

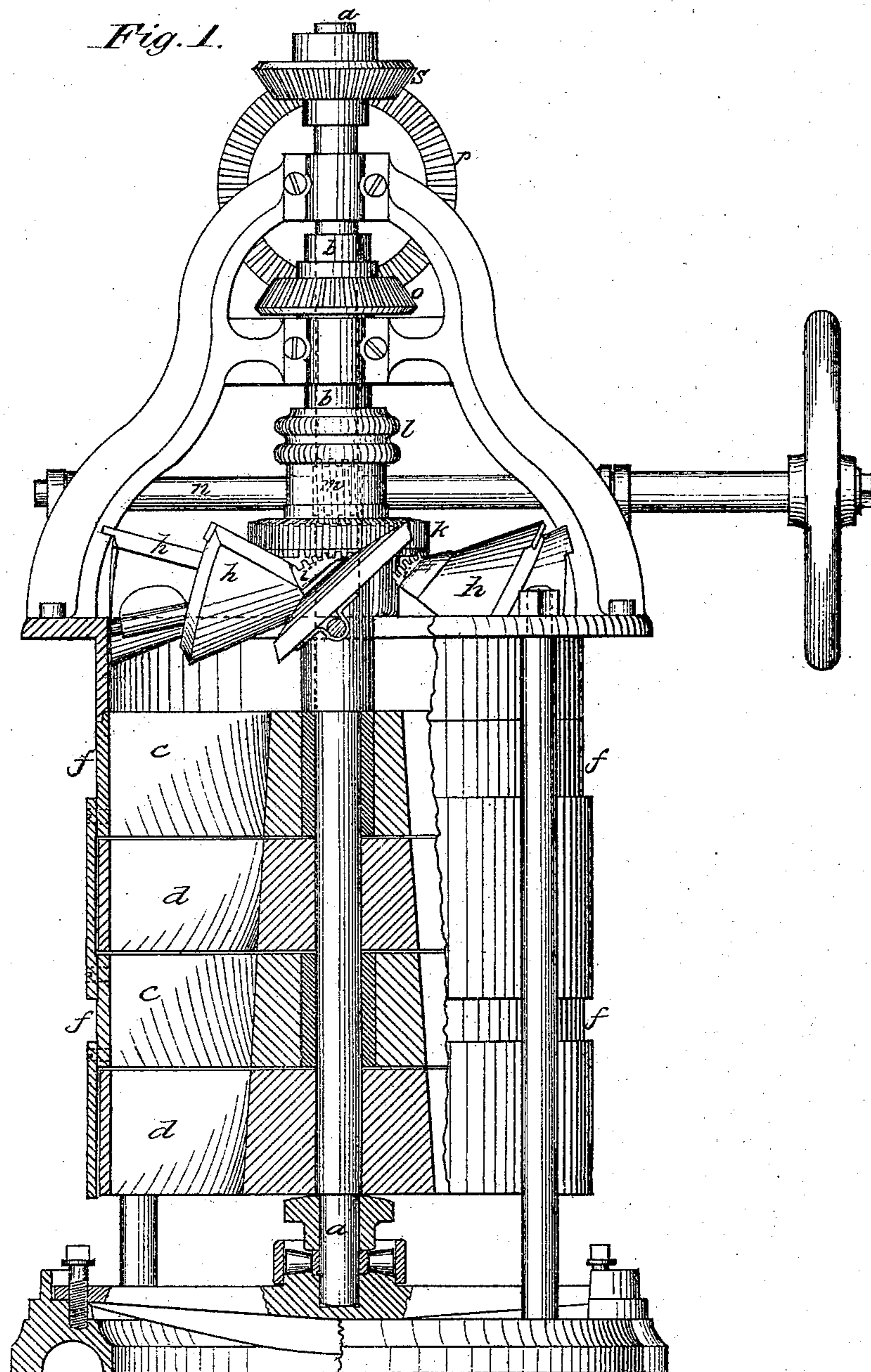
DANIEL & FRANK M. WOODSUM.

Sheet I.

Improvement in Water Wheel.

No. 118,324.

Patented Aug. 22, 1871.



Witnesses:
Charles A. Harkness
Geo. E. Bird

Inventor:
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Sheet II.

Improvement in Water Wheel.

No. 118,324.

Fig. 2.

Patented Aug. 22, 1871.

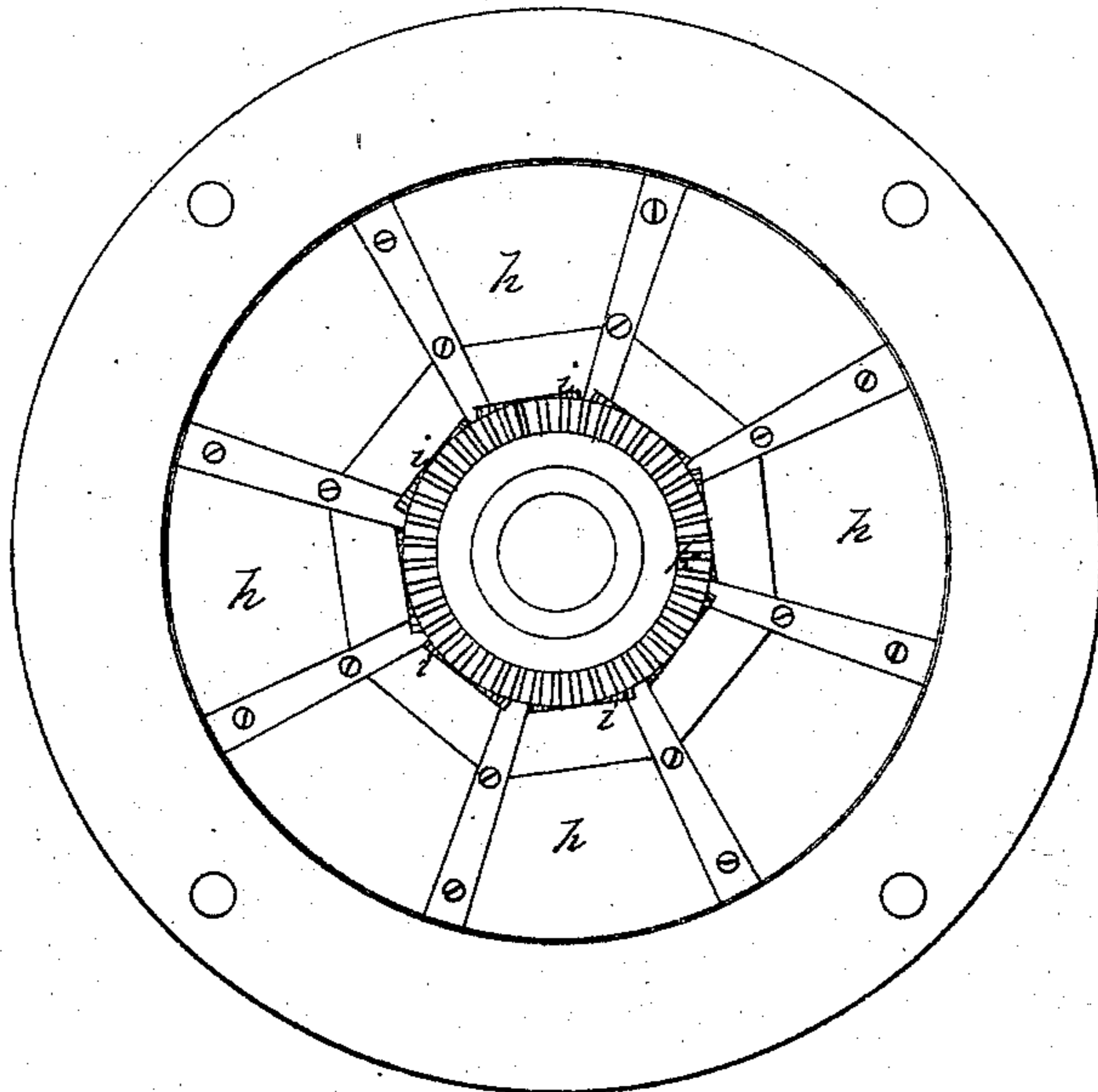


Fig. 3.

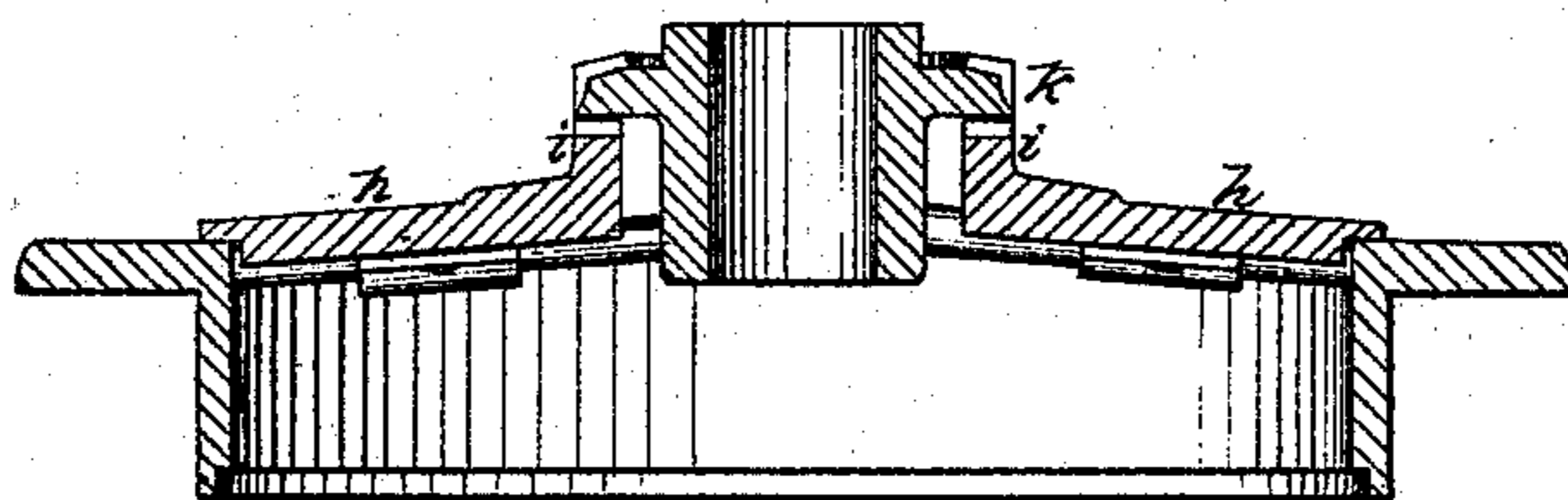
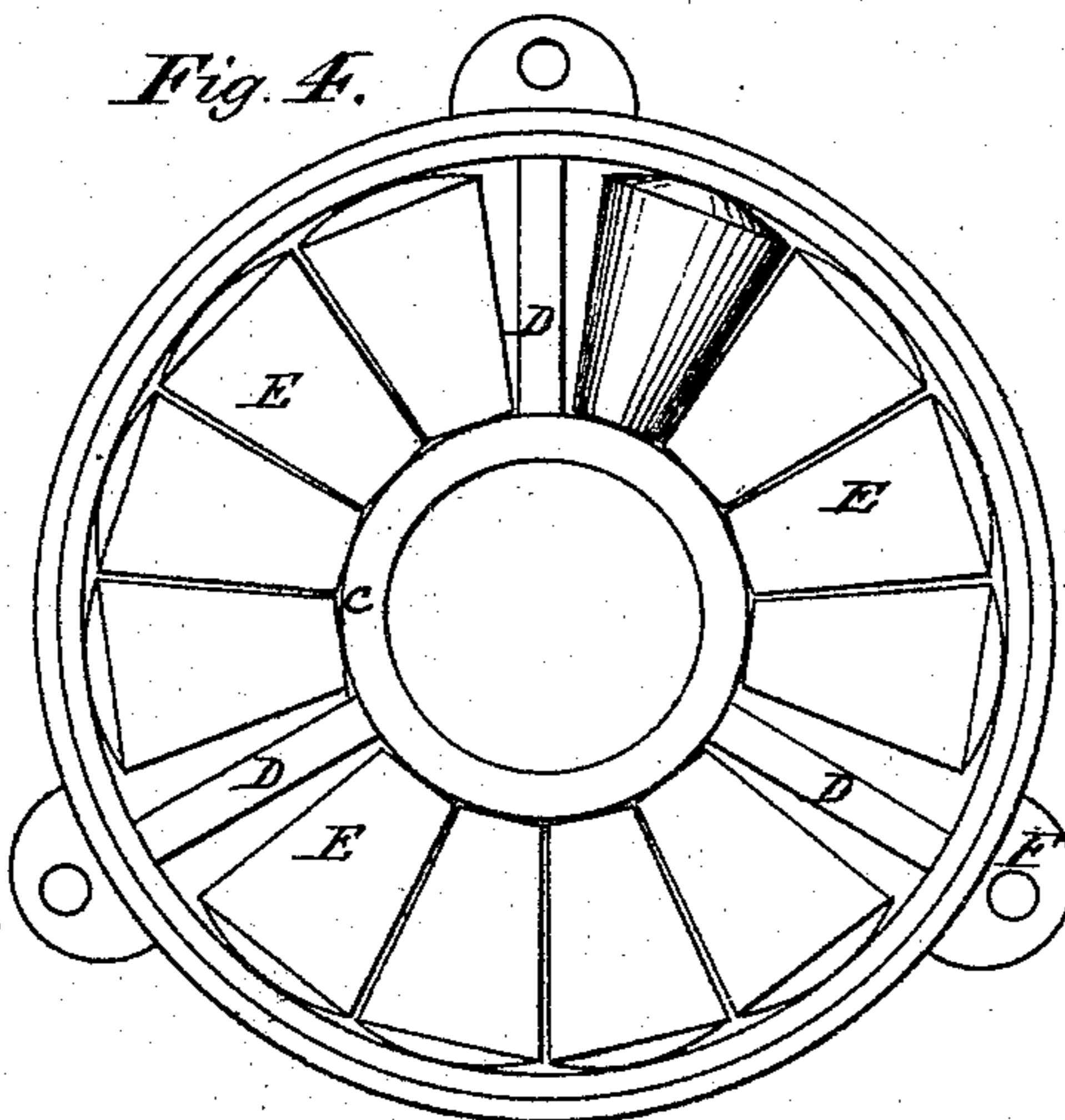


Fig. 4.



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UNITED STATES PATENT OFFICE.

DANIEL WOODSUM AND FRANK M. WOODSUM, OF HARRISON, MAINE.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 118,324, dated August 22, 1871.

To all whom it may concern:

Be it known that we, DANIEL WOODSUM and FRANK M. WOODSUM, both of Harrison, in the county of Cumberland and State of Maine, have invented a new and Improved Water-Wheel; and we hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing forming part of this specification, in which—

Plate 1 is a side view of the wheel, with a portion of the casing and the sleeve within the casing broken out, showing the buckets of the wheel or wheels. Plate 2, Figure 1, is a section of the wheel. Plate 2, Fig. 2, is a top plan of the improved step for the bottom end of the vertical shaft shown in detail, but to be applied to the bottom end of the shaft *a*. Plate 2, Fig. 3, side elevation of same.

The parts of the wheel may be thus described: *a* shows the main shaft of the machine, the same being vertical, and extending through the box or casings containing the buckets, and carrying on its upper end the gears *o s*. *b* is a sleeve upon the shaft *a*, so placed as to have the alternate and equal spaces of the main shaft between them, as shown in Fig. 1, Plate 2. To these sleeves and to the alternate spaces of the shaft *a* are rigidly attached the buckets *c* and *d*, the ones to the shaft, the others to the sleeve, those attached to the shaft *a* having an opposite inclination to that of those attached to the sleeve. (See Plate 1.) The buckets *c c* are rigidly attached to the casing *f*, and the buckets *d d* are attached, on the outer ends, to the sleeve *g* within the casing. (See Plate 1, and Fig. 1, Plate 2.) As the buckets attached to the sleeve *b* are placed uppermost, and the buckets so attached to the sleeve are placed uppermost, and are connected by means of the casing *f*, it is evident that their power may be concentrated at some point above. The circular space at the top of the casing is closed by the valves *h h*. The lower parts of these valves are fixed each to an axle or pivot on which they turn. Their lower edges are provided with a slotted piece, secured by screws inserted through the slots, which run in the direction of tangents to the circumference of the casing. Upon the inner ends of the valves *h* are the gears *i*, which gears match the gears *k* which rotate around the sleeve *b*, being operated by the spiral screw *m* on the horizontal shaft *n*. The beveled gear *o* is rigidly attached to the sleeve *b*, and matches the

beveled gear *p* upon the shaft *r*. (See Fig. 1, Plate 2.) Likewise matching the beveled gear *p* is the other beveled gear, *s*, which is rigidly attached to the shaft *a*. In Figs. 2 and 3, Plate 2, is shown our improved step, upon which the lower end of the shaft *a* rests, the said step not being shown in Plate 1, but shown in the figures above set forth in large detail. The said step is constructed of the two cylindrical pieces A and B, having the lower and upper surfaces, respectively, flat. In suitable grooves in the upper surface of the part B are placed radial axes, their inner ends being inserted into the circular or cylindrical piece C, which is firmly connected with the piece B by the rods D. Each of these axes has a conical roller, E, which are of the same size and construction. The outer ends of the axes are held in place by the circular or cylindrical piece A, which is firmly secured upon them by the bolts F passing through ears or projections.

The operation of the wheel thus constructed is as follows: The water being let on, the flow is regulated by means of the valves *h*, by which it can be wholly cut off. The purpose of the slotted slides is to render the valves adjustable to the space each is required to fill when it is designed to cut the flow off entirely. The action of the water upon the buckets *c* gives a rotation to the sleeve *b* in one direction as well as to the outer casing *f*, both the said sleeve and casing being rotated by the said buckets *c*. The action of the same water upon the buckets *d* moves them in an opposite direction from *c*, and imparts the said motion to the shaft *a* and the sleeves *g g* within the casing *f*. This increase in the number of distinct wheels increases the power in the same ratio. The power of all the buckets connected with the sleeve *b* is concentrated upon the gear *o*, while all the power of the buckets connected with the shaft *a* is concentrated upon the gear *s*. The operation of the two gears *s* and *o* increases the power of the gear *p* and shaft *r*.

The step may be applied to all upright shafts, the lower end of the shaft being made to conform to the place in the said step for receiving the said shaft. Thus revolving on the said rollers *e e*, the revolution of the shaft is much reduced in friction, and the durability of the step is much increased, and constant repairs avoided.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of the two sets of oppo-

sitely-revolving wheels *c d*, in combination with the surrounding casing *f*, collar *b*, and gearing *o, p*, and *s*, whereby the power of all the wheels is centered upon a single shaft, substantially as shown and described.

2. The shaft *n*, gears *m k*, valves *h*, and segments *i*, when all are arranged to operate substantially as described.

3. The combination of the shaft *a*, the collar

b, oppositely-revolving wheels *c d*, casing *f*, shaft *n*, gears *m, k, o, p*, and *s*, valves *h*, segments *i*, and friction-rollers *E*, when all are united to form a water-wheel, substantially as described.

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Witnesses:

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