

Jan. 13, 1925.

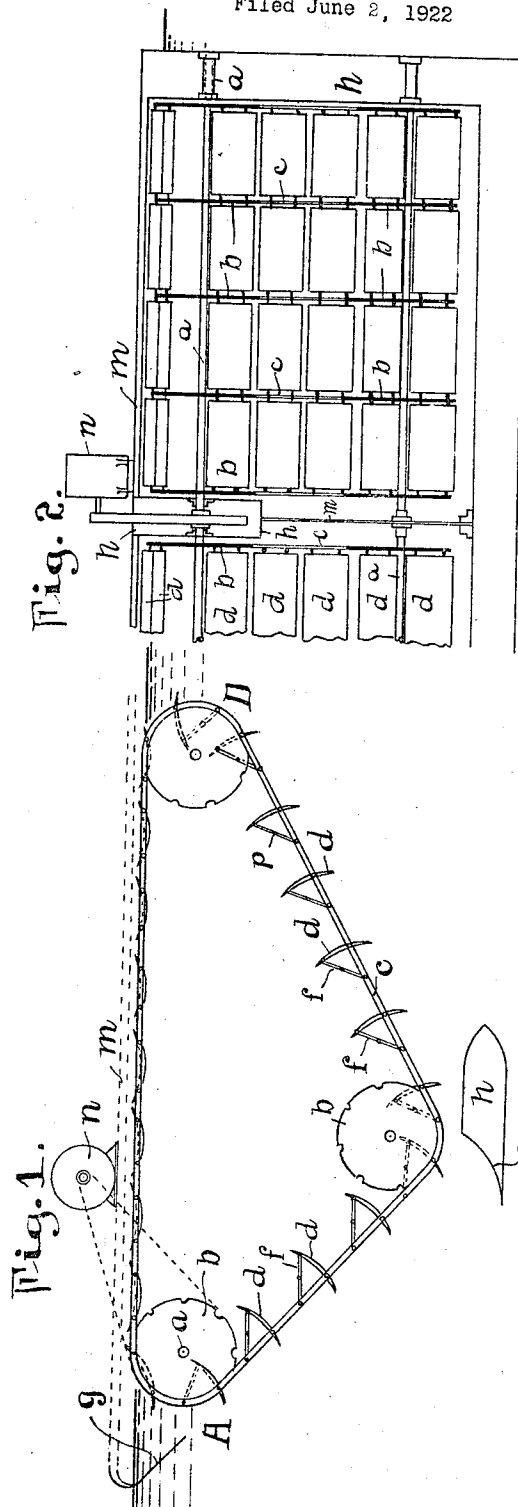
V. HOMOLA

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STREAM OR CURRENT MOTOR

Filed June 2, 1922

2 Sheets-Sheet 1



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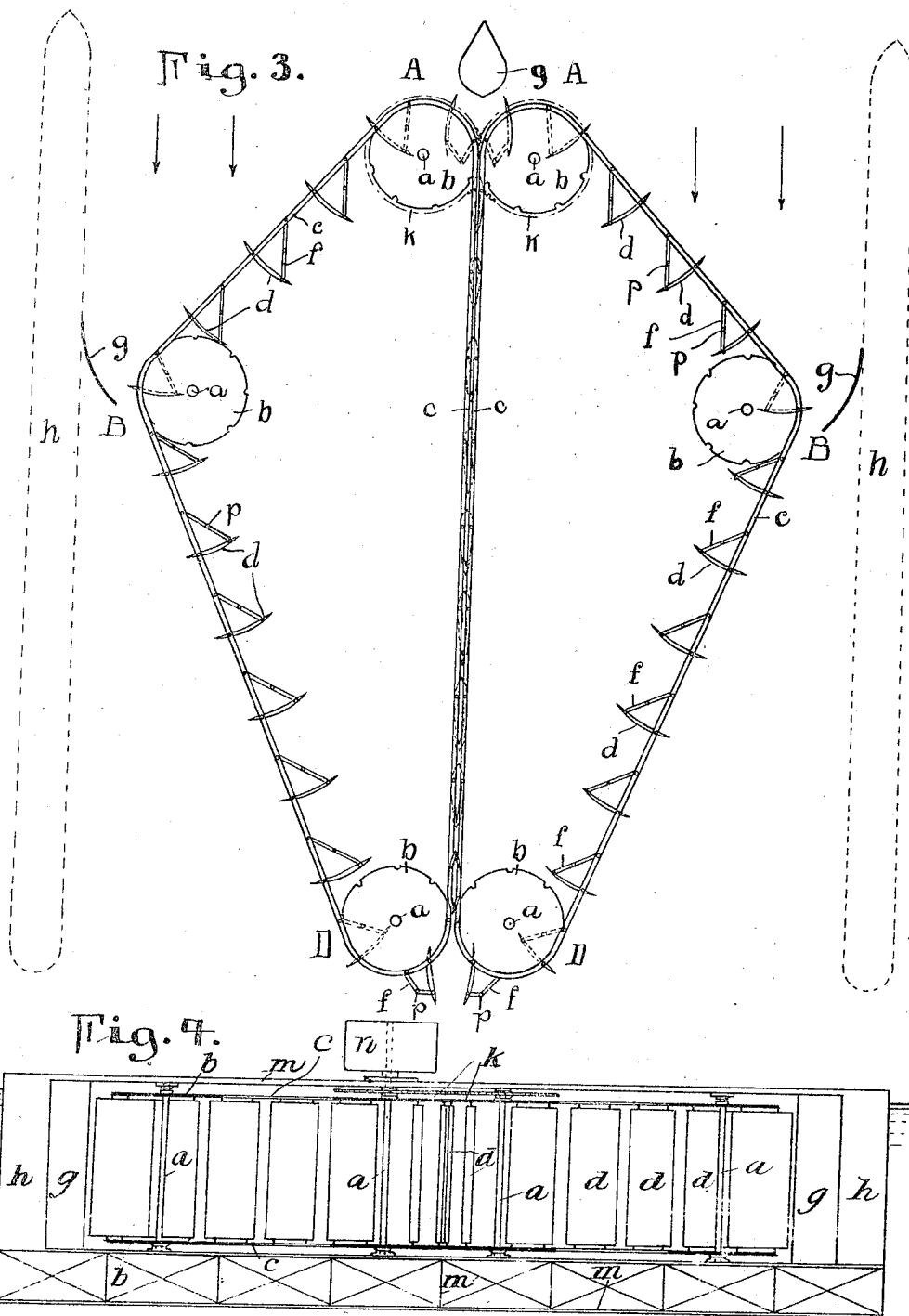
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UNITED STATES PATENT OFFICE.

VICTOR HOMOLA, OF BUDAPEST, HUNGARY.

STREAM OR CURRENT MOTOR.

Application filed June 2, 1922. Serial No. 565,325.

To all whom it may concern:

Be it known that I, VICTOR HOMOLA, engineer, a citizen of the Hungarian State, residing at Budapest, Hungary; I. Budafok-ut 81, have invented certain new and useful Improvements in Stream or Current Motors, of which the following is a specification.

This invention relates to a new chain-stream-motor, by which the greatest possible active water cross-section may be utilized with the least possible waste of energy.

In the drawing, two examples of the construction of the subject of this invention are schematically illustrated.

Fig. 1 shows an arrangement with horizontal shafts, in which the rows of vanes are fixed on chains or on something similar, so that during the motion of the vanes the chains remain in vertical planes lying in the direction of the stream.

Fig. 2 is a fragmentary cross-sectional view of the arrangement shown in Fig. 1. Fig. 3 is a top plane view of a slightly modified form of the arrangement embodying the vertical shaft, and

Fig. 4 is a transverse sectional view of the arrangement shown in Fig. 3.

On the shafts "a," arranged parallel to each other and transverse to the direction of the current are mounted the sprocket-wheels "b," around which run the endless chains. To the chains there is attached a system of vanes. The rows of vanes running closely parallel to each other can be of any desired number. For example in Fig. 2 there are shown in cross-section 4 rows of vanes.

In this invention the rows of vanes move along the sides of a triangle the apices of which are rounded and during the motion one side remains parallel with the direction of the stream, while the other two intersect it at an acute angle. The side of the triangle lying parallel with the direction of the current is that part of the system of vanes along which no energy is obtained, the vanes here being dragged upstream, during which motion they are turned down into a position of smallest resistance. The two other sides of the triangle, with the rounded transition parts, are the working part of the system of vanes. By arranging the working sections slanting to the direction of the current several advantages are obtained: 1. the cross-section of water utilized is increased as the vanes do not move in

the "current-shade" of each other; 2. the energy of the water entering in its original current direction is utilized in two sections (sections "A—B" and "B—D") similar to a water turbine with double flow; 3. above all, by suitably choosing the angles which the two linear sections of the working part make with the direction of the stream, it is rendered possible for the resultant of the forces transmitted without shock to the vanes on the two sections of the working part, to act parallel to the direction of the chains, whereby the highest efficiency is secured.

Hence it is obviously most advantageous to choose the hypotenuse for that part to which no energy is transferred and the two other sides for the working part, as in the examples of construction described above. Energy is transmitted to the vanes on the sections "A—B" and "B—D" and thence transferred to the shafts by means of the chains.

Every vane is provided with a prop or band "f," which, however, serves only to support the vanes against the pressure acting on its front surface. At the place "D" the chains wind about the guiding rollers so that the vanes under the pressure of the water acting behind during their passage around the rollers are turned down. Along the working parts, the vanes secured eccentrically by bolts are to the greatest extent of their surface within the interior of the above-mentioned triangle; after being turned down, they automatically assume the position of smallest resistance, being in the meantime dragged in an upstream direction, along the non-working part "A—D."

The turning down of the vanes is shown in the drawing at the places "D." The vanes are readjusted into the working-position, also automatically, when turning around "A."

In order to secure a high efficiency, the vanes must receive the kinetic energy of the water entering in its original current direction so that the resultant of the forces exerted on the vanes lies in the direction of the chain, moreover, the flow through both sections, "A—B" and "B—D," must be smooth and without jerk and such that to the first-operated working section "A—B" purposely only so much energy is transferred that the remaining energy operates the second working section "B—D" with the

same velocity as was transmitted to portion "A—B." All these conditions are easily fulfilled in the present new invention as the path and form of the vanes as well as the angle of support are three variables that can always be chosen to conform with the above conditions.

Through the change of direction around the point "B" there can easily be produced an eddy of water and from this arises the danger that the vanes, when passing there, may be prematurely turned down. To prevent this, guide-vanes "g" may be employed which render impossible the eddy-effect by filling the water-free spaces arising around the point "B" with a suitable quantity of water introduced from outside. By this means the cross-section utilized will also be increased.

In the same way there may—in the spirit of the invention—be employed guide-vanes in the neighborhood of the point "A," in order to facilitate the smooth and jerkless adjustment of the vanes into the working position and to increase the efficiency of the motor by the fact that those particles of water which would otherwise come into contact with vanes in a non-working position are thus deflected to the working vanes.

For the same purpose, that is for steering the turning-down of the vanes, similar guide-vanes may be employed in the interior of the triangle "A B D" at the point "D."

In the arrangement shown in Figs. 1 and 2 each of the rows of vanes may have a chain of its own, or two adjacent rows may have one common chain. By using several series of vanes, water cross-sections of any dimensions may be utilized. Here the chain-wheels (sprockets) may be connected with their shafts in a way that permits disengagement, so that the single rows of vanes may be switched in or out independently of each other.

In another form of the invention the following arrangement is made: The rows of vanes move in the horizontal as shown in Fig. 3, so that every pair of the system of vanes possess parallel non-working parts (hypotenuses), which arrangement from the practical point of view presents many advantages. By this means, above all, quite small depths of water may be utilized, even in the case of large breadths, so that the motor, if fastened to an anchor on a foremost point of its axis of symmetry and placed on a floating body, always lies automatically in the best working position, i. e. in the direction of the current.

Moreover, in this arrangement the resistance of the vanes which are dragged in the upstream direction can be diminished by covering the vanes in this section, if necessary. Here the adjacent pairs of sprocket-wheels at "A" and "D" are in gear. The

power may be taken from one shaft of the motor or from several at the same time. This form of arrangement, too, permits the application of several rows of vanes in every triangle, parallel to each other, each of which, can be switched off separately.

The supporting device of the vanes may be constructed in various manners. A simple example of construction is shown schematically in Figs. 1 and 3, where the support between paddle and chain consists of two links *f* connected to each other by means of a pin-joint *p*.

Instead of using these brackets, it is also suitable to simply bind the vanes by means of small chains or something similar.

In each arrangement the motor is set out of operation by switching off the supporting devices, whereby all paddles, like the non-working ones, are set in the direction of the current.

The whole of the stream-motor is built within the interior of a floating body, the walls of which serve, at the same time, as bearings of the shafts. Fig. 2 shows an example of a form of arrangement in cross-section. "h" are the parts of the floating body, connected with each other by means of a frame-work, "m."

This frame-work supports, at the same time, all those structural parts which serve for the increase of the strength, for the covering etc. and it also supports the guide-vanes. All parts of the motor being thus united in one structure, it may easily be set at anchor, dragged away, sunk or raised.

What is claimed as a new invention and desired to secure by Letters Patent, is—

1. A water motor including a pair of frames each composed of rotatable shafts positioned in triangular arrangement, sprocket wheels mounted adjacent the respective ends of the shafts, chains operating about the sprocket wheels and vanes operatively mounted on the chains, the frames being arranged in juxtaposed relation and the chains thereof each having one side positioned parallel with the current and along which the vanes pass when in an inactive position and the remaining portions of the chains being arranged so that the vanes will be traversed by the same part of the current and guide vanes arranged adjacent the turning points of the paths of the vanes.

2. A motor as claimed in claim 1 wherein the vanes are supported by the pin joints of the chains, the pin joints serving as axes of rotation for the vanes.

3. A water motor including a frame composed of three rotatable shafts positioned in triangular arrangement, sprocket wheels mounted adjacent the respective ends of the shaft, chains operating about the sprocket wheels, a plurality of vanes rotatably supported on the pin joints of the

chains in such a manner that the greater part of the active surfaces of the vanes lies within the interior of the triangle and sectional links connecting the said inner portions of the vanes with the chains, substantially as and for the purposes set forth.

4. A water motor including a pair of frames each composed of three rotatable shafts positioned in triangular arrangement, sprocket wheels carried by the shaft adjacent the respective ends thereof, chains operating about the sprocket wheels and also arranged in triangular formation, a plurality of vanes each of which are mounted in suitable spaced relation on opposed pin joints of the chains so that the greater part of the active surface of the vanes lies within the interior of the triangle, sectional links

connecting said inner portions of the vanes with the chains, the frames being arranged in juxtaposed relation and the chains thereof each having one side positioned parallel with the current for the passage of the vanes when in an inactive position and the remaining portions being arranged so that the vanes will be traversed by the same part of the current and guide vanes arranged adjacent the turning points of the path of the vanes.

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

VICTOR HOMOLA.

Witnesses:

CH. FORMAGYI,
O. TOLUAI.