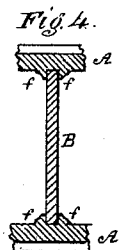
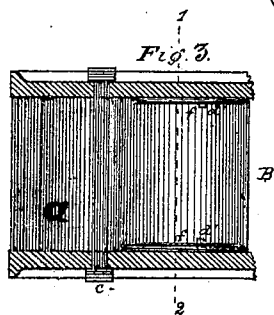
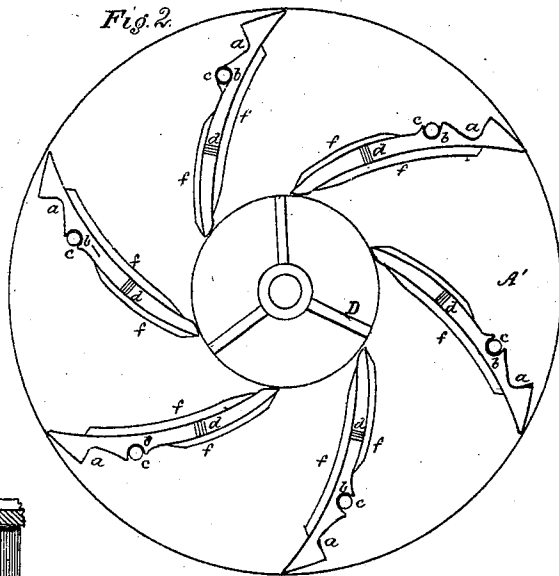
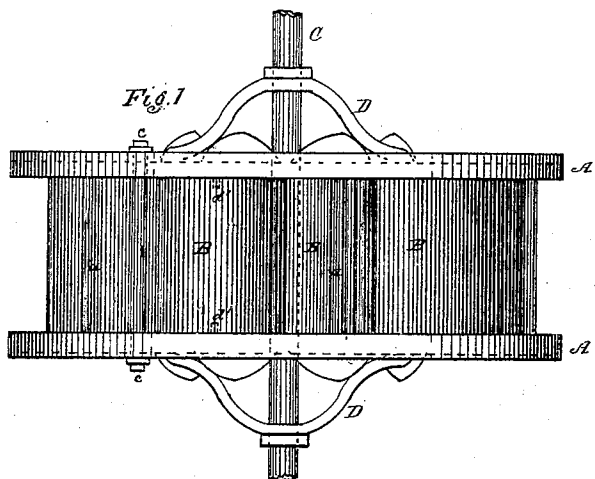


E. P. H. CAPRÓN.
Turbine Water-Wheels.

No. 141,759.

Patented August 12, 1873.



Witnesses. { *Abraham S. Peel* *Elisha P. H. Capron.*
Abraham S. Peel *Elisha P. H. Capron.*
 Inventor.

UNITED STATES PATENT OFFICE

ELISHA P. H. CAPRON, OF HUDSON, NEW YORK, ASSIGNOR TO THE CAPRON WATER-WHEEL COMPANY, OF SAME PLACE.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **141,759**, dated August 12, 1873; application filed December 17, 1872.

To all whom it may concern:

Be it known that I, ELISHA P. H. CAPRON, of the city of Hudson, in the county of Columbia and State of New York, have invented new and useful Improvements in Turbine Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings forming a part of this specification.

My invention relates to improvements in turbine water-wheels of the kind known as the inward-flow turbine-wheel; and has for its object to construct the buckets or floats in such a manner that the power of the water impinging upon them shall be utilized and rendered effective to the greatest possible extent; and also to provide improved means for attaching and securing the buckets to the disks, so that, while the said buckets are detachable and may each be removed and replaced without removing the rest, they shall at the same time be capable of being as firmly secured in position as they would be if cast solid with the disks. The nature of my invention consists, first, in the novel and peculiar form and construction of the buckets themselves, for the purpose of carrying out the objects of my invention. A vertical recess is formed on that side of the bucket on which the water impinges as it enters the wheel, near its outer end, into which said recess the water rushes when it first strikes on the bucket, by which means the effective action of the water is greatly increased and the sides of the said recess are placed at such an angle with the line of the bucket that the water, in its rebound, will be retained within the wheel, and not thrown outward beyond its periphery. Running parallel with this recess, a little nearer to the inner end of the bucket, is a groove for receiving an upright bolt, by which the disks and buckets are secured in position, which said bolt or rod fits closely within the said groove. Each end of the bucket is brought to a thin edge, and upon the top edge and also upon the bottom edge of the bucket is provided a small slot, into which fits a corresponding projection formed on each disk. And it consists, secondly, in the combination with the buckets, constructed as above described, of the disks

provided with the projections already mentioned and fillets or beads running along the sides of the buckets, and the upright bolts, for the purpose of keeping the buckets securely and firmly in position.

In order that my invention may be fully understood, I will proceed to a more particular description thereof, referring to the accompanying drawings, in which—

Figure 1 represents an elevation of the wheel, showing the buckets in position. Fig. 2 is a plan view of the lower disk, showing the upper edges of the buckets. Fig. 3 is a side elevation of one of the buckets and portions of the disks in section; and Fig. 4, a section taken through the line 1 2, (in Fig. 3,) showing the fillets or beads.

Similar letters of reference indicate the same parts in each of the figures.

A and A' represent the upper and lower disks, and B B B the buckets or floats. The disks have each a circular opening in their center for discharging the water, and are secured to the shaft or spindle C by means of curved arms or tripods D D, and the said shaft C passes continuously through the wheel, which rotates thereon. This construction of the wheel, however, I do not claim as forming a part of this invention.

My improvements consist, first, in the peculiar form and construction of the buckets; and, secondly, in improved means for securing the same within the disks.

Each end of the bucket is brought to a thin edge, as shown in Fig. 2, and near its outer end is formed a vertical recess, *a*, the extreme outer end of the bucket being made in a wedge-like form. Running parallel with this recess *a* and nearer to the inner end of the bucket is a second recess or groove, *b*, into which fits closely an upright bolt, *c*, having a screw-nut at one end and a solid head or a screw-nut at the other end, which said ends extend to the outer sides of the upper and lower disks respectively. Two ridges are thus formed on that side of the bucket upon which the water impinges, one on each side of the recess *a*, and the sides or walls of the said recess thus formed are inclined slightly inward. Into this recess the water rushes when it first enters the wheel, by which means

it obtains a firm hold upon the bucket, and its power is concentrated, and, the said recess being slightly inclined inward, the water, in its rebound, is retained within the wheel, and is not thrown outward beyond the periphery of the disks. On the upper edge of the bucket, as also on its lower edge, is a small slot, *d*, into which fits a corresponding projection, *d'*, provided on the inner side of each disk; and upon the inner sides of each disks are fillets or beads *fff*, either cast solid with the disks or rigidly secured thereto, and which fit closely to the upper and lower portions of the sides of the buckets, between which said fillets the buckets are inserted.

It will be seen that each bucket is separately detachable, and, when in position, is held firmly by means of the fillets *f*, projections and slots *d d'*, and bolt *c*, so that it cannot move in any direction, thus combining the advantages attending its being detachable with the stability and firmness of a fixed bucket; and it will also be obvious that, by the peculiar form and con-

struction of the bucket, as regards that side of the same upon which the water impinges, the momentum of the water is utilized and rendered effective to the greatest possible extent by reason of its being concentrated on the bucket, near its outer end, at the moment it first enters the wheel.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A detachable bucket or float of a turbine water-wheel, constructed as described and shown, being provided with the recess *a*, groove *b*, and slots *d*, for the purposes herein set forth.

2. The bucket *B*, constructed as shown and described, in combination with the bolt *c* and disks *A A*, the latter being provided with the fillets *fff* and projections, as and for the purposes set forth.

ELISHA P. H. CAPRON.

Witnesses:

JULIAN GIFFORD,
ABRAHAM S. PEET.