(No Model.)

E. W. STUBBS.

TURBINE WATER WHEEL.

No. 294,929. Patented Mar. 11, 1884.

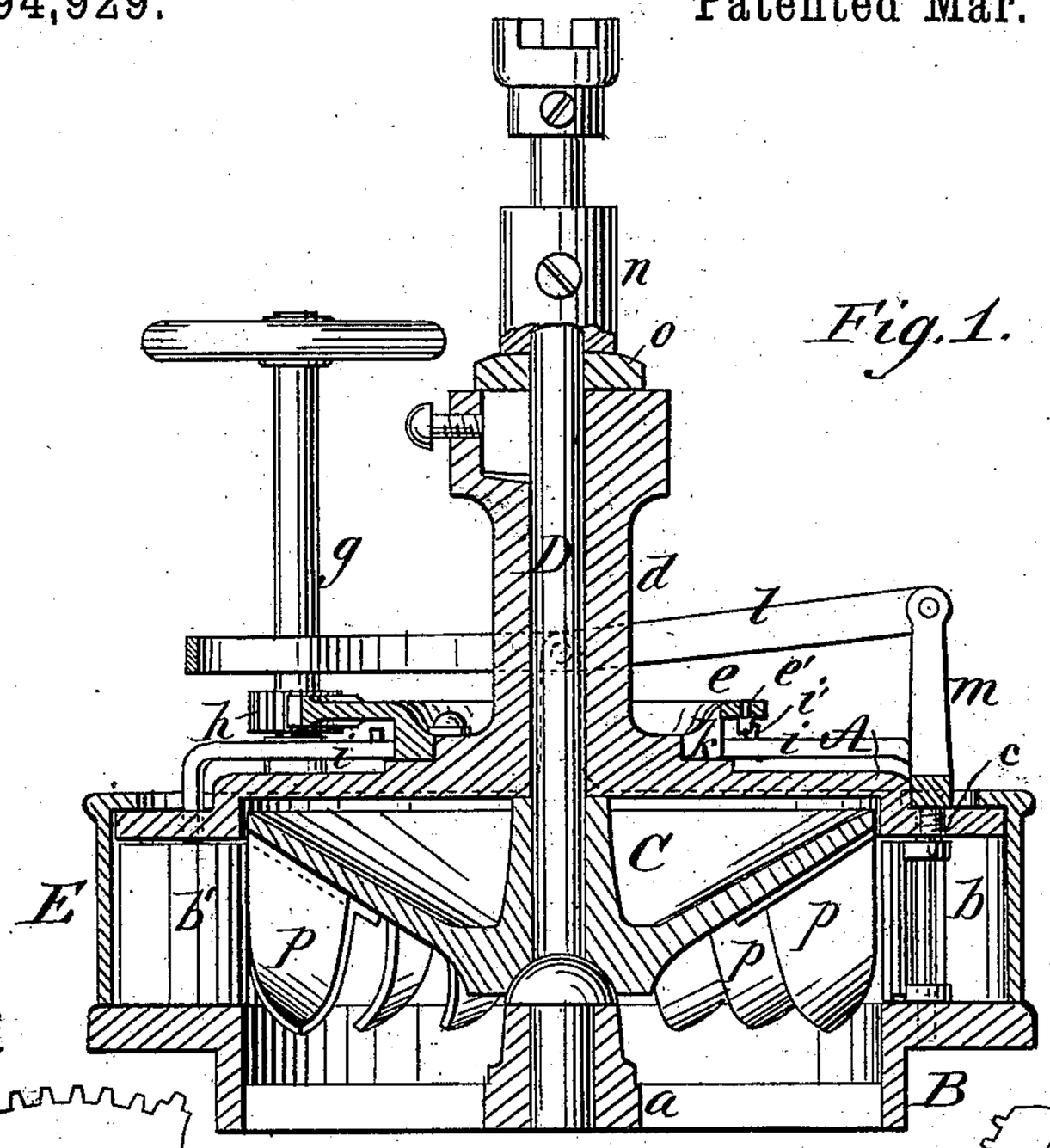


Fig. 1.

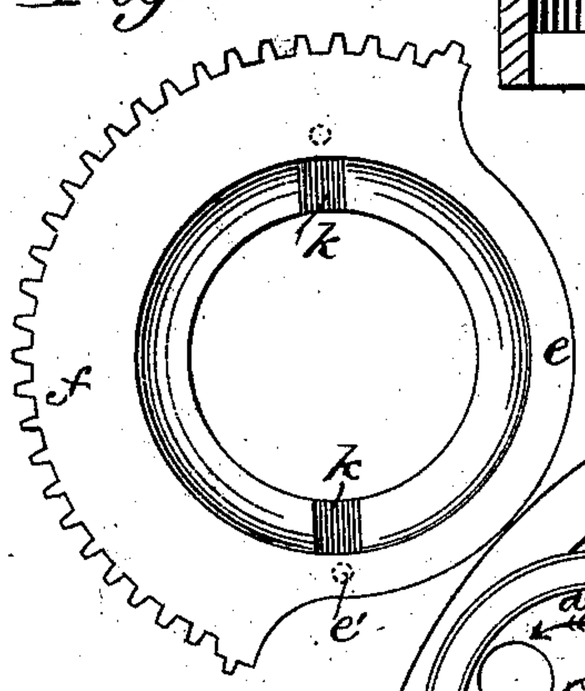


Fig. 3.

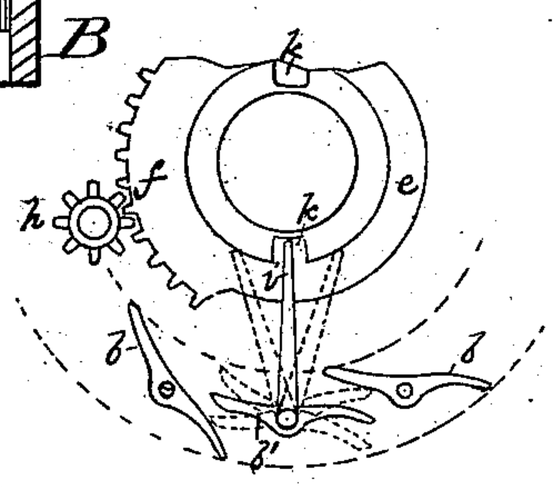
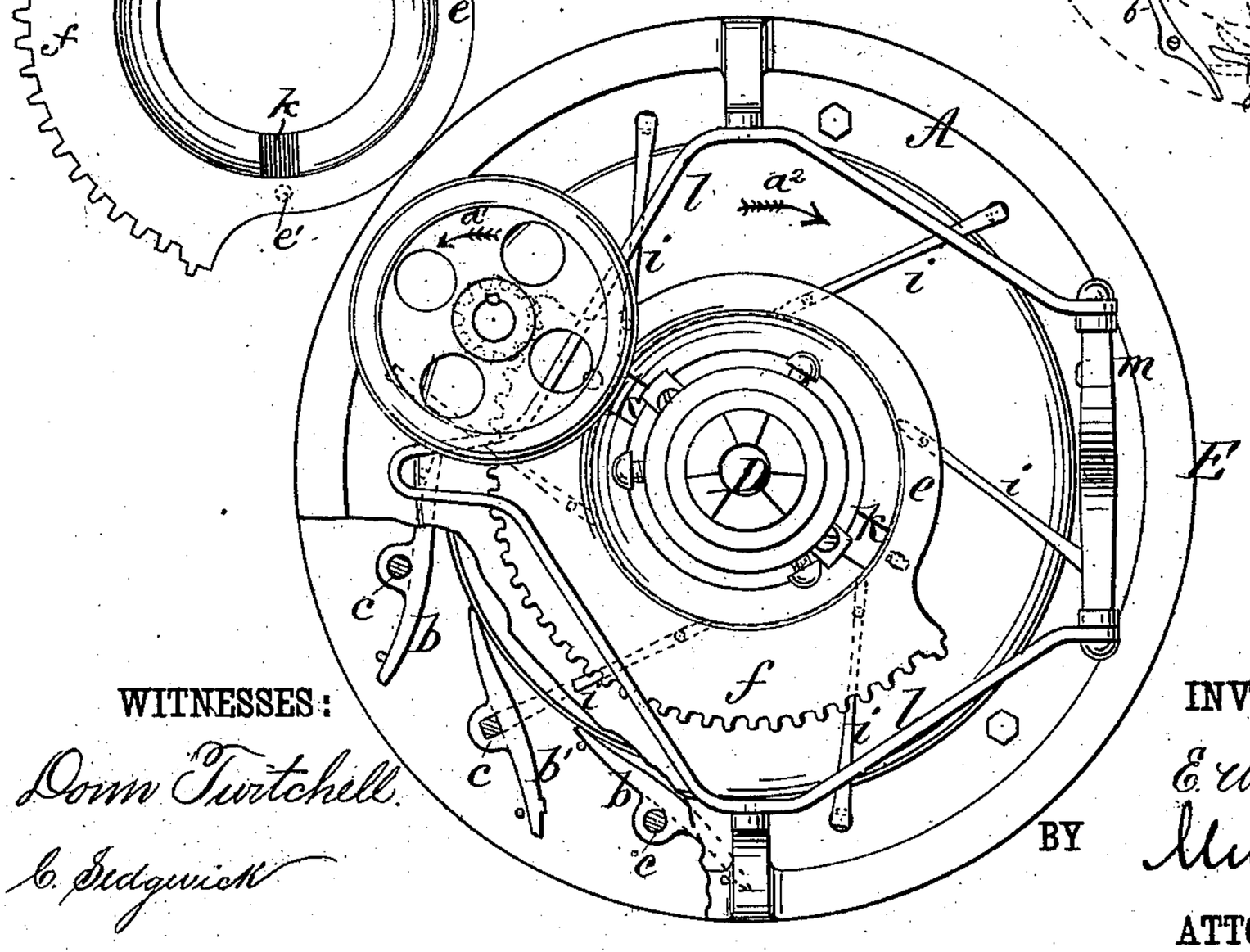


Fig. 4.

Fig. 2.



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ELBRIDGE W. STUBBS, OF LINCOLNTON, NORTH CAROLINA.

TURBINE WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 294,929, dated March 11, 1884.

Application filed October 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, ELBRIDGE W. STUBBS, of Lincolnton, in the county of Lincoln and State of North Carolina, have invented a new and Improved Turbine Wheel, of which the following is a full, clear, and exact description.

My improvements relate to the class of water-wheels in which the water is supplied to the wheel through peripheral chutes, the object being to obtain a discharge of water upon the paddles of the wheel in solid streams, which will give the best effect, and also to obtain a greater proportionate power when the gates are partly open.

To these ends my invention consists in a novel construction of the guides or chutes and the mechanism for opening them.

It further consists in a flange-ring gate hung upon a yoke pivoted to a support on the top plate, as hereinafter fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical transverse section of my improved water-wheel. Fig. 2 is a plan view with the cover of the case broken open. Fig. 3 is a plan view of the loose ring having a cogged segment. Fig. 4 is a detail view of the ring, the pinion that operates it, and two stationary guides and one movable guide.

The case of the wheel is formed by a top plate, A, a ring-bottom, B, and an inclosing-ring, E, which rests on its lower edge upon the bottom B, and is formed at its upper edge with a flange projecting over the top plate, A.

C is the wheel on the shaft D, that is stepped in a bridge, *a*. The diameter of the wheel C corresponds to the aperture in the ring-bottom B, and within the space in the case around the wheel are the chutes formed by guides *b b'*, every other one of which is pivoted on an axle, *c*. The top A is formed with a post or hub *d*, for the shaft, and around this hub upon the plate A is loosely fitted a ring, *e*, one side of which is formed with a cogged segment, *f*. This ring is dish-shaped or concave, so that its outer edge and the segment *f* stand above the surface of the top A. Upon the top A is fitted a shaft, *g*, provided with a hand-wheel, and carrying at its lower end a pinion, *h*, that meshes with the segment *f*, so that by turning the shaft *g* the ring *e* will be turned. The movable guides *b'* are secured to their axles *c*, and the axles are formed above the top A with crank-arms *i*, that extend beneath the ring *e*, and these arms are provided with pins or projections *i'*, for contact with projections *e'* on the under side of the ring *e*. The ring *e* is formed next to the hub *d*, in its concave portion, and at opposite sides with slots *k k*. The lugs *e'* and the slots *k* are so placed that by the rotation of the ring *e* the lugs come in contact with one arm *i* at opposite sides of the wheel, and move the same to cause them to enter the notches *k*, where, by the continued rotation of the ring, the guides *b'* will be either opened or closed in pairs successively, according to the direction in which the ring is rotated. The outer flanged ring, E, serves as a gate to the wheel, and for that purpose it is hung upon a yoke, *l*, which is pivoted to a fixed support, *m*, on the top A, so that by raising the yoke up and down the ring-gate is opened and closed.

Instead of the yoke, racks or other similar devices may be used for operating the gate.

On the shaft D, above the hub or post *d*, is fixed a collar, *n*, beneath which is a ring or washer, *o*, that rests on the top of the post, thereby serving to support the shaft and wheel, and in connection with the step *a*, at the lower end of the shaft, forms a bearing and prevents excessive wear upon the lower step. The body of the wheel C is in the form of an inverted cone, and on the beveled under side are fixed the wings or buckets *p*, which are triangular in their outlines and curved on the side that receives the impact of the water. By this construction of the wheel a greater proportionate power is obtained when the gate is only partially open, dead-water prevented from accumulating around the hub above the top of the wheel, and the discharge of the water from the wheel, after having acted thereon, facilitated.

By the arrangement of the guides *b b'* as shown, and the manner in which the alternate guides *b'* open and shut, they form chutes which act to convey the water to the wheel in

a solid stream instead of in knife-blade streams. A more useful effect of the water is thus obtained.

In operation, the wheel being in motion, if it be desired to close the gates, the shaft g is to be turned in the direction of the arrow a' by its hand-wheel, and this will cause the ring e to turn in the direction of the arrow a^2, and the lugs e' thereon, coming in contact with the pins i' of two of the arms i of the movable guides b', will move the said arms and cause them to enter the notches k of the ring, when the lugs and pins pass each other, for as the arms i come in line toward the center of the ring, their pins get nearer to the center of the said ring, and are moved out of line of the lugs of the ring. Now, by the continued rotation of the ring, the arms will be carried around with the ring by the notches k until their ends clear the said notches and the guides closed, as shown in Fig. 4.

To open the guides the ring is turned in the reverse direction to the arrow a^2.

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

1. In water-wheels, the pivoted guides b' and fixed guides b, in combination with the wheel C, and wheel-case provided with an outer ring-gate, substantially as shown and described.

2. In a water-wheel, the combination, with the ring e, provided with the projections e' and slots k, and means for operating the same, of the pivoted guides b', provided with the arms i, having projections i', substantially as herein shown and described.

3. In a water-wheel, the combination, with the ring e, provided with the cogged segment f, the projections e', and slots k, and the shaft g, provided with the pinion h, of the guides b', the axles c, and the arms i, provided with the projections i', substantially as herein shown and described.

4. In a water-wheel, the combination, with the top plate, A, provided with the support m, of the yoke l, pivoted to the support m, and the flanged-ring gate E, hung upon said yoke, substantially as herein shown and described.

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