

(No Model.)

C. E. VAN DUSEN.  
HYDRAULIC MOTOR.

No. 267,620.

Patented Nov. 14, 1882.

Fig. 1.

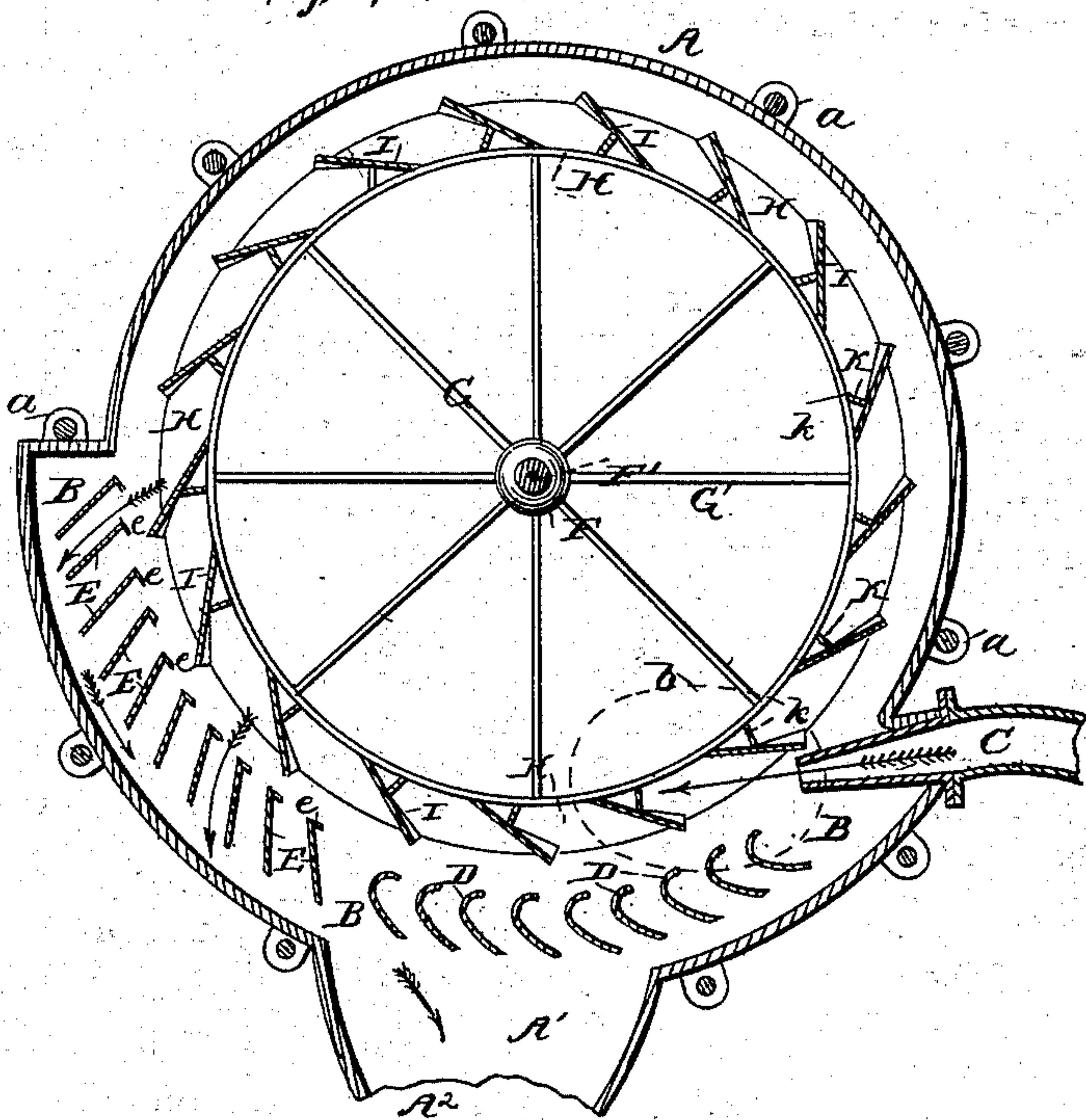


Fig. 2.

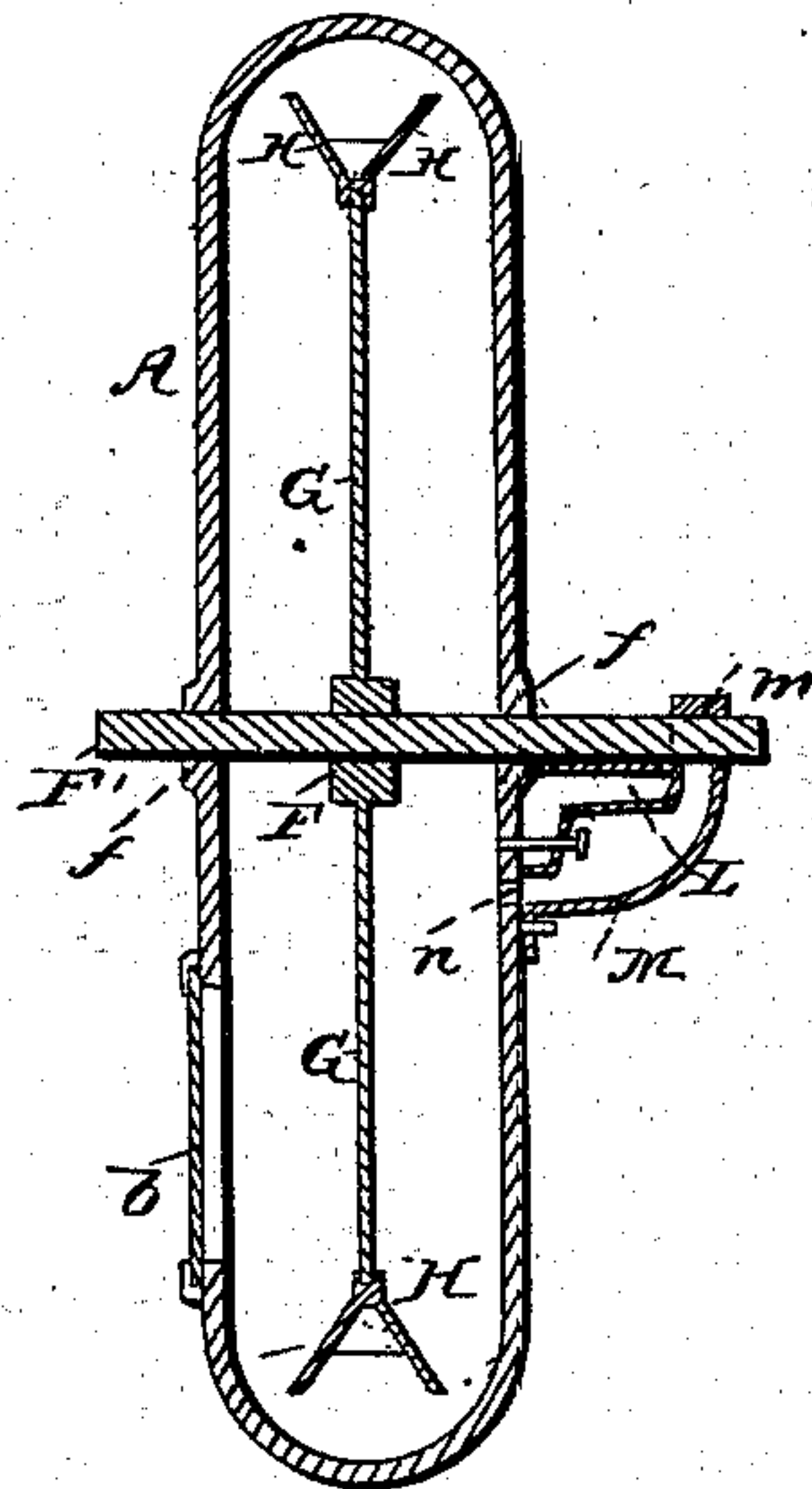


Fig. 3.

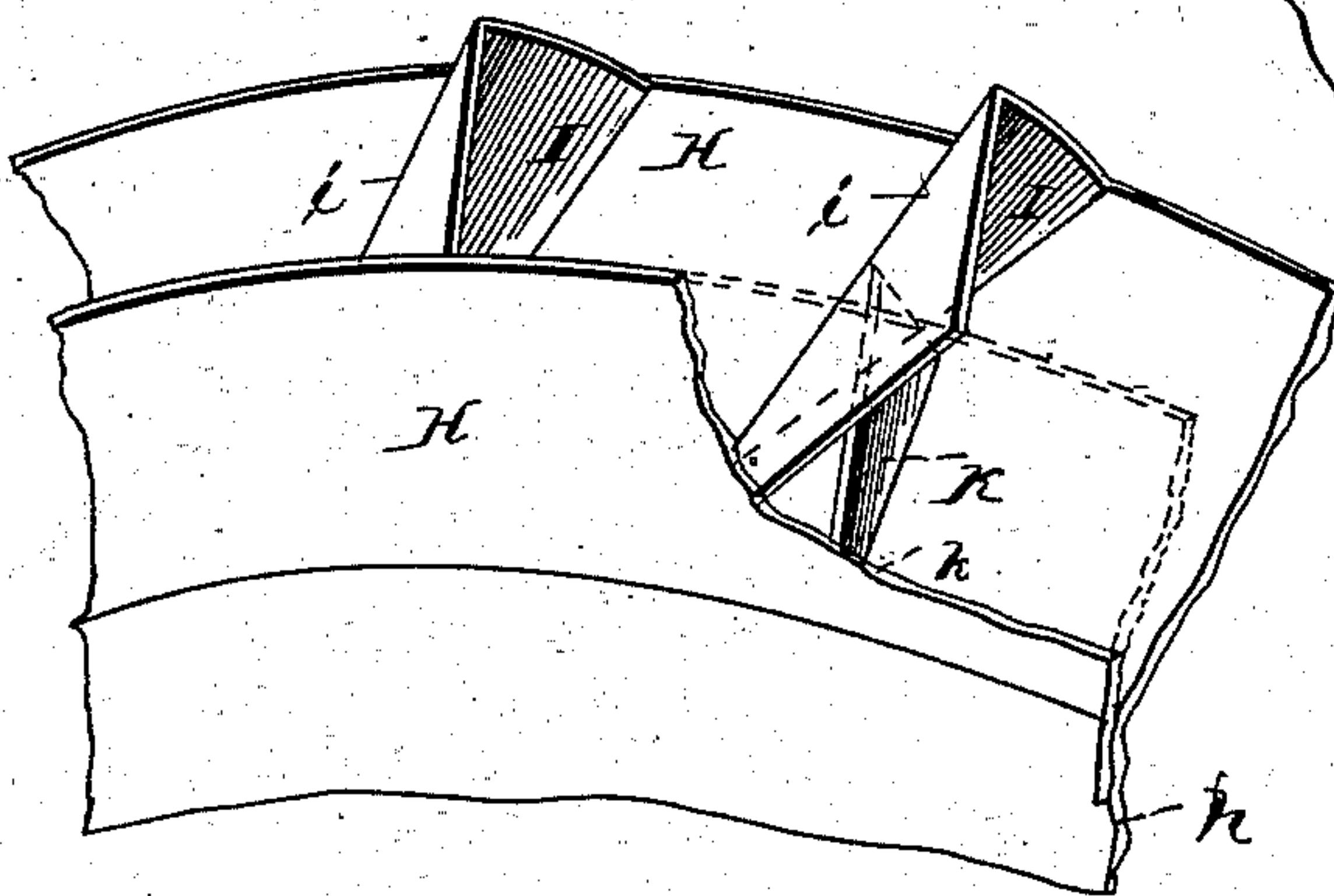
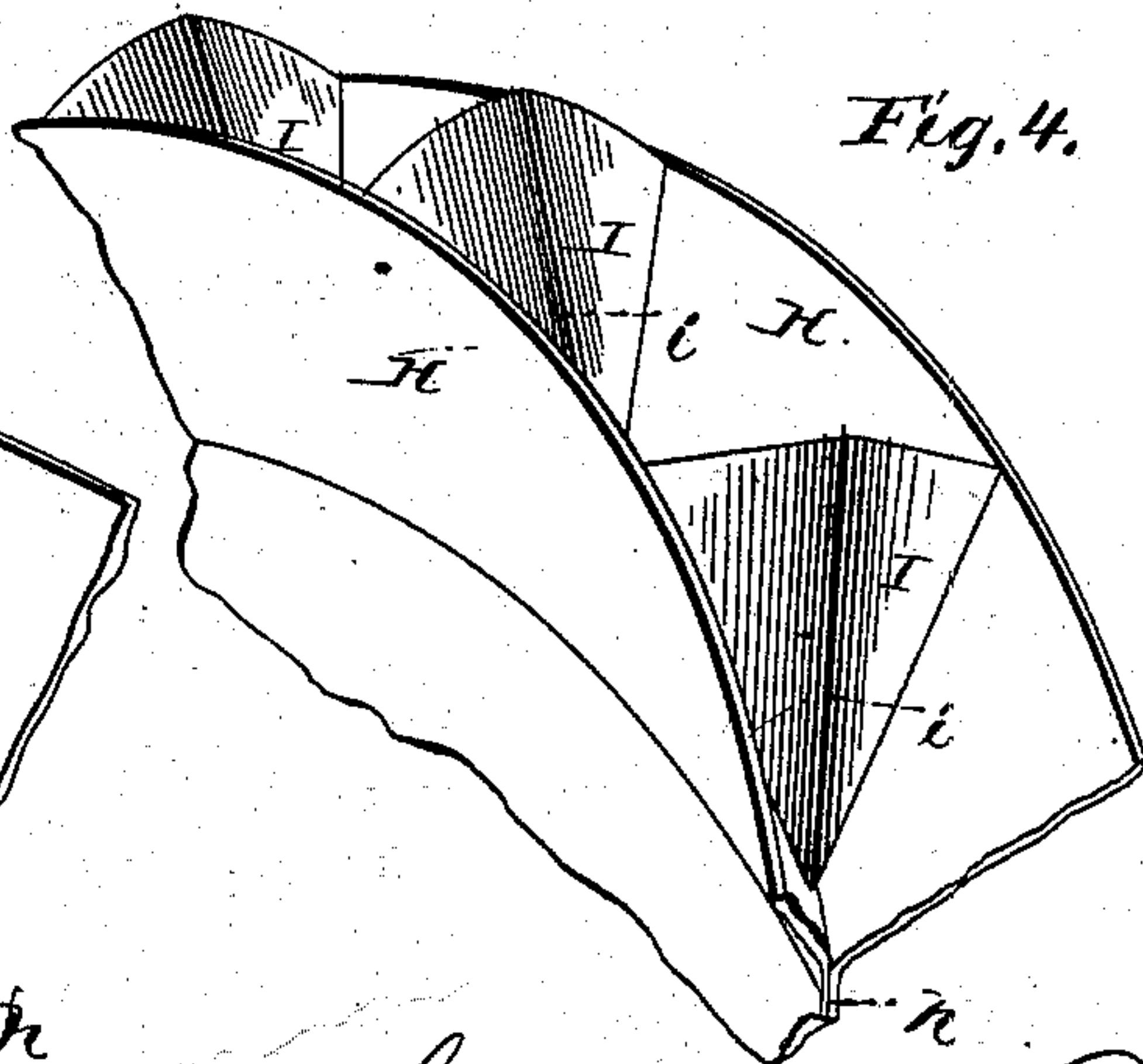


Fig. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

CHARLES E. VAN DUSEN, OF ONEONTA, NEW YORK, ASSIGNOR OF ONE-HALF TO ORSON A. MILLER, OF SAME PLACE.

## HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 267,620, dated November 14, 1882.

Application filed September 11, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. VAN DUSEN, of Oneonta, in the county of Otsego and State of New York, have invented certain new and useful Improvements in Hydraulic Motors; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a vertical sectional view of my improved hydraulic motor. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a perspective view of part of the rim of the bucket-wheel, and Fig. 4 is a similar view of the same from a different point of view.

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

My invention has relation to hydraulic motors, or so-called "hydrant-motors," adapted to run sewing-machines, small printing-presses, lathes, and any other light machinery; and it consists in the improved construction of the same, as hereinafter more fully described and claimed.

In motors of this class, where the bucket-wheel is inclosed in a casing which impinges upon the buckets as the wheel revolves within the casing, it is important to so construct the buckets that there shall be no reaction or backlash of the spent water against the buckets. Hence one part of my improvement consists in the construction and arrangement of the buckets, and of the fixed chutes for conveying the spent water into the discharge opening or outlet in the bottom of the casing. It is also important that the machine be so constructed that there shall be no leakage of water, so that the motor may be used in carpeted rooms without the least damage or injury; and the second part of my invention therefore relates to the construction of the casing and its bosses or bearings for the shaft of the bucket-wheel or water-wheel in such a manner as to prevent absolutely leakage through the shaft-bearings.

In the accompanying drawings, the letter A represents the outer casing, which, as usual, is made in two parts, bolted together by their

flanges *a*. The lower part of the casing is formed with the water-pocket *A'*, which has a discharge opening or outlet, *A*<sup>2</sup>, at its lower end, if desired. The sides of casing *A* may be made slightly bulging toward the center to allow of the free motion of the wheel and provide for sufficient width or breadth of the water-way, with its fixed chutes. The latter are arranged in an enlargement of casing *A*, which forms the waste-water way *B*, leading to the pocket *A'*. This enlargement or water-way is in the form of an expanded circle, covering about one-third of the periphery of the lower part of the circular casing *A*. If desired, a hand-hole may be made in one side of the casing, just opposite to the induction-nozzle *C*, which may be covered by a tightly-fitting glass, *b*, as shown in dotted lines in Fig. 1, through which the action of the stream of water as it strikes the buckets may be observed.

The spent-water chutes or deflectors consist of a series of plates fixed in and following the contour of the water-way *B*. In other words, the water-pocket *A'* and under side of the water-way *B* are separated from the wheel-chamber by these chutes or conductors, by which the spent water is deflected from the buckets as it is discharged therefrom into the water-way, which carries it to the outlet.

As will be seen by reference to Fig. 1 of the drawings, that part of the series of chute-plates *D* which extends across the outlet is curved or shaped like the letter *C*, while the other part or series, which extends from the terminus of the curved plates up to the terminus of the water-way *B*, consists of straight plates *E*, having lips or angles *e*, the ridge formed by the angle deflecting the spent water, as it leaves the buckets in that part of the wheel chamber, down into the water-way leading to the outlet, so that no part of it can fly back against the buckets, and thus retard the motion of the wheel. The latter consists of a cast-iron hub, *F*, steel spokes *G*, and a rim, *H*, which is composed of two annular plates of thin galvanized iron, tin, or other suitable sheet metal, the inner rims of which are soldered together, as shown at *h*, while their outer edges diverge to a *V* shape, with an angle of about thirty degrees, more or less. Within the annular *V*-shaped groove or channel thus



formed are placed the buckets I, at intervals of about two and a half inches apart, (in a wheel about twenty inches diameter,) each bucket consisting of a triangular plate set at an angle of about thirty degrees, and the middle part of the plate struck up to form a ridge, *i*, extending midway through the plate from top to bottom. The point or apex of the triangle fits into the bottom of the channel formed by the diverging plates H H, and the sides or edges of plates I are securely soldered to the sides of plates H H, as will appear by reference to Figs. 3 and 4 of the drawings.

The bottom of each bucket is formed by a lozenge-shaped plate, K, fitting with its pointed lower end, *k*, into the bottom of the channel formed by plates H H, and abutting with its upper end against the inside of the bucket-plate I, as will appear more clearly by reference to Fig. 3 of the drawings, in which one side of the wheel has been broken away to show plainly the construction of the buckets. The induction-nozzle C is so placed in the lower rim of casing A, where the enlargement or water-way B commences, that the stream of water will strike squarely against these bottom plates, K, and thus spend all its force in impelling the wheel. By bending the bucket-plates I in the manner shown, so as to form the central rib, *i*, the water, as it is discharged from the buckets, does not splash against the sides of the wheel-chamber, but is contracted into a narrow stream, which is deflected by the chute-plates D and E into the water-way B, and through it to the outlet. This shape of the bucket also operates to present the least possible resistance to the air in the wheel-chamber as the wheel revolves.

The wheel-hub F is fixed upon a shaft or axle, F', which is journaled in boxes or bearings *ff*, located centrally in the sides of casing A. Bolted to the outside of the casing is a bracket, L, which supports the bearing-brass, and placed below this, but surrounding it on all sides, is a drip-cup, M, the upper part, *m*, of which forms a half-circle through which shaft

F projects. In Fig. 2 I have shown only one of these bearings, with its appropriate drip-cup, although of course there should be two, one on each side of the machine, so that it may be used either right or left handed; and I have also shown part of one side of the cup broken away to show the bearing-bracket L inside. The bottom of the cup communicates through an aperture, *n*, with the interior of the casing, so that all water which leaks through the bearings or bosses in the sides of the casing is fed back into the same and discharged with the rest of the water through the outlet A<sup>2</sup>.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The casing A, having the enlargement or water-way B and induction-nozzle C, and provided in the water-way with a series of chute-plates or deflectors, D and E, spanning the outlet below the wheel-chamber, substantially as and for the purpose herein shown and set forth.

2. The water-wheel or bucket-wheel, having a V-shaped rim, composed of the diverging side plates, H H, the triangular bucket-plates I, bent to form a central ridge, *i*, and the lozenge-shaped bottom plates, K, all constructed and combined, substantially as and for the purpose herein shown and described.

3. In a bucket-wheel adapted for hydraulic motors, the buckets consisting of the triangular plates I, bent to form a central rib or ridge, *i*, and the bottom plates, K, cut at their upper end to fit the bent plates I, upon which they impinge, substantially as and for the purpose herein shown and specified.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

CHARLES E. VAN DUSEN.

Witnesses:

LOUIS BAGGER,  
WM. SECHER.