P. SANDER.

APPARATUS FOR ACTUATING WATER MOTORS.

APPLICATION FILED OCT. 18, 1911.

1,029,030.

Patented June 11, 1912.

2 SHEETS—SHEET 1.

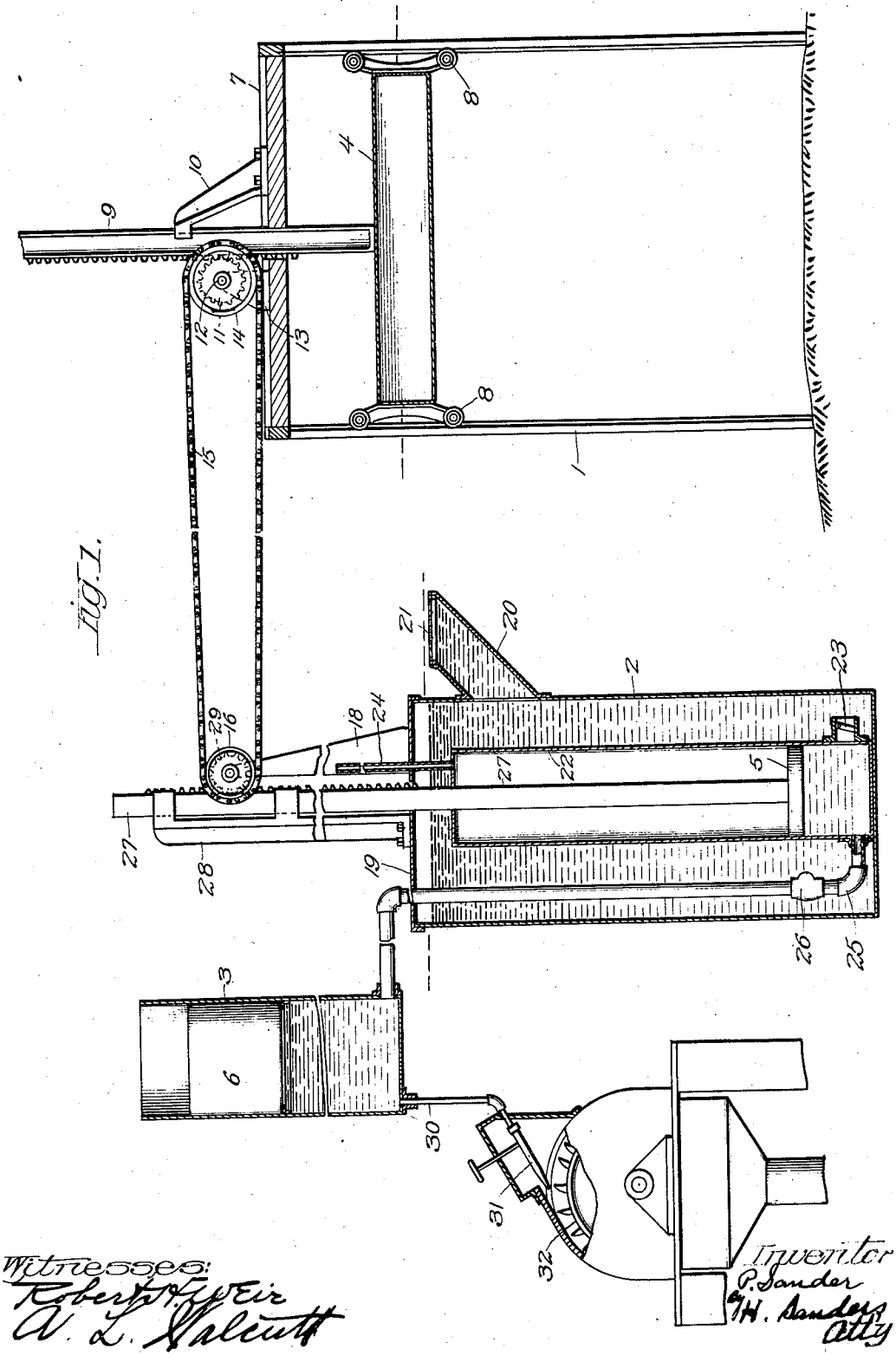

Fig. 1.

Witnesses:
Robert F. Fleet
A. L. Walcutt

Inventor
P. Sander
by H. Sanders
Atty

P. SANDER.

APPARATUS FOR ACTUATING WATER MOTORS.

APPLICATION FILED OCT. 18, 1911.

1,029,030.

Patented June 11, 1912.

2 SHEETS—SHEET 2.

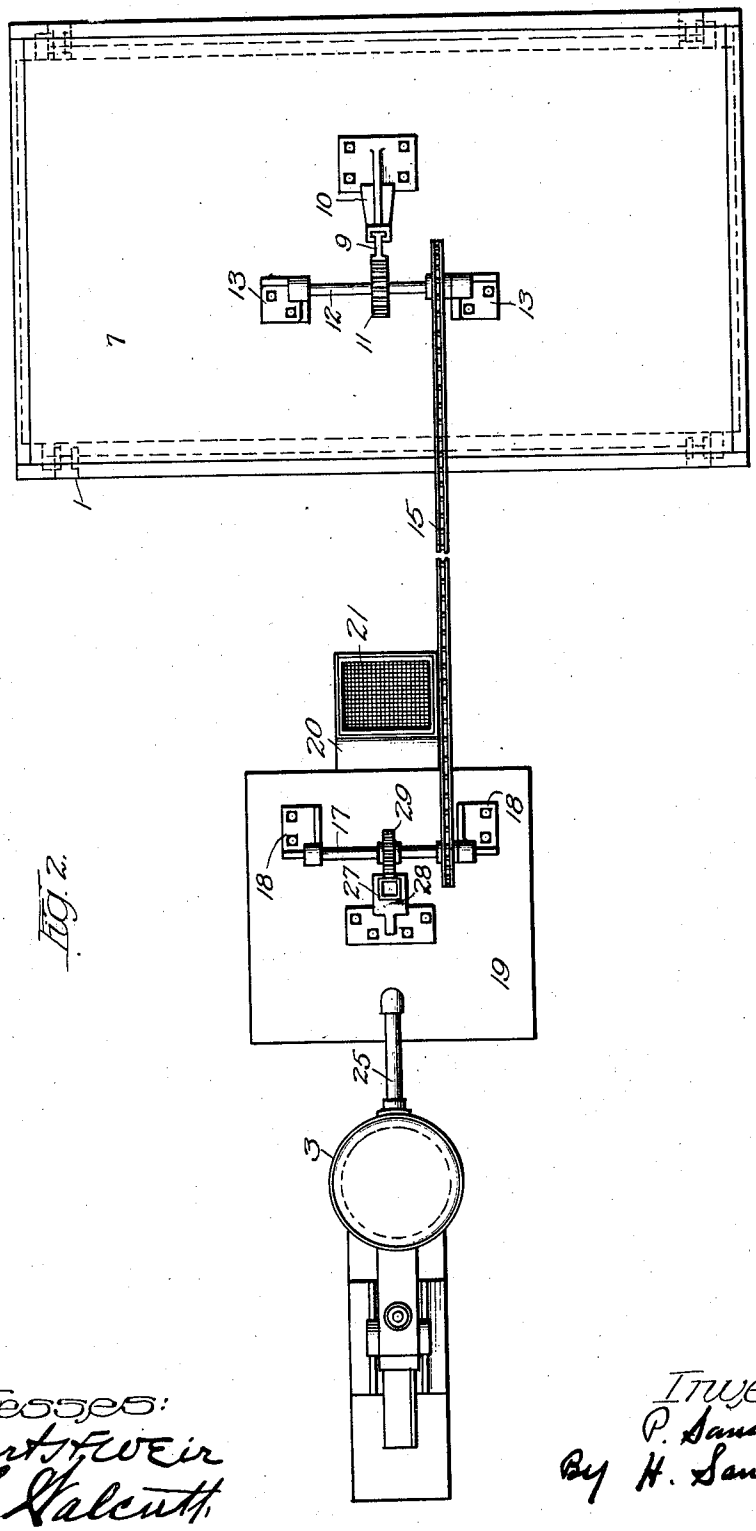

Fig. 2.

Witnesses:
Robert F. Weir
A. L. Walcutt.

Inventor
P. Sander
By H. Sanders
Atty.

UNITED STATES PATENT OFFICE.

PETRUS SANDER, OF MOLINE, ILLINOIS.

APPARATUS FOR ACTUATING WATER-MOTORS.

1,029,030. Specification of Letters Patent. Patented June 11, 1912.

Application filed October 18, 1911. Serial No. 655,280.

To all whom it may concern.

Be it known that I, PETRUS SANDER, a citizen of Sweden, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Apparatus for Actuating Water-Motors, of which the following is a specification.

This invention relates to improvements in apparatus for actuating water motors and more particularly to that class of water motors designed for intermittent motion wherein the motive power is the rising tide of the sea.

My apparatus consists of three floats each occupying a separate chamber. Two of the chambers are in communication with the sea at such a depth as to be nearly but not entirely submerged at high tide and the third is positioned entirely above the water line.

The object of the invention is to produce a device of this class that is cheap to manufacture and that is easy to construct.

With the foregoing and other objects in view the invention consists in the combination and arrangement of parts to be hereinafter fully described in the following specification, pointed out in the claim and illustrated in the accompanying drawings which form a part of the specification and in which—

Figure 1 is a vertical sectional side elevation of the device. Fig. 2 is a plan.

Like reference characters indicate corresponding parts throughout the several views.

1, 2 and 3 represent the chambers and 4, 5 and 6 the floats. The chamber 1 is constructed without any side or end walls but with grooved rods for supports which sustain the roof 7. The float 4 disposed within this chamber is provided at its four corners with rollers 8 riding in the grooved rods or supports. To the float 4 is secured a rack 9 which extends through the roof 7 and is partially supported by a guide 10 disposed upon the roof and meshes with a serrated wheel 11 that is mounted upon a shaft 12 journaled in a pair of supports 13 also disposed upon the said roof. 14 is a sprocket wheel also carried by the shaft 12 and connected by a chain 15 to another sprocket wheel 16 mounted upon a shaft 17 that is journaled in supports 18 upon the roof 19 of the chamber 2. This chamber is walled and preferably formed of masonry or metal of some kind. The chamber 2 is further provided with an arm 20 which is hollow and communicates with the interior and projects out from the said chamber and has as a covering over its free extremity a sieve or screen 21. This chamber is further provided with a substantially cylindrical hollow water tight inner compartment 22 which snugly incases the float 5 and is provided near its lower termination with a water inlet valve 23 that communicates with the contents of the chamber 2 and at its upper extremity with an air pipe 24 and with an outlet pipe 25 near its base which pipe leads up through the chamber 2 and into the chamber 3 and is provided with a check valve 26 to prevent the return of the water. The float 5 is provided with a rack 27 that extends up through the roof 19 and through a guide 28, which is secured to the said roof, and engages a serrated wheel 29 mounted upon the shaft 17.

Referring now to the chamber 3 which is disposed above the water level the same is provided with the float 6 and with an outlet pipe 30 of much smaller diameter than the pipe 25 that furnishes water to the said chamber; the pipe 30 is provided with a turbine nozzle 31 above a water wheel 32 which is actuated by the water coming from the said nozzle and through the medium of the water wheel 32 power may be conveyed or transmitted as desired by any preferred form of power transmission apparatus.

Operation: The chamber 1 is seated in shallow water at such a point that the high tide will not reach its roof; the chamber 2 is similarly seated but the open end of its arm 20 is so positioned as to be below the level of the water at high tide. After the device is installed in position the first high tide encountered by it will raise the float 4 but as the chamber 2 will be void of water no power will be generated, the first tide being used to fill the chamber 2 through the medium of its arm 20. After the tide has receded and the float 4 has been borne upon it to a point nearest the base line of the chamber 1 the device will be in readiness for useful operation. The tide now again coming in will raise the float 4 which will raise the rack 9 and so rotate the shaft 12 transmitting power by the chain 15 to the shaft 17 the connections of which will depress the rack 27 (the water level now being below

the open end of arm 20) and float 5 will force the water in the compartment 22 out through the pipe 25 up into the chamber 3. Part of this water will escape with great force through the pipe 30 and nozzle 31 upon the water wheel 32 while the excess water will fill the chamber 3 thus raising the float 6; when the tide has reached its greatest height the water within the compartment 22 will have been forced out, the chamber 2 will begin again to fill with water coming in through the arm 20 and valve 23 thus raising the float 5 and rack 27, the air pipe 24 permitting the operation, and whatever water now remains in the chamber 3 will soon be evacuated. With the receding tide the float 4 will again be carried to its lowest level, during which process the power is stopped, when it will be ready for the returning tide which will cause a resumption of power.

What is claimed is:—

In a device of the class described, the combination with a pair of partially submerged water chambers, of a third water chamber disposed above the water level, a float within one of the partially submerged water chambers, an intermittently submerged arm open at either end connected to the other partially submerged water chamber, a compartment having an inlet valve disposed within the last named partially submerged chamber, an air pipe connected to the said inner compartment projecting above the high water level, a float within the said inner compartment, power transmission mechanism connecting the last named float and the float beforementioned; an outlet pipe provided with a check valve connecting the said inner compartment and the aforesaid third water chamber, a float within the last named chamber, an outlet pipe for that chamber and a water wheel disposed beneath the said outlet pipe.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two subscribing witnesses.

PETRUS SANDER.

Witnesses:
NELS A. LARSON,
MATHIAS DAHL.