No. 830,973. PATENTED SEPT. 11, 1906.

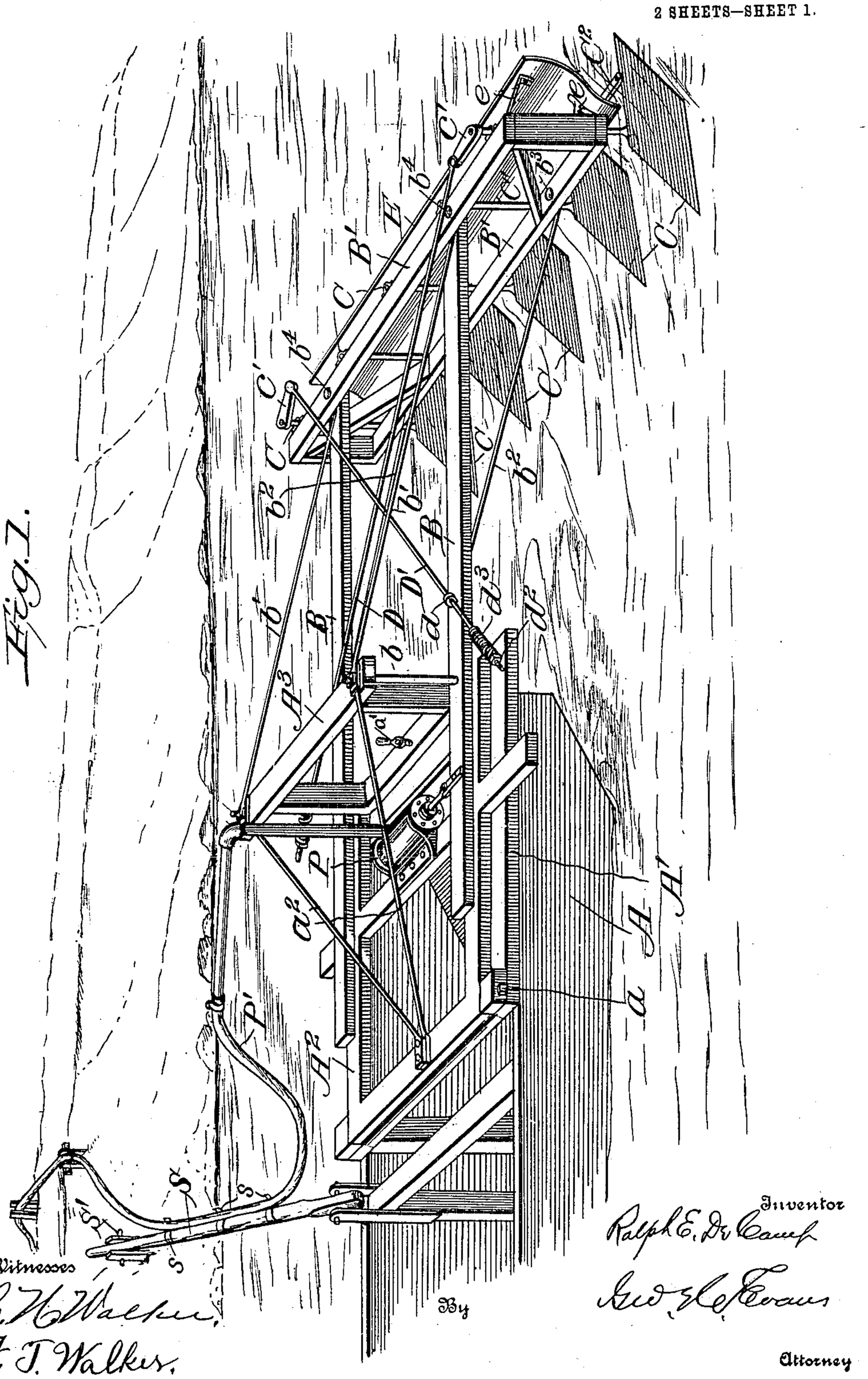
R. E. DE CAMP.

CURRENT MOTOR.

APPLICATION FILED AUG. 28, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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J. T. Walker.

Inventor

Ralph E. De Camp

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2 SHEETS—SHEET 2.

Fig. 2.

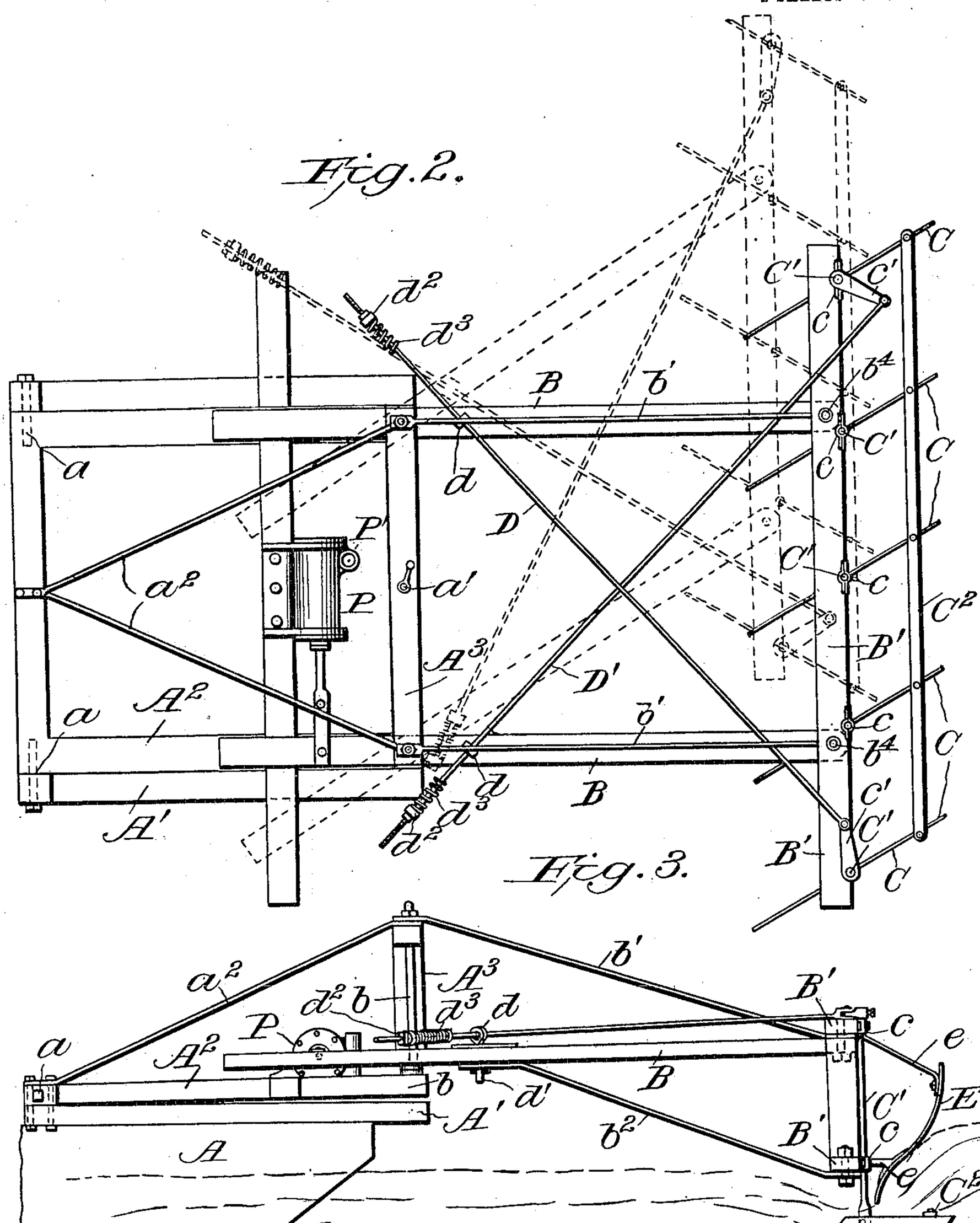

Fig. 3.

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RALPH E. DE CAMP, OF HELENA, MONTANA.

CURRENT-MOTOR.

No. 830,973. Specification of Letters Patent. Patented Sept. 11, 1906.

Application filed August 28, 1905. Serial No. 276,072.

To all whom it may concern:

Be it known that I, RALPH E. DE CAMP, a citizen of the United States, residing at Helena, in the county of Lewis and Clarke, and State of Montana, have invented certain new and useful Improvements in Current-Motors, of which the following is a specification.

My invention relates to that class of motors which are actuated by the current or tide.

The object of the invention is to provide a current-motor which shall be simple in its construction and reliable in its action. This object is accomplished by the construction shown in the accompanying drawings, in which—

Figure 1 is a perspective of my improved current-motor as used in irrigation. Fig. 2 is a plan of the motor with the deflector omitted, the full lines showing the parts in one position and the dotted lines showing the same reversed. Fig. 3 is a side elevation thereof.

A designates a support of any suitable kind for the motor, such as a scow or float.

A′ designates a rigid framing secured to the upstream end of said support, and A^2 designates the vertically-movable frame hinged at its rear end at *a* to the rear end of the frame A′. The front end of the movable frame A^2 may be raised and lowered by any suitable mechanism, a screw *a*′ being shown. The front end of the movable frame A^2 is provided with an upright extension A^3, from which braces a^2 extend to the rear end of the movable frame A^2.

The motor proper comprises parallel horizontally-extending levers B B, pivoted near their rear ends on vertical bolts *b b*, mounted in the ends of the extension A^3, so as to swing horizontally. The front ends of these levers B B are pivotally connected by a depending frame consisting of upper and lower rigidly-connected bars B′ B′, which form the rudder or blade carrying frame. The levers B B are supported at their forward ends from the framing A^3 by means of the braces *b*′ *b*′, the adjacent ends of the braces a^2 *b*′ being mounted on the upper ends of the pivot-bolts *b b*. The lower end of the rudder-frame B′ is braced from the levers B B by the braces b^2, the forward ends of which pivot on the pivot-bolts b^3, which are in vertical alinement with the pivot-bolts b^4 of the rudder-frame B′. Horizontal reciprocation of the frame B′ and oscillation of the levers B are thus provided for.

C C designate a series of rudders or blades set vertically edgewise and having central vertical posts C′, pivotally mounted in bearings *c c* on the front of the rudder-frame B′, and the forward ends of these rudders or blades are pivotally connected by a connecting-bar C^2, so that the series will move in unison. These rudders may be of any suitable shape and material; but I find that the rhomb shape shown is the more satisfactory, as it prevents the accumulation of seaweed and other floating matter on the downward and rearward inclined front edges of the blades or rudders.

The upper ends of the posts or shafts of the end rudders or blades are provided with cranks *c*′ *c*′, and crossed reversing-rods D D′ are pivotally connected at their front ends to said cranks. The rear ends of these reversing-rods slide freely in stop-forming bearings *d d*, having depending stems *d*′ *d*′, pivotally mounted in the levers B B just in advance of their pivotal points *b b*. The rear threaded ends of the reversing-rods D are provided with nuts d^2, between which and the stops *d d* are suitable springs d^3 to engage the stops in the extreme forward throw of the rods. The cranks and rods are so arranged with relation to the blades or rudders that the latter will be normally at an incline, as shown in full lines in Fig. 2, so that the water will act on these inclined faces and force the series of blades to the left, carrying therewith the frame B′ and levers B B. When the limit of movement is about reached, the spring d^3 on the rod D′ will be compressed against the stop *d*, and the left-hand crank will be turned, and in so doing turn the whole series of blades or rudders, to the reversed position, (shown in dotted lines,) whereupon the movement of the parts from left to right begins, and so on indefinitely.

I find that by confining or damming the flow of water just above the rudders and deflecting it downward a more efficient action is produced, and I therefore provide the front or upstream side of the rudder-frame with a deflector E, secured thereto by attaching-arms *e e*. The deflector is inclined downward and rearward over the upper forwardly-projecting edges of the blades or rudders C,

and so causes the flow to be directed against the blades with considerable force, and thereby increasing the efficiency of the motor.

Power is taken from my improved current-motor by connecting the rear shorter end of one or both of the levers B to the piston of a pump P, mounted on the frame A^2, or to any other machine or apparatus to be operated. From the pump a pipe or hose P′ leads to the shore for irrigating and other purposes, and this pipe is supported by a pivoted spar S, extending to the shore and there pivoted to a suitable support S′. The spar is provided with brackets *s*, in which the pipe or hose is held.

What I claim is—

1. The combination with a horizontally-reciprocating rudder-frame, and a series of vertically-disposed, pivotally-connected blades or rudders mounted thereon at an angle to the current, of crossed reversing-rods operatively connected at one end to the axes of two of the rudders or blades to alternately turn them in opposite directions, and stops with which the opposite ends of the said rods contact in one direction of their movement to produce such reversal of the blades or rudders.

2. The combination with a horizontally-reciprocating rudder-frame, and a series of vertically-disposed, pivotally-connected blades or rudders mounted thereon at an angle to the current, of crossed reversing-rods operatively connected at one end to the axes of two of the rudders or blades to alternately turn them in opposite directions, stops through which the opposite ends of the reversing-rods slide and springs or buffers on the rods to contact with the said stops in one direction of the movement of the rods to produce such reversal of the blades or rudders.

3. The combination with horizontally-swinging parallel levers, and a rudder-frame pivoted to the outer ends of said levers, of a series of vertically-disposed, pivotally-connected rudders or blades inclined to the current and having stems journaled on the said frame, cranks on two of the stems, crossed reversing-rods connected at their outer ends to the said cranks, and stops mounted on the levers and through which the inner ends of the rods have limited outward movement.

4. The combination with a vertically-adjustable frame, horizontally-swinging parallel levers pivoted thereon, and a rudder-frame pivotally connecting the outer ends of said levers, of a series of vertically-disposed, pivotally-connected rudders or blades inclined to the current and having stems journaled on the frame, cranks on two of the stems, crossed reversing-rods connected at their outer ends to the said cranks, and stops mounted on the levers and through which the inner ends of the reversing-rods have limited outward movement.

5. The combination with the horizontally-reciprocating rudder-frame, a series of vertically-disposed, pivotally-connected blades or rudders mounted thereon and mechanism for automatically reversing the angle of the blades or rudders, of a deflector mounted on the rudder-frame above the upper forward edges of the blades to direct the flow downward thereto.

6. The combination with a support, a pair of horizontally-swinging parallel levers projecting upstream therefrom and a depending rudder-frame pivotally connecting the outer ends of said levers, of a series of vertically-disposed, pivotally-connected, parallel rudders, set at an incline to the current and having upwardly-projecting stems journaled on the said frame, crossed reversing-rods operatively connected at their outer ends to two of the rudder-stems to turn them and stops on the levers to limit the outward movement of the rods and so turn the rudder-stems.

7. A current-motor comprising a frame having a vertical extension provided at its ends with vertical pivot-bolts, parallel horizontal levers pivoting near their rear ends on said bolts, a depending rudder-frame pivotally connecting the outer ends of said levers, braces extending from the rear ends of said frame to the upper ends of said pivot-bolts, braces extending from the forward ends of said levers to the upper ends of said pivot-bolts, braces extending from the lower inner portions of the lever and pivoted at their outer ends to the lower corners of the rudder-frame, a series of vertically-disposed, pivotally-connected rudders or blades mounted on the rudder-frame and means for automatically reversing the position of the blades.

8. The combination with the horizontally-reciprocating rudder-frame and a series of vertically-disposed, pivotally-connected blades or rudders inclined to the current; said blades being rhomboid-shaped and carried at the lower ends of vertical shafts, their front edges being inclined downward and rearward for the purpose set forth, of means for automatically reversing the inclination of the blades as the frame reaches the ends of its movements.

In testimony whereof I affix my signature in presence of two witnesses.

RALPH E. DE CAMP.

Witnesses:
ALBERT S. HOVEY,
OLIVER C. DALLAS.