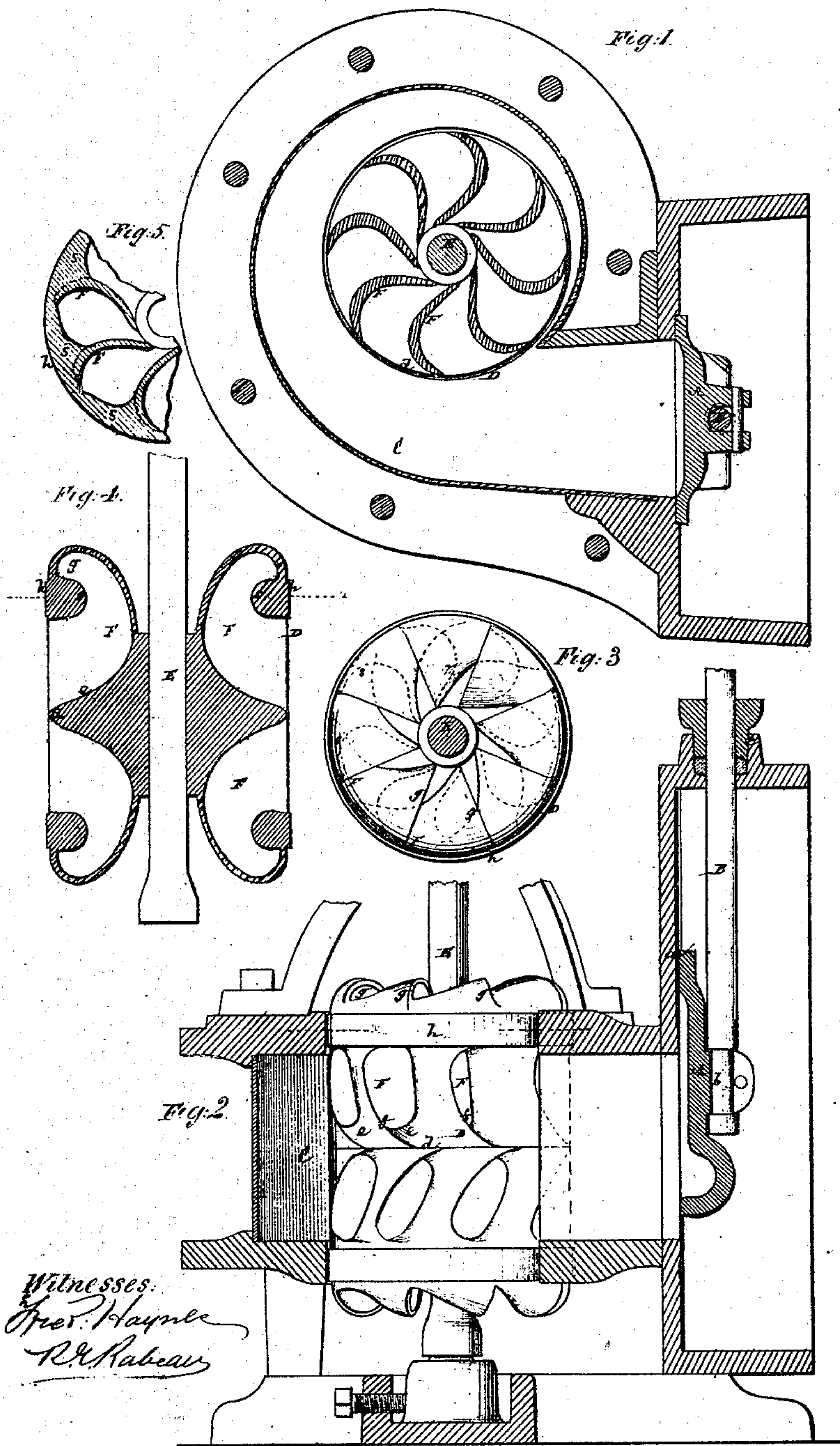


G. H. Jones,

Water Wheel.

No. 105694.

Patented July 26, 1870.



Witnesses:
Thos. Haynes
R. H. Kabeau

George H. Jones
per. Brown & Coombs & Co

Attorneys

UNITED STATES PATENT OFFICE.

GEORGE H. JONES, OF ROSE, NEW YORK.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 105,694, dated July 26, 1870.

To all whom it may concern:

Be it known that I, GEORGE H. JONES, of Rose, in the county of Wayne and State of New York, have invented a new and useful Improvement in Water-Wheels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a horizontal section of a turbine wheel constructed in accordance with my improvement, and Fig. 2 a vertical sectional view of the same. Fig. 3 is an upper or end view of the wheel proper removed from its case, and Fig. 4 a vertical section of the same. Fig. 5 is a section of the wheel in part, taken as denoted by the line *xx* in Figs. 2 and 4.

Similar letters of reference indicate corresponding parts.

My invention consists in a novel construction of the buckets and intermediate portions of the wheel proper, for operation within a case or chamber, preferably of scroll form, and whereby a most efficient action and economical application of the water are obtained. The invention also includes a novel construction of the gate, together with its stem and surface against which the gate works, whereby the operation of the gate is protected against interference by frost, grit, or sediment.

Referring to the accompanying drawing, A represents the gate, which is hollowed out or of **D** form on its face, and the upper portion of the surface against which it works recessed, as at *a*, to secure any sand which may have lodged on the upper edge of the gate passing, when the gate is hoisted, into the wheel, and to prevent marring of the face of the gate. The stem B, by which the gate is raised, is connected with the latter, so as to be capable of turning therein, but restricted as regards longitudinal movement, except in common with the gate, as shown at *b*; also made capable of turning in the gland or stuffing-box *c*, through which it plays. This mode of attaching the stem facilitates the working of the gate in time of frost, by first turning the stem when choked by ice, which eases the starting of the stem to effect the movement of the gate. The case or chamber C, in which the wheel works,

is of a scroll form, and preferably spiral configuration, increasing one-twelfth of the radius in each successive radial division of it into eight equal parts from the center of the wheel. This construction of the scroll I find the most effective in making available the centrifugal force of the water, and varying velocity and pressure of it in its passage round the scroll. The wheel proper, D, which is suitably carried by a vertical shaft, E, is here shown double—that is, with an upper and lower row of buckets; but it may, if desired, be made single, and the description here will be confined to a single or upper row only, the lower row and its intermediate parts, as shown in the drawing, being similar in construction, only reversely tapering to secure a like action and counterbalancing force or pressure on the wheel in direction of its axis. Said wheel may have any desired number of buckets in a row, the water entering at the periphery, and being discharged within and over the end of the wheel. The case in which the wheel works need not necessarily be of the spiral or scroll form herein described, as any suitable case applicable to turbine wheels generally may be used; but it is preferred to construct the case as described. The buckets F F are not only inclined, but also, as it may be termed, double-curved. Thus the bottom to the upper wheel or division between the two rows of buckets (indicated by the letter *d*) is brought to an edge at the skirt of the wheel, and made to curve upward, as at *e*, in its approach to the shaft by an easy curve of thirty-five degrees, or thereabout, to the horizon; also, the curved buckets, as at *f*, made to lie at an inclination of about forty degrees, more or less. These inclinations serve to deflect the water upward. Said buckets are of an enlarging capacity in an upward direction to secure proper run of the water from the scroll through them, and are of a hollow shell-like form, opening at their discharge mouths or ends *g* within the body of the wheel, and above its end or ends *h*, where the greatest discharge of water takes place. The wheel D, thus constructed with buckets F scooped out and through its body, and discharging inward and upward, revolves at its ends *h* closely within the case or chamber C, and, by the detour

given to the water through its buckets, makes available the whole or greater power of the water. But it here should be noted, as an additional or distinctive feature in my improved direct and reacting turbine water-wheel, having curved buckets and taking its water from the outside and discharging it either in part or in whole in a direction parallel to the axis, that said wheel is provided or constructed in rear of each bucket, within the case-fitting rim portion *h* of it, with what may be termed a secondary backing, *s*, lying against said rim, and with its widest end to the back of the bucket opposite to where the water strikes the latter. The use of these backings is to keep the water that has just entered the wheel, and has not yet acted on the buckets, from mixing with the water that has so acted, and has commenced to react by discharging through the issues or mouths *g*, such mixing, if allowed, destroying or impairing the efficiency of the water so mingled together, and making it a dead weight on the wheel. Said backings can be applied either to single or double curved buckets.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The wheel *D*, with its buckets *F* scooped out and through the body of the wheel, curved or inclined, as at *e* and *f*, and with its buckets of an increasing capacity upward, or in a parallel direction with the shaft of the wheel, and arranged to discharge inwardly and in said direction, as at *g*, substantially as specified.

2. In a direct and reacting turbine wheel, having curved buckets and receiving and discharging the water, as described, the combination of the secondary backings *s* with the curved buckets *F*, and relatively to the case-fitting portion or rim *h*, substantially as shown and described.

3. The combination, with the elements recited in the preceding claim, of the scroll case or chamber *C*, essentially as described.

4. The combination of the gate *A*, hollowed out on its face, as described, the surface against which said gate works, recessed, as at *a*, and the stem *B*, made capable of revolving, substantially as specified.

GEORGE H. JONES.

Witnesses:

G. F. MERRITT,

GEO. W. SHERMAN.