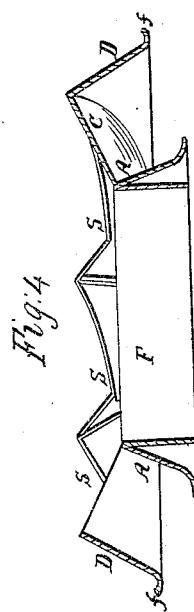
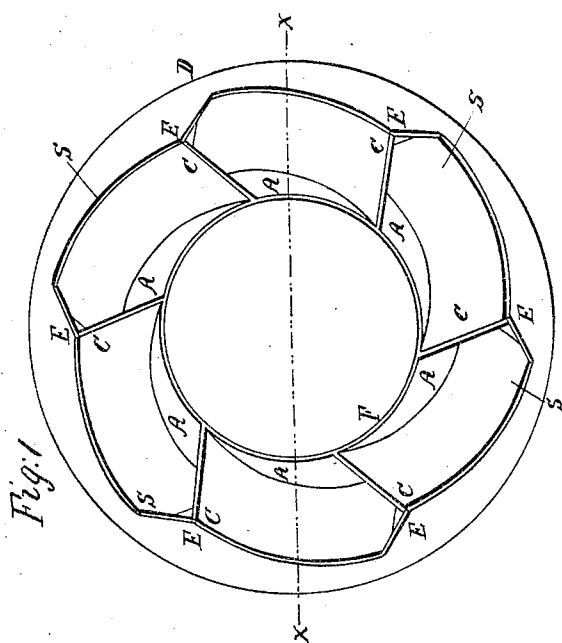
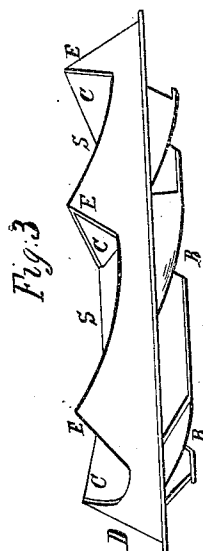
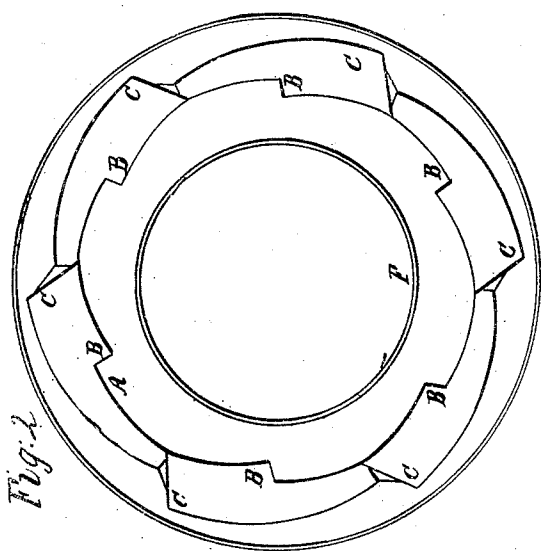


N. Johnson,
Water Wheels,

No 2, 138,

Patented June 22, 1841.



UNITED STATES PATENT OFFICE.

NELSON JOHNSON, OF TRIANGLE, NEW YORK.

IMPROVEMENT IN THE CONSTRUCTION OF WATER-WHEELS.

Specification forming part of Letters Patent No. 2,138, dated June 22, 1841.

To all whom it may concern:

Be it known that I, NELSON JOHNSON, of Triangle, in the county of Broome and State of New York, have invented a new and useful Improvement in Water-Wheels, called "Johnson's Improved Direct Percussion and Reaction Water-Wheel," which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a top view of the wheel. Fig. 2 is a view of the wheel turned upside down, or bottom view. Fig. 3 is an edge or side view or side elevation. Fig. 4 is a vertical section taken at the dotted line *xx* of Fig. 1; Fig. 5, one of the buckets detached from the wheel; Fig. 6, a side view of the wheel as modified for a counter-balance in saw-mills.

Similar letters refer to similar parts in the figures.

This improved water-wheel consists of a circular concavo-convex rim *A*, (shaped on the outside to resemble the section of a bell, with the upper part cut off horizontally,) the greater diameter being downward and projected so as to form a flange or lip to extend over the deck, and concentric with this rim *A* is another rim *D*, of nearly the same form, but of greater diameter, the one placed so far from the other as to leave a space between the two sufficiently large to admit the concave buckets *c*, which are placed and secured between said rims. The upper edge of the outer rim *D* is scalloped to correspond with the curvature of the buckets *c*, which are generally placed to correspond with said scallops, although they may sometimes be placed a little below the edges of the scallops, in order to allow the buckets to carry a greater quantity of water. The buckets *c* are made concave on the upper side, or the segment of a circle of any required degree, and placed between the rims at an angle of about thirty or forty degrees with a horizontal plane when the wheel is designed to turn horizontally, as in this case. The edges will of course conform in shape to the rims against which they are fitted and secured. The rims will be the same or nearly the same depth. The outer one will be set higher than the inner one. The inner rim will be scalloped from the lower edge of each bucket to near the middle of the same, as at *B*. These scallops are to allow the water to escape more freely from the wheel after it

has performed its office. The scallops in the outer rim are for the purpose of allowing the water to have a more direct percussion on the buckets as it passes in from the top and edge of the wheel. The lip around the lower edge of the outer rim must run close to the upper side of the deck of the scroll to prevent the escape of the water. This arrangement will throw the greater portion of the wheel inside the scroll and out of the back-water, and will expose the whole wheel to the direct percussion and reaction force of the water as it is thrown into the scroll. The water will strike directly against the concave face of the buckets and cause the wheel to turn in the same direction as the water enters, the water acting by percussion. It will then leave the wheel in a contrary direction, acting on the wheel by its gravity and causing the wheel to continue its revolving motion in the same direction as produced by the percussion, the water acting on three inclined surfaces of every issue at the same time—namely, on the two rims and on the buckets—producing much more power by a given quantity of water than in the use of any other wheel. Around the smaller diameter of the inner rim is secured a vertical rim *F*, which fits and is fastened to the shaft of the water-wheel.

Two wheels made in the manner above described may be fixed on a horizontal shaft and made to turn vertically, in which case the flanges or lips of the larger rim will run close against the inside of the deck of the scroll to prevent the escape of water. This arrangement will throw the whole face of each wheel into the scroll to be acted on by the water therein, which fills the issues entering at the scalloped sides of the outer rim.

In my old form of wheels heretofore patented the flange or lip was placed around the smaller diameter of the outer rim, which caused the wheel to be brought outside the deck and in back-water, which retarded its motion.

This principle of wheel may be so modified in its construction that it may be used as a fly or counterbalance wheel to act against the saw-frame and pitman of a saw-mill, which will reduce the friction created by the use of separate balance-wheels, as formerly used, the principal object, however, being to produce a counter-balance in order to regulate the mo-

tion of the water-wheel and to save water. For this purpose, in casting the wheel several of the issues must be cast solid, which will save water and cause the wheel to move as a fly or balance wheel and with a regular and steady motion.

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

The manner in which I have combined the buckets *c* with the inner bell-shaped rim *A* and outer conical rim *D* by forming the scal-

lops *S* in the upper edge of said outer rim *D*—*i. e.*, where the water enters—instead of in the lower edge of said rim, where it discharges, as in my original improvement, and combining one edge of the bucket with the scallops thus arranged and the other with the inner bell-shaped rim, as set forth.

NELSON JOHNSON.

Witnesses:

WM. P. ELLIOT,

C. H. WILTBERGER.