

(No Model.)

C. W. RAU.

DOUBLE ACTING WATER WHEEL.

No. 313,621.

Patented Mar. 10, 1885.

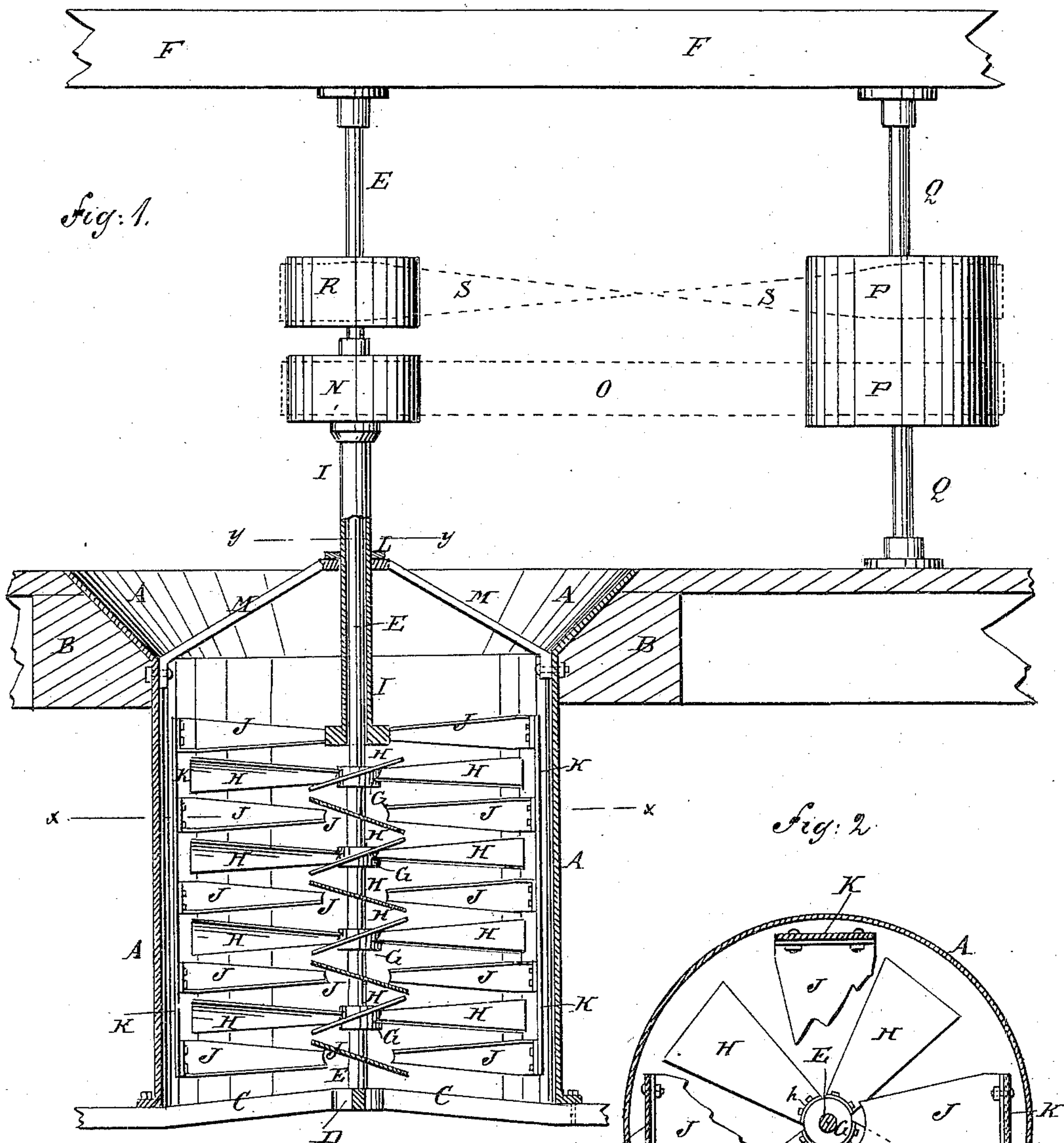


Fig. 4.

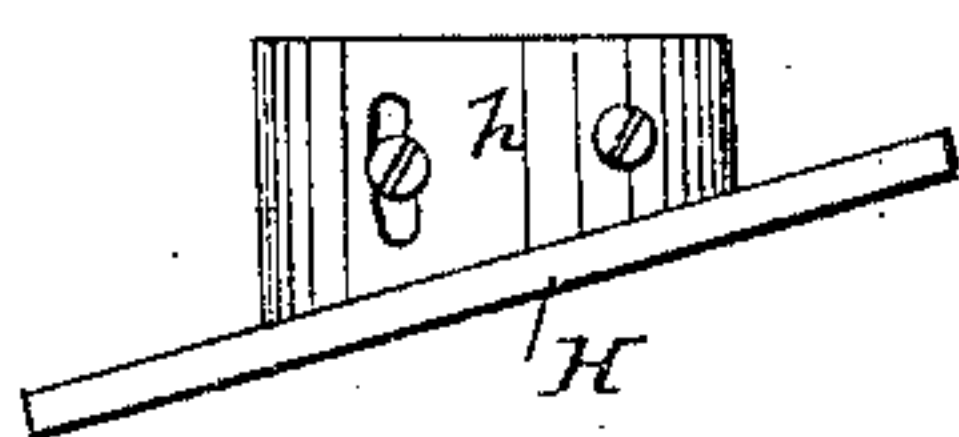


Fig. 3.

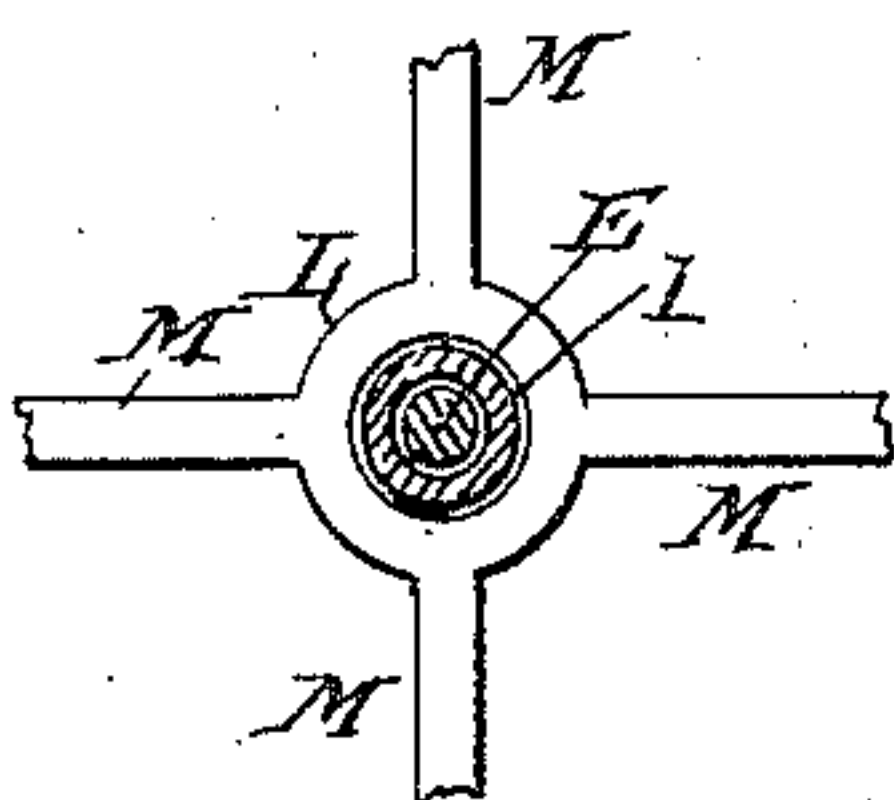
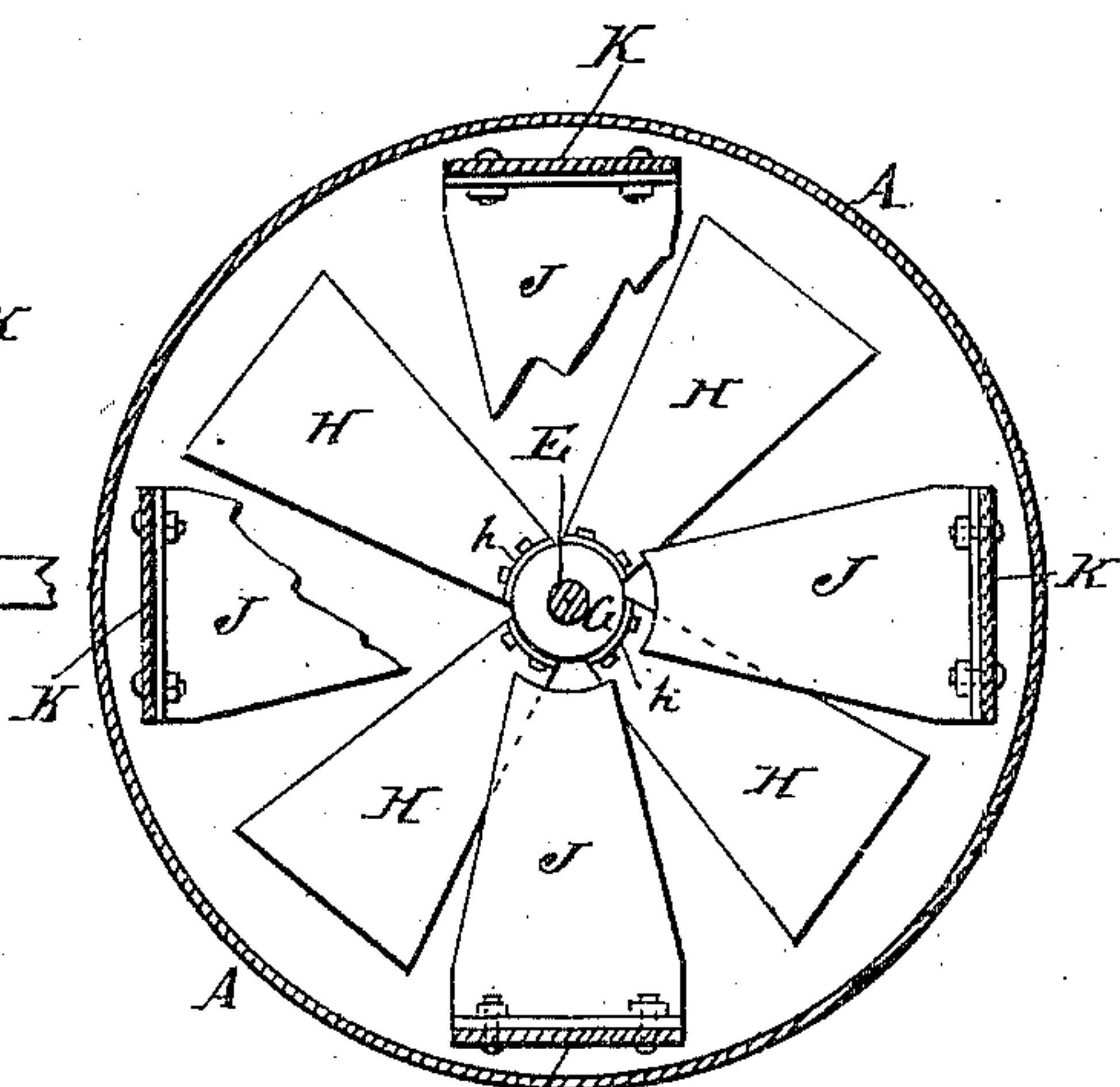


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES WILLIAM RAU, OF ALLENTOWN, PENNSYLVANIA.

DOUBLE-ACTING WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 313,621, dated March 10, 1885.

Application filed January 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WILLIAM RAU, of Allentown, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful Improvements in Double-Acting Water-Wheels, of which the following is a full, clear, and exact description.

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 sectional side elevation of my improvement. Fig. 2 is a sectional plan view of the same, taken through the line *xx*, Fig. 1. Fig. 3 is a sectional plan view of a part of the same, taken through the line *yy*, Fig. 1. Fig. 4 is an end elevation of one of the inner blades of the wheel.

The object of this invention is to promote efficiency in the operation of water-wheels.

The invention consists in the construction and arrangement of parts, as will be hereinafter fully described and claimed.

A represents a cylindrical case the upper end of which is flared or made funnel-shaped to receive the water. The upper end of the case A is attached to a suitable supporting-frame, B, and its lower end is attached to a spider or frame, C, in which is formed a bearing, D, to receive the lower end of the vertical shaft E. The upper end of the shaft E revolves in bearings in a supporting-frame, F.

To the shaft E, within the case A, are secured four (more or less) hubs, G, to each of which are attached four (more or less) paddles or blades, H. The blades H are inclined, as shown in Fig. 1, and have upwardly-projecting flanges *h* upon their inner ends, which are slotted to receive the fasteningscrews, (see Fig. 4) so that the inclination of the said blades can be regulated, as may be desired. These flanges *h* are curved, as shown in Fig. 2; but the arc of curvature is slightly greater than that of the hubs G, so that the said flanges will not bind while being adjusted.

Upon the upper part of the shaft E is placed a tubular shaft, I, to the lower end of which, a little above the upper hub G, are attached the inner ends of four (more or less) blades, J, the outer ends of which are attached to upright bars K.

To the bars K, below each hub G, are attached the outer ends of four (more or less) blades, J, the inner ends of which project nearly to the shaft E, and which are inclined in the opposite direction from the said blades H. The lower part of the tubular shaft I is centered upon the shaft E by a bearing, L, formed upon or attached to the inner ends of the bars M, which bars incline downward, and are attached at their outer ends to the upper end of the cylindrical part of the case A.

To the upper end of the tubular shaft I is attached a pulley, N, around which passes a belt, O. The belt O also passes around a long pulley, P, attached to the counter-shaft Q.

To the shaft E, above the pulley N, is attached a pulley, R, around which passes a belt, S. The belt S is crossed and passes around the pulley P, as shown in dotted lines in Fig. 1. With this construction, when water is admitted into the case A it acts upon blades H J, and revolves the shafts E I and pulleys R N in opposite directions, which opposite motions, by means of the crossed belt S and the straight belt O, act together to drive the pulley P with an increased power.

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

1. The combination, with the shaft E, of a series of inclined blades, H, and flanges *h* at the inner ends of said blades, said flanges being slotted, as shown, and pivotally secured to said shaft, and a set-screw passing through the slot into the shaft, substantially as set forth.

2. The improved water-wheel herein shown and described, the same consisting, essentially, of the open cylinder A, having arms M C secured to the opposite ends thereof, hollow shaft I, provided with series of imperforate inclined blades J, vertical bars K, to which the outer ends of said blades are connected, internal shaft E, and a series of imperforate blades, H, secured thereto, said blades being arranged to project between the blades J, substantially as described.

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Witnesses:

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