A. Hubbell.

Water Wheel.

No. 90,000. Patented May 11, 1869.

Fig. 1.

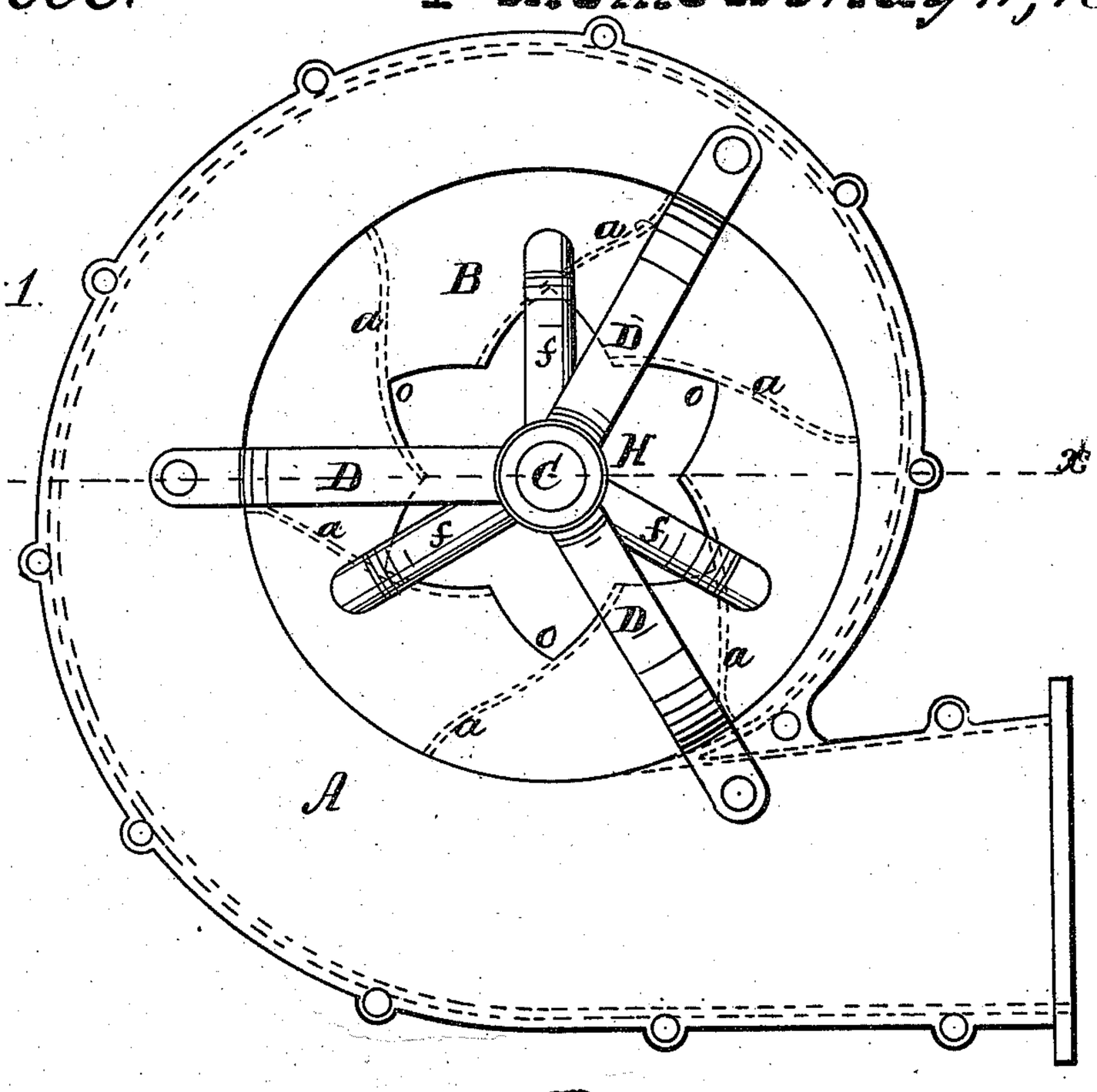
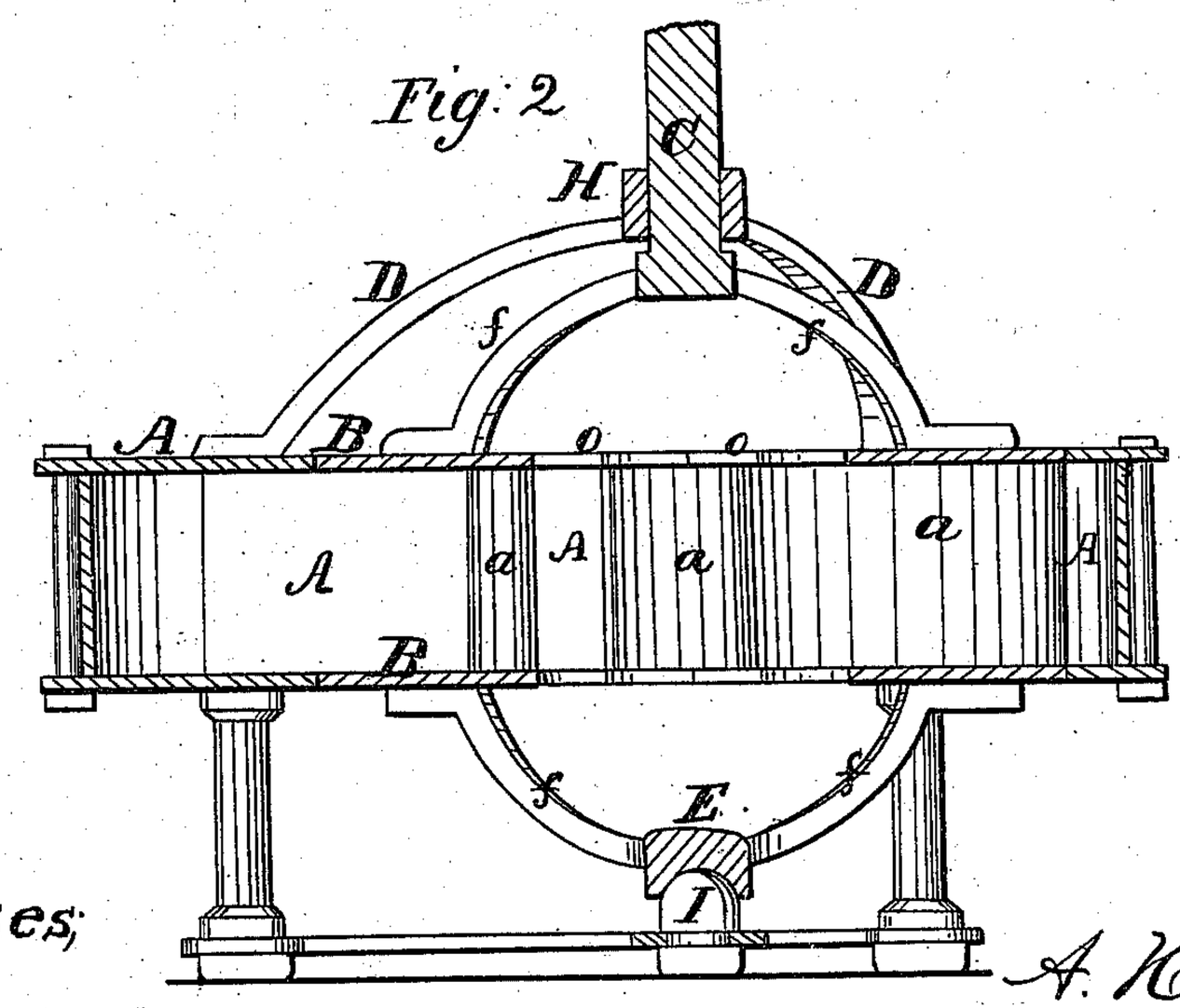


Fig. 2.



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his attys.

United States Patent Office.

ABIJAH HUBBELL, OF SALISBURY, CONNECTICUT, ASSIGNOR TO HIMSELF, GEORGE V. CAPRON, AND E. P. H. CAPRON.

Letters Patent No. 90,000, *dated May* 11, 1869.

IMPROVEMENT IN TURBINE 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, ABIJAH HUBBELL, of Salisbury, in the county of Litchfield, and State of Connecticut, have invented certain new and useful Improvements in Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon, like letters indicating like parts wherever they occur.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it.

My invention relates to that class of water-wheels known as "central-discharge" wheels; and

The invention consists—

First, in a peculiar manner of forming and arranging the buckets, and top and bottom plates; and,

Second, in a novel manner of securing the shaft to the wheel, all as hereinafter explained.

Figure 1 is a plan view of my improved wheel and case, complete.

Figure 2 is a transverse vertical section on the line *x–x* of fig. 1.

In constructing my wheel, which may be cast entire or formed of plates bolted together, I make a top and a bottom plate, B, in the form shown in fig. 1, these plates being circular, as usual, on their exterior, with an opening, or hole, at their centre, occupying about one-third of the diameter of the wheel.

This central opening, instead of being circular, as is usually the case in such wheels, has a series of notches, *o*, cut or formed in the plate, around the exterior of this central opening, as shown in fig. 1, the opening thus being made star-shaped, or nearly so, as represented.

The buckets consist of curved metal plates, inserted between the top and bottom plates B, the form of these buckets being shown by the dotted lines *a*, fig. 1. These buckets *a* are arranged tangentially, as there shown, and so that the inner end of each bucket shall extend along one side of the notch *o*, in the plates B, the other side of the notch *o* being the width of the mouth, or space, through which the water is discharged between the buckets *a*.

The water, as it enters the scroll, first impinges against and acts upon the outer concave portion of the buckets, and thence is deflected toward the centre, still pressing upon the rear side of the bucket, until it arrives at the edge of plate B, at the notch *o*, when it is at once discharged, through the central opening below.

The position and form of the buckets are intended to be such that the whole power of the water shall be utilized by the time it has reached the inner end of the buckets, and, therefore, the notched form is given to the plate B at that point, in order that the water may be discharged free of the wheel, at the earliest possible moment after it has lost its power, as any further detention of it within or upon the wheel would only tend to retard its motion and detract from its power.

Instead of extending the shaft C down through the centre of the wheel, as usual, I secure it to the upper plate B, by means of three or more curved arms, *f*, as shown more clearly in fig. 2, the extremity of these arms *f* being firmly bolted to the plate B, and the arms *f* uniting at the centre, and forming a hub, to which the shaft C is firmly secured; or, if the shaft be of cast-iron, it and the arms *f* may be all formed in a single piece.

Similar arms, *f*, are secured to the lower plate B, and unite at the centre, to form a bearing, or hub, E, which is mounted upon a step, I, in the usual manner.

The shaft C is supported above by three arms, D, bolted firmly, at their outer ends, to the case A, and united at their inner ends, to form a hub, or box, H, which forms a bearing, or box for the shaft C, as represented in the drawings.

By these means, I avoid extending the shaft through the wheel, and thus insure a larger and more open space for the discharge of the water, and thereby also lessen the chances of the clogging of the wheel by sticks or other rubbish.

By this method of construction, I am enabled to produce a wheel of extreme simplicity and efficiency.

Having thus described my invention,

What I claim, is—

1. A water-wheel, consisting of the plates B, having the central notched opening, and having the buckets *a*, formed and arranged in relation thereto, substantially as described.

2. The shaft C, secured to the wheel by means of the arms *f*, so as to leave an unobstructed opening through the centre of the wheel, substantially as described.

ABIJAH HUBBELL.

Witnesses:

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