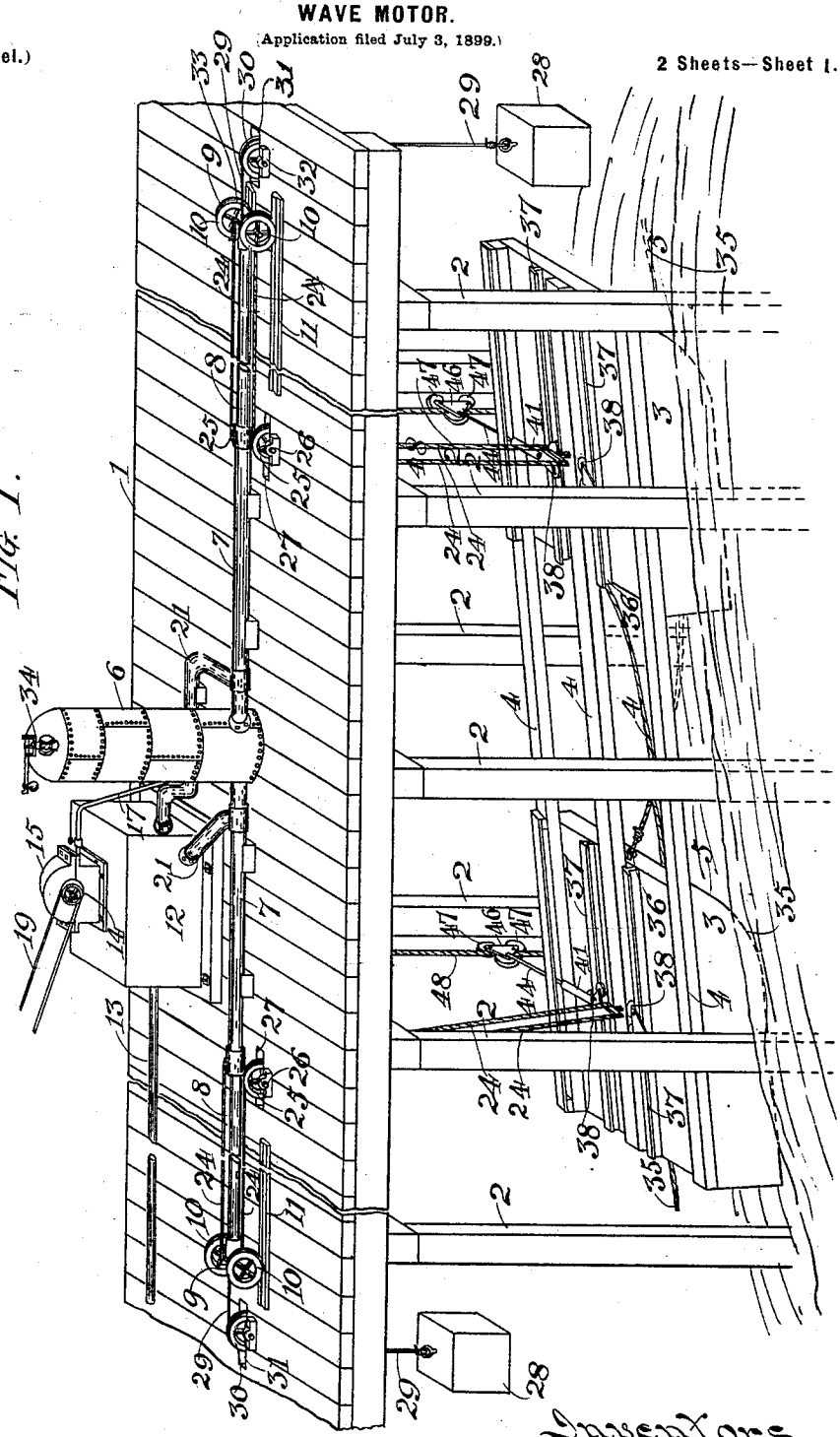
No. 671,592. Patented Apr. 9, 1901.

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WAVE MOTOR.

(No Model.) (Application filed July 3, 1899.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses.
Robt. Fain
J. A. Rodefer

Inventors.
A. R. Hamilton.
H. T. Hollingsworth.
A. L. Perley
by Knight Bros.
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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FIG. III.

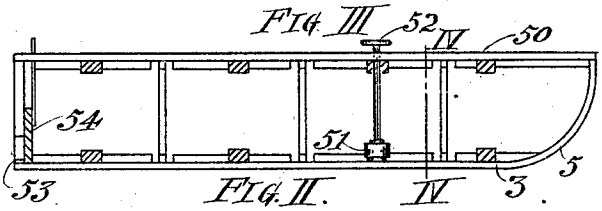


FIG. IV.

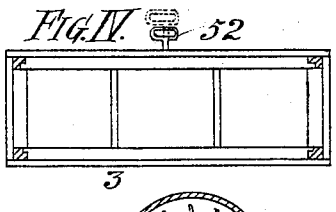


FIG. II.

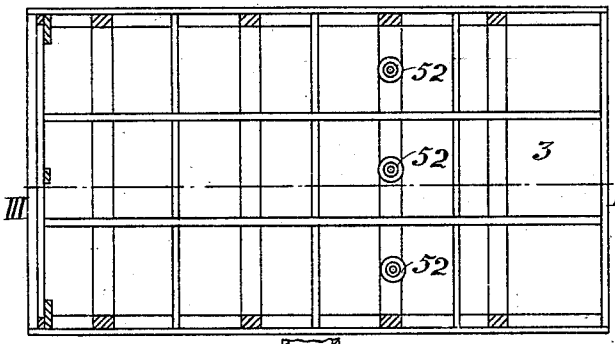


FIG. V.

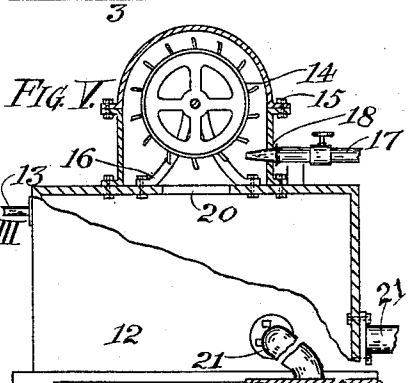


FIG. VI.

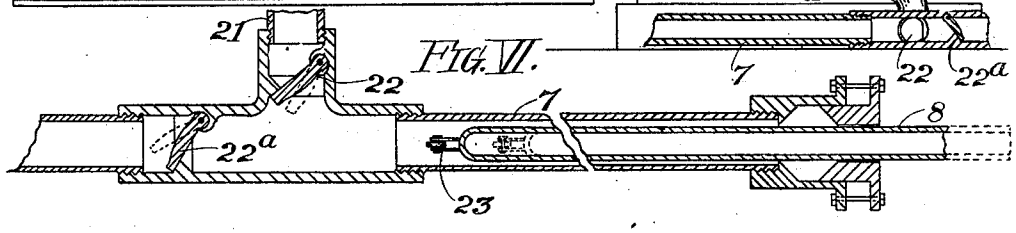


FIG. VII.

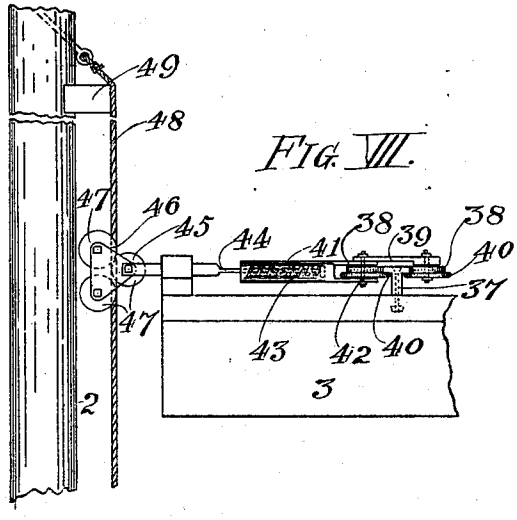
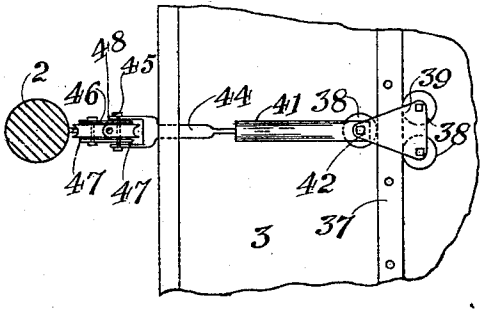


FIG. VIII.



Witnesses.
Robt. Fain.
J. Q. Rodefer.

Inventors
A. R. Hamilton.
H. T. Hollingsworth.
A. L. Perley.
by Wright Brown & Quinby
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALBERT R. HAMILTON, HENRY T. HOLLINGSWORTH, AND ARTHUR L. PERLEY, OF LOS ANGELES, CALIFORNIA.

WAVE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 671,592, dated April 9, 1901.

Application filed July 3, 1899. Serial No. 722,675. (No model.)

To all whom it may concern:

Be it known that we, ALBERT R. HAMILTON, HENRY T. HOLLINGSWORTH, and ARTHUR L. PERLEY, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Wave-Motors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to certain new and useful improvements in wave-motors; and it consists in certain features of novelty hereinafter described and claimed.

Figure I is a perspective view of our improved motor. Fig. II is a top view of one of the floats. Fig. III is a longitudinal vertical section taken on line III III, Fig. II. Fig. IV is a transverse section taken on line IV IV, Fig. III. Fig. V is a detail view of the motor-wheel and its connections. Fig. VI is a longitudinal section of the pumping apparatus. Fig. VII is a detail side elevation of the guide controlling lateral movement of the float. Fig. VIII is a top view of the guide.

Referring to the drawings, 1 represents a platform or wharf supported on a series of piles 2.

3 represents floats adapted to rest upon the water and located between the opposing piles 2. The floats 3 are preferably placed some distance apart in the direction in which the waves travel and are preferably connected together in tandem style by means of stringers 4. The floats rise and fall between the piles 2 by the action of the waves, the forward ends of the floats being preferably curved upward, as shown at 5, to facilitate the rising movement of the floats.

6 represents a pressure-tank for holding air and water, said tank being located on top of the wharf 1.

7 represents cylinders connected on each side to the pressure-tank 6, and 8 represents pistons adapted to reciprocate within said cylinders. The outer ends of the pistons 8 are preferably supported by means of trucks 9, the wheels 10 of which rest upon tracks 11, which extend parallel with the pistons 8, said wheels 10 traveling upon the tracks as the pistons are reciprocated within the cylinders.

12 represents a water-tank supplied by a pipe 13, the pipe 13 being employed to maintain a proper working quantity of water in the tank 12.

14 represents a rotary motor-wheel inclosed by a housing 15 and supported by a bracket 16 on top of the water-tank 12.

17 represents a pipe leading from the pressure-tank 6 to the motor, said pipe having a nozzle 18 for directing the water onto the motor-wheel.

19 represents a belt whereby power may be conveyed to any suitable mechanism for the use of the same.

20 represents an opening in the tank 12 beneath the power-wheel, through which the water drops after it has performed its function.

21 represents pipes leading from the bottom of tank 12 to the respective cylinders 7 on each side of the pressure-tank 6, the pipes 21 being supplied with valves 22, which permit the water to flow outwardly into the cylinders 7, but which close from pressure applied within the cylinders.

22ª represents valves placed within the cylinders which open when pressure is formed by the reciprocating pistons, but which close from backward pressure from the pressure-tank 6, the result being that as the pistons are drawn outwardly the water will flow from the tank 12 into the cylinders 7, and as the pistons 8 are forced inwardly the water is forced into the pressure-tank 6. The water being used over and over requires a very small amount of the same. The inner ends of the pistons 8 are preferably supplied with wheels 23, which travel on the inside of the cylinders, thus preventing the tendency of the inner ends of the pistons to bend downwardly, said wheels at the same time affording a guide to hold the pistons true and reducing the friction of the same against the sides of the cylinders.

24 represents cables on each side of the pistons 8, said cables having their upper ends connected to the trucks 9, the cables passing over pulleys 25, journaled at 26 to the wharf.

27 represents slots in the wharf in which

the pulleys operate and through which the cables 24 pass. The lower ends of the cables 24 are secured to the floats 3.

28 represents counterweights supported beneath the wharf by means of cables 29, said cables passing over pulleys 30, located in slots 31 in the wharf and journaled at 32 to the wharf. The inner ends of said cables are secured at 33 to the rear side of the trucks 9. Thus as the float rises by the action of the water the trucks 9 are drawn outwardly on the tracks 11 by means of the counterweights 28, the pistons 8 performing their outward stroke in the cylinders 7. Then as the float drops the weight of the same will cause the trucks 9 to travel inwardly, forcing the pistons 8 into the cylinders and pumping the water from the cylinders into the pressure-tank 6, the action being repeated as often as the floats rise and fall.

34 represents a governor on the pressure-tank.

35 represents guy-ropes connected at 36 to the floats, which limit the backward and forward movement of the same.

37 represents a T-rail secured to the upper sides of the floats, and 38 represents flanged pulleys adapted to travel on said rails, said pulleys being journaled to a triangular plate 39 and preferably placed at the corners of the triangular plate and having flanges 40 on their under sides, which prevent their displacement.

41 represents a sleeve having its inner end pivoted at 42 to the plate 39.

43 represents a coil-spring placed within the sleeve 41, and 44 a rod extending into the sleeve and engaging said spring, the opposite end of the rod 44 being pivoted at 45 to a triangular plate 46, said plate having a series of pulleys 47 journaled to each of its corners. The pulleys 47 ride vertically on a cable or wire rope 48, suitably attached to one of the supporting-piles 2 and held at some distance from the same by means of a block 49, this arrangement forming a guide for the float and permitting it to rise and fall without friction and at the same time admitting of the backward-and-forward movement of the same between the piles.

50 represents a deck on the floats, which permits of the loading of the same to a greater or less extent with water, the deck excluding the water when not required and the water being let into the float by means of valves 51, operated by a hand-wheel 52. To facilitate the filling or draining of the float, we also provide orifices 53, controlled by a valve 54.

We claim as our invention—

1. In a wave-motor the combination, of a suitable support, a pressure-tank, cylinders connected with the tank, pistons adapted to operate in said cylinders, trucks for supporting the outer ends of said pistons, tracks on which said trucks travel, a float, and cables for connecting the float with the trucks, substantially as set forth.

2. In a wave-motor the combination, of a suitable support, a pressure-tank, cylinders connected with the tank, pistons adapted to operate in said cylinders, trucks for supporting the outer ends of said pistons, counterweights connected with said trucks, a float, and cables for connecting the float with said trucks, substantially as set forth.

3. In a wave-motor the combination, of a suitable support, a pressure-tank, cylinders connected with the tank, pistons adapted to operate in said cylinders, trucks for supporting the outer ends of said pistons, counterweights, cables connecting the counterweights with the trucks, pulleys over which the counterweights and cables travel, a float, cables for connecting the float with the trucks and pulleys over which the float-cables pass, substantially as set forth.

4. In a wave-motor the combination, of a suitable support, a pressure-tank on the support, cylinders connected with the pressure-tank, pistons adapted to operate within said cylinders and wheels for supporting the inner ends of said pistons substantially as set forth.

5. In a wave-motor, a series of piles, a float adapted to operate between the piles, a T-rail secured to the float, a plate with pulleys journaled thereto and adapted to travel on said rail, a sleeve connected with said plate, a spring within said sleeve, a rod extending into the sleeve and engaging the spring, a cable secured to the piles, pulleys connected with said rod and adapted to travel on said cable, substantially as set forth.

6. In a wave-motor, a float adapted to operate between the piles, a track secured to the float, flanged pulleys adapted to travel on said track, a plate to which the pulleys are journaled, a sleeve having pivotal connection with said plate, a spring in said sleeve, a rod extending into said sleeve and engaging the spring, a plate to which the opposite end of the rod is pivoted, pulleys journaled to said plate, and a vertically-extending cable secured to a pile and on which said pulleys travel vertically as the float moves up or down substantially as set forth.

ALBERT R. HAMILTON.
HENRY T. HOLLINGSWORTH.
ARTHUR L. PERLEY.

Witnesses to signatures of Albert R. Hamilton and Henry T. Hollingsworth:
JAS E. KNIGHT,
J. A. ROELOFSZ.

Witnesses to signature of Arthur L. Perley:
HENRY PLASS,
FRANK H. FARNSWORTH.