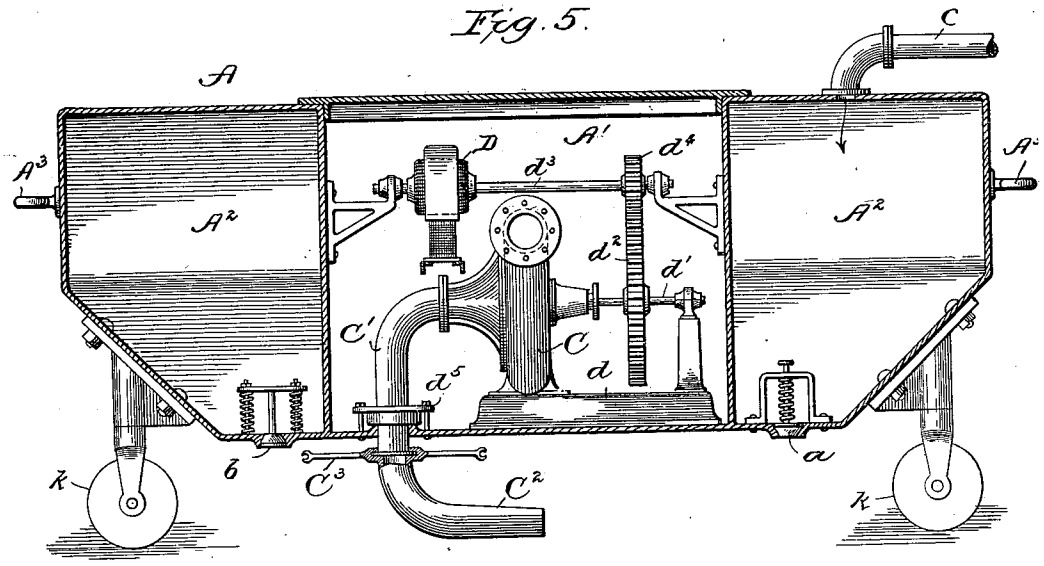
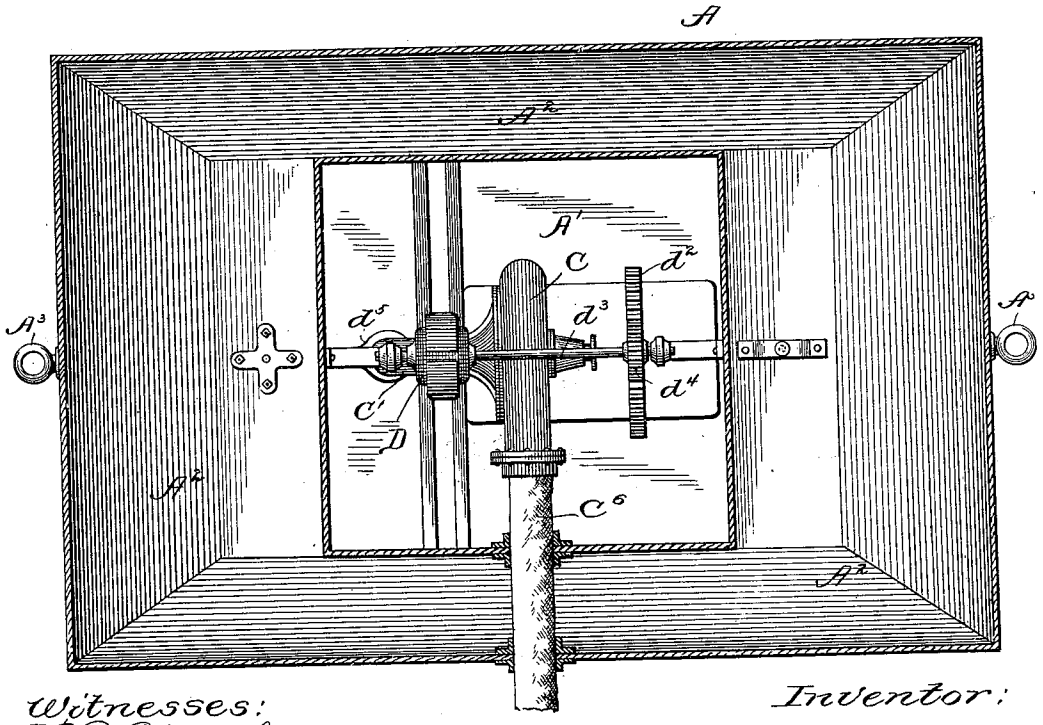


Fig. 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

GUST A. OVERSTROM, OF DEER LODGE, MONTANA, ASSIGNOR OF ONE-HALF TO J. P. HANSON, OF BUTTE, MONTANA.

SUBMARINE DREDGE.

SPECIFICATION forming part of Letters Patent No. 658,922, dated October 2, 1900.

Application filed April 21, 1900. Serial No. 13,697. (No model.)

To all whom it may concern:

Be it known that I, GUST A. OVERSTROM, a citizen of the United States, residing at Deer Lodge, in the county of Deer Lodge and State of Montana, have invented a new and useful Improvement in Submarine Dredges, of which the following is a specification.

My invention relates to improved submarine dredging mechanism for use in raising and delivering to the shore submerged beach-sand and fine gravel adjacent thereto.

My invention is adapted more especially for dredging gold-bearing beach-sands and delivering them to gold-saving apparatus on the shore, and is intended particularly for use in places where conditions render the employment of floating dredges impracticable. At Cape Nome, Alaska, for example, beach-sands rich in gold extend from the edge of the tundra or frozen lands some distance—say two hundred to two hundred and fifty feet—out beyond the low-tide line, and while these beach-sands have been worked at great profit from the tundra to the line of low tide no successful means have, so far as I am aware, been devised for dredging the submerged sands, for the reason, more especially, that no floating dredge or other above-water apparatus can be made to withstand the destructive effect of the heavy surf and tide-waves.

My object is to provide dredging apparatus of novel and generally-improved construction which may be operated effectively, economically, and without danger of injury to the apparatus at Cape Nome or wherever like conditions may exist to raise and deposit upon the shore the submerged gold-bearing beach-sands.

In carrying out my invention I provide, generally stated, a hydraulic suction and force pump and operating-motor therefor mounted on a support, which is preferably a controllable float device. Suitable pipe connections extend from the float device to an air-compressor on the shore, whereby the float device and machinery carried thereby may be caused to rise and descend or float at any desired depth below the surface of the water. A suitable discharge-pipe extends from the hydraulic pump to the shore, where it discharges into suitable gold-saving apparatus. The hydraulic pump-operating motor may be of any suitable type, either electric, pneumatic, or otherwise, though I prefer to provide an electric motor operated from a dynamo on the shore. Means are also provided to be operated from the shore for moving the support or float device and machinery carried thereby, with its pipe connections, over a large area of the ground to be worked.

In the accompanying drawings I have shown my improved apparatus in the form I prefer to provide, the illustrations showing it in operative position on a beach having the characteristics of the Cape Nome formation.

Figure 1 is a broken diagrammatic view of the outer portion of the apparatus, and Fig. 2 a similar view of the rest of the apparatus, the views being taken together to represent the whole; Figs. 3 and 4, central longitudinal sections of Figs. 2 and 1, respectively; Fig. 5, a vertical section taken longitudinally through the float device and showing its compartments and the motor and hydraulic pump, and Fig. 6 a plan section of the float device.

A is a float device which I prefer to construct, as shown, with a central air-tight compartment A′ the full height of the device, surrounded on four sides by an outer air-tight compartment A^2. In the lower side of the compartment A^2 are a water-inlet valve *a* and a water-outlet valve *b*, both provided with spring-seating means, as shown. Extending from the top of the compartment A^2 is an air supply and exhaust pipe *c*, running to the shore and there connecting with an air-compressor B. Interposed in the pipe *c* is an air supply and exhaust cock *c*′.

In the compartment A′ is a centrifugal hydraulic pump C, which may be operated to run at a high speed and capable of raising and discharging the beach-sands with force sufficient to prevent the leaving behind of the heavier particles and nuggets of gold. The pump may be of any suitable type. In the construction shown it has a base *d* and a drive-shaft *d*′, carrying a gear-wheel d^2. Also mounted in the compartment A′ is an electric motor D, having an armature-shaft d^3, carrying a pinion d^4 in mesh with the gear-wheel d^2. The suction-pipe C′ of the pump extends through a water-tight joint d^5 in the base of

the compartment, and swiveled to its outer end is a bent suction-nozzle C^2. On the nozzle C^2 at the swiveled joint is a wheel C^3, to which is fastened operating-cables *e*. The cables *e* extend to a windlass *e'* on the shore. By pulling upon one or the other of the cables *e* the operator on shore may turn the nozzle C^2 in a circle in the horizontal plane. C^4 is the delivery-pipe of the pump extending to the shore and there emptying into the gold-saving device E, which may be a sluice-box, as shown. Fastened at intervals along the pipe C^4 are suitable floats C^5, which may be air-tight cylinders communicating, if desired, through pipes *f* with the compressor B on the shore. Interposed in the pipes *f* are air supply and exhaust cocks *f'*. The connection between the pipe C^4 and pump is through a length of flexible hose C^6, and in order that the pipe may be moved to different angles without disturbing its position at the sluice-box another length of flexible hose C^6 is interposed therein on shore. Also interposed in the pipe upon the shore is a suitable expansion-joint C^7, whereby the pipe may be readily lengthened and shortened the extent of one length. On the shore is a portable steam-engine F and dynamo F', insulated wires *g* extending from the dynamo to the motor D. Securely anchored at opposite edges of the working ground are snub-posts G, to which are secured pulleys or snatch-blocks G'. Cables G^2 are fastened to the handles A^3 on opposite ends of the float device and run through the snatch-blocks G' to a windlass G^3 on the shore. Adjacent to the windlass G^3 are snub-posts and snatch-blocks G^4 for guiding the cable. The air-supply pipes *c f* may consist of lengths of gas-pipe and interposed lengths of flexible hose, whereby they may be readily lengthened and shortened and turned to different angles.

The apparatus may be placed in position in the general manner indicated in the figures. The compartment A^2 of the float device is filled with air under pressure, so that it will float and be easily placed in a desired initial position, the pipe-floats C^5 being also charged with compressed air to raise the pipe C^4 and permit its ready adjustment. Air is then caused by the manipulation of the cocks *c' f'* to exhaust to the desired extent from the floats to decrease their displacement and allow the pipe C^4 and float device A to settle gently down upon the beach-sand. As the air is permitted to escape from the float device water enters the compartment A^2 through the valve *a* until the desired displacement is effected. When it is desired to raise the float device, air under pressure is let into the chamber A^2 to force the water out through the valve *b*. The pipe-floats may be provided with inlet and outlet valves like the valves *a b*, or, if desired, they may be simply air-tight vessels which prevent the pipe from setting too heavily upon the sand. When the motor and pump are started, the sand and water are drawn through the suction-nozzle C^2 and discharged through the pipe C^4 into the sluice-box E. Gradually the float device is allowed to settle down to the bed-rock and the nozzle is turned by means of the cable *e* to sweep around as desired and draw in its supply at different angles, and thus from a comparatively large area.

The depth to which the float device is sunk renders it comparatively free from the disturbing action of the surf and tide-waves, it being also protected to a material extent by the wall of sand against which it is operated. The pipes extending in the outward direction from the shore present but little surface to the action of the surf and waves and the floats operate to sustain it sufficiently to permit it to be easily shifted as desired. The cables G^2 and pipes all tend to steady the float device in its operative position, and by means of the cables G^2 the float device may be moved back and forth across the working ground, as desired. To render the matter of moving the float more easy, it may be mounted on casters *k*, as shown.

In practice the end of the nozzle C^2 would be but about two feet below the intake of the pump, so that the force of the suction would easily raise quite heavy particles of gold and the force of the discharge would be sufficient to carry such particles to the shore. Were the pump located upon shore at the necessary elevation it would be impossible to obtain a current under suction force sufficient to raise coarse particles of gold from the submerged bed-rock.

While I have shown the details of my improved apparatus in the form in which I now prefer to provide them, it is obvious that they may be variously changed to suit requirements without departing from the spirit of my invention as defined by the claims.

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

1. In a submarine dredge, the combination of a submerged support, a suction and force pump and an operating-motor therefor on the support, a delivery-pipe extending from said pump to the shore, and means for moving the submerged support with the pipe across the ground to be worked.

2. In a submarine dredge, the combination of a submerged support, a suction and force pump and an operating-motor therefor on the support, a delivery-pipe extending from the said pump to the shore, and means connected with the support and extending to the shore for moving the submerged support with the pipe across the ground to be worked.

3. In a submarine dredge, the combination of a submerged support, a suction and force pump and an operating-motor therefor on the support, a delivery-pipe, provided with an

interposed flexible length, extending from said pump to the shore, and means for moving the submerged support with the pipe across the ground to be worked.

4. In a submarine dredge, the combination of a submerged support, a suction and force pump and an operating-motor therefor on the support, a delivery-pipe, extending from the said pump to the shore, provided with interposed flexible and expansible lengths, and means for moving the submerged support with the pipe across the ground to be worked.

5. In a submarine dredging apparatus, the combination of pulleys anchored at opposite edges of the ground to be worked, a submerged support, a suction and force pump, and an operating-motor therefor on the support, a delivery-pipe extending from the said pump to the shore, and cables connected with the support and extending over said pulleys to the shore, for the purpose set forth.

6. In a submarine dredge, the combination of a float device, a suction and force pump and an operating-motor therefor on the float device, a delivery-pipe extending from the pump to the shore, and means for increasing and diminishing the displacement of the float device at will.

7. In a submarine dredge, the combination of a float device formed with an air-tight compartment having water inlet and outlet valves, a compressed-air supplier communicating with said compartment and operating to let water in or force it out of said compartment, to increase or diminish the displacement of the float, a suction and force pump and an operating-motor therefor on the float device, and a delivery-pipe extending from the pump to the shore.

8. In a submarine dredge, the combination of a float device, a suction and force pump and an operating-motor therefor on the float device, a delivery-pipe extending from the pump to the shore, means for increasing and diminishing the displacement of the float device at will, and means upon the shore connected with the float device for moving said device while submerged and with the delivery-pipe across the ground to be worked.

9. In a submarine dredge, the combination of a float device, a suction and force pump and an operating-motor therefor on the float device, a delivery-pipe extending from the pump to the shore, floats connected with the pipe, and means for increasing and diminishing the displacement of the float device at will.

10. In a submarine dredge, the combination of a submerged support, a suction and force pump and an operating-motor therefor on the support, a suction-nozzle for the pump pivotally mounted upon the support and extending beneath the same, means connected with said nozzle and extending to the shore for turning the nozzle, and a delivery-pipe extending from the pump to the shore.

GUST A. OVERSTROM.

In presence of—
M. D. KERN,
C. M. SAWYER.