

1,014,066.

G. M. KIEVLAN.
CURRENT MOTOR.
APPLICATION FILED AUG. 10, 1911.

Patented Jan. 9, 1912.

4 SHEETS—SHEET 1.

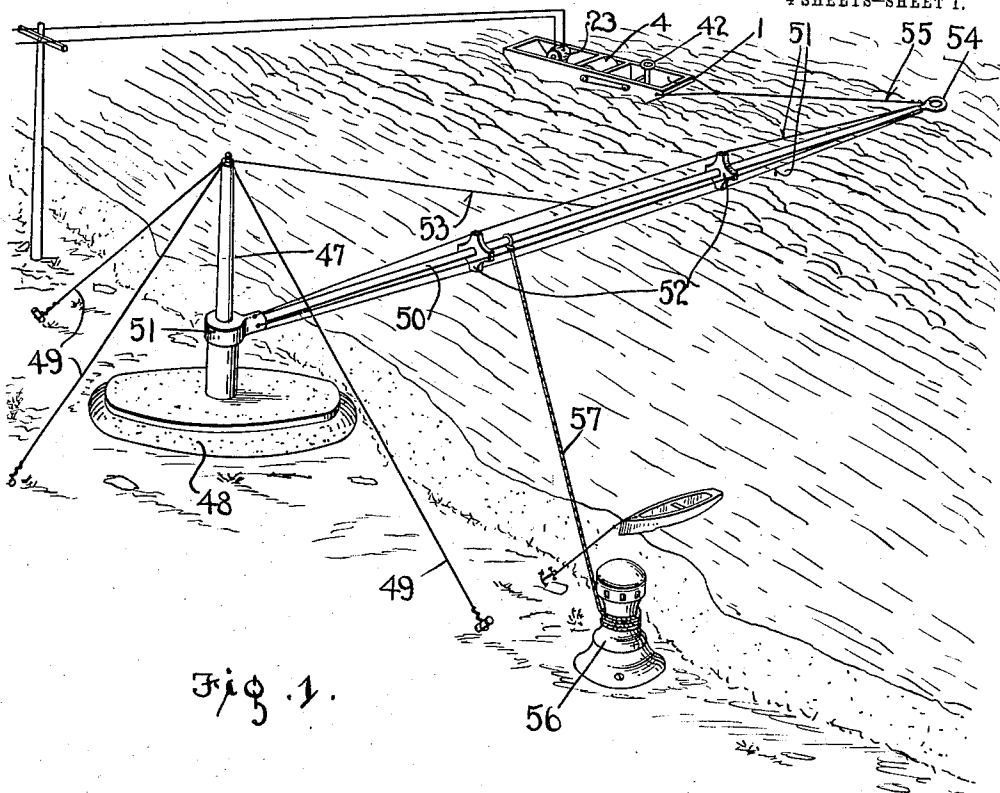


Fig. 1.

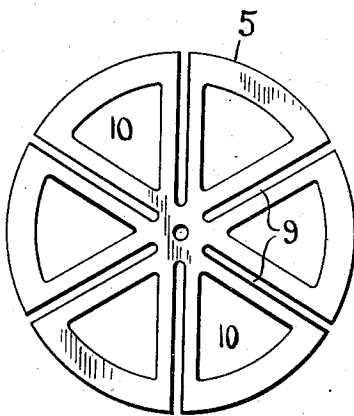


Fig. 8.

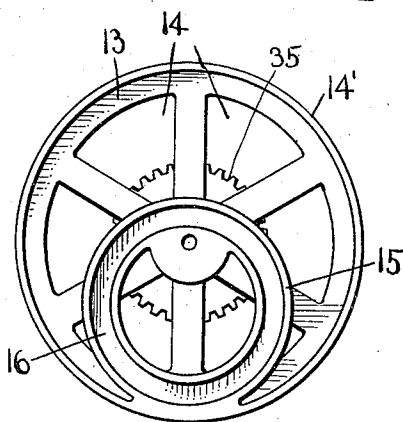


Fig. 9.

Witnesses
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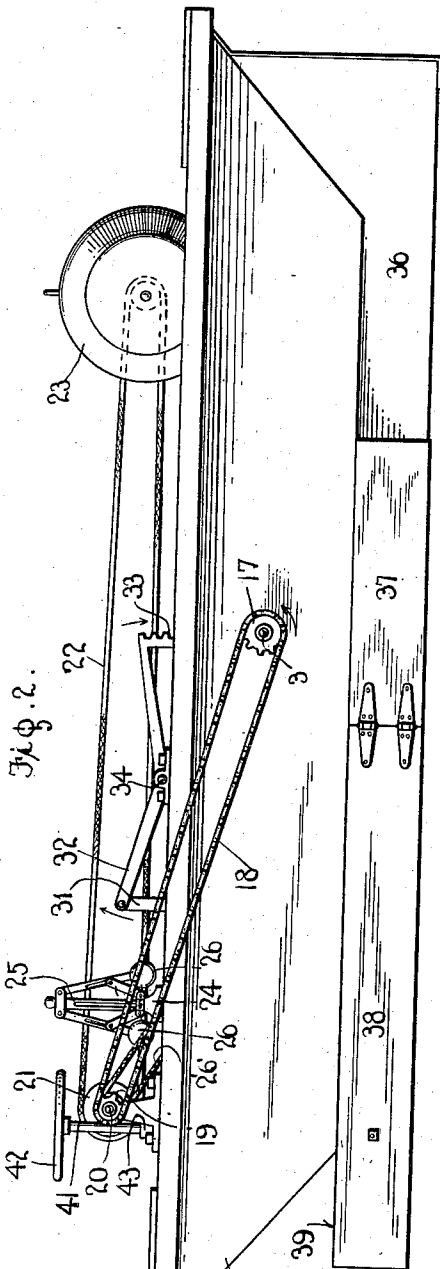
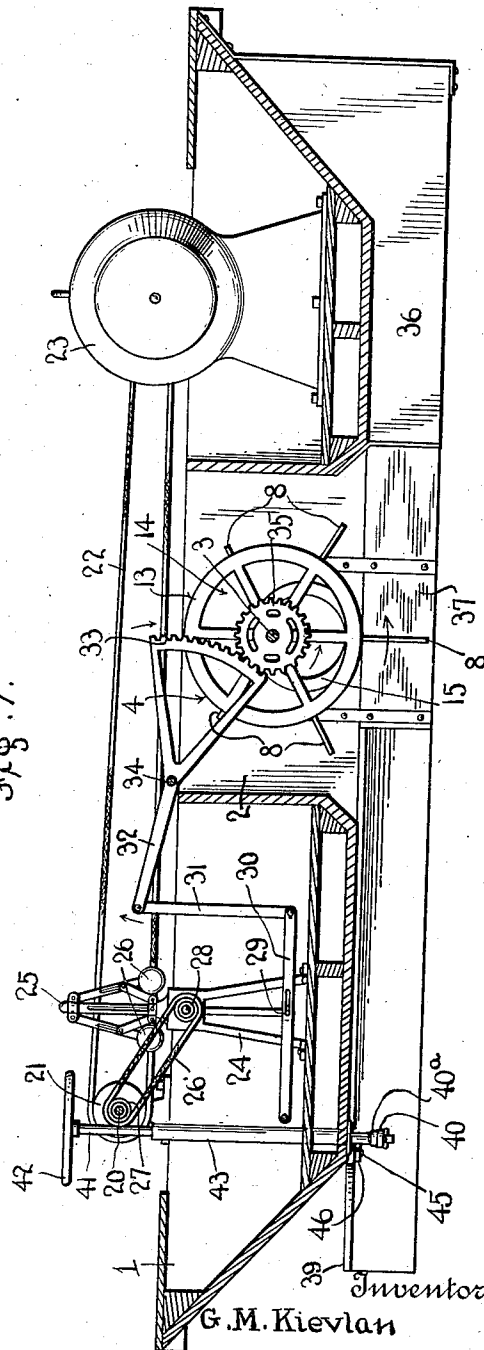


Fig. 2.

Fig. 7.



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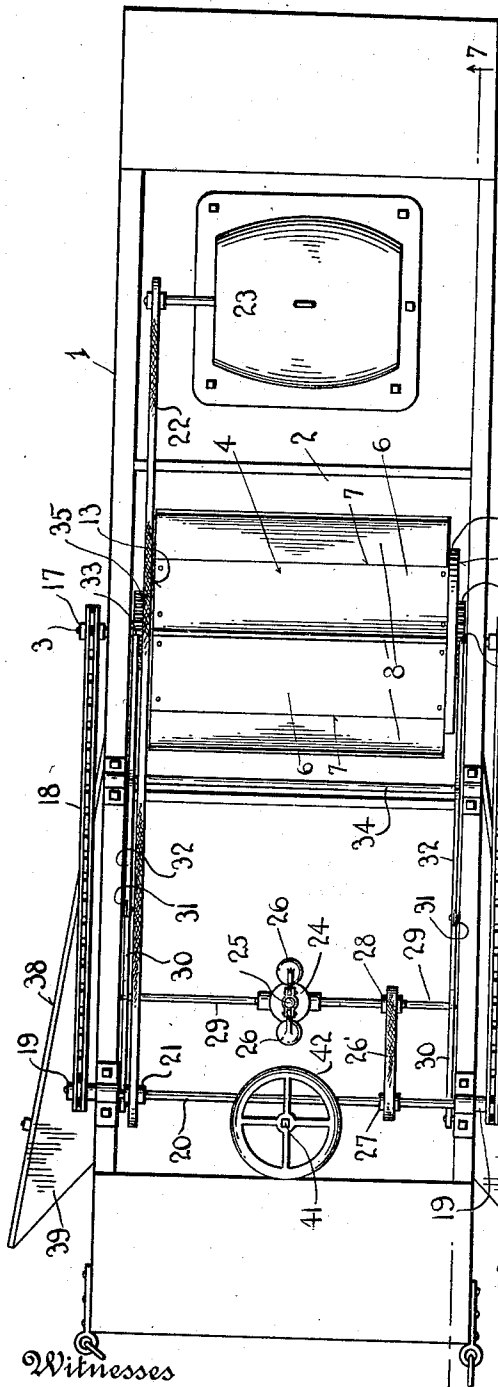
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4 SHEETS—SHEET 3.



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Fig. 3.

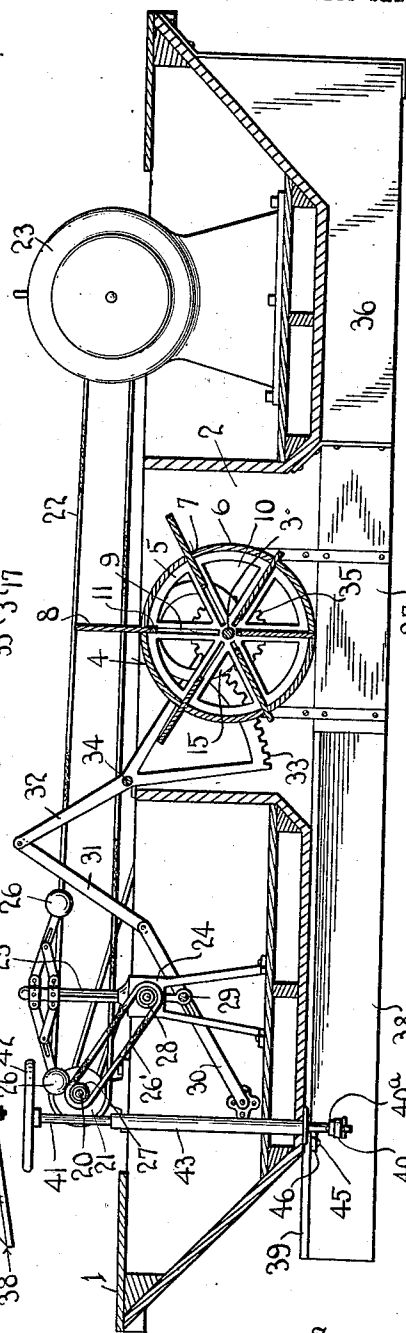


Fig. 4.

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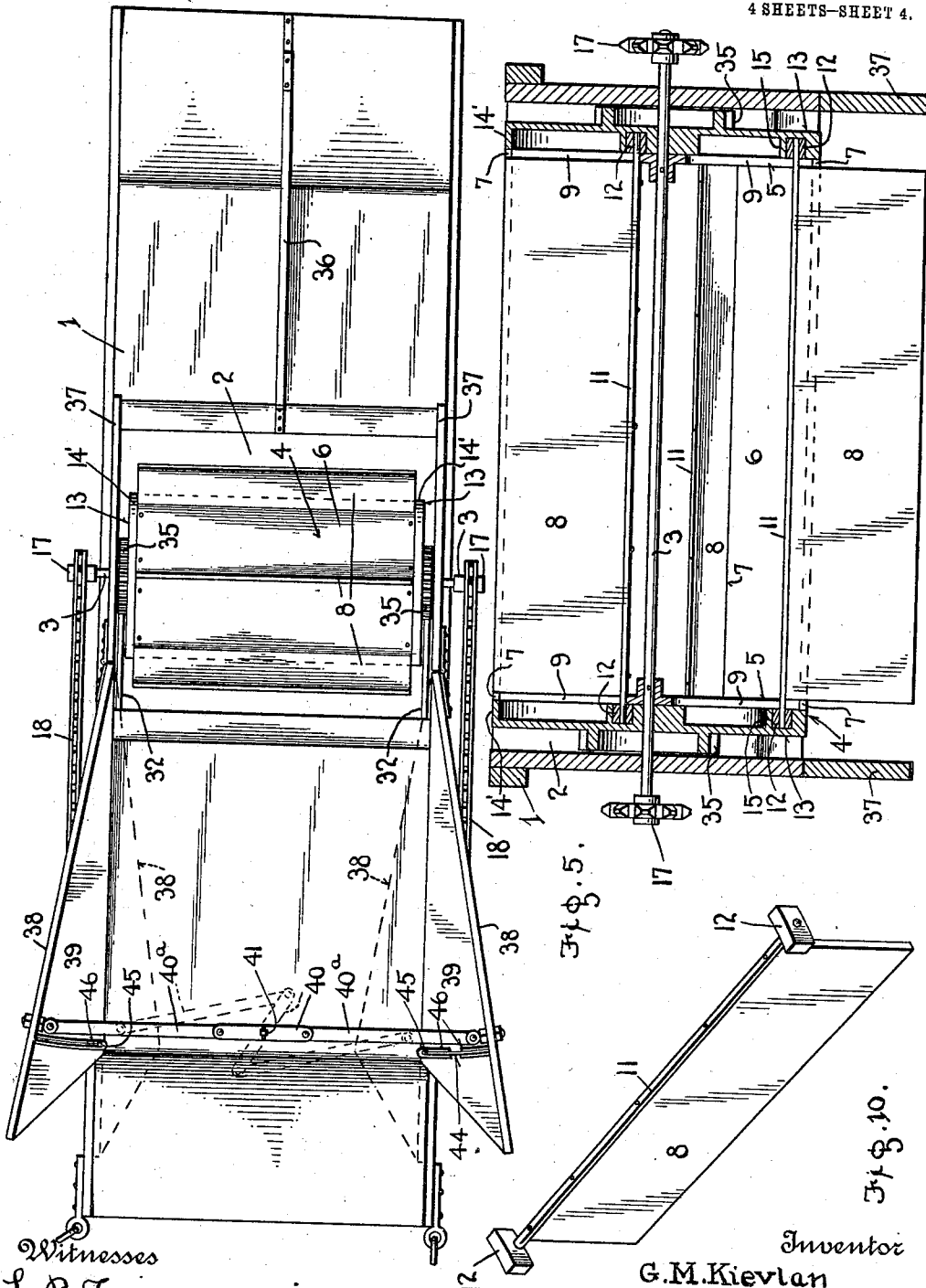
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4 SHEETS-SHEET 4.



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UNITED STATES PATENT OFFICE,

GEORGE MICHAEL KIEVLAN, OF ATCHISON, KANSAS.

CURRENT-MOTOR.

1,014,066.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed August 10, 1911. Serial No. 643,386.

To all whom it may concern:

Be it known that I, GEORGE MICHAEL KIEVLAN, a citizen of the United States, residing at Atchison, in the county of Atchison and State of Kansas, have invented certain new and useful Improvements in Current-Motors; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in current motors.

One object of the invention is to provide a current motor having an improved construction and arrangement of power wheel provided with blades adapted to be projected and retracted into and out of operative positions as the wheel is revolved by the current.

Another object is to provide a current motor having an improved governor whereby the speed of the wheel is automatically controlled.

A further object is to provide a current motor in the form of a boat having means whereby the same is anchored in the channel of a stream and may be drawn out of the channel to permit the passage of vessels.

Still another object is to provide means whereby an increased current of water may be directed against the blades of the power wheel of the boat.

With these and other objects in view the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 is a diagrammatic perspective view showing the motor arranged in a stream and the manner in which the motor is drawn out of the channel to permit the passage of vessels; Fig. 2 is a side view of my improved current motor; Fig. 3 is a plan view thereof; Fig. 4 is a vertical longitudinal section; Fig. 5 is a vertical cross section taken on a line with the shaft of the current wheel; Fig. 6 is a bottom plan view of the motor; Fig. 7 is a vertical sectional view through a portion of the motor on the line 7-7 of Fig. 3 showing the construction and arrangement of one side of the governor mechanism for controlling the position of the wheel blades and the speed of the motor; Fig. 8 is a detail view of one of the ends of the

current or power wheel; Fig. 9 is a similar view of one of the blade operating members of the wheel; Fig. 10 is a detail view of one of the blades of the wheel and its operating device.

My improved current motor comprises a flat bottom boat 1, which may be of any suitable size and in which preferably midway between its ends is formed a wheel compartment 2 which opens through the bottom of the boat as shown. In the compartment 2 is revolubly mounted a shaft 3 on which is fixedly mounted a power wheel or drum 4, said wheel or drum comprising heads 5 which are connected by a series of segmental plates 6 spaced apart to form longitudinally disposed slots 7 through which are adapted to be projected and retracted the blades or paddles 8 of the wheel. The blades or paddles 8 are in the form of flat plates having their ends slidably mounted in radially disposed slots 9 formed in the heads 5. In the heads 5 between the slots 9 are preferably formed substantially triangular openings 10.

The blades or paddles 8 are secured at their inner edges to operating rods 11 the ends of which project through the slots 9 and are pivotally engaged with segmental operating blocks 12 by means of which said blades are projected and retracted through the slots 7 in the drum or wheel as will be hereinafter more fully described. On the ends of the shaft 3 adjacent to the outer sides of the heads 5 are blade operating plates or disks 13, said disks being preferably of skeleton form or provided with a series of radial openings 14 corresponding to the openings 10 in the heads 5 whereby water is permitted to pass freely from the drum or wheel. Each plate or disk 13 has on its inner side adjacent to its outer edge an annular laterally projecting flange 14' which spaces the disks or plates from the outer sides of the heads 5. Formed integral with the inner side of the plates or disks 13 are eccentric rings 15 said rings being provided with circular grooves or channels 16 with which are engaged the segmental blade operating blocks 12 and by means of which said blocks and the rods 11 are actuated to project and retract the blades out of and into the wheel, said blades being projected into the water to a greater or less distance according to the position of the eccentric ring. The position of the eccentric ring 16 is automatically determined

by means of a governor mechanism herein-after described.

Fixedly mounted on the ends of the shaft 3 adjacent to the outer sides of the boat 2 are sprocket gears 17 which are connected by sprocket chains 18 to sprocket gears 19 on the power transmitting or counter shaft 20 mounted in suitable bearings in the front or bow end of the boat. On the shaft 20 is fixedly mounted a belt pulley 21 which is connected by a belt 22 to a dynamo 23 arranged in the rear end or stern of the boat as shown. The electricity generated by the dynamo when operated by the power wheel through the driving mechanism herein described is conducted to the shore or other desired point by suitable conducting wires. If desired the power transmitting shaft 20 may be connected in any suitable manner with a dynamo or other machinery arranged on the shore or at any other suitable location where the power of the current wheel may be applied thereto.

In order to automatically control the speed of the current or power wheel, I provide a governor mechanism comprising a bearing standard 24 which is suitably arranged in the stern end of the boat and has slidably mounted therein a vertically disposed governor shaft 25 on the upper edge of which is arranged a centrifugal governor 26 of the usual or any suitable form, said governor being operatively connected with and driven from the shaft 20 by a belt 26 which engages the pulley 27 on the shaft 20 and a pulley 28 on the governor mechanism as shown. The lower end of the shaft 25 is engaged with a cross bar 29 connected at its ends with arms 30 which are pivotally connected at one end to the inner sides of the boat and are connected at their opposite ends by links 31 to blade adjusting levers 32 having forked outer ends on which are arranged segmental racks 33. The levers 32 are pivotally mounted on a shaft 34 arranged across the boat as shown. The rack bars 33 are adapted to engage spur gear pinions 35 which are fixedly secured to or formed integral with the outer side disks or plates 13 on which are formed the eccentrics 15. By thus connecting the governor with the power transmitting shaft 20 the motion of said shaft will be imparted to the governor which, when thus operated will have a tendency to force the shaft 25 downwardly thus swinging the bar 29 and arms 30 downwardly thereby rocking the levers 32 and causing the segmental racks thereon to turn the disks or plates 13, thus changing the position of the eccentrics 15 which will shift the point at which the blades are projected to their greatest extent. In thus shifting the blade projecting eccentrics the current, instead of striking the full projected blades, will strike those only partly

projected thus retarding the speed of the power wheel and the dynamo driven thereby.

The boat is provided on the lower side of its rear or stern end with a centrally disposed keel or fin 36 and on the lower edges of the sides of the boat at the ends of the wheel compartment 2 are arranged the downwardly extending current directing boards 37 to the forward ends of which are hingedly connected current collecting boards or wings 38 to the upper edges of which are secured filling plates or boards 39 which are slidably engaged with the under side of the boat and which when the collecting boards 38 are in an open or operative position fill the spaces between the upper edges of the same and the lower side of the boat, thus directing the full force of the current through or between the current directing boards 37 and against the blades of the power wheel. The boards 38 and 39 are adapted to be retracted and projected by a double crank or cross head 40 fixed on the lower end of an operating shaft 41 which is mounted in a suitable bearing in the bottom of and projects upwardly into the forward end or bow of the boat and has arranged thereon an operating wheel 42. The lower portion of the shaft is disposed in a tube or sleeve 43 having a water tight connection at its lower end with the bottom of the boat whereby leakage is prevented through the opening for the shaft. The cross head 40 is connected to said boards by links 40^a as shown. By thus arranging the shaft 41 the current collecting boards 38 and filling boards 39 may be readily projected and retracted to operative and inoperative positions at the sides of the boat. The filling boards 39 have formed therein near their outer ends segmental slots 44 with which are engaged guide studs 45 arranged in the bottom of the boat, said slots being protected by slotted segmental wear plates 46 secured to the outer sides of the boards 39 and which are engaged by the heads of the studs 45 as shown. By providing the current collecting boards 38, more or less current of water may be directed against the blades of the power wheel when desired.

The boat or motor is preferably arranged for operation in the channel of a stream and is anchored in position and adapted to be drawn out of the channel to permit the passage of vessels by means of a suitable anchoring mechanism which is arranged on the shore or banks of the stream or other suitable support and comprises a vertically disposed bearing shaft or standard 47 which is secured in a suitable base 48 and braced by inclined brace rods 49 secured to the upper end thereof and to the ground or other support as shown. The shaft 47 is provided with an enlarged lower portion which forms

a shoulder to support a boom 50 having on its inner end a bearing head 51 which is revolubly mounted on the shaft 47 as shown. The boom 50 is preferably braced and strengthened by a series of trussed brace rods 51 secured at their ends to the ends of the boom and are engaged with truss plates 52 as shown. The boom is supported in position and further braced by an inclined brace rod 53 which is secured at one end to the upper end of the shaft 47 and at its opposite end to the boom. In the outer end of the boom is arranged an eye 54 to which is attached one end of a cable 55 the opposite end of which is secured in any suitable manner to the front end or bow of the boat 1 as shown. In order to swing the boom around on the shaft 47 and thereby draw the boat or motor to operative or inoperative positions, I provide a suitably mounted reel or windlass 56 on which is adapted to be wound a boom operating cable 57 the outer or free end of which is secured to the boom in any suitable manner.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

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

Having thus described my invention, what I claim is:

1. In a current motor, a boat, a power wheel shaft revolubly mounted therein, a power wheel, said wheel comprising heads fixedly mounted on said shaft, segmental plates secured at their ends to said heads and forming between themselves longitudinal slots, a series of blades slidably engaged at their ends with the heads of the wheel and adapted to be projected and retracted through the slots between said plates, blade adjusting plates revolubly mounted on said shaft at the ends of the wheel, cam grooves formed in said blade operating plates, segmental blade operating blocks slidably mounted in said grooves and connected with said blades whereby they are projected and retracted, a power transmitting shaft geared to the shaft of said power wheel, a governor driven by said power transmitting shaft, and means to connect said governor with said blade adjusting plates.

2. In a current motor, a boat, a power wheel revolubly mounted therein, said wheel having slidably mounted therein a plurality of blades, a blade projecting and retracting mechanism adapted to project the blades on the working side of the wheel, and means to automatically adjust said blade projecting mechanism whereby the blades are projected

to a greater or less extent and the power of the wheel thereby controlled.

3. In a current motor, a boat, a power wheel revolubly mounted therein, a plurality of radially disposed blades slidably mounted in said wheel, means to project said blades on the working side of the wheel and to retract the same on the opposite sides thereof, blade projecting plates arranged at the ends of said power wheel, eccentrically arranged rings formed on said plates or disks and having therein annular grooves, segmental blocks pivotally connected to the ends of said blades and adapted to slidably engage the grooves in said eccentric rings whereby as the power wheel is turned, said grooved rings will project and retract the blades, a governor mechanism connected to and driven by said wheel, and means to operatively connect said governor mechanism with said blade adjusting plates or disks whereby the latter are turned and the position of the grooved eccentric rings thereon adjusted to cause said rings to project the blades into the water to a greater or less extent.

4. In a current motor, a boat, a power shaft revolubly mounted therein, a power wheel or drum operatively mounted on said shaft, said wheel comprising heads fixedly mounted on said shaft and having formed therein series of radially disposed slots, segmental plates connected at their ends to the edges of said heads and spaced apart to form radially disposed slots, a series of blades slidably mounted in said slots, operating rods secured to the inner edges of said blades and having their ends projecting through the slots in said heads, segmental blade operating blocks pivotally mounted on the ends of said rods, blade operating plates arranged on said shaft adjacent to the heads of the wheel, eccentric rings arranged on said plates, said rings having formed therein annular grooves adapted to receive the segmental blocks on said blade operating rods whereby when said wheel is turned the blades will be projected and retracted between the segmental plates of the wheel and a governor mechanism driven by said wheel and having an operative connection with said blade operating plates whereby the latter are turned and the eccentric rings thereon adjusted to change the position at which the blades are projected to their greatest extent thereby automatically controlling the power and speed of the wheel.

5. In a current motor a revolubly mounted power shaft, a power wheel fixedly mounted on said shaft, a series of blades adapted to be projected from and retracted into said wheel, operating rods connected to said blades, segmental blocks arranged on the ends of said rod, operating plates arranged on said shaft adjacent to the ends of the

wheel, eccentric rings arranged on said
 plates and having an operative connection
 with said blade operating blocks whereby the
 blades are projected on the working side of
 5 the wheel and retracted on the opposite side
 thereof, gears fixed to said blade operating
 plates, pivotally mounted blade adjusting
 levers, segmental racks arranged on the
 10 outer ends of said levers and having an op-
 erative engagement with the gears on said
 blade operating plates, lever operating arms
 pivotally mounted at one end and having an
 operative connection with said levers, a gov-
 15 ernor connected to and driven by the shaft
 of said power wheel and having an operative
 connection with said lever operating arms
 whereby the speed and power of said wheel
 will be automatically controlled by said gov-
 20 ernor through the arms, levers and gears
 connecting the same with said blade oper-
 ating plates.
 6. In a current motor, a boat, a power
 wheel operatively mounted therein, a series
 of blades arranged in said wheel, means to
 25 project said blades on the working side of
 the wheel and to retract the same on the
 opposite side thereof, a governor mechanism
 operatively connected to said blade project-
 ing mechanism whereby the latter is auto-
 30 matically adjusted to change the position
 at which the blades are projected thereby
 regulating the speed and the power of the
 wheel, a dynamo connected to and operated
 by said wheel, a keel arranged on the bot-
 35 tom of the rear end of said boat, current col-
 lecting boards hingedly connected at the
 opposite sides of the forward end of the
 boat, means to open and close said boards to
 operative and inoperative positions whereby
 40 more or less current is directed to the blades
 of the wheel and filling plates adapted to

close the space between the upper edges of said collecting boards and the adjacent sides of the boat when said boards are in an open position.

7. A current motor of the character de-
 scribed comprising a boat, a power wheel
 revolubly mounted in said boat, a power
 transmitting shaft operatively connected to
 said power wheel, a governor operated by
 said power transmitting shaft, means to connect
 said governor with said power wheel
 whereby the speed of the latter is auto-
 matically controlled, means whereby the
 power transmitting shaft is operatively con-
 55 nected with the objects to be driven thereby,
 current directing boards arranged on the
 bottom of the boat at the opposite ends of
 the wheel, current collecting boards hingedly
 connected at their inner ends to said direct-
 60 ing boards and adapted to be swung in-
 wardly and outwardly from the sides of the
 boat, filling plates secured to the upper
 edges of said boards and having a sliding
 engagement with the bottom of the boat,
 65 said plates being adapted to fill the space
 between the current collecting boards and
 the adjacent sides of the boat when the
 boards are in an operative position, a board
 operating shaft mounted in the forward end
 70 of the boat, a cross head fixed on the lower
 end of said shaft and having an operative
 connection with said boards whereby the lat-
 ter are projected and retracted by said shaft
 to operative and inoperative positions.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE MICHAEL KIEVLAN.

Witnesses:

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EARL C. BROWN.