

J. S. TEED.

Improvement in Water Wheels.

No. 121,555.

Patented Dec. 5, 1871.

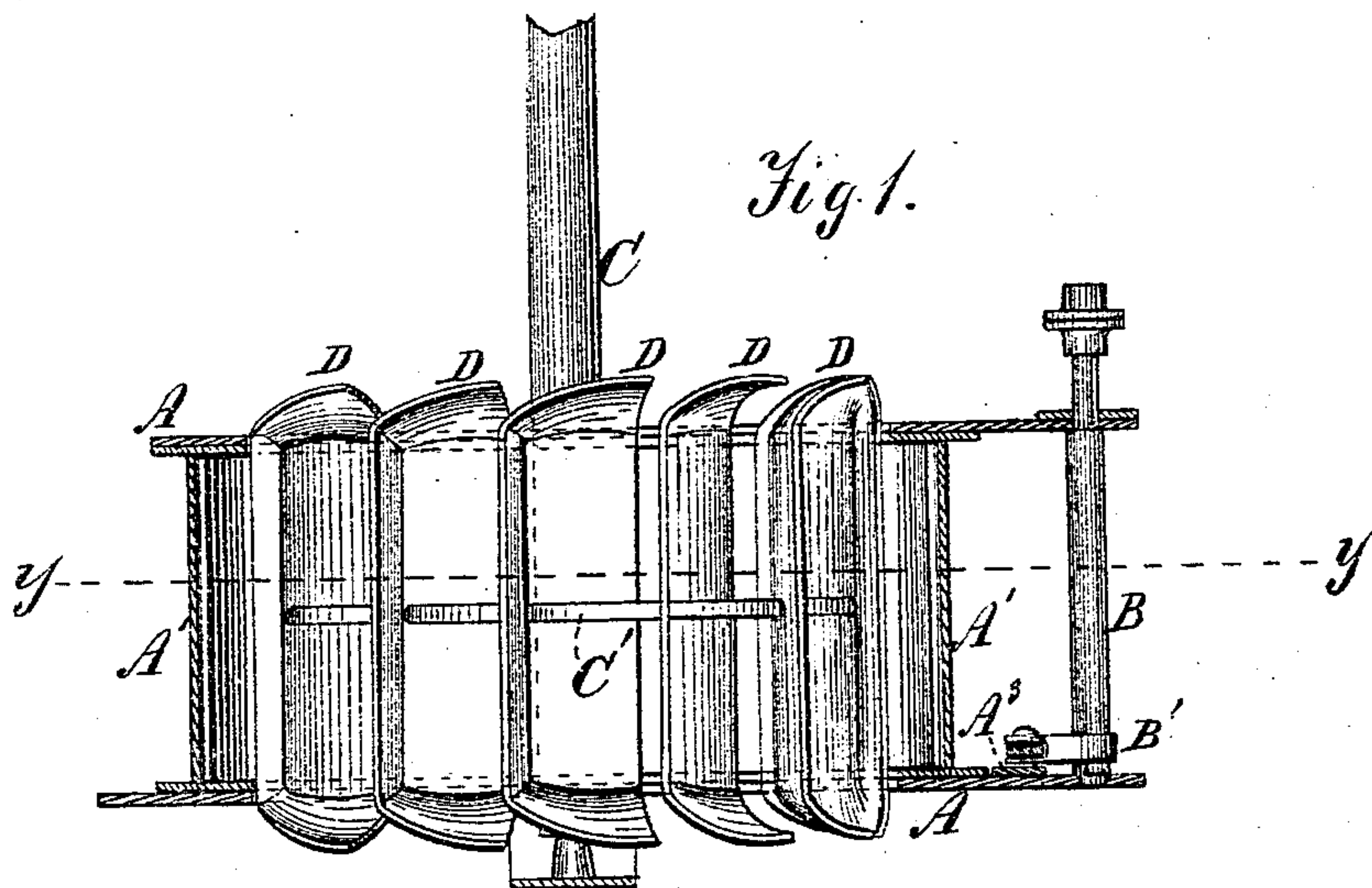


Fig 2.

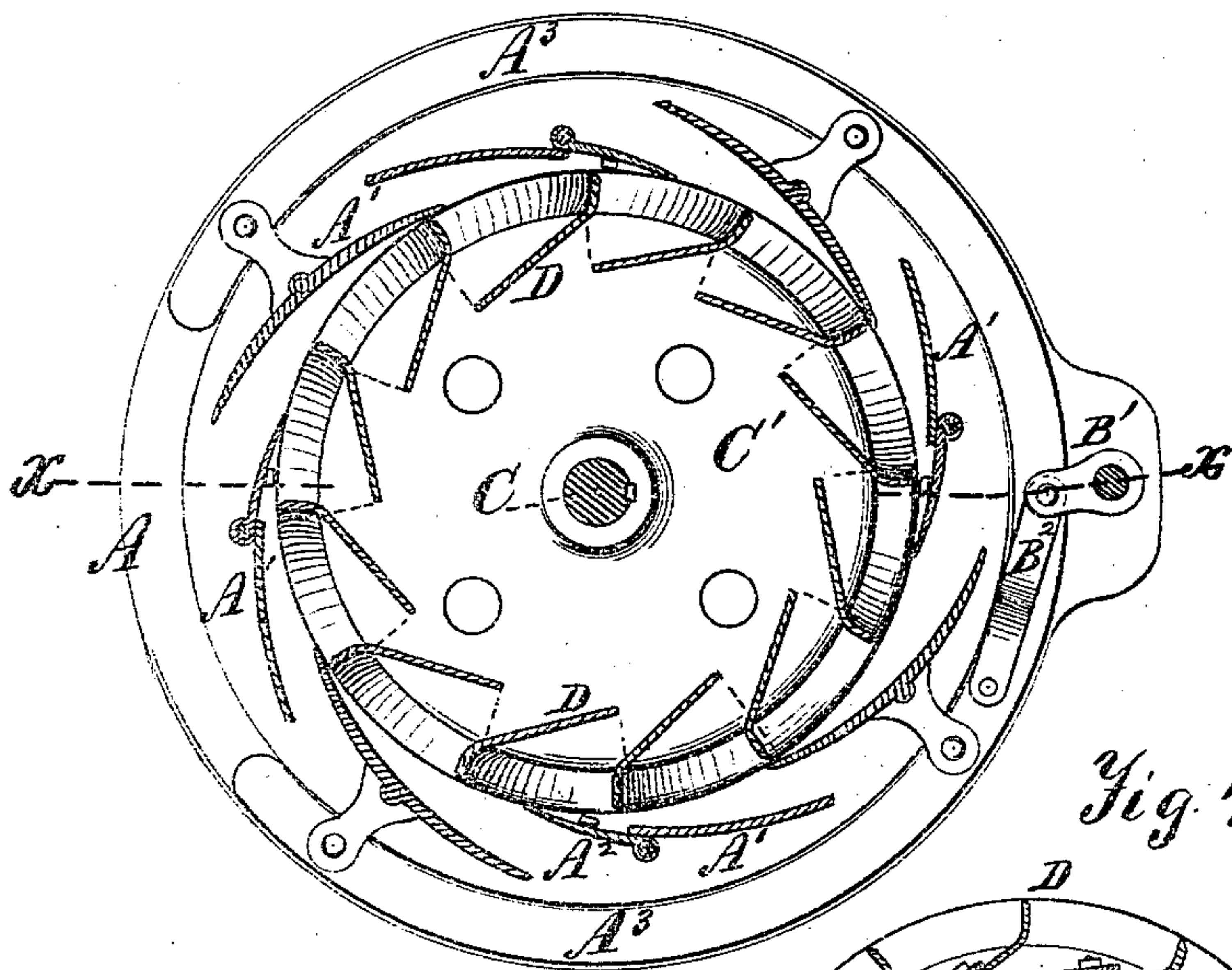


Fig 3.

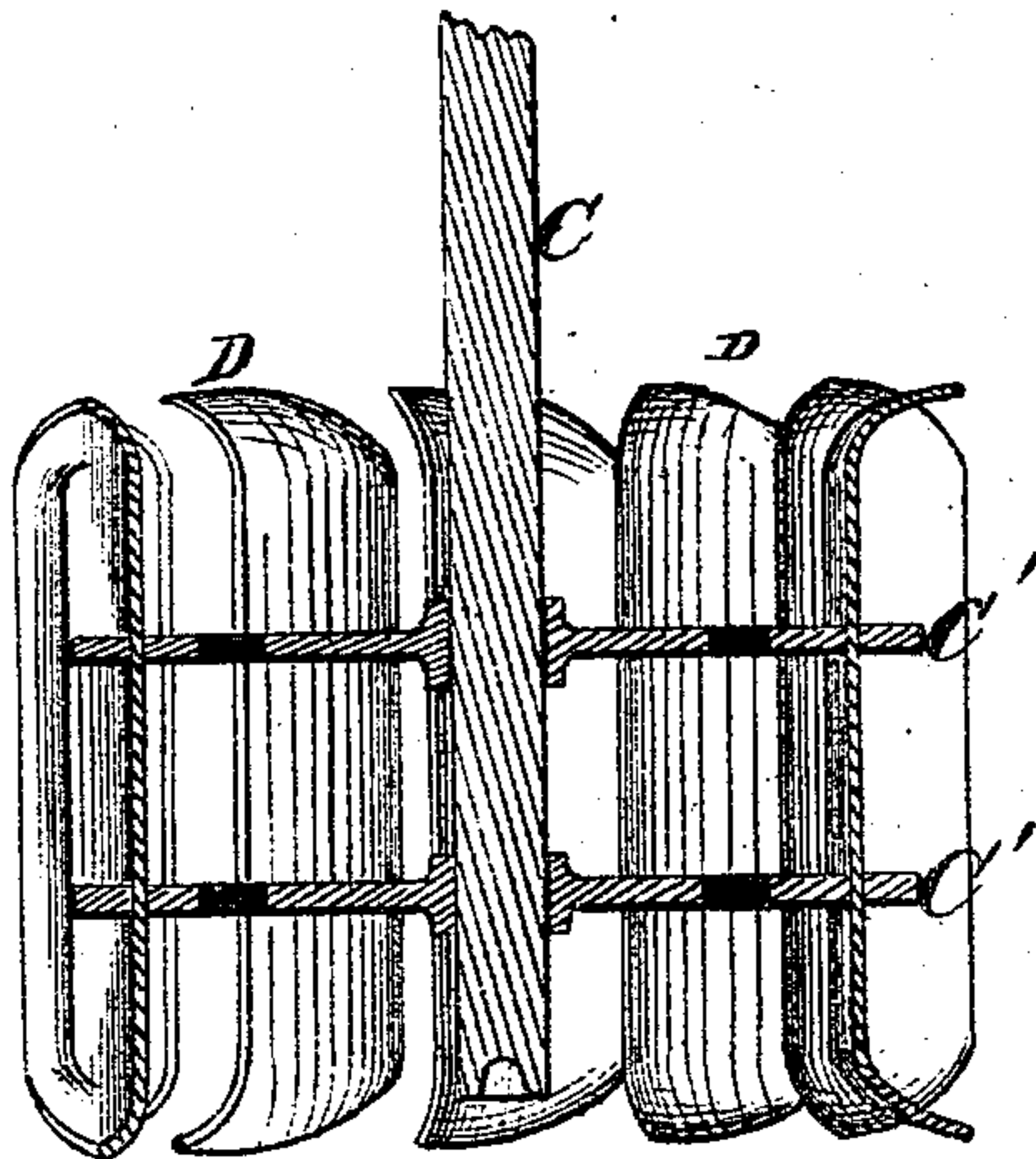
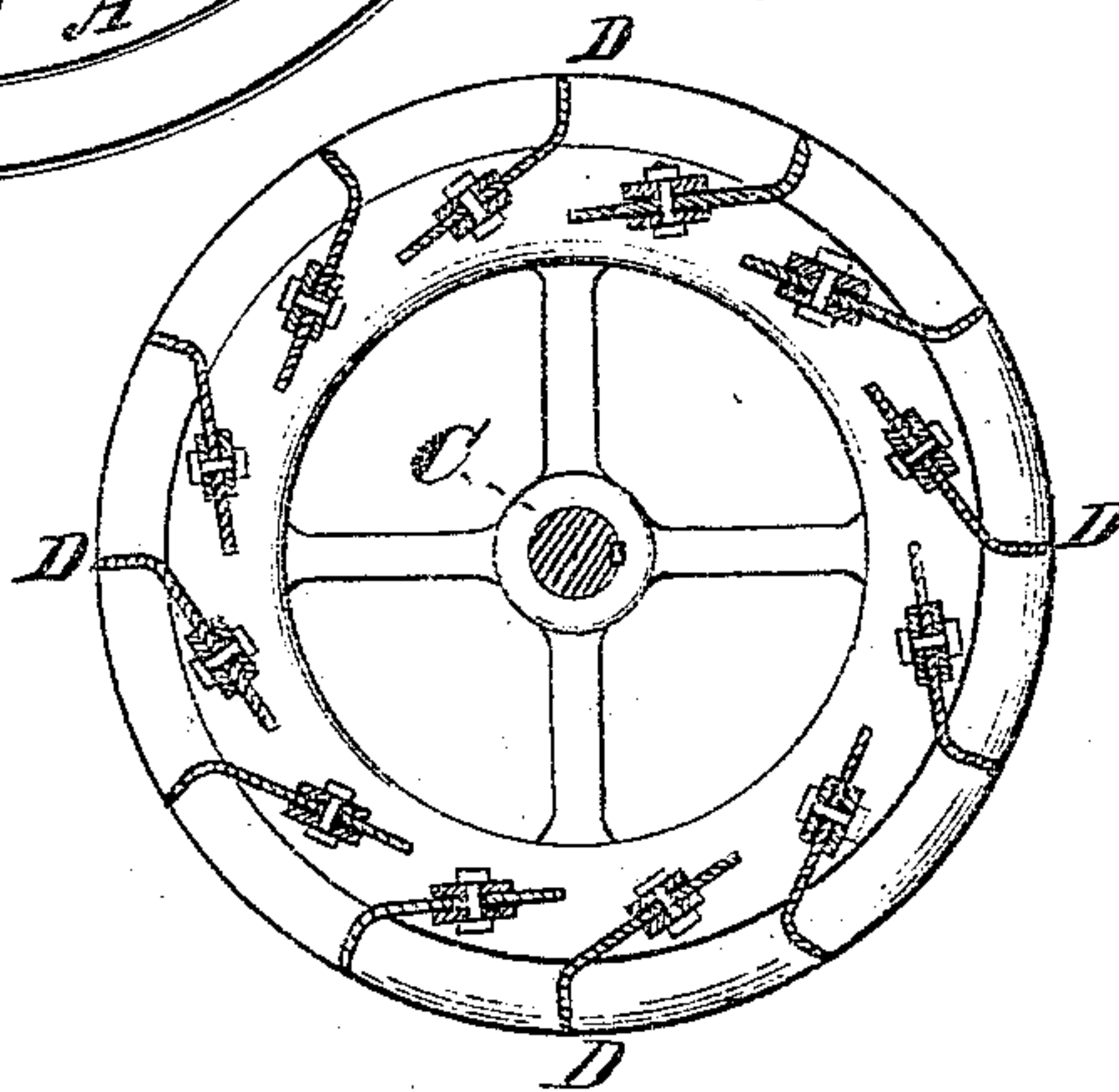


Fig 4.



Witnesses.
A Ruppert
Edw. J. Cile

J. S. Teed
Inventor.
D. P. Holloway & Co
Atty

UNITED STATES PATENT OFFICE.

JESSE S. TEED, OF GUILFORD, NEW YORK.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 121,555, dated December 5, 1871.

To all whom it may concern:

Be it known that I, JESSE S. TEED, of Guilford, in the county of Chenango and State of New York, have invented certain 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 annexed drawing making a part of this specification, in which—

Figure 1 is a vertical section of my improved wheel on line *xx* of Fig. 2, showing the case in which it revolves, the form of its buckets, and the mechanism for opening and closing the gates or chutes; the wheel in this figure being shown with a diaphragm in its center for supporting the buckets. Fig. 2 is a horizontal section on line *yy* of Fig. 1, showing the buckets, the diaphragm in which they are held with the apertures through it for the discharge of water, the gates or chutes which are operated by machinery, and those which are operated by the pressure of the water or other substance. Fig. 3 is a vertical section of the wheel, having two diaphragms or sets of arms to which to secure the buckets. Fig. 4 is a horizontal section, showing the method of attaching the buckets to the rim or diaphragm.

Corresponding letters refer to corresponding parts in all the figures.

This invention relates to water-wheels; and it consists in the peculiar construction of the buckets of such wheels, and in certain combinations and arrangements of the parts of the case in which they run, as will be more fully described hereinafter. The first consideration in the construction of water-wheels is to so form and arrange the parts as to utilize the greatest possible percentage of the power of the water used upon them; and the object of the present invention is the production of a wheel that shall utilize a greater percentage of such force than has heretofore been done, and to furnish at the same time a wheel that shall be economical in its first cost and require but small outlays for repairs.

In constructing wheels of this character I use for the bottom plate of the case A a sheet of metal, which may be either cast or wrought, it being of sufficient thickness to support the parts of the wheel. Through the center of this plate an aperture is formed of just sufficient size to permit the wheel to pass through, and upon its under side a bar of metal or of wood is secured, in the center of which a step is placed for the reception and support of the

lower end of the shaft. This plate also forms the support for the lower ends of the shafts or pivots upon which the gates turn. Upon the upper side of the case another ring of metal is placed, the aperture in its center being of the same size as the lower one, it forming the support and bearings for the upper ends of the gates, and in connection with such gates and the lower ring or plate forming the case of the wheel. When, however, the wheel and its case are to be placed in a flume in which the water is of greater depth than the wheel, a cap of hemispherical or other suitable form is to be placed over the upper end of the wheel and secured to the upper side of the upper ring or plate of the case; and if desired a gooseneck or crooked pipe may be attached to such cap for the purpose of taking off the water that is discharged from the upper ends of the buckets of the wheel, such pipe passing down to any desired point outside of the flume. In making up this case I prefer to use two sets of gates or chutes for admitting water to the wheel and for giving it its proper direction. One set of these gates is marked $A^1 A^1$, and they are operated by a ring, A^3 , which is arranged upon the lower plate of the case, the buckets having upon their lower ends ears or projections for connecting them to said ring, and pivots upon their ends for holding them in position; or they may have a shaft running through them, the ends of which shall enter cavities in the plates, and thus hold them. The second set of buckets is marked A^2 , and is of less width than those first alluded to. They have, at or near one of their edges, pivots for holding them in position, their curvature being about the same as that of the other series; they are not, however, attached to the ring which operates the others, but are automatic in their operations, and entirely independent of them in their outward movements, they being intended to have such movement only when some obstruction is passing through the wheel, at which times they will swing outward and allow such obstructions to pass, when they will immediately swing inward again in consequence of the pressure of the water upon their outer surfaces, they being prevented from passing beyond a certain point in closing by stops or pins in or upon the plate A. These last-named gates or chutes are arranged between each of the other series, and serve as the points against which their edges rest when closed. The

ring A^3 , to which the gates A^1 are attached, may extend entirely around the case, and it may be operated by means of a link, B' , which has one of its ends attached to it while its opposite end is connected to a crank, B' , upon a vertical shaft, as shown in Fig. 1, which shaft may extend upward to any portion of the building in which the wheel is placed, so that the gates can be operated from any convenient place. The wheel consists of a shaft, C , buckets $D D$, and one or more diaphragms or arms and flange, $C' C'$. The shaft may be of any size or length, according to the size of the wheel and the position in which it is to be placed. The shaft carries one or more diaphragms, to which the buckets are secured; when only one such diaphragm is used it is placed in such a position as to be about in the center of the buckets, and is to be perforated as shown in Fig. 2, so that any water which may be discharged through the spaces between the buckets above the diaphragm, and inward toward the center of the wheel, may pass downward through said perforations or apertures. Should more than one diaphragm be used, the whole number are to be perforated; but instead of using the diaphragm one or more spiders with a flanged rim may be used, such rims having lugs formed upon them to bolt the buckets to, as shown in Fig. 4. The buckets $D D$, which form an important part of this invention, are constructed substantially as shown in Figs. 1 and 3, their central portion consisting of a flat plate or piece of metal, except that upon their outer edges there is formed a flange, which is to be made to stand at an angle of forty-five degrees, more or less, to the flat surface of such bucket. This flange extends the entire length of the flat or straight portion of the bucket, and is for the purpose of receiving a portion of the impact of the water as it passes through the gates and comes in contact with the wheel, the remaining portion of such impact being received upon the flat portion of the bucket. The length of the straight portion of the buckets is to be about the same as the length or depth of the case; but above and below such case, or the points of the buckets which are opposite the inner surfaces of the rings which constitute the ends of the case, flanges are formed, as shown in Fig. 1. The flanges, which commence at a point about

opposite the inner surfaces of the rings which form the ends of the case, extend upward and downward or outward at such an angle or curve as to discharge a portion of the water at each end of the wheel at or nearly at a right angle to the axis of the wheel, so that a portion of the water which propels it may be discharged at the ends and outside of the wheel, and a portion of it inside buckets and inside of the wheel to be passed down or out through the center thereof.

I have shown and described a wheel of the vertical type; but it is apparent that the axis of a wheel according to my plan may be placed in a horizontal or in an inclined position, and that in such positions it will produce good results.

I am aware that water-wheels have heretofore been constructed which have discharged water at their ends. I do not, therefore, claim broadly a water-wheel thus discharging its water.

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

1. A water-wheel the buckets of which are of greater length than the case, in which it is inclosed, such buckets being constructed substantially as shown and described, as a consequence of which a portion of the water which propels it may be discharged at each end of each bucket and a portion through the center of the wheel, substantially as and for the purpose set forth.

2. The buckets $D D$, constructed with their central portions and inward edges in the form of a plane or flat surface while their ends and outer edges are curved, substantially as shown, in combination with a diaphragm or spiders for holding them in position, substantially as and for the purpose set forth.

3. The combination of the gates A^1 , which are operated by mechanism, and the independently-moving gates or chutes A^2 with the plates or rims of the case, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JESSE S. TEED.

Witnesses:

A. RUPPERT,
C. F. CLAUSEN.

(168)