

No. 755,728.

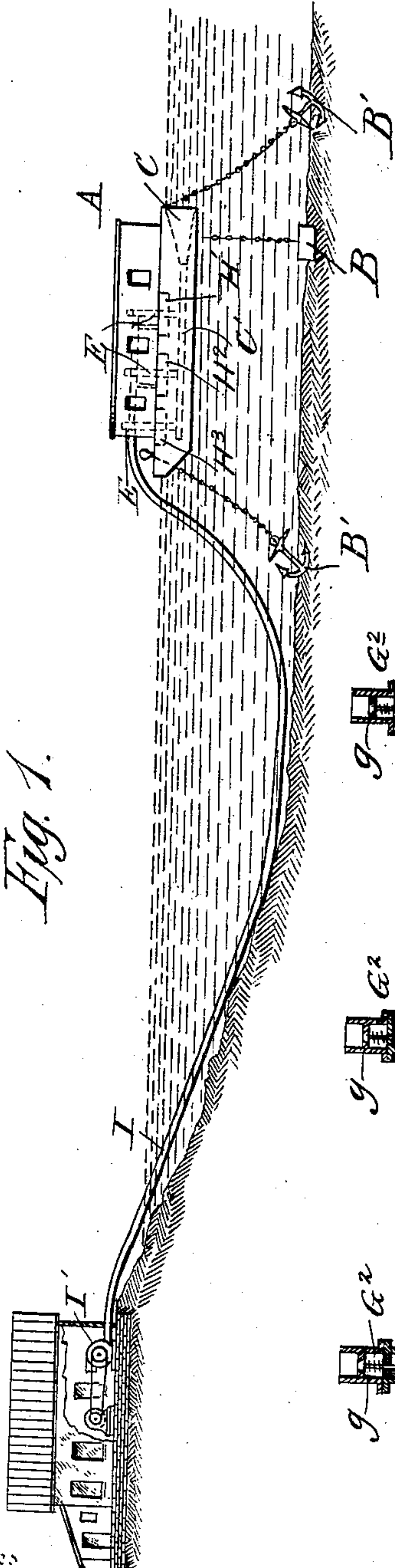
PATENTED MAR. 29, 1904.

D. G. WEEMS.
WAVE MOTOR.

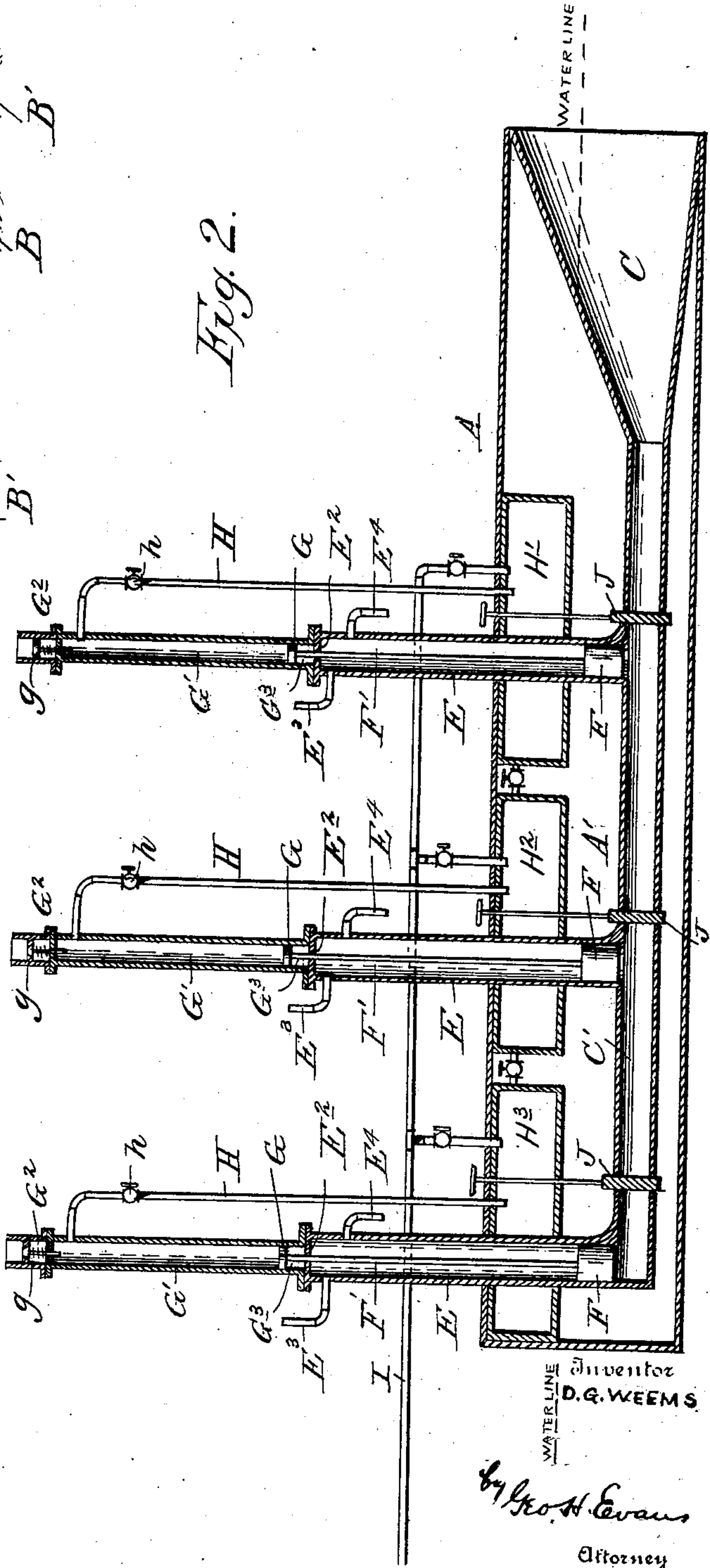
APPLICATION FILED JAN. 6, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
F. L. Oursand
G. M. Coppenhaver



Inventor
D. G. WEEMS
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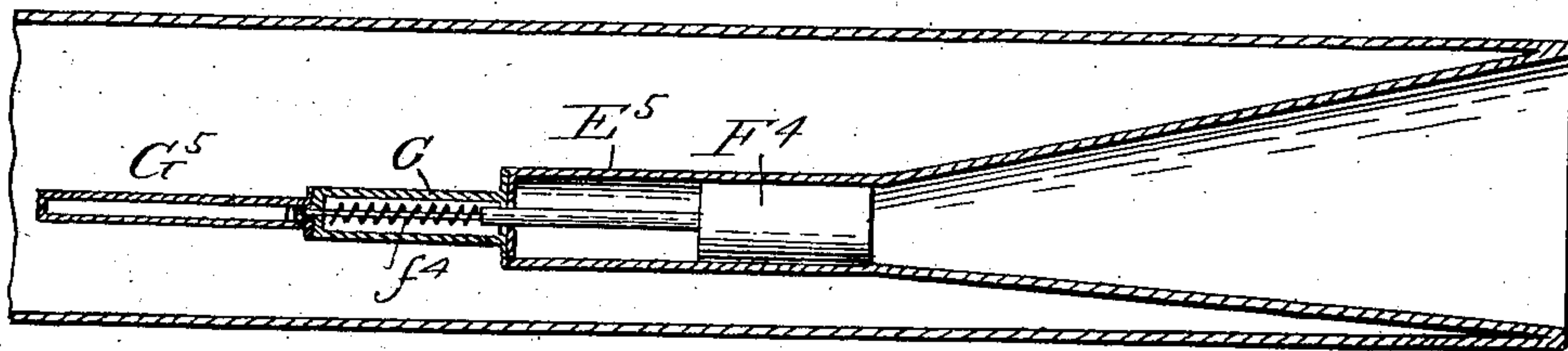
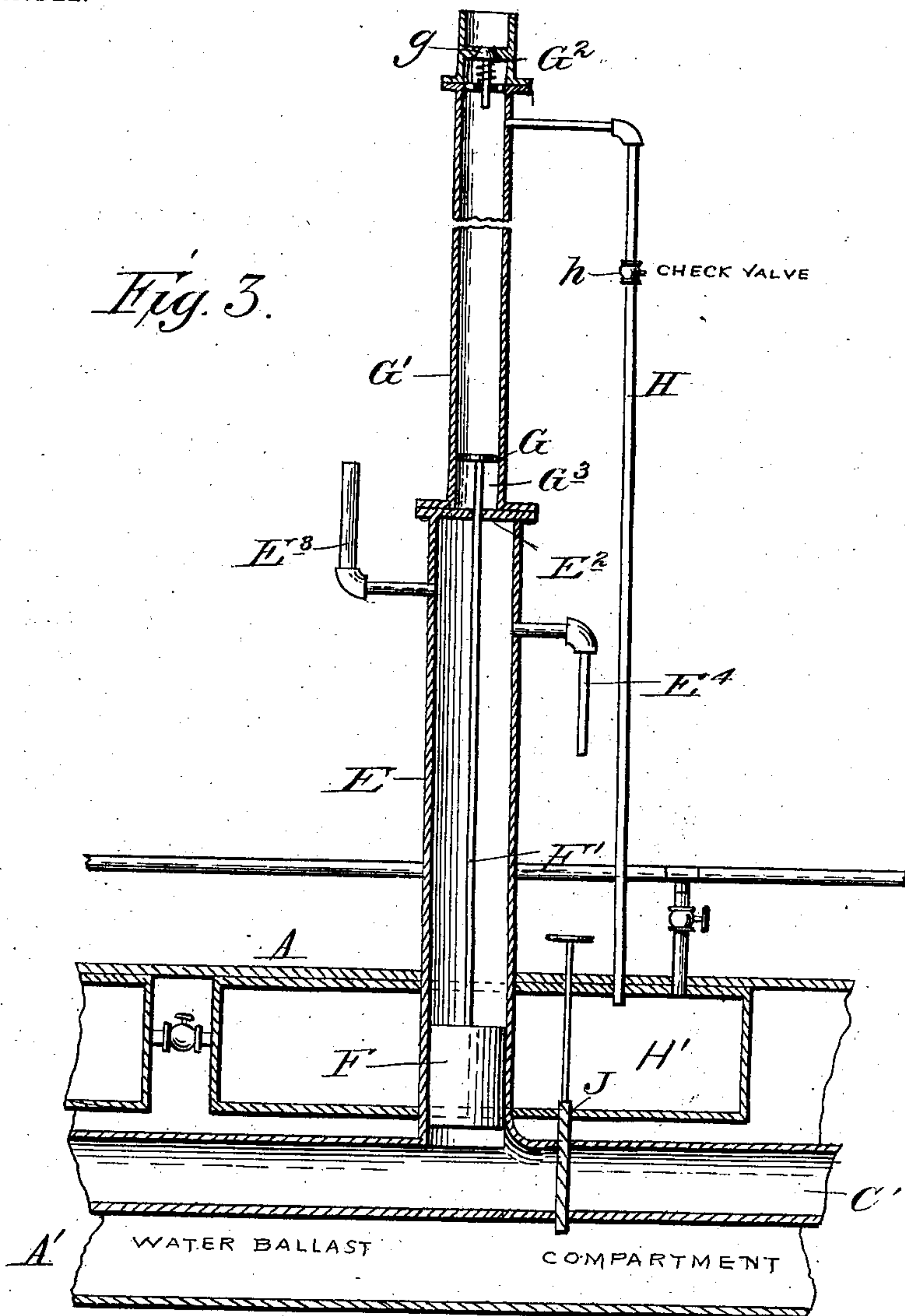
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WITNESSES:

F. L. Oviand

G. M. Copenhagen

Fig 4.

INVENTOR:

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UNITED STATES PATENT OFFICE.

DAVID G. WEEMS, OF BONANZA, COLORADO.

WAVE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 755,728, dated March 29, 1904.

Application filed January 6, 1904. Serial No. 187,923. (No model.)

To all whom it may concern:

Be it known that I, DAVID G. WEEMS, a citizen of the United States, residing at Bonanza, Saguache county, State of Colorado, have invented Improvements in Wave-Motors, of which the following is a specification.

My invention relates to that class of motors commonly called "wave-motors."

The objects of the invention are to provide a simple and efficient motor of the class described, to provide a novel form of float or vessel for the various parts of the apparatus, to provide the float with a horizontally-disposed flaring mouth for the entrance and concentration of the waves, and to provide a pipe or series of pipes at the rear end of said flaring mouth in which is or are mounted a plunger or plungers, forming the actuating means of an air-compressor mechanism for operating a suitable compressed-air motor located on the vessel or float or on the shore, as may be desired, also to provide valves to regulate the admission of the wave-power to any desired number of plungers. These and other objects I accomplish by the construction shown in the accompanying drawings, in which—

Figure 1 shows a cross-section of the sea and adjoining shore with a vessel provided with my improvements and anchored in place. Fig. 2 is an enlarged vertical longitudinal section through my improved vessel and air-compressing mechanism. Fig. 3 is an enlarged vertical section through one of the tubes, plungers, and air-compressors. Fig. 4 is a view of a modification in which the plunger is arranged to work horizontally instead of vertically.

A designates a float or vessel in the form of a scow or pontoon and having one or more water-ballast compartments A' to enable the vessel to be submerged to the desired extent, preferably that shown in Fig. 2. The front end of the vessel A is held from up-and-down movement by one or more heavy anchors B and from lateral shifting by the other anchors B' B'. The vessel is constructed with a horizontally-disposed flaring mouth or funnel C, from the rear smaller end of which extends a horizontal pipe C', with which communicate the lower open ends of a plurality of vertical

tubes or cylinders E. From every plunger a piston-rod F' extends, carrying on its upper end the piston G of an air-compressing pump G'. These air-pumps G' are formed of cylinders of smaller diameter than the plunger-cylinders and may be double acting or single acting, as may be desired. The closed upper ends E² of the plunger-cylinders form air-cushions for the upper ends of the plungers in case they are thrown suddenly upward, while just below the air-cushion every cylinder E has an air-inlet pipe E³ to prevent the forming of a vacuum above the plunger and allow it to descend.

E⁴ is a water-discharge pipe for any water that may get above the plungers.

In the closed upper end of the pump-cylinder G' is an air-cushion G², and a similar cushion G³ is formed in its lower end, so that the sudden rise and fall of the piston G will be cushioned. Air is supplied to the pump-cylinder G' through a check-valve g and is discharged through a pipe H, having a check-valve h. The air from the first pump is carried by a pipe H to a high-pressure tank H', and the air from the other pumps is carried to other tanks H² H³. These tanks are connected with the supply-pipe I of a pneumatic motor I', located, preferably, in the powerhouse I² on shore. The motor I' may be used to drive an electric generator or any other machinery or apparatus as occasion may require. If desired, the pneumatic motor may be placed on the vessel with a generator and the electric current carried to the shore. A gate-valve J is placed in horizontal pipe C' in front of each plunger-cylinder E, so that the water may be shut off from all the plungers by closing the front valve or from the other plungers by closing the other valves.

If desired, the plungers and pumps may work horizontally, as in Fig. 4, where the plunger F⁴ works in the horizontal cylinder E⁵, communicating with the rear contracted end of funnel C, and the air-pump G⁵ is in line with the cylinder E⁵. The plunger F⁴ is returned to its forward position by spring f⁴.

The operation, briefly stated, is as follows: The waves enter the funnel-like mouth and

the water passes with great force against the plungers, which are forced thereby, together with the pump-plungers, in a direction to compress the air drawn in on the downstroke and force it out through the pipes H to the tanks or reservoirs, from which it may be taken as desired for operating machinery, to generate electricity, &c. The pressure of the water in passing to the series of plungers is distributed among them, and the sudden rush of water does not have to be borne by any one of them, though by means of the gate-valves the pressure may be all given to one of the pumping mechanisms where the force of the waves is not too great.

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

1. The combination with a vessel having a flaring open mouth and a tube or cylinder communicating with the small end thereof, of a plunger mounted in said tube for operation by the waves, and a transmitting device connecting the plunger with the device to be operated.

2. The combination with a floating vessel, having a flaring open mouth and a tube or cylinder communicating with the small end thereof, of a plunger mounted in said tube or cylinder and an air-pump the piston of which is connected to said plunger.

3. The combination with a floating vessel having an open flaring mouth, and a horizontal pipe at the small end thereof, of a vertical tube or cylinder communicating at its lower end with said horizontal tube, an air-pump cylinder on the upper end of the plunger-cylinder, and a rod connecting the plunger with the pump-piston.

4. In combination with a floating vessel having one end constructed with a flaring, open mouth, the small end connected with horizontal pipe, an upright tube-well leading from said pipe, a plunger mounted therein, and an air-pump actuated by said plunger, the upper end of the tube-well being provided with an air-cushion chamber, to cushion the upstroke of the plunger.

5. In combination with a floating vessel one end constructed with an open mouth and one or more upright tube-wells, communicating

therewith, of plungers in said tube-wells, and water-tight ballast-compartments in the vessel to regulate the relation of the said open mouth to the water-line.

6. In combination with a floating vessel one end constructed with an open mouth, and the upright tube-wells, of plungers in the tube-wells, air-pumps operated by said plungers, and storage-tanks on board for the storage of compressed air from the pumps.

7. In combination with a floating vessel having one end constructed with an open mouth and one or more upright well-tubes communicating therewith, plungers in the tubes, air-pumps operated by the plungers and the gate-valves shutting off one or more of these tube-wells.

8. In combination with a floating vessel constructed with an open mouth at one end, and the upright tube-wells connected in series therewith, of the plungers in the tubes and connected with the mechanism to be operated, the vessel being anchored by heavy weights so as to allow the waves to break into the said open mouth.

9. In combination with a floating vessel constructed at one end with an open mouth and the upright pipe-wells, of the plungers, the air-pumps operated thereby, the upper and lower ends of the air-pumps being provided with a cap or air-cushion receiving the pump-piston on the upward and downward strokes.

10. A wave-power mechanism comprising, a floating vessel having in one end a flaring mouth, a horizontal tube communicating with the small end thereof, vertical tube-wells opening at their lower ends into said horizontal pipes and a valve in the horizontal pipe in advance of every tube-well, of plungers in the tube-wells, air-pumps at the upper ends of the tube-wells and having their piston-rods extending down to and connected with the plungers, and air-tanks on the vessel having valved communication with the several air-pumps.

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

DAVID G. WEEMS.

Witnesses:

J. S. SUNNERMÜLLER,
JOHN SCHMALL.