(No Model.) 2 Sheets—Sheet 1.

J. H. BOYD.

HYDRAULIC MOTOR.

No. 525,130. Patented Aug. 28, 1894.

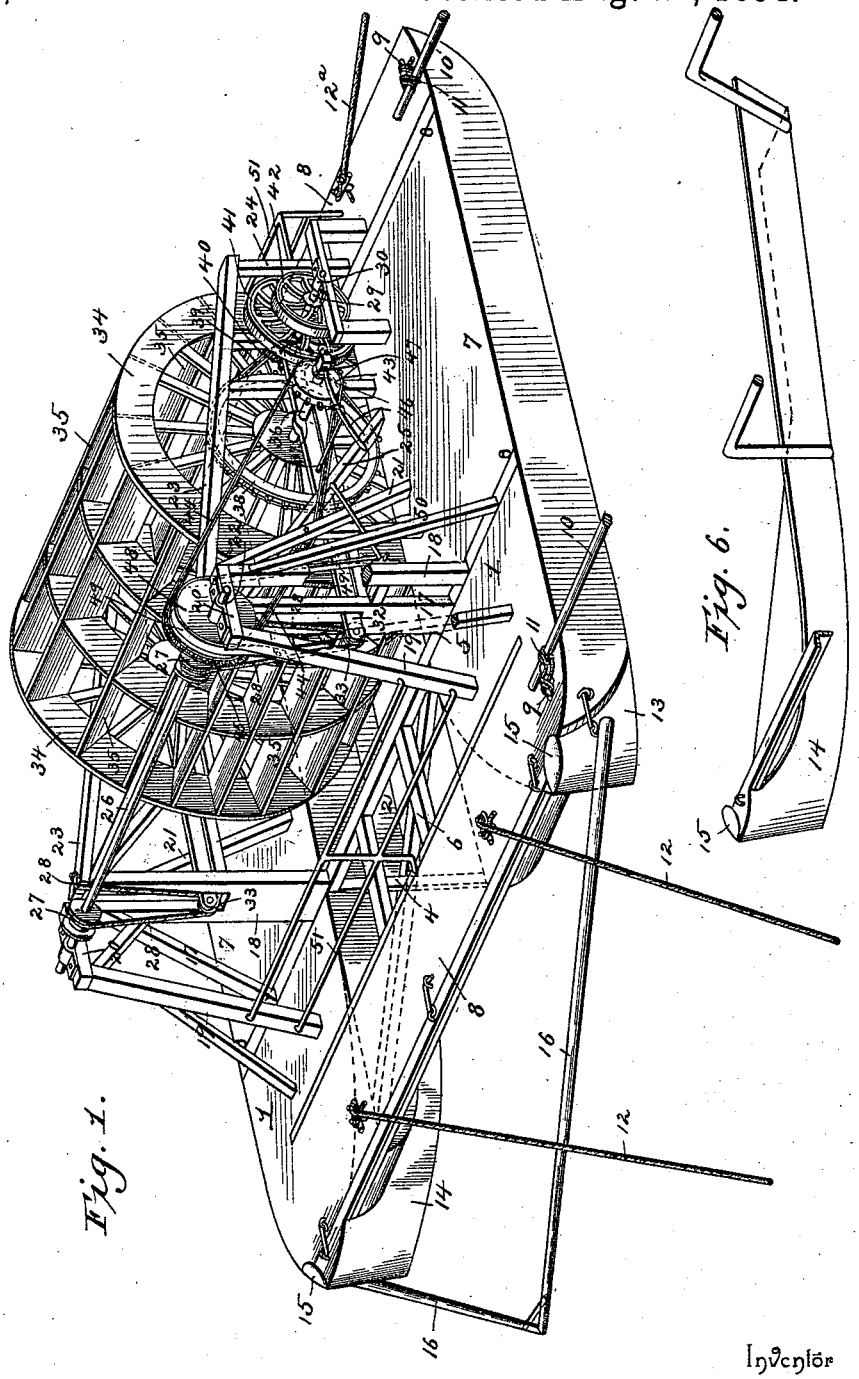

Fig. 1.

Fig. 6.

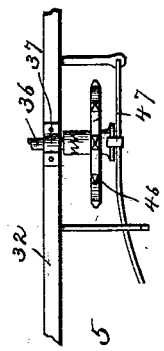

Fig. 5

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(No Model.) 2 Sheets—Sheet 2.

J. H. BOYD.

HYDRAULIC MOTOR.

No. 525,130. Patented Aug. 28, 1894.

Fig. 2.

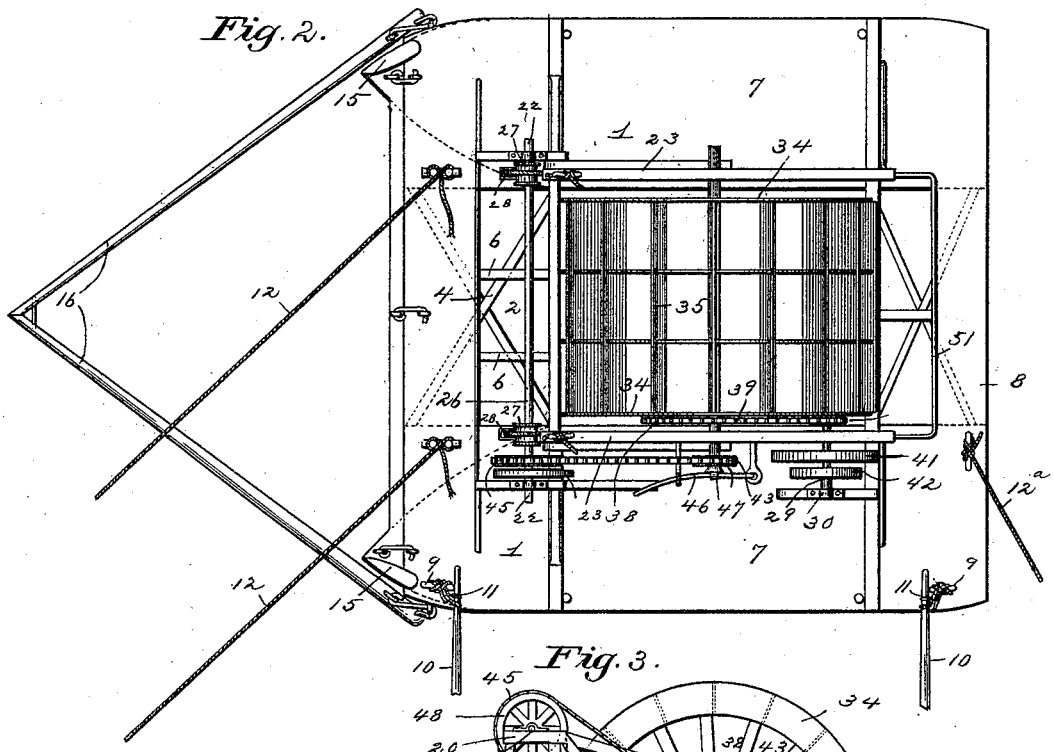


Fig. 3.

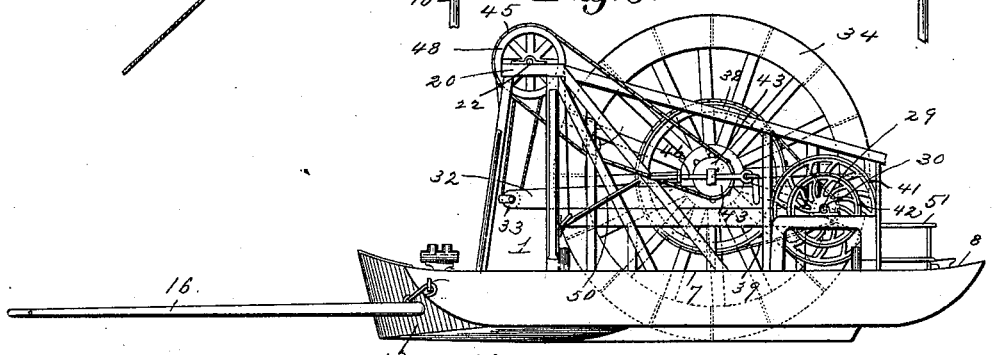
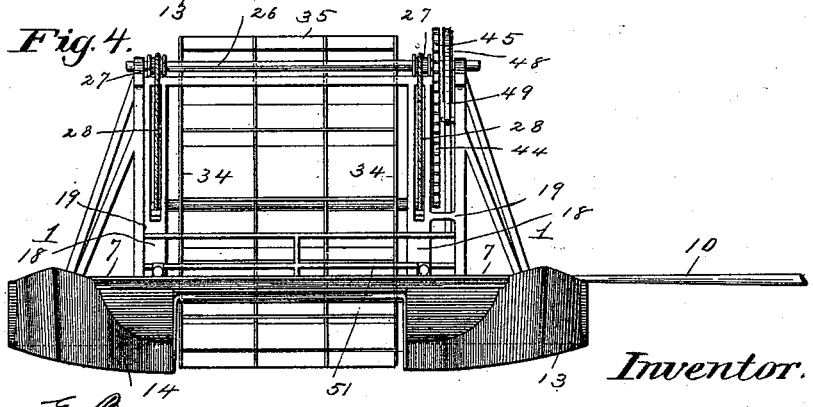


Fig. 4.



Witnesses
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James H. Boyd

UNITED STATES PATENT OFFICE.

JAMES H. BOYD, OF WATERVILLE, WASHINGTON.

HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 525,130, dated August 28, 1894.

Application filed July 5, 1893. Serial No. 479,674. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BOYD, a citizen of the United States of America, residing at Waterville, in the county of Douglas and State of Washington, have invented a new and useful Hydraulic Motor, of which the following is a specification.

My invention relates to hydraulic motors, and has for its object to provide a simple and efficient device adapted to utilize the power of a current or tide, and provided with means whereby it may be anchored or otherwise fixed in mid-stream.

Further objects and advantages of the invention will appear in the following description and the novel features thereof will be particularly pointed out in the claim.

Referring to the drawings:—Figure 1 is a perspective view of a motor embodying my invention. Fig. 2 is a plan view. Fig. 3 is a side view. Fig. 4 is a front view. Fig. 5 is a detail plan view of the clutch-device. Fig. 6 is a detail view in perspective of one of the shoes which are attached to the boats.

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

1 designates twin boats spaced apart and held at the desired interval by interposed framing 2, consisting of the X-shaped or bridge braces 4, the transverse tie-beams 5, and the longitudinal supporting bars 6 which are preferably disposed above the plane of and rest upon said X-shaped or bridge braces with their upper sides in the plane of the tie-beams. This framework, including the boats, is floored over to form the side platforms 7 and the end platforms 8. The side platforms are provided with cleats 9 for the attachment of the extremities of spars 10 by means of cords or lashings 11, said spars being secured at their outer or remote extremities to stationary objects upon the shore, or to suitable piles, not shown, to prevent the structure from swinging inward or toward the shore. Bow and stern lines or cables 12 and 12^a are also employed for connection with stationary objects, and which in connection with said spars, hold the structure in the desired position with relation to the current or direction of movement of the water to be utilized.

The front ends of the boats are provided with shoes 13, having the long beveled or rounded inner sides 14, which converge toward their rear ends in order to concentrate the current between the boats. These shoes are held in place by means of the ears 15, which bear upon the upper surfaces of the platforms forming the tops of the boats adjacent to the bows of the latter. It will be seen that the inner sides of the boats are deeper than the outer sides thereof in order to set more deeply in the water to prevent the deflection or lateral dispersion of the volume of water which flows between the boats. Secured to the boats near their front ends are the rear ends of the forwardly extending spars 16, which are connected at their front ends and rest upon the surface of the water, thus forming a débris guard and prevent floating objects from entering the space between the boats.

Mounted upon each boat or floating member is a side frame 17, and as these frames are identical in construction the specific description of one will be sufficient.

18 represents an upright, and 19 an adjacent rearwardly inclined brace arranged in front of the upright and connected to the upper end of the latter by means of a horizontal piece 20.

21 represents a rear brace connected at its upper end to the upper end of said upright. This portion of the frame constitutes a standard, and in the horizontal portion 20 is a bearing 22.

23 is an approximately horizontal beam arranged longitudinally of the boat with its front end approximately in the plane of the upper end of the standard, and it is supported at intervals by the uprights 24 and the inclined brace 25.

Mounted in the bearings 22 at the upper ends of the standards is a transverse spindle 26 carrying the drums 27, and 28 represents supporting cables which are secured at one end to the frame, preferably the adjacent ends of the beams 23, and attached at the other end to the drums 27.

29 represents a drive-shaft mounted in suitable bearings 30 on one of the boats, and pivoted to the frame-work at a point 31 slightly in advance of said shaft is a lever 32. A corresponding lever 32 is pivoted to the frame-

work on the other boat, and both levers are provided at their front ends with anti-friction rolls 33, around which pass the loops of the supporting cables 28.

34 represents a water-wheel approximately equal in width to the interval between the inner sides of the boats and provided with the spaced blades, the shaft 36 of said wheel being mounted loosely in bearings 37 in the levers 32. A sprocket wheel 38 is fixed to the water-wheel at one end concentric with its shaft, and is connected by means of a chain 39 with a sprocket pinion 40 on the drive-shaft 29, whereby the rotary motion of the wheel is conveyed to the drive-shaft.

41 represents a fly-wheel and 42 a belt-wheel, which are fixed to the said drive-shaft, the latter being designed to carry a belt to convey motion to suitable machinery.

Loosely mounted upon the shaft of the water-wheel is a sprocket-wheel 43 connected by a chain 44 with a similar sprocket-wheel 45, which is fixed to the transverse spindle 26; and 46 represents a clutch, which may be of any suitable or preferred construction, and is provided with an operating handle 47, whereby it may be thrown into and out of connection with the loose sprocket-wheel 43 to secure the latter to the shaft of the water-wheel or allow said shaft to rotate loosely therein. When the sprocket-wheel 43 is fixed by the adjustment of the clutch to the shaft of the water-wheel the rotary motion thereof is communicated through the chain 44 and the sprocket-wheel 45 to the spindle 26, thereby turning the drums 27 and winding the supporting cables 28 thereon to elevate the front ends of the supporting levers 32, and hence lift the water-wheel out of the current. Adjacent to the sprocket-wheel 45 and fixed to the spindle 26 is a brake-wheel 48, around which passes a brake-strap 49 fixed at one end to a suitable portion of the framework and connected at the other end to a brake-lever 50. By means of this brake mechanism the water-wheel may be lowered as slowly as may be expedient after the disconnection of the clutch from the sprocket-wheel 43. While the sprocket-wheel 43 is locked to the shaft of the water-wheel the inertia of the latter is sufficient to prevent the rotation of the drums and the lowering of the water-wheel.

The operation of the above mechanism will be obvious from the above description, and it will be understood that the elevation of the water-wheel to withdraw it from the current is accomplished by the power of the wheel acting through connections consisting of the sprocket-wheels 43 and 45 and the chain 44 when the first named sprocket-wheel is secured to the shaft of the water-wheel by means of clutch mechanism.

It will be understood, furthermore, that the elevation of the water-wheel may be varied to cause it to dip more or less into the water, and may be held at any desired elevation by means of the brake-mechanism, for which suitable locking devices, not shown, may be provided.

Guards 51 are arranged at opposite ends of the framework at the inner sides of the front and rear platforms to prevent operatives from coming in contact with the revolving wheel.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

Having described my invention, what I claim is—

In a device of the class described, the combination with twin spaced floating members and supporting frames carried thereby, of bearing levers fulcrumed to said supporting frames, a water-wheel having its shaft mounted in bearings carried by said levers, a drive-shaft operatively connected with the water-wheel, a rotatable spindle carrying drums, cables fixed to the framework, passing around anti-friction rolls on the extremities of the bearing-levers, and reeled upon said drums, sprocket-wheels arranged respectively upon the spindle and the shaft of the water-wheel, one of said sprocket-wheels being loose, a chain connecting said sprocket-wheels, a clutch-device for locking the loose sprocket-wheel to its shaft, and a brake mechanism connected with the said spindle, substantially as specified.

JAMES H. BOYD.

Witnesses:
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