2 Sheets--Sheet 1.

S. SHERWOOD.

Water-Wheel.

No. 160,356. Patented March 2, 1875.

Fig 1

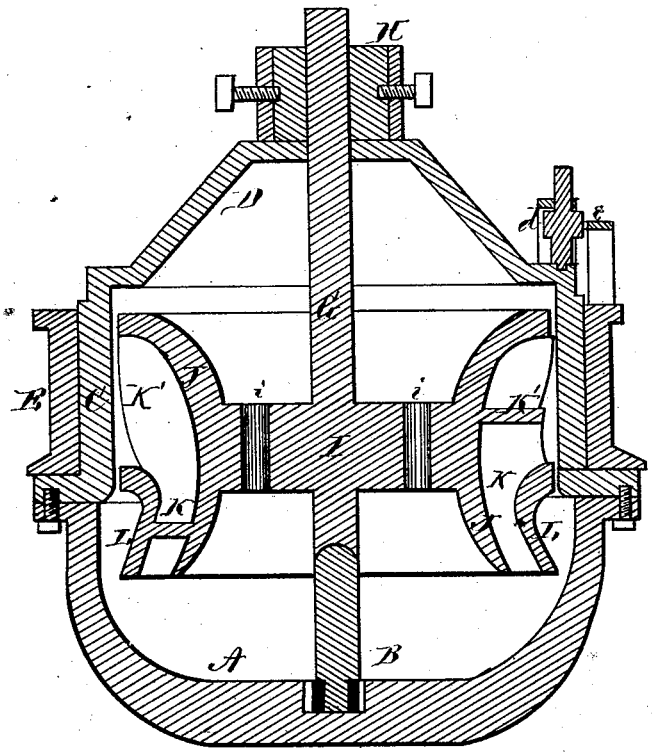
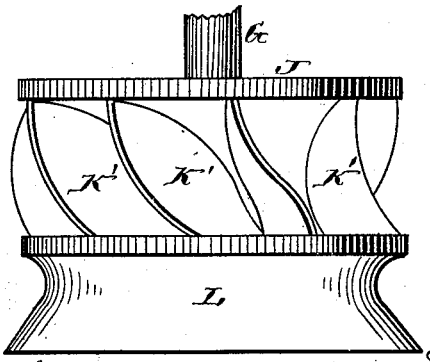


Fig 3



Witnesses:
Franck L. Durand
C. L. Event

Inventor.
Samuel Sherwood
per Howard Gleason
Attorneys.

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S. SHERWOOD.

Water-Wheel.

No. 160,356. Patented March 2, 1875.

Fig 2

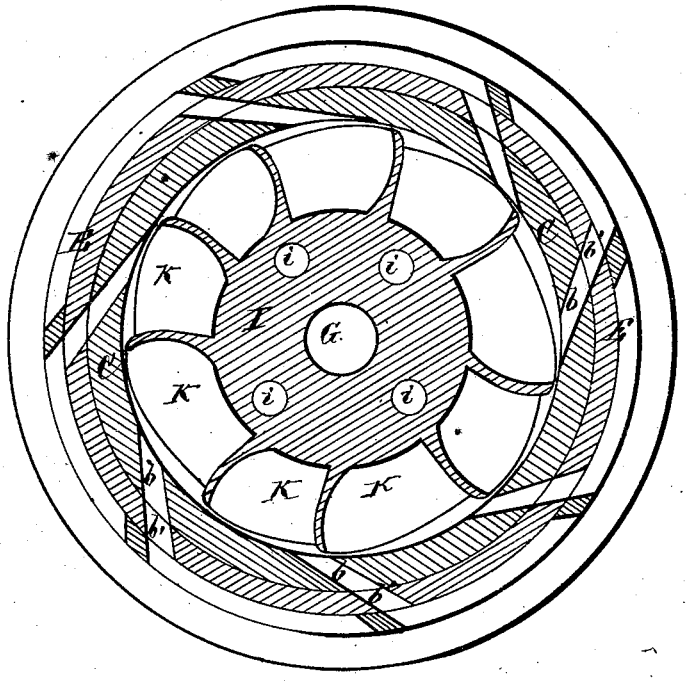


Fig 4

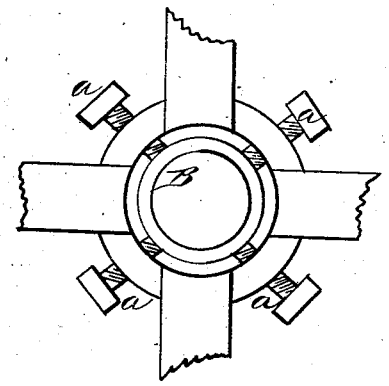
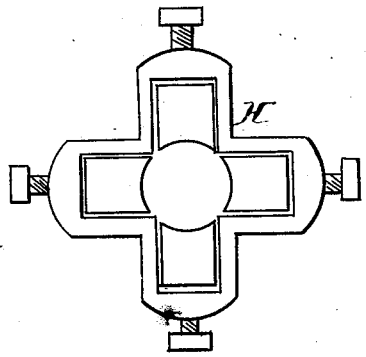


Fig 5



Witnesses:
Franck L. Durand
C. L. Ewert

Inventor.
Samuel Sherwood,
per
Franklin Mason
Attorneys.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

SAMUEL SHERWOOD, OF INDEPENDENCE, IOWA.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **160,356**, dated March 2, 1875; application filed April 3, 1873.

To all whom it may concern:

Be it known that I, SAMUEL SHERWOOD, of Independence, in the county of Buchanan and in the State of Iowa, have invented certain new and useful Improvements in Water-Wheels; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a water-wheel, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a longitudinal vertical section, and Fig. 2 a horizontal section, of my entire water-wheel with case and gate. Fig. 3 is a side elevation of the wheel proper. Fig. 4 shows the step, and Fig. 5 the bush, for the shaft.

A represents the bridge-tree with step B, which is adjusted by means of set-screws *a a*. On the bridge-tree A is secured the casing *c*, which is provided with a conical cap, D. *b b* are the chutes in casing, which, with the openings *b′ b′* in the surrounding gate E, are made inclined, as shown in Fig. 2. The gate E is moved to open and close the chutes by means of a pinion, *d*, arranged on the cap D, and working in a cogged bar, *e*, on the cap. G represents the wheel-shaft resting upon the step B, and passing up through the center of the cap D, and through a bushing, H, to be adjusted to run true. On the shaft G is secured the wheel, the body of which consists of a circular center-piece, I, with vertical holes *i i*, and a flaring curved rim, J, extending above and below the same, as shown in Fig. 1. To the body I J are secured the buckets K K, which are curved and set at an angle, as shown in Fig. 3, and their lower ends surrounded by a flaring rim, L. This rim prevents the lower ends of the buckets from becoming broken by the flood-trash, and prevents the wheel from leaking. The buckets K K extend below the casing C, and it is this portion of the bucket which is surrounded by the rim L. The chutes *b b* are tapering, as shown in Fig. 2, and the openings *b′ b′* in the gate E are made to correspond, so as to form gradually-contracting passages for the water to enter the wheel.

These passages, it will be seen, are in such position that the water will strike the wheel on a tangent.

Heretofore the delivery or discharge end of the buckets of water-wheels have been made of a size comparatively as large as the receiving or mouth end, and only the peculiar curve or spiral given to the blades was depended on for obtaining power from the wheel.

I construct my buckets as follows: The blades K′ of the buckets K are cast with, and form a part of, the body I. These blades are given a very slight spiral curve, and set at a gradual downward inclination or angle on the body of the wheel. The upper portion, or receiving mouth, of the blades are placed some distance apart, and the ends are brought nearer and nearer together as the blades descend, thus forming a wide mouth or receiving-end, and a narrow or small discharge-end, to the buckets, as shown in Fig. 1.

The object and advantages of thus constructing the buckets, and providing their lower ends with an inclosing-rim, L, as before set forth, is that the buckets are enabled to receive a very large volume of water, which, as it passes into and through the wheel, is confined in a small space as it approaches the bottom of the wheel, and is finally delivered in a very small volume compared with that at which it enters. By this means the full force and power of the water are obtained and utilized. The water being brought together, and compressed or confined, it exerts and creates a greater friction on the curved faces of the blades, consequently creating more power with a small quantity of water than it otherwise would were the delivery-end comparatively as large as the receiving-end, and the water allowed to pass freely through the wheel. Also, by making the delivery-end so comparatively small much flood-trash is prevented from passing through and injuring the wheel. The inclosing-flange or flaring rim L protects and strengthens the lower ends of the buckets,

and confines the water therein. The holes *i* through the central part or body of the wheel allow the escape of air and prevent a vacuum being formed in the case, and also in case of overflow allow the water to pass down through the wheel and not collect on top thereof.

I am aware that the lower portion or bottom of the buckets of water-wheels have before been provided with an inclosing-rim; also, that the wheel has before been perforated vertically to allow the escape of air; this, therefore, I do not claim; but

What I do claim, and desire to secure by Letters Patent, is—

In combination with the wheel I *i* J, the buckets K, formed with a very large broad mouth or receiving-end, and a small delivery or bottom-discharge end, and blades K′ placed in a very gradual and downwardly-curved position on the wheel, the top portion of the blades being separated some distance apart, and the lower ends brought nearer together and protected by an inclosing flaring rim or band, L, as and for the purposes described.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of March, 1873.

S. SHERWOOD.

Witnesses:
J. S. WOODWARD,
ASA BLOOD.