

John G. Garretson's
Imp't. in Water Wheels.

Fig. 1.

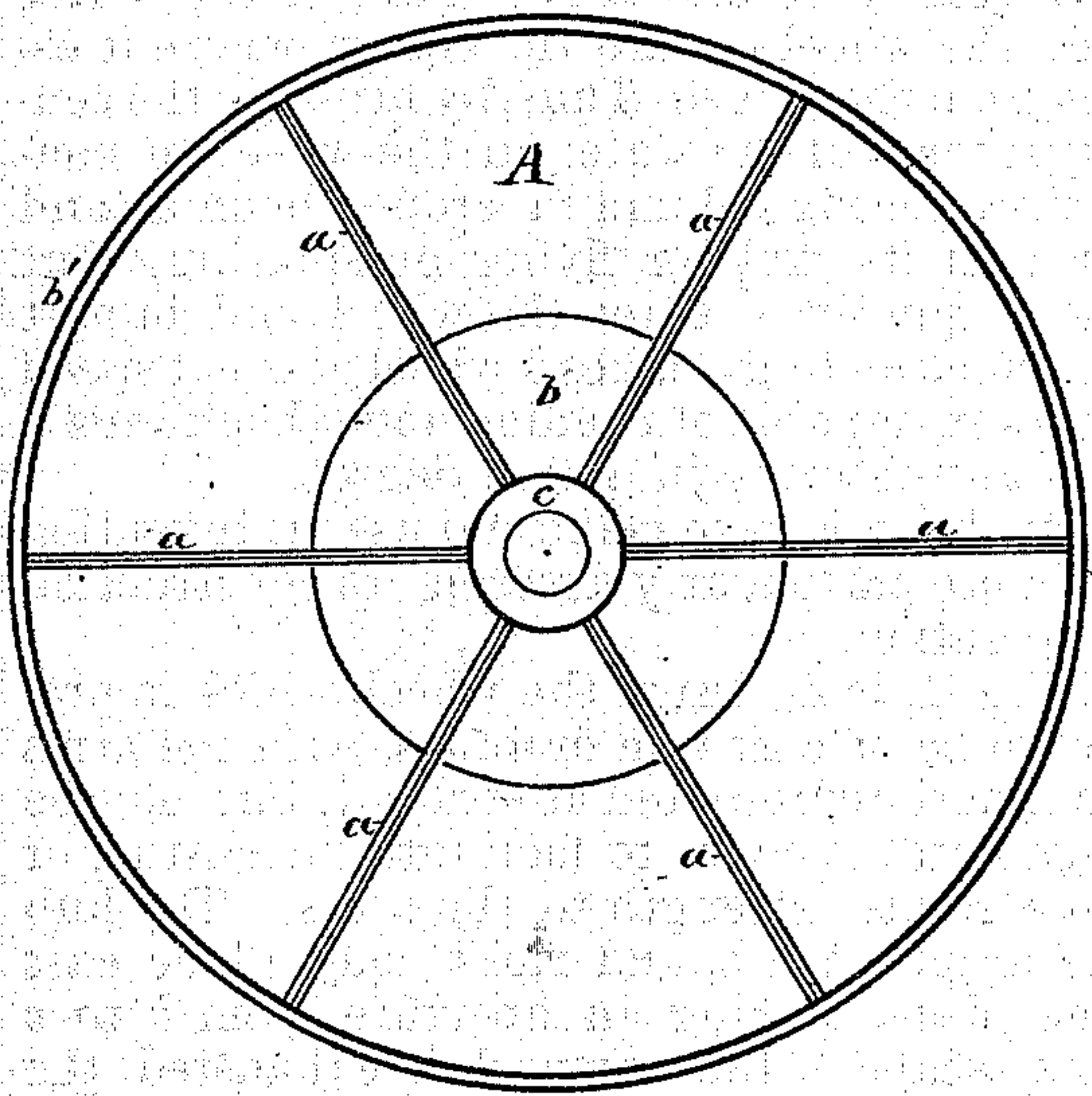


Fig. 2.

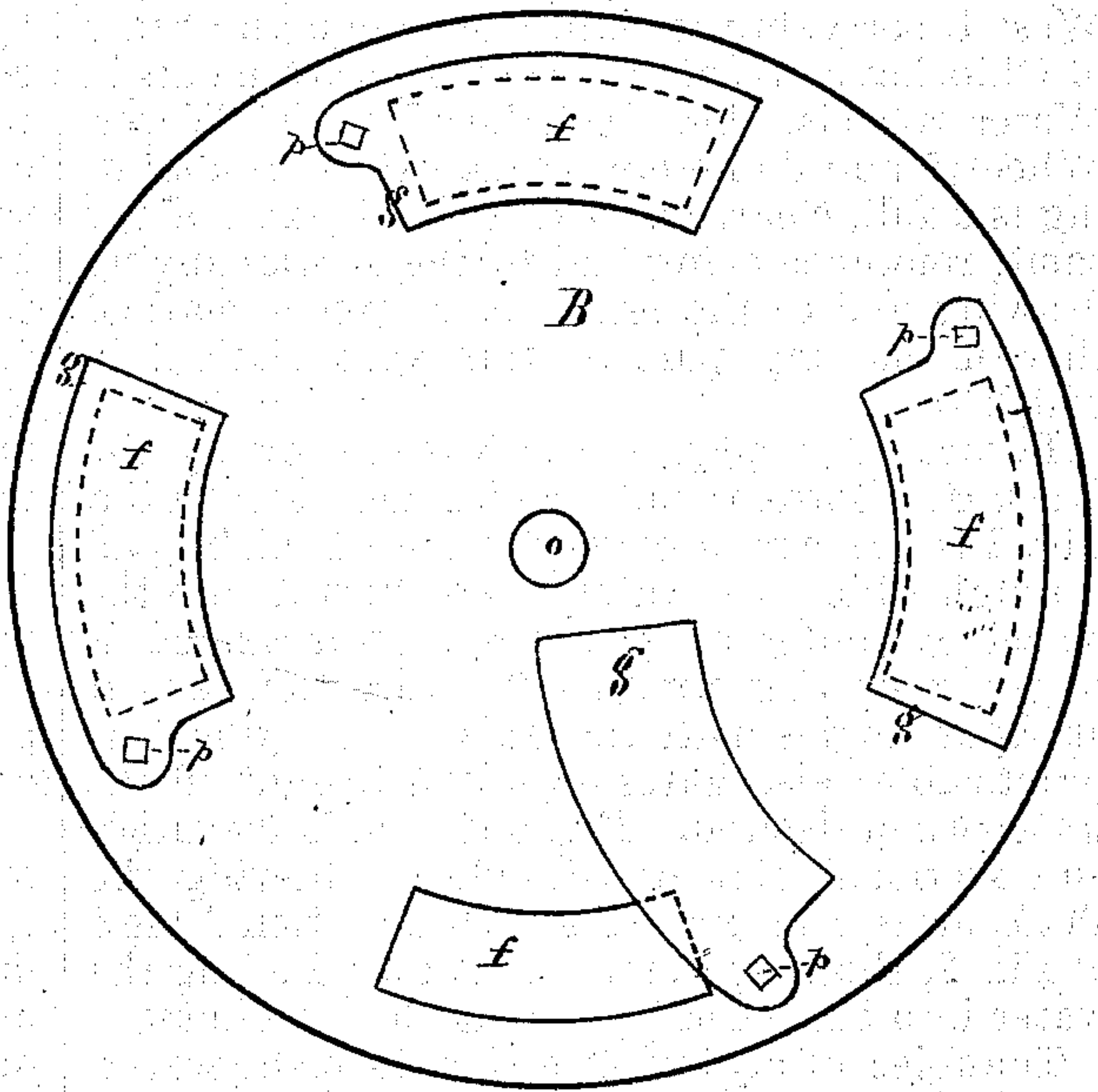


Fig. 3.

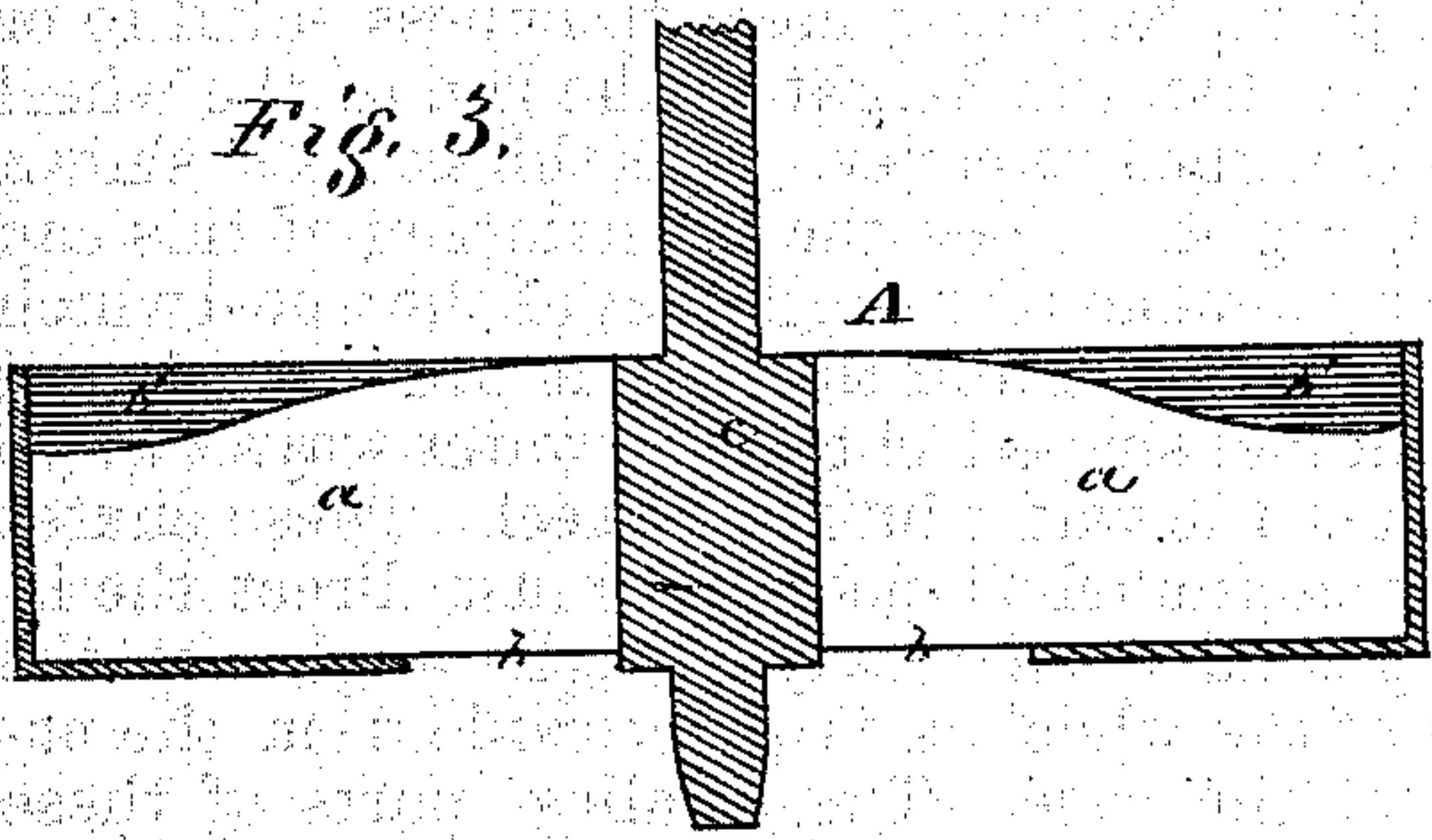
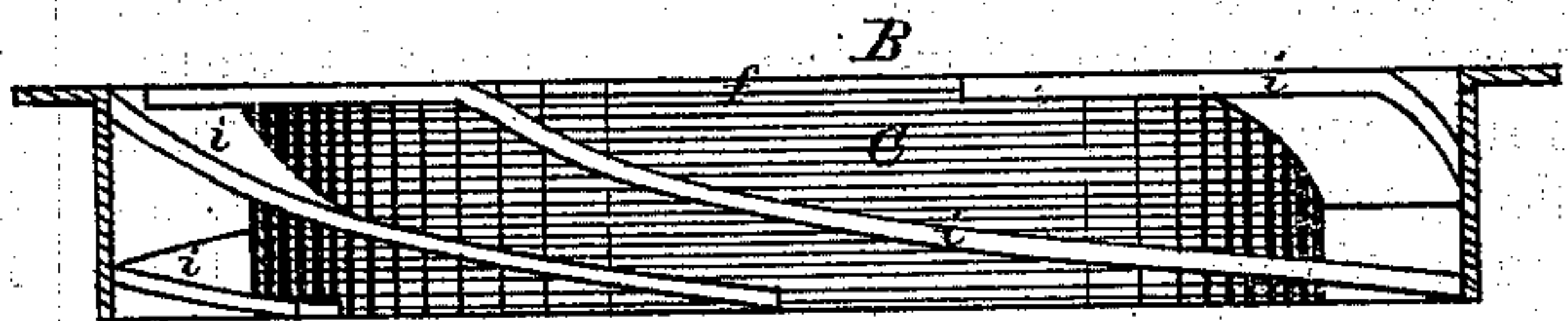


Fig. 4.



Attest.

S. B. Whitacre
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UNITED STATES PATENT OFFICE.

JOHN G. GARRETSON, OF WEST LIBERTY, OHIO.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 119,026, dated September 19, 1871.

To all whom it may concern:

Be it known that I, JOHN G. GARRETSON, of West Liberty, in the county of Logan and State of Ohio, have invented certain Improvements in Water-Wheels, which I call the "Triumph Water-Wheel;" and do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon making part of this specification, in which—

Figure 1 is a plan of the wheel, showing the arms, rim, bottom, and opening near the center. Fig. 2 is the cap or cover for the wheel, by and through which the water is conducted into the wheel by chutes or water-ways, so arranged as to give the water a motion in a direction as near at right angles with the axis of the wheel as practicable; also, gates or valves to shut off the water when desired. Fig. 3 is a side elevation and sectional view of the wheel, showing the shaft, arms, rim, &c. Fig. 4 is a sectional view of Fig. 2, showing the manner of conducting the water into the wheel by funnel-shaped chutes.

The object of my invention is to furnish a water-wheel of the simplest conceivable form, being easily molded and cast in iron or brass, all in one piece, without curves or angles other than such as is necessary to facilitate the castings or give greater strength to the parts; the wheel being neither turbine nor reaction, nor yet properly percussion as that word is generally understood, but when at work may run in the water, under water, and be full of water, to the exclusion of all air as a rare medium through which percussion properly might be supposed to take place; but the entering column thrown into the wheel is prevented from escape downward by the solid bottom, outward by the rim, and upward by the cap; is compelled to move toward the center where it is met by the centrifugal force of the water already in the wheel obstructing its escape in that direction; and is compelled to go round and round with the velocity and momentum that it entered the wheel; the arms extending from the bottom to the cap merely obstruct this round-and-round motion of the water unless they yield to it and go with it, so that, by this action of the centrifugal force, the whole wheel and all the water within it becomes, as it were, a solid body in circular motion, receiving continual im-

pulse from the momentum of the entering column of water. The entering column, thus confined, by its superior force gradually overcomes the centrifugal force and drives part of the water within the wheel toward the center, where it escapes from the wheel. Thus, by utilizing the centrifugal force of the water in the wheel to confine the entering column in proper bounds, and to prevent its striking, flying, or splashing, but cause it quietly to enter the wheel and impart its momentum to it, makes a wheel of great speed and power, capable of running under back-water, and is anti-freezing in a high degree.

To enable others to make and use my invention I will more particularly describe its construction and operation.

A, Fig. 1, is a plan of the wheel, which is proposed to be of cast iron or brass, with the arms *a a a a* here represented as straight, but may be of any suitable curve to facilitate the casting or to give greater strength to the parts. The hub *c*, the arms *a a a a*, and rim *b'* may all be cast in one piece, leaving an aperture from *b* to *c* for the escape of the water when exhausted, the proportion of the parts being nearly that represented in the figure. B, Fig. 2, is the cap or covering for the wheel, and does not consist of a thin plate, but must have thickness equal to or greater than the height of the rim of the wheel it is designed to cover. This thickness is shown at B, Fig. 4. Upon the construction of this cap greatly depends the excellency of the wheel which it covers, for in and through it are constructed the funnel-shaped chutes or water-ways *i i i* to conduct the water into the wheel. These chutes must be funnel-shaped, and must direct the issuing column as nearly at right angles to the axis of the wheel as is practicable from the nature of the case. The smallest parts of these chutes must be just where the water leaves the cap and enters the wheel; or, in other words, that must be the pinching point, as seen at *i i i*, Fig. 4. The outer rim of this cap should be cast with a flange to rest on the bottom of the flume, while the lower part should extend down a little inside of the rim *b'* to prevent the escape of the water between them. *f f* are openings or mouths of the funnel-shaped chutes *i i i*, and may be covered by the valve *g* or any other suitable gate. These valves may be made to open or close by turning the square-topped shaft P. Fig. 3 is an elevated

sectional view of the wheel. This wheel may be of any diameter, from a few inches to several feet. Fig. 4 is a sectional view of the cap, and shows the necessary thickness in order to form the funnel-shaped chutes *i i i i* for conducting the water properly into the wheel.

The operation may be as follows: Open one or more of the valves *g* and the water enters through the chutes into the wheel, and then endeavors to fly off at a tangent, but is prevented by the rim *b'*; the solid bottom preventing its escape downward, and the cap preventing its rising upward, it is compelled to move in a circuit, still bearing against the rim *b'* with all its centrifugal force; the column, still entering, eventually fills the whole wheel with water from the hub *c* to the rim *b'*, and from the bottom to the cap. The entering column can now gain no admittance but by contending with the centrifugal force of the water. Thus confined, the entering column cannot strike, splash, or fly, but quietly takes position side by

side with the water already in the wheel, imparting its momentum to the wheel, and compelling part of the water previously in the wheel to approach the center and pass off.

Now what I claim as new and my invention, and desire to secure by Letters Patent, is—

The combination of the cap B, Fig. 2, with its funnel-shaped chutes *i i*, with the wheel A, Fig. 1, constructed as described, the funnel-shaped chutes throwing the water into the wheel at nearly right angles to the axis of the wheel, while the centrifugal force of the water already within the wheel prevents the striking, splashing, or flying of the entering column, but causes it to quietly take position in the wheel and impart to the wheel the momentum with which it entered, in the manner and by the means above set forth.

JOHN G. GARRETSON.

Witnesses:

R. N. JORDAN,
JENNIE JORDAN.