

(Model.)

C. DILKS.
Water Wheel.

No. 243,527.

Patented June 28, 1881.

Fig. 1.

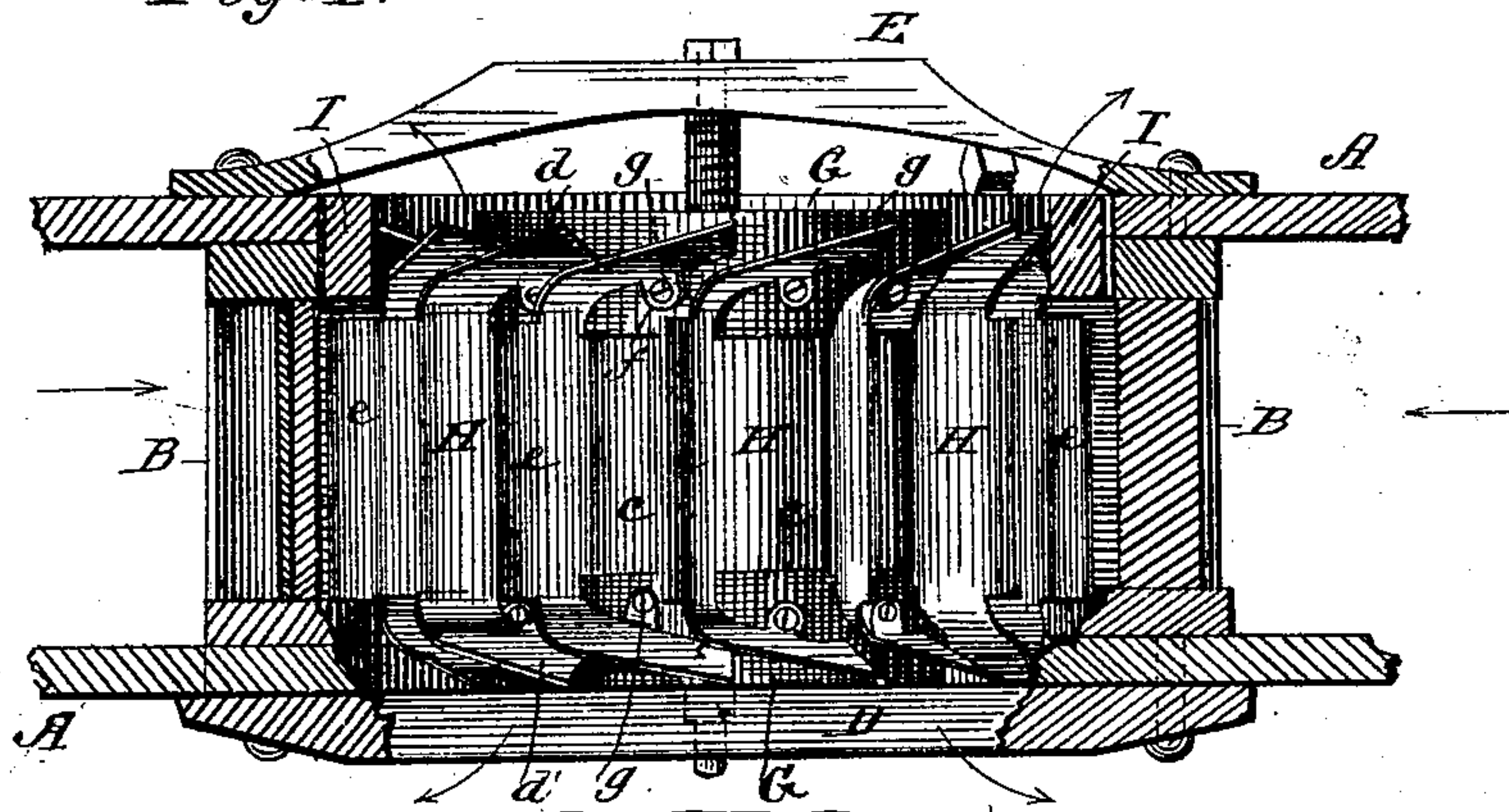


Fig. 2.

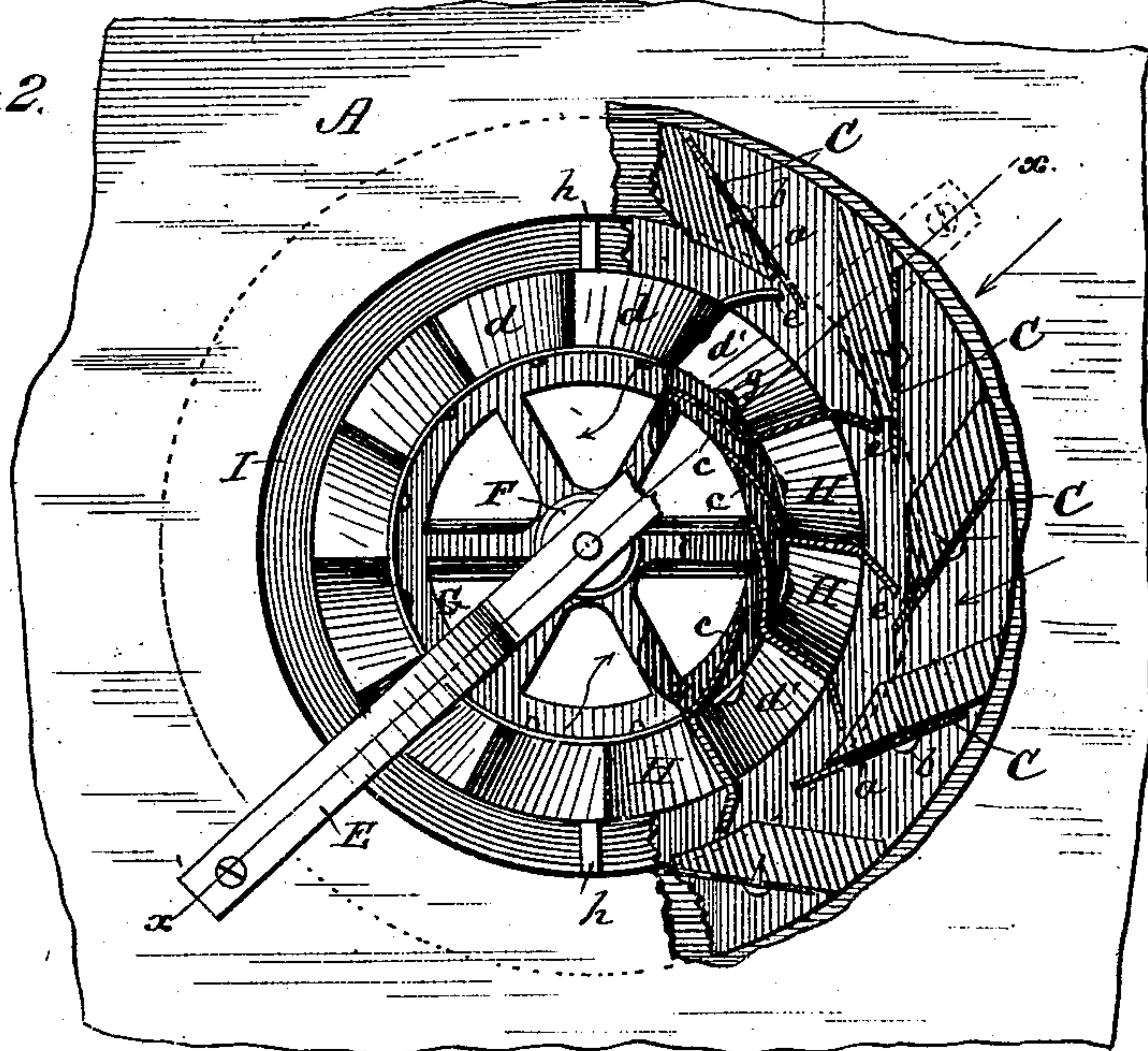
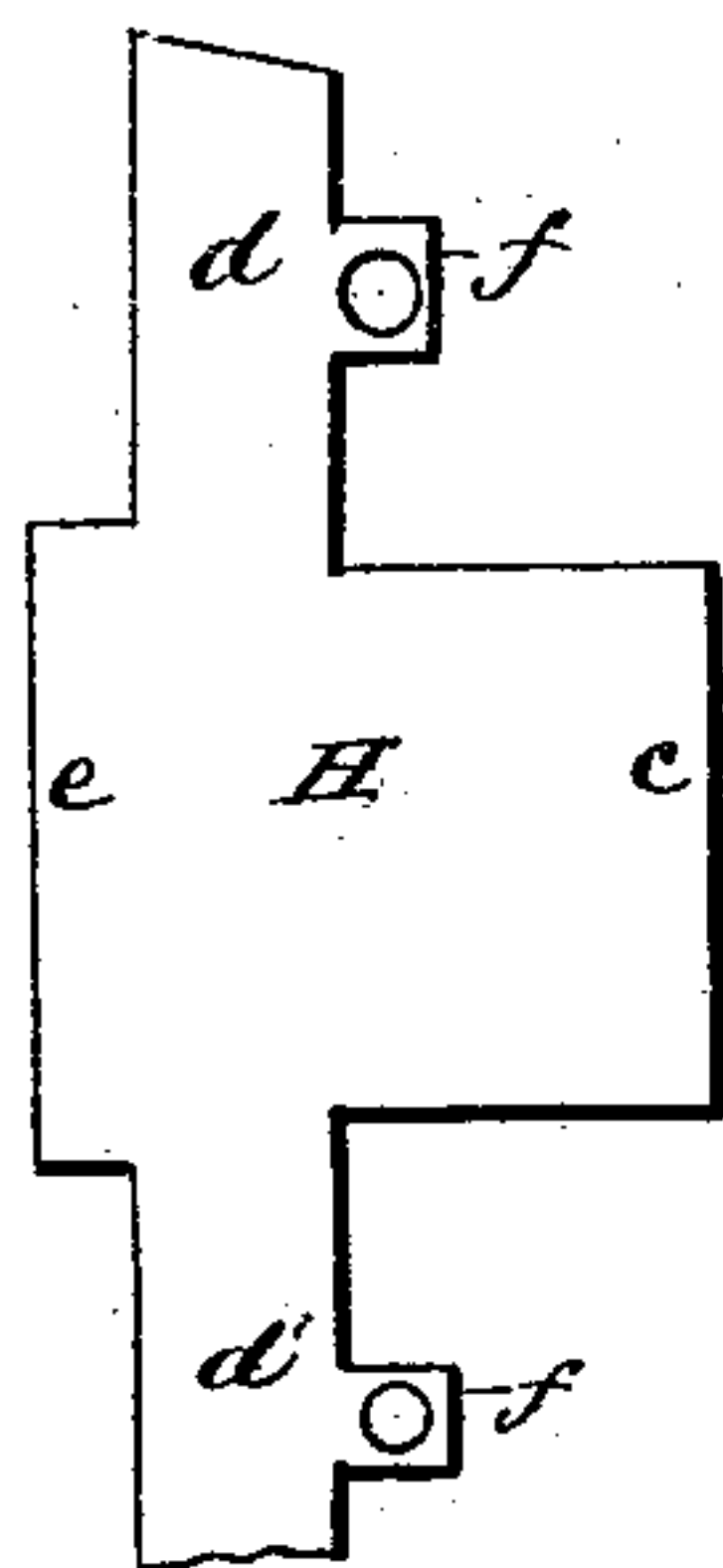


Fig. 3.



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CALVIN DILKS, OF ALLOWAYSTOWN, NEW JERSEY.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 243,527, dated June 28, 1881.

Application filed February 17, 1881. (Model.)

To all whom it may concern:

Be it known that I, CALVIN DILKS, of Allowaystown, in the county of Salem and State of New Jersey, 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 accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a vertical section through the penstock or case, showing the side of the wheel. Fig. 2 is a top view with a portion of the penstock and wheel broken away and shown in horizontal section. Fig. 3 is a detail, showing
15 the shape of the bucket as cut out from plate metal.

My invention relates to an improvement in horizontal water-wheels of that form in which the water is admitted to the periphery of the
20 wheel through lateral guides or chutes, and after striking the wheel is discharged therefrom centrally, downwardly, and upwardly.

My improvement consists in the peculiar construction and arrangement of the buckets
25 in the wheel, and in the peculiar arrangement of the wheel in the case for permitting its easy removal, as will be hereinafter more fully described.

In the drawings, A represents the penstock, between whose upper and lower walls is arranged a circular series of water-guides, B. The space outside these water-guides is supplied with water from a connection with the flume at one side of the penstock, at which point is
35 to be placed a suitable gate. For regulating the amount of water delivered to the wheel through the chutes or water-guides without diminishing its velocity at the time of impact a set of gage-plates, C, is placed flat on the
40 sides of the water-guides, (which converge toward each other as they approach the wheel,) and which plates C are made adjustable through slots *a* and set-screws *b*, so that by extending them toward the wheel a smaller discharge-
45 opening is left, through which the water passes, and consequently a smaller amount is delivered to the wheel.

Within the series of water-guides in the penstock is arranged the wheel, the lower end of
50 whose shaft is stepped in a bearing in the bridge-piece D, beneath the penstock, while a

bearing in a second bridge-piece, E, above the penstock holds it steady. The wheel is composed of a main hub portion, F, which is rigidly fastened to the wheel-shaft by bolts, keys, 55 or set-screws, and two rims or wheels, G G, connected to the hub by radial arms, which rims and hub may be cast in one piece. These rims have a wide peripheral portion, and to them are applied the buckets H, of a peculiar form. These buckets are made of heavy boiler-iron, with a rectangular portion, *c*, upper and lower wings, *d d'*, and flange *e*. The part *c* fits between the edges of the two rims, and, curving inwardly, constitutes the cen- 65 tral discharge. The wings *d d'* rest edgewise upon the peripheral portion of the rims, the one above and the other below the water-guides, and are curved rearwardly, forming the upper and lower discharge. These upper and lower wings, *d d'*, are provided on their edges 70 next to the rims with ears or lugs *f*, which are perforated and receive the two screw-bolts *g* that are employed for fastening in each bucket. The middle part of the bucket, or the portion 75 in the line of the wings *d d'*, is arranged on the wheel very nearly radial to the center, while the flange *e* is bent forward in the direction of the movement of the wheel. The merit of this peculiar construction of wheel is that while 80 the wheel discharges centrally, downwardly, and upwardly, the entrance of the edges of the two rims into the angle between the wings and rectangular portion *c* serves to separate the central discharge from the upper and lower 85 discharge and holds the water to its proper place on the wheel. It also serves to brace and strengthen the connection of the buckets to the wheel, permitting them to be firmly and detachably held in place by two screw-bolts. 90 The flange *e*, on the exterior edge of the bucket, also secures an advantage, in that it gives an increased leverage on the wheel, and acts also to prevent the wheel from speeding when the work is off by producing a back action after 95 a certain speed has been obtained.

To permit the wheel to be readily taken out, a pair of detachable, semicircular, segmental rings, I I, are fitted at the upper edge of the wheel, so as to fit in the circular opening in 100 the penstock and rest in the angle between the end of flange *e* and the outer edges of the

wings *d*. Between the abutting ends of these rings are forced wedges *h h'*, which firmly hold the rings in place. By removing these rings it will be seen that the entire wheel may be
5 lifted out.

The wheel, it will be seen, is perfectly symmetrical at its upper and lower edges, and this enables it to be taken out and its position reversed to make it run in one direction or the
10 other. For this reversal, however, the water guides or chutes have also to be taken out and reversed.

One great advantage of my construction of buckets and mode of attaching them is that
15 the water-issues at the central, upper, and downward discharge may be made larger or smaller by simply bending these portions of the plate without changing the connection of the bucket to the rim.

20 Having thus described my invention, what I claim as new is—

1. The wheel composed of upper and lower rims, *G G*, and a hub, combined with buckets having the rectangular portion *c* and wings *d d'*, the rims being fitted into the angle between
25 the parts *c* and *d d'*, as described.

2. The wheel composed of upper and lower rims, *G G*, and a hub, combined with buckets having the rectangular portion *c*, wings *d d'*, and flange *e*, arranged substantially as de-
30 scribed.

3. The combination, with a wheel having the upper wings, *d*, and the flanges *e*, of a penstock and detachable segmental rings filling
35 the space between the inner edges of the penstock, the ends of flanges *e*, and the outer edges of the wings *d*, to permit the wheel to be removed, as described.

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