(No Model.)

L. C. RYAN.

WATER WHEEL.

No. 287,330. Patented Oct. 23, 1883.

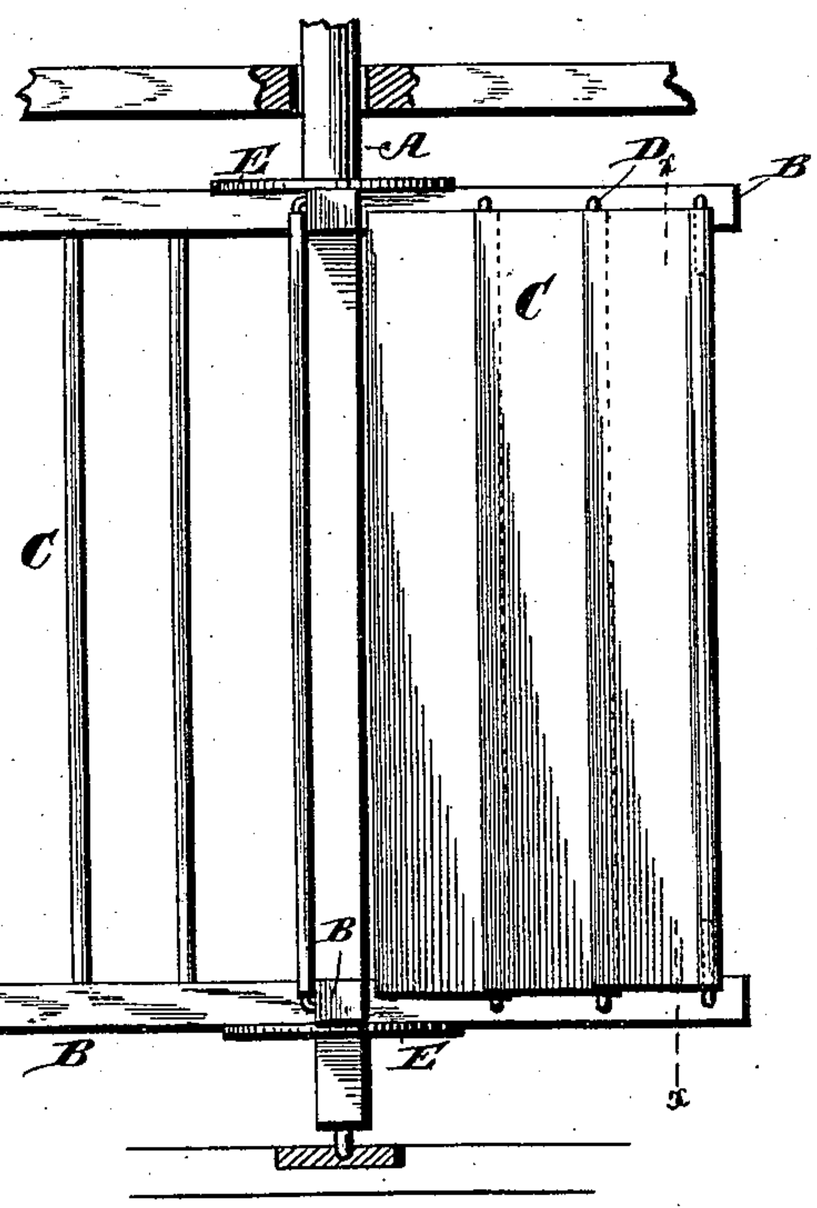


Fig. 1.

Fig. 3.

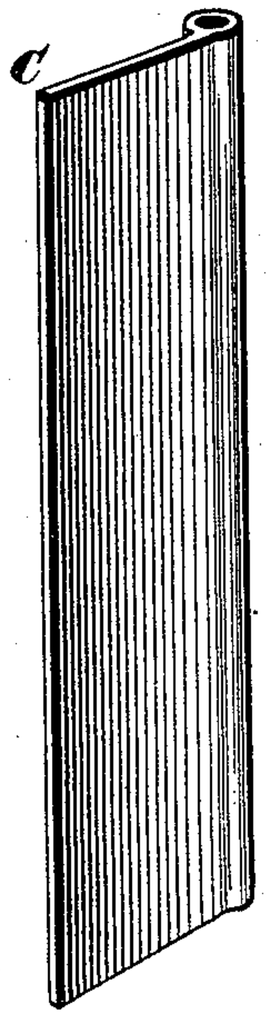
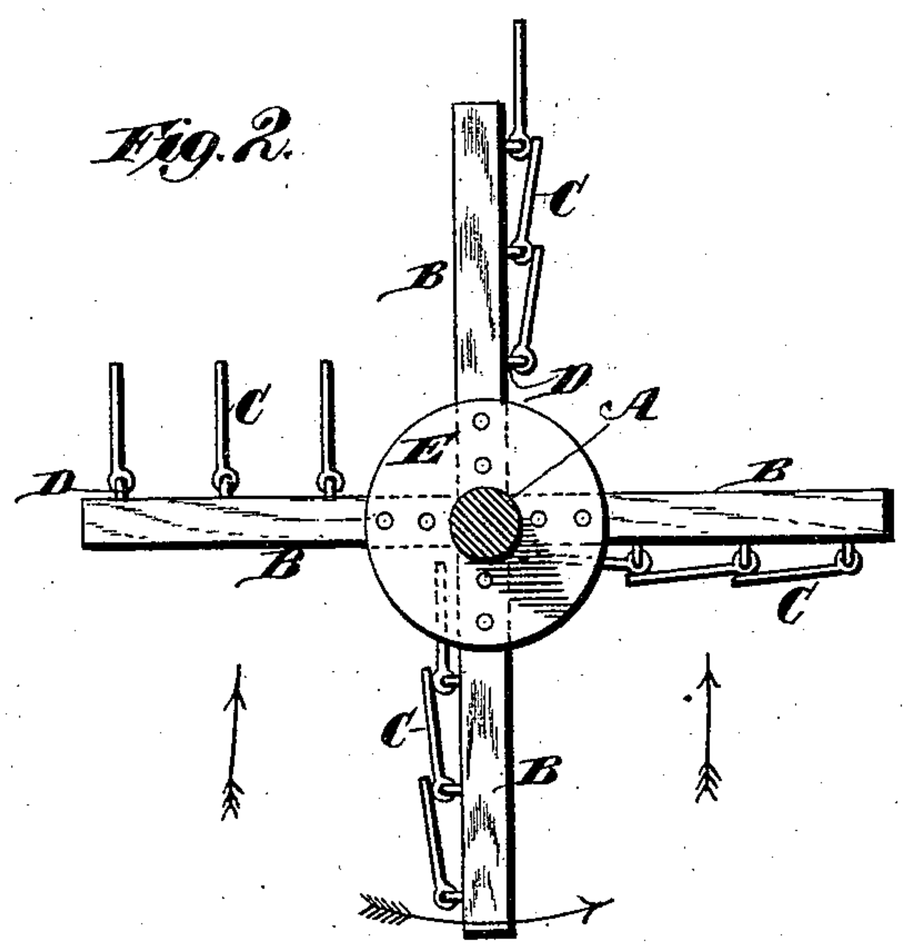


Fig. 2.



Witnesses.

Robert Everett

J. A. Rutherford

Inventor:

Laurence C. Ryan.

By James L. Norris.

Atty.

UNITED STATES PATENT OFFICE.

LAWRENCE C. RYAN, OF HAWKINSVILLE, GEORGIA.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 287,330, dated October 23, 1883.

Application filed October 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE C. RYAN, a citizen of the United States, residing at Hawkinsville, in the county of Pulaski and State of Georgia, have invented new and useful Improvements in Water-Wheels, of which the following is a specification.

The present invention relates to that class of current water-wheels in which several series of blades or floats are pivoted to arms extending from a rotary shaft, the floats being so arranged that the impact of the water against the same will hold a certain number of blades closed and others open, so as to effect the rotation of the wheel.

The invention consists in a water-wheel having a series of floats or blades attached to arms extending from a central shaft in such a manner, and made of such a length, that said arms present a firm bearing-surface for the floats, so as to maintain the same in a closed position when they are presented to the current to receive the impact thereof, which causes the rotation of the wheel, the floats on the down side of the stream being automatically opened by the force of the water, so as to present their edges to the water and cause the latter to pass between the floats.

In the drawings, Figure 1 is a side elevation of the wheel; Fig. 2, a top or end view thereof, and Fig. 3 shows one of the floats detached.

The rotary shaft A of the wheel is provided with two sets of radial arms, B. Four of these arms are shown to each set, but, if preferred, a greater number of arms can be employed.

C indicates the blades or floats, arranged in several radial sets or series, and hinged or pivoted at their ends to the arms which extend from the shaft, the number of floats to each set varying according to the size of the wheel. The floats are pivoted to the supporting-arms by suitable pintles or pins fitting into eyes or sockets at the ends of the floats, and the latter extend over or lap partially across the radial arms, as is shown in Figs. 1 and 4. Each float is capable of a half-revolution only about its axis, and the floats of each set are also so arranged that when swung around their edges shall overlap, whereby, when thus closed, they shall lie in a plane radial to the axis of the shaft. The floats can be hinged or pivoted to the radial arms in various ways—as, for example, the bent pivots D can be secured to the arms and extended inwardly, so as to fit into sockets located at the inner corners of the floats; or, in lieu of such construction, the pivots can be attached to the floats and fitted to turn in bearings secured to the arms. The wheel is preferably provided with caps or heads E, which are secured to the outer sides of the arms, so as to brace the same, and, if necessary, any other auxiliary strengthening devices can be employed.

In arranging the wheel for operation it will be submerged in the stream with its shaft arranged vertically, and journaled at its lower end in a bearing formed in any suitable fixed frame or bed. The upper end of the shaft is journaled in any suitable upright, which can be secured to the banks or any desired foundation, and motion transmitted from the wheel-shaft to mechanism to be driven thereby by means of gearing, pulleys, and belting or other appropriate devices. The impact of the running water against this wheel will cause the floats of one set or series to close or overlap, as illustrated, so that the sides of these floats shall be presented to the current, while the floats of the remaining sets will turn upon their pivots, so as to feather or present their edges to the current, and thereby allow the wheel to be turned by the impact of the water against the sides of such floats as are presented to the current. As the wheel revolves and the overlapping or closed set of floats presenting their sides to the current is carried around, a second set will be brought into position as soon as or a little before the first set has been swung round. The floats carried round and allowed to feather will, as the wheel revolves, feather, and hence as they are brought up into the current will offer but little resistance to the revolution of the wheel. By such arrangement it will be seen that the current will act continuously upon the sides of the floats at one side of the wheel, while at the opposite side thereof the edges only of the floats are presented to the current, so that a steady motion will be insured. The radial arms to which the floats are pivoted constitute stops, which allow each float to make a half-revolution only about its

pivots or axle, these stop-surfaces being formed by causing the ends of the floats to lap partly over the faces of the radial arms, as is clearly shown in Fig. 1. In this way, when a set of floats is brought up to the currents the force of the latter will cause the floats to turn upon these pivots and swing back upon the arms which hold the floats, so that one side of each float shall receive the impact of the running water, and thereby an extended surface be presented to the same.

It will be obvious that this wheel can be arranged with its axis in a horizontal position, and the wheel submerged either wholly or in part in the water, and also that it could be used successfully as a windmill.

I am aware that floats or blades have heretofore been hinged to radial arms of a rotary shaft, so that the edges of the floats will overlap each other when they are closed or in an operative position; but I am not aware that floats so hinged or applied have been made longer than the space between a pair of arms, so as to extend upon the latter and have a firm bearing thereon. It will be understood that the edges of each set of floats overlap each other, and thus the entire faces of said floats do not bear directly upon the surface of the arms, the positive contact portions of the floats being the edges in which the pintles are fitted, or where the hinges are located.

Having thus described my invention, what I claim is—

In a water or current wheel, the combination of the rotary shaft A and the radial arms B with the pivoted floats C, having overlapping edges, and of length sufficient to extend partly across the arms B, whereby bearing surfaces or stops are provided for said floats to hold them in a closed position, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LAWRENCE C. RYAN.

Witnesses:
W. D. KING,
F. H. BOZEMAN.