

O. D. BOOTH.
CURRENT MOTOR.

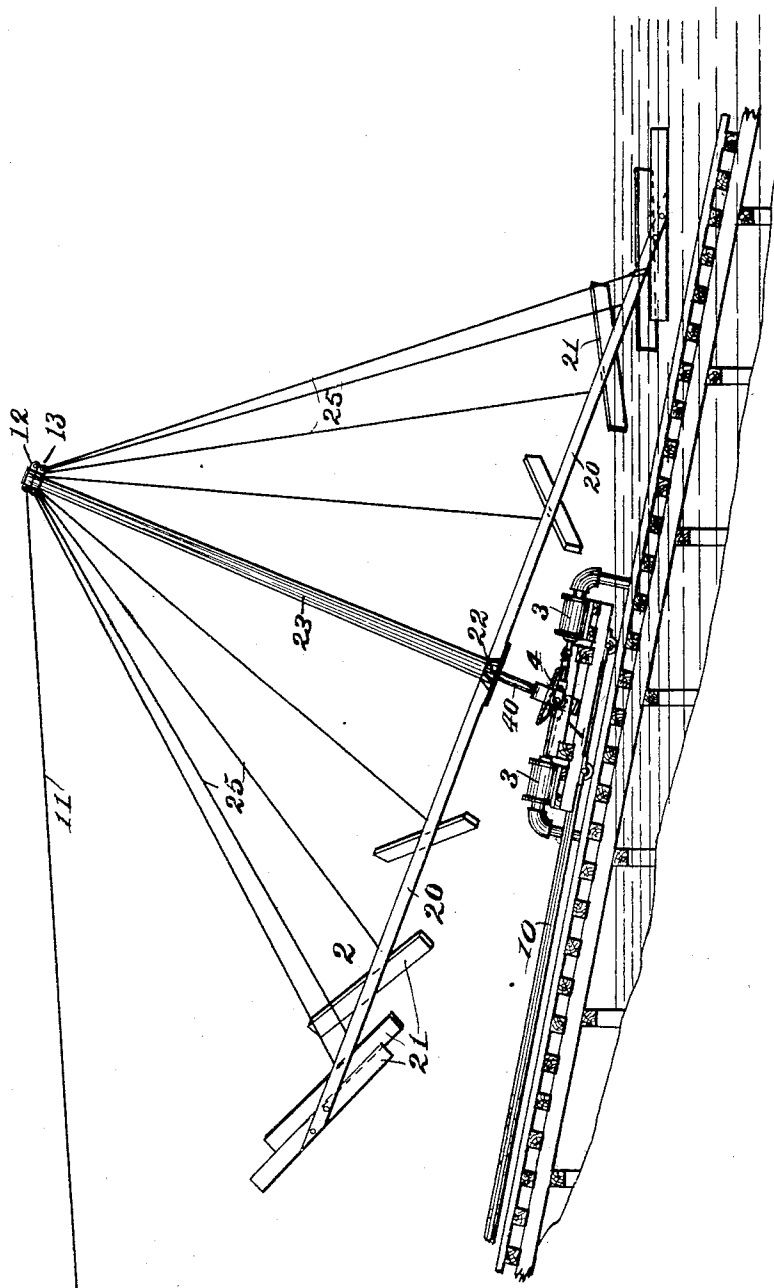
APPLICATION FILED MAY 28, 1913.

1,112,352.

Patented Sept. 29, 1914.

4 SHEETS-SHEET 1.

Fig. 1.



Witnesses

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4 SHEETS-SHEET 2.

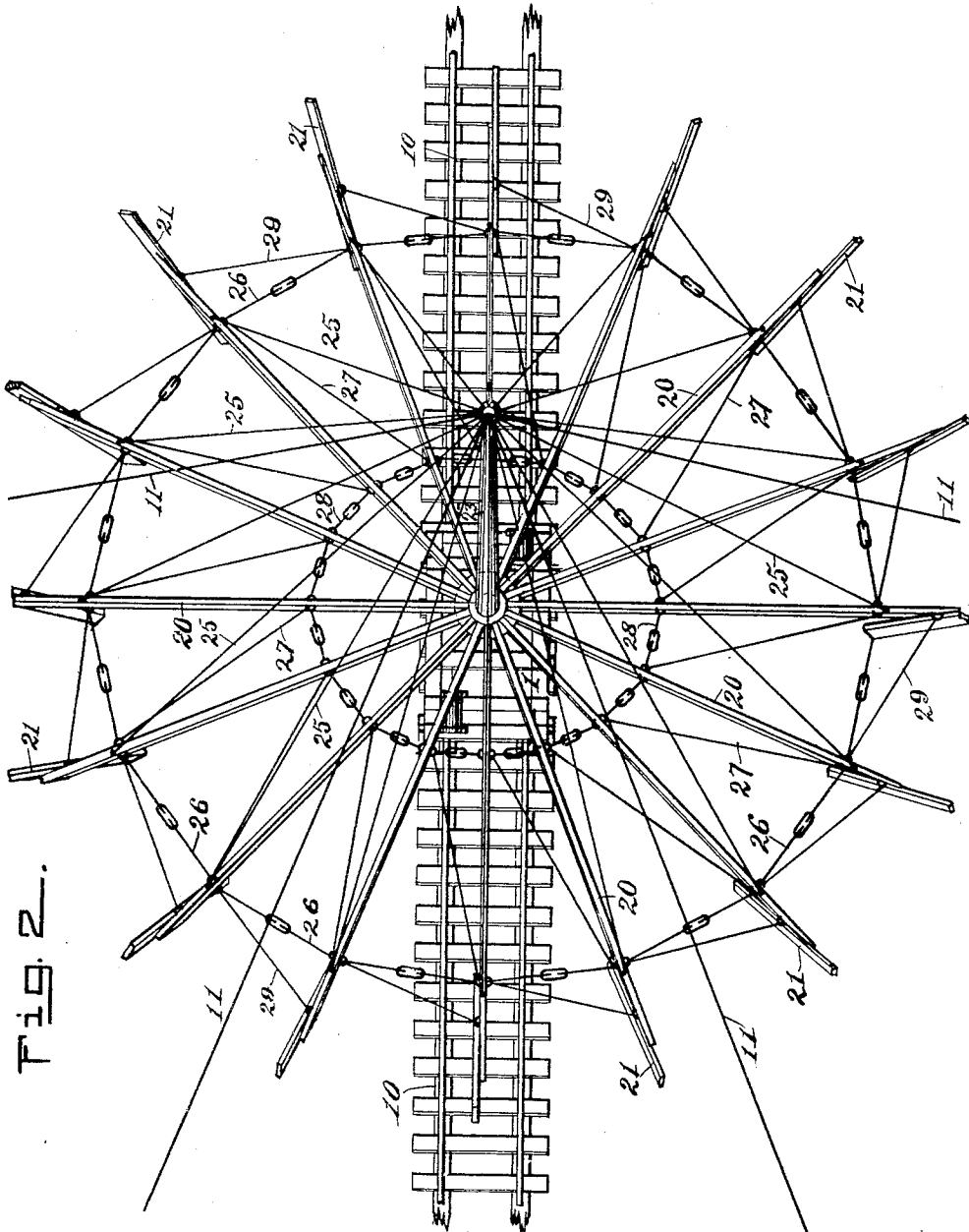


Fig. 2.

Witnesses

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4 SHEETS-SHEET 3.

Fig. 3.

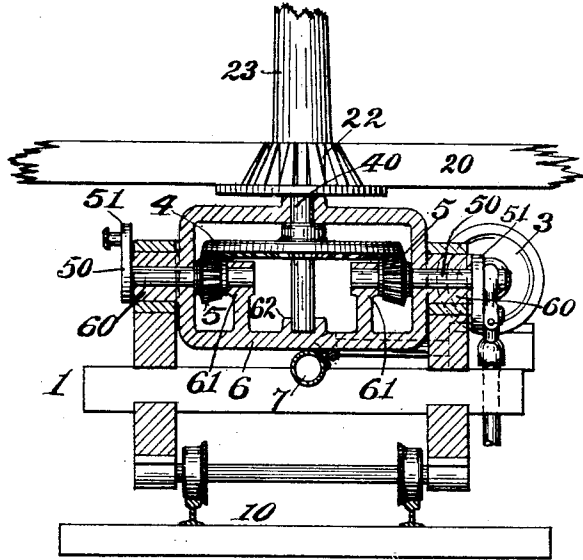
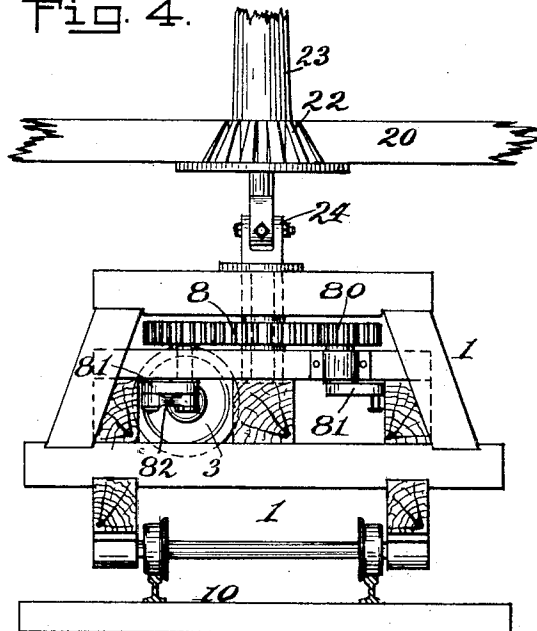


Fig. 4.



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4 SHEETS-SHEET 4.

Fig. 5.

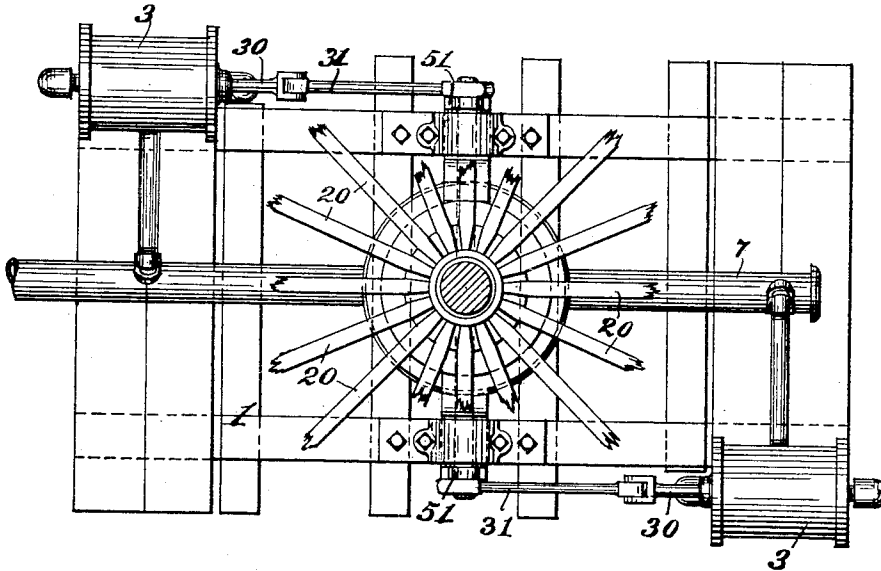
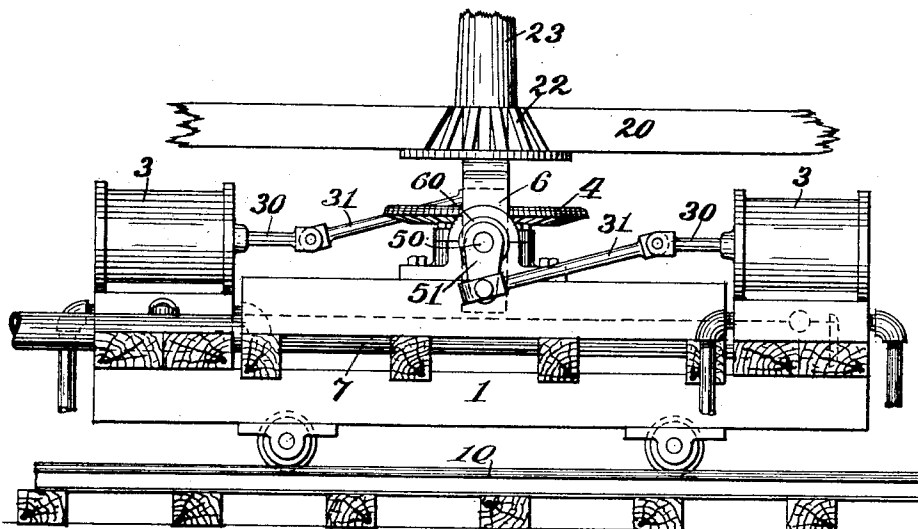


Fig. 6.



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UNITED STATES PATENT OFFICE.

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CURRENT-MOTOR.

1,112,352.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, OSCAR D. BOOTH, a citizen of the United States, residing at Everett, in the county of Snohomish, State of Washington, have invented a new and useful Improvement in Current-Motors, of which the following is a specification.

My invention relates to current motors, or devices designed to develop the power contained in a stream of water due to the normal flow thereof.

The object of my invention is to simplify and improve the construction of such devices, to increase their capacity for power development and their efficiency.

The scope of my invention will be pointed out in the claims which terminate this specification.

In the accompanying drawings I have shown my invention in the forms which are now preferred by me.

Figure 1 is a side elevation of my device in position for use, except that the arms and paddles carried thereby have been omitted from the half of the wheel toward the point of vision, thereby avoiding complication of the view. Fig. 2 is a plan view of my device in working position. Fig. 3 is a sectional elevation through the car and the mechanism by which the paddle wheel is operatively connected with the mechanism to be driven, showing my preferred construction. Fig. 4 shows, in elevation, another or substitute construction for the same purpose. Fig. 5 shows the car in plan view, the hub and a short portion of the wheel arms being also shown. Fig. 6 is a side elevation of the same.

The broad constructional features of my invention comprise the use of a paddle wheel mounted to turn upon an inclined upright axis and mounted upon a car which carries pumps operated by said wheel, the carriage traveling along an inclined trackway laid up and down the sloping bank of the river.

The construction of the paddle wheel 2 may be widely varied. The construction shown employs a hub 22 which receives the inner ends of radial arms 20, to the outer ends of which are secured paddles 21. A mast 23 extends upward, in an inclined position when the wheel is working. From the upper end of the mast, guy lines 11 extend in such directions as may be required to hold the wheel in the position desired.

These guy lines 11 are secured by one end to a collar 12 within which the mast turns and which rests upon a collar 13 that is fixed upon the mast and to which the guy lines 25 are attached.

The wheel as shown, has guys 25 extending from the upper part of the mast to the outer part of the arms 20. It also has rods 26 and 28 connecting successive arms 20 at different points in the length of said arms, which rods 26 and 28, are preferably provided with turnbuckles, to adjust and tighten them. I have also shown diagonal rods 27 extending between arms and strengthening the wheel against turning strains. While the above construction is that preferred by me, I may employ other and widely differing types of wheels.

The trackway 10 is placed on the sloping bank of the river and should preferably run down to or below low-water mark, or what is likely to be low-water mark for the season when it is desired to run the wheel. This applies more particularly to locations where the water level is subject to considerable fluctuation. Where this fluctuation is little or nothing, this might not be necessary. Upon this trackway is placed a car 1, which constitutes a movable base for the wheel. The construction of this car may be anything which fits properly with the other parts of my device. This car is moved up or down the inclined trackway as necessitated by the change in water level. I have not shown the means employed for moving the car, nor those for locking or holding it in the selected position. These may be of any form found suitable.

A shaft 40 is centrally secured to and turns with the paddle wheel, projecting downward therefrom. Secured thereon is a gear wheel 4, this, in the preferred construction shown in Figs. 3, 5, and 6, being a bevel gear. This shaft is journaled in a frame 6 which provides a top bearing and a lower bearing 62. The frame also has trunnions 60 journaled on the frame carried by the car, their axes being substantially horizontal and preferably extending in a direction substantially parallel the direction of the flow of the stream.

The trunnions 60 are hollow and within them are journaled the power transmission shafts 50, upon the inner parts of which are secured bevel pinions 5 which mesh with the

bevel gear or bull wheel 4. I provide arms 61 on the frame in which the extreme inner ends of the shafts 50 are journaled. With the outer ends of these shafts connections are made with the mechanism to be operated. I have shown cranks 51 as employed for this purpose, although any other suitable means may be employed.

In the above described construction, the paddle wheel is supported upon the trunnions 60 upon which it is rocked to vary its angular position. Such rocking does not interfere with the transmission of the power, as the transmission shafts are located in the rocking axis.

The alternate construction shown in Fig. 4 is as follows: A spur gear 8 is mounted in fixed position on the frame carried by the car. The construction between the shaft of this gear and the shaft of the paddle wheel is by a universal coupling 24, which permits whatever rocking of the paddle wheel may be necessary. Spur pinions 80 are placed to mesh with gear 8 and have cranks 81 secured thereto, which, through rods 82 actuate pumps 3. In Figs. 5 and 6, I have shown two pumps 3 which are operated through connecting rods 31 and piston rods 30 from the cranks 51 carried by shafts 50. The pumps deliver their water through a common pipe 7, which extends lengthwise the car and the trackway.

The operation of my device is believed to be evident. The car carrying the wheel is run down the trackway to or into the water. If the axis of the wheel is inclined toward the stream, the paddles upon this side will dip into the stream and the wheel will be turned thereby, and this will operate the pumps in a manner which is obvious.

What I claim as my invention, is:

1. In a current motor, in combination, a series of paddle-carrying arms, a central or hub member to which said arms are secured, an axial shaft secured to rotate with said central member, a bearing frame having journal bearings for said shaft adapted to support the shaft in an upright position, a horizontal pivot axis for said bearing frame, a bevel gear secured to the rotative shaft, a shaft lying in the axis of said bearing frame and a bevel gear on said latter shaft meshing with the other bevel gear.

2. In a current motor, in combination, a paddle-carrying wheel having an axial shaft secured to turn therewith and having an upright axially placed mast, a bearing frame in which said central shaft is journaled, pivot and supporting bearings for said frame lying horizontally, a collar rotatably mounted upon the upper end of said mast, guys extending outwardly from said collar to fixed anchorages, and transmission mechanism connected with said central shaft.

3. In a current motor, in combination, a paddle-carrying wheel having an axial shaft secured to turn therewith and having an upward extension forming a mast, a collar secured to the upper end of the mast, guys extending from said collar to the outer parts of the wheel frame, a second collar rotatively mounted on the mast above the first collar, guys extending from the second collar to fixed anchorages, a step bearing member in which the lower end of the axial shaft is journaled, and pivot supports for said step bearing member lying in a horizontal plane.

4. In a current motor, in combination, a paddle-carrying wheel having an axial shaft secured to turn therewith and having an upward extension forming a mast, a collar secured to the upper end of the mast, guys extending from said collar to the outer parts of the wheel frame, a second collar rotatively mounted on the mast above the first collar, guys extending from the second collar to fixed anchorages, a step bearing member in which the lower end of the axial shaft is journaled, pivot supports for said step bearing member lying in a horizontal plane, and a power transmission device containing two intermeshing bevel gears, one secured to the axial shaft of the wheel and the other journaled co-axial with the pivot axis of the step bearing member.

5. In a current motor, in combination, an inclined track extending into the water, a car mounted to traverse said track, a paddle wheel having a step bearing supported on said car by pivot bearings extending transversely of the car and track, said wheel having an upwardly extending axial mast, a collar rotatively mounted on the upper end of said mast, and guys extending from said collar to fixed anchorages.

6. In a current motor, in combination, an inclined trackway extending transversely of the flow of the current, a car upon said trackway, a paddle-carrying wheel having a central shaft secured thereto, a frame pivoted upon said car by horizontal pivots and having a bearing support for the shaft of said paddle wheel, the pivots of said frame being tubular, a shaft journaled in said tubular pivots, and intermeshing bevel gears secured to said last mentioned shaft and the shaft of the paddle wheel.

7. In a current motor, in combination, a paddle-carrying wheel, a central shaft secured to said wheel, a frame having bearing supports for said shaft and having horizontal, hollow, supporting trunnions, a shaft journaled in said trunnions, intermeshing bevel gears connecting said shafts, a crank secured to the horizontal shaft.

8. In a current motor, in combination, an inclined trackway, a car mounted on said trackway, a horizontally placed paddle-car-

rying wheel having an upright shaft secured thereto, a bearing member in which said shaft is journaled and supported, said bearing member having supporting trunnions having their axes substantially horizontal, a shaft journaled in one of said trunnions, intermeshing bevel gears carried respectively by this shaft and by the shaft of the paddle wheel, a crank on the outer end of the horizontal shaft, a pump having its cylinder secured to the car in alinement with said crank shaft, and its piston connected with said crank.

9. In a current motor, in combination, an inclined trackway, a car mounted on said trackway, a paddle wheel having a central shaft secured thereto, and an upwardly extending axial mast, guys connecting with said mast, a bearing member in which said shaft is supported and journaled in an upright position, said bearing member having supporting hollow trunnions lying in substantially horizontal position, crank shafts lying in said trunnions, a bevel gear secured to the paddle wheel shaft, bevel pinions mounted upon the crank shafts and meshing with the bevel gear on the paddle wheel, cranks secured to the outer ends of said crank shafts, and pumps mounted upon the car and operatively connected with said cranks.

10. In a current motor, in combination, a paddle wheel having an axial shaft secured thereto and lying in an uprightly inclined position, a power gear secured to turn with said paddle wheel shaft, a frame mounted upon trunnions and having rotative bearings for said paddle wheel and gear, a transmission shaft journaled in the trunnion axis of said frame and a pinion carried by the transmission shaft and meshing with the power gear.

11. In a current motor, in combination, a paddle wheel having an upwardly inclined axis and a shaft projecting downwardly, a

frame mounted to rock upon horizontal trunnions and having top and bottom bars, the paddle wheel shaft being journaled in both top and bottom bars of said frame and intersecting the trunnion axis thereof, a power transmitting shaft axially journaled in one of the trunnions, intermeshing bevel gears carried, one by said power transmitting shaft and the other by the paddle wheel shaft.

12. In a current motor, in combination, a paddle wheel having a shaft projecting from one side, a box-like frame having hollow supporting pivot trunnions, power transmitting shafts journaled in said trunnions, said frame having arms projecting from its lower side and providing inboard bearings for said power transmitting shafts, the paddle wheel shaft being journaled in said frame in position at right angles to the trunnions, a bevel gear secured to the paddle wheel shaft just within said frame, bevel pinions secured to the power transmitting shafts and meshing with said bevel gear, and cranks secured to the outer ends of said power transmitting shafts.

13. In a current motor, a paddle wheel comprising a series of radial arms secured together to form a wheel frame, a mast secured to said frame in axial position and extending to a considerable height above the wheel frame, guys extending from the upper end of said mast to the outer ends of the arms, paddles secured to the outer ends of said arms, a frame carrying a step bearing for said mast and having pivot bearing supports lying in an axis which extends transversely of the axis of the mast, and guy lines extending from fixed anchorages to the top of the mast and having a rotative connection therewith.

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