

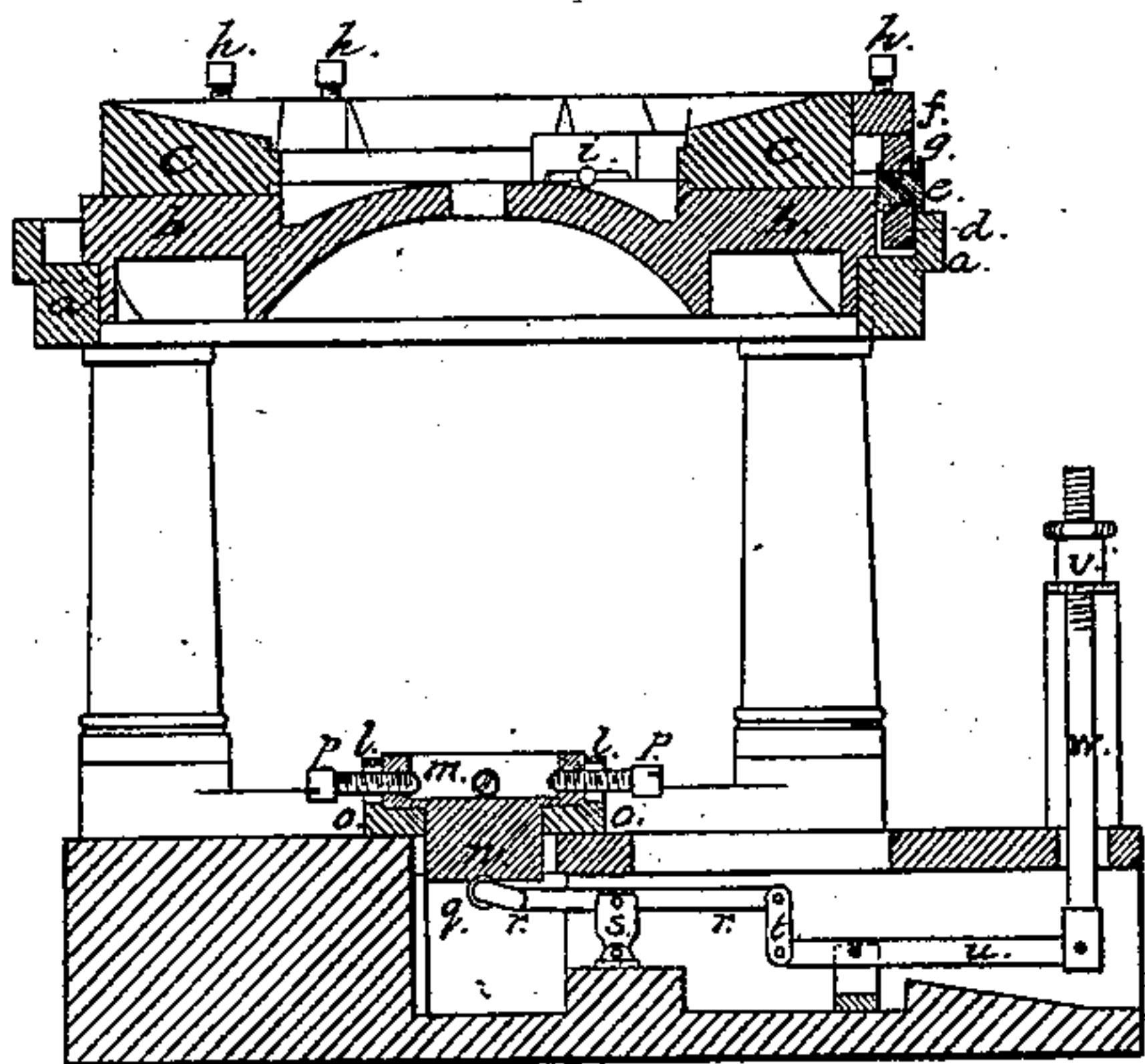
*D. H. Brown,*

*Water Wheel,*

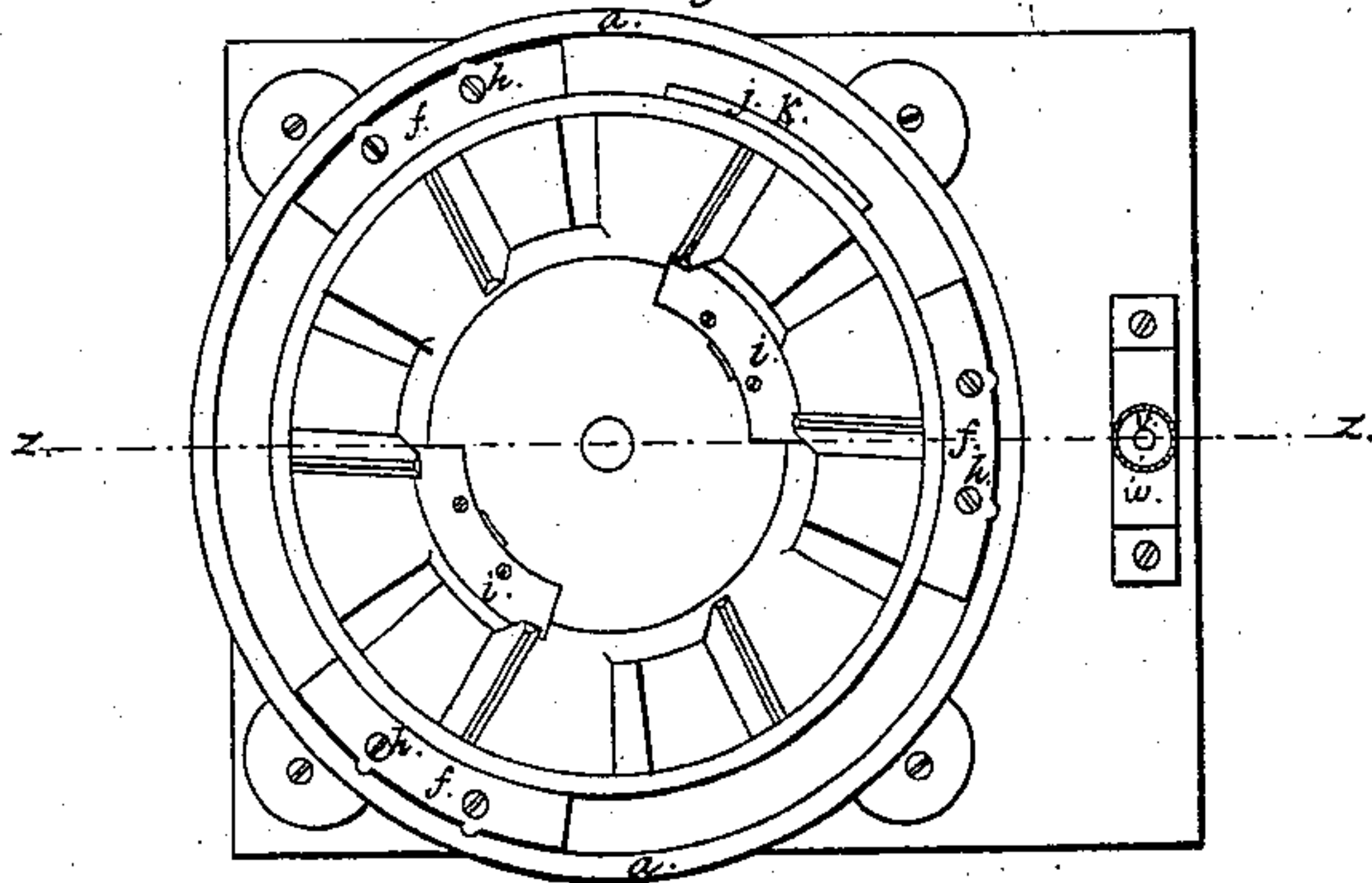
*N<sup>o</sup> 59,353.*

*Patented Nov. 6, 1866.*

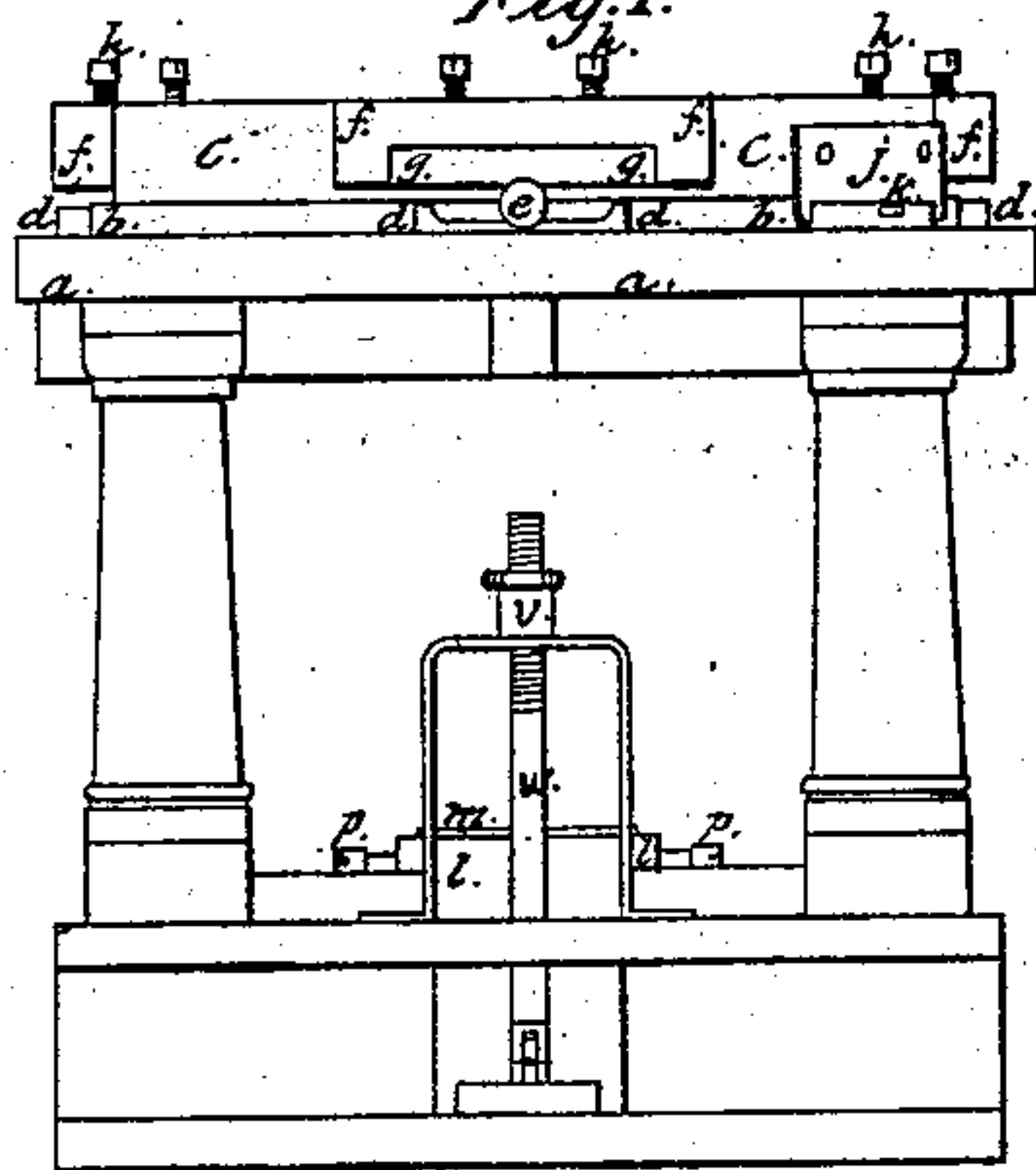
*Fig. 3.*



*Fig. 2.*



*Fig. 1.*



*Witnesses,*

*J. G. Hildert  
W. W. Frothingham*

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D. H. Brown  
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# UNITED STATES PATENT OFFICE.

DANFORTH H. BROWN, OF NORTHFIELD, VERMONT.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 59,353, dated November 6, 1866.

*To all whom it may concern:*

Be it known that I, DANFORTH H. BROWN, of Northfield, in the county of Washington and State of Vermont, have invented Improvements in Water-Wheels; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to the detail of construction by which the gates of horizontal submerged water-wheels are easily moved in opening and shutting; and also to the details of construction by which the shafts of such wheels are raised or lowered to insure the perfect meshing of the gearing therewith connected, notwithstanding the wear of the steps of such shafts.

The invention is applicable to turbine-wheels generally, and particularly to wheels such as are shown and described in the United States Letters Patent No. 34,696, dated March 18, 1862.

Figure 1 of the drawings shows, in elevation, a wheel-foundation, the shaft-step and apparatus connected therewith, the wheel-chute, chute-case, and water-gate, in connection with which parts my invention is incorporated. Fig. 2 shows the same in plan, while Fig. 2 3 is a vertical central section taken on the line *z z*, seen in Fig. 2.

The chute-case *a* is a ring of metal preferably, and is supported, by posts or otherwise, conveniently above the wheel-foundation, so as to give room for the wheel and the shaft-supporting apparatus. The chute itself is turned so as to fit into and rest in the chute-case, the wheel (not shown in the drawings) also fitting into the same chute-ring case, so that the upper side of the wheel fits up to the lower side of the chute *b*.

The water-gate is marked *c*, having openings through it corresponding with the openings in the top of the chute, and covers adapted to entirely cover the said openings. On the side of the chute itself, at intervals around it, are projections *d*, which answer as ways or tracks for the friction-rolls *e*, while on the gate, at corresponding intervals, are projections *f*, which serve to contain the pieces *g*, made adjustable, so that the face of the gate can be set with exactness in relation to the face of

the chute—that is to say, with the two faces fairly in contact with each other, but with the weight of the gate resting wholly on the friction-rolls *e*. The means for adjusting the pieces *g* for the purpose described consist of set-screws *h*.

Where the gate is large or light, and liable to be sprung by the weight of water at or near the center, so as to cause the face of the gate to rest and drag on the face of the chute, similar devices to those just described may be provided on the interior circles of the gate and chute, as seen at *i i*, Figs. 2 and 3.

To prevent undue movement of the gate, the stop-piece *j* is secured thereunto, which is operative at each end on the pin *k*, secured in the chute, this being best seen in Fig. 1.

As the gate is opened and closed by the well-known means of a segment-gear and pinion, these are not shown in the drawings.

This part of my invention, just described, consists in securing the lower part, *d*, of the friction-roller ways to the chute itself instead of to the chute-case or other part of the wheel pit or foundation, as in the patent before referred to, so that, notwithstanding any settling or derangement of the chute-case or other part of the wheel-foundation, the gate will always work freely and easily over the chute; also in making the upper ways for the friction-rolls in two parts, *f* and *g*, provided with means for adjustment of one part within the other.

At the bottom of the race-way, and solidly secured thereunto, is a cylinder, *l*, in which is fitted a second cylinder, *m*, this having a solid projection, *n*, extending through the sole-plate *o* of the cylinder *l*.

The set-screws *p* form the means for securing and adjusting the shaft-step (not shown) in the cylinder *m*, and centrally with respect to the chute-case, chute, and gate, the cylinder *l* having slotted holes therein, through which the set-screws *p* project, so that they can rise and fall without obstruction as the cylinder *m* is adjusted vertically.

In the bottom of the projection *n* is a semi-circular groove corresponding to a roll, *q*, fitted in the end of lever *r*, which is pivoted to a vibrating or swinging fulcrum-piece, *s*, this moving back and forth as the lever *r* changes its position, allowing the roller *q* to move vertically instead of in an arc of a circle.



The power to raise or lower the shaft-step may be applied directly to the long arm of this lever *r*, or it may be applied, as I prefer and as is shown in the drawings, through the intervention of the link *t* and lever *u*, the weight of the parts supported resting on the nut *v*, which may be in the hub of a hand-wheel operating on the screw cut on the rod *w*.

This second part of my invention just described consists in the combination and arrangement of mechanism for adjustment of the shaft.

I claim—

1. The arrangement of the lower friction-roller ways, *f*, as projections directly from the chute, as and for the purpose described.

2. In combination with the gate *c*, the construction of the upper part of the friction-roller ways in two parts, *f* and *g*, when provided with means for their adjustment relative to each other, as described.

3. The combination of the slotted cylinder *l* with the inner cylinder, *m*, its set-screws *p*, the lever *r*, and moving fulcrum *s*, operating together, substantially as set forth.

DANFORTH H. BROWN.

Witnesses:

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