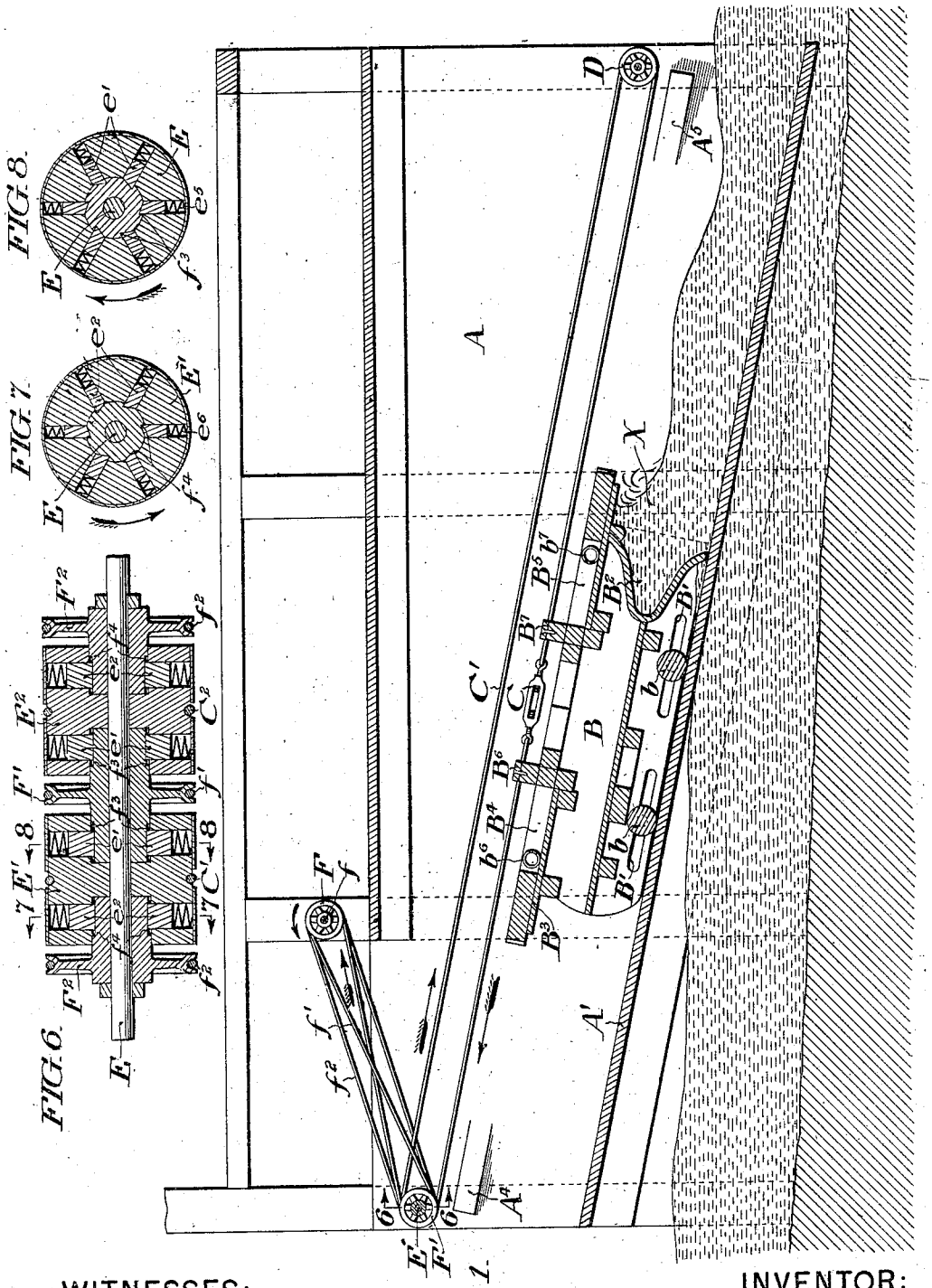
No. 877,021. PATENTED JAN. 21, 1908.

J. TYDINGS.

WAVE MOTOR.

APPLICATION FILED APR. 27, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

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FIG. 2.

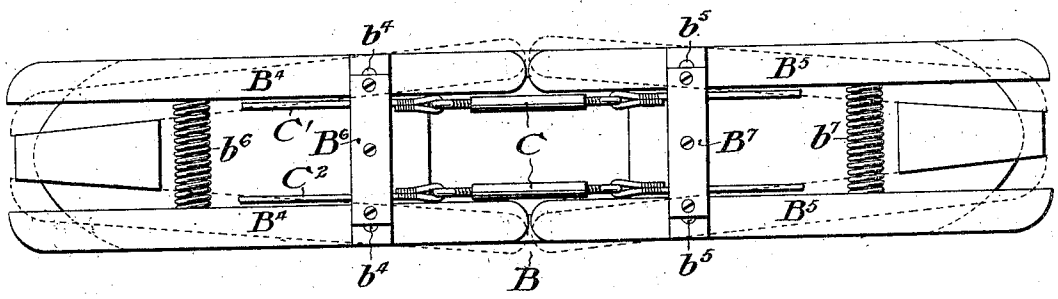


FIG. 3.

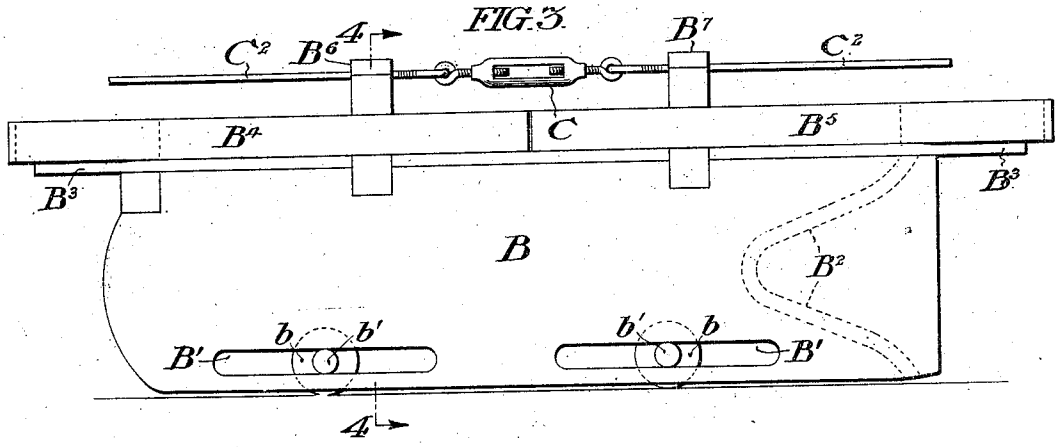


FIG. 4.

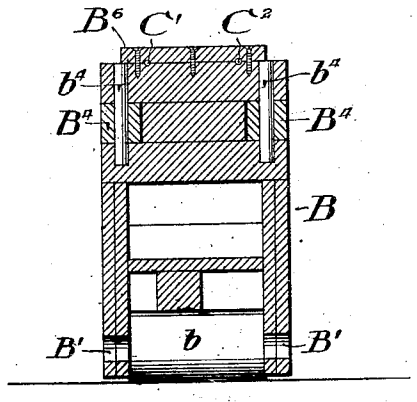
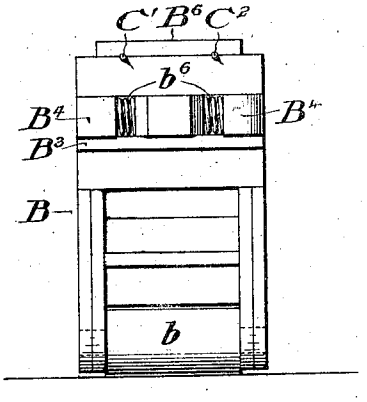


FIG. 5.



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UNITED STATES PATENT OFFICE.

JOHN TYDINGS, OF PHILADELPHIA, PENNSYLVANIA.

WAVE-MOTOR.

No. 877,021. Specification of Letters Patent. Patented Jan. 21, 1908.

Application filed April 27, 1906. Serial No. 313,953.

To all whom it may concern:

Be it known that I, JOHN TYDINGS, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Wave-Motors, whereof the following is a specificatoin, reference being had to the accompanying drawings.

My invention consists of a wave motor comprising a car arranged to be reciprocated by the action of the waves, and, by suitable flexible connectors, to transmit its motion of reciprocation and effect the rotation of a shaft.

In the accompanying drawings Figure 1, is a longitudinal sectional view of a motor conveniently embodying my invention. Fig. 2, is a top plan view of the motor car shown in section in Fig. 1. Fig. 3, is a side elevation of said car. Fig. 4, is a vertical sectional view of said car taken on the line 4—4, in Fig. 3. Fig. 5, is an elevational view of the left hand end of the car shown in Fig. 3. Fig. 6, is a sectional view of the motor clutch drums, taken on the line 6—6, in Fig. 1. Fig. 7, is a transverse sectional view of said drum taken on the line 7—7, in Fig. 6. Fig. 8, is a transverse sectional view of said drum taken on the line 8—8, in Fig. 6.

Referring to Fig. 1, A is the frame-work or housing comprising the inclined track A^1. The car B, which is preferably formed of buoyant material, is mounted to reciprocate from end to end of the track A^1, upon the rollers b, the gudgeons b^1 of said rollers, being entered in the bearings B^1, at opposite sides of the car. The length of said bearings B^1, is so proportioned to the length of traverse of the car, that the gudgeons b^1, are at all times in rolling contact therewith; each roller being gradually shifted toward the lower end of its bearings as the car passes to the upper end of the track A^1; and being gradually returned to the upper end of its bearings when the car passes to the lower end of the track A^1. The front end of said car comprises a recess or wave pocket B^2, so shaped as to receive the maximum impact of the waves X, which thus force the car to the top of the incline, from which it gravitates to the bottom of the incline when released; the shape of said pocket being such as to discharge the spent wave. Upon the top B^3, of said car B, are mounted similar pairs of brake levers B^4, B^5, which are respectively arranged to oscillate upon the vertical stud shafts b^4, b^5. The levers B^4 are arranged to contact with inclined abutments A^4, projecting from the opposite walls of the housing A, and converging toward the end thereof; so that the levers B^4, which are normally held in the position shown in full lines in Fig. 2, by the spring b^6, are deflected from that position toward the center of the car as indicated in dotted lines in said figure, when forced into contact with said abutments and thus gradually check the movement of the car and limit its upward traverse. The lower end of the housing A being provided with inclined abutments A^5, similar to the inclines A^4, above described; the downward traverse of the car is gradually checked by the coöperation of said levers B^5, therewith; in manner similar to that above described with respect to the levers B^4.

Upon the top B^3, of the car are similar clamps B^6, B^7, by which the endless rope belts C^1, C^2 are firmly secured to the car B, after being adjusted by the turnbuckles C. Said belts extend over idle pulleys D, which are journaled at the lower extremity of the housing A; and, over the drums E^1, E^2, which are mounted for free rotation upon the stationary drum shaft E, and arranged to change the reciprocatory motion transmitted to them, by the respective rope belts C^1 C^2, to continuous rotary motion of the driving shaft F as follows: Said belts C^1, and C^2, respectively encircle the independent drums E^1, E^2, which latter are both engaged to rotate the wheel F^1, when the belts C^1, C^2 are shifted in the direction of the arrows upon Fig. 1, by the traverse of the car B, toward the top of the incline A^1. Said drums E^1, E^2, are disengaged from the wheel F^1, and engaged with the counterpart wheels F^2, by the reverse traverse of said car and belts C^1, and C^2, connected therewith. The aforesaid selective rotation of the wheels F^1, F^2, is effected by oppositely inclined pawls e^1, e^2, in the drums E^1, E^2 which are alternately engaged with the ratchet teeth f^3, f^4, upon the hubs of the wheels F^1, F^2, the pawls e^1 of both drums E^1, E^2, being inclined on their inner faces and connected with the ratchets upon the wheel F^1, as shown in Fig. 8, and, the pawls e^2 of each of said drums E^1, and E^2, being inclined upon their inner faces and engaged with the ratchets upon the respective wheels F^2, as shown in section in Fig. 7.

The wheel F^1, is connected with the drum F, upon the shaft f, by means of the crossed belt f^1; and, the wheels F^2, are also con-

nected with said drum F, by the respective straight belts f^2, so that the shaft f, is constantly rotated in the direction indicated by the arrow shown in Fig. 1; such motion being transmitted by the crossed belt f^1, while the car B, is passing toward the top of the incline, and, by the straight belts f^2, while the car is passing toward the bottom of the incline A^1. Said belts f^1, f^2, being thus alternately active and idle, the belts f^2, cause the idle rotation of the wheels F^2, upon the shaft E, while the drum F, is positively rotated by the crossed belt f^1; and, the belt f^1, causes the idle rotation of the wheel F^1, during the time said drum F, is positively rotated by the belts f^2. It is to be understood that the aforesaid alternate reverse idle rotation of the wheels F^1, F^2, causes whichever of the series of pawls e^1, or e^2, are for the time being inoperative, to be disengaged from the respective ratchet teeth; but said pawls are continuously presented for operative engagement with the ratchets by means of the spring e^5, e^6, so that there is no interruption in the transmission of continuous rotary movement to the drum F, occasioned by the reversal of the direction of traverse of the car B, and the driving belts C^1, C^2, and drums E^1, E^2, connected therewith.

It is to be understood that the rotary movement of shaft f, may be transmitted therefrom by any convenient means, but I have not illustrated any such means, as the same forms no part of my present invention.

I do not desire to limit myself to the precise construction and arrangement of my improvements which I have herein set forth, as it is obvious that various modifications may be made therein, without departing from the essential features of my invention.

I claim:

1. In a wave motor, the combination with a stationary track; of a car arranged to traverse said track; a brake lever upon said car; and an inclined abutment in fixed relation with said track, arranged to coöperate with said brake lever to check the traverse of said car, substantially as set forth.

2. In a wave motor, the combination with a stationary track; of a car arranged to traverse said track; a brake mechanism upon said car; and, means in stationary relation with said track, arranged to coöperate with said brake mechanism to check the traverse of said car, substantially as set forth.

3. In a wave motor, the combination with a stationary track; of a car arranged to traverse said track; a pair of brake levers upon said car; a spring tending to thrust said levers into operative position; and, means in stationary relation with said track, arranged to coöperate with said brake levers to check the traverse of said car, substantially as set forth.

4. In a wave motor, the combination with a stationary track; of a car arranged to traverse said track; a pair of brake levers upon said car; a spring tending to thrust said levers into operative position; and, inclined abutments in stationary relation with said track, arranged to coöperate with said brake levers to check the traverse of said car, substantially as set forth.

5. In a wave motor, the combination with a stationary track; of drums mounted to rotate at the opposite ends of said track; an endless belt connecting said drums; means carried by said belt, arranged to adjustably vary the length of the latter; and, a car attached to said belt and arranged to traverse said track, substantially as set forth.

6. In a wave motor, the combination with a stationary track; of drums mounted to rotate at the opposite ends of said track; an endless belt connecting said drums; a car attached to said belt; brake mechanism carried by said car; and, means in stationary relation with said track, arranged to coöperate with said brake mechanism to check the traverse of said car, substantially as set forth.

7. In a wave motor, the combination with a stationary track; of two shafts mounted at respectively opposite ends of said track; two drums mounted on one of said shafts; idle pulleys on the other of said shafts; two endless belts respectively connecting said drums and idle pulleys; a car attached to both of said belts and arranged to traverse said track; a shaft counter to said shaft provided with drums; and, means operatively connecting said drums with said counter shaft, whereby said counter shaft is rotated in one direction by alternate connection with said endless belts, in accordance with the direction of traverse of said car in alternately opposite directions, substantially as set forth.

In testimony whereof, I have hereunto signed my name, at Philadelphia, Pennsylvania, this 25th day of April, 1906.

JOHN TYDINGS.

Witnesses:
ARTHUR E. PAIGE,
E. L. FULLERTON.