

No. 706,150.

Patented Aug. 5, 1902.

T. S. BARWIS.
WATER WHEEL.

(Application filed Oct. 21, 1901.)

(No Model.)

Fig 1

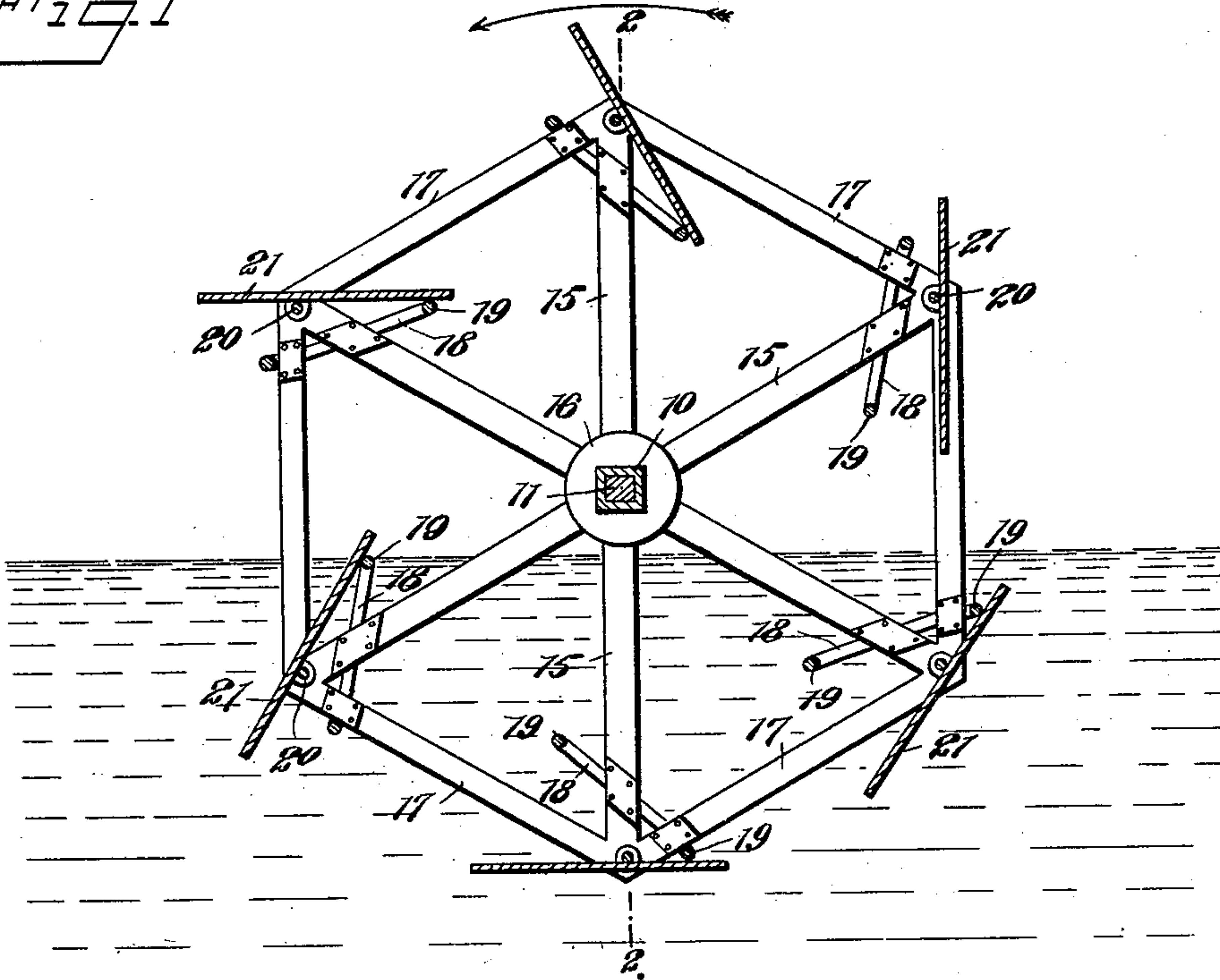
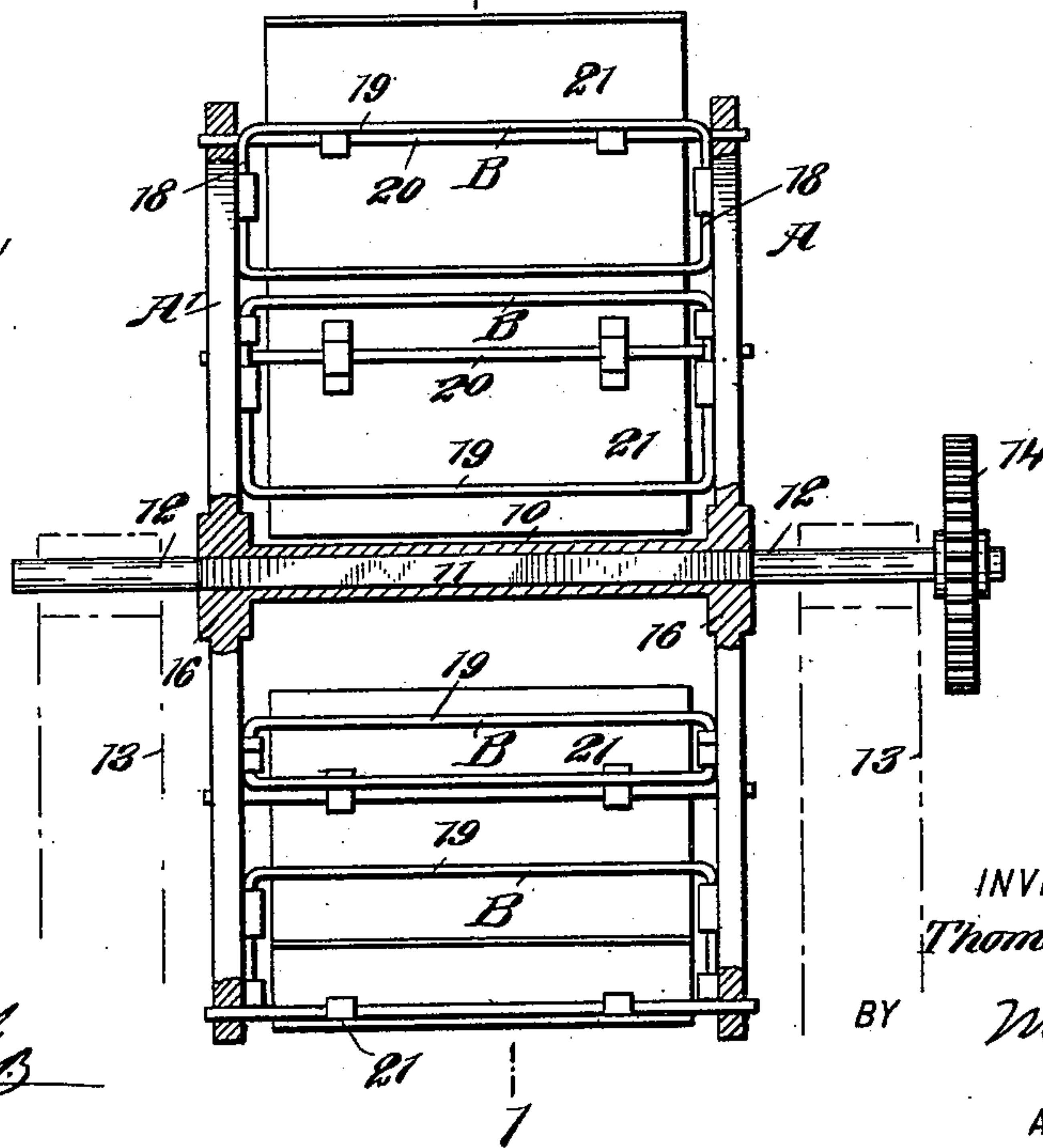


Fig 2



WITNESSES:

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UNITED STATES PATENT OFFICE.

THOMAS SHEPPARD BARWIS, OF VANCOUVER, CANADA.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 706,150, dated August 5, 1902.

Application filed October 21, 1901. Serial No. 79,399. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SHEPPARD BARWIS, a subject of the King of Great Britain, and a resident of Vancouver, in the Province of British Columbia and Dominion of Canada, have invented a new and Improved Water-Wheel, of which the following is a full, clear, and exact description.

The purpose of this invention is to provide a simple construction of water-wheel provided with wings so mounted that they automatically feather and otherwise adjust themselves to the element and offer the least possible resistance when in line with ebbing or discharge water.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both figures.

Figure 1 is a vertical section through the water or current wheel, the section being taken practically on the line 11 of Fig. 2; and Fig. 2 is a section taken at right angles to the section shown in Fig. 1 and substantially on the line 22 of said figure.

The wheel consists of two heads A and A', connected by a sleeve 10, preferably polygonal in cross-section, and this sleeve receives the polygonal portion of the shaft 11, the ends 12 of which shaft are circular in cross-section and are adapted to be journaled in suitable bearings 13. At one end of the shaft 11 a gear-wheel 14 is secured, or a pulley-wheel may be substituted for the gear, as the power is to be transmitted from said wheel. The heads A and A' are shown as hexagonal, although they may be of any desired form, and under the construction shown each head consists of a series of radiating arms 15, connected with a suitable hub 16, attached to the sleeve 10, and peripheral bars 17, which are either made integral with or are attached to the end portions of the arms 15.

Guide-frames B are employed in connection with the two heads A and A'. These guide-frames are located at the peripheral portion of the wheel, one at each arm 15, and these frames B are at an angle to the arms

15 and likewise at an angle to the peripheral bars 17, which they cross. The guide-frames B consist of end sections 18, which are attached rigidly in any approved manner to the arm 15 and the adjacent peripheral bar 17 and longitudinal members 19, one longitudinal member extending across the wheel at the top and adjacent to the peripheral bar 17, to which the guide-frame is attached, and the opposing longitudinal member 19 extends from side to side of the wheel at a point adjacent to the longitudinal edge of the arm 15, to which the guide-frame is secured, which edge is opposite that facing the point of attachment of the frame to the peripheral bars 17, employed as the other supports for the frame. The outer longitudinal members 19 are quite close to the peripheral surface of the wheel, while the inner members 19 are much farther removed from the supporting-arms 15 of the frame, and, as heretofore stated, the guide-frames B are at an angle to their supports, so as to extend diagonally across the arms, and thereby bring the longitudinal members of each frame on opposite sides of the pivot of one paddle, one longitudinal stop member of each frame being located closer to the pivot of the paddle than the other member of the same frame.

At the outer end of each arm 15 of each head A and A' the trunnions 20 of a wing or plate 21 are pivoted. These plates or wings 21 are limited in their movement by engagement with the longitudinal members of the guide-frames B, and the plates or wings 21, as shown in Fig. 1, may assume a perpendicular position, a horizontal, or a diagonal position, according to the position in which the plates are brought by the action of the water. The arrow in Fig. 1 indicates the direction in which the water-wheel is adapted to turn. Preferably the trunnions of the wings 21 are nearer their outer than their inner edges. This construction of water-wheel is exceedingly simple, durable, economic, and effective, and said wheel may be adapted either as a tide-water wheel, a current-wheel, or may be used in a flume, as required.

The stop-frame which is associated with each paddle has its members located at different distances from the pivot of the paddle and on opposite sides of a line drawn through

the paddle-pivot and perpendicular to a line connecting the two members of the said frame. Assuming that the wheel rotates in the direction indicated by the arrow in Fig. 1, each paddle as it is carried downward toward and into the water assumes the lower left-hand position of the paddle, which is shown in contact with that stop or member of the frame which lies farthest from the paddle-pivot, the farther stop in this instance holding the paddle in one of its operative positions. As the wheel continues to turn, the paddle as it approaches the lowermost position is free to feather, thus allowing the paddle to drop away from the farther stop and to engage with the near stop or that member of the frame which is closest to the paddle-pivot. With the paddle in its lowermost position the current has no influence on the paddle, because it lies in the plane of the path of the current; but as the paddle is carried up on the ascending side of the wheel said paddle remains in engagement with the near stop, and is thereby held in another operative position by said near stop, as will be clearly understood by reference to Fig. 1. From this explanation it appears that each paddle when passing below the horizontal plane of the axis of the wheel is held in two operative positions by the farther and near stops, and between these operative positions the paddle is free to feather and to assume a neutral position at the lowermost point of the rotation of the wheel.

35 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A power-wheel comprising a skeleton

frame, paddles independently hung on said frame, and a pair of stops for each paddle 40 and carried by the frame, said stops being located on opposite sides of a line passing through the pivot of the paddle and perpendicular to a line connecting the two stops; each stop of the pair being disposed in the path of 45 the paddle, and one stop of each pair being located closer to the pivot of the paddle than the other stop of said pair, whereby the stops act alternately to hold one paddle in two operative positions, when below the axis of motion of the wheel, and said paddle is free to lie in the plane of movement of the fluid at the lowest point to which it may be carried on the rotation of the wheel.

2. A power-wheel comprising a skeleton 55 frame having radial arms, paddles hung eccentrically on said arms, and stop-frames extending diagonally across the arms, and each frame having a member extending between said arms, said members of each frame being 60 disposed in the path of the unequal portions of one paddle and on opposite sides of a line passing through the pivot thereof, and perpendicular to a line connecting the two frame members, one member of each stop-frame being located closer to the pivot of said paddle 65 than the other member of said frame, as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of 70 two subscribing witnesses.

THOMAS SHEPPARD BARWIS.

Witnesses:

J. W. LANGLEY,
JAMES LEDDY.