

J. FRANK.  
Water-Wheels.

No. 129,807.

Patented July 23, 1872.

Fig. 1.

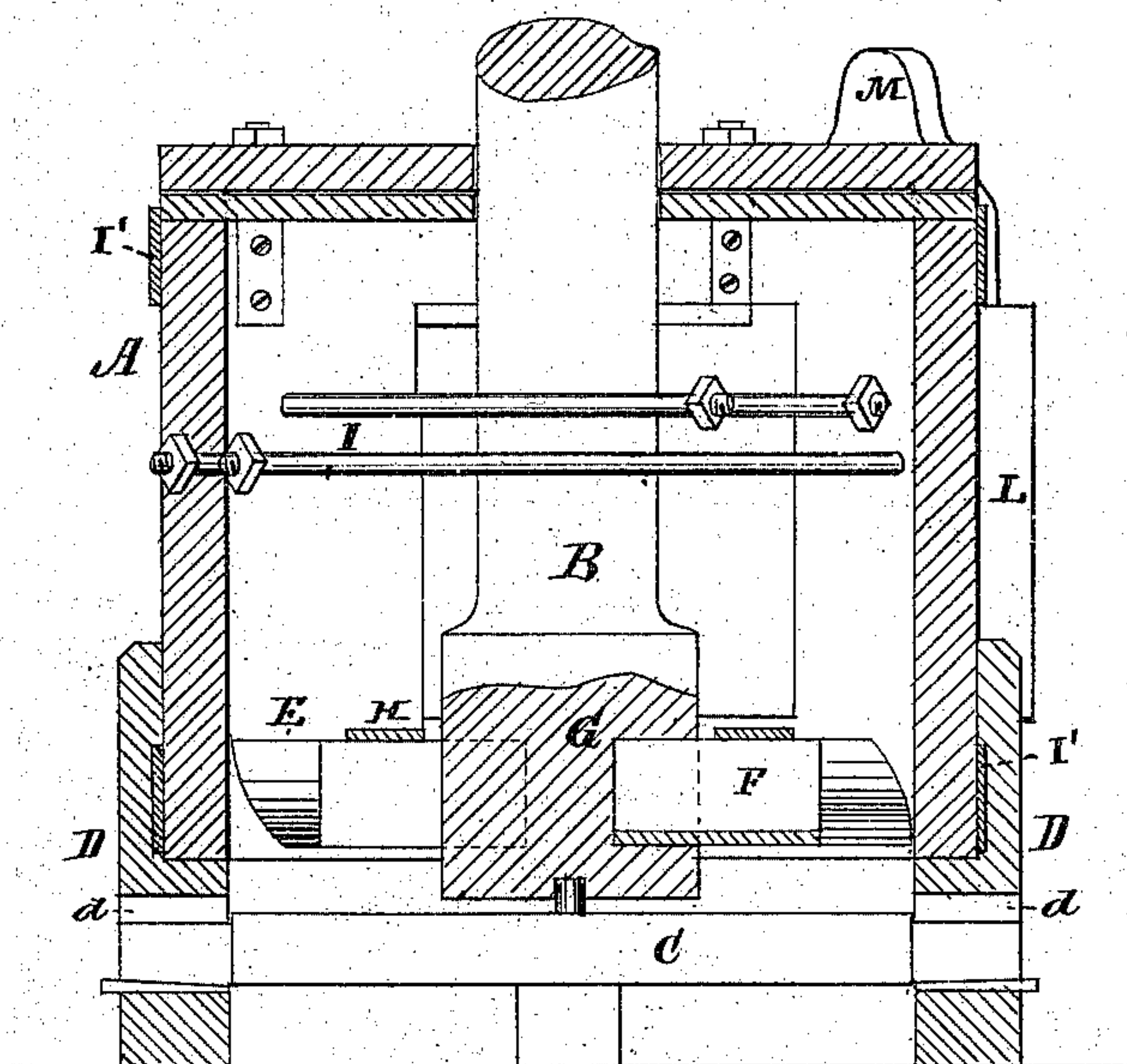
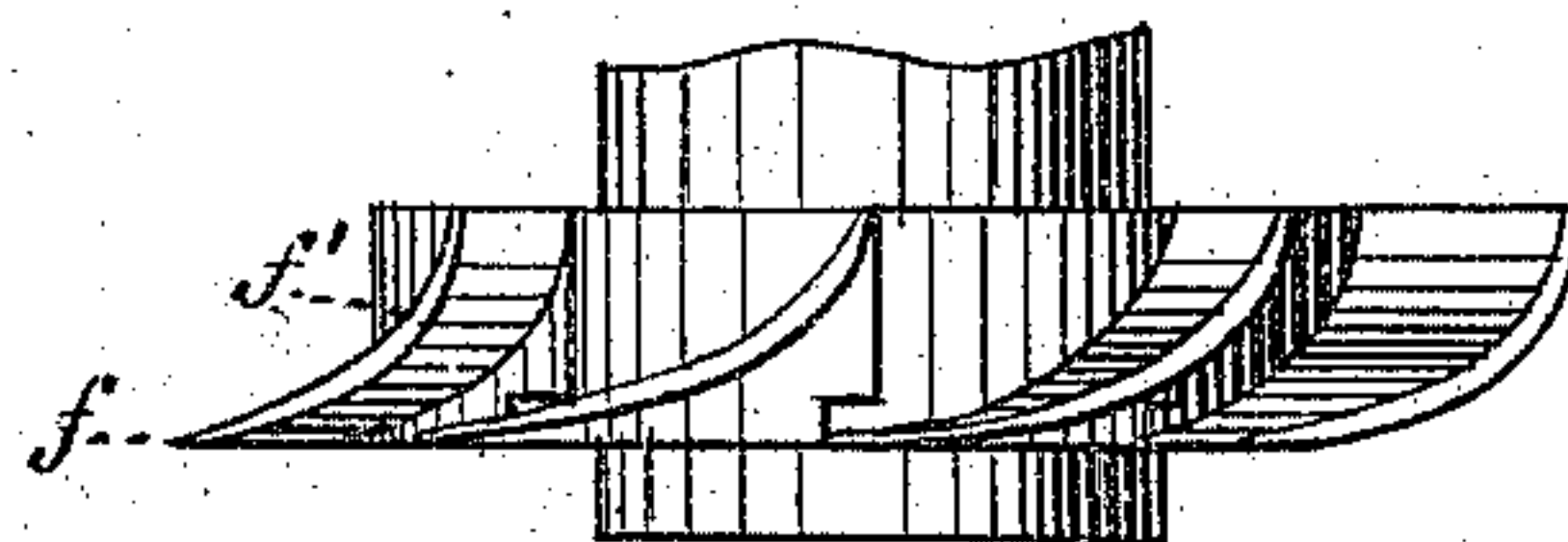
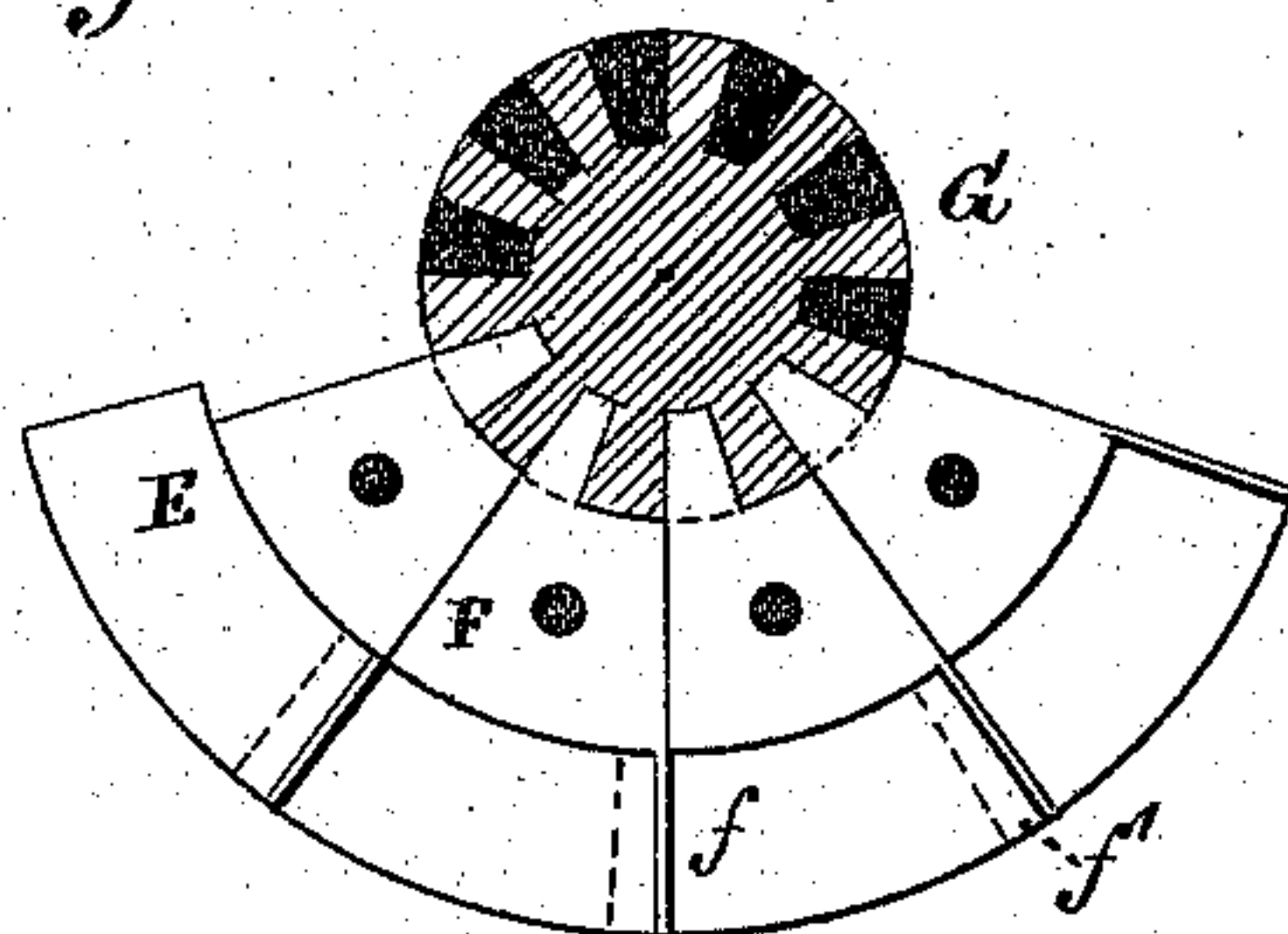
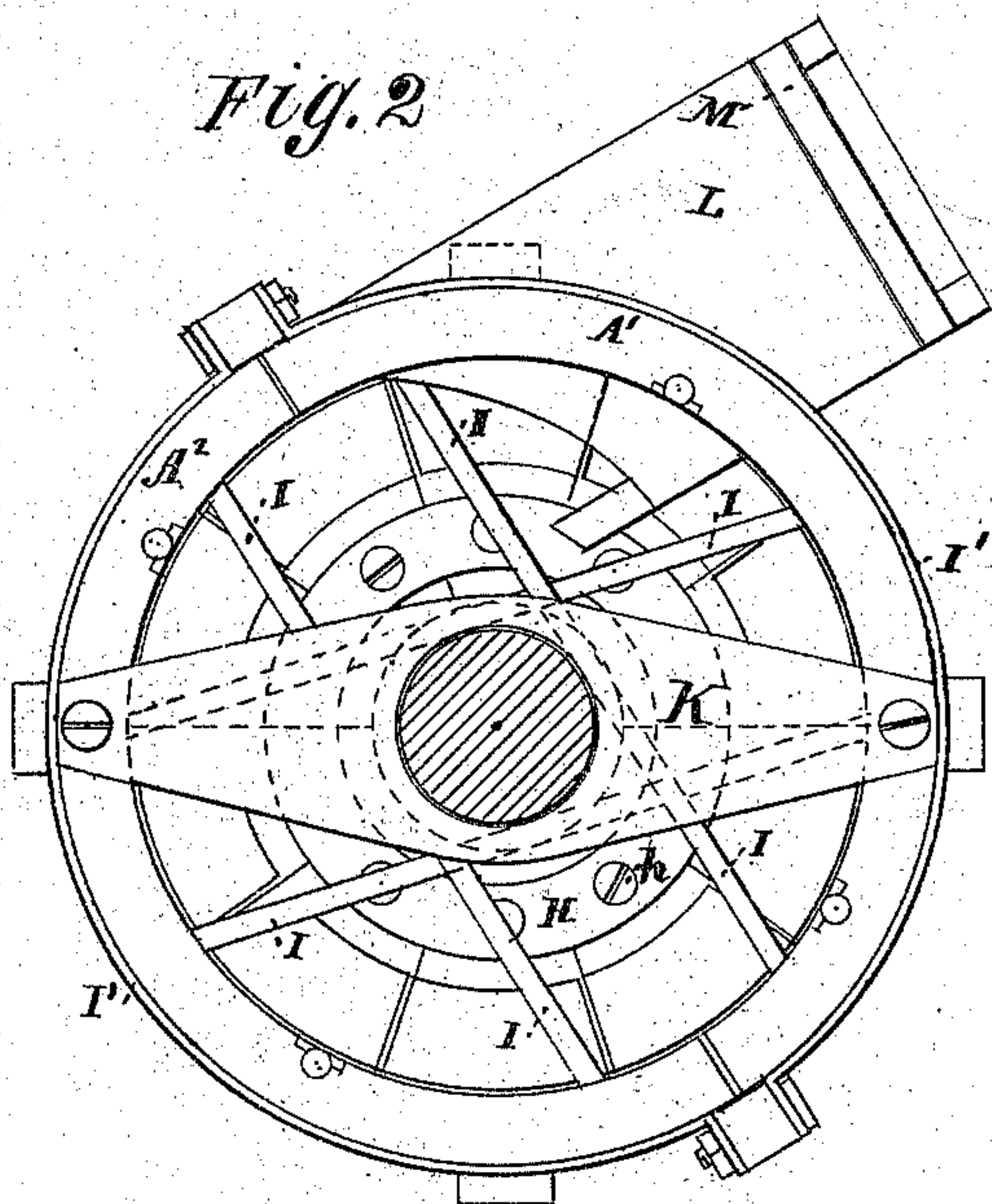


Fig. 2.



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# UNITED STATES PATENT OFFICE.

JOHN FRANK, OF CHESTER, OHIO.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 129,807, dated July 23, 1872.

Specification describing certain Improvements in Water-Wheels, invented by JOHN FRANK, of Chester, in the county of Meigs and State of Ohio.

The invention consists in adjusting a water-wheel vertically by means of slotted uprights, a tenoned bridge-tree, and an adjustable wedge-support; in attaching the buckets by mortise and tenon to a central hub, and then holding it by a single band and a bolt to each bucket; in giving a gradual curve, then a quick rise at the end, and then a relative height and width to the buckets; and, finally, in making the curb in sections, detachably held by cross-rods on the inside and bands on the outside.

In the drawing, Figure 1 is a vertical section. Fig. 2 is a plan view with the cover removed, and Figs. 3 and 4 are detail views of the bucket.

A represents the curb of a water-wheel, B the vertical shaft by which its power is transmitted, and C the bridge-tree in which said shaft is pivoted. D D are two standards or uprights, each having a vertical slot, *d*, in which the tenons of bridge-tree can be moved up and supported on wedges to take up wear of wheel. E is the wheel, formed of radial buckets F, that are fastened at their small and tenoned ends in mortises of the hub G, and held securely by the horizontal circular band H, through which passes a bolt, *h*, into each bucket. The buckets are constructed with the gradual incline *f* and the sudden rise to a nearly horizontal plane on the surface *f'*. The buckets are also made with a height and

width that bear a certain proportion to each other—namely, as three to eight. The curb A is made in two sections, A<sup>1</sup> A<sup>2</sup>, which are held together by cross-rods I I, that pass through the inside thereof, and by the bands I' I' about the outside. K is the guide through which plays the vertical shaft B. L is the chute through which water is let in upon the wheel, and M is the gate of said chute.

The operation is as follows: The water, passing through chutes, strikes the upper inclines of buckets, forces forward the wheel by its impact, and slides back over incline *f* and rising surface *f'* out of the wheel.

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

1. The tenoned bridge-tree C, slotted uprights D, and wedge-support, combined with water-wheel shaft B, as and for the purpose described.

2. The combination of tenoned and radial water-wheel buckets F with the mortised hub G, band H, and a bolt for each bucket, as and for the purpose described.

3. A water-wheel bucket, F, having gradual curve *f*, rising surface *f'*, and a height and width in the proportion of about three to eight, as and for the purpose described.

4. The cross-rods I I and bands I' I', combined with sections A<sup>1</sup> A<sup>2</sup> of a water-wheel, as and for the purpose described.

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