(No Model.) 2 Sheets—Sheet 1.

J. RINGEN.

APPARATUS FOR UTILIZING SURF POWER.

No. 418,590. Patented Dec. 31, 1889.

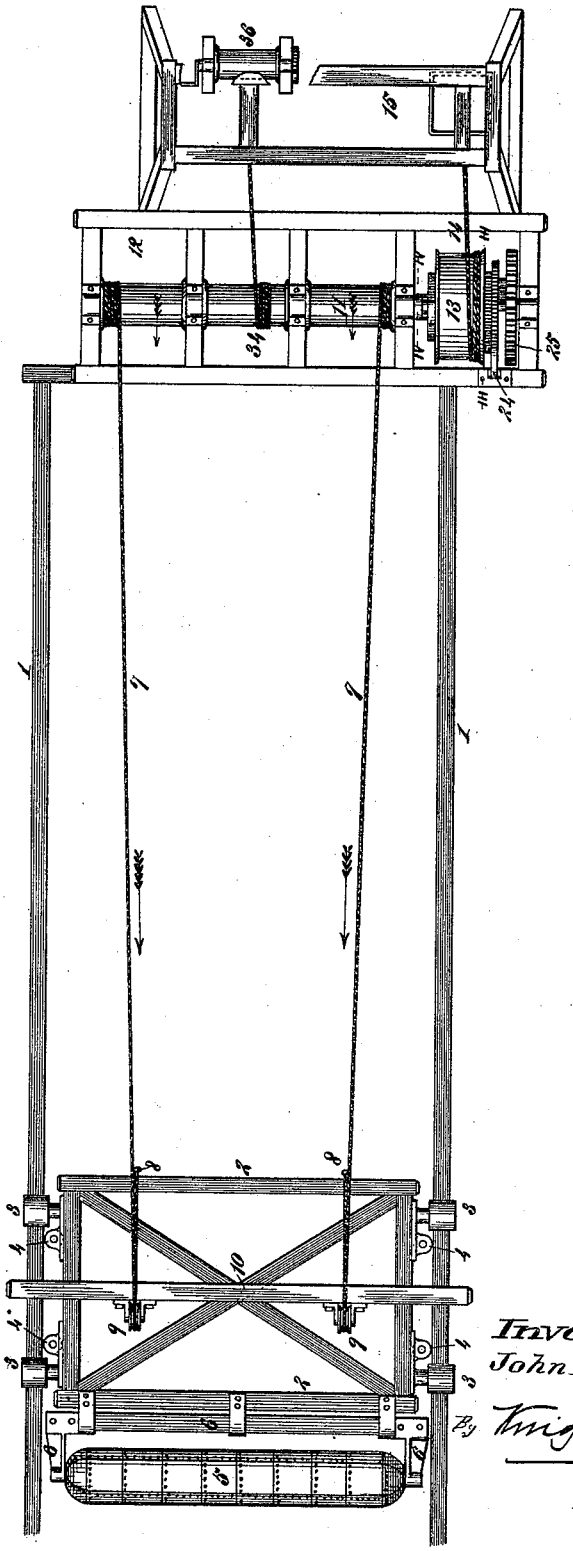

Fig. 1.

Attest:
E. Arthur
Geo. E. Wheelock

Inventor:
John Ringen
By Knight Bros
Attys

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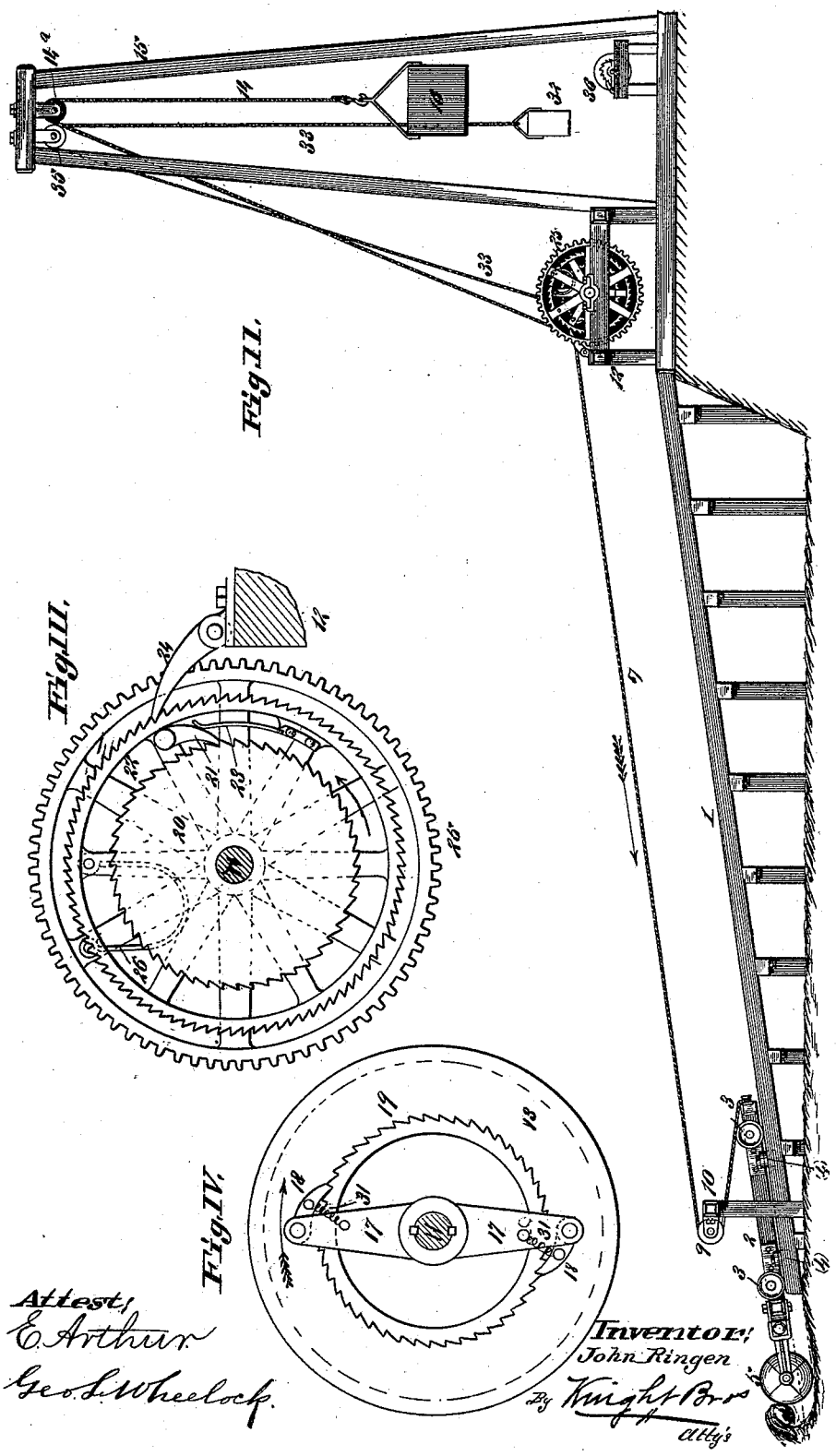

Fig. II.

Fig. III.

Fig. IV.

Attest:
E. Arthur
Geo. L. Wheelock.

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UNITED STATES PATENT OFFICE.

JOHN RINGEN, OF CORONADO, CALIFORNIA.

APPARATUS FOR UTILIZING SURF-POWER.

SPECIFICATION forming part of Letters Patent No. 418,590, dated December 31, 1889.

Application filed July 27, 1889. Serial No. 318,889. (No model.)

To all whom it may concern:

Be it known that I, JOHN RINGEN, of Coronada, in the county of San Diego and State of California, have invented a certain new and useful Improvement in Apparatus for Utilizing Surf-Power, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure I is a top view of my improved device or apparatus. Fig. II is a side elevation. Fig. III is an enlarged view showing one end of the drum, the shaft being shown in section on line III III, Fig. I. Fig. IV is a similar view showing the other end of the drum, the section through the shaft being taken on line IV IV, Fig. I.

My invention relates to an improved device for utilizing the power of an ocean surf; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, 1 represents a suitable inclined plane or supporting-frame, and upon which travels a truck 2. The truck is provided with wheels or rollers 3, that bear upon the inclined plane, and is also provided with friction-rollers 4, which fit between the rails or tracks of the inclined plane, as clearly shown in Figs. I and II. The truck is thus held by these rollers from lateral movement on the inclined plane while it is allowed to move lengthwise of the plane upon its rollers 3.

5 represents a cylinder hinged to the truck 2 by means of a suitable frame 6. The object of hinging the cylinder to the frame is to permit it to rise and fall under the action of the water without lifting the truck from the inclined plane.

7 represents cables secured to the truck 8, and which pass in an outward direction around pulleys 9, secured to a frame 10, and from thence the cables pass in an inward direction to a shaft or windlass 11, supported on a frame 12 at the upper or inner end of the inclined plane 1, or the frame 12 may be placed wherever it is most convenient. The cables pass around the windlass or shaft 11, and it will be understood that as the surf strikes the cylinder 5 and forces the truck 2 shoreward the cables 7 will be moved in the direction of the arrows, Figs. I and II. Then as the cylinder and truck move away from the shore the cables move in the opposite direction.

At one end of the shaft or windlass 11 is a drum 13. Around this drum passes a cable 14, which extends in an upward direction over a pulley 14^a, supported in the upper end of a derrick 15. From the pulley 14 the cable extends in a downward direction and has secured to its lower end a weight 16. Rigidly secured to the shaft or windlass 11 is an arm or arms 17, (see Fig. IV,) and pivoted to these arms are dogs or pawls 18, held into engagement with a ratchet-wheel 19 on the inner end or face of the drum. The drum is loosely mounted on the shaft or windlass. To the outer face or end of the drum 13 is secured a ratchet-wheel or disk 20. (See Fig. III.) This disk is engaged by a pawl 21, secured to a ratchet-wheel 22, which is also secured to the outer face of the drum, or which may be loosely mounted on the shaft or windlass 11, which extends through the center of the drum. The pawl 21 is held into engagement with the disk 20 by means of a spring 23, secured to the ratchet-wheel 22.

24 represents a pawl or dog secured to the frame 12, and which engages the teeth of the ratchet-wheel 22.

25 represents a gear-wheel loosely mounted on the shaft or windlass 11, and which is connected by means of a heavy spring 26 to the ratchet-wheel 22. The gear-wheel 25 would mesh into one of a train of gearing-wheels for transmitting the power to any mechanism which it is desired to operate.

The operation is as follows: As the surf strikes the cylinder 5 and forces the truck 2 inwardly the cables 7 wind the windlass 11 in the direction indicated by the arrow in Fig. I. This motion is transmitted to the drum 13 through means of the arm 17 and pawls 18 and ratchet-wheel 19, the latter being on the drum, the pawls being held into engagement with the ratchet-wheel by means of springs 31. This action turns the drum 13, winding thereon the cable 14 and lifting the weight 16. As the surf leaves the cylinder, the cylinder and truck move downwardly again on the in-

clined plane and the windlass 11 turns in the reverse direction to that represented by the arrow. The next surf moves the cylinder and truck inward and the operation just described is repeated. The gravity of the weight 16 causes the drum 13 to unwind as soon as it is relieved of the pressure of the truck or as soon as the truck starts to move seaward again, and in turning its power is transmitted to the gear-wheel 25 (and from the latter to the mechanism to be operated, as stated) through means of the disk 20, ratchet-wheel 22, and connecting-spring 26. The turning of the drum under the influence of the weight moves the disk 20 and ratchet-wheel 22 in the direction indicated by the arrow in Fig. III, and through means of a connecting-spring 26 the gear-wheel 25 is of course turned in the same direction. By employing the spring 26 instead of using a rigid connection between the ratchet-wheel 22 and gear-wheel 25, I am able to provide a substantially continuous motion to the gear-wheel, whether the weight 16 is rising or falling, for this reason: While the weight is turning the parts by its gravitation the spring 26 will be compressed at its ends. Then, as the weight is being wound up, as described, the ratchet-wheel 22 will be prevented from retrograde movement by the pawl 24, and the pressure of the spring 26 will be utilized or will exert its tension on the cog-wheel 25 and cause it to revolve while the ratchet-wheel 22 is standing still and while the drum itself is actually turning in the opposite direction to that of the gear-wheel. By this arrangement I am enabled to obtain a continuous operation of the machinery.

To prevent slack in the cables 7, I employ a weight 32, which is connected by means of a cable 33 to the windlass or shaft 11, as shown at 34, Fig. I. The cable 33 passes over a pulley 35 on the upper end of the derrick 15.

Should it be desired to pull the truck and cylinder shoreward, so that they will not be operated by the surf, it can be done by means of a cable (not shown) and a windlass 36. By an arrangement of this kind I am able to utilize the enormous power or force of the surf, and this power may be transmitted and utilized to operate any desired machinery or mechanism or any desired system of machinery or mechanism.

When I refer in the claims to "transmitting mechanism," I wish it understood that I mean the windlass or shaft 11, the drum 13, and the weight 16, with their connecting parts, or the parts operating in conjunction with them, to transmit the power, as described, or any substantial equivalent of these parts.

I claim as my invention—

1. In an apparatus for utilizing surf-power, the combination of an inclined plane or supporting-frame, a truck mounted on the inclined plane or supporting-frame, the frame 6, hinged to said truck, a cylinder secured to the said frame 6, a transmitting mechanism, and cables connecting the transmitting mechanism to the truck, substantially as and for the purpose set forth.

2. In an apparatus for utilizing surf-power, the combination of an inclined plane or supporting-frame, a truck provided with wheels and friction-rollers, the frame 6, hinged to the lower end of the truck, a cylinder secured to the frame 6, a transmitting mechanism, and cables connecting the transmitting mechanism to the truck, substantially as and for the purpose set forth.

3. In an apparatus for utilizing surf-power, the combination of the inclined plane or frame, a truck traveling on the inclined plane or frame, a cylinder hinged to the truck, a transmitting mechanism, and cables connecting the transmitting mechanism to the truck, substantially as and for the purpose set forth.

4. In an apparatus for utilizing surf-power, the combination of an inclined plane or supporting-frame, a truck, a cylinder hinged to the lower or inner end of the truck, transmitting mechanism, cables forming a connection between the transmitting mechanism and the truck, a frame, and pulleys secured to the frame around which said cables pass, substantially as and for the purpose set forth.

5. In an apparatus for utilizing surf-power, the combination of an inclined plane or supporting-frame, a truck traveling on the inclined plane or supporting-frame, a cylinder secured to the truck, transmitting mechanism, and cables connecting the transmitting mechanism to the truck, said transmitting mechanism consisting, essentially, of a windlass or shaft to which said cables are secured, a drum, arms secured to the shaft or windlass and provided with pawls or dogs, a ratchet-wheel secured to the drum and engaged by said pawls or dogs, a weight, a cable connecting the weight to the drum, a ratchet-disk secured to the drum, a ratchet-wheel on the drum or shaft, a pawl forming a connection between the ratchet-wheel and ratchet-disk, a fixed pawl engaging the ratchet-wheel, a gear-wheel, and a spring connecting the gear-wheel to the ratchet-wheel, all substantially as and for the purpose set forth.

6. In an apparatus for utilizing surf-power, the combination of an inclined plane or supporting-frame, a truck traveling on the inclined plane or supporting-frame, a cylinder secured to the truck, transmitting mechanism, and cables connecting the transmitting mechanism to the truck, said transmitting mechanism consisting, essentially, of a weight, a drum, a windlass, connection between the drum and windlass, a gear-wheel, and a spring-connection between the gear-wheel and drum, all substantially as and for the purpose set forth.

7. In an apparatus for utilizing surf-power,

the combination of an inclined plane or supporting-frame, a truck traveling on the inclined plane or supporting-frame, a cylinder secured to the truck, a transmitting mechanism, cables connecting the transmitting mechanism to the truck, and a weight 32, connected to the transmitting mechanism by means of a cable 33, substantially as and for the purpose set forth.

JOHN RINGEN.

In presence of—
E. S. BABCOCK, Jr.,
H. W. MALLETT.