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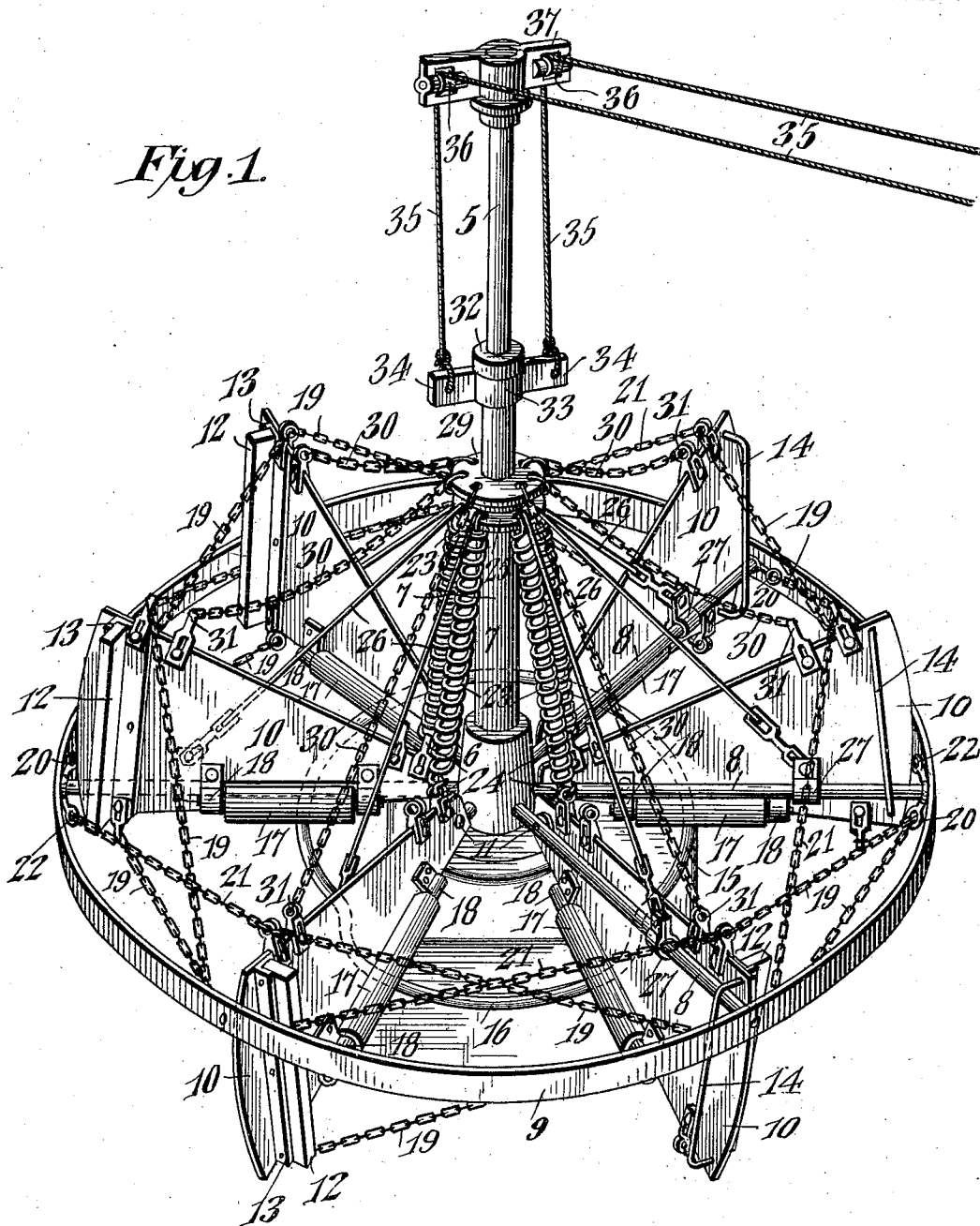
HYDRAULIC MOTOR.

APPLICATION FILED JUNE 2, 1908.

934,128.

Patented Sept. 14, 1909.

2 SHEETS—SHEET 1.



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Fig. 2.

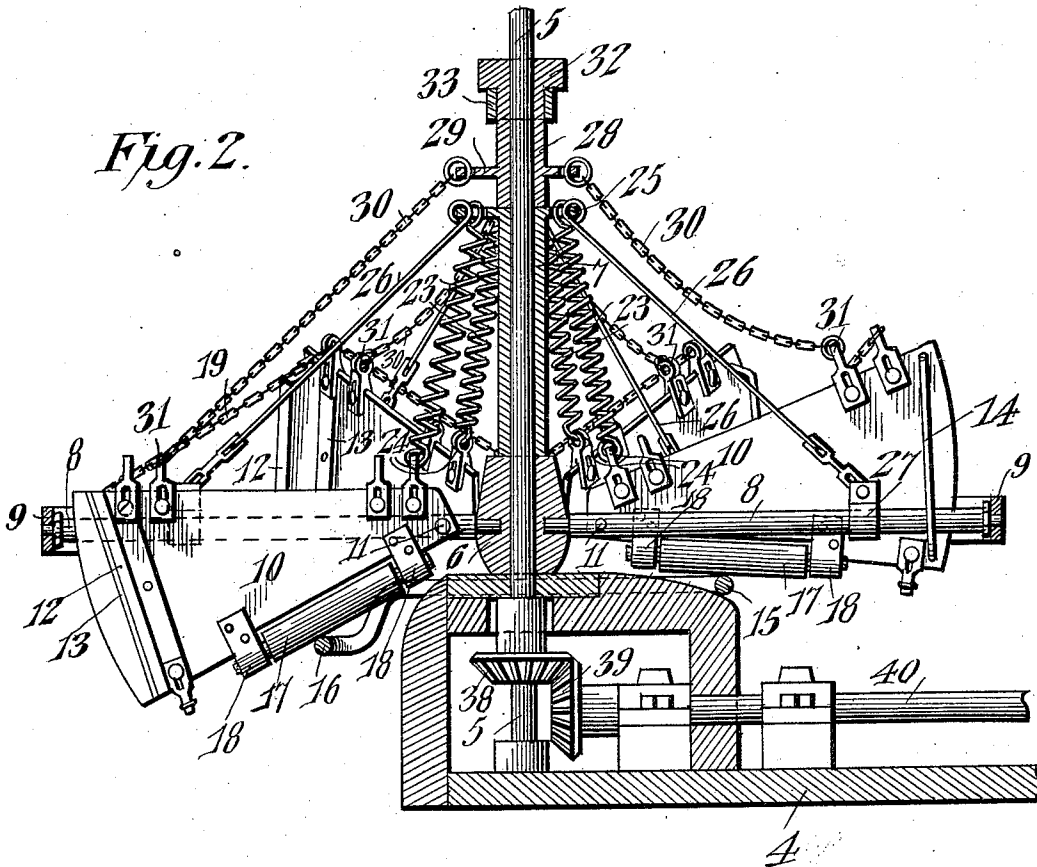
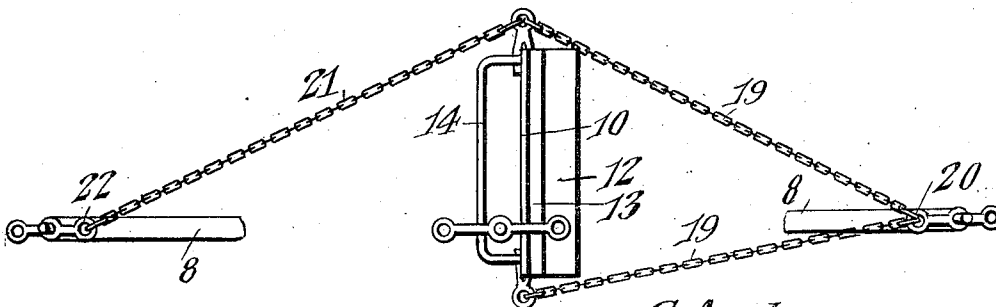


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHRIS ANDERSON, OF MALHEUR COUNTY, OREGON, AND HUBERT M. RUDDOCK, OF CALDWELL, IDAHO.

HYDRAULIC MOTOR.

934,128.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed June 2, 1908. Serial No. 436,239.

To all whom it may concern:

Be it known that we, CHRIS ANDERSON, a subject of the King of Denmark, who did on the 9th day of November, 1903, in the district court of the third judicial district of the State of Idaho, in and for the county of Canyon, declare on oath that it was his *bona fide* intention to become a citizen of the United States of America, residing in Malheur county, State of Oregon, and HUBERT M. RUDDOCK, a citizen of the United States of America, residing at Caldwell, in the county of Canyon, State of Idaho, have invented certain new and useful Improvements in Hydraulic Motors, of which the following is a specification.

This invention relates to hydraulic motors, and the primary object is to provide a novel structure that can be placed in practically any kind of a current of water, as for instance, a stream, and will develop power therefrom, which power can be transmitted to any convenient place as desired.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a perspective view of the motor. Fig. 2 is a vertical longitudinal sectional view therethrough. Fig. 3 is an end view of one of the blades and the draft and brace cables therefor.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, a suitable support 4 is provided, which may be a boat or other holding means, and journaled in said support is a substantially vertical shaft 5. Secured to this shaft is a hub 6, which preferably includes an elongated sleeve 7, and projecting from said hub are radial spokes 8 connected at their outer ends by a circular rim 9. Radially disposed blades 10, located alongside the spokes 8, are pivoted at their inner ends thereto, as shown at 11, said blades thus being capable of vertical swinging movement. On their rear or active faces, they are provided with outstanding wings 12 that are disposed transversely of the blades, and are preferably secured thereto by angle iron strips 13. The opposite sides of said blades have keeper yokes 14, which embrace the adjacent spokes, thus insuring that the blades will remain alongside the spokes and also limiting their swing-

ing movements. A track 15 is arranged below the blades, and the outer portion thereof is depressed as shown at 16. Rollers 17, journaled in ears 18 that are carried by the lower portions of the blades, operate on the track, and consequently it will be evident that during the rotation of the frame, the blades will successively move downwardly and then be caused to swing upwardly due to the configuration of the track 15. In order to effectively brace the blades, cables 19 are secured to their upper and lower portions at their outer ends, these cables being fastened to ears 20 that are carried by the outer ends of the spokes. Other cables 21, fastened to the upper portions of the blades, extend in an opposite direction to oppositely extending ears 22, these oppositely extending ears being preferably formed of a single piece, through which the end of the spoke passes, as will be clear by reference to Fig. 3. To assist in the elevating movement of the blades, coiled springs 23 are provided, the lower ends of which are secured in eyes 24 located on the inner portions of the blades, each blade being preferably provided with a plurality of these eyes, in order that the springs can be fastened to the blades at different distances from their pivot axes. The upper ends of the springs are fastened to an outstanding annular flange 25 carried by the upper end of the sleeve 7, and also secured to this flange, are supporting rods 26 that are fastened to clips 27 embracing the spokes.

A collar 28 is slidably mounted on the shaft 5, and has an outstanding annular flange 29 to which are connected cables 30 also connected, as shown at 31 to the outer ends of the blades. This collar terminates at its upper end in a head 32, and surrounding the collar below the head, is a ring 33 having outstanding arms 34. Elevating cables 35 are secured to the arms 34 and pass over pulleys 36 journaled in a cross head 37 in which the upper end of the shaft 5 is rotatably mounted. The cables 35 extend to any desired point. The lower end of the shaft 5 is preferably provided with a bevel gear 38 in mesh with another gear 39 that is keyed or otherwise secured to a drive shaft 40. The particular form of the driving mechanism and its location, however, is unimportant.

It will be evident that if this structure is properly placed so that the blades when in their lower position, will enter a flowing

current of water, the frame, and consequently the shaft 5 will be rotated, and thus power developed, which can be transmitted to any suitable mechanism. The blades are effectively held in their opposite positions by the braces and guides. Their downward movement is permitted by the depressed portion 16 of the track 15, but the upwardly extending portion of said track will readily carry them up, inasmuch as their weight is to some extent counteracted by the spring. Furthermore the motor can be stopped at any time by drawing upon the cables 35, which by elevating the collar 28, will cause the active blades to be raised. In this connection, it will be noted that while all the blades are connected to the elevating means, only those that are in their lower position have to be raised, and this raising action is assisted by the springs.

From the foregoing, it is thought that the construction, operation, and many advantages of the herein described invention, will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is:—

1. In a motor of the character set forth, the combination with a rotary support, of a plurality of blades rotatable with the support and having a downward and upward movement thereon, means for directing the blades in said movement, and means connected to all the blades for elevating those that are in their lower positions independently of those that are elevated.

2. In a motor of the character set forth, the combination with a shaft, of a rotary support associated therewith, a plurality of blades rotatable with the support and having a downward and upward movement on said support, means for directing the blades in said movement, a collar slidably mounted on the shaft, a separate connection between the collar and each blade to elevate those that are in their lower positions independently of those that are elevated, and means for raising and lowering the collar.

3. In a motor of the character set forth, the combination with an upright shaft, of a rotatable supporting frame having a hub fixed to the shaft, a plurality of blades pivotally mounted on the frame, a vertically slidable collar located on the shaft above the hub, a flexible connection between each blade and the collar, means connected to the collar for raising and lowering the same, and a track located beneath the blades and having a depressed portion.

4. In a motor of the character set forth, the combination with a rotatable frame including radial spokes, of blades pivoted on the spokes, the outer ends of the blades having a shiftable engagement with the spokes and said blades having upward and downward swinging movements alongside and with respect to the spokes, and means for effecting the swinging movement of the blades during the rotation of the frame.

5. In a motor of the character set forth, the combination with a rotatable frame including radial spokes, of vertically swinging blades pivotally mounted on the frame, keeper guides carried by the blades and slidably embracing the spokes, and means for effecting the swinging movement of the blades with respect to the spokes during the rotation of the frame.

6. In a motor of the character set forth, the combination with a substantially upright shaft, of a hub fixed to the shaft, radial spokes projecting from the hub, a rib connected to the outer ends of the spokes, vertically swinging blades pivoted on the spokes and located alongside the same, keeper yokes secured to the blades and embracing the spokes, a track located beneath the blades and having a depressed portion, and rollers journaled on the blades and operating against the track.

7. In a motor of the character set forth, the combination with a rotary frame, of blades pivotally mounted thereon, divergently disposed draft cables connected to the frame and to the upper and lower portions of each blade, and means for effecting the swinging movement of the blades.

8. In a motor of the character set forth, the combination with a rotary frame including radial spokes and a rim, of oppositely extending ears secured to each spoke, vertically movable blades located alongside the spokes, and oppositely extending cables connected to each blade and to the ears of the spokes.

9. In a motor of the character set forth, the combination with a rotatable support, of blades movably mounted thereon and rotatable therewith, means for effecting the raising and lowering of the blades on the support, and springs engaged with the blades for assisting in the elevating movements thereof.

10. In a motor of the character set forth, the combination with a rotatable supporting frame including a hub, of blades pivotally mounted on the supporting frame, a track on which the blades operate, said track having a depressed portion that permits the blades to move downwardly, and coiled springs connected to the blades and to the hub for assisting in the upward movement of said blades.

11. In a motor of the character set forth,

the combination with an upright shaft, of a
hub secured thereto, radially disposed spokes
extending from the hub, a rim connected to
the spokes, a plurality of vertically swinging
5 blades pivotally mounted at their inner ends
on the spokes and located alongside the same,
keeper yokes secured to the blades and em-
bracing the spokes, draft and brace cables
connecting the blades and spokes, a track
10 located beneath the blades and having a de-
pressed portion, rollers journaled on the
blades and operating on the track, coiled
springs connected to the hub and to the

blades for assisting in the elevation of said
blades, a vertically operating collar located 15
on the shaft above the hub, cables connected
to said collar and to the blades, and elevat-
ing cables connected to the collar for raising
the same.

In witness whereof, we affix our signatures 20
In presence of two witnesses.

CHRIS ANDERSON.

HUBERT M. RUDDOCK.

Witnesses:

THOMAS E. BUCKNER,
J. M. THOMPSON.