

(No Model.)

2 Sheets—Sheet 1.

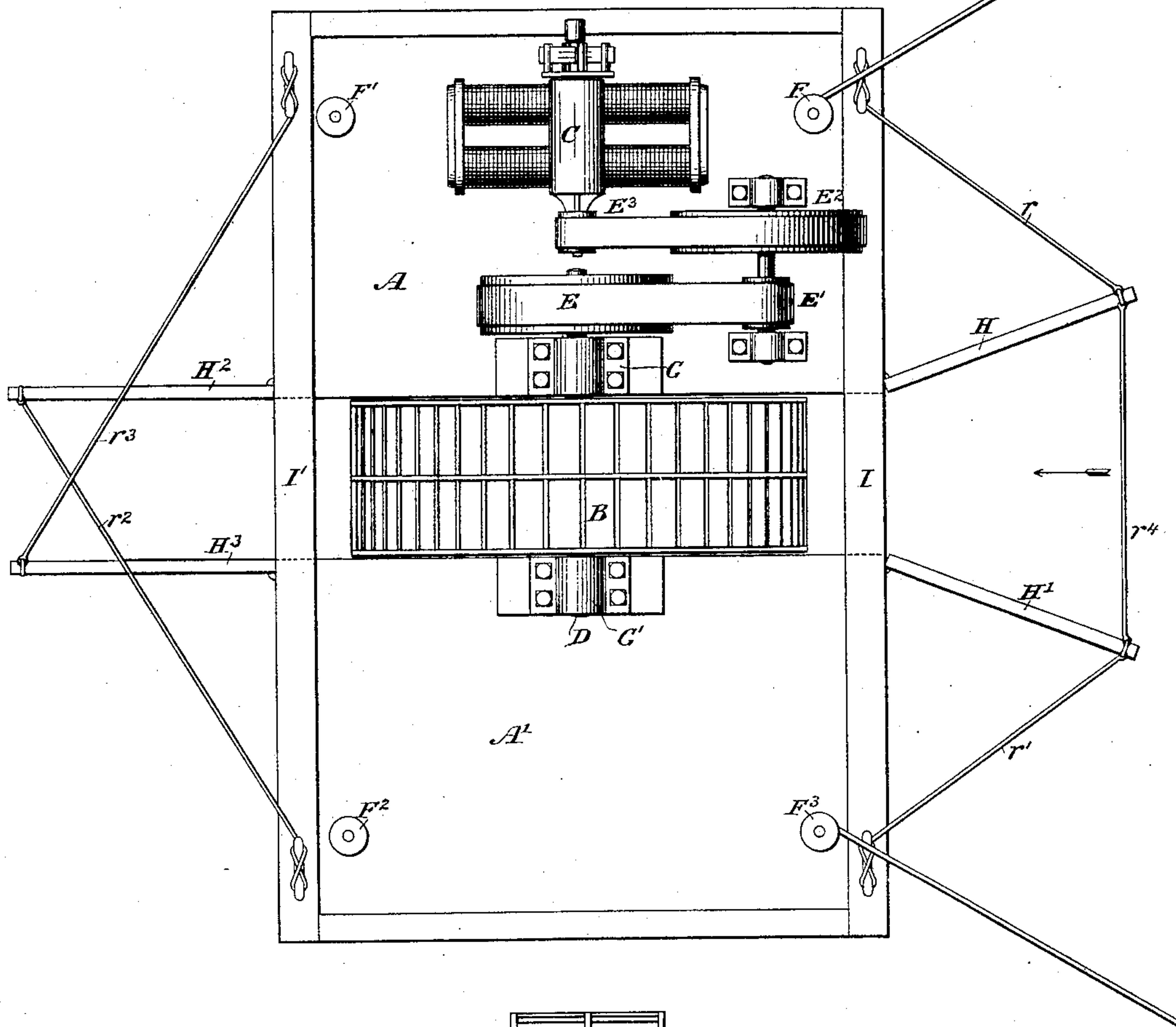
A. MAN.

APPARATUS FOR UTILIZING THE CURRENT FORCE OF FLOWING WATERS  
IN PRODUCING ELECTRIC CURRENTS.

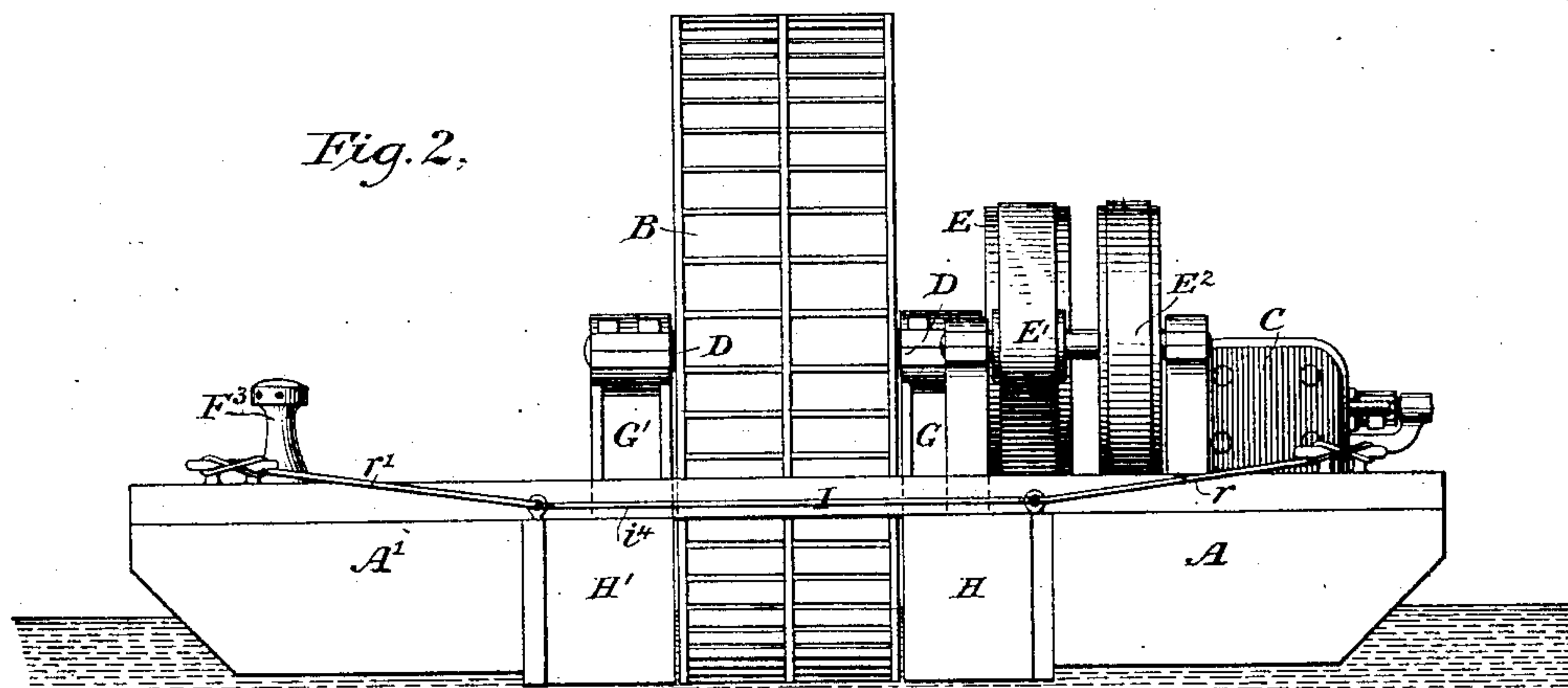
No. 313,746.

Patented Mar. 10, 1885.

*Fig. 1,*



*Fig. 2,*



Witnesses

Geo. W. Breck  
Carne E. Ashley

By his Attorney

Inventor

Albon Man,  
M. H. Phelps

(No Model.)

2 Sheets—Sheet 2.

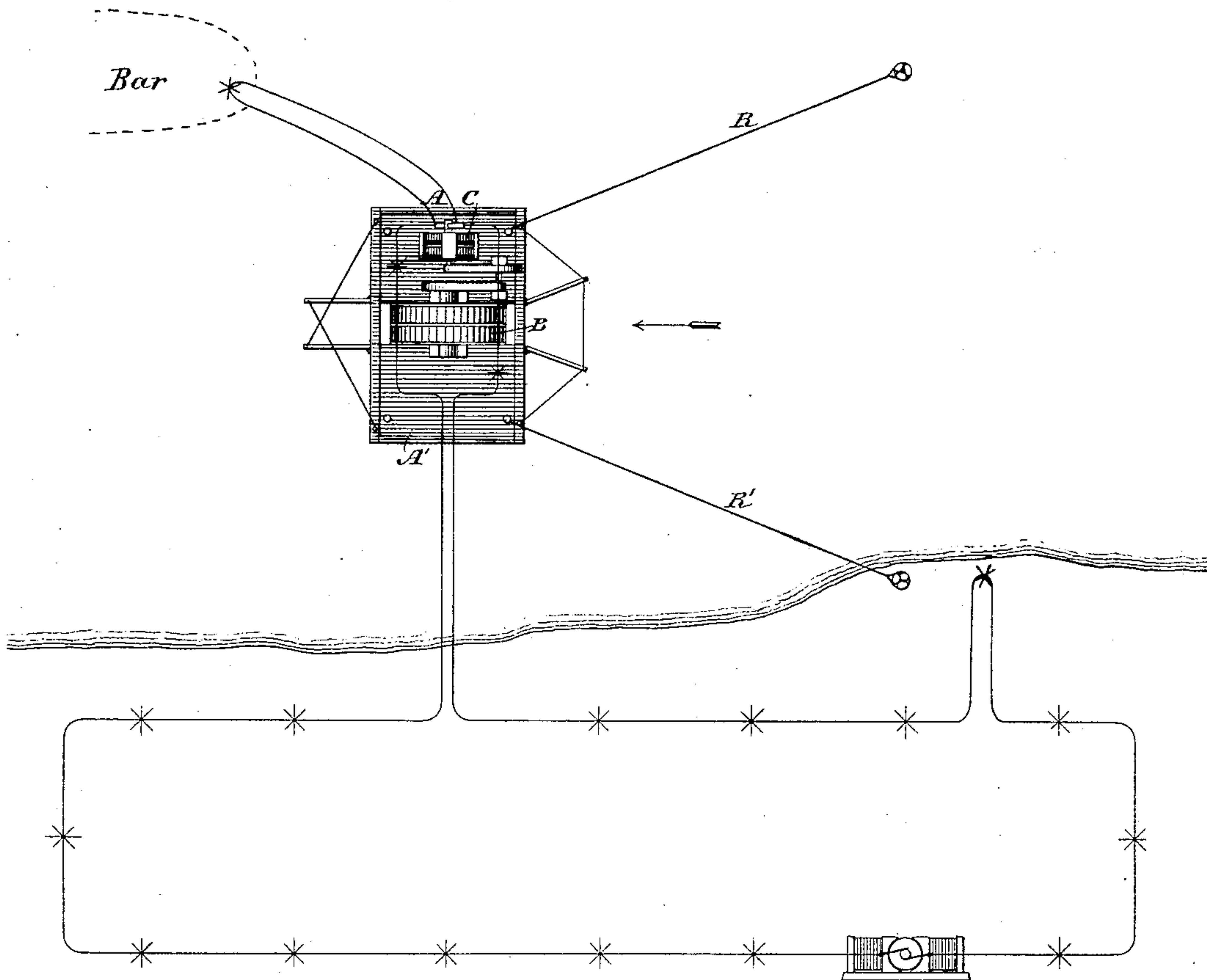
A. MAN.

APPARATUS FOR UTILIZING THE CURRENT FORCE OF FLOWING WATERS  
IN PRODUCING ELECTRIC CURRENTS.

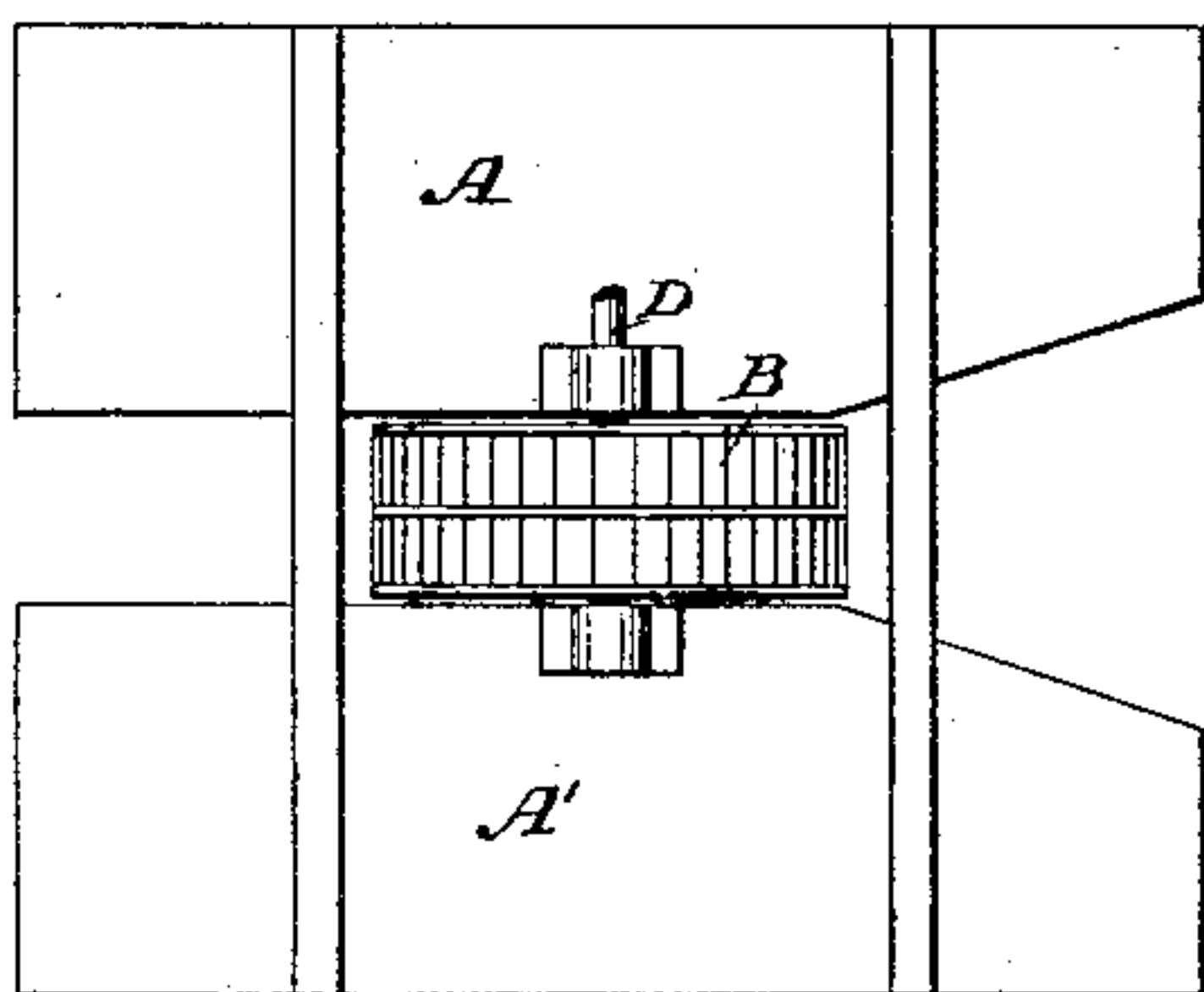
No. 313,746.

Patented Mar. 10, 1885.

*Fig. 3,*



*Fig. 4,*



Witnesses

Geo W. Breck.  
Carrie C. Ashley

Inventor

By his Attorney

Albon Man  
M. H. Phelps



# UNITED STATES PATENT OFFICE.

ALBON MAN, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE RIVER AND RAIL ELECTRIC LIGHT COMPANY, OF OHIO COUNTY, WEST VIRGINIA.

APPARATUS FOR UTILIZING THE CURRENT FORCE OF FLOWING WATERS IN PRODUCING ELECTRIC CURRENTS.

SPECIFICATION forming part of Letters Patent No. 313,746, dated March 10, 1885.

Application filed January 9, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, ALBON MAN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Apparatus for Utilizing the Current Force of Flowing Waters in Producing Electric Currents, which is fully set forth in the following specification.

The object of my invention is to provide a means for utilizing the current force of flowing water having a moderate slope for the generation of electricity for lighting such waters, and for analogous purposes, which shall be capable of practical application to navigable rivers. An apparatus suitable for this purpose requires a high degree of mobility, because of certain well-known characteristics of such rivers. First among these is the changeable character of their beds between their banks. In all rivers, and especially those which flow through alluvial valleys, the erosion of banks and bottom maintains a constant flux, more or less rapid, in the entire topography of the bed. These changes are largely accelerated in rate and increased in importance by the periodical variations of stage to which most rivers are subject. Under the influence of floods extensive channel changes are effected within comparatively brief periods of time. It is therefore evident that a current apparatus designed for use on such streams should be readily adjustable both to follow the thread of the current in its lateral movements and also to follow the surface of the water in its vertical oscillations. Another consideration is that the portions of a navigable stream which require illumination are generally separated by considerable intervals, and that these intervals are also subject to constant change. Thus the cutting away of a bar by the action of the current may leave a stretch of considerable length clear of obstruction and without need of illumination, while the lodging of a snag may at any time start the formation of a bar in what was before an unobstructed channel. The effect of a flood may be to clear up a previously-obstructed reach, or to clog a previously-clear reach. It is therefore apparent that the illuminating ap-

paratus should be capable not only of easy movement within the limits above referred to, but also of ready transfer from one place of danger on the river to another. My invention is especially designed to meet these requirements. I propose to mount a current-wheel and a dynamo to be driven thereby upon a floating support, to make this support fast in the stream by means of anchors, shore-ropes, or piles, and to provide suitable warping devices therefor, whereby its position in the stream may be properly adjusted as the shifting of the current or the changing condition of the channel may demand. Apparatus of this sort will be readily applicable to all navigable rivers and tidal waters, and their current force can thus be directed to effect their own illumination at a moderate and entirely practicable cost.

My invention further consists in certain details of construction and application, herein-after fully set forth in the description and pointed out in the claims.

In the drawings, Figure 1 represents a plan view of my device. Fig. 2 is an end view. Fig. 3 is a diagram showing the device in operation and the circuit-connections of the dynamo. Fig. 4 shows a modification.

A A' represent two floats securely bound together by braces I I', between which is hung the current-wheel B, mounted on shaft D, supported by bearings G G'. The floats A A' are so ballasted as just to submerge the buckets or blades of the wheel B. Motion-multiplying apparatus E E' E<sup>2</sup> E<sup>3</sup>, of any desired construction or form, connects the current-wheel with a dynamo-electric machine, C. Wings or deflecting-boards H H' H<sup>2</sup> H<sup>3</sup> are hinged fore and aft to the floats A, and are held in position by ropes, chains, or stays  $r$ ,  $r'$ ,  $r^2$ ,  $r^3$ , and  $r^4$ . In the position shown the guide-boards H H' serve to concentrate the current upon the wheel, while the guide-boards H<sup>2</sup> H<sup>3</sup> serve to restrain the water after it has passed the float and prevent the formation of eddies under and about the wheel. The deflecting guide-boards need not be attached to the float, but may be placed in the bed of the stream above it. Such an arrange-



ment would be the obvious equivalent of my construction.

The general working of the apparatus is shown in Fig. 3, wherein the floats are moved  
5 by means of cables R R', passing, respectively, from piles driven in the river-bed and from a shore, fastening to capstans F F' upon the float. These capstans, together with the cables, constitute a warping device, by means of  
10 which the position of the floats in the stream may be varied at pleasure.

It is obvious that by the use of ropes attached to the other shore of the river, or to other piles, or by the use of anchors, the range  
15 within which the floats may be readily moved is capable of indefinite extension, and that the whole apparatus may be moved step by step up and down the river to points requiring illumination.

It is evident that the concentration of the current by the deflecting-boards will add materially to the power of the wheel, and that the increased current, when deflected downward by the wheel, will tend to scour out the  
25 bottom of the river. The effect of this scour will be to further increase the volume of water and the force of the current operating upon the wheel, thus augmenting the effectiveness of the apparatus; and it may also be made to  
30 serve a useful purpose in the improvement of the channel itself.

I propose in using the apparatus to place it at the foot of bars or shallow reaches, where the character of the river is such as to require  
35 improvement of this sort, and, by gradually warping the floats up stream, to simultaneously accomplish the two results of systematically deepening the channel and generating electrical energy.

I propose to use the lights fed by the currents generated by my apparatus for purposes of signaling as well as of illumination, and it is a part of my present invention to provide colored-glass globes for lights placed  
45 upon the floats or set to mark dangerous points, whereby appropriate signals may be given—as, for instance, that the channel is on the left or on the right of a particular light. I may also use such colored globes in transmitting arbitrary signals between the floats  
50 and the shore or between the floats and moving boats.

I have shown in Fig. 4 in diagram a modified construction in which the shape of the  
55 boat itself is caused to deflect the water upon the wheel in place of the movable wings or guide-boards H.

While it is the main object of my invention to furnish electricity for illuminating the  
60 banks and channels of rivers, and I have hereinbefore described it with reference to that object alone, it is evident that it may frequently be desirable to take off currents from my portable apparatus for other purposes—as for lighting towns, propelling motors, and the analogous uses to which electricity is applicable in  
65 the arts—and I wish it understood that I claim

the exclusive use of my portable apparatus for such purposes as well as for the purpose of river-illumination. 70

The means shown for controlling the position of the attached deflecting-surfaces, consisting of ropes or stays passing to and operated from the float, are not broadly claimed herein, but are reserved as subject-matter for  
75 a future application for patent.

I claim—

1. A portable mechanism for utilizing the current force of flowing water for purposes of illumination, consisting of a current-wheel, a  
80 floating support therefor, anchoring or attaching devices for said support, a dynamo-electric machine connected by motion-multiplying apparatus to said wheel, an electric circuit containing lamps or other illuminating  
85 devices, and longitudinal and transverse warping apparatus whereby the position of the floating support may be readily adjusted up and down or across the stream.

2. A mechanism for utilizing the current  
90 force of rivers and the ebb and flow of tidal waters for purposes of illumination, consisting of a current-wheel mounted upon a floating support, anchoring or attaching devices for said support, a dynamo-electric machine  
95 suitably geared to said current-wheel, electric lamps suitably placed upon the shore or otherwise located in the vicinity of objects or places dangerous to navigation, an electric  
100 circuit connecting the dynamo with the lamps, and longitudinal and transverse warping apparatus, whereby the position of the floating support in the stream may be readily varied up and down or across said stream.

3. A mechanism for utilizing the current  
105 force of flowing water for purposes of signaling and illumination, consisting of a current-wheel, a floating support therefor, anchoring or attaching devices for said support, a dynamo-electric machine suitably geared to said  
110 wheel, an electric circuit containing electric lamps fed by said dynamo, and suitably-colored signal-globes for said lamps located at selected points along the river course, whereby suitable danger or navigation signals may be  
115 given.

4. A mechanism for utilizing the current force of flowing water for purposes of signaling and illumination, consisting of a current-wheel, a floating support therefor, anchoring  
120 or attaching devices for said support, a dynamo-electric machine suitably geared to said wheel, electric lamps in circuit with said dynamo and located upon said support, and suitably-colored signal-globes for said lamps,  
125 whereby danger, navigation, or other signals may be transmitted from the float.

5. A mechanism for utilizing the current force of flowing water for purposes of illumination, consisting of a current-wheel, a float-  
130 ing support therefor, anchoring or attaching devices for said support, a dynamo-electric machine connected by motion-multiplying apparatus with said wheel, electric lamps in the



circuit of the dynamo, deflecting surfaces for concentrating the flow of water upon the wheel, and longitudinal and transverse warping apparatus whereby the position of the floating support in the stream may be readily varied up and down or across said stream.

6. A mechanism for utilizing the current force of flowing water for purposes of illumination, which consists of a current-wheel, a floating support therefor, anchoring or attaching devices for said support, a dynamo-electric machine connected by motion-multiplying apparatus with said wheel, electric lamps in the circuit of said dynamo, deflecting surfaces attached to said support and held in place by ropes or stays, and longitudinal and transverse warping apparatus whereby the position of the float in the stream may be readily varied up and down or across said stream.

7. A portable mechanism for utilizing the current force of flowing water for the generation of electricity, which consists of a current-wheel mounted upon a floating support, anchoring or attaching devices for said support, a dynamo-electric machine connected in any suitable manner with said current-wheel and driven thereby, a circuit fed by the dynamo, lights or other electrical translating devices in said circuit, and longitudinal and transverse warping apparatus whereby the position of the float in the stream may be readily varied up and down or across said stream.

8. A portable mechanism for utilizing the current force of flowing water for the generation of electricity, which consists of a current-wheel mounted upon a floating support, anchoring or attaching devices for said support, a dynamo-electric machine connected in any suitable manner with said current-wheel and driven thereby, a circuit fed by the dynamo, lights or other electrical translating devices in said circuit, and longitudinal and transverse warping apparatus consisting of rope short-

ening and lengthening devices located upon and operated from the float, whereby the position of the latter in the stream may be readily varied lengthwise and transversely of said stream.

9. A portable mechanism for utilizing the current force of flowing water for purposes of illumination, consisting of a current-wheel, a floating support therefor, anchoring or attaching devices for said support, a dynamo-electric machine operated by said current-wheel, an electric circuit containing lamps or other illuminating devices, and longitudinal and transverse warping apparatus, consisting of rope shortening and lengthening devices located upon and operated from the float, whereby the position of the float in the stream may be readily changed lengthwise and transversely of said stream.

10. A portable mechanism for the generation of electricity by means of the current force of navigable rivers and for simultaneously scouring the river-bed, which consists of a current-wheel mounted upon a floating support, a dynamo-electric machine connected with said wheel by motion-multiplying apparatus, circuit-connections for said dynamo, anchoring or attaching appliances whereby the floating support may be held stationary in the stream, and warping appliances for adjusting its position longitudinally, whereby the dynamo will be operated by the revolution of the wheel, and at the same time a channel will be scoured in the river-bed as the floating support is warped up stream.

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

ALBON MAN.

Witnesses:

F. F. RANDOLPH,  
M. H. PHELPS.