(No Model.) 4 Sheets—Sheet 1.

J. TOOHEY.

WATER MOTOR.

No. 493,569. Patented Mar. 14, 1893.

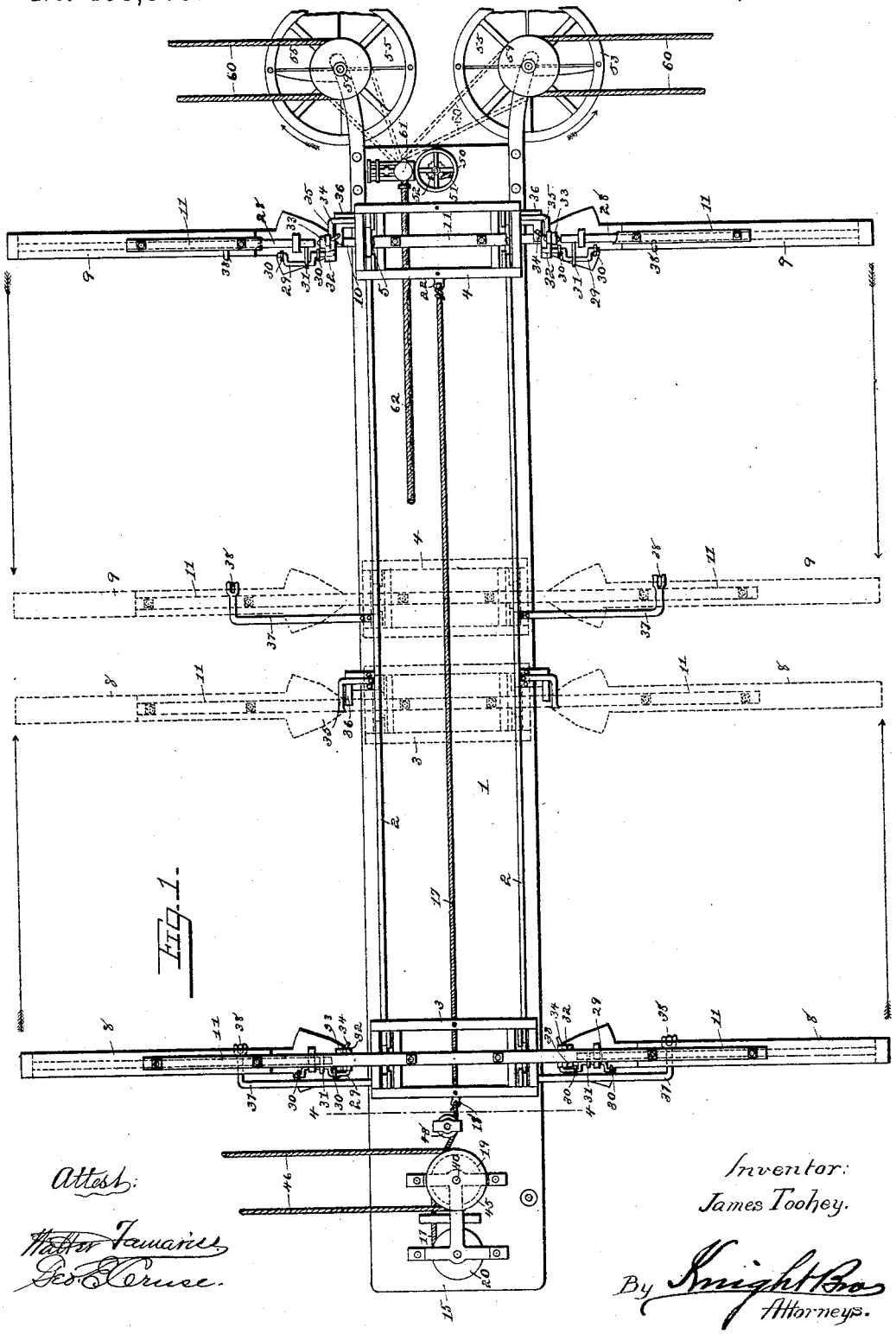

Fig. 1.

Attest:
Walter Tamaine
Geo. Bruce.

Inventor:
James Toohey.
By Knight Bros
Attorneys.

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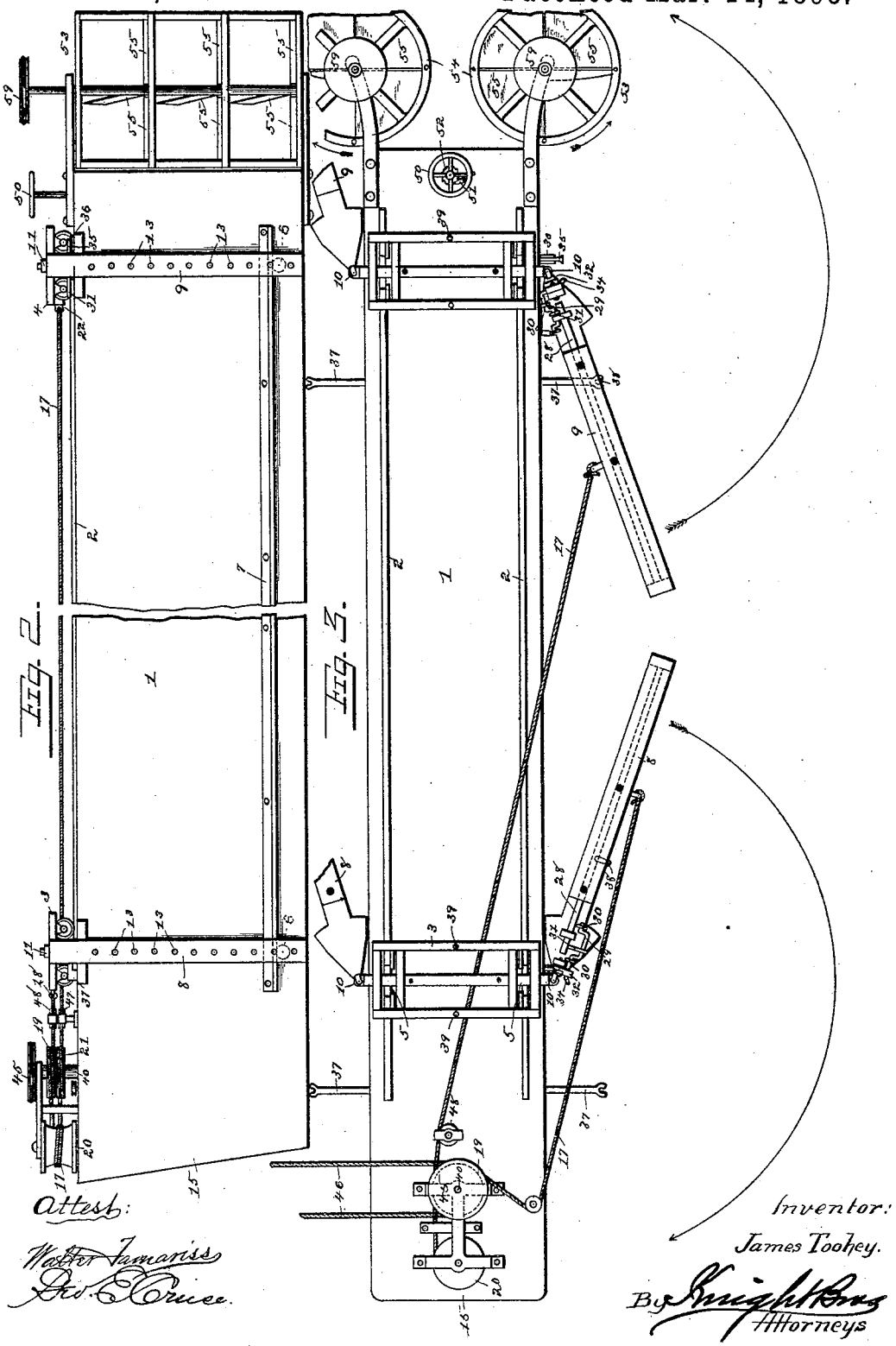

Fig. 2.

Fig. 3.

Attest:

Walter Famariss

Geo. E. Bruce.

Inventor:

James Toohey.

By Knight Bros

Attorneys

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J. TOOHEY

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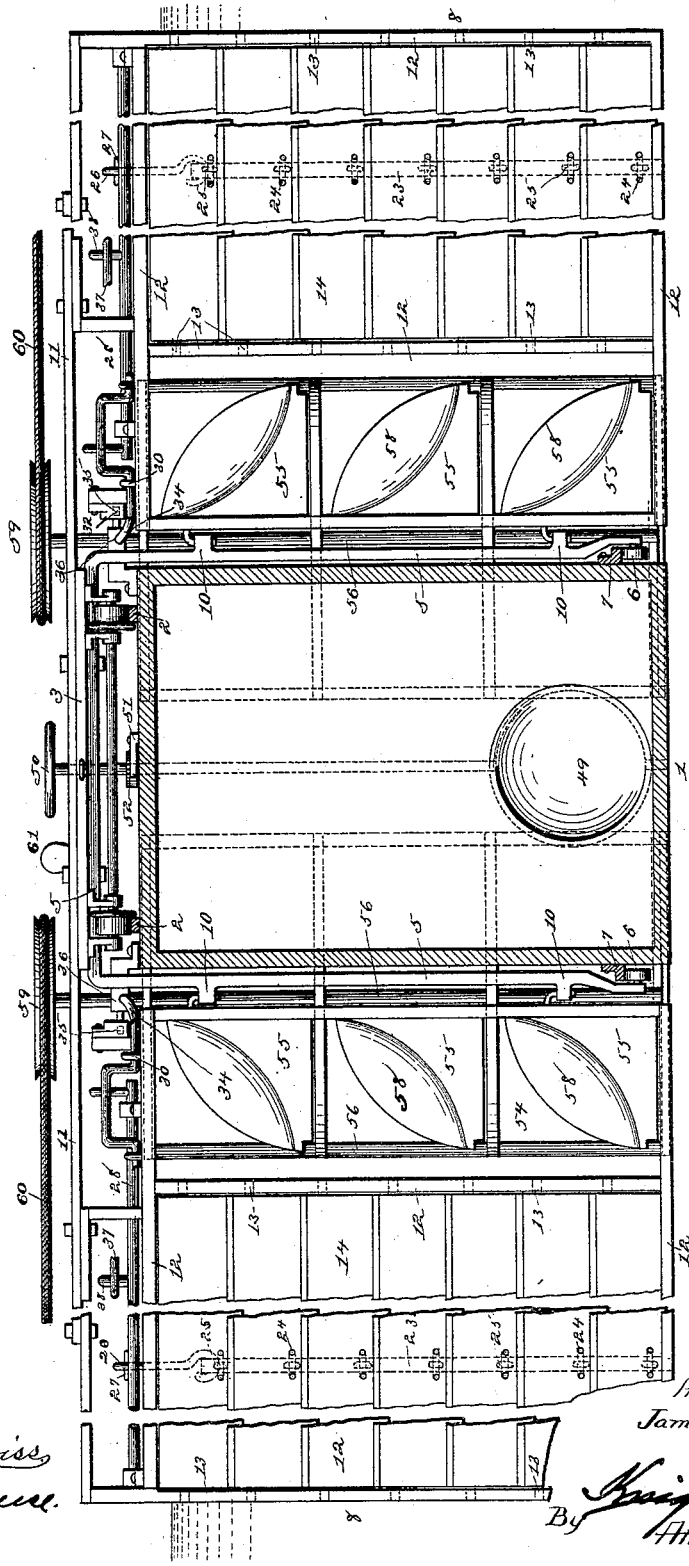

Fig. 4.

Attest:
Walter Thomaris
Geo. E. Crum.

Inventor:
James Toohey
By Knight Bros
Attorneys.

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J. TOOHEY.

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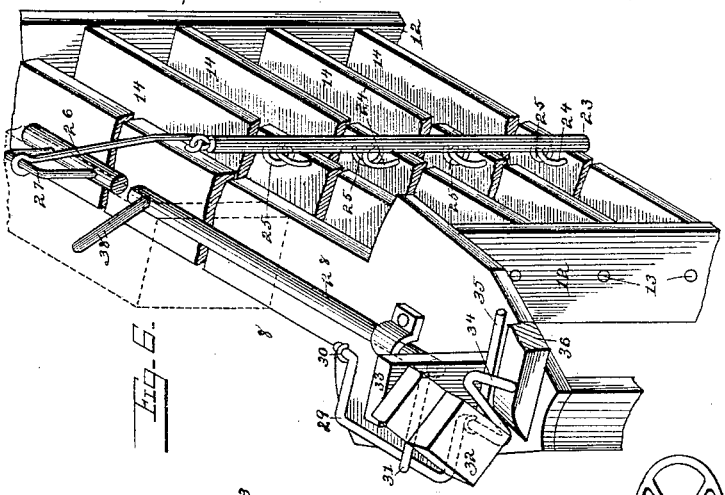

Fig. 6.

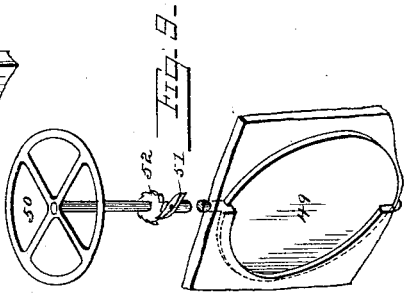

Fig. 9.

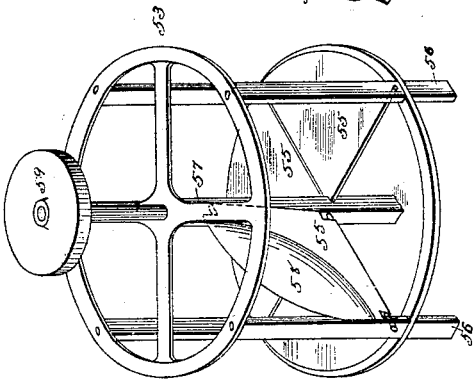

Fig. 7.

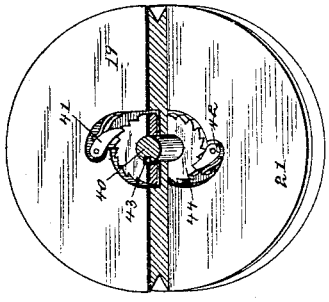

Fig. 8.

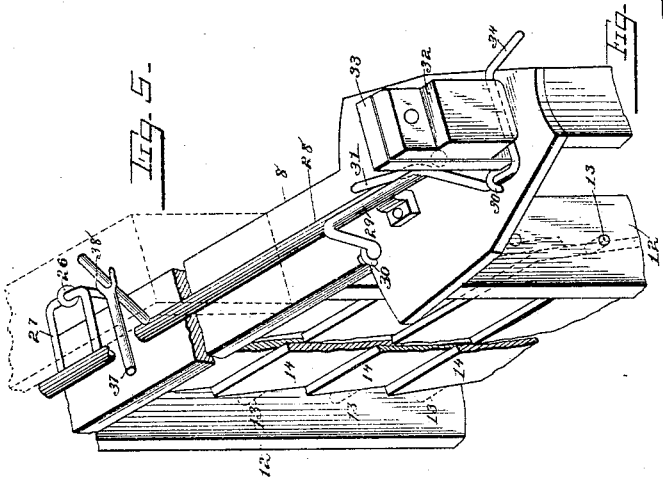

Fig. 5.

Attest:

Inventor:
James Toohey.

By Knight Bros
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES TOOHEY, OF KANSAS CITY, KANSAS.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 493,569, dated March 14, 1893.

Application filed August 25, 1892. Serial No. 444,122. (No model.)

To all whom it may concern:

Be it known that I, JAMES TOOHEY, of Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Water-Motors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improvement in water motors, and my invention consists in features of novelty hereinafter described and pointed out in the claims.

Figure I is a plan view of my improved motor. Fig. II is a broken side elevation. Fig. III is a detail plan view showing operation of gates when the trucks are stationary. Fig. IV is an enlarged transverse section taken on line IV, IV Fig. I. Fig. V is an enlarged detail perspective showing the slats in the gate closed. Fig. VI is an enlarged detail perspective showing the gate slats open. Fig. VII is an enlarged perspective of one of the rear motor wheels. Fig. VIII is an enlarged detail perspective of the ratchet pulleys. Fig. IX is an enlarged detail perspective of the valve for letting water into the body of the motor.

Referring to the drawings: 1 represents the boat or body of the motor which may be constructed of any suitable shape to form a water tight compartment. On the upper side of the boat 1 is a rail track 2 on which travel trucks 3, 4.

5 represents U-shaped frames attached to each of the trucks, said frames extending down each side of the boat and having pulleys 6 journaled at their lower ends. The pulleys 6 travel beneath tracks 7 secured to the sides of the boat and thus hold the trucks firmly to their tracks.

8, 9 represent gates secured to the trucks 3, 4 by a hinged connection between the gates and the U-shaped frame as shown at 10, and by transverse frames 11 bolted to the trucks and to the upper side of the gate. The frames 11 are only used when it is desired to hold the gates rigidly at right angles with the trucks, said frames may be dispensed with when it is desired to let the gates turn on their hinges, the purpose of which will be explained farther on.

When the motor is anchored out in a stream with the current flowing on each side of the same, the gates on each side of the boat will be used, as shown in Figs. I and IV, the gates at this time being rigidly secured to the trucks by means of the frames 11, but when it is desired to use the gates on one side only, the boat is anchored at one side of the stream, the frames 11 are removed and the gates are permitted to swing on their hinges 10 as shown in Fig. III.

I will first describe the operation of the motor when anchored out in the stream, and then describe the operation when it is anchored to the bank or to one side of the current. The gates 8, 9 have a suitable substantial framework 12 to which are pivoted at 13 a series of transverse slats 14. It will be noticed that the pivotal points of the slats are above the center of the same, the purpose of which will be described hereinafter.

15 represents the forward end of the boat which is pointing up stream.

As shown in Fig. I the motor is set for operation the slats 14 in the upper gates 8 being closed as shown in Fig. V, and the slats in the lower gates 9 being open as shown in Fig. VI. It will be seen that when the slats in the gates are closed as shown in Fig. V there will be a broad solid surface for the current to act against, but when the slats are open as shown in Fig. VI there will be comparatively little resistance to the current. As the current presses against the upper gates 8 they will be carried with the truck 3 to which they are attached, to the central position shown in dotted lines Fig. I.

The truck 3 has a cable or rope 17 attached thereto at 18, said rope passing around a pulley 19, thence around a capstan 20, thence returning passing around a pulley 21 situated beneath the pulley 19, from whence it extends back to and is connected with the truck 4 at 22. It will thus be seen that a connection is formed between the two trucks, and that when the gates 8 and trucks 3 are forced by the action of the current from the forward position to the position shown in dotted lines (see Fig. I), the gates 9 will be drawn up from their lower position to the position shown in dotted lines Fig. I. It will be understood that while the last described movement of the

gates and trucks is taking place the slats in the gates 8 are closed and that the slats in the gates 9 are open permitting the current to pass freely between the same. When the gates reach their central position as shown in dotted lines in Fig. I the slats in the gates 8 will be thrown from their closed position into their open position, and the slats in the gates 9 will be thrown from their open position to their closed position, and as the current will thus operate the gates 9 instead of the gates 8, both sets of gates will travel from their second position back to their first position, at which time the slats in the gates 8 will again be closed and the slats in the gates 9 again be opened, and the operation may be repeated for an indefinite period, the gates having the closed slats always returning the gates with the open slats back to the proper position to be acted upon by the current.

I will now describe the means for operating the slats 14.—The slats are loosely connected to each other by means of a vertical bar or rod 23 and staples 24, 25. The upper end of the rod 23 is loosely connected by a link 26 with a bail 27 on a horizontal shaft 28, said shaft 28 being suitably journaled to the upper portion of the gate. When the shaft 28 is held in the position shown in Figs. IV and V the rod 23 and the slats 14 will be held in their depressed position, the slats being closed ready to receive the force of the current. The shaft 28 is held in the last named position by a U-shaped rod 29 which is pivoted at 30 to the gate frame, the U-shaped rod pressing against a pin 31 on the shaft 28. The U-shaped rod is held in engagement with the pin 31 by means of a weight 32 which is pivoted to a standard 33, the bottom of said weight engaging an extension 34 of the U-shaped rod 29, and thus holding the rod in the position shown in Fig. V until the weight 32 is swung on its pivot and the rod 29 is released.

As before stated, the gates 8 when in the upper position as shown in Fig. I, have their slats closed, then as they are carried down by the force of the current to the position shown in dotted lines and as they reach their lowest point, a pin or rod 35 which is attached to the side of the boat comes in contact with the weight 32 and swings it out of engagement with the extension 34 of the rod 29 (see Fig. VI) and at the same time the extension 34 rides up on a beveled block 36 which is attached to the boat, throwing the U-shaped rod into the position shown in Fig. VI and permitting the current to open the slats 14 (which are pivoted above the center for this purpose) where they are held by the current until the gate returns to its former position, at which time an arm 37 secured to the boat will come in contact with a pin 38 on the shaft 28 and pressing against the same will rotate the shaft to a certain extent thus closing the slats, and at the same time the weight 32 will throw the U-shaped rod 29 back into the position shown in Fig. V the weight riding upon the extension 34 and thus by the means described holding the slats closed. The pin or rod 35, block 36, and arm 37 constitute what may be termed "trips" as they trip the parts that automatically operate the slats.

I have described the means for operating the slats in but one of the gates, but it will be understood that they all operate alike. In Fig. III I have shown the gates working on their hinges instead of being secured rigidly to the trucks. This may be desirable at times where it is desired to work at one side of the current, in such a case the rope 17 is attached to the respective gates as shown in Fig. III instead of to the trucks, the gates in all the other particulars acting the same as before described. When the gates act on their hinges the trucks are secured stationary to the boat by means of pins 39 which pass into the body of the boat. The pulleys 19, 21 are loosely mounted on a shaft 40 and are provided with pawls 41, 42 which engage ratchet wheels 43, 44 which are keyed to the shaft 40. Thus as the gates move to and fro the rope 17 will operate the pulleys 19, 21 and by the pawl and ratchet connection will rotate the shaft 40 constantly in one direction.

45 represents a pulley on the upper end of the shaft 40, and 46 a cable on the same by which means power may be transmitted to any desired machinery or place. 47, 48 represent guide pulleys for the rope 17.

As it is desired at times to lower the boat in the water in order to get a greater amount of water to act upon the gates, I provide a valve 49 situated at the rear end of the boat, which I can open to a greater or less degree by means of a hand wheel 50 and thus admit a sufficient quantity of water to sink the boat to any desired degree. 51, 52 represent a pawl and ratchet by which means the valve may be held at the point desired. In order to pump the water out again when it is desired to change the position of the boat or for other reasons I provide wheels 53, 54 which are suitably journaled to the frame at the rear end of the boat. These wheels are provided with flaps 55 pivoted at one of their ends to the outer standards 56, and to the central standard or post 57 of the wheel (see Fig. III). The wheels 53 turn in the direction shown by arrows Fig. I. The flaps 55 are beveled on their under side as shown at 58 and as each flap passes out beyond the line of the boat the current will strike the beveled portion 58 and throw the flap up into the vertical position shown in Fig. VII which gives the current a broad surface to act upon. After the flap has passed on beyond the center it will again resume its horizontal position and while in this position will create very little resistance against the current. The central standard 57 of the wheel has a pulley 59 secured to its upper end on which may travel a cable 60 to operate a pump 61 to pump out the boat, or to operate any other desired device.

62 represents a hose which may be connected with the pump 61. The hose may be used in connection with a pile driver or in various other ways.

I claim as my invention—

1. In a water-motor, the combination of a suitable support, reciprocating gates attached to said support and working in a horizontal plane, connections between said gates and a power transmitting device consisting of the pulleys and the ropes connected with the gates and passing around the respective pulleys whereby said power transmitting device may be operated by the force of the current against said gates, and means connected with and operated by the gates for throwing the idle gates into position to be operated upon by the current, substantially as set forth.

2. In a water-motor, the combination of a suitable support, traveling trucks mounted on said support, gates attached to the trucks, a power transmitting device, means in connection with said trucks and power transmitting device, consisting of the pulleys, the capstan and the ropes connected with the respective gates, passing around the pulleys whereby the action of the current against said gates will cause the trucks to travel to and fro, and thus operate the power transmitting device, substantially as described and for the purpose set forth.

3. In a water motor, the combination of the boat 1, tracks 2, trucks 3, 4, traveling on said tracks, gates 8, 9, working at the sides of the boat and secured to the sides of the trucks, and a rope 17, connecting the trucks with a power transmitting device, substantially as and for the purpose set forth.

4. In a water-motor the combination of the boat 1, trucks 3, 4, tracks 2, on which the trucks travel, gates 8, 9, secured to the trucks, rope 17 connecting the trucks, said rope passing around ratchet pulleys 19, 21 and around a capstan 20, said ratchet pulleys being turned by the rope 17 and thus causing the shaft 40 to which they are journaled to constantly rotate in one direction, and thus rotate a pulley 45 by which power may be transmitted, substantially as described and for the purpose set forth.

5. In a water-motor, a support, a gate having a suitable frame, a series of slats pivoted to said frame at a point other than their center, a rock shaft 28 to which said slats are connected and by which they are held in raised or lowered position, a detent for holding the rock-shaft at either limit of its movement, and a trip engaging the detent and attached to the support for controlling the movement of the shaft, substantially as described and for the purpose set forth.

6. In a water-motor, a gate having a suitable frame, a series of slats pivoted to said frame at a point other than their center, rod 23 and staples 24, 25, connecting the slats to each other, link 26 connecting the rod 23 with a bail 27, and shaft 28 to which the bail 27 is secured, said slats being either opened or closed by operating the shaft 28, substantially as described and for the purpose set forth.

7. In a water-motor, a gate having a suitable frame, slats pivoted to said frame, shaft 28 journaled to said frame, means for connecting the shaft with the slats, pin 31 on the shaft, U-shaped rod 29 pivoted to the frame, extension 34 on the U-shaped rod, and a weight 32 in engagement with said extension whereby said extension may be held at a fixed point, and thereby hold the rod 29 against the pin 31, thus holding the slats in their closed position, substantially as described and for the purpose set forth.

8. In a water-motor, the combination of the boat 1, trucks 3, 4, on the boat, gates secured to the tracks, slats 14 in said gates, shaft 28 on said gates, means for connecting the shaft 28 with the slats, pin 38 on the shaft 28, and arm 37 on the boat, whereby when the gates have arrived at a certain position the arm 37 will engage the pin 38 and rotate the shaft 28 to a certain degree thus closing the slats 14, substantially as described and for the purpose set forth.

9. In a water-motor, the combination of the boat 1, gates secured to the boat, slats 14 in the gates, shaft 28 for operating the slats, U-shaped rod 29, for holding the shaft to the position in which it holds the slats closed, weight 32 for holding the rod 29 in said position, pin 35 attached to the boat for the purpose of raising the weight 32 and releasing the rod 29, and a bevel projection 36 on the boat for the purpose of throwing the rod 29 over to one side and thus permit the current to open the slats, substantially as described and for the purpose set forth.

JAMES TOOHEY.

Witnesses:
JNO. S. CAMPBELL,
GEORGE YOUNG.