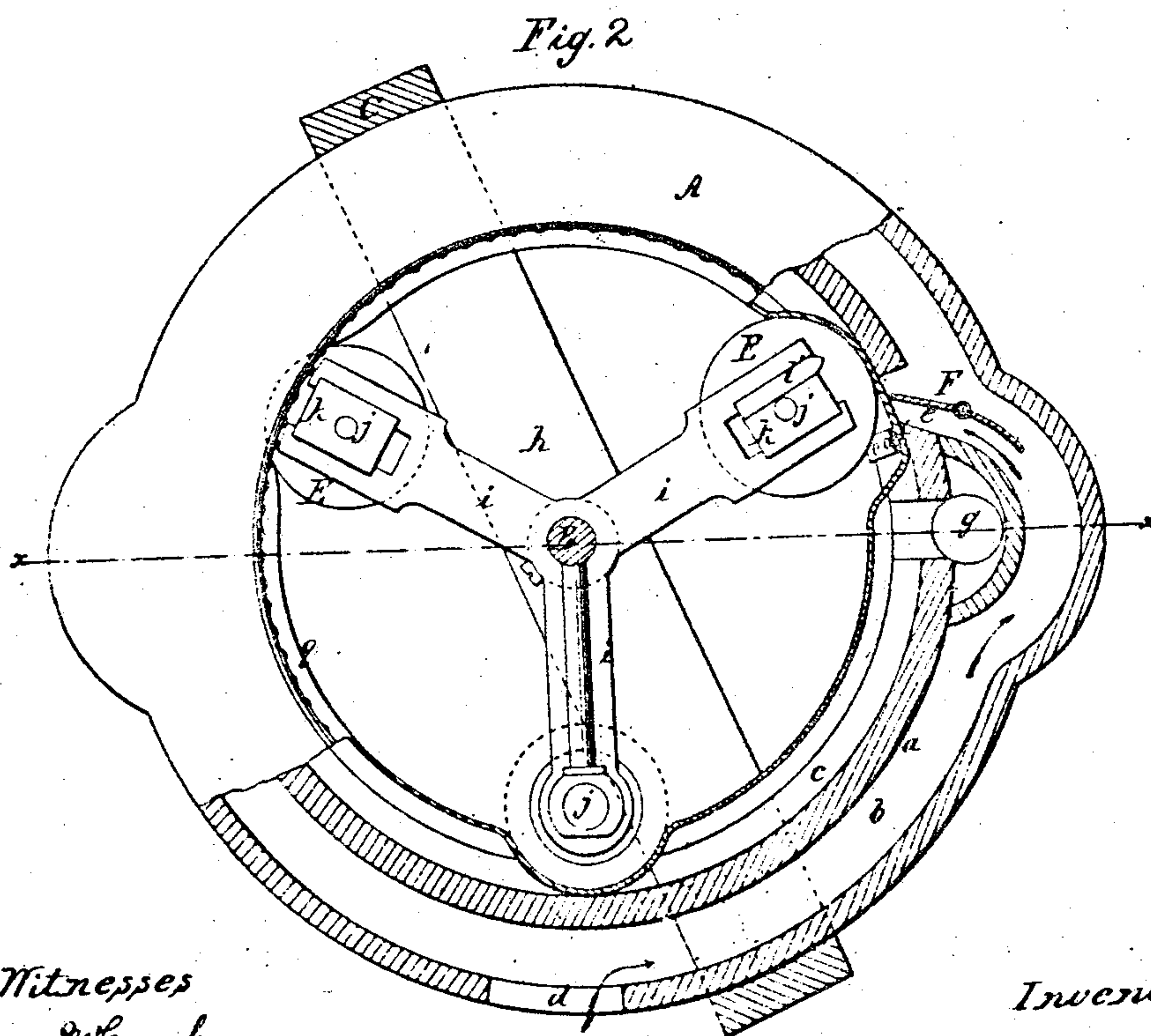
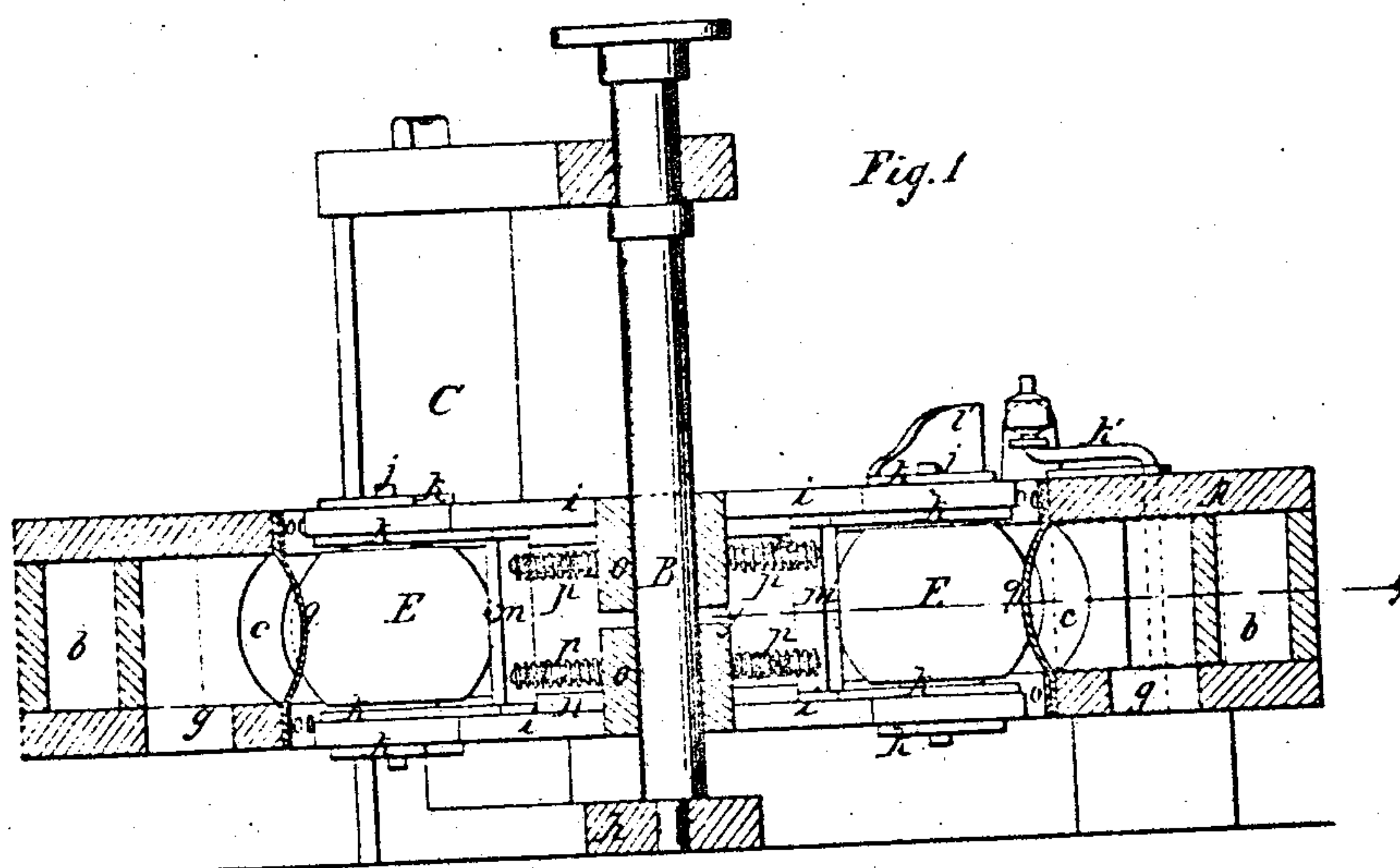


J. W. Smith,
Water Wheel.

N^o 40,195.

Patented Oct. 6, 1863.



Witnesses
J. W. Smith
E. W. Reed

Inventor
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UNITED STATES PATENT OFFICE.

JARED W. SMITH, OF MIDDLETOWN, CONNECTICUT.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 40,195, dated October 6, 1863.

To all whom it may concern:

Be it known that I, JARED W. SMITH, of Middletown, in the county of Middlesex and State of Connecticut, 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 vertical section 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 an improved horizontal water wheel; and it consists in having the inner side of the water-case which encompasses the wheel formed of india-rubber or other suitable or elastic material, and arranged in such a manner with water-passages and spherical rotating wheel-buckets as to operate in a very advantageous manner.

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

A represents the water-case which encompasses the water-wheel, and which is of annular form and divided by a partition, *a*, into two annular compartments, *b c*, as shown clearly in Fig. 2. The outer compartment, *b*, has an induction-opening, *d*, made into it, through which the water passes into *b*, and the water escapes from *b* into *c* through the openings *e e*, which are at opposite points in the water-case. One of these openings is shown in Fig. 2, and by the side of these openings there are abutments or cut-offs *f*, which close the compartment *c* and compel the water to pass out through eduction-openings *g*, one of which is shown in Fig. 2.

B represents the shaft of the wheel, which has a vertical position, its lower end being stepped in a cross-bar, *h*, in the lower part of a frame, C, in which the case A is placed.

The wheel D is composed of two sets of radial arms, *i*, attached to the shaft B, one set being directly over the other, and three arms in each set. Between these arms, near their outer ends, there are fitted vertical shafts *j*, on which balls or spheres E are placed. These balls or spheres constitute the buckets, and they may be constructed wholly of wood or metal

and arranged in such a manner as to yield or give between the arms. In order to accomplish this, the ends of the shafts *j* may be fitted in plates *k*, arranged to slide on the arms, the shafts passing through slots *l* in the arms, and the inner ends of the plates *k* connected by an upright bar, *m*, through which horizontal pins *u*, attached to the hubs *o* of the arms *i*, pass. On these arms *i* spiral springs *p* are placed, which springs bear against the bars *m* and have a tendency to press the buckets against the inner side of the case A. (See Fig. 1.) A requisite degree of elasticity, however, might be obtained by having the outer portion of the buckets composed of india-rubber or other suitable elastic or yielding material, as shown in red in Fig. 2, the shafts *j* in this case being stationary. The inner side, *q*, of the water-case A, which is the inner side of the compartment *c*, is formed of a strip of india rubber or other suitable elastic material, and the side of the partition *a* which is opposite the strip *q* is made of concave form, the curvature corresponding to that of the balls or buckets E. The springs *p* or the elastic buckets, whichever are used, have a tendency to keep the buckets pressed against the elastic strip or side *q* of the compartment *c*, and the latter pressed against the concave side of the partition *a*.

From the above description it will be seen that the water does not act directly against the buckets, but in passing into the compartment *c* forces out the strip *q* directly behind the buckets, and thus acts upon the latter, causing the wheel to rotate with a power due to the force of the water. The water is discharged from the compartment *c* each time a bucket passes the eduction-openings *g*. A valve, F, may be fitted in each opening *e*, said valves having cranks *k'* on their upper ends, and arranged with a spring or any equivalent device, so that the valves may be operated by a projection, *U*, on the upper arms *i*. These valves are so arranged as to cover or close the openings *e* while the buckets are passing over the abutments *f*. I do not, however, deem their use indispensable, as the wheel will operate very well without them.

By this invention it is believed that a decided advantage is obtained over ordinary horizontal wheels, as all the water that passes into the case A acts upon the buckets, there being

no space around the buckets through which water may pass, and at the same time there is no friction to overcome, produced in the ordinary wheels by a close fitting of buckets within the case or scroll.

My invention may be constructed at a moderate cost, and there are no parts liable to get out of repair. The yielding strip *q* may be readily replaced by a new one, when necessary, at a trifling cost.

This water-wheel, like most other horizontal ones, may be used as a pump, the power being applied to the shaft B, the induction-opening *d* being the suction and the discharge-openings *g g* the eduction or force openings.

Having thus described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

The annular case A, provided with a central partition, *a*, of concave form at its inner side, and dividing the case into two compartments, *b c*, which communicate with each other by openings *e e*, in combination with the elastic strip *q*, rotating buckets E of the wheel, and the discharge-openings *g g*, and with or without the valves F, all arranged substantially as and for the purpose specified.

JARED W. SMITH.

Witnesses:

E. W. N. STARR,
W. P. VINAL.