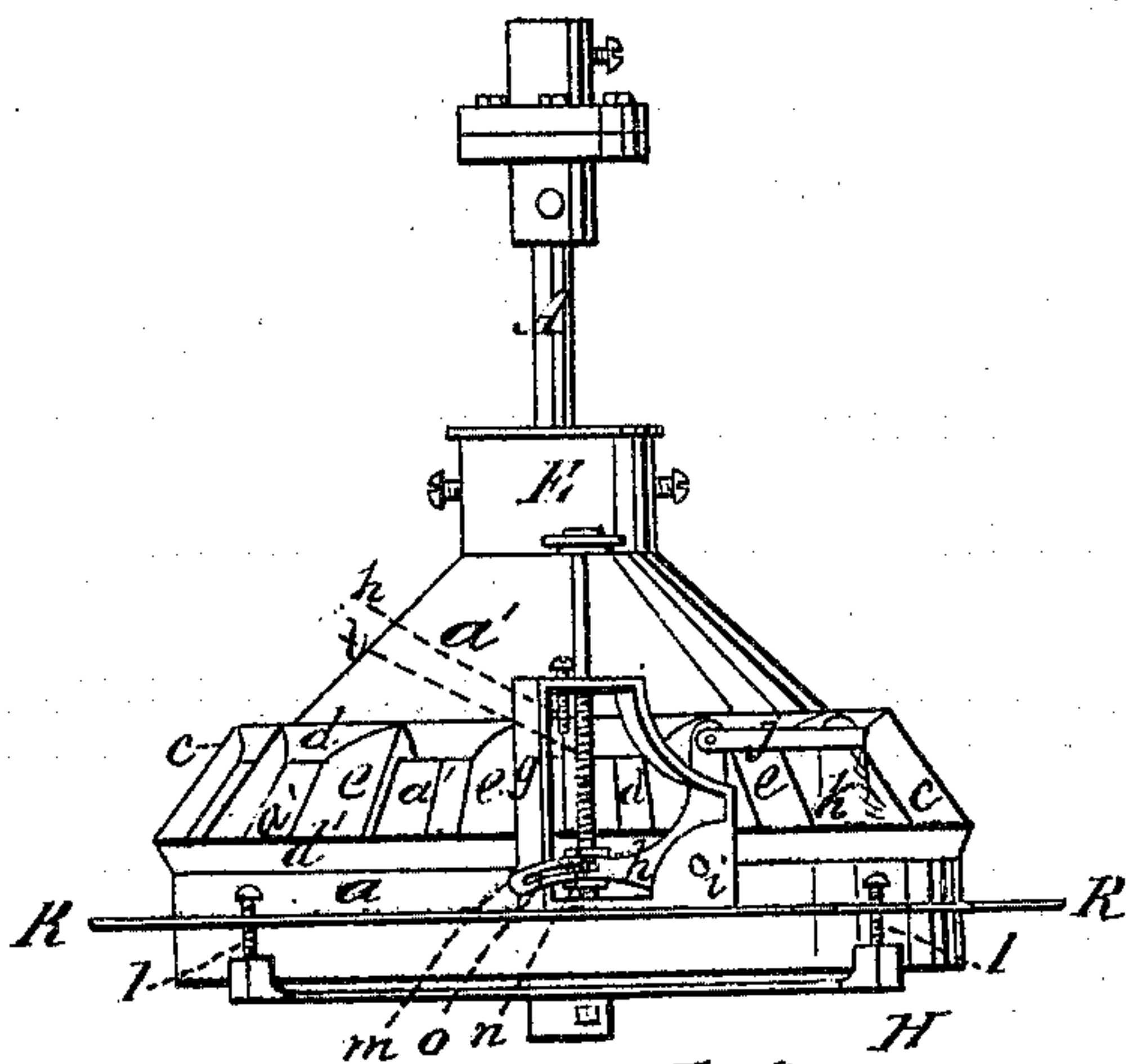
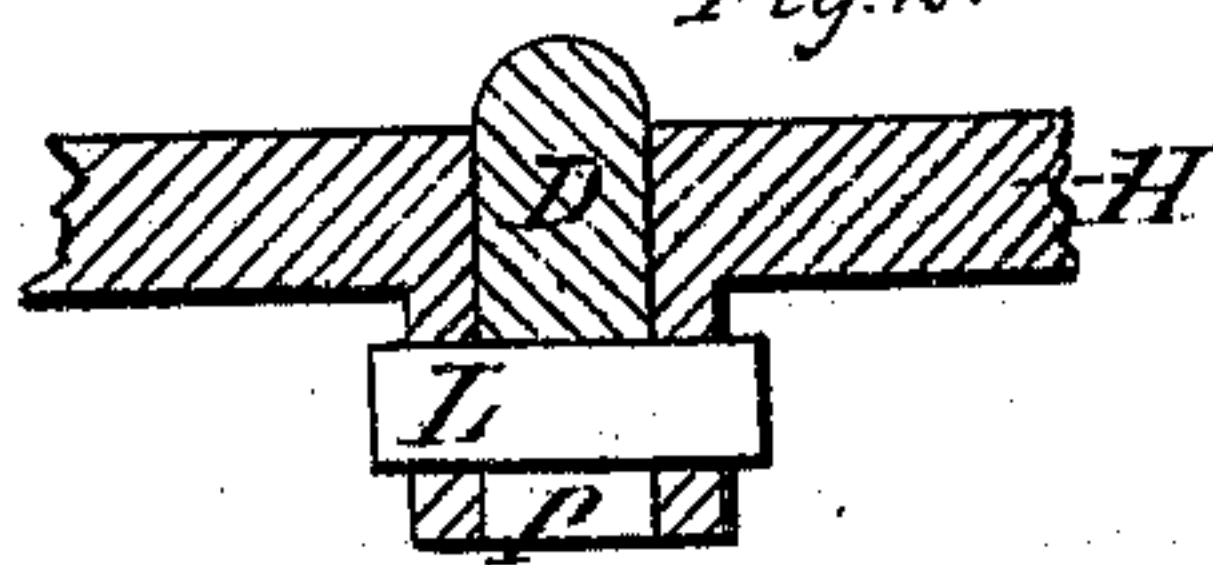


*J. I. Case.*  
*Water Wheel.*  
*N<sup>o</sup> 97,355. Patented Nov. 30, 1869.*

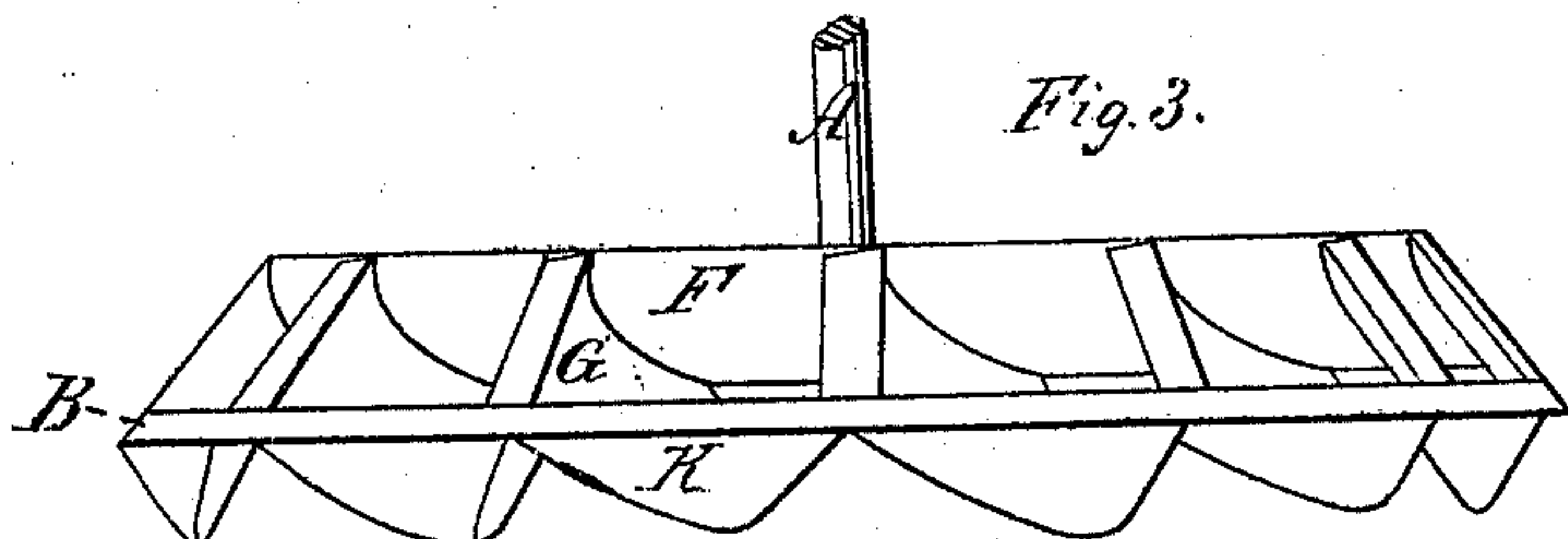
*Fig 1.*



*Fig 2.*



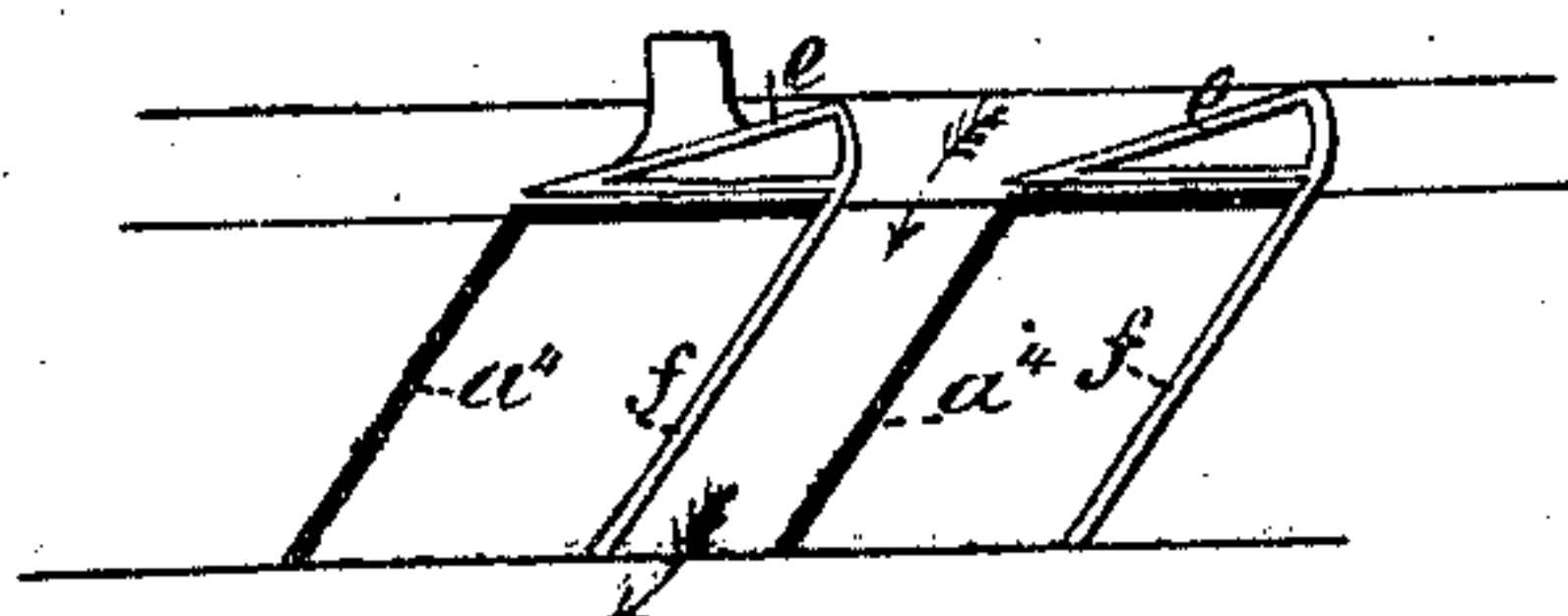
*Fig 3.*



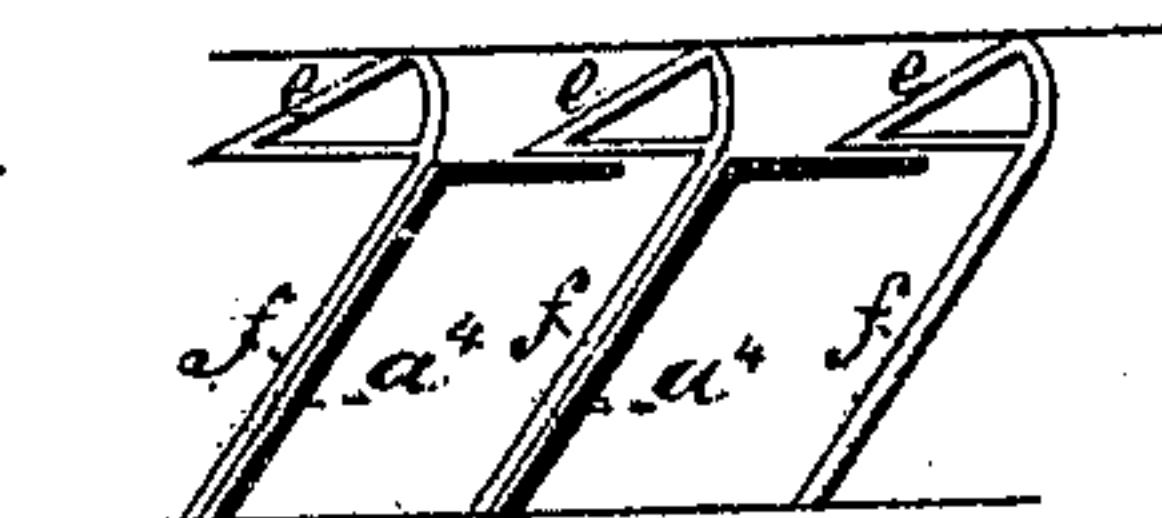
*Fig 4.*



*Fig 5.*



*Fig 6.*



Witnesses.

*Joseph Arbeiter*  
*Jerome W. Phys.*

Inventor.

*Joel I. Case.*



# United States Patent Office.

JOEL T. CASE, OF BARKHAMSTED, CONNECTICUT.

Letters Patent No. 97,355, dated November 30, 1869.

## 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, JOEL T. CASE, of Barkhamsted, county of Litchfield, and State of Connecticut, have invented certain new and useful Improvements in Water-Wheels; and to enable others skilled in the art to make and use the same, I will proceed to describe it, referring to the drawings, in which the same letters indicate like parts in each of the figures.

The nature of this invention will be understood from the specification and drawings, the object of which is to simplify its construction, regulate the pressure, quantity, and flow of water uniformly upon all parts of the wheel.

In the accompanying drawings—

Figure 1 is a side elevation.

Figure 2 is a section of the bridge and step of the wheel-support.

Figure 3 is a side view of the wheel.

Figure 4 is an edge view of the bottom of its buckets.

Figures 5 and 6 show sections of the rotating ring or gate, which opens and closes the port through which the water is admitted to the wheel.

*a* is the wheel-case.

*a'* is a cone-shaped cover to the wheel-case, and is provided with openings *a'*, sides and bottom guide-plates, in number more or less, corresponding to the number of buckets in the wheel, each of which openings *a'* is provided with sides and a bottom water-guide plate, arranged at an angle in which it may be desirable to throw the water upon the wheel, and near the lower or outer edge of the cover *a'*, the sides being at about a right angle with the line of the cover *a'*, and the bottom at about an angle of forty-five degrees, more or less, with a perpendicular line.

Directly over these openings is arranged a rotary flange-ring, *e*, which consists of two flanges, *d d'*, between which, and at regular intervals, are arranged and secured curved bonnets *e*, the back edge of which is about flush with the edges of the flanges *d d'*. The other edge fits down, as also the inner flange, upon the surface of the cover *a'*. The lower edge of the flange *d'* fits down over the lower edge of the cover *a*, so as to keep it, the ring *e*, firmly in its proper place upon the cover, and allow it to be moved or rotate back and forth thereon, over the openings or water-ports *a'*. The back edge of the plate or bonnet *e* is bent down and fits closely to the cover *a'*.

Each of these bonnets is provided with a flap, *f*, which extends down through the openings *a'*, and arranged at about the same angle, or parallel with the plate *a'*, so that when the ring is moved in one direction, the openings *a'* will be simultaneously uncovered, more or less, as desirable, by the movement of the ring back and forth over these ports, by means of an apparatus hereinafter described. Various other ways may be employed for securing these rings in place.

This cover is also provided with a flange, or other means, by which it is connected to the case *a*.

Upon one side of this case *a* is secured a boxing, *g*, in which is arranged an angle-lever, *h*.

The angle-corner is secured in the lower corner of the box *g*, by a pin or screw, *i*.

A connection, *j*, is made from one end of said lever, *h*, to a boss, *k*, upon the ring *e*.

The other end of lever *h* is operated by means of a perpendicular screw, *l*, arranged within the box *g*.

Upon said screw is arranged a lifting or depressing-nut, *m*.

The outer end of the lever *h* is connected to said nut by a screw, *n*, working through and in a slit, *o*, so that by turning the shaft or screw *n*, through the medium of the lever *h* and connection *j*, the ring *e* will be actuated back and forth over the ports in the cover, and allow a greater or less flow of water to act upon the wheel.

A regulating-screw, *p*, is arranged in the top of the box, for the nut *m* to strike against, by means of which the action or motion of the ring is regulated to allow a given quantity of water to flow upon the wheel.

*B* is the wheel, connected to the shaft *A* by means of arms or plate.

The lower end of this shaft takes its bearing in or on the step *D*.

The upper end is adjusted in its proper place and position in the box *E* by means of set-screws.

The flange *F*, or upper side of the buckets, is located so as to be just one side of the openings *a'*, through the cover *a'*, and at an angle of about forty-five degrees with the shaft *A*.

To the outside of the flange *F* are secured buckets *G*. The shape of the bottom or back of the bucket is clearly shown in fig. 4.

The outer edge or side of the bucket *K* is turned up or formed in a circular line corresponding to the diameter of the wheel, and about equal distance from the flange *F*.

The upper edges of these buckets are designed to fit closely inside of the cover, to prevent waste of water.

Thus, it will be seen, that the water is admitted through the openings in the cover and guided in a fixed direction, and expends its force directly against the buckets, and then escapes therefrom underneath the buckets, without reacting in any manner to retard the motion of the wheel.

*H* is a bridge, secured to the under side of the wheel-case by means of bolts *I*.

*D* is a step, inserted into the hub of the bridge *H*, is held therein by a key, *L*, so that when any repairs are needed it is only necessary to support the wheel in place, remove the key *L*, and the step may be easily removed from the under side, repaired, or a new one



inserted in its place, and secured therein, by again inserting the key L through the hub and slit P, formed in the lower end of said step.

This wheel is designed to be set in an opening formed in the bottom of a flume, and is held in a fixed position thereto, by means of bolts and flange R.

I believe I have thus shown the nature, construction, and advantage of this improvement, so as to enable others skilled in the art to make and use the same therefrom.

I do not claim the wheel of itself considered, nor do I claim the slitted step D.

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

1. The bonnet gate-ring *c*, constructed as described,

arranged over corresponding openings *a*<sup>1</sup>, upon a cone-shaped cover *a'*, for admitting, cutting off, or regulating the flow of water, substantially as set forth.

2. The combination of the screw *m*, angle-lever *h*, connection *j*, with the ring *c*, substantially as and for the purpose set forth.

3. The combination of the wheel B with the case *a* and ring *c*, substantially as set forth.

4. The slitted step D, in combination with key L and bridge H, substantially as and for the purpose set forth.

JOEL T. CASE. [L. S.]

Witnesses:

JOSEPH ARBEITER,  
JEREMY W. BLISS.