

No. 726,733.

PATENTED APR. 28, 1903.

P. J. NEVINS.
TIDE MOTOR.

APPLICATION FILED FEB. 19, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1

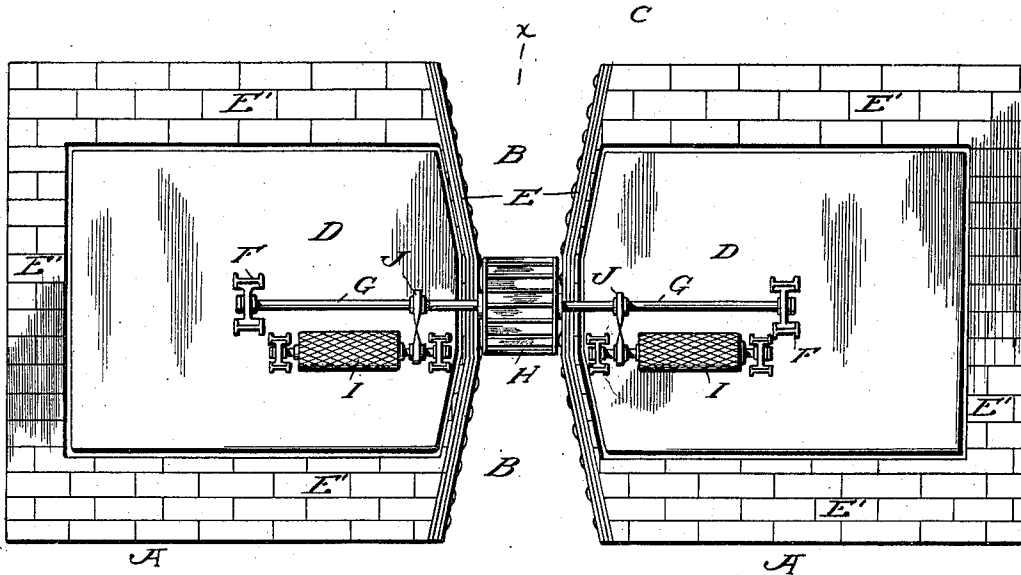
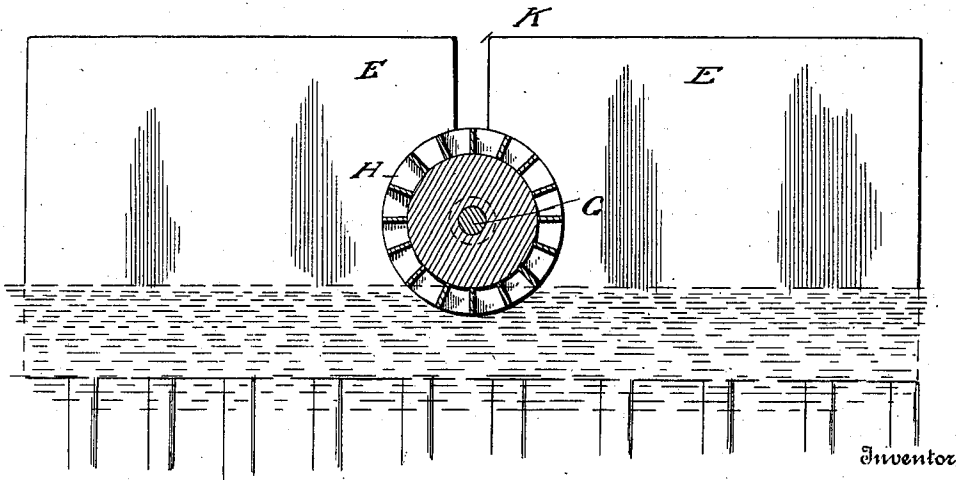


Fig. 2



Witnesses

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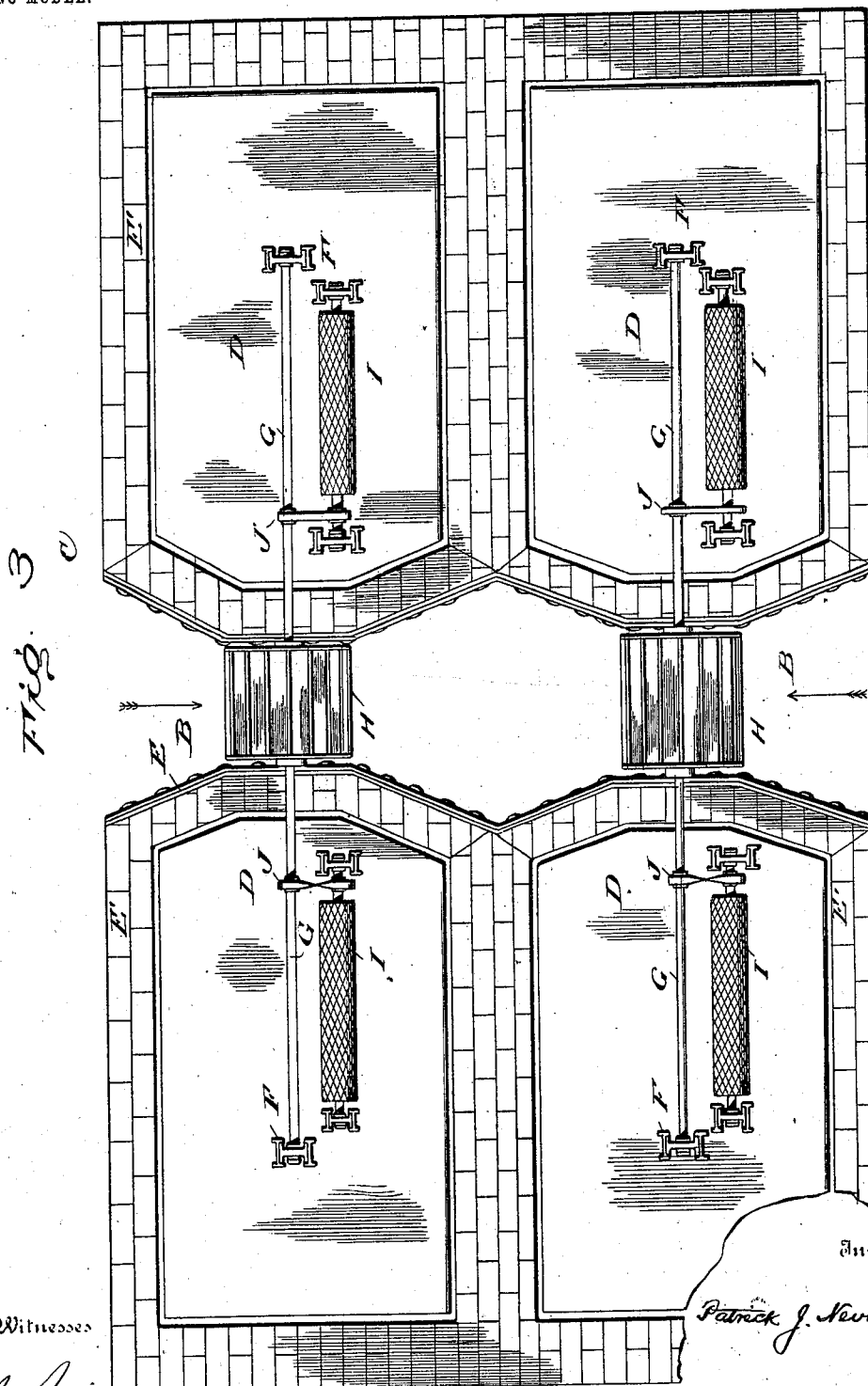
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Witnesses

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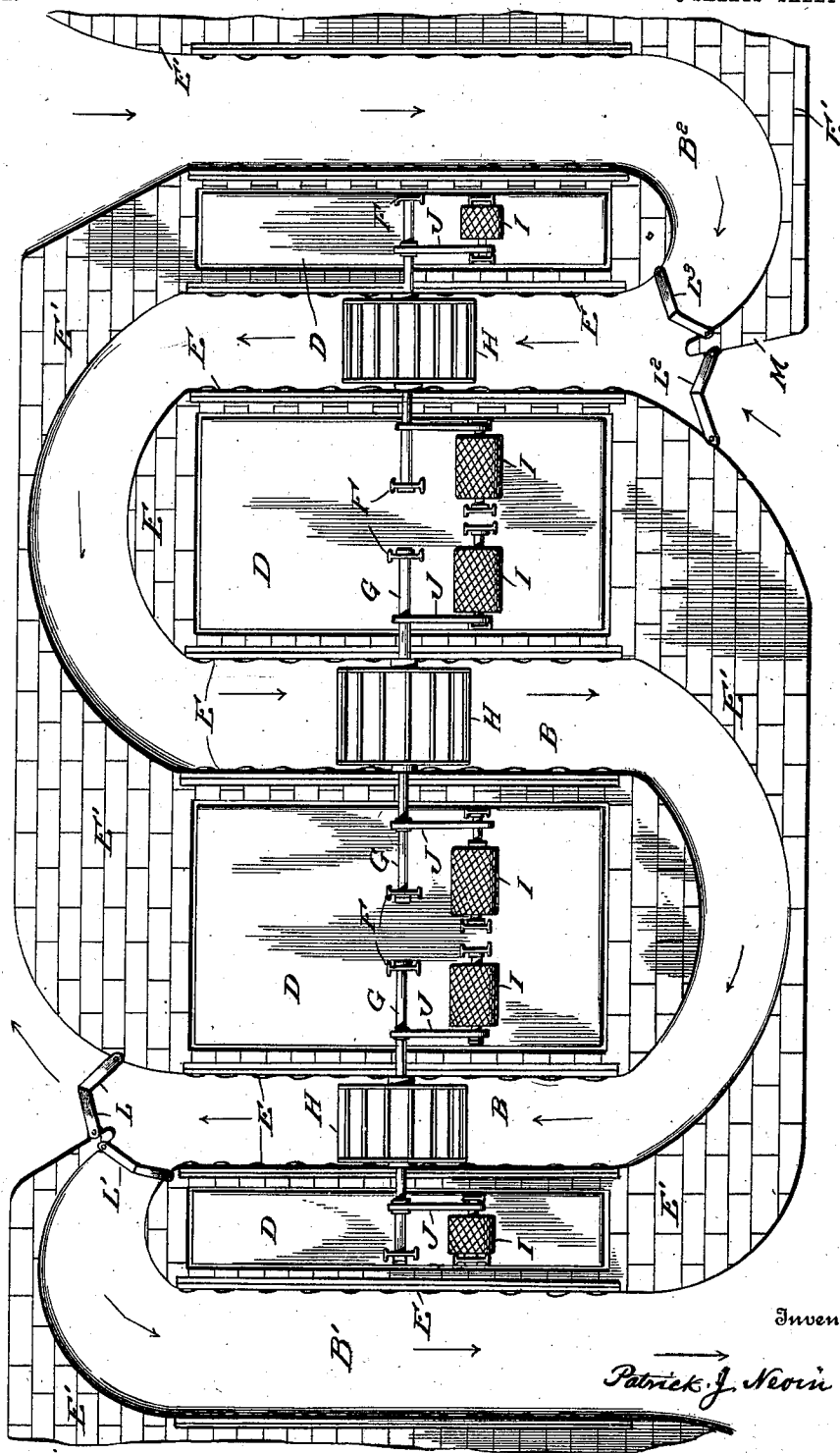
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3 SHEETS—SHEET 3.

Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

PATRICK J. NEVINS, OF HAVERHILL, MASSACHUSETTS.

TIDE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 726,733, dated April 28, 1903.

Application filed February 19, 1903. Serial No. 144,109. (No model.)

To all whom it may concern:

Be it known that I, PATRICK J. NEVINS, a citizen of the United States, residing at Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Tide-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 certain new and useful improvements in tide-powers, and has for its object to utilize the flow and ebb of the tide at such localities where it may be taken advantage of.

My invention is based upon the knowledge that the flow and ebb of the tide are irresistible and that it consequently contains power which, if properly utilized, may be advantageously employed.

My invention is particularly adapted to the generation of electricity, although it may be advantageously employed for other purposes; and it consists in the peculiar construction and arrangement of canals, gates, reservoir, locks, and power-transmitting mechanism hereinafter more fully described.

In order that those skilled in the art to which my invention appertains may fully understand the same and appreciate its advantages, I will proceed to describe my improvements, referring by letters to the accompanying drawings, in which—

Figure 1 represents a plan view of the generic principle of my invention as applied to a single power-transmitting wheel for conveying power to one or more dynamos. Fig. 2 is a central vertical section on the line *xx* of Fig. 1. Fig. 3 is a plan view showing a duplication of the mechanism illustrated at Fig. 1; and Fig. 4 is a similar view showing a multiplication of the mechanisms shown at Figs. 1 and 3, all adapted to be run in the same direction by both the flow and receding of the tide.

Similar letters of reference indicate like parts in the several figures of the drawings.

A represents the shore of any watercourse subject to ebb and flow of the tide.

B is a feeding-canal leading to an impounding-reservoir C.

Each side of the canal B are arranged floats or platforms D, which are surrounded by pil-

ing E and riprap construction E', the piling occurring each side of the canal B being adapted to allow the entrance of the water 55 underneath the floats or platforms D, the buoyancy or displacement of which is regulated so that the water-wheel, presently described, may be kept at any predetermined depth within the water flowing in and out 60 through the canal B.

Arranged upon the floats D are suitable supports F, carrying journal-boxes in which is mounted a shaft G, which, as shown, bridges the canal B. Upon this shaft G is mounted 65 an undershot or other suitable water-wheel H, designed to be rotated in one direction by the water of the incoming tide as it flows through the canal B to the reservoir C and in the opposite direction as the impounded water 70 in the reservoir flows outward through said canal. Also mounted upon the floats D are dynamos I, connected to the shaft G by twisted belts J, passing around suitable pulleys on the shaft G and the dynamo-shafts in an ob- 75 vious manner, so that by shifting or straightening the belts J the dynamos may be caused to run continuously in one direction. Mechanism other than the belts J may be employed for transmitting power from the shaft G to the 80 dynamos.

The upper part of the inclosures of the floats D on each side of the canal is provided with vertical slots K, as shown at Fig. 2, to provide for the vertical movement of the shaft 85 G as the floats or platforms D rise or fall as a result of the changes in the water-level resulting from the income or outgo of the water through the open piling E each side of the canal B. The caissons surrounding the floats 90 D constitute guides for sustaining the floats in proper relation during any vertical movement of said floats; but, if thought desirable, any suitable and auxiliary means may be employed for this purpose. 95

In Fig. 3 of the drawings I have illustrated a duplication of the construction shown at Fig. 1, and it is obvious that the construction may be multiplied to any extent, according to the distance between the inlet of the canal 100 B and the impounding-reservoir C.

At Fig. 4 I have shown a modified construction by means of which a series of water-wheels may be arranged in axial line and

driven in the same direction during the inflow and outflow of the water. In this construction the floats D are arranged within their cribs or surroundings in the same manner as
5 already described; but the canal B is of serpentine form, leading from the first or initial wheel H to and beyond the final one of the series and thence to the impounding-reservoir C and also outwardly to the tide-
10 water, as shown at B'.

The canal B at its juncture with the reservoir C is provided with outwardly-inclined lock-gates L and with similarly-inclined gates L' at the locality leading back to tide-water.

15 The canal B at its initial end leads in the reverse direction, as shown at B², to the reservoir C, and the two arms of the canal at this point are separated by a bulkhead M, the canal at this point being bridged by inwardly-inclined lock-gates L² L³.
20

In the construction and arrangement shown the course of the water on the incoming tide is shown by the arrows trending to the left, the inwardly-inclined gates L² being opened
25 by the pressure of the water, while the similarly-inclined gates L³ are closed. The water flows toward the left, as indicated, and causes the first wheel H in the series to turn toward the inlet, the second one in the opposite
30 direction, and the third in the same direction as the first. As the water reaches the outwardly-inclined gates L, between the canal and the reservoir C, it opens said gates and permits the water to pass to the reservoir,
35 while the equalizing pressure of the tide-water on the portion B' of the canal holds the gate L' in a closed condition.

When the tide changes, the pressure of the water impounded in the reservoir C closes
40 the gates L and opens the gates L³ at the bulkhead M, and, flowing through the gates L³, closes the gates L², so that the water from the reservoir seeking its level traverses the serpentine course of the canal D and causes
45 the series of water-wheels H to rotate in the same directions that they were rotated by the

incoming tide and upon reaching the outwardly-inclined gates L' opens the same and traverses the portion B' of the canal to tide-water.

From what has been said it will be understood that the generic principle of my invention involves the employment of a canal to confine and lead the water, a reservoir communicating with the canal, floats or platforms
55 arranged within caissons having one open side below the water-level, and a water-wheel within the canal secured to a shaft mounted upon the floats, said shaft connected in any suitable manner with any mechanism to be
60 driven.

What I claim as new, and desire to secure by Letters Patent, is—

1. A tide-power embracing the combination of a reservoir, a canal leading therefrom and
65 to tide-water, floats or platforms each side of the canal, a water-wheel within the canal and supported upon a shaft mounted upon the floats or platforms, and means for transmitting power from said shaft to any suitable
70 mechanism to be driven, substantially as hereinbefore set forth.

2. A tide-power embracing the combination of a reservoir, a serpentine canal connecting the reservoir with tide-water, a series of axi-
75 ally-arranged water-wheels located within the parallel arms of the canal and supported upon shafts mounted upon floats located within caissons, automatically-operated lock-gates within the canal for causing the inflow and
80 outflow of the water to traverse the canal in the same direction, and suitable means for transmitting power from the water-wheel shafts to any desired locality or mechanism,
85 as hereinbefore set forth.

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

PATRICK J. NEVINS.

Witnesses:

EDWARD M. DALEY,
PATRICK J. ANDERSON.