No. 30,916. PATENTED DEC. 18, 1860.

E. F. M. FLETCHER.
WATER WHEEL.

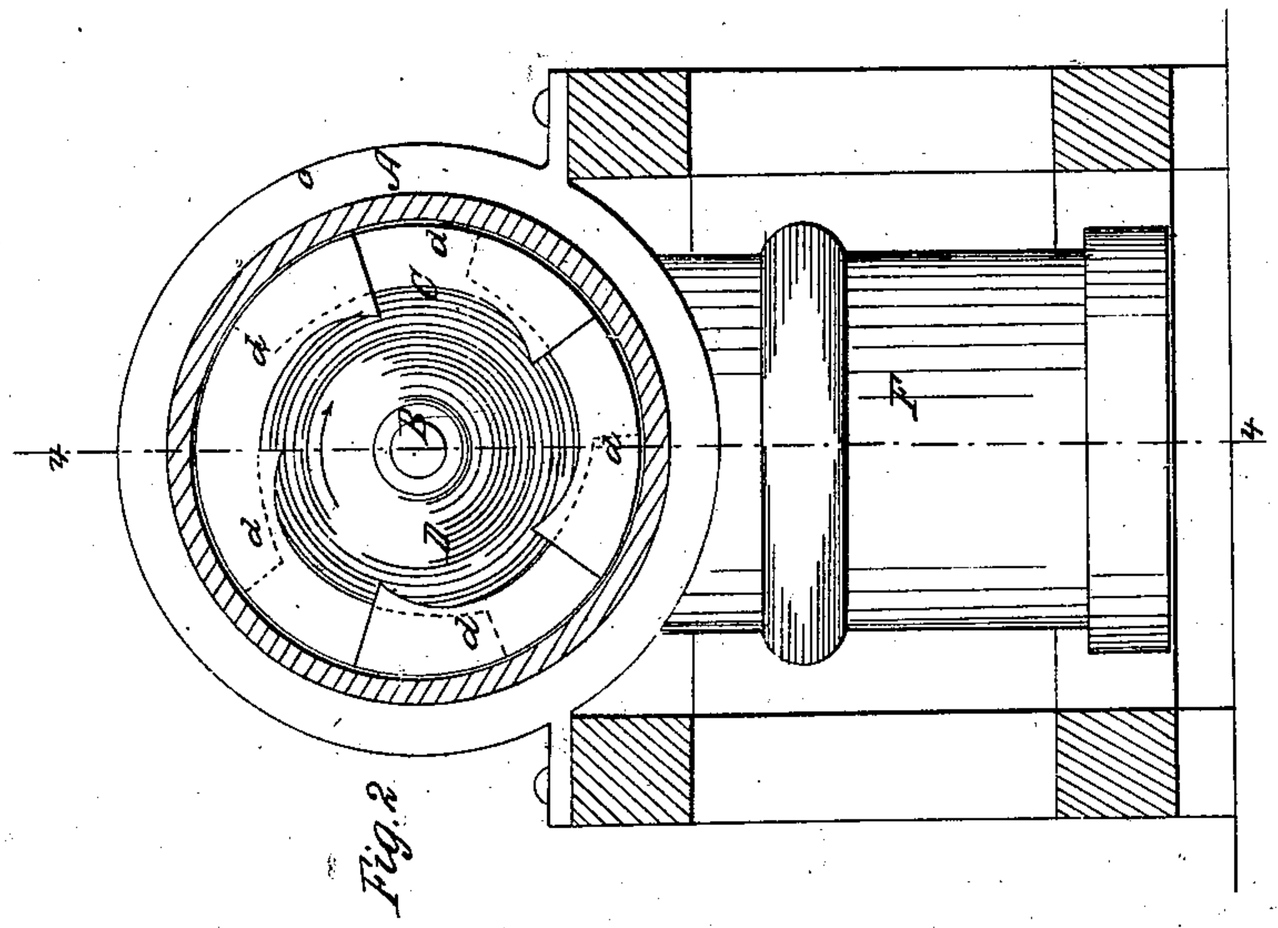

Fig. 2

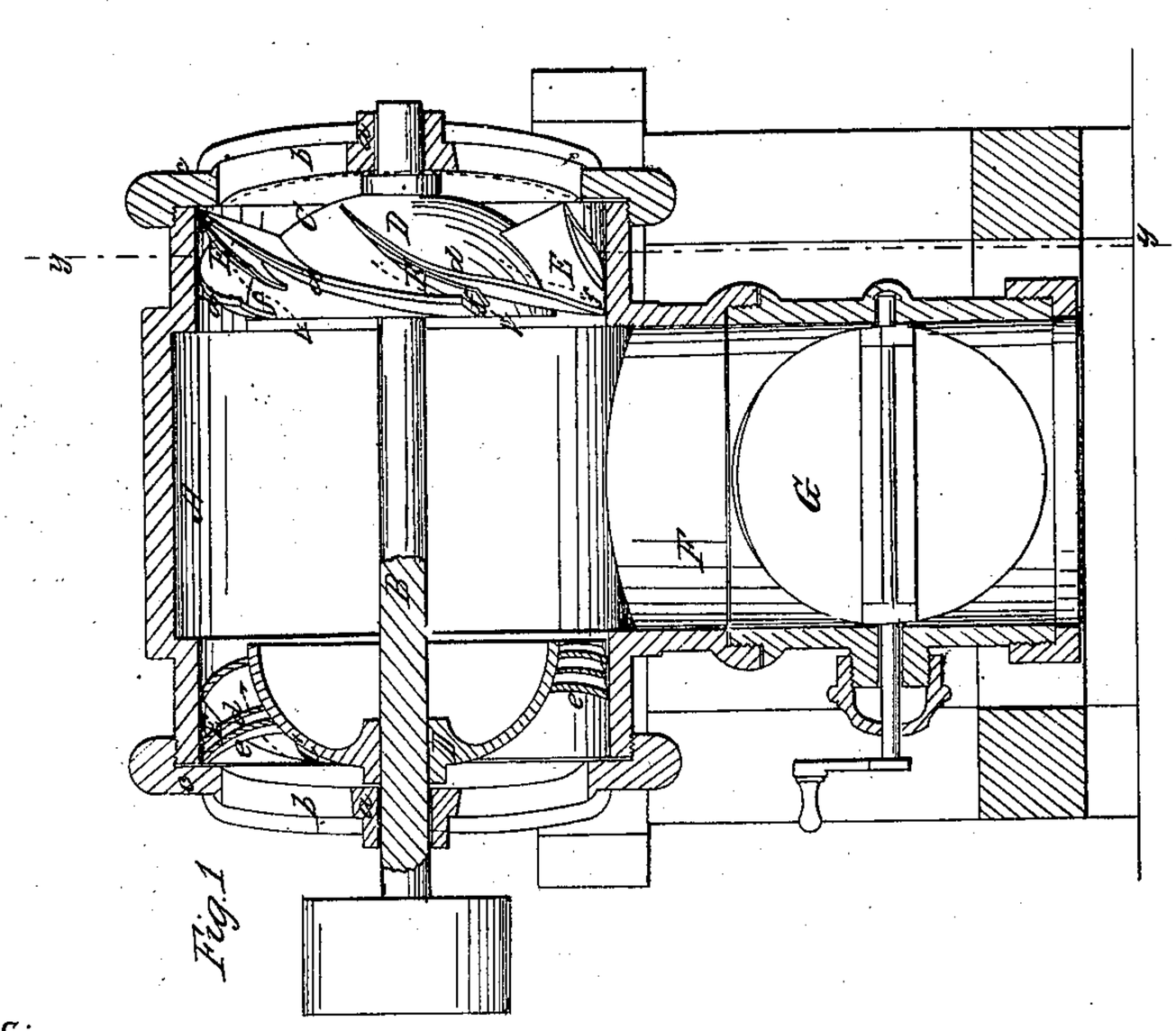

Fig. 1

Witnesses;
J W Combes
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UNITED STATES PATENT OFFICE.

E. F. M. FLETCHER, OF GEORGIA PLAIN, VERMONT.

WATER-WHEEL.

Specification of Letters Patent No. 30,916, dated December 18, 1860.

To all whom it may concern:

Be it known that I, E. F. M. FLETCHER, of Georgia Plain, in the county of Franklin and State of Vermont, have invented a new and Improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a vertical section of my invention taken in the line *x*, *x*, Fig. 2. Fig. 2, a transverse vertical section of the same, taken in the line *y*, *y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

This invention consists in the employment or use of wheels formed by having spiral buckets attached to semi-spherical hubs and using in connection with the buckets; springs, so applied to the wheels as to regulate the capacity of the issues according to the force or supply of water, so that the wheel will always work economically, or, in other words give out the maximum power of the head under varying heights of the same.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A, represents a horizontal cylinder in which a shaft B, is placed centrally, said shaft having its bearings *a*, at the junction of arms *b*, the outer ends of which are attached to rims *c*, which screw on the ends of the cylinder A. On each end of the shaft B, there is placed a wheel C. These wheels are formed of hollow semi-spherical hubs D having buckets *d*, on their outer surfaces, said buckets being of spiral form and having a concave or "dished" surface at their face side as shown at *e*, in Fig. 1.

The convex surfaces of the hubs D face outward from the cylinder A, and the edges of the buckets *d* run just in contact with the inner surface of the cylinder A. The buckets *d*, extend to the inner edges of the hubs D, and to the outer edge of each bucket there is attached a spring plate E. These plates are equal to the buckets in height or depth, and each plate extends inward to a point directly opposite the inner end of the bucket in front of it as shown in Fig. 1.

The plates E determine the capacity of the issues *f* of the wheels and when not acted upon with any great force by the water sufficient to spring them they render the issues quite narrow but of a capacity commensurate with the head of water. When, however, the head increases and the force of the water is sufficient to actuate the plates E, the issues are enlarged the greater the force of the water the more the plate will be pressed outward or toward the bucket to which it is attached. The water therefore, it will be seen, regulates the capacity of the issues according to its force or the volume which passes through the wheels and the maximum power of the head under varying heights will always be given by the wheel.

The cylinder A, has a draft tube F communicating with it, said tube being provided with the usual gate or valve G. The lower end of the tube F, is immersed of course and the flow of water through the wheel regulated by adjusting the valve or gate. The water is admitted to the wheels as indicated by the arrows, the ends of the cylinder A, receiving the water direct from a penstock. The semi-spherical hubs D serve as deflectors and direct the water toward the buckets *d*, in one unbroken or uninterrupted volume and obviate the necessity of the ordinary guides which are employed to direct the water so that it may act properly against the buckets. The spring or elastic plates E render the wheel self-regulating as previously alluded to so that its capacity is varied according to the supply of water and the latter used in the most economical way.

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

The combination of the two hemispherical hubs D, D, shaft B, concave and tapering buckets *d d*, and springs E, the whole being constructed and arranged and operating in the manner and for the purposes set forth.

E. F. M. FLETCHER.

Witnesses:

CYRUS HOTCHKISS,

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