(No Model.) 2 Sheets—Sheet 1.

J. W. COVER.

CURRENT MOTOR.

No. 538,819. Patented May 7, 1895.

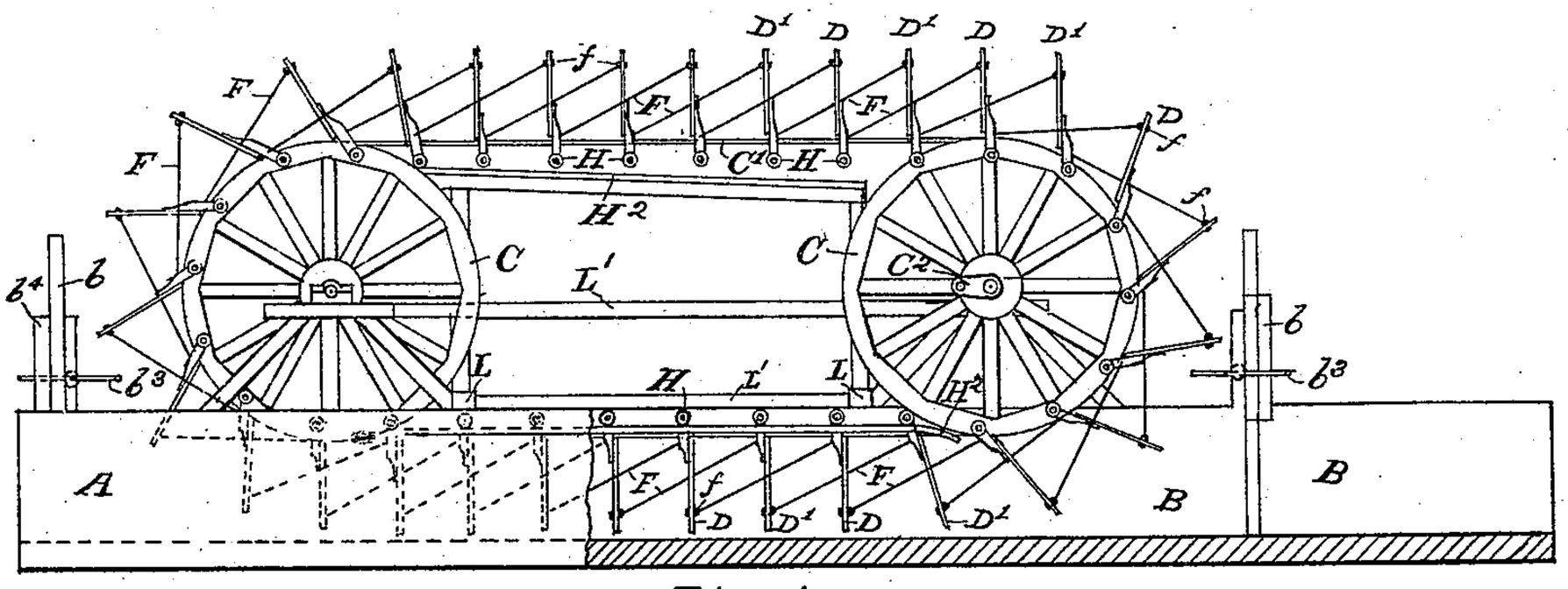

Fig. 1.

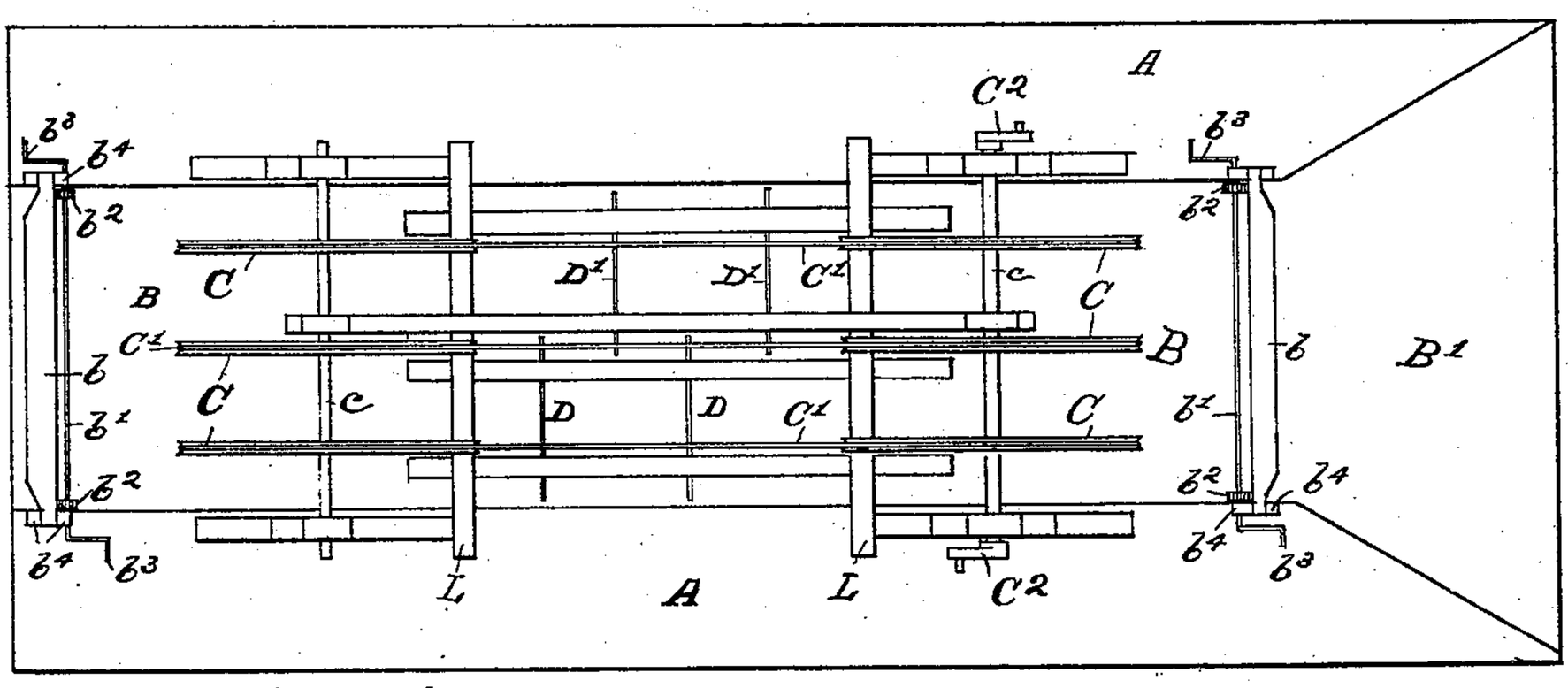

Fig. 2.

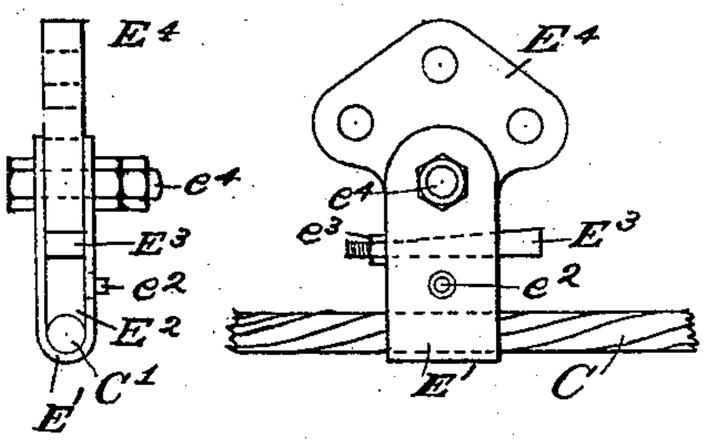

Fig. 5. Fig. 6.

Witnesses.
Frank E. Adams
M. V. Ropkey

Inventor.
John W. Cover;
by H. L. Reynolds,
his atty.

(No Model.)

2 Sheets—Sheet 2.

J. W. COVER.

CURRENT MOTOR.

No. 538,819. Patented May 7, 1895.

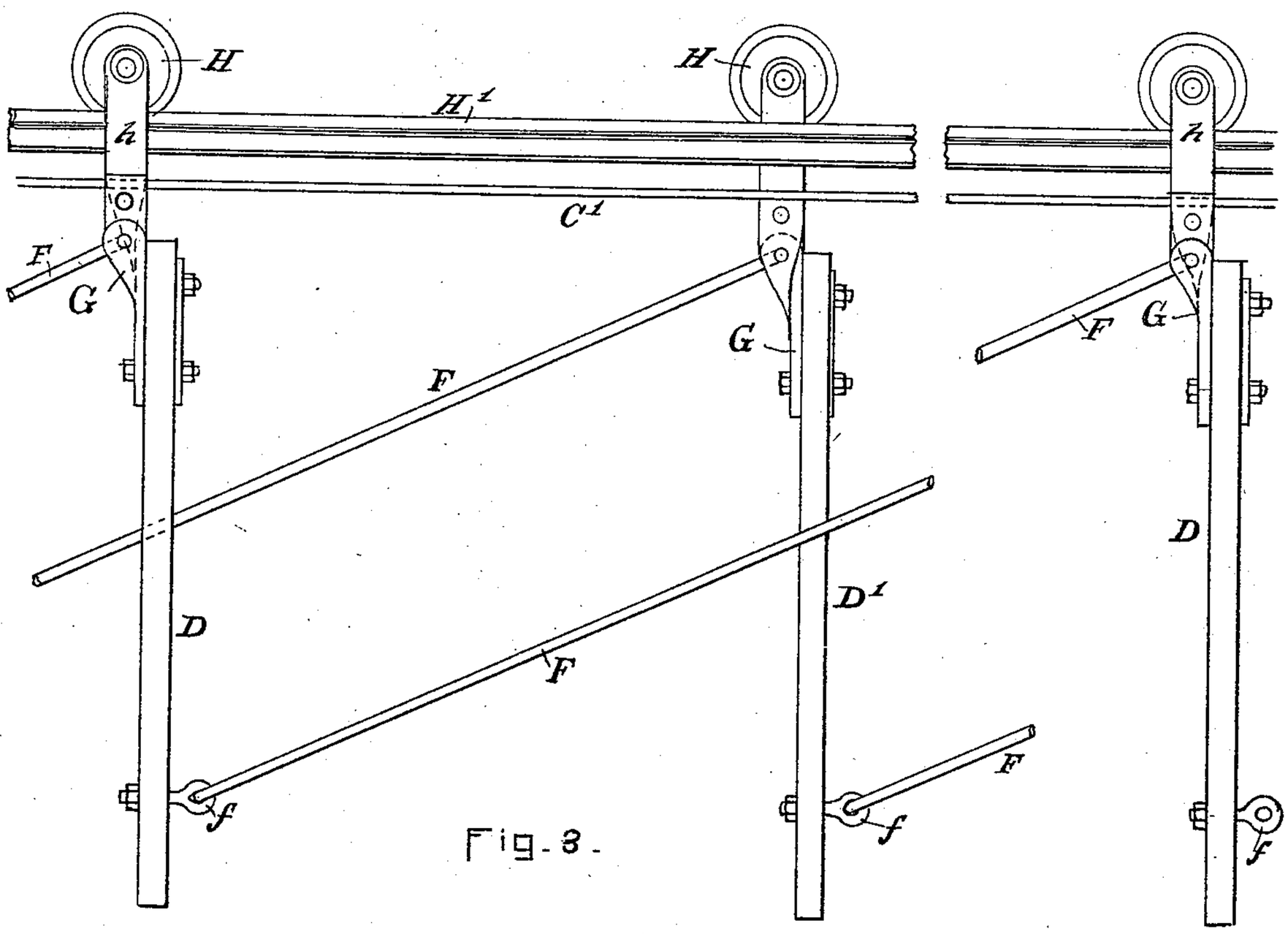

Fig. 3.

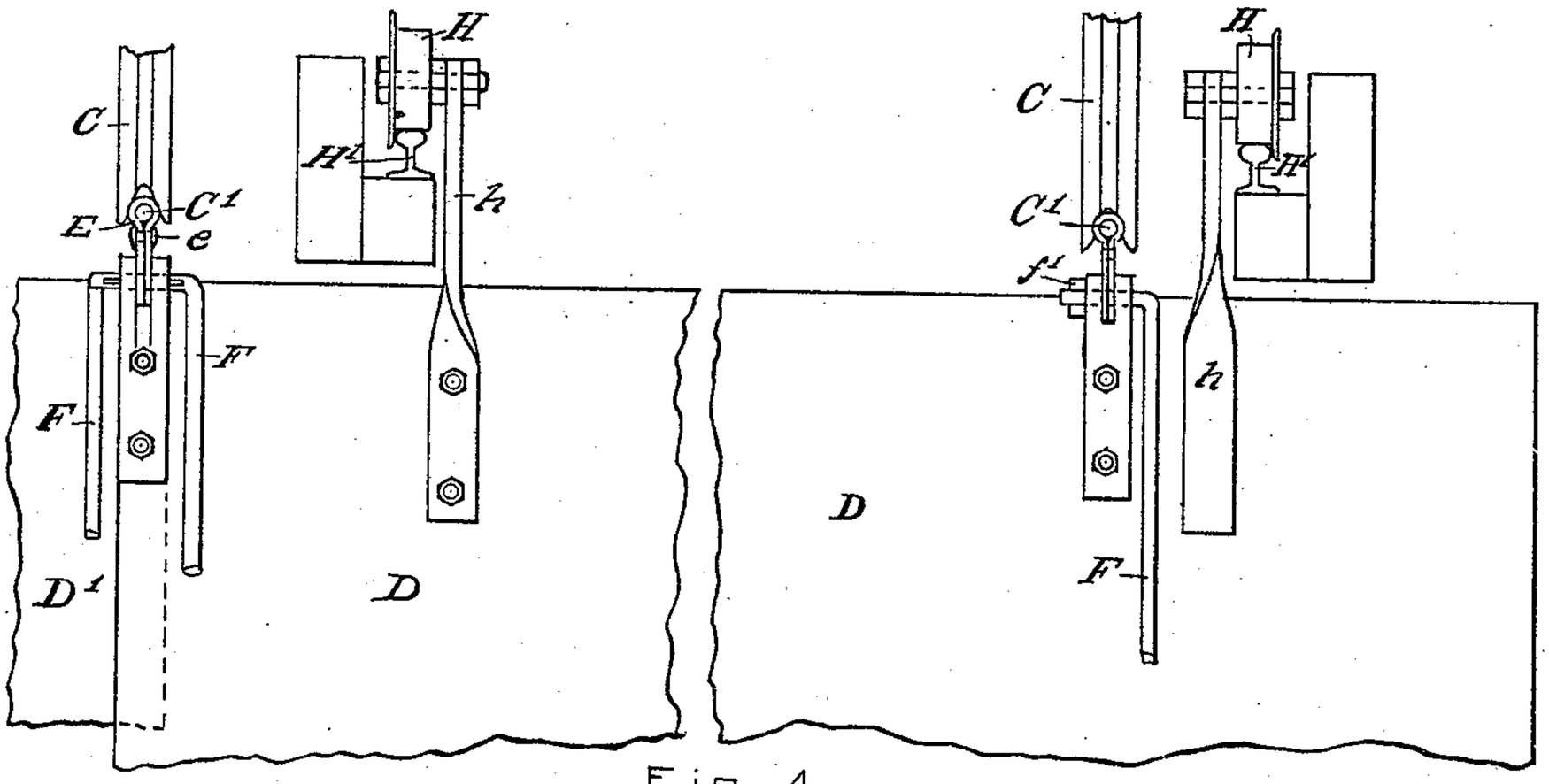

Fig. 4.

Witnesses.
Frank E. Adams
M. H. Ropkey

Inventor.
John W. Cover,
by H. L. Reynolds,
his atty.

UNITED STATES PATENT OFFICE.

JOHN W. COVER, OF EVERETT, ASSIGNOR OF ONE-HALF TO MILTON O. TIBBITS, OF SNOHOMISH COUNTY, WASHINGTON.

CURRENT-MOTOR.

SPECIFICATION forming part of Letters Patent No. 538,819, dated May 7, 1895.

Application filed May 17, 1894. Serial No. 511,509. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. COVER, a citizen of the United States, residing at Everett, in the county of Snohomish and State of Washington, have invented certain new and useful Improvements in Current-Motors; and I do hereby 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.

My invention relates to current motors which utilize the current of a river or stream for generating power.

It consists more particularly of a float having a longitudinal sluice-way through its center and two wheels carrying endless chains or cables to which are fastened a series of buckets.

The details of construction will be more fully pointed out later.

Figure 1 is a side elevation of my machine, partly in section. Fig. 2 is a plan view with, however, the larger portion of the buckets and certain other parts removed to prevent confusion. Figs. 3 and 4 are a side and end elevation of buckets and the means for attaching them to the cables and supporting them. Figs. 5 and 6 show a clip used for fastening the buckets to the cables.

The hull of the float is made in two parts A, A, connected together at the bottom by timbers and flooring, thus forming a floating sluice-way B. The forward end B′ of this sluice-way is made with inward sloping sides which act to concentrate the force of the current. Both ends of this sluice-way have gates *b*, *b*, which may be used to either entirely close the sluice-way so that it may be pumped out, or to regulate the amount of water used and the power generated. The forward one of these gates may be placed, as shown, at the back end of the converging sides, or at the extreme forward end of the float. These gates slide in vertical grooves or guide ways in the sides of the sluice-way, which are continued above the upper surface of the float by the posts b^4. A rod *b*′, which extends across the sluice-way just inside of the gate, has bearings in one of these posts b^4, and crank handles at each end. Gears b^2, upon this rod or shaft engage racks upon the inside of the gate to raise and lower it by.

Near each end of the sluice-way, but within the gates, are the two power wheels, C, C. These wheels consist in each case of a number of narrow grooved wheels, as shown of three, mounted upon the same shaft and keyed thereto. Each of these narrow sections of the wheel is placed opposite a similar one on the other shaft and an endless cable passes over them. These cables run in the grooves in the wheels and carry a series of buckets, D, D, and D′, D′. These buckets are in two series, each series extending half way across the sluice-way and alternating with the other. The inner ends of each series are attached to the central cable, lapping somewhat by the buckets of the other series. The outer ends are attached to independent cables.

In building a large machine, the number of series of buckets may be increased, if desired. It will be best not to make each bucket too long both for structural reasons, and more important still, because it is necessary to allow this opportunity for the water to flow through the sluice-way, which it will do in a somewhat zig-zag course. It has been found that to get the most power out of the water its motion must be checked gradually and each bucket given its share of the power. This is secured by the use of a half length bucket.

In building large machines having a wide sluice way the shafts are subjected to considerable bending strain due to the weight of the wheels and the pull of the buckets on the cables. To avoid the necessity for making the shaft large enough to take this strain when supported from the sides and the expense which this would involve, I have provided central supports therefor which may be placed close to each sectional wheel, thus making it unnecessary to make the shaft larger than required to transmit the twisting strain. These central supports are constructed as follows: Extending across the sluice way just inside each set of wheels are beams L, which form supports for the truss L′, which extends longitudinally the sluide way and underneath the wheel shafts C, where they sup-

port bearings for the same. I have only shown one such bearing under each wheel, but it is evident that the number might be increased as much as the necessities required. The cross beams L might be made as trusses also if the sluice way were wide enough to make it desirable, as the longitudinal truss L′ might also be made as a plain beam. These trusses might be made nearly as deep as the diameter of the wheels, if it were necessary for strength, the limit to their depth being determined by the space between the upper and lower sections of the endless cables and attached buckets.

The buckets are attached to the cables by clips, which may be of any particular construction found to be desirable. The clip shown in Fig. 4, consists of a plate E of wrought iron bent about the cable and secured thereon by a rivet or bolt through it at *e*. It extends farther down and has a hole for the guy rod F, which holds the bottom of the bucket next back of it. These guy rods are attached to the bottom of the buckets by eyebolts, so that they may pivot thereon and to the clip by being bent and passing through the clip and the pivot piece G, of the bucket, thus forming the pivot for the bucket to swing upon. A pin *f*, keeps it in place. These guys may be made of wood, if desired, when they would have more stiffness to support the outer edge of the bucket when rising out of the water.

The clip shown in Figs. 5 and 6, is somewhat different. This consists of a wrought iron plate E′, passing around the cable C′, and has between its two sides the blocks E^2, and E^4, and the wedge E^3. The bolt e^4, secures the clip together. The block E^2, is curved to fit one side of the cable and the wedge is driven tight to secure a good hold on the cable. The block E^2 is prevented from slipping out, by a pin e^2, passing through the plate E′.

The wedge is held in place by threading the small end and screwing a nut upon it.

The block E^4, is the pivot block from which the buckets are hung. They are attached thereto in the same manner as that heretofore described for the other form of clip, the lugs upon the pivot piece G embracing the block E^4.

To support the buckets in their passage from one wheel to the other and prevent their dragging on the bottom of the sluice-way, each bucket has a wheel H, supported by an arm *h*, near each end and running on a track H′. This track is supported on suitable timbers and extends only between the wheels. At the forward end the track drops down slightly, as shown at H^2, to insure the proper engagement of the wheels. A similar track H^2, may be placed between the wheels to support the buckets on the upper side. In this case it would want to slope toward the front wheel so as to allow a little sag in the cable just back of the front wheel.

Sprocket wheels and chains may be used instead of grooved wheels and cables as shown herein.

The power generated by my motor may be used for pumping water, or for any other use. I have shown cranks upon each end of the forward shaft, to which pumps may be attached.

There are various ways in which the power may be utilized, but I have not shown them as they are not necessarily a part of the motor.

I claim—

1. In a current motor the combination with a sluice-way, two sets of wheels placed over said sluice-way with their shafts extending across the same, and endless conveyers with buckets attached extending about said wheels, of beams extending across said sluice-way just inside the wheels and beams supported thereby longitudinally the sluice-way and carrying bearings for the center of the wheel shafts, substantially as shown and described.

2. In a current motor the combination with a floating sluice-way having converging sides at its forward end, a gate whereby it may be closed, a set of wheels near each end having their shafts extending across said sluice-way, endless conveyers passing over the same, and buckets attached to said conveyers, of beams extending across the sluice-way inside the wheels, and longitudinal beams supported thereon and supporting bearings for the center of the wheel shafts, substantially as shown and described.

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

JNO. W. COVER.

Witnesses:
H. L. REYNOLDS,
CHARLES LOVEJOY.