N. V. JOHNSON.

WATER MOTOR.

APPLICATION FILED AUG. 17, 1911.

1,024,341.

Patented Apr. 23, 1912.

2 SHEETS—SHEET 1.

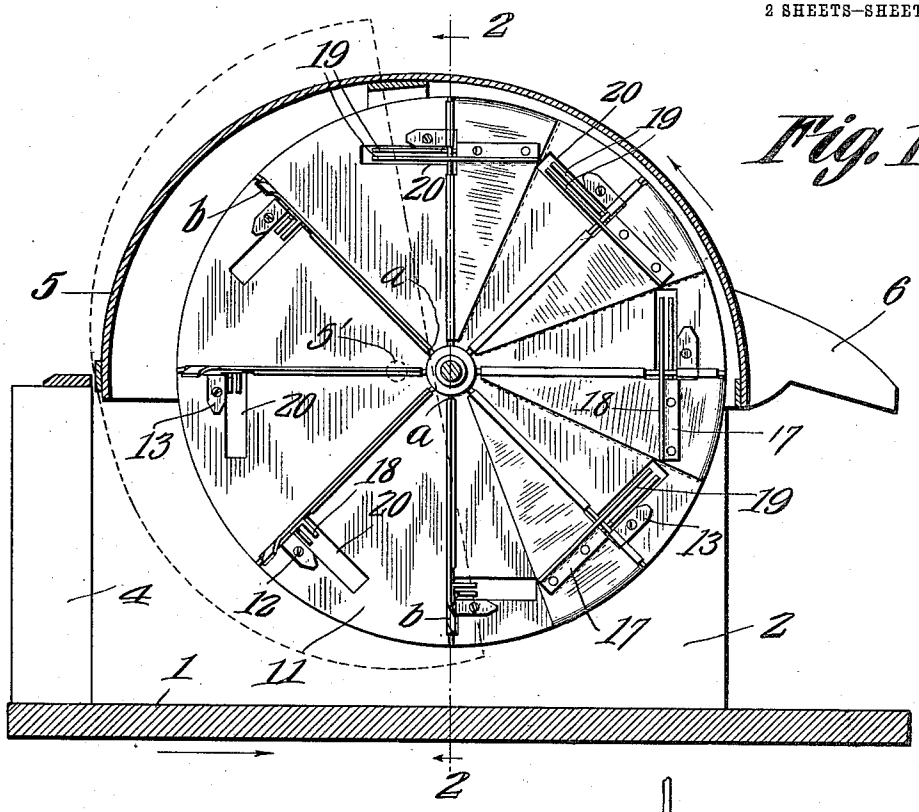

Fig. 1.

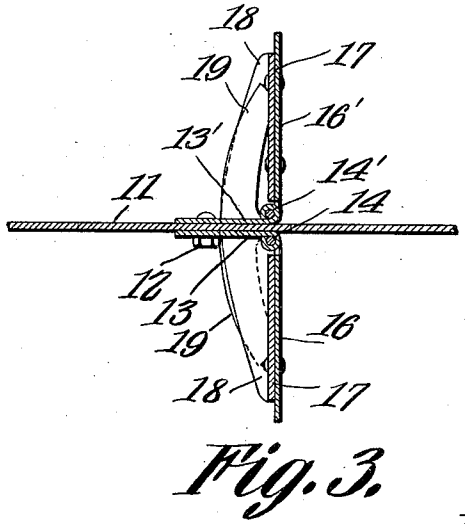

Fig. 3.

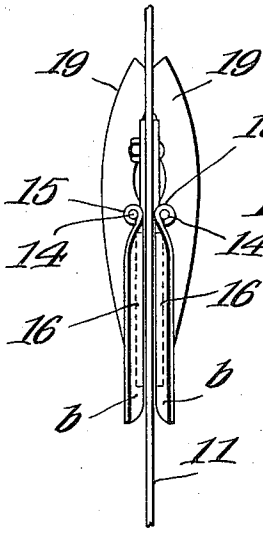

Fig. 4.

Witnesses

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2 SHEETS—SHEET 2.

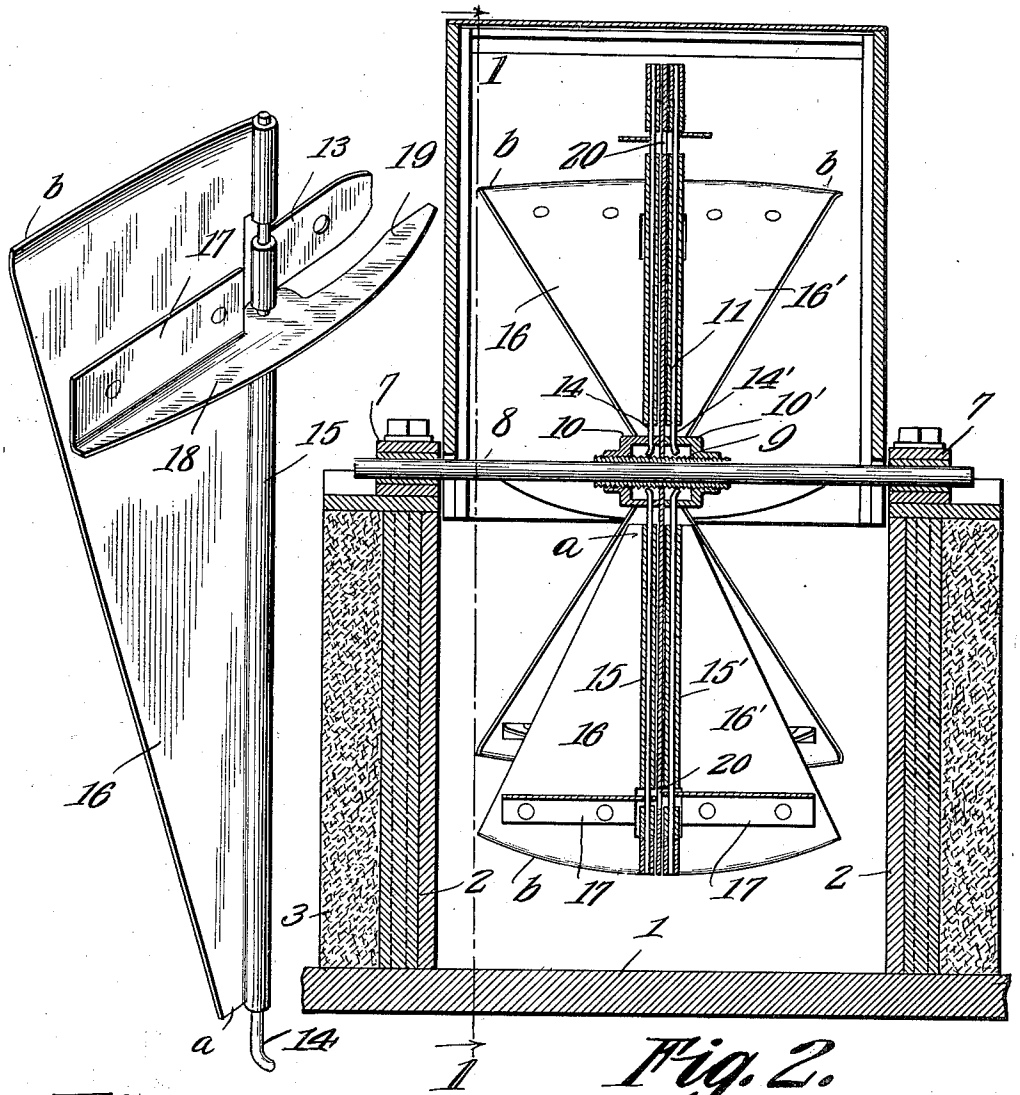

Fig. 5.

Fig. 2.

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UNITED STATES PATENT OFFICE.

NIEL VICTOR JOHNSON, OF TACOMA, WASHINGTON.

WATER-MOTOR.

1,024,341. Specification of Letters Patent. Patented Apr. 23, 1912.

Application filed August 17, 1911. Serial No. 644,642.

To all whom it may concern:

Be it known that I, NIEL V. JOHNSON, a citizen of the United States, residing at Tacoma, in the county of King and State of Washington, have invented a new and useful Water-Motor, of which the following is a specification.

The present invention relates to improvements in water motors, and the primary object of the invention is the provision of a current or impact wheel known as the vertical type, the said wheel being provided with a circular disk supporting member connected and rotatable with a shaft, said disk having disposed in co-active and radially disposed pairs a plurality of blades or paddles, adapted to be opened upon their approach to the current of flowing water and to be automatically closed by gravity after leaving the water, each pair of wings being provided with means for locking the same in extended position when in power receiving contact with the water.

A further object of this invention is the provision of a water motor wheel of the vertical type, provided with a sectional hub secured and rotatable with a shaft, said hub carrying a circular disk, having connected thereto in radial pairs a plurality of co-acting closing and opening paddles or wings, the same being so constructed as to receive the greatest impact at their outer ends while being held extended by the impact with the water and limited in such extension by a co-active device carried by the respective pairs of wings or paddles.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a horizontal sectional view taken on the line 1—1 of Fig. 2. Fig. 2 is a cross section taken on line 2—2 of Fig. 1. Fig. 3 is an enlarged detail sectional view through the supporting disk of the wheel showing two of the paddles or blades in extended and locked position. Fig. 4 is a top plan view looking at the edges of the supporting disk with a pair of the wings in collapsed position. Fig. 5 is an enlarged detail perspective view of one of the wings or paddles removed from the wheel.

The present form of wheel is adapted to be mounted in a sluice-way and have the current conveyed thereto in a confined state, and consists primarily of a base 1 having upstanding therefrom the walls 2 of the sluice-way, said walls being reinforced by means of slabs of concrete 3 with the outwardly extending sluice-way guides 4, said walls 2 having pivotally connected near the upper ends thereof the semi-circular in elevation hood or dome 5, the same being adapted to be normally in the position as shown in full lines in Fig. 1 and when it is desired to have access to the wheel or cut the flow of water therefrom, the same is operated by the handle 6 to assume the position as shown in dotted lines in Fig. 1. By this means it will be seen that the semi-circular hood acts as a cut-off valve to prevent the water from actuating the wheel and permits access to the said wheel for repairs or otherwise.

Journaled for rotation in the bearings 7 is a horizontally disposed shaft 8, which has connected centrally thereof and rotatable therewith a threaded sleeve 9, to which is connected the two sections 10 and 10′ forming a clamping hub for supporting the circular disk 11 of the water wheel.

Connected by means of bolts 12 upon opposite sides of the disk or wheel 11 at points equi-distantly apart and near the outer edge thereof are the hinge plates 13 and 13′, for the reception of the outer ends of the hinge pins or rods 14 and 14′, whose inner ends are connected for rotation to the hub sections 10 and 10′ respectively, the sleeves 15 and 15′ of the respective blades or paddles 16 and 16′, which as shown are arranged in pairs, have their sleeves 15 disposed radially upon opposite sides of the disk 11. Each of the said blades as clearly shown in Fig. 5 is provided with the slightly outwardly curved ends as at *b*, near or adjacent to the periphery of the disk 11, the said blades being substantially V-shaped in elevation and provided with the short inner ends as at *a* adjacent the hub of the wheel. Upon the hinge side of the blades are connected the plates 17 provided with the flanges 18 formed at right angles, to said

blades, said flanges 18 being provided with the prongs, fingers or arms 19, which when the blades are assembled in pairs, are disposed in pairs one above the other in cross fashion, through the opening 20 formed in the body of the disk 11 to assume the positions as shown in Fig. 3, the blades there being shown in water receiving position, or in the position as shown in Fig. 4 where the blades are in collapsed position .

From the foregoing description it will be seen that when the water flow is in the direction as shown by the arrow in Fig. 1, this wheel being known as what is termed as an under-shot wheel, the same will actuate the disk 11 by striking the blades upon the opposite side to that shown in Fig. 2, or upon the plane side thereof.

By reference to Fig. 1 it will be seen that the blades will begin opening by gravity after leaving the dead center line above, and when in a position approximately 45° therefrom, and that they will remain open until released by the pressure of water in the sluice-way, and be permitted to close after leaving the perpendicular, below, or approximately at an angle of 45° therefrom.

By forming the blades as clearly shown in Fig. 5, it is noted that the greatest impact of the water thereagainst is at the long end of the lever or the wide part of the blades, and that by extending the outer ends as at *b*, that the blades are assisted in being opened to their final position, and also provide a means for entering the body of water with the least amount of skin friction.

What is claimed is:

1. A water wheel comprising a shaft, a sectional hub mounted thereon and providing a concentric cavity thereabout, a circular disk clamped between the sections of the hub to the shaft, a series of rods having their lower ends connected to the sections of the hub and extending radially out upon opposite sides of the disk, the said rods being arranged in radial pairs, a paddle swingingly connected to each rod and radially of the disk, and means for limiting the extension of the respective paddles.

2. A water wheel comprising a shaft, a sectional hub mounted thereon and providing a concentric cavity thereabout, a circular disk clamped between the sections of the hub to the shaft, a series of rods having their lower ends connected to the sections of the hub and extending radially out upon opposite sides of the disk, the said rods being arranged in radial pairs, a paddle swingingly connected to each rod and radially of the disk, said disk being provided with elongated apertures through the body thereof, and an arm carried by each of said paddles and adapted to project through the opening of the disk and lock the paddles in extended position.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

NIEL VICTOR JOHNSON.

Witnesses:

E. R. JONES,

WALLACE J. HILL.