

T. W. Mahler, Water Wheel.

N^o 55685.

Fig. 1. Patented June 19, 1866.

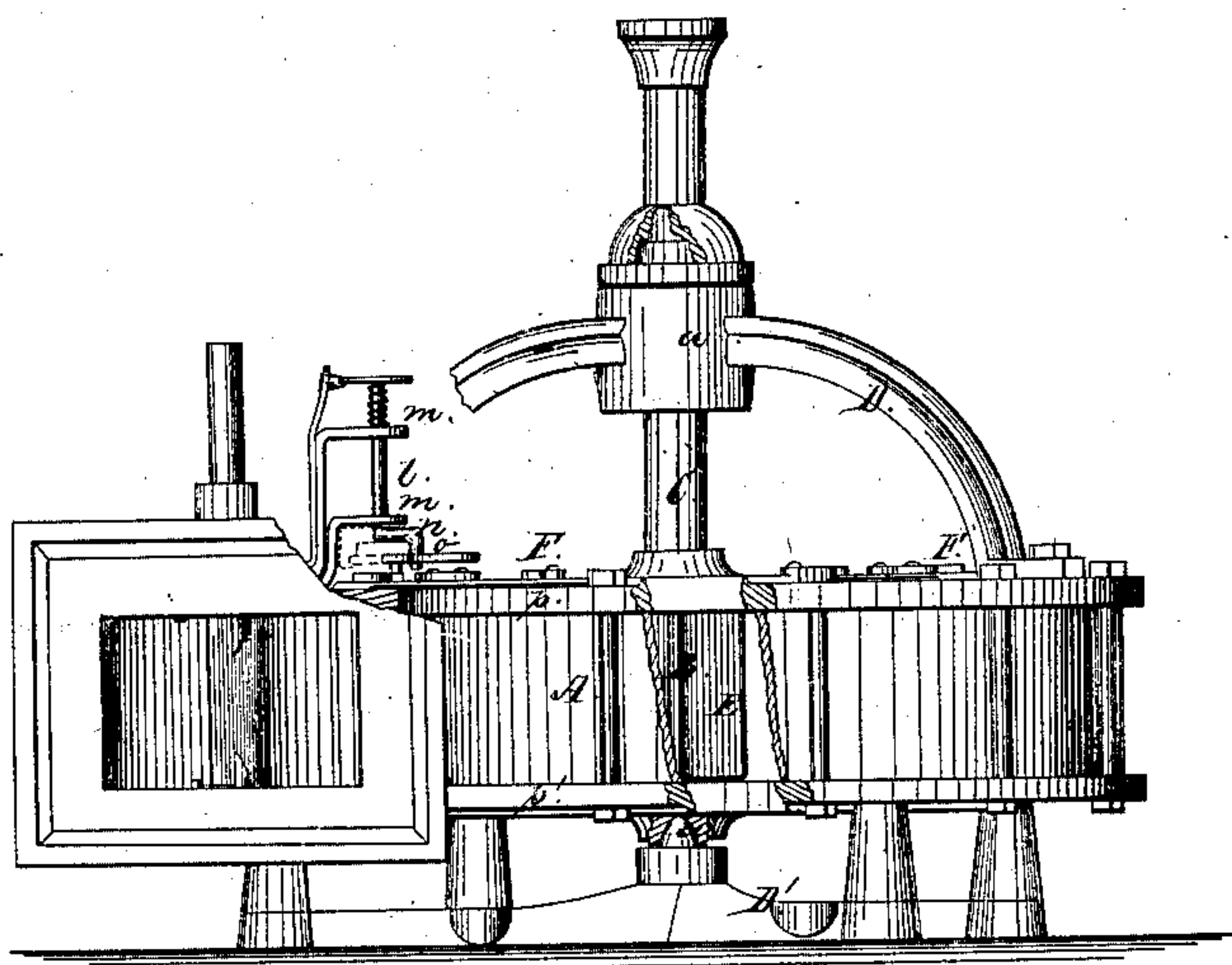


Fig. 2.

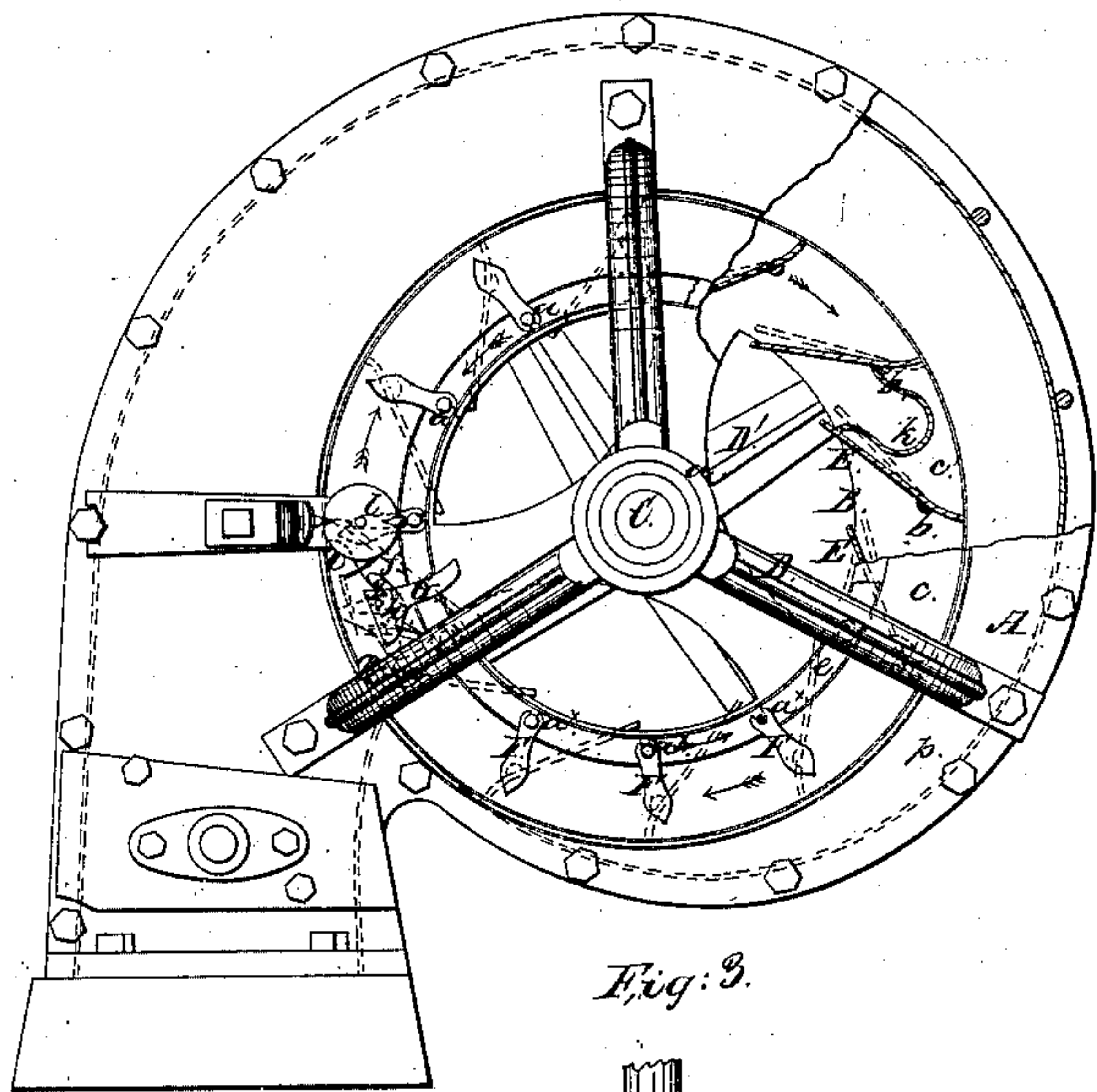


Fig. 3.

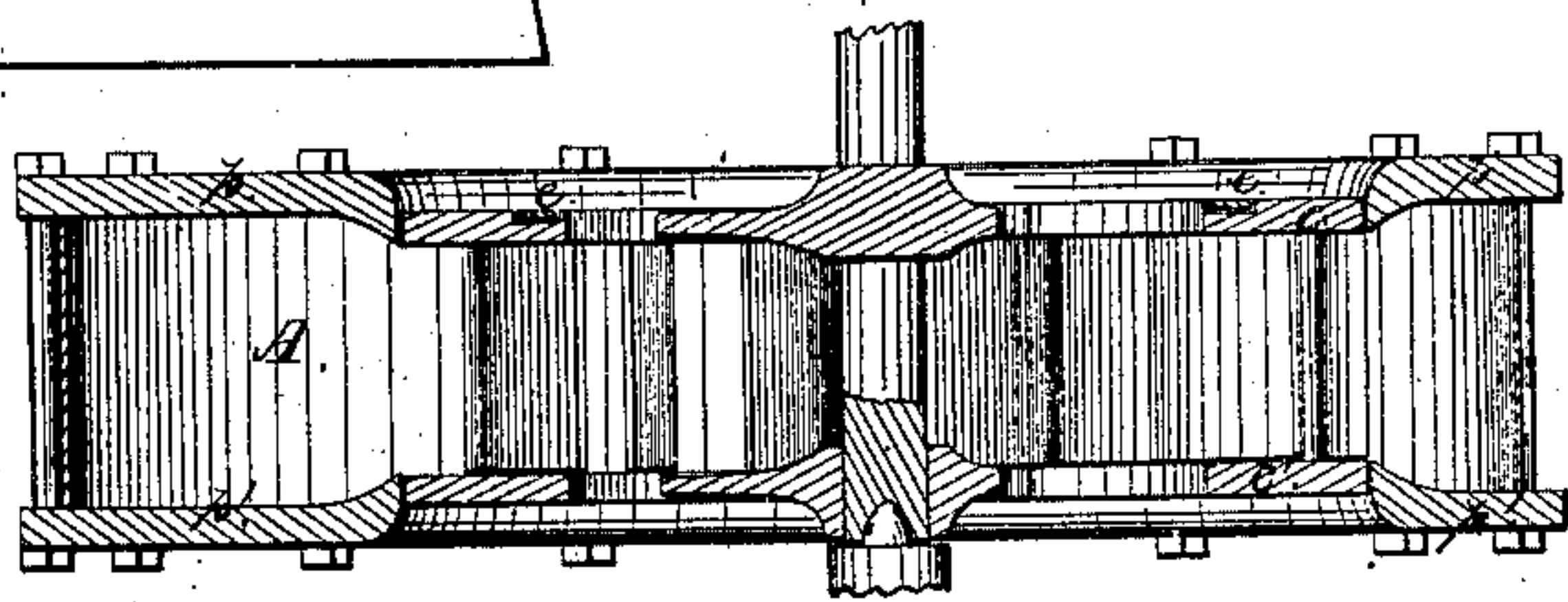
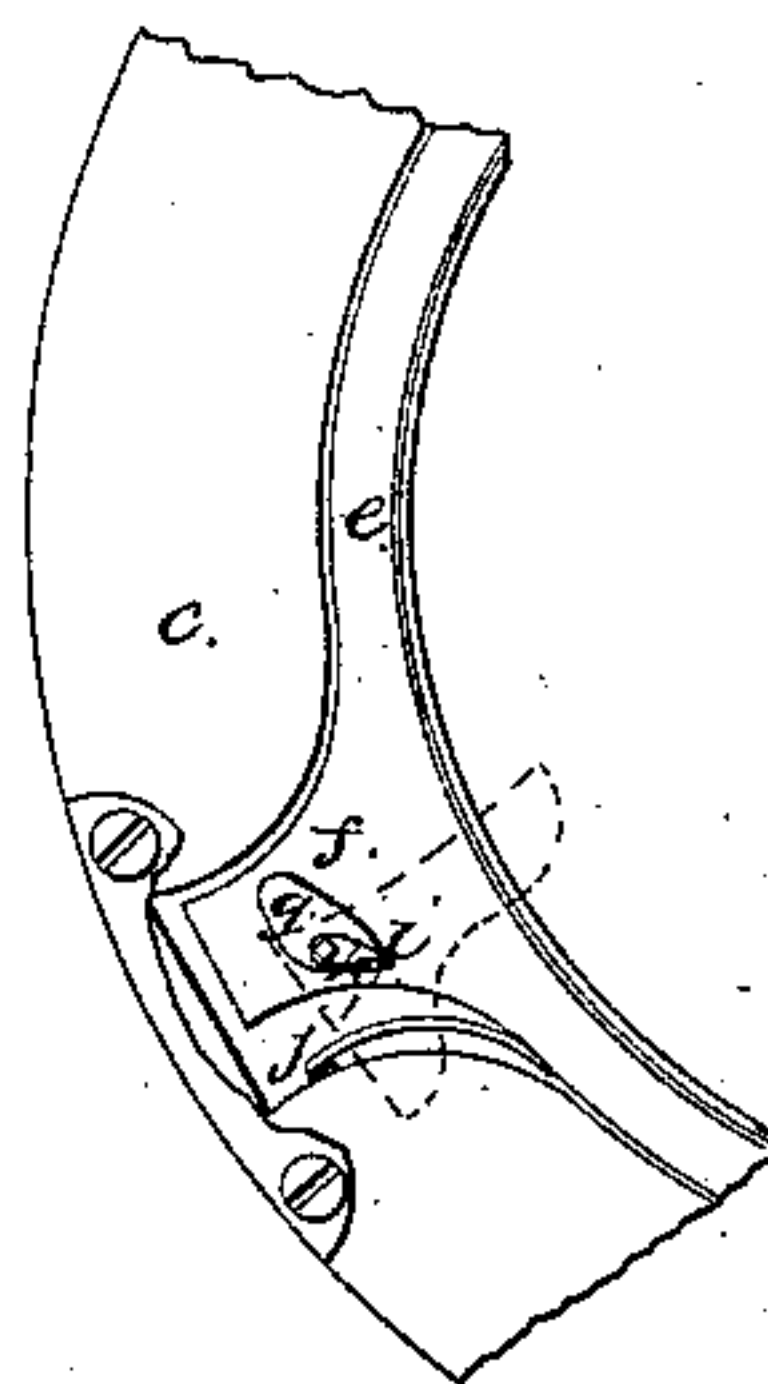


Fig. 4.



Witnesses:
J. M. Blount
Wm. Brewin

Inventor:
T. W. Mahler
Per Munro & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

T. W. MAHLER, OF ROME, NEW YORK.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 55,685, dated June 19, 1866.

To all whom it may concern:

Be it known that I, THEODORE W. MAHLER, of Rome, in the county of Oneida and State of New York, have invented a new and Improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side view of my invention, partly in section; Fig. 2, a plan or top view of the same, partly in section; Fig. 3, a vertical central section of the same; Fig. 4, a detached view of a part pertaining to the same.

Similar letters of reference indicate like parts.

This invention relates to a new and useful improvement in horizontal water-wheels; and it consists in having the buckets applied to the wheel in such a manner that they will be capable of being adjusted in order to vary the capacity of the issues and regulate the discharge of water from the wheel as occasion may require.

It is well known to millwrights and hydraulic engineers that a horizontal water-wheel cannot be run at less than its maximum speed and power without requiring a greater amount of water proportionally than is required to run it to give out its full power, and hence a great waste of water attends the use of wheels of this class. My invention, however, greatly diminishes this difficulty, for whenever it is required to run the wheel at less than its maximum power the buckets are adjusted so as to contract the issues, and thereby restrict the discharge of water and effect a saving of the same.

The invention also consists in an improved construction of the wheel-scroll, as hereinafter fully shown and described, whereby the difficulty attending the retardation of the flow of water through the scroll on account of friction is avoided and the wheel supplied with water, which flows freely, or is not restricted in an appreciable degree by friction attending the contact of the water with the side of the scroll.

A represents the scroll in which the wheel B works. C is the wheel-shaft, and *a a* the

bearings of the shaft, which bearings are in suitable supports D D'.

E represents the buckets of the wheel, which work on vertical axes, *b*, fitted in the top and bottom rims, *c c'*, of the wheel. These buckets may be of any proper form, and they are allowed to work or turn freely on their axes.

The upper ends of the axes *b* of the buckets extend through the rim *c* of the wheel, and have each an arm, F, on them, said arms projecting inward toward the inner edge of the rim *c* and connected by pivots *a** to pins *d*, attached to a ring, *e*, which is fitted loosely in an annular groove near the inner edge of the rim, as shown clearly in Fig. 2. This ring *e* has a projection, *f*, extending from it, and this projection has a hole, *g*, made in it, through which a small shaft, *h*, passes into rim *c*, the upper end of said shaft having a plate, G, attached to it, which serves as a lever, and the shaft *h* having a bit, *i*, extending from it at right angles, which bit works in the hole *g* of the projection *f*.

By actuating the plate or lever G the shaft *h* is turned, and the bit *i*, in consequence of working in the hole *g* of the projection *f* of the ring *e*, turns the ring *e*, and the buckets E will be thereby adjusted or turned on their axes so as to expand or contract the issues or spaces between the inner ends of the buckets. When the plate or lever G is in the position shown in black, Fig. 2, the buckets will be in such a position as to have issues of the greatest capacity, and when said plate is turned to the position shown in red the buckets will be adjusted so as to contract the issues. A spring, *j*, bears against one side of the projection *f*, and this spring has a tendency to keep the buckets in the position represented in black. A spring, *k*, for a similar purpose, is also inserted between two of the buckets E shown in Fig. 2.

The buckets E may be adjusted to vary the capacity of the issues while the wheel is in motion, a vertical shaft, *l*, being fitted in bearings *m*, attached to the scroll, and said shaft having a crank, *n*, at its lower end, with a pendent pin, *o*, at the outer end of the crank, as shown clearly in Fig. 1. By turning the shaft *l* so that the pin *o* will be over the rear part of the rim *c* the long arm of the plate or

lever G will, as the wheel rotates, come in contact with pin *o* and the plate or lever, and consequently the buckets will be moved to the position shown in red and the issues contracted. By turning the shaft *l* so that the pin *o* will be over the outer part of the rim *c* the short arm of the plate or lever will, as the wheel rotates, come in contact with the pin *o* and the plate or lever G, and the buckets will be moved to the position shown in black, and the issues will be enlarged to their fullest capacity.

Thus by this simple arrangement the wheel may be run to advantage or with a saving of water when giving out less than its maximum power, and the buckets all adjusted simultaneously by a very simple manipulation of a shaft.

The scroll A is of a greater depth than the wheel, its top plate, *p*, being above the top rim, *c*, of the wheel, and its lower plate, *p'*, below the lower rim, *c'*, (see Fig. 3,) and the inner edges of the plates *p p'* are of curved form, projecting toward each other sufficiently far to admit of the edges of the rims *c c'* working snugly against them. By this means it will be seen that the water is allowed to act upon the buckets at a distance below the top and bottom plates of the scroll, and said water will not be retarded by friction, as would be the case were the plates *p p'* on a level with the top and bottom rims, *c c'*; of the wheel.

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

1. The buckets E, hinged on axes *b* in such a manner that they may be turned or adjusted substantially as shown and described, and for the purpose specified.

2. Connecting the axes *b* of the buckets E by means of arms F to a ring, *e*, adjusted through the medium of the plate or lever G, shaft *h*, and a bit, *i*, on said shaft, working in a hole, *g*, in a projection, *f*, of ring *e*, all arranged substantially as and for the purpose specified.

3. The shaft *l*, provided at its lower end with a crank, *u*, and pin *o*, in combination with the plate or lever G, substantially as and for the purpose set forth.

4. The scroll A, having greater depth than the wheel, or with its top and bottom plates, *p p'*, respectively above and below the top and bottom rims, *c c'*, of the wheel, substantially as and for the purpose specified.

The above specification of my invention signed by me this 12th day of February, 1866.

THEODORE W. MAHLER.

Witnesses:

GEORGE BARNARD,
J. W. ANSELL.