No. 852,232. PATENTED APR. 30, 1907.

E. KOHLER.

WAVE MOTOR.

APPLICATION FILED NOV. 20, 1906.

3 SHEETS—SHEET 1.

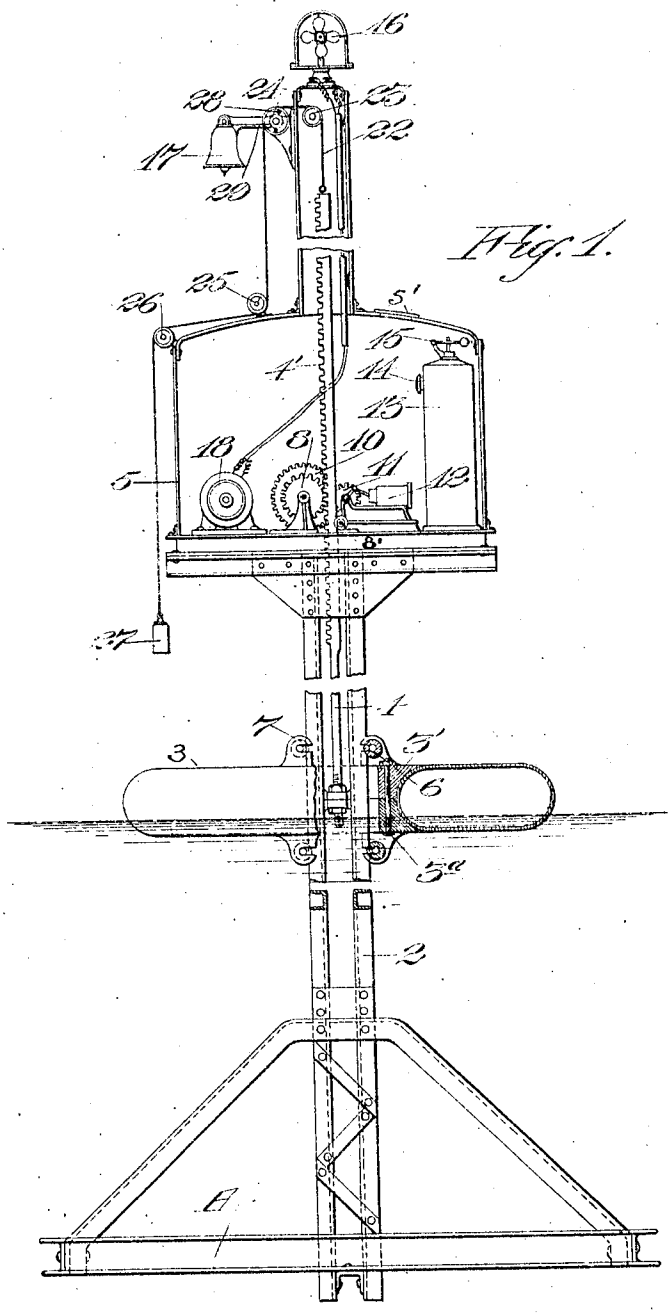


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

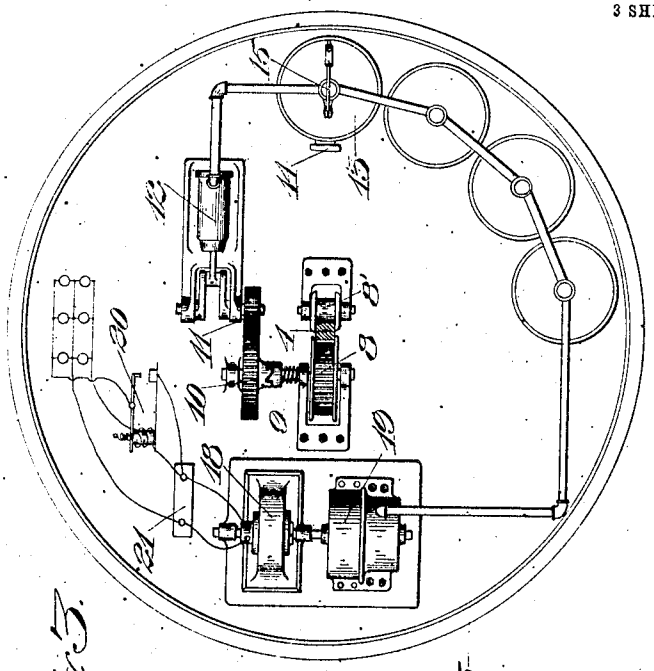


Fig. 3.

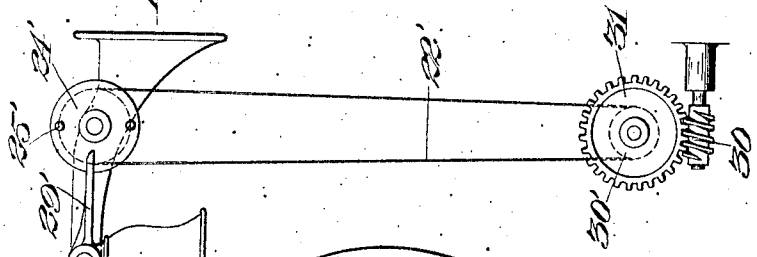
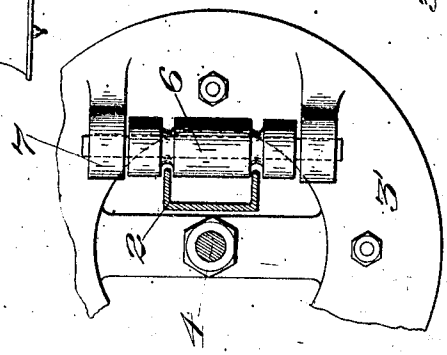


Fig. 4.



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3 SHEETS—SHEET 3.

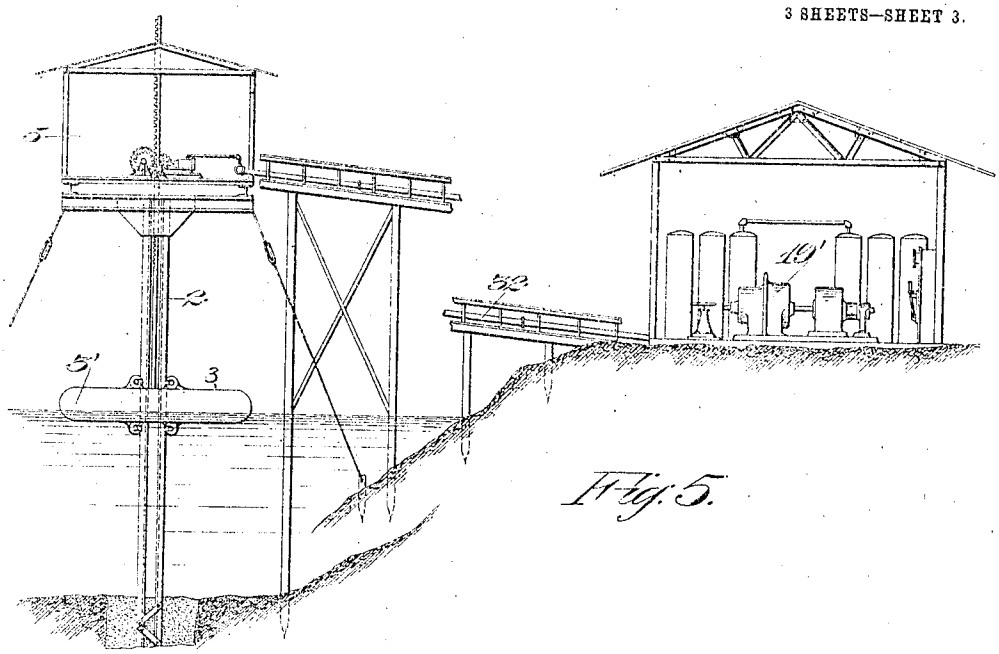


Fig. 5.

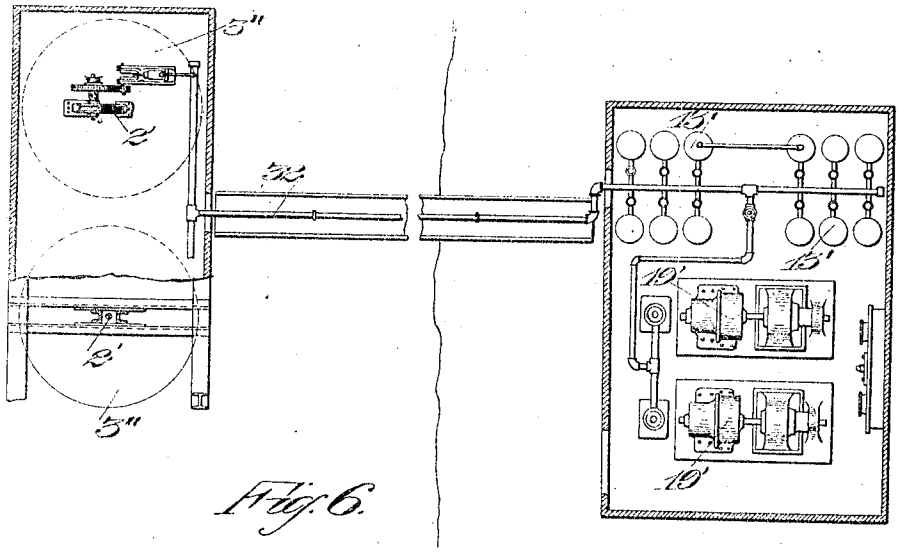


Fig. 6.

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UNITED STATES PATENT OFFICE.

ERNEST KOHLER, OF SAN FRANCISCO, CALIFORNIA.

WAVE-MOTOR.

No. 852,232. Specification of Letters Patent. Patented April 30, 1907.

Application filed November 20, 1906. Serial No. 344,193.

To all whom it may concern:

Be it known that I, ERNEST KOHLER, a citizen of the United States, residing in the city and county of San Francisco, and State of California, have invented new and useful Improvements in Wave-Motors, of which the following is a specification.

My invention relates to wave motors. Its object is to provide a simple, practical apparatus for conserving and utilizing the energy of the waves; and especially for converting wave energy into electrical energy for producing light, or for operating machines and industries of various kinds.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a front elevation of my wave motor, partly in section. Fig. 2 is a plan view, showing general arrangement of machinery. Fig. 3 shows a modified form for operating the bell. Fig. 4 is a plan view of casting 3'. Fig. 5 shows general arrangement of a power station. Fig. 6 is a plan view of same.

A represents a suitable platform or base supporting the iron post or column or tower 2. This structure rests upon the bottom where the apparatus is to be located, and the base is firmly anchored in suitable foundations, which ordinarily will be a rocky reef or other substantial support.

Column 2 is preferably composed of heavy channel irons and the parts are braced and made sufficiently strong and rigid to withstand the heaviest seas. Surrounding the central column or pillar 2, and slidable up and down thereon is a buoy or float 3 which has a shaft or stem 4 connected with it and extending up inside of the column and the casing 5, which latter houses the machinery.

The casing 5 is fixedly mounted on a platform supported on the column and disposed above the range of action of the waves. The float 3 may be of any suitable construction. As here shown it comprises a sheet metal annulus clamped between the two castings 3' by means of the bolts 3^a. The float has a free up and down sliding movement on the flanges of the column 2 by virtue of the rollers 6, the axles of which are journaled in the brackets 7 of the castings 3'. The rod 4 is fastened securely to the float and its upper end terminates in the rack 4', which operates as the float rises and falls on the gear 8 suitably journaled in the casing 5.

The gear 8 operates through its shaft and suitable clutch mechanism 9 to actuate a gear 10 which meshes a gear 11 on the crankshaft of the air compressor 12.

8' is a guide roller acting on the rack to maintain the latter in mesh with the gear 8.

As the float rises and falls the rack 4' and its connections with the air compressor operates the air compressor to force compressed air into a reservoir 13. A series of these reservoirs may be employed, connected together and charged to a certain pressure and carrying a sufficient supply, so that if the waves are temporarily quiet, there will be a sufficient pressure maintained in the reservoirs to continue the operation of the mechanism or machinery adapted to be run by the apparatus. 14 represents a pressure gage and 15 a safety valve. The casing 5 which forms a housing for the mechanism is provided with one or more closures or manholes 5', through which access may be had to the interior of the casing. The energy thus stored in the reservoirs may be utilized for any desired purpose. In the present instance I have shown the apparatus adapted to operate a signal light 16, and a warning bell 17. The light is operated through suitable connection from the dynamo 18 which may be run from the turbine 19; power to run the turbine being furnished by the air pressure in the reservoirs.

The lights may be arranged in any suitable manner, and there may be interposed in the electric lighting circuit the usual circuit breaker 20 and voltage regulator 21. The bell may be operated automatically by a variety of ways. In the present instance I have shown the bell as being sounded according as the float rises and falls by means of the cord 22 attached to the top of the rod 4, and passing over guide pulleys 23—24—25 & 26, and having a weight 27 attached to its other end. The pulley 24 is provided with a series of pins 28 which act on the lever 29 to oscillate the bell and cause its hammer to sound the bell.

In Fig. 3 I have indicated a modification of the means for operating the bell in which the turbine shaft has a worm 30 to engage a corresponding gear 31. The shaft of this gear

carries a pulley 30′ around which passes a rope or belt 22′ to an upper pulley 24′, which latter is provided with pins 25′. These pins 25′ engage a lever-arm 29′ to sound the bell in the manner already described.

Where this invention is to be used for generating power for commercial purposes, I employ the same principle of construction as will be seen by reference to Fig. 1. In this case though I may employ a multiple unit arrangement with a plurality of masts 2′, each provided with its individual float 3″, and each float operating its individual compressor; the air supply from the several compressors leading to a common air trunk 32, which runs to the main land where the various storage reservoirs 13′ and motors 19′ are located.

The supporting structure for the compressors and exposed mechanism is sufficient to withstand the strain and buffeting to which the apparatus may be subjected.

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

1. A wave-motor comprising a suitably supported vertical channel-iron-column, a float slidably mounted on said column and having grooved rollers engaging the flanges of the column, said float comprising a buoyant-annulus clamped between separable castings which surround the column and carry said rollers, and mechanism with operative connection with the float for storing the energy generated by the rise and fall of the float.

2. A wave-motor comprising a suitably supported vertical column, a float slidably mounted thereon, a platform supported on the column above the float, said float comprising a buoyant-annulus clamped between separable castings which surround the column, a rack-bar connected with the float, a gear mounted on said platform and engageable by said rack, said gear having a shaft, a loose-gear on said shaft, clutch-mechanism for intermittently locking said loose gear to the shaft, an air-compressor operably connected with said loose-gear, and means on the platform for storing the energy generated by said compressor.

3. In a wave-motor, a plurality of fixedly supported vertical columns carrying a platform, a float slidable on each of said columns, said float comprising a buoyant-annulus clamped between separable castings which surround the column, an air-compressor corresponding to each float mounted on said platform, means connected with the float for operating said compressors, a main-service-pipe receiving the compressed-air from said compressors, a series of connected reservoirs connected with said service-pipe, and motors operated by the energy stored in said reservoirs.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ERNEST KOHLER.

Witnesses:
JOHN KUHL,
JOHN OAKES.