

J. L. HELMER.  
Water-Wheel.

No. 168,641.

Patented Oct. 11, 1875.

Fig. 1.

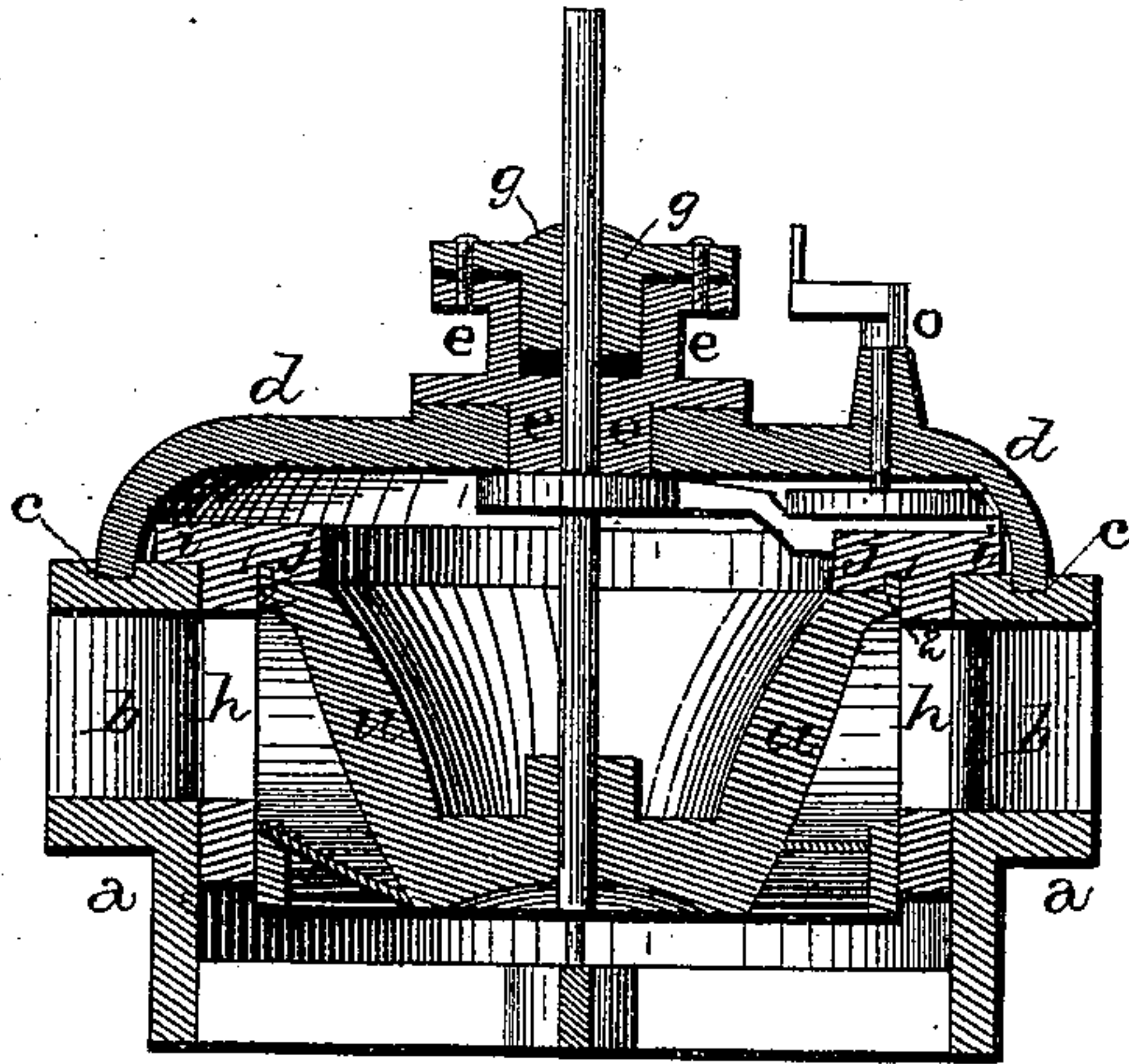


Fig. 2.

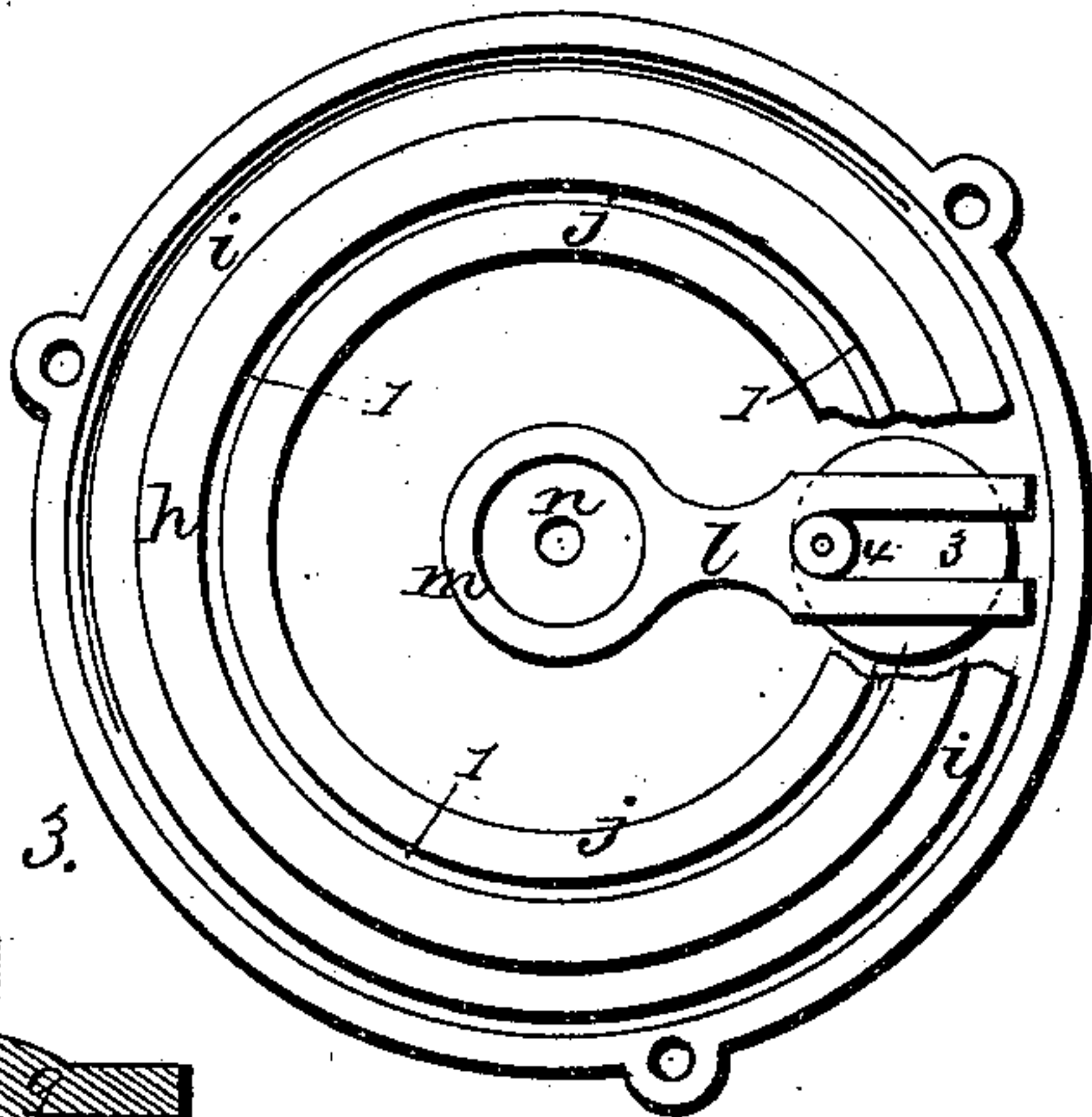


Fig. 3.

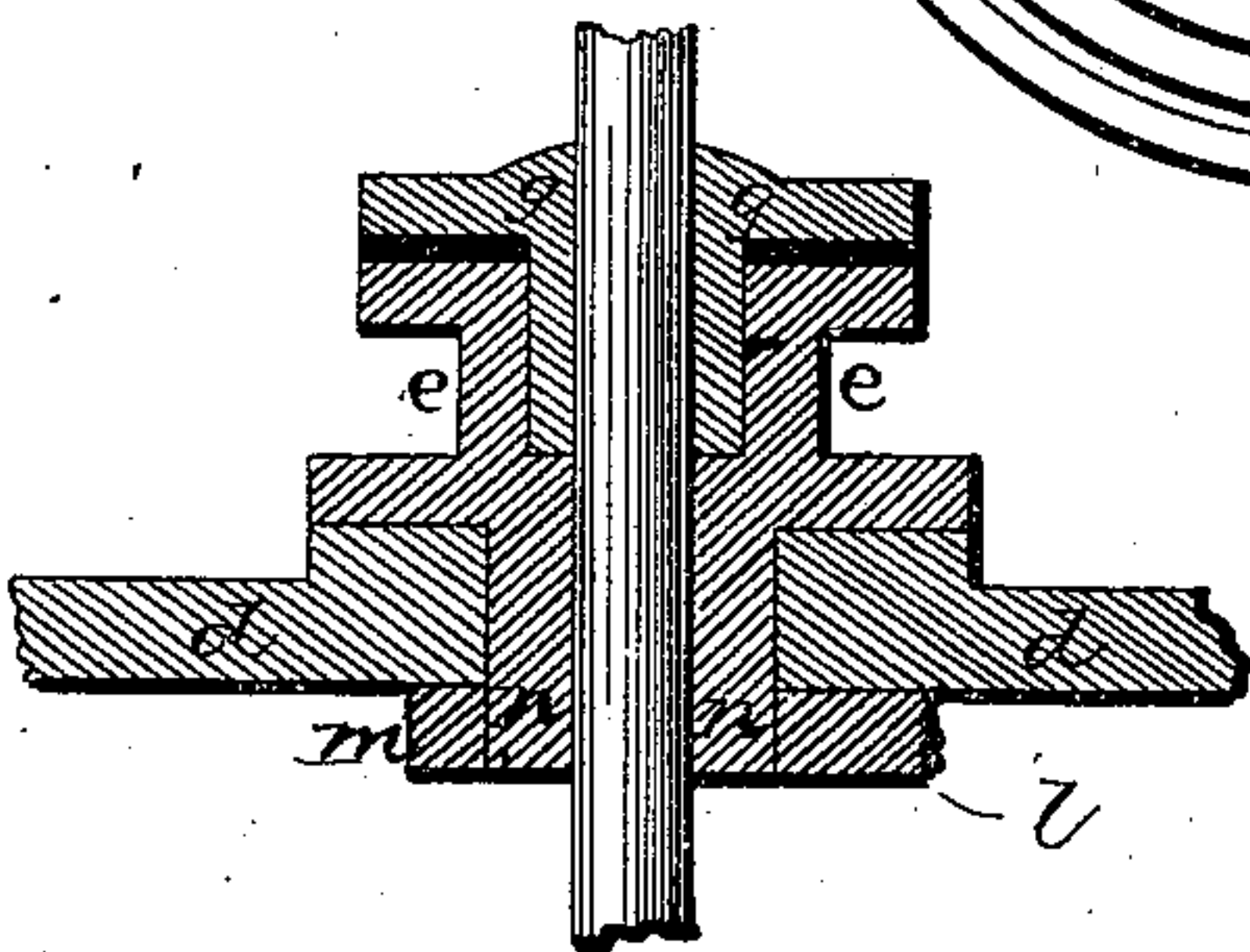
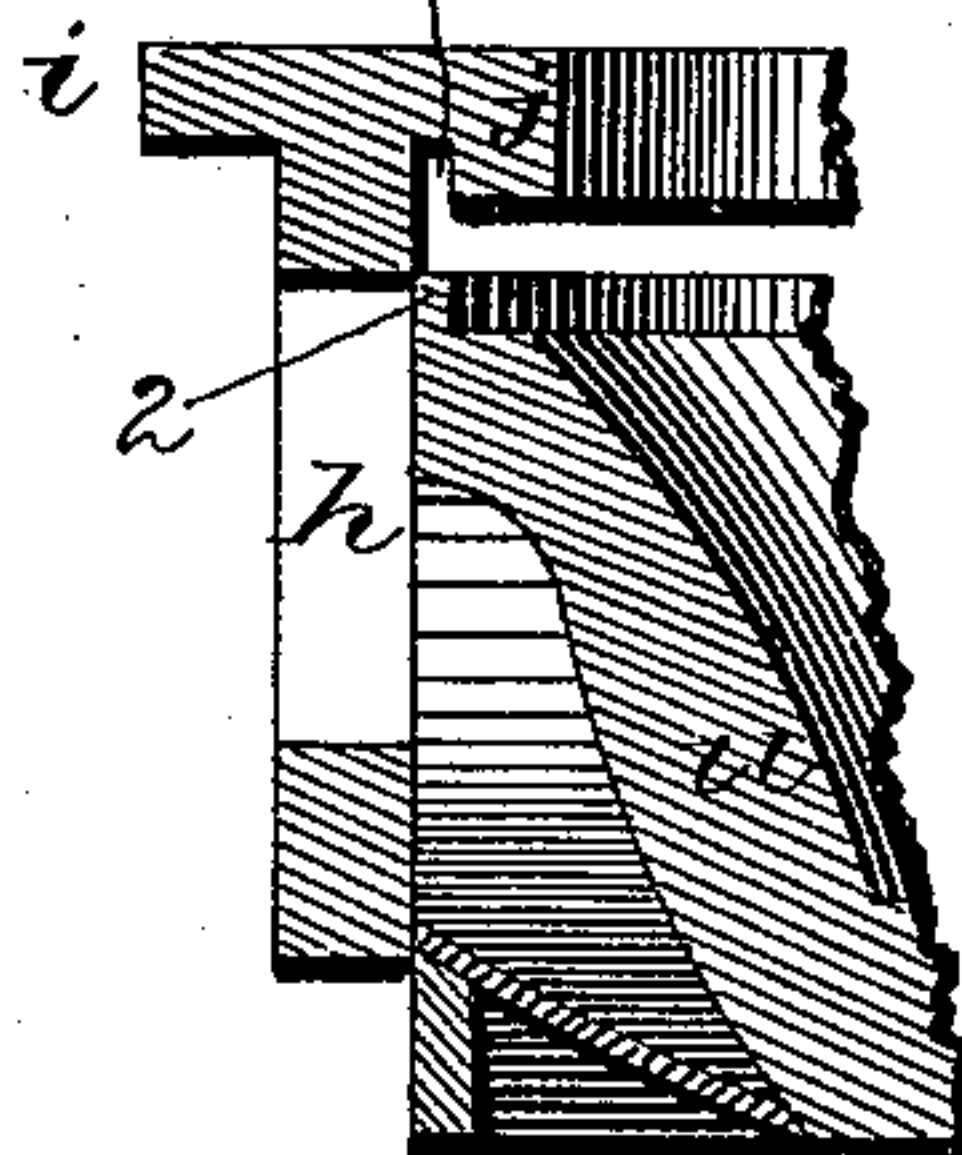


Fig. 4.



WITNESSES.

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INVENTOR.

J. L. Helmer  
per  
F. A. Lehmann,  
att'y.



# UNITED STATES PATENT OFFICE

JAMES L. HELMER, OF ROME, NEW YORK.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 168,641, dated October 11, 1875; application filed July 31, 1875.

*To all whom it may concern:*

Be it known that I, JAMES L. HELMER, of Rome, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Water-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in water-wheels; and it consists in the construction and arrangement of parts that will be more fully described hereafter, whereby tight joints between all of the working parts are formed to prevent leakage, and the construction of the wheel is cheapened and improved.

The accompanying drawings represent my invention.

*a* represents the curb, having the chutes *b* formed between its upper and lower parts, and having the circular groove *c* formed in its top, into which groove fits the lower edge of the dome *d*, so as to form a water-tight joint at this point. Through the center of the dome is made an opening, down through which projects the lower part of the bearing-box *e*, which box is bolted, or otherwise secured, to the dome. This box and dome are made in separate parts, so that when the box becomes worn by the constant friction of the shaft, it can readily be removed and replaced by another. Around the outer edges of the top of the box is formed a wide flange, that forms a means of attachment for the follower *g*. Between the curb and the wheel is placed the gate *h*, which has a flange, *i*, formed around its outer top edge for lapping over the top of the curb, for the double purpose of forming a water-tight joint and supporting the gate in position. Upon the inner edge of the gate is formed a second flange, *j*, which extends out over the outer edge of the wheel, and which flange has a recess, *1*, cut in its under side, so as to receive the flange *2*, formed on the top edge of the wheel. Dovetailed in the top of this gate is an arm, *l*, that is bifurcated at its outer end, as shown, and has an eye or ring, *m*, formed in its inner end, for fitting snugly around the extension *n* of the

bearing-box *e*. This arm or lever has a two-fold function—that of moving the gate back and forth for closing and opening it, and that of preventing any side movement, friction, or play on the gate while moving.

By claspings tightly around this extension the arm holds the gate firmly in position, and prevents any unnecessary wear and tear should the wheel not be set even and true.

Passing down through the dome is a short shaft, *o*, that has attached to its end a disk, *3*, or crank, to which is eccentrically attached a small friction-roller, *4*, that catches and works between the divided end of the arm *l*.

By turning the shaft *o* continuously in either direction the gate will be opened its full distance and then closed again.

These operating devices differ in action from the wheels now in use, inasmuch as most others can be turned only so far in one direction and then must be reversed, while this one can be turned continuously in either direction.

The buckets of the wheel are of such a shape as to act by impact, weight, and reaction of the water, and are either cast with, or afterward secured to, the body *u*, as may be preferred.

This body or hub starts from the bottom of the buckets, where it is flat; then extends upward and slightly outward to the top edge, upon which is formed the flange *2* to fit into the recess *1*.

Having thus described my invention, I claim—

1. The gate *h*, having the flange *j*, recess *1*, and flange *2* on the wheel, as specified.
2. The hub *u*, formed as shown, and having a flange, *2*, formed around its top, as set forth.
3. The combination of the gate *h*, arm *l*, and extension *n*, as shown and described.
4. The combination of the shaft *o*, disk or crank *3*, friction-roller *4*, and arm *l*, as specified.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 20th day of July, 1875.

JAMES L. HELMER. [L. S.]

Witnesses:

E. L. STEVENS,  
WILLARD RINKLE.