

John T. Fanning's improved Turbine Water Wheel Chutes.

No. 120,954.

Patented Nov. 14, 1871.

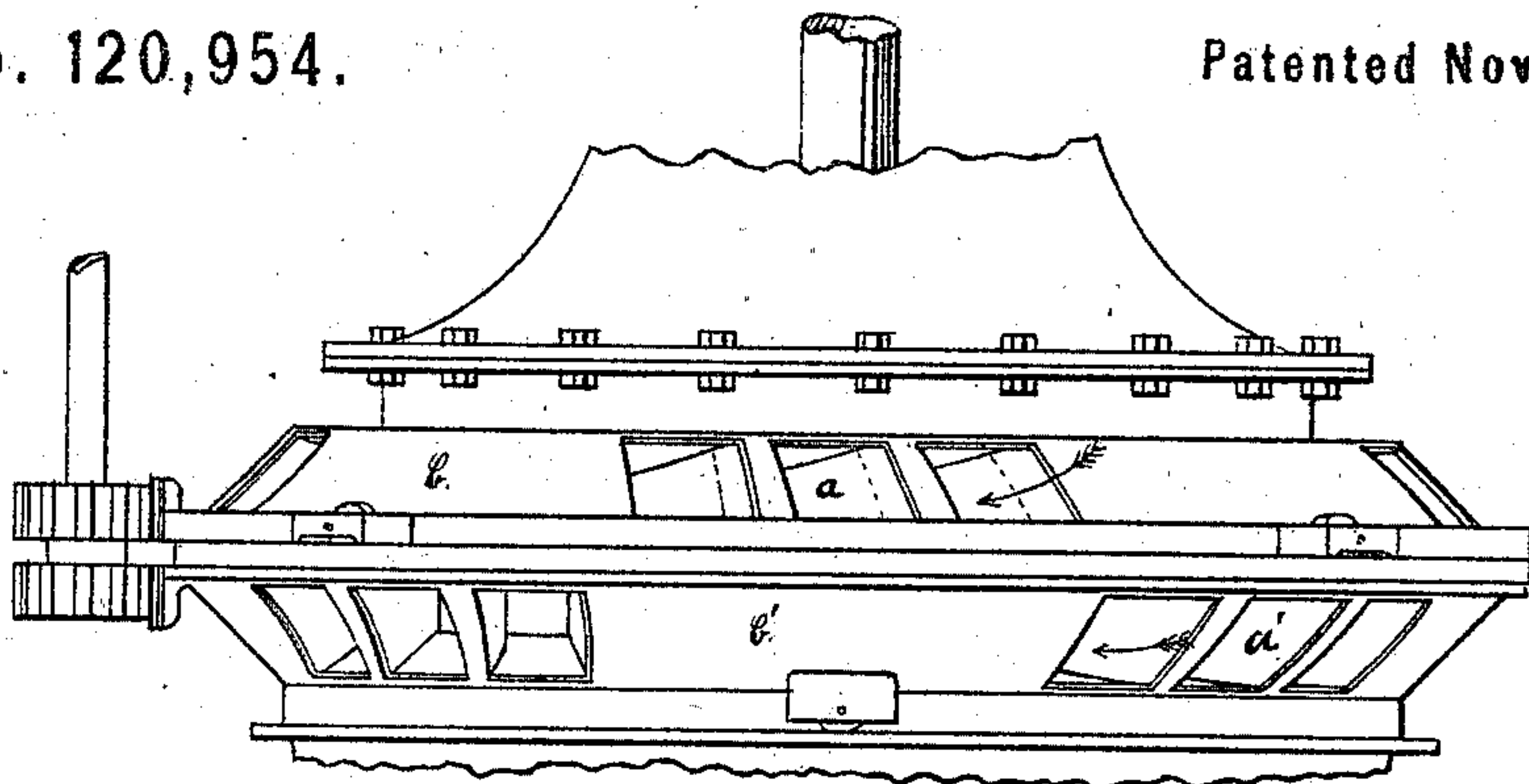


Fig. 1.

Scale 1 inch

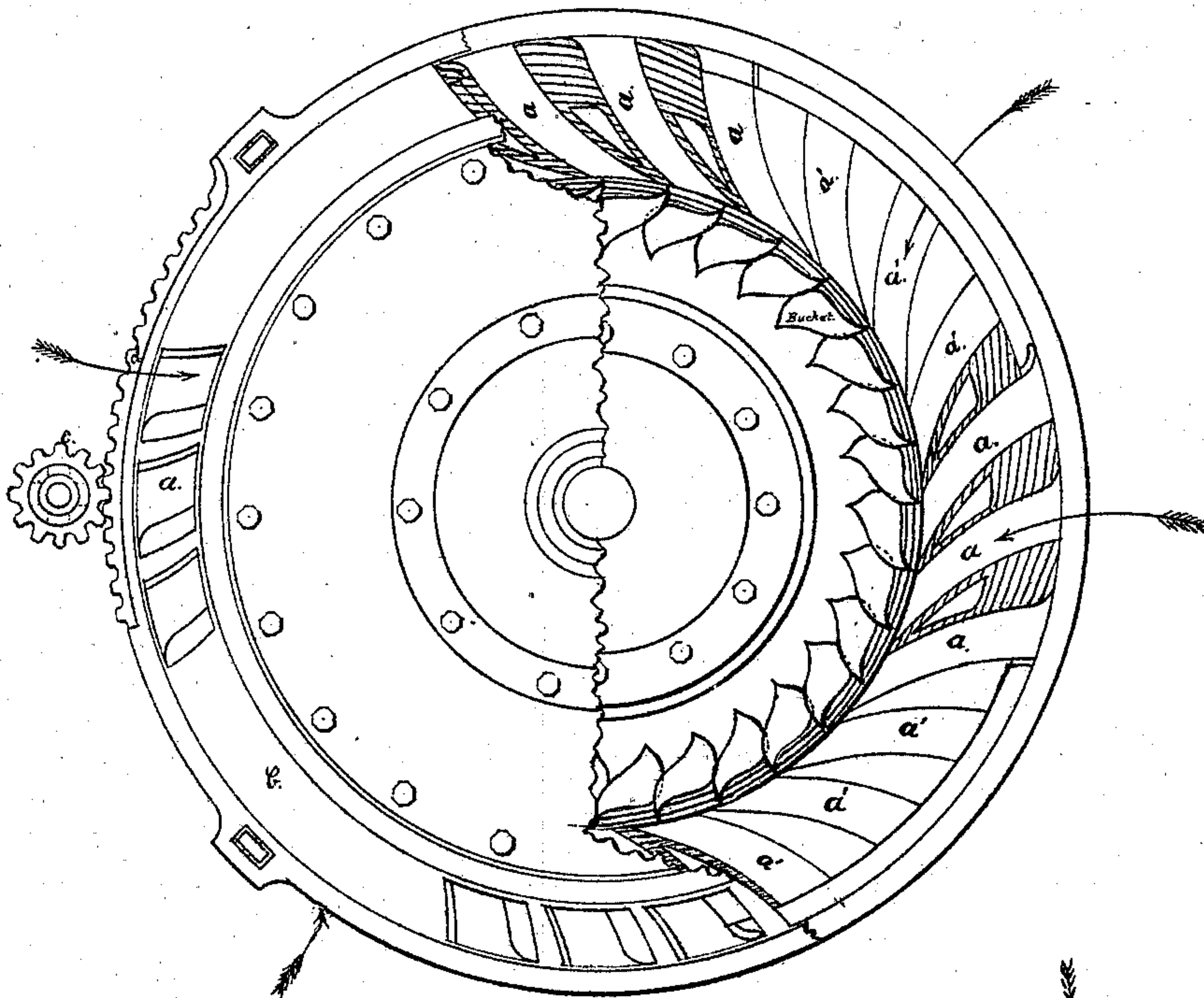


Fig. 2.

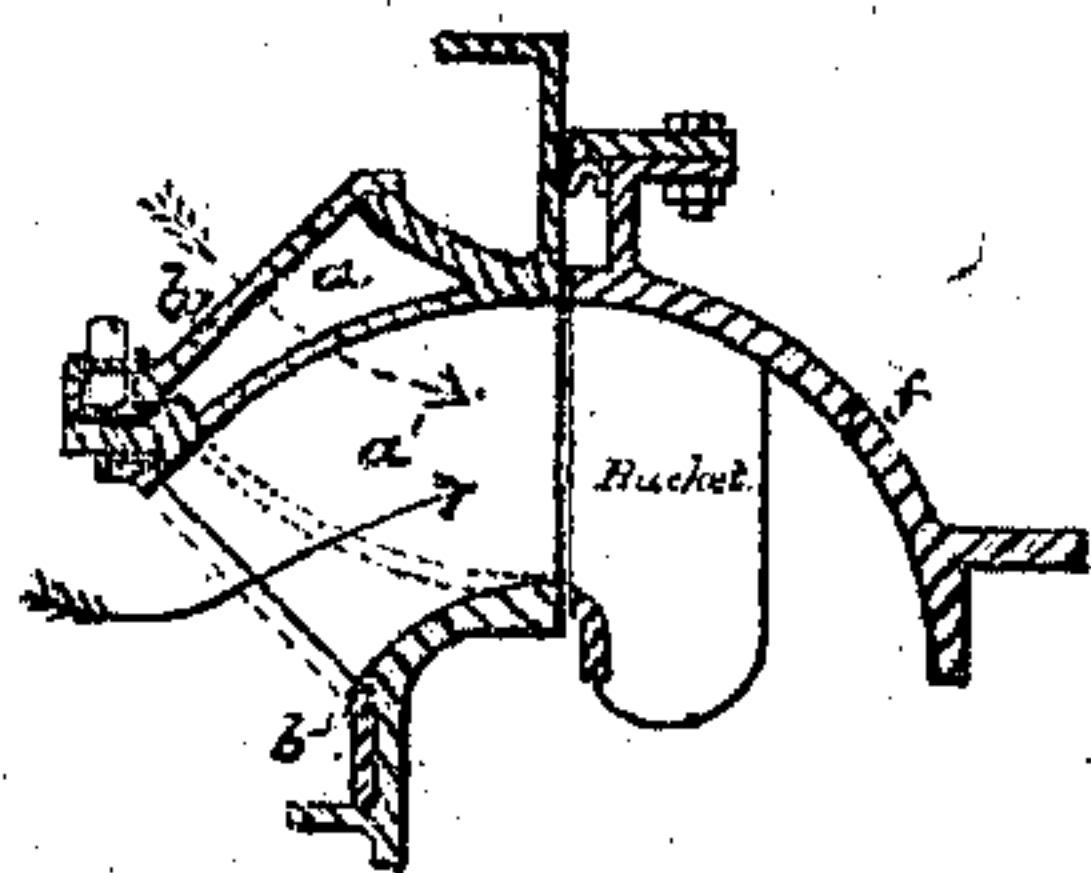


Fig. 3.

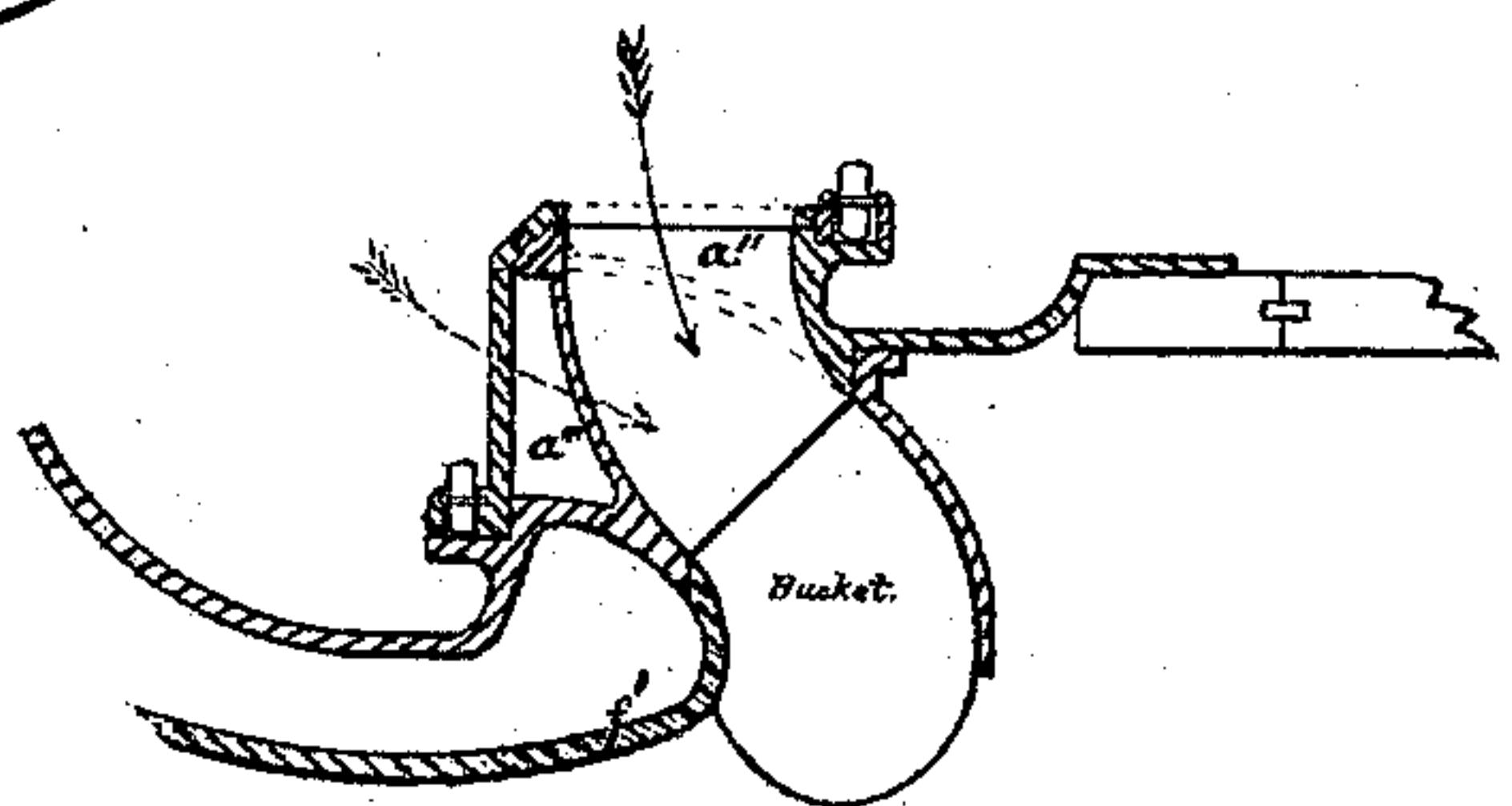


Fig. 5.

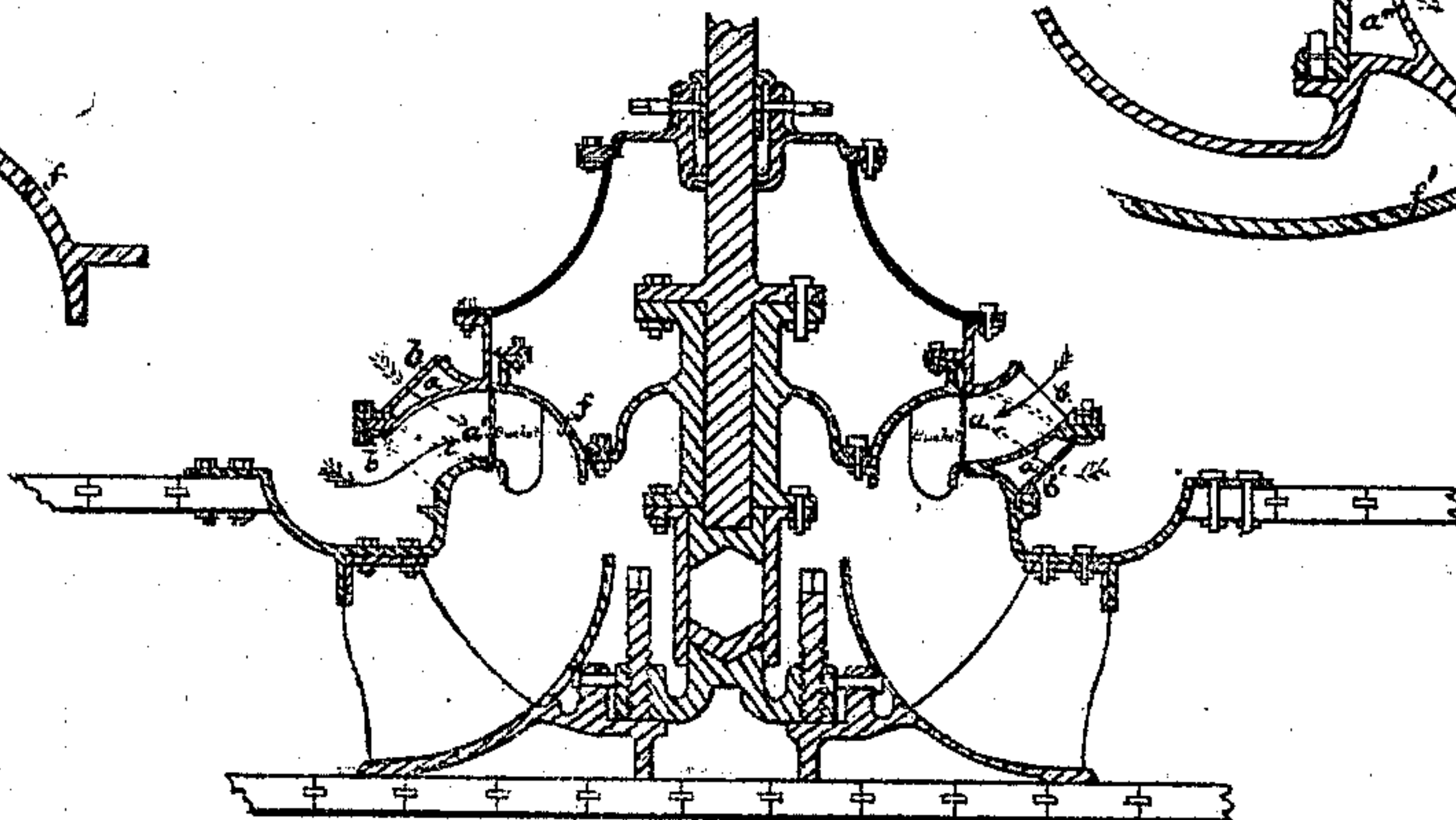


Fig. 4.

Scale 1/2 inch.

WITNESSES

George Perkins
H. C. Richards

INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN T. FANNING, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN CHUTES OF WATER-WHEEL CASES.

Specification forming part of Letters Patent No. 120,954, dated November 14, 1871.

To all whom it may concern:

Be it known that I, JOHN T. FANNING, of Norwich, in the county of New London and State of Connecticut, have invented a new and Improved Arrangement of Turbine Water-Wheel Chutes, of which the following is a specification:

This invention consists in arranging the chutes of a water-wheel in a continuous series, the members of which are contiguous, the effluent ends of the series also being adapted to discharge water to the wheel in the same general plane, while the influent ends, either individually or in groups, are alternately arranged to receive the water in different planes. In connection with the chutes so arranged I employ two distinct series of gates, one of which is adapted to close the influent ends of the chutes which are located in the same general plane, and the other to close the ends of the alternate chutes located in the different plane. The details of construction and manner of operation will be fully described hereinafter.

Figure 1 is an elevation of a double set of alternate grouped chutes *a a'* with their gates *b b'*. Fig. 2 is a one-half plan of a like set of the same chutes and gates, and a one-half horizontal section through the same. Fig. 3 is a vertical section through a like set of the chutes. Fig. 4 is a vertical section through a like set of alternate grouped chutes *a a'* and gates *b b'*, as applied to an inward-flow turbine water-wheel. Fig. 5 is a vertical section through a similar set of chutes, *a'' a'''*, applied to a diagonal-flow turbine water-wheel.

The chutes *a a'* are shown in elevation in Fig. 1, in plan in Fig. 2, and in vertical section in Figs. 3 and 4. They are arranged in alternate equal groups around the wheel, with three chutes in each group and with four groups of each alternate, making eight groups in the entire ring. These alternate groups *a*, to which the upper concentric gate *b* is fitted, curve downward and horizontally, and those, *a'*, to which the lower concentric gate *b* is fitted, curve upward and horizontally from their outward to their inward ends, and the centers of the inner ends of all the chutes are brought into the same horizontal plane and into a limiting circle surrounding the bucketed turbine wheel *f*, and the center lines of all the chutes reach that circle in directions nearly tangential. The opposite sides of each chute are

nearly parallel to each other, excepting near their influent ends. The tops and bottoms of and the partitions between the chutes are intended to be cast in iron or other metal. They may be trued up in a lathe or otherwise to receive the concentric gates, and fitted and bolted to a turbine-wheel frame. The inner ends of the chutes *a a'* should be jointed so as just to clear the periphery of the turbine wheel as it revolves. The gates *b b'* are shown in elevation in Fig. 1, and in plan in Fig. 2, and in vertical section in Figs. 3 and 4. They are each formed in one continuous or made-up concentric ring, of cast-iron or other metal, so formed as to cover closely the influent ends of all the chutes in the groups of alternates to which it belongs, and each has such openings through it corresponding in size to the breadths and heights of the groups of chutes that when it has been revolved around its chutes a distance equal to the width of one chute and its partition one chute in each of its groups will then be fully uncovered, and when the revolution has been continued another like distance two chutes in each of its groups will then be fully uncovered, and when the revolution has been continued another like distance all of the chutes of all of its groups will then be fully uncovered and open, and in condition to conduct water to one-half of all the buckets of the wheel. If, then, the other gate be revolved in a similar manner, one, then two, then all of the chutes in all of its groups will be fully uncovered. When the opening revolutions are completed for both gates, then all the chutes will be in condition to deliver water to all of the buckets simultaneously. The gates are shown in the drawing as fully open. The four covering parts of each gate, as it is opened, are moved behind the backs of their adjoining alternate groups of chutes. The gates are intended to be moved by levers or by racks and pinions. If they are fitted with racks *d* they may be revolved by a pinion, *e*, in the usual manner of operating similar contrivances, and may be easily adjusted by a regulator or by a hand-wheel, so that any fractional part of or the whole vent may be opened or closed and the flow of water onto the wheel controlled according to the work required to be done or available supply of water to be used. Chutes can also be arranged in similar double sets of single alternates, or as readily arranged in similar alternate groups of

two, four, or other number of chutes in each group, and their gates made to conform to them. Alternate chutes or groups of chutes a'' a''' , Fig. 5, constructed in double sets on similar principles, can be arranged for application to parallel, outward, or other-flow turbine water-wheels f' , by revolving the chutes together about the centers of their effluent ends in their radial planes.

I do not herein claim the construction or arrangement of a single set of turbine-wheel chutes with centers in the same plane combined with a concentric gate.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A series of chutes contiguously arranged, and having their effluent or inner ends adapted to discharge the water to the wheel in the same general plane, and their influent ends located alternately, either in groups or individually, in different planes, substantially as described.

2. A series of chutes having their influent ends arranged alternately in different planes, and each set of such ends provided with its independent annular gate, as described.

JOHN T. FANNING.

Witnesses:

GEORGE PERKINS,

W. H. RICHARDS.

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