

W. R. GREEN.  
Water-Wheels.

No. 153,252.

Patented July 21, 1874.

Fig. 1.

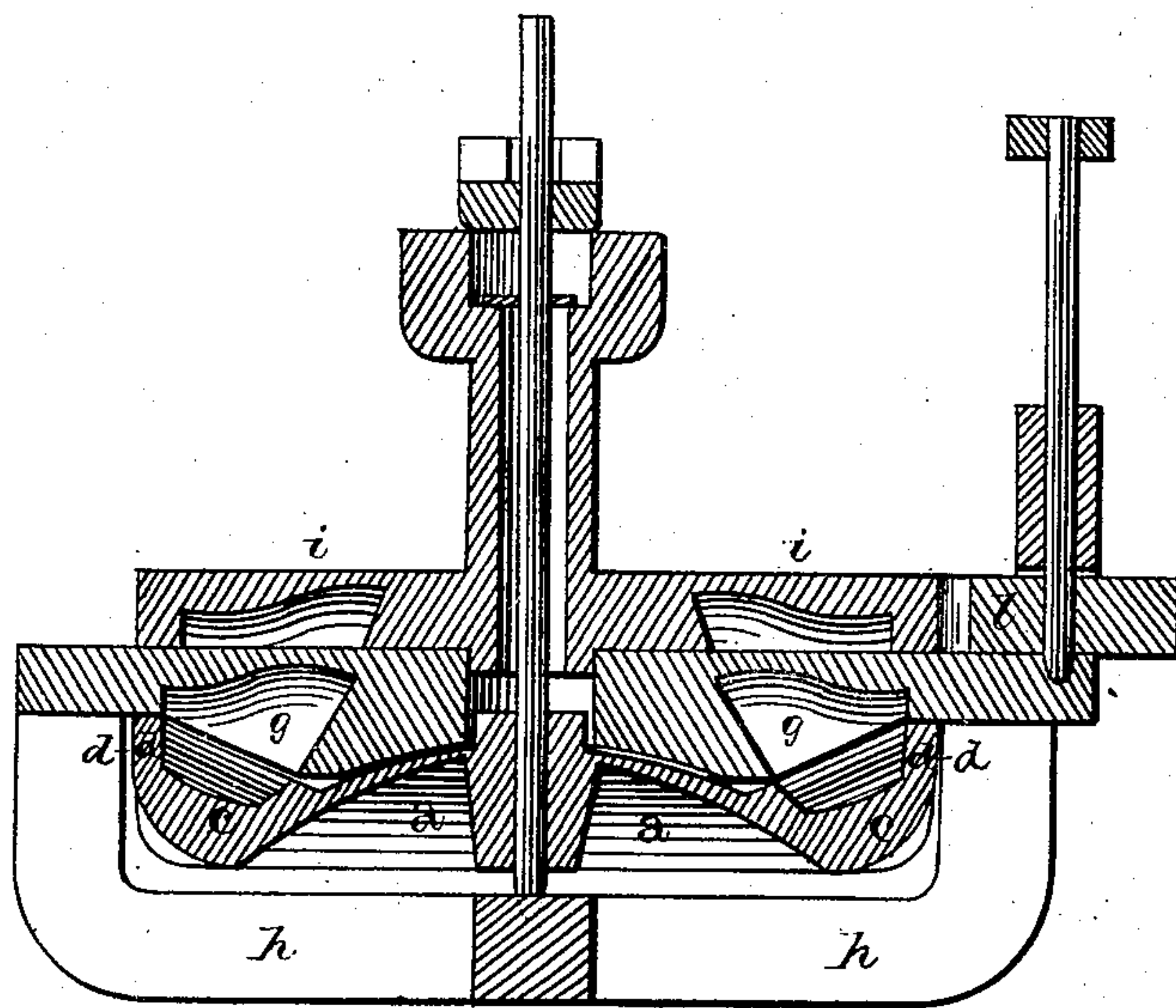
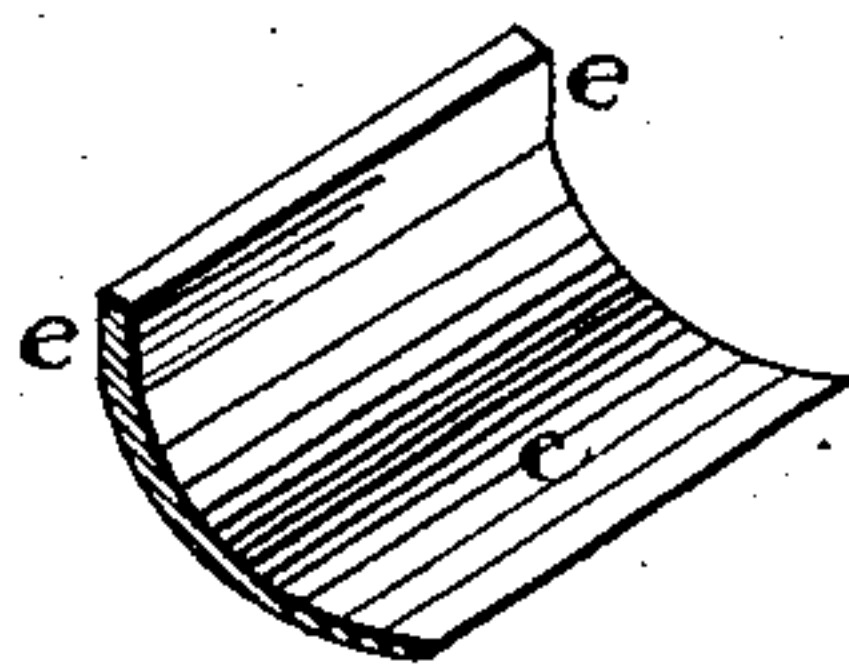


Fig. 2.



WITNESSES:

Gas. E. Hutchinson  
Wm. Hale

INVENTOR.

Wm. R. Green  
per  
F. A. Lehmann, atty

# UNITED STATES PATENT OFFICE.

WILLIAM R. GREEN, OF EXETER, WISCONSIN.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **153,252**, dated July 21, 1874; application filed March 2, 1872.

*To all whom it may concern :*

Be it known that I, WILLIAM R. GREEN, of Exeter, in the county of Green and State of Wisconsin, have invented a new and useful Improvement in the Construction of Turbine Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings making a part of this specification.

The nature of my invention relates to an improvement in turbine water-wheels; and it consists in making the wheel concave upon its upper side, and the chutes convex upon their under side, so as to fit down into the top of the wheel and fill the entire space, and thus prevent the wheel from being filled with water, and having to carry a useless weight, as will be more fully described hereinafter.

In the accompanying drawings, Figure 1 is a vertical section of my wheel, and Fig. 2 is a perspective of one of the buckets alone.

*a* represents the wheel, having the hub, the buckets *c*, and outer rim *d*, which connects the buckets together, all cast in a single piece. The top of the hub is made convex, and rising from the base of this convex portion the buckets rise upward and outward at an angle of about thirty degrees, thus making the top of the wheel concave. Each one of the buckets *c* have a vertical shoulder, *e*, formed upon their upper edges, against which the water strikes

with full force as it leaves the chutes, and propels the wheel around, both by the force of the impact and the reaction of the water as it escapes from the downwardly-curved buckets. The chutes *g* are cast in a single plate, and are secured to the top of the supports *h*, upon which the wheel is journaled. These chutes extend in an opposite direction from the buckets, and are so formed that they project downward and inward at the same angle as the top edges of the buckets, and thus fill the entire space formed by the concavity of the wheel. Filling the space in this manner, there is no room left for the wheel to fill with water, whereby it is compelled to carry a useless weight, thus increasing the friction of the parts, and consequently their wear and tear. Upon the top of the chutes is placed the circular gate *i*, which is operated in the usual manner by the pinion *l*.

Having thus described my invention, I claim—

The wheel *a*, made concave upon its top, in combination with the chutes *g*, which project downward and fill this concavity so as to prevent the wheel from being weighed down with water, substantially as set forth.

Dated this 24th day of February, 1872.

WILLIAM R. GREEN.

In presence of—

FRANCIS B. AMES,  
ANDREW SEXTON.