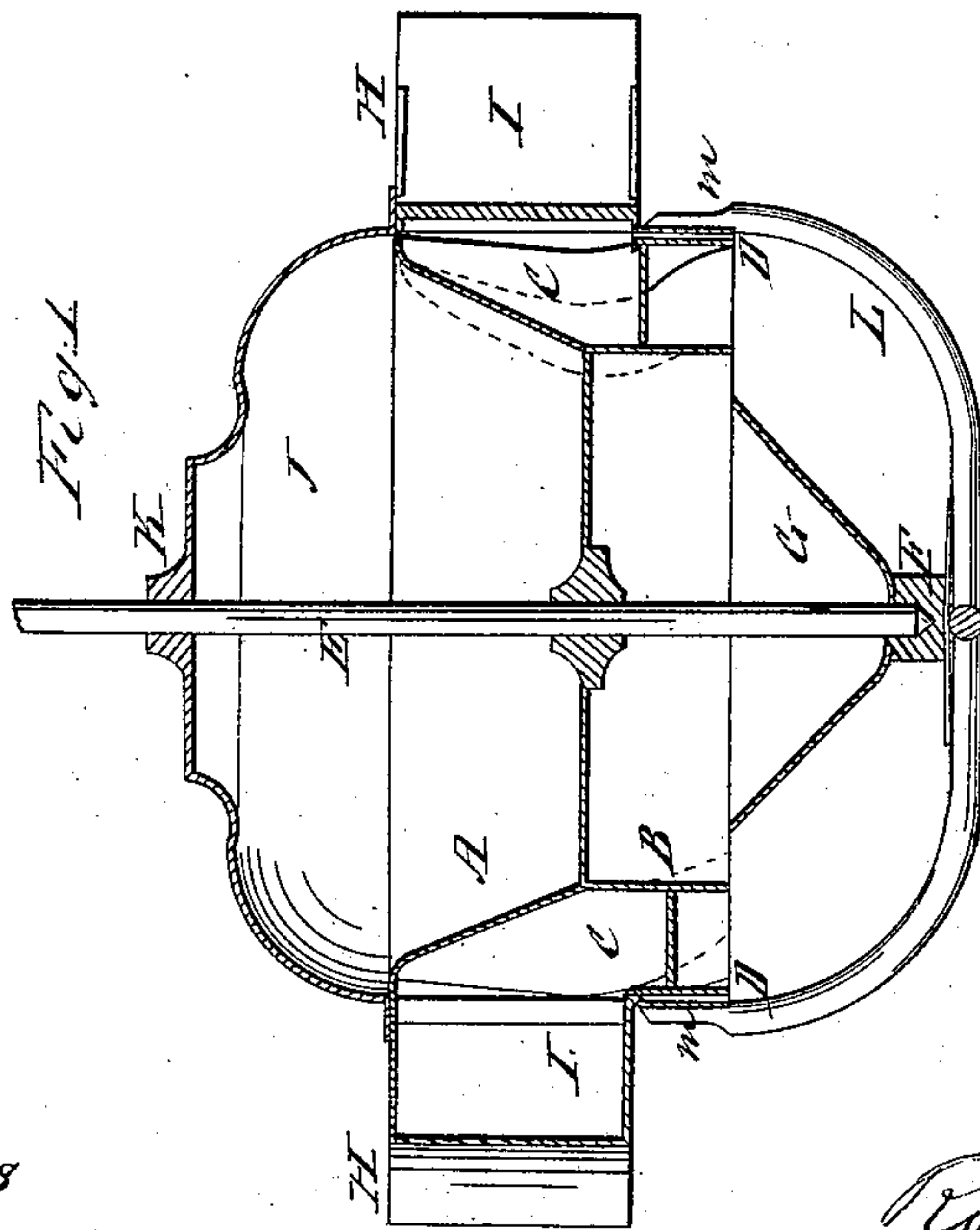
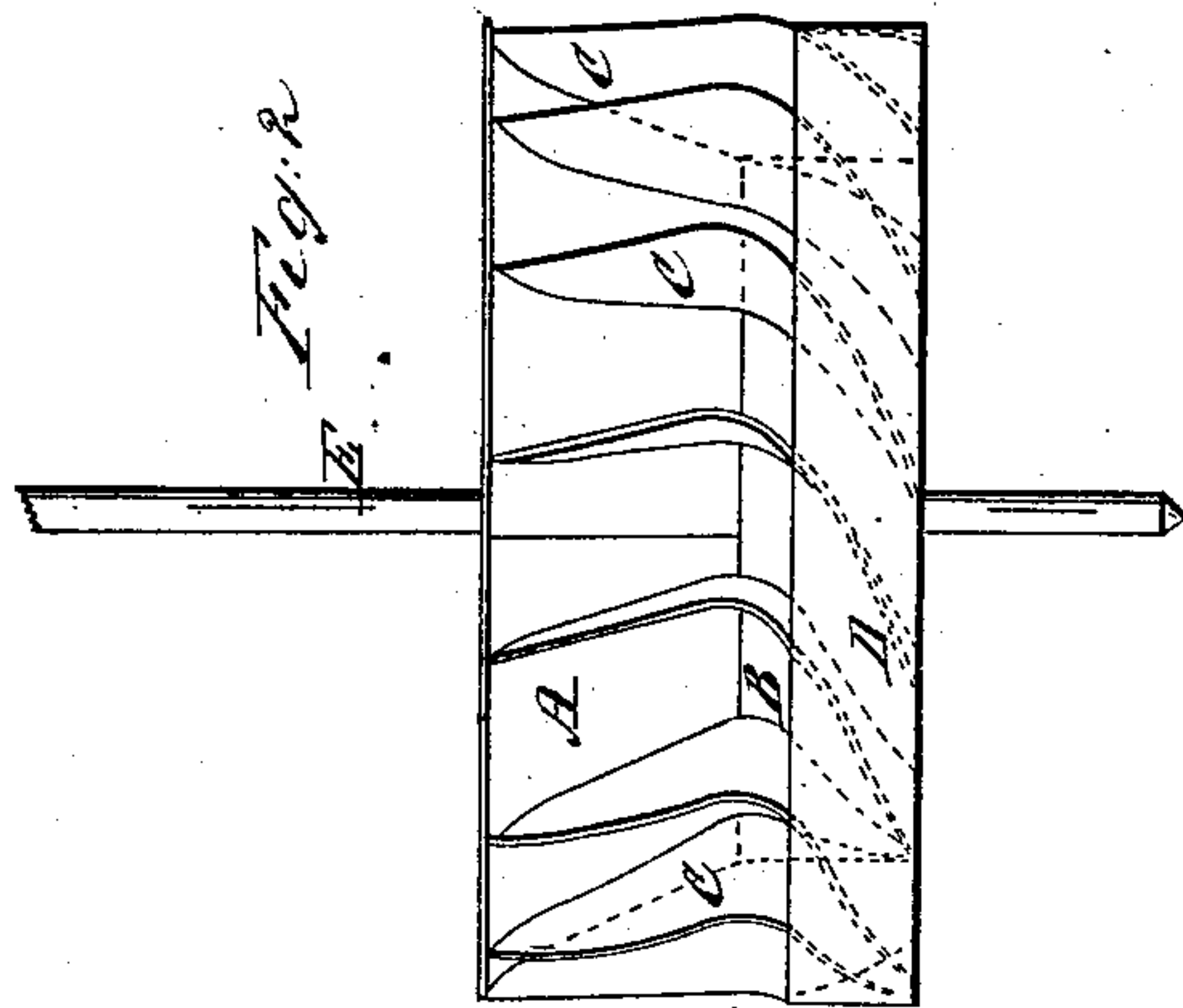


R. Dunbar,

Water Wheel,

Nº 67,175.

Patented July 30, 1867.



Witnesses

B. H. Muehle
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attys

United States Patent Office.

ROBERT DUNBAR, OF BUFFALO, NEW YORK.

Letters Patent No. 67,175, dated July 30, 1867.

IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ROBERT DUNBAR, of the city of Buffalo, county of Erie, and State of New York, have invented a new and improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure I is a vertical section representing the wheel placed in the curb in which it works, and

Figure II is an elevation of the wheel separate from the curb.

The nature of this invention relates, first, to making the hub to which the buckets are attached cylindrical and vertical in the lower section thereof, and flaring or widening out in the upper section thereof; second, in inclining the bucket forward in that part thereof which is in contact with the flaring part of the hub, and in making its upper part tapering from the inside edge thereof, to conform to the flaring shape of the hub, while the outside edge of the bucket in the whole line thereof, when placed in the wheel, shall stand in a vertical plane.

Letters of like name and kind refer to like parts in each of the figures.

A B represent the hub to which the buckets are attached, the upper part A being made flaring or widening out, and the lower part B cylindrical and vertical. It is made of cast iron in the ordinary process of casting, the buckets and the wheel being cast together as a whole. The bucket is represented at C. Its novelty consists in its peculiar shape and position upon the hub. The lower part, which connects with the cylindrical part of the hub and the anti-friction band D, is equal in width, or nearly so, and the edge thereof which connects with the hub lies in the same angle as the edge which connects with the band, so that the water discharges at the same angle at the hub as at the band, while the upper part (or that part which connects with the flaring part of the hub,) is made tapering or upon an angle, so that it will fit the flaring part of the hub, and in its connection with this part of the hub it is inclined forward, as shown in the drawings, so that the water as it strikes or fills this part of the bucket will have a lifting as well as a propelling effect upon the wheel. The hub is also made flaring in connection with the forward inclination of the bucket in order that the water may have a similar lifting as well as propelling effect upon the wheel. The lifting effect of the water upon the hub and buckets relieves the pressure and friction of the wheel-shaft in its step, and causes the wheel to run lighter. This construction also gives the water more power upon the wheel. E is the wheel-shaft, and F the step in which it runs; G is the lubricating cup; H is the curb in which the wheel is placed, which has four or more chutes I, through which the water is carried to the wheel; and J is the cap which sets upon the curb, and which has a bearing, K, for the upper end of the wheel-shaft. L is a cross or frame, and is connected with the curb, as shown at *m*, to form a support for the step. These parts are of well-known construction to those acquainted with this class of wheels, and a detailed description thereof in this specification is not deemed to be necessary. It will be noticed that the lower part of the face of the bucket lying between the band and the hub is an inclined plane. There is no curve or twist in this part of the bucket, and hence the whole sheet of water passing over the bucket is discharged at the same angle.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A hub made flaring in the upper part thereof, as represented at A, in combination with the forward inclination of the bucket, in connection therewith, for the purposes and substantially as set forth.
2. I claim giving a plane surface to the lower part of the face of the bucket of said wheel lying between the cylindrical part of the hub and the anti-friction band D, substantially as described.

ROBT. DUNBAR.

Witnesses:

B. H. MUEHLE,

E. B. FORBUSH.