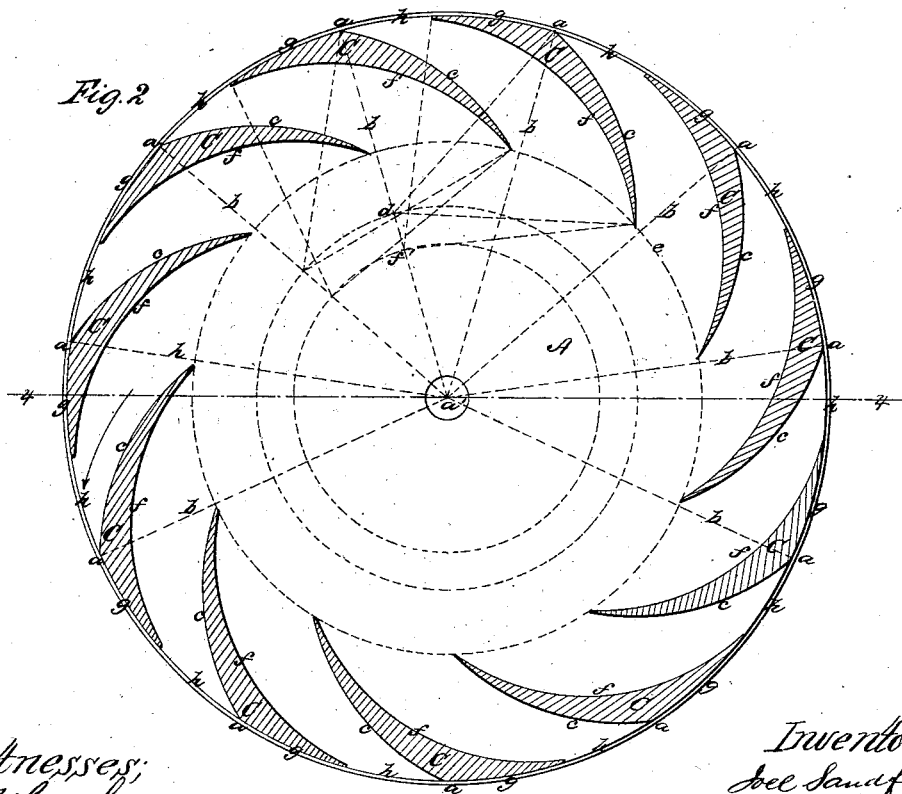
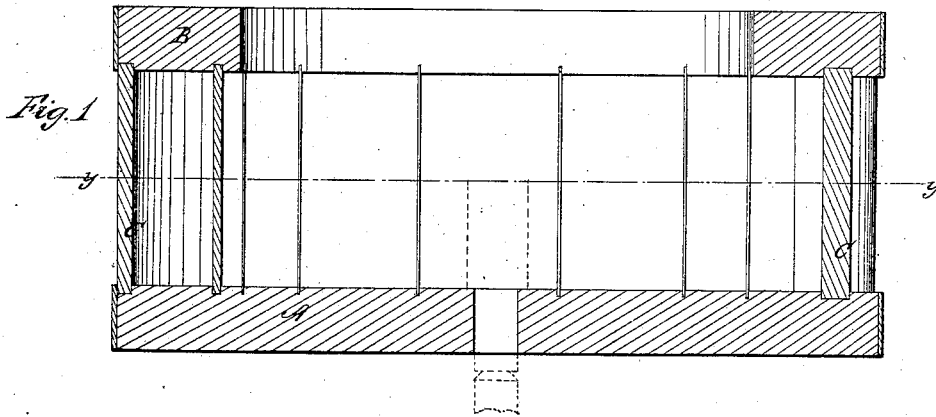


J. Sandford,

Water Wheel,

N^o 45,755

Patented Jan. 3, 1865.



Witnesses;
J. W. Cronin,
Alex. F. Roberts.

Inventor;
J. Sandford,
per Munn & Co.

UNITED STATES PATENT OFFICE.

JOEL SANDFORD, OF POLO, ILLINOIS.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 45,755, dated January 3, 1865.

To all whom it may concern :

Be it known that I, JOEL SANDFORD, of Polo, in the county of Ogle and State of Illinois, have invented a new and Improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side sectional view of my invention, taken in the line $x x$, Fig. 2; Fig. 2, a horizontal section of the same, taken in the line $y y$, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

This invention relates to a new and improved horizontal water-wheel; and it consists in a novel construction of the buckets, as hereinafter set forth, whereby it is believed that a large percentage of the power of the water is obtained.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a circular plate, which forms the bottom of the wheel, and B is an annular plate or rim, which forms the top of the wheel. C are the buckets, which are placed in a vertical position between the plates A and B.

The buckets C are formed as follows: The plate A, which is the bottom of the wheel, has its periphery divided into a number of parts, corresponding to the number of buckets designed to be used. These points of division are indicated by a , and b represents radii extending from the points a to the center a' of the plate. (See Fig. 2.) The backs of the buckets C are formed of two different curved surfaces—one, c , being a part of a circle described from a center, d , which is at the centers of the radii b , the parts c extending from the points a to a circle, e , which intersects the

radii b two-thirds of their length from the center of plate A. The inner sides, f , of the buckets C are a portion of a circle, the center f' of which is on the radii b , one-third of their length from the center of the plate A, the sides f extending from the inner ends of the parts c to the periphery of A. The other parts g of the backs of the buckets extend from the outer ends of the same to the outer ends of c , and coincide with the periphery of A. By this arrangement it will be seen that the spaces between the buckets gradually contract from their inner to their outer ends, the issues h being the narrowest part, and hence the water in passing out between the buckets acts upon them the whole distance of their length.

It is designed that the number of buckets in all cases should be in accordance with the size of the wheel and the supply of water thereto, so that the combined areas of the issues h will be less—say, from one-fourth to one-sixth—than the area of the flume through which the wheel is supplied with water. By this means the water cannot escape through or between the buckets without producing the effect desired.

I do not claim, broadly, constructing the buckets of water wheels of curves irrespective of the manner of forming the curves, as described; but

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

A water-wheel, constructed with buckets C, each formed of three arcs, described from the several centers $d f' a'$, all as herein shown and described.

JOEL SANDFORD.

Witnesses:

ANDREW SANDFORD,
JAMES C. LUCKEY.