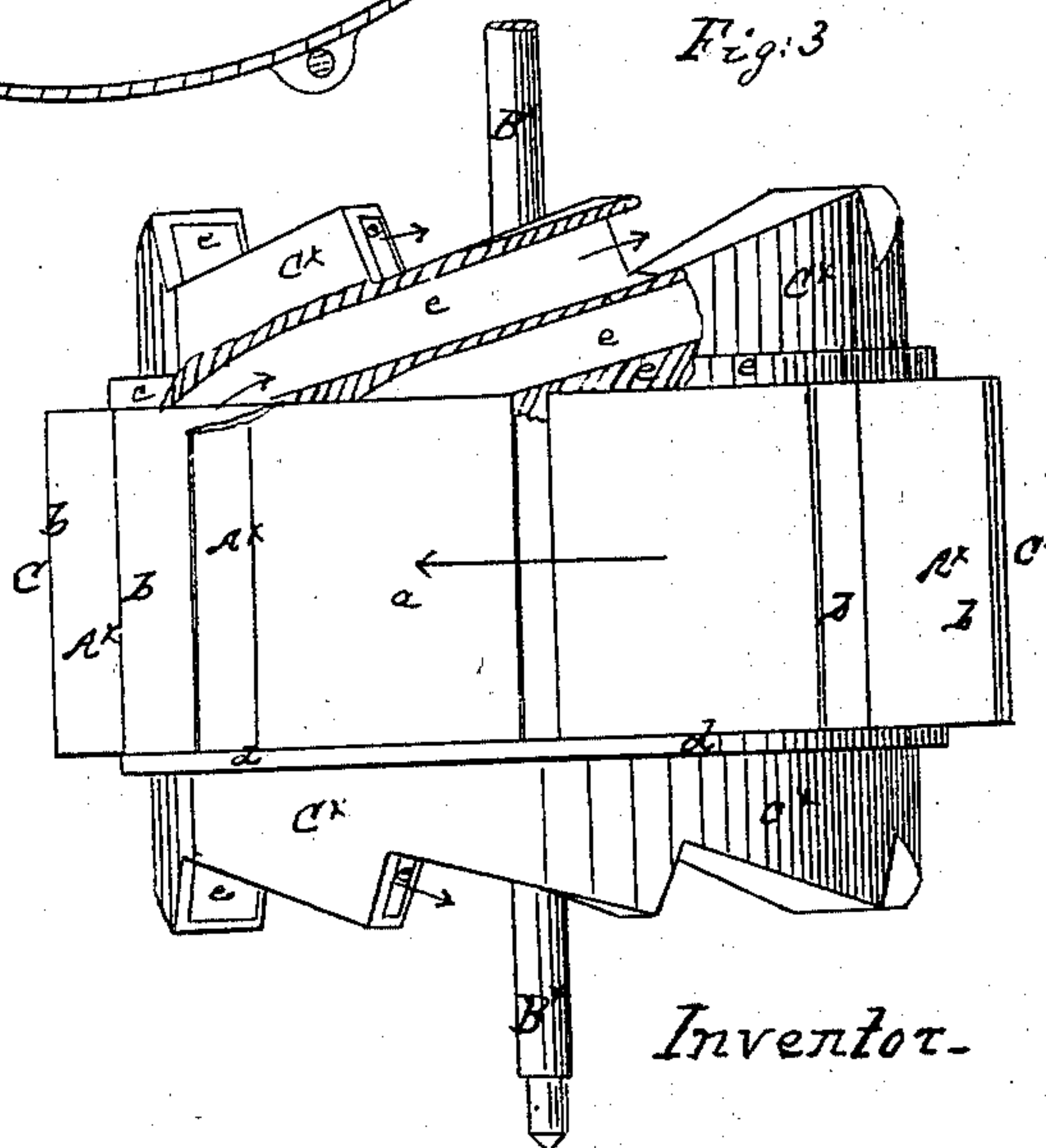
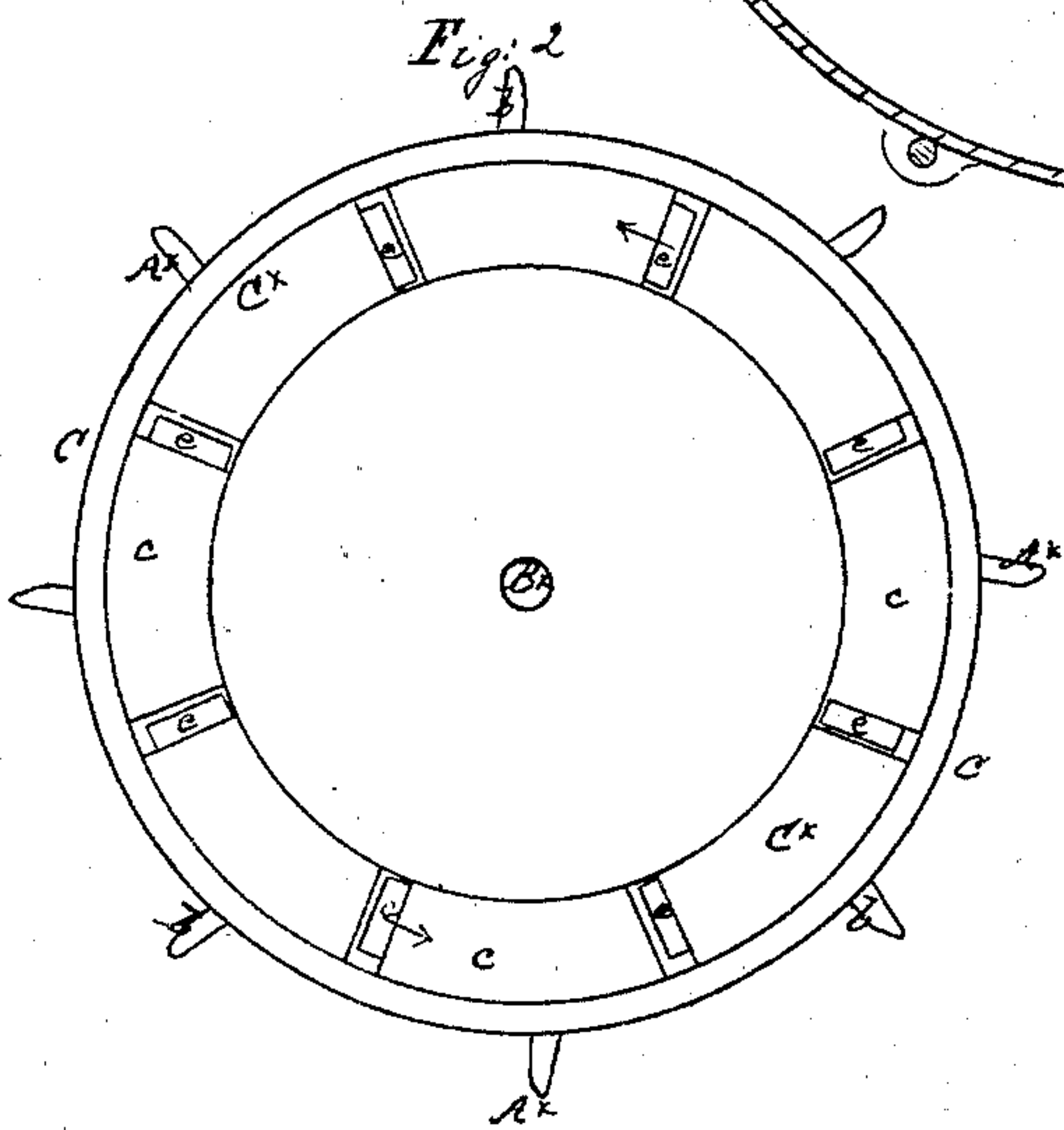
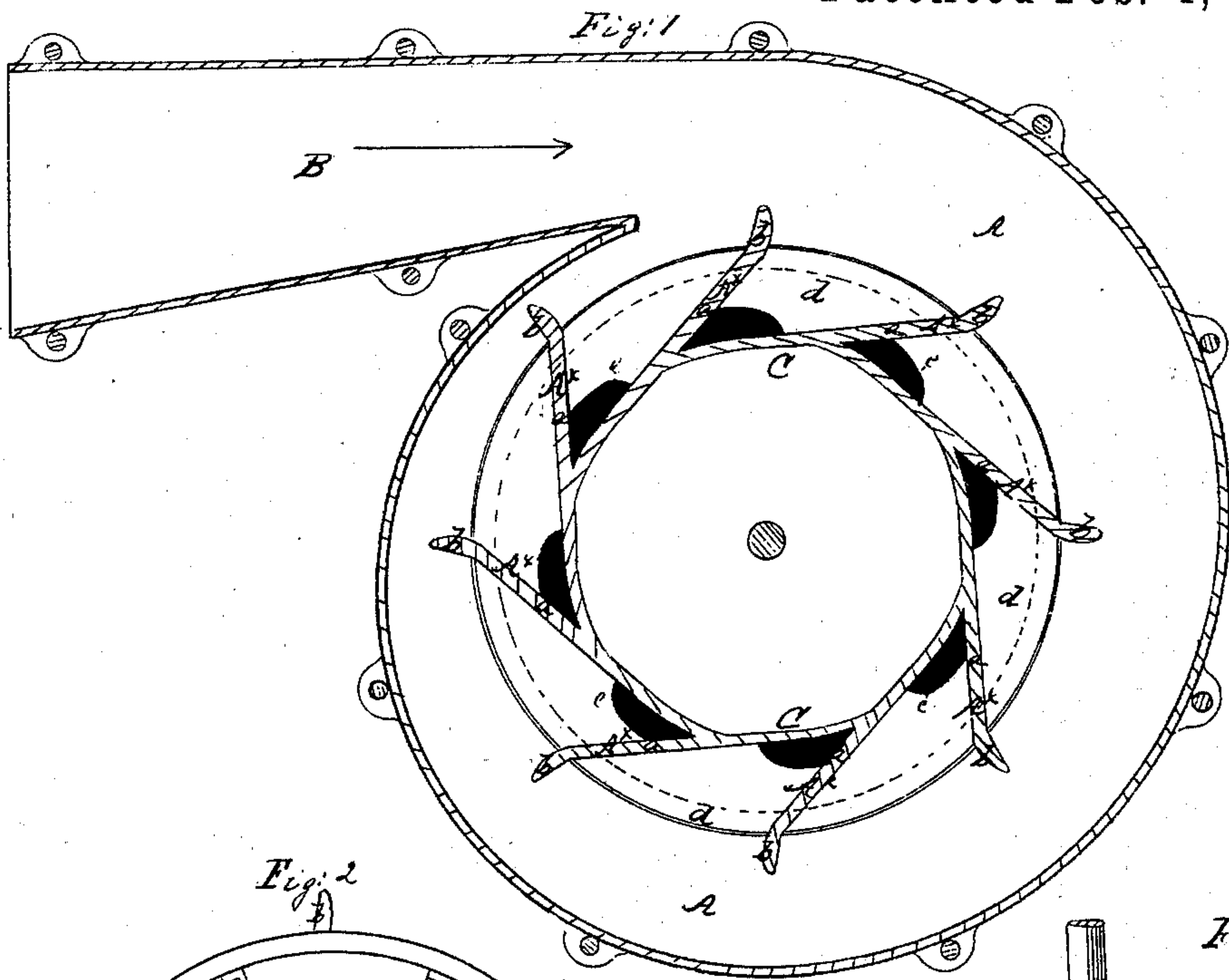


W. J. HOFFMAN.  
WATER WHEEL.

No. 74,089.

Patented Feb. 4, 1868.



Inventor.

Witnesses.

W. J. Hoffman  
Attest

W. J. Hoffman  
Per Brown, Coombes &  
Attys

# United States Patent Office.

WILLIAM J. HOFFMAN, OF CROTON FALLS, NEW YORK, ASSIGNOR TO  
GEORGE V. HOFFMAN.

*Letters Patent No. 74,089, dated February 4, 1868.*

## IMPROVEMENT IN WATER-WHEELS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM J. HOFFMAN, of Croton Falls, in the county of Westchester, and State of New York, have invented a new and useful Improvement in Water-Wheels; 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 portion of this specification, in which—

Figure 1 is a horizontal section of a water-wheel constructed according to my invention.

Figure 2 is a plan view of a portion of the same.

Figure 3 is a side view and partial section of the same portion thereof.

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

This invention relates to that class of water-wheels in which it is sought to utilize not only the direct action of the water upon the buckets, but also the reactive force of the water in leaving the wheel; and the invention consists in buckets of a novel construction arranged, in relation with inclined passages at the upper and lower sides of the wheel, in such manner as to secure the desired result in a very superior degree.

To enable others to understand the construction and operation of my invention, I will proceed to describe it with reference to the drawings.

A indicates the scroll, placed eccentric to and surrounding the wheel, and furnished with the inlet-chute B. The central part, C, of the wheel is furnished with buckets, A\*, which for the greater portion of their length are tangential, as shown more fully at *a* in fig. 1, but which at their outer ends are made nearly or quite radial from the vertical shaft B\* of the wheel, as represented at *b* in the same figure. The upper and lower sides of the spaces between the buckets C are closed by the top and bottom disks *c d*, each of which is furnished near its periphery with an annular portion, C\*, projecting upward or downward, as the case may be, and having formed in it inclined passages, *e*, the said passages of each of the disks *c d* communicating, one with the internal space just mentioned of each bucket at the innermost extremity of such space.

The water being admitted to the wheel through the chute B, strikes first the radial outer portions *b* of the buckets, and acts directly thereon to turn or propel the wheel, after which, the water passing farther around within the scroll A, acts upon the tangential portions *a* of the buckets with what may be termed a glancing action, exerting a still further force upon the wheel, and then, as it approaches the narrower portion of the scroll, passes outward into a trough, the inclined passages *e* acting upon the inclined surfaces at the upper side of those passages at the top of the wheel, and the lower sides of those at the bottom thereof, in a manner similar to the action exerted upon the tangential portions *a* of the buckets, as just set forth, and finally, in leaving or passing out of the said passages, the water, by its reaction against the surrounding water or against the atmosphere, exerts a reactive force to still further rotate the wheel, so that by these means a very large proportion of the entire or theoretical power of the water is utilized.

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

The tangential buckets A\*, constructed with radial or nearly radial end-portions, *b*, and arranged with reference to the inclined passages *e* near the periphery of the wheel, substantially as and for the purpose specified.

W. J. HOFFMAN.

Witnesses:

J. W. COOMBS,

A. LE CLERC.