B. M. MAJILTON.

TURBINE WATER-WHEEL.

No. 182,458. Patented Sept. 19, 1876.

Fig. 1

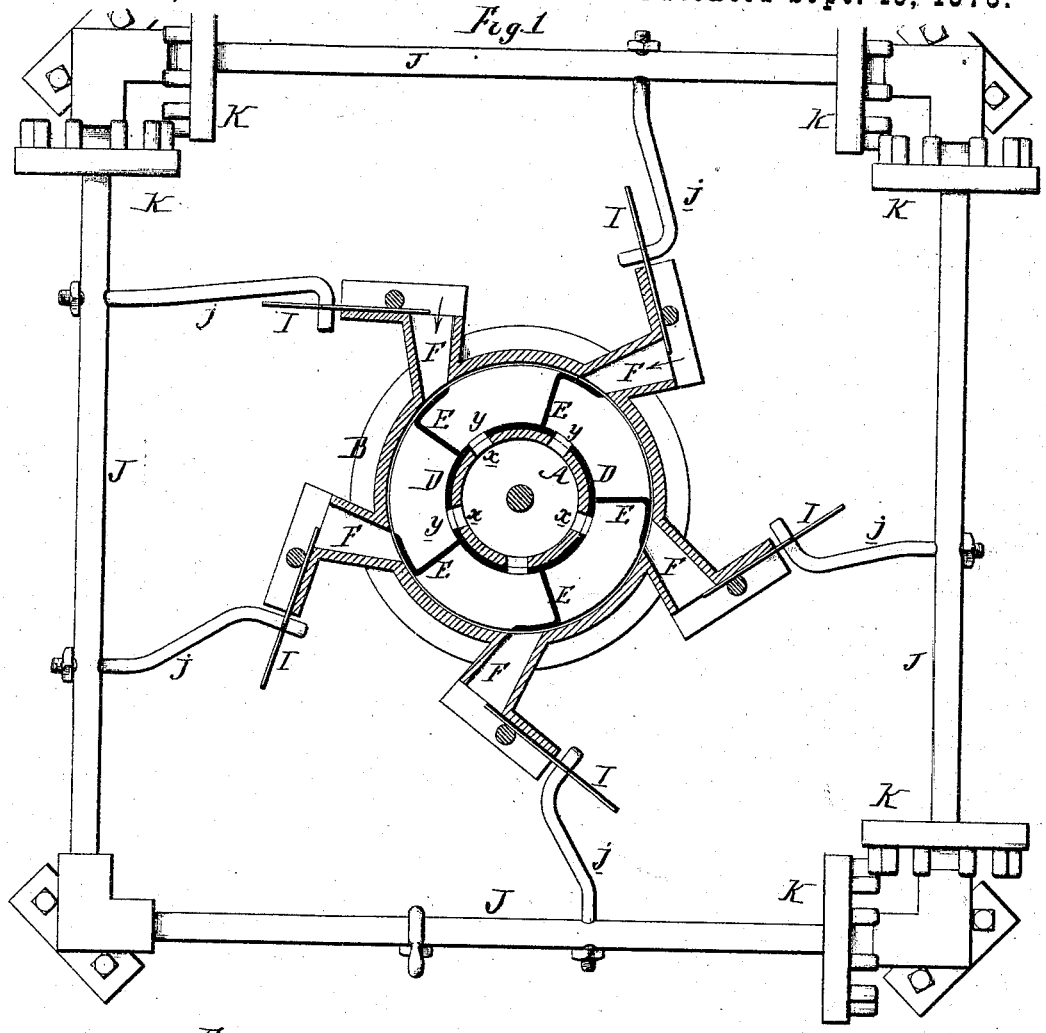


Fig. 2

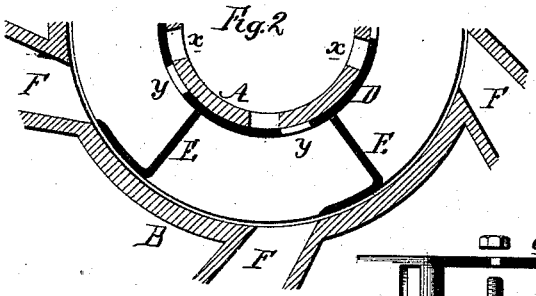


Fig. 3

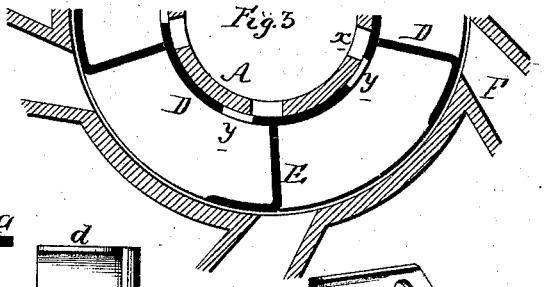


Fig. 4

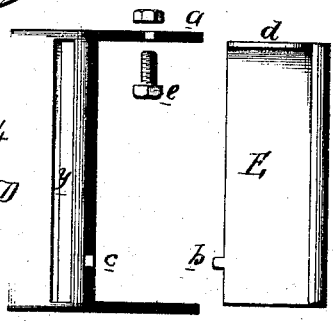
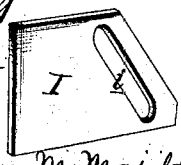


Fig. 5



Witnesses.
Thomas McElwain
Henry Howson Jr

Benjamin M. Majilton.
by his Attorneys.
Howson and Sons

UNITED STATES PATENT OFFICE.

BENJAMIN M. MAJILTON, OF CHESTER, PENNSYLVANIA.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **182,458**, dated September 19, 1876; application filed August 24, 1876.

To all whom it may concern:

Be it known that I, BENJAMIN M. MAJILTON, of Chester, Delaware county, Pennsylvania, have invented Improvements in Turbine Water-Wheels, of which the following is a specification:

The main object of my invention is to so regulate the admission of water to, and its discharge from, a turbine water-wheel that the force of the water shall be exerted on the buckets to the best advantage.

Further features of my invention relate to the operating of the gates, and to the construction of the buckets.

In the accompanying drawing, Figure 1 is a sectional plan view of my improved water-wheel with its gates and devices connected therewith; Figs. 2 and 3, enlarged sectional plans of portions of the wheel, showing the parts in different positions; and Figs. 4 and 5, detached views, representing a wheel-bucket and inlet-gate.

The wheel-casing consists of the inner ring A, outer ring B, and the usual upper and lower annular covering-plates, the whole inclosing an annular chamber within which turns the wheel, the latter consisting of a ring, D, fitting snugly to, but so as to turn freely on, the inner ring A of the casing, and having upper and lower flanges *a a*, between which fit the buckets E—five in the present instance.

Each bucket E consists of an L-shaped strip of metal, having at its inner edge a lug, *b*, adapted to an opening, *c*, in the ring D of the wheel, and each bucket is provided at the top with a lip, *d*, which is secured to the top flange *a* of the wheel by a bolt and nut, *e*, or other suitable fastening.

The water is discharged through ports *x* into the interior of the central ring, and the water-ring B is furnished with as many inlet-branches F as there are buckets in the wheel, each branch being furnished with a grate, I, adapted to guides at the outer end of the branch, and having an inclined slot, *i*, for receiving one end of a bent rod, *j*, secured at its other end to a rock-shaft, J.

Four of these rock-shafts are shown in the present instance, and the movement of one is communicated to the others through the medium of suitable wheels K, so that all the gates may be operated simultaneously, the several rods being so bent or cranked that all the gates will be moved to the same extent.

The inner ring D of the wheel has a number of ports, *y*, corresponding in size and number with the ports *x*, and these ports are so arranged in respect to the inlets F of the casing and the buckets E of the wheel that when the front edge of the bucket commences to contract the inlet-opening the water in the chamber in advance of that bucket begins to escape, as shown in Fig. 3, and when the rear edge of a bucket commences to expose an inlet, the port of the chamber behind that bucket is being closed.

The outlet-ports are always fully open when the inlets are closed, as shown in Fig. 1, and the inlets are open when the outlets are closed—an arrangement which insures the most advantageous exertion of the force of the water on the wheel.

By constructing the buckets E of the wheel and attaching them to the same in the manner described, a cheap and simple wheel is insured, the buckets of which are firmly held when in use, but can be readily removed and replaced when necessary.

I claim as my invention—

1. The combination, in a turbine water-wheel, of an inner ring, A, having outlet-ports *x* and an outer ring, B, and its inlets F, with a wheel having buckets for controlling the inlets and outlets, substantially in the manner described.

2. The within-described wheel, composed of the ring D, flanges *a a*, and buckets E, constructed for attachment to and detachment from the said ring and flanges, substantially as set forth.

3. The combination of the inlet-passages and their gates with shafts J, geared together, and carrying arms *j*, for the simultaneous operation of the gates, substantially in the manner described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJAMIN MALION MAJILTON.

Witnesses:

HUBERT HOWSON,

HARRY HOWSON.