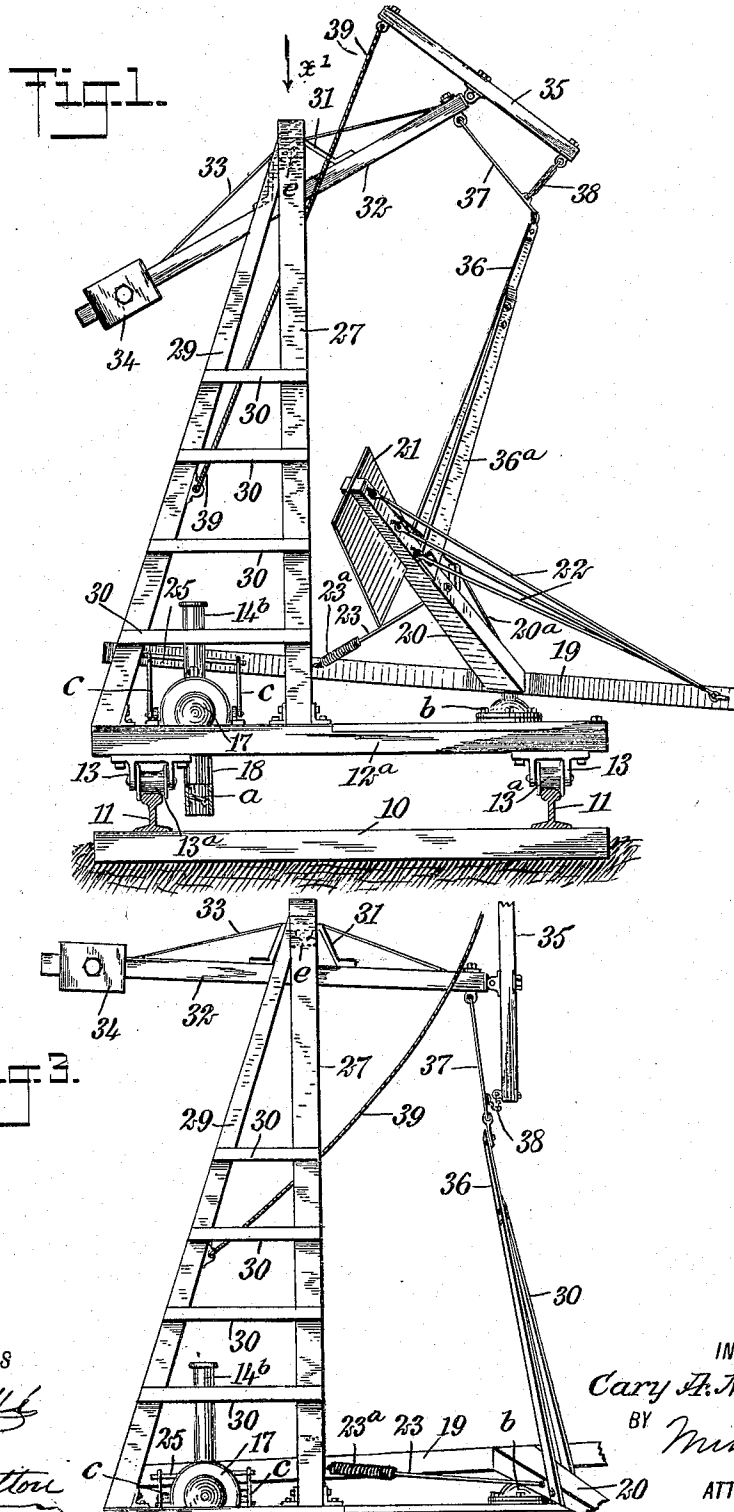


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CURRENT MOTOR.
APPLICATION FILED JAN. 20, 1909.

930,878.

Patented Aug. 10, 1909.

3 SHEETS—SHEET 1.



WITNESSES
Ben. Goff
Wm. Patton

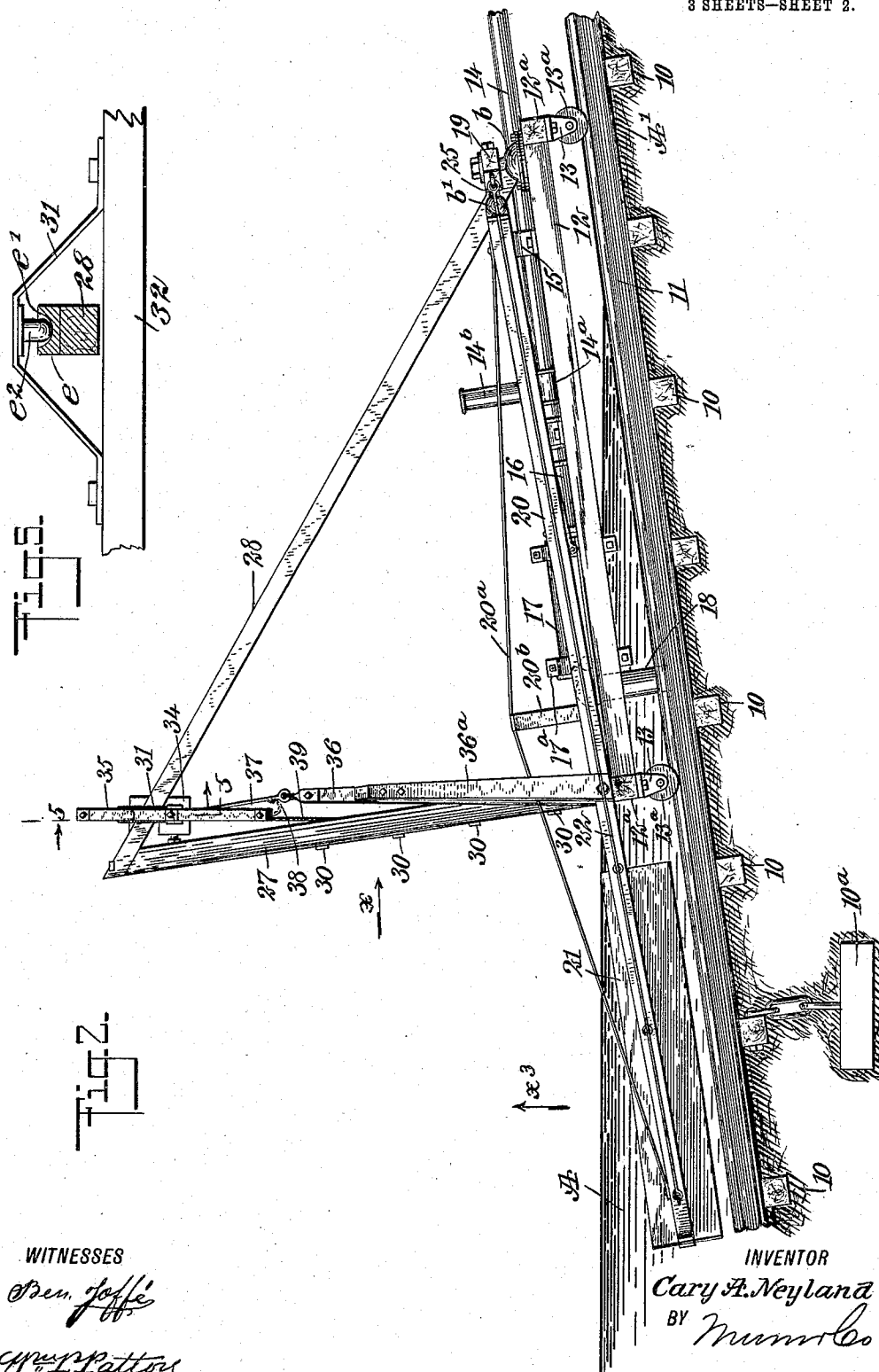
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ATTORNEYS

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3 SHEETS—SHEET 2.



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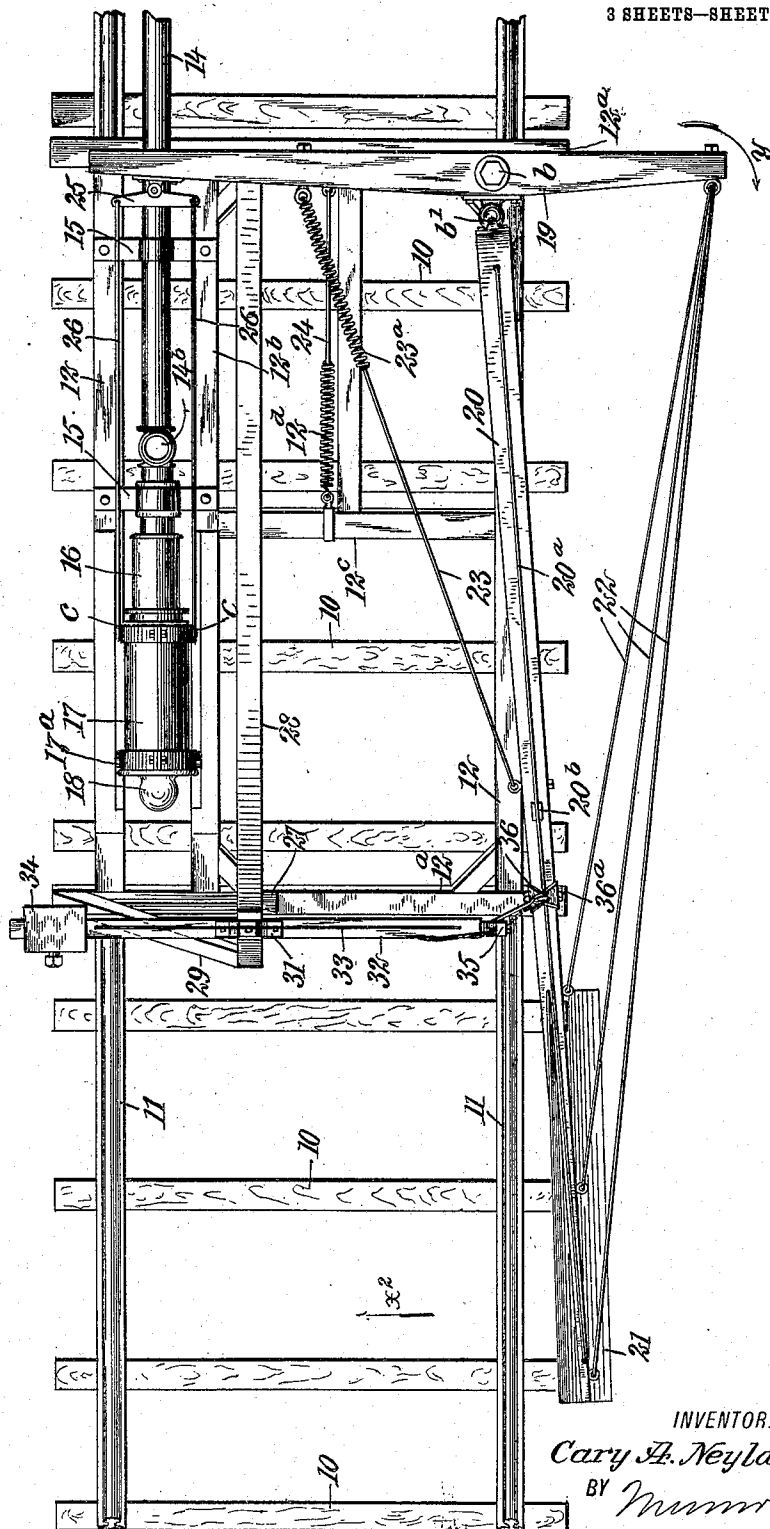
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3 SHEETS—SHEET 3.

Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

CARY ALBERT NEYLAND, OF SPOKANE, WASHINGTON.

CURRENT-MOTOR.

No. 930,878.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed January 20, 1909. Serial No. 473,228.

To all whom it may concern:

Be it known that I, CARY A. NEYLAND, a citizen of the United States, and a resident of Spokane, in the county of Spokane and State of Washington, have invented new and useful Improvements in Current-Motors, of which the following is a full, clear, and exact description.

This invention relates to wave or current motors, of a class that utilize the force of a moving body of water, such as a flowing stream or tidal action, for useful effect.

The purpose of my invention is to provide novel features of improvement for a current motor, and more particularly for the current motor of my invention patented by me February 25, 1908, and numbered 880,393.

The invention consists in the novel construction and combination of parts, as is hereinafter described and defined in the appended claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a front elevational view, seen in direction of the arrow *x* in Fig. 2, showing parts as they appear when the motor blade is elevated from the water; Fig. 2 is a side elevation of the same; Fig. 3 is a view similar to Fig. 1, but showing the parts in the changed position they assume when the motor blade is engaged with a moving body of water; Fig. 4 is a plan view seen in the direction of the arrow *x'* in Fig. 1, and Fig. 5 is an enlarged transverse sectional view, substantially on the line 5—5 in Fig. 2.

For a proper explanation of the details of the present invention, the drawings in the present application largely embrace features shown in said Letters Patent No. 880,393, which will be briefly described, and the novel features of the present invention that are therewith embodied will be fully explained in connection therewith.

Primarily considered, the patented current motor No. 880,393, and the present improvement, are designed for the operation of a water pump, that is directly connected therewith and will be so described.

The entire pumping apparatus for its effective operation, is so positioned on the shore of a running stream that an operative detail thereof, such as a paddle blade, may be submerged in the rapid current of water, and moved along therewith a pre-determined

distance, then raised from the water and returned to its first position for a repetition of the operation, the pump being actuated by the sweeping movement of the paddle blade. 60

In Fig. 2, A represents a flowing body of water, on the inclined shore A' of which the cross ties 10, for the support of track rails 11, are embedded, said railway track extending at a suitable inclination down into the water a sufficient distance for the proper operation of the apparatus, and is therein anchored by a weight 10^a. A rectangular truck frame is provided for support of other details, said frame consisting of longitudinally disposed side timbers 12, 12, and transverse end timbers 12^a, 12^a, that space the side timbers in parallel planes. On the end timbers 12^a bracket frames 13 are secured near their ends, wherein low truck wheels 13^a are rotatably supported, said wheels having grooved peripheries that are seated upon the track rails 11, which are thus adapted to support the truck frame movably on the track rails. A truck frame timber 12^b is secured by its ends on the transverse timbers 12^a parallel with and suitably spaced from a side timber 12, that is at the left side of the truck frame. Centrally between the timbers 12, 12^b a conduit pipe 14, is supported and secured by transverse clamps 15, said pipe having a hollow plunger 16, secured on one end thereof of increased diameter. A pump cylinder 17 that receives the plunger 16 is slidably supported on guides secured on the timbers 12, 12^b. Upon the opposite end of the cylinder 17 from that wherein the plunger 16 works, the upper end of a depending suction pipe 18 is secured, that extends into the water A when the truck frame is in position for the proper operation of the apparatus. One means for supporting the cylinder 17 consists in providing a clamping band 17^a secured on the cylinder near the suction pipe 18, rollers being oppositely pivoted on the band, which are seated upon the guides before mentioned, and thus support the cylinder for its free reciprocal movement. 100

There is a check valve *a* of ordinary form introduced in the suction pipe 18, and a check valve 14^a placed in the conduit pipe 14, above which extends an air pipe 14^b. Upon the end of the truck frame nearest the shore at the right in Figs. 2 and 4, a sweep beam 19 is pivoted, so that a main portion of said beam extends across the truck frame, and a shorter member thereof projects from 110

the opposite side thereof, said pivot connection *b* being adapted for universal rocking movement. Upon the sweep beam 19, near its pivot support *b*, a paddle arm 20 is loosely secured by one end, and thence extends toward the outer or lowermost end of the truck frame. The connection *b'* between the beam 19 and paddle arm 20, is such that the latter may receive rocking movement in any desired direction.

A truss rod 20^a is secured by its ends upon the paddle arm 20, near ends of the latter, engaging the upper side thereof, and at the center of said arched truss rod a post 20^a is introduced between it and the paddle arm, thus adapting the truss rod to reinforce said arm in an obvious manner.

Upon the end of the paddle arm 20 that projects away from the sweep beam 19, an elongated, preferably rectangular paddle blade 21 is secured, that extends farther from the lower side of the arm than the upper side thereof. On the end of the sweep beam that is nearest to the pivot connection *b*, a plurality of guy rods 22 are attached by one end and thence diverge, their opposite ends being secured at intervals on the outer side of the paddle arm 20. The paddle arm is further supported by a brace rod 23 that is attached by one end thereof upon the side of the arm opposite from that whereon the guy rods 22 are secured, at a point near the heel of the paddle blade 21, and thence extends toward the sweep beam 19. Upon the end portion of the brace rod 23, nearest to the sweep beam 19, a coiled spring 23^a is secured, which in taut condition is affixed by its extended end upon said beam, as shown in Fig. 4, the tension of which serves to cooperate with the guy rods for steadying the paddle arm 20 against improper lateral sway. Another brace rod 24 is secured by one end on a cross bar 12^c that is a portion of the truck frame, and trends toward the sweep beam 19 whereon it is attached, a coiled spring 12^d forming a portion of said brace rod, the pull of which prevents an improper upward rocking movement of the longer portion of the sweep beam.

Clamped upon the pump cylinder 17 at its end which receives the plunger 16, are two upright standards *c, c*, which are disposed at opposite sides thereof. Upon the end portion of the sweep beam 19 that projects over the conduit pipe 14, a yoke bar 25 is centrally pivoted, said yoke bar having a length equal with the distance between the standards *c, c* on the pump cylinder 17. Two similar connecting rods 26 are pivoted by one end of each upon the upper ends of the standards *c, c*, and at their opposite ends are pivoted upon respective ends of the yoke bar 25.

It will be seen that a lateral rocking movement of the sweep beam 19 and paddle arm

20, in the direction of the arrow *x*² in Fig. 4, will draw the pump cylinder 17 over the plunger barrel 16, and raise water thereinto, and that an opposite movement of said sweep beam will reversely move the pump cylinder, which will close the valve *a* in the suction pipe 18, and by shortening the space between the suction pipe and the check valve 14^a, force water through the latter into the conduit pipe 14.

A means for controlling the action of the sweep beam, paddle arm and paddle blade, that embodies novel features will now be described: Upon the transverse frame timber 12^a, near the suction pipe 18, a stanchion 27 is erected and supported in a nearly upright position by a brace bar 28, that extends from the upper end of said stanchion toward the transverse frame timber 12^a, whereon the sweep beam 19 is pivoted, and said extended end is firmly secured on said transverse timber. There is another brace bar 29 provided for the stanchion 27, that is secured on the same cross timber therewith, by its lower end, and is inclined toward the stanchion whereon its upper end is laterally attached as indicated in Figs. 1 and 3. A plurality of rungs 30 are secured by their ends at equal distances apart upon the stanchion 27 and brace bar 29, said rungs serving to stiffen the connection of these parts, and also affording a ladder for ready access to the top of the stanchion when this is desired.

A yard arm 32 is provided, whereon an arched bracket frame 31 is secured by its feet, that are seated upon the upper side thereof near the longitudinal center of said yard arm. At a suitable point near the stanchion 27 a bracket block *e* is secured upon the upper side of the brace 28 and has a level upper side, wherein a socket or depression *e'* is formed. At the center and on the lower side of the bracket frame 31 a fulcrum stud *e*² is downwardly extended, said stud having a rounded free lower end, that is seated in the socket *e'*, which connection of parts adapts the yard arm to receive rocking adjustment as occasion may require. Upon the upper side of the yard arm 32 a truss brace 33 is secured, that is attached at its ends on the ends of the yard arm, and at its arched center engages the arched bracket frame 31, thus rendering the yard arm capable of resisting bending strains. Upon one end portion of the yard arm 32, a counter balance weight 34 is adjustably mounted and secured, and upon the opposite end thereof a rocker bar 35 is pivoted at the center thereof.

A bifurcated hanger bar formed of two connected members 36, 36^a is attached by the lower ends of said members upon the paddle arm 20 near the blade 21, which they oppositely embrace. The hanger bar member 36 is longer than the member 36^a that is secured

by its upper end laterally thereon, and at the upper end of the member 36 one end of a link rod 37 is loosely secured, said link rod being in a like manner connected with the end portion of the yard arm 32, near the rocker bar 35.

A short chain or other flexible connection 38 is attached at one end thereof upon the link rod 37, near the upper end of the hanger bar member 36, and at the opposite end said flexible connection is attached to one end of the rocker bar 35 that is nearest thereto. Upon the opposite end of the rocker bar 35, one end of a check cable 39 is secured, that is thence extended downward and attached to the brace bar 29, and as shown in Fig. 1, the length of the cable 39 is such, that when drawn taut the downward rocking movement of the weighted end of the yard arm 32, and the corresponding upward rocking movement of the paddle blade 21, will be arrested thereby at a proper point for an effective operation of the apparatus.

Assuming that the railway track is anchored in the stream A that flows in the direction of the arrow x^3 , shown in Fig. 2, and that the truck frame thereon is so positioned as to permit a proper submergence of the paddle blade 21 in the current of the stream, the cable 38 will when this occurs be slackened as shown in Fig. 3. It will be noted in Figs. 2 and 4, that when the blade 21 is in position for immersion, the sweep beam 19 will be disposed at right angles to a central line through the pump cylinder 17, plunger 16 and conduit pipe 14, which will locate the cylinder at its point of sliding movement that is farthest from said sweep beam. Upon an immersion of the paddle blade 21, the force of the current of water it is submerged in, will instantly rock the sweep beam 19 in the direction of the curved arrow y in Fig. 4, which will pull upon the cylinder 17 and force water that has occupied the plunger 16, through the check valve 14^a into the conduit pipe 14. The depending portion of the paddle blade 21 will, by the action of the current of water, be caused to feather said blade, so that when it reaches the full extent of its rocking movement in the water, said blade will be disposed vertically, considered transversely thereof. As the paddle arm 20 is rocked along with the beam 19, the hanger bar 36, link rod 37, and flexible connection 38, pull upon the adjacent end of the rocker bar 35, which in turn pulls upon the check cable 39, and as the weight 34 on the yard arm 32 is now free to act, the relative position of said parts will be as shown in Fig. 1, the weight being depressed and the blade 21 raised. The gravity of the paddle arm 20 and blade thereon will now cause it to swing toward the side of the truck frame opposite from that toward which the current of water had swung it, and the descent of the paddle

blade into the water will elevate the weight 34 into the position shown in Fig. 3, whereupon the operation will be repeated.

It will be seen from the foregoing description, that the action of the current of water wherein the apparatus is submerged, will by the alternate depression and elevation of the paddle blade 21, be adapted to reciprocate the pump cylinder 17 and elevate water through the conduit pipe 14, to a reservoir or other receiver for use as may be desired.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a current motor of the character described, the combination with a supported truck frame, a stanchion erected thereon, and a lateral brace engaging the stanchion, of a yard arm, an arched bracket frame secured on said yard arm near its center, a bracket block having a socket and secured on the brace, and a depending stud on the bracket frame that is seated in the socket of the bracket block.

2. In a current motor of the character described, the combination with a supported erect stanchion, and an inclined brace therefor, of a yard arm, an arched bracket frame secured on the yard arm near its center, a stud rounded at its free end and depending from the center of the bracket frame, a block on the brace, having a socket that receives the depending stud, and a truss brace secured by its ends on the ends of the yard arm, and seating at the bowed center thereof upon the arched bracket frame.

3. In a current motor of the character described, the combination with a rockably supported sweep beam, a paddle arm thereon, and a paddle on the free end of said arm, of a controlling means for said arm and paddle, comprising a rockably supported yard arm, a counter-balance weight on one end of said arm, a rocker bar centrally pivoted on the other end of said yard arm, a link rod connected by one end to an end of the yard arm near the rocker bar, a flexible connection between an end of the rocker bar and the other end of the link rod, a hanger bar depending from said end of the link rod, and a check cable pendent from the other end of the rocker bar, said hanger bar being secured at its lower end upon the paddle arm.

4. In a current motor of the character described, the controlling means for the motor paddle arm and blade thereon, comprising a supported stanchion, a truss-braced yard arm centrally pivoted on the upper portion of the stanchion, a counterbalanced weight on one end of the yard arm, a rocker bar centrally pivoted on the other end of the yard arm, a check cable extended from one end of the rocker bar into engagement with a brace for the stanchion, a link rod on the yard arm, a flexible connection between the other end of

the rocker bar and said link rod, and a bifurcated hanger bar pendent from the outer end of the link rod and secured at the lower ends of its links upon the paddle arm near
5 the blade thereon.

5. In a current motor of the class described, a truck frame, a stanchion thereon, a yard arm on the stanchion, a lateral brace for the stanchion, a bracket block having a
10 socket connected to the brace, a bracket arm on the yard arm, and a depending stud on the frame seated in the socket of the block.

6. In a current motor, a stanchion, a brace therefor, a yard arm on the stanchion, a

bracket frame secured to the yard arm, a
stud depending from the bracket frame, a
15 block on the brace provided with a socket for receiving the stud, and a truss brace connected by its ends to the ends of the yard
arm and seated on the bracket frame. 20

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARY ALBERT NEYLAND.

Witnesses:

A. S. DUNN,
W. C. DAVY.