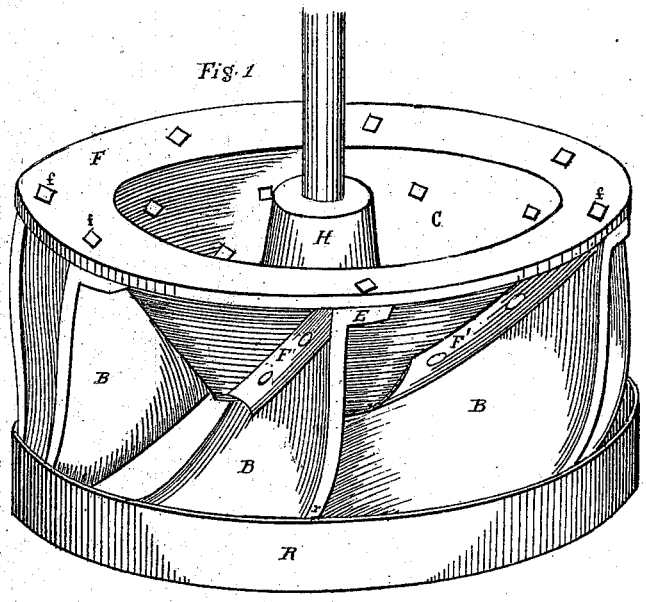
R. R. ROYER.

Improvement in Water-Wheels.

No. 115,362. Patented May 30, 1871.

Fig. 1



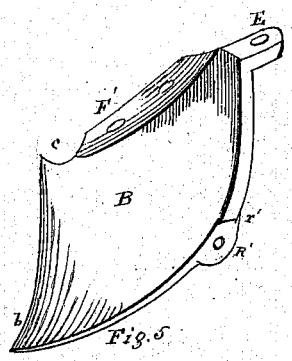


Fig. 2

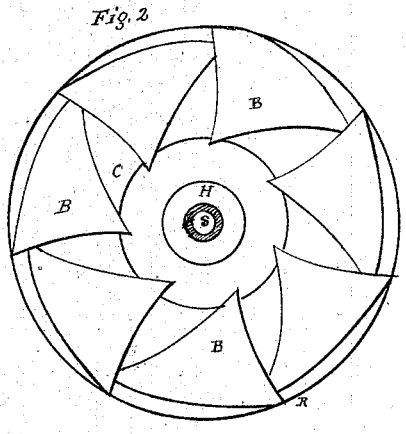
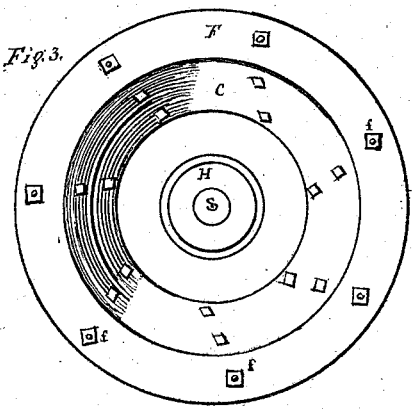
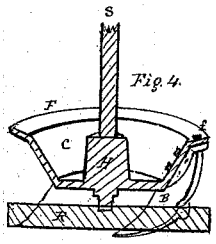


Fig. 3.





Witnesses.

W. B. Wilcox

Jacob Stauffer

Inventor.

Reuben R. Royer.

UNITED STATES PATENT OFFICE.

REUBEN R. ROYER, OF EPHRATAH, PENNSYLVANIA.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 115,362, dated May 30, 1871.

I, REUBEN R. ROYER, of Ephratah, in the county of Lancaster and State of Pennsylvania, have invented certain Improvements in the Buckets and Arrangement of Water-Wheels, of which the following is a specification:

The nature of my invention consists in the curve of the buckets and their relation to the frustum of a conic side and dished top of the wheel so as to utilize the whole volume and pressure of the water in a downward and central direction, thereby gaining the maximum power with a free discharge and reduced friction in a single series of buckets.

The accompanying drawing will show the construction and manner of attachment, in which—

Figure 1 is a perspective view of the wheel and buckets combined; Fig. 2, the under side of the wheel, reduced in size; Fig. 3, the same seen from the top; Fig. 4, a section still more reduced in size; Fig. 5, a detached bucket, to show its several parts for attachment.

A brief explanation will enable those skilled in the art to make and use my invention.

The general plan is that of other water-wheels of this class, differing, however, in the curve of the buckets and the plan and arrangement of the conic central dished top, and the adaptation of said buckets to the conic sides in a single series, as shown.

The flange F is slightly beveled inward. The conic basin or central dish dips down about two-thirds of the height of the wheel combined. The ordinary ring R supports the buckets below. The buckets B, Fig. 5, have an ear, E, perforated for a bolt, *f*, through the flange of the top F, to which they are fastened, as also to the inclined or conic side C of the top, by a flange, F′, showing two bolt-holes, secured by nuts, shown in Figs. 1 and 3. The end *c* of the bucket rests on the base or frustum of the cone. The point *b* of the bucket comes down to a level with the bottom of the ring R. The outer edge of the bucket has a shoulder, *r′*, resting on the top of the ring, with a lug beneath it, R′, for a screw-bolt or rivet to fasten it to the side of the ring R. The doubly-curved face of the buckets, somewhat in principle to a mold-board on plows, has the exterior surface concave, gradually changing the curve to a convex, discharge pitching downward, with the combined screw-curve in the bucket and conic top of the head *c*, thus presenting a large surface of the blade free entrance and discharge for the action of the water to exert all its powers of weight and velocity of motion to propel the wheel. H is a central hub, which supports the shaft *s*. This shaft has its ordinary step and bearings, and the whole wheel is placed in any approved case and penstock, which are no part of my invention.

I am aware that patent No. 38,775, June 2, 1863, is constructed with the same object in view, in which the shaft has its step in a post inclosed in a conical chamber. The bucket, although attached to the hub, (which is also the shape of an inverted frustum,) differs substantially in the construction and arrangement of the buckets.

Patent No. 97,778, December 14, 1869, also shows a conic-dished top so as to form two series of buckets with a vertical inlet—both of which arrangements I disclaim. Nor do I claim a conic hub, in itself considered.

The peculiarly-curved face of my buckets, with the ear E, bevel or inclined flange F′, shoulder *r′*, and lug R′, discharge-point *d*, in combination with the plain flange F of the conic basin *c* with its central hub H for the shaft, is an arrangement of parts which, by their combined and relative construction, is found, as practically tested, to be of superior efficacy and a decided improvement; therefore,

What I claim as my invention, and desire to secure by Letters Patent, is—

A bucket, B, with a doubly-curved face, and provided with a bevel flange, F′, projecting ear E, shoulder *r′*, lug R′, when said bucket is attached by a nut and bolt, *f*, through the ear E and flange F of the top, and the flange F′ of the buckets bolted through the conic sides C of the dished top, with its central hub H for the shaft *s*, all combined in relation to each other in the manner shown, and for the purpose specified.

REUBEN R. ROYER.

Witnesses:

WM. B. WILEY,

JACOB STAUFFER.