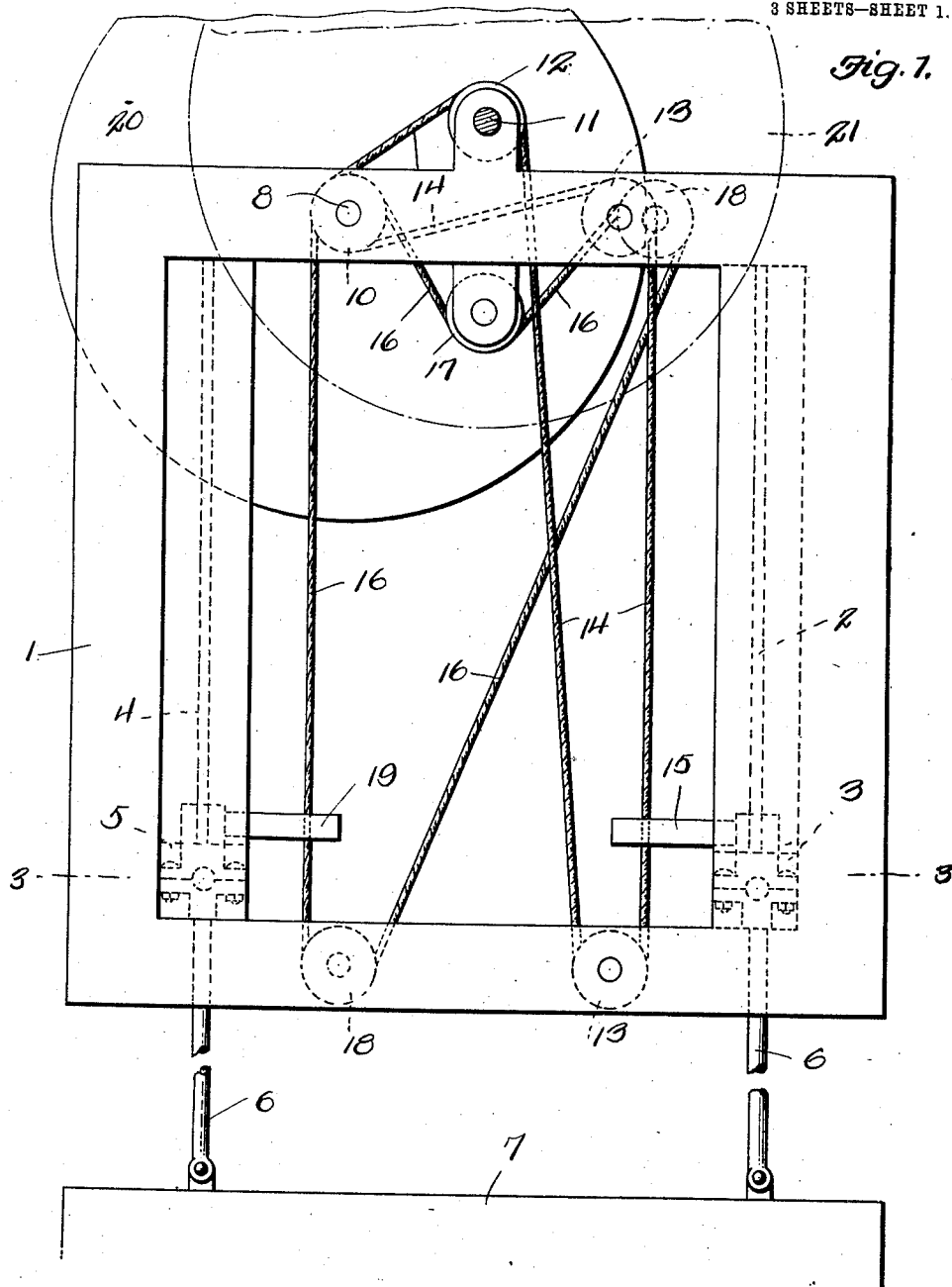


1,016,400.

F. D. CHAPPELL.
WAVE AND TIDE MOTOR.
APPLICATION FILED SEPT. 23, 1910.

Patented Feb. 6, 1912.

3 SHEETS—SHEET 1.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 2.

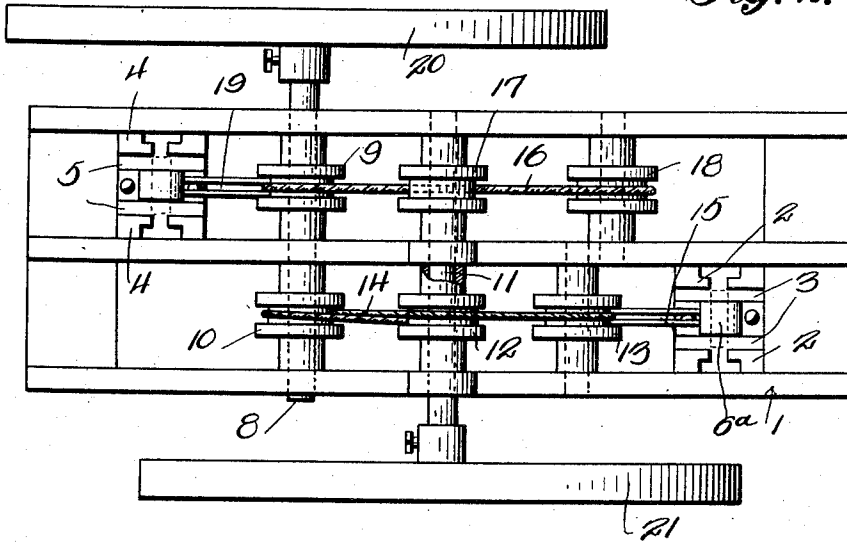


Fig. 3.

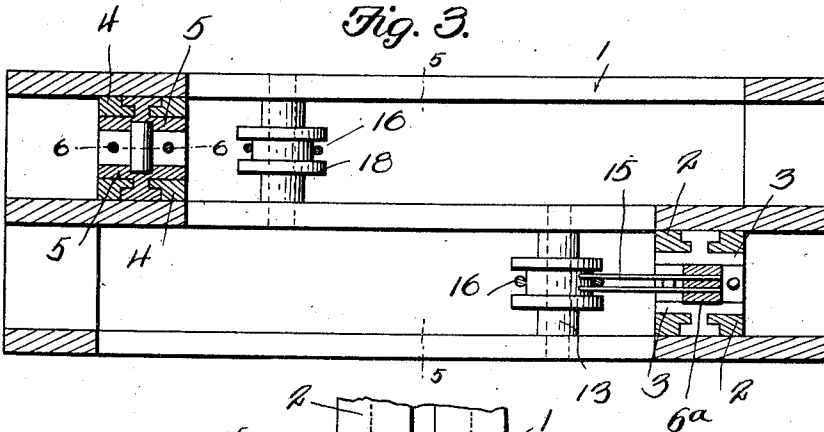
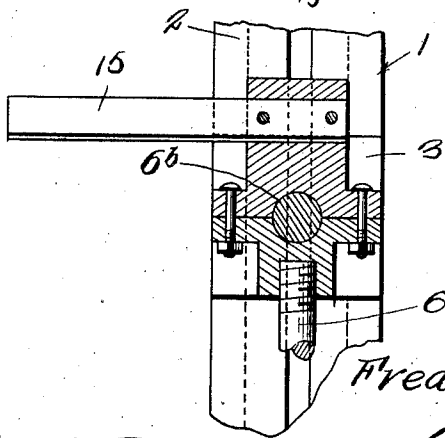


Fig. 6.



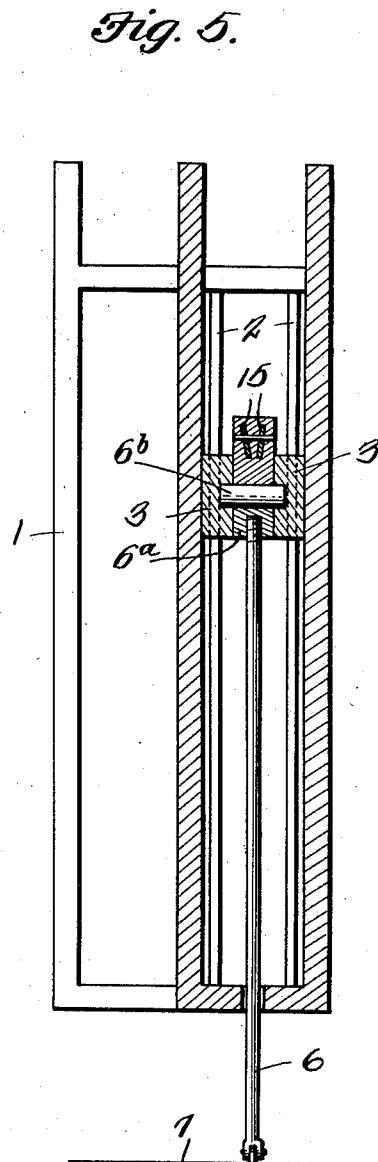
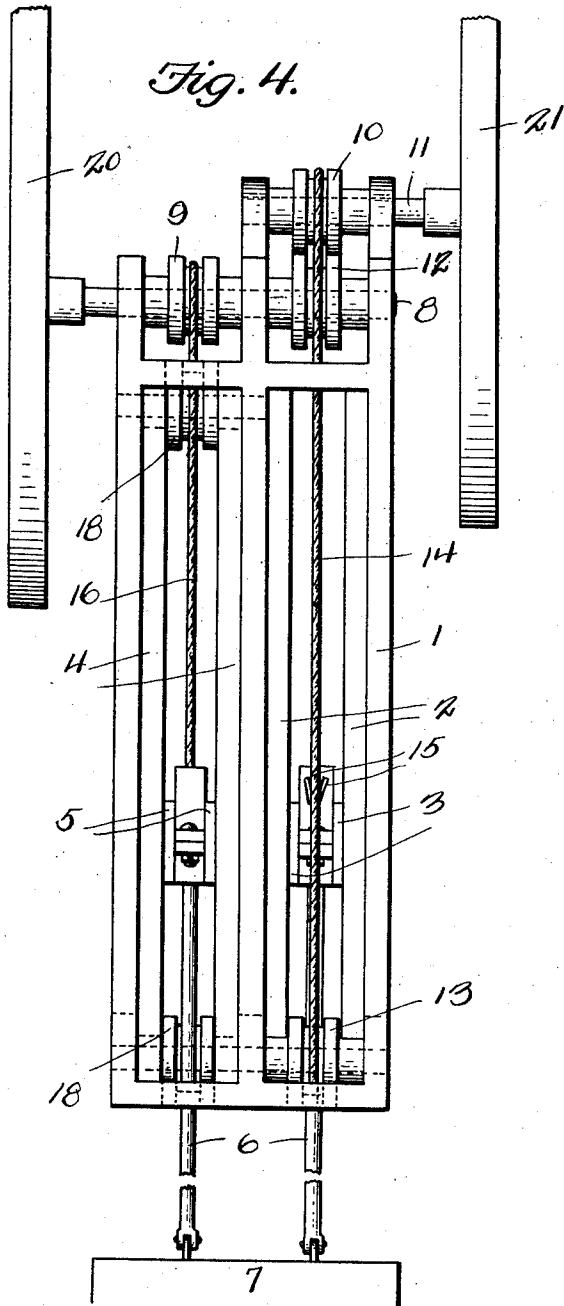
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FREDERICK D. CHAPPELL, OF OAKLAND, CALIFORNIA.

WAVE AND TIDE MOTOR.

1,016,400.

Specification of Letters Patent.

Patented Feb. 6, 1912.

Application filed September 23, 1910. Serial No. 583,499.

To all whom it may concern:

Be it known that I, FREDERICK D. CHAPPELL, a citizen of the United States of America, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Wave and Tide Motors, of which the following is a specification.

This invention relates to wave and tide motors, and has for an object to provide novel, simple and efficient float-controlled mechanism operating on the rise and fall of the waves to impart to a power shaft a continuous motion in one direction and to provide improved float-actuated heads operating with unlimited movements and constructed so that the power shaft will revolve substantially at the same rate of speed regardless of the strokes of the said actuating heads.

In the drawings, forming a portion of this specification and in which like numerals of reference indicate similar parts in the several views:—Figure 1 is a side elevation of by improved wave and tide motor. Fig. 2 is a top plan view thereof. Fig. 3 is a detail horizontal section through the motor. Fig. 4 is an end view of the motor. Fig. 5 is a detail vertical section showing the construction of one of the heads and the connection therewith of the float connecting means and the gripping means. Fig. 6 is a section taken on the line 6—6 of Fig. 3.

The motor preferable consists of a supporting frame 1 which is preferably secured between the vertical supports or piles. At one end the frame 1 is formed to provide spaced parallel guide members 2 in which a vertically sliding head 3 is operatively mounted. The head 3 is in the form of a sectional block and is provided with lateral flanges engaging the guide members 2. At the opposite end the said frame 1 is provided with similar parallel guide members 4 in which a head 5 is mounted for vertical sliding movement, the said head being identical in construction with the previously described head 3. Each head supports a depending reciprocating rod 6 which are pivotally connected at their lower ends with a hollow float 7 or suitable well known form of buoyant element. The upper ends of the reciprocating rods are connected with blocks 6^a which are disposed between the sections of the sliding heads 3 and 5 and which are connected to said sections by bearing pins 6^b.

A power shaft 8 is journaled in the frame at the top thereof and as illustrated, said shaft has fixed thereto driving pulleys 9 and 10 respectively. A similar shaft 11 is journaled in the frame 1 and is located adjacent to the shaft 8. This shaft has fixed thereto a driving pulley 12 which is arranged in line with the pulley 10 on the power shaft 8 and in line with similar guide pulleys 13 journaled in the frame. A continuous flexible connection or belt 14 extends about the pulleys 10, 12 and 13 respectively, and as illustrated, the said connection or belt is arranged on certain of the hereinbefore described guide pulleys so that a portion thereof will extend vertically with respect to the base of the frame 1 and parallel with the side of the frame adjacent to the head 3. The head 3 is provided with horizontally disposed spring-gripping jaws 15 which are arranged in intersecting planes with respect to each other and as shown in Fig. 4, these jaws straddle the element 14 and they are constructed to grip the same on downward movement of the float 7 so as to impart movement to the power shaft 8. The lower edges of the strips 15 are by this arrangement adapted to bite into the belts or cables when the floats move downwardly and to slide on the cables or belts when the floats move upwardly. A similar continuous flexible element or belt 16 is operatively associated with the drive pulley 9 and the guide pulleys 17 and 18 on the frame 1. This connection or belt has one of its portions disposed vertically with respect to the base of the frame and parallel with respect to one of the ends of the frame so as to be engaged by the gripping members 19 on the head 5.

The power shaft 8 has preferably secured thereto a fly wheel 20 and the shaft 11 has secured thereto a similar wheel 21.

From the construction of the motor described and illustrated herein it will be seen that on upward movement of the float 7 the heads 3 and 5 will be correspondingly moved. Incident to the peculiar construction of the gripping members 15 and 19 respectively it will be seen that they will operate on upward movement of the float to move on the actuating elements or belts without moving the same. On a reverse or downward movement of the float the gripping members 15 will operate to effectively engage the belts so as to impart thereto the

desired movements to revolve the shaft 8
in one direction.

I claim:—

- 5 1. In a wave motor, a frame having guide
ways and adapted to be supported in a
body of water in a vertical position, heads
slidable on said guide ways, rods connected
with said heads, floats carried by said rods,
a drive shaft journaled on said frame, pul-
10 leys journaled on said frame, an endless
belt movable over said pulleys and resilient
gripping jaws carried by said heads and
adapted to bite into said belt when said
heads are moved downwardly.
- 15 2. In a wave motor, a frame provided
with vertical guide ways and adapted to be
secured to vertical supports, heads slidable
on said guide ways, rods connected with said

heads, a float connected with said rods, a
power shaft journaled on said frame and 20
provided with spaced pulleys, a second
power shaft journaled on said frame and
provided with spaced pulleys, pulleys
mounted on said frame in alinement with
said pulleys, endless belts trained over said 25
pulleys and converging resilient gripping
jaws arranged on said heads and adapted
to grip said endless belts in moving down-
wardly.

In testimony whereof I affix my signature 30
in presence of two witnesses.

FREDERICK D. CHAPPELL.

Witnesses:

A. K. DAGGETT,
O. C. BALDWIN.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."**