

No. 893,790.

PATENTED JULY 21, 1908.

R. A. FONTAINE.
WATER WHEEL.

APPLICATION FILED NOV. 28, 1907.

Fig. 1.

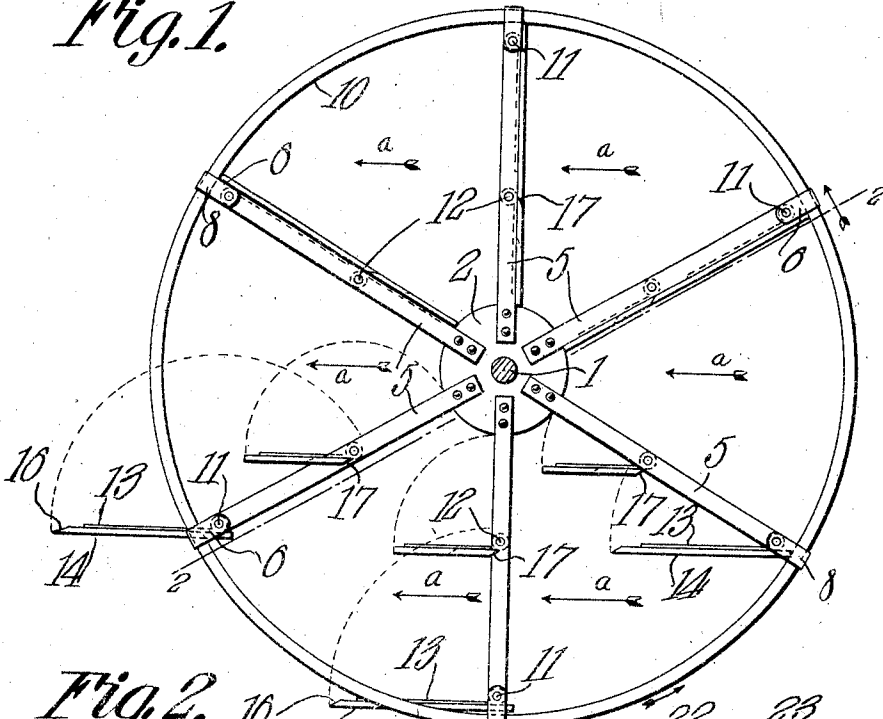
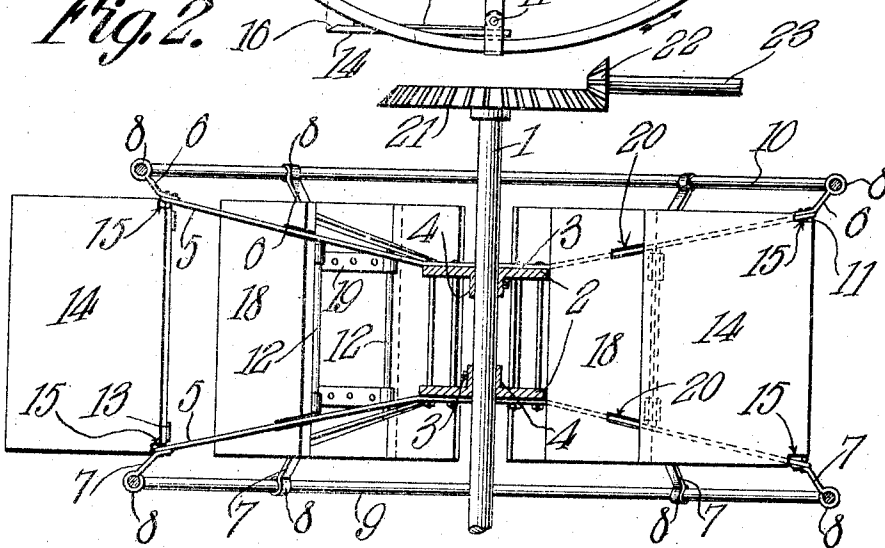


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT A. FONTAINE, OF FONTAINE, VIRGINIA.

WATER-WHEEL.

No. 893,790.

Specification of Letters Patent.

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Application filed November 26, 1907. Serial No. 403,887.

To all whom it may concern:

Be it known that I, ROBERT A. FONTAINE, a citizen of the United States, residing at Fontaine, in the county of Henry and State of Virginia, have invented a new and useful Water-Wheel, of which the following is a specification.

This invention relates to water wheels of that type designed to be completely submerged and the object of the invention is to provide a wheel of this character having wings or blades which are mounted in a novel manner and designed to be positively held along planes radiating from the center of the wheel while moving in the direction of the current and to automatically shift out of operative position while moving against the current so as to afford no resistance to the current at one side of the wheel.

Another object is to provide a wheel frame of novel form, the parts being so constructed and arranged as to positively hold the wings or blades, so that there is no danger of the same becoming broken or forced out of operative position by the current moving thereagainst.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a plan view of a wheel embodying the present improvements. Fig. 2 is a section on line $x-x$, Fig. 1 and showing the gears connected thereto for transmitting power therefrom.

Referring to the figures by characters of reference, 1 designates a shaft having hub sections in the form of superposed disks 2 fastened thereto in any suitable manner as by means of set screws 3 extending through sleeves 4 which surround the shaft and extend from the adjoining faces of the disks. Radiating from the two disks are arms 5, the upper arms being inclined upwardly toward their outer ends while the lower arms are inclined downwardly toward their outer ends and disposed directly below the upper arms. Brackets 6 extend upwardly from the outer ends of the upper arms and similar brackets 7 extend downwardly from the outer ends of the lower arms. These lower brackets 7 have eyes 8 through which extends a ring 9 constituting means for holding

the lower arms spaced apart at the proper intervals. Brackets 6 also have eyes 8 engaging a ring 10 similar to the ring 9 and for the same purpose.

As heretofore stated the upper arms 5 are located directly above the lower arms, thus forming pairs, the outer ends of the arms of each pair being connected by a rod 11. Said arms are also connected at an intermediate point by another rod 12. Pivotaly mounted upon each outer rod 11 are hinge straps 13 located close to the upper and lower arms respectively and secured in any preferred manner to one face of a wing or blade 14 which is substantially rectangular in outline and is designed to bear against the arms 5. Those corners of the blade adjoining the rod 11 are preferably cut away as indicated at 15 so as to permit the blade to swing freely upon the rod and to assume a position at an angle thereto, in which event that portion of the blade extending past the rod will assume a position between the arms 5 as clearly indicated in the lower portion of Fig. 1. That edge of the blade or wing farthest removed from the rod 11 is preferably beveled as indicated at 16 and is designed to lap the similarly beveled edge 17 of the adjoining inner blade or wing 18. This blade or wing has hinge straps 19 extending across one face thereof and pivotaly mounted on one of the inner rods 12. In order that the inner blades may be free to swing between the arms 5 as is necessary at certain points during the rotation of the wheel, slots or grooves 20 are preferably formed within the wings 18 as indicated in Fig. 2. The two wings 14 and 18 are preferably of the same height and are designed when bearing against the arms 5 to completely close the space therebetween.

In order that power may be transmitted from the wheel to any machinery, which it may be desired to operate, a large master gear 21 is preferably secured to the upper portion of shaft 1 and meshes with a small gear 22 secured to a shaft 23 which may be mounted in any preferred manner.

The wheel as heretofore stated is designed to be completely submerged and the upstream side thereof may, if preferred, be suitably housed or extended into the bank of the stream. This, however, is not necessary as the wheel will work equally as well whether or not the open portion thereof is housed. If the current is flowing in the direction indicated by arrows a in Fig. 1 the blades or

wings 14 and 18 upon passing that portion of the current moving against the axis of the wheel, will be forced by the current against the radial arms 5 so that the beveled portions 5 16 of all of the blades upon one side of the wheel will lap the correspondingly beveled portions of the inner blades 18, thus presenting a perfectly smooth surface to the water. After the blades have traveled approximately 10 one-hundred-eighty degrees the current will be directed against the opposite faces of the blades and cause them to swing in arcs as indicated by dotted lines so as to bring the blades parallel with the direction 15 of the current. These blades can therefore move against the current without offering any material resistance thereto and as they gradually return to their initial positions they swing toward each other until they can 20 assume positions against the arms 5 so as to be operated upon by the current and cause the wheel to rotate. Importance is attached to the fact that the arms 5 not only serve to connect each pair of blades with the shaft 25 but they also constitute braces or backings against which the blades swing, the arms therefore reinforcing the blades transversely and absolutely preventing them from splitting, bending, or becoming otherwise injured 30 as a result of the force of the current thereupon. The rings 9 and 10 constitute efficient spacing means for the outer ends of the arms and the blades connected to them and by locating them above and below the blades 35 they in no sense interfere with the operation of the blades.

What is claimed is:

1. A water wheel comprising upper and lower radiating arms, said arms being arranged in pairs, the upper and lower arms of

each pair diverging outwardly, combined connecting and spacing rings connected to the outer ends of the upper and lower arms respectively, and a blade pivotally connected to the arms of each pair and disposed to bear thereagainst and to be backed thereby during a portion of the rotation of the wheel. 45

2. A water wheel comprising a hub, upper and lower arms radiating therefrom and arranged in pairs, the upper and lower arms of each pair diverging outwardly, brackets extending upwardly and downwardly from the respective arms of each pair, connecting rings carried by the brackets, and a blade 50 pivotally mounted between the arms of each pair and disposed to bear against and to be backed by said arms during a portion of the rotation of the wheel. 55

3. A water wheel comprising a hub, upper and lower arms radiating therefrom and arranged in pairs, the upper and lower arms of each pair diverging outwardly, outer and inner blades of uniform height pivotally connected to the arms of each pair, said blades 60 being disposed to bear against and to be backed by the arms during a portion of the rotation of the wheel, the adjoining edges of the blades being beveled and disposed to lap, upwardly and downwardly extending brackets 65 upon the outer ends of the respective arms of each pair, and connecting and bracing rings carried by the brackets. 70

In testimony that I claim the foregoing as my own, I have hereto affixed my signature 75 in the presence of two witnesses.

ROBERT A. FONTAINE.

Witnesses:

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W. O. MINTER, Jr.