(No Model.)

F. L. LAMM.

WATER WHEEL.

No. 348,400. Patented Aug. 31, 1886.

Fig. 1.

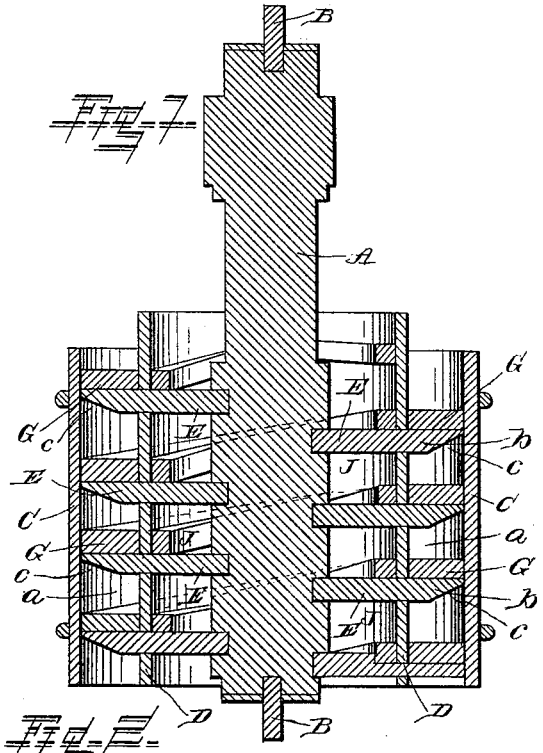


Fig. 2.

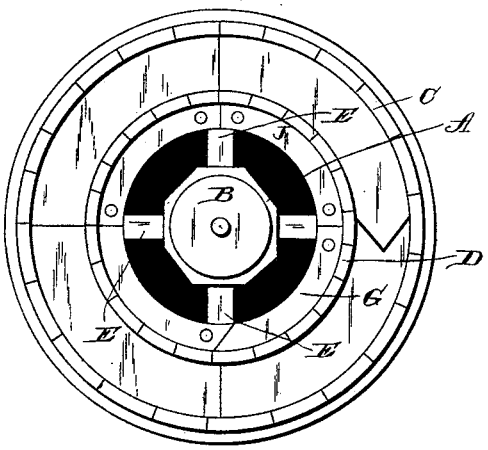
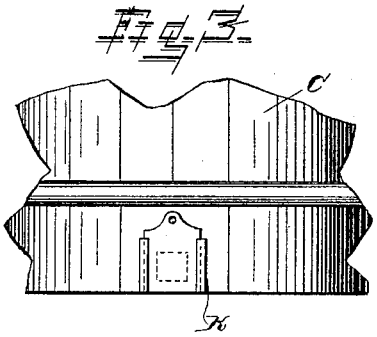


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRIEDRICH L. LAMM, OF EMBARRASS, WISCONSIN.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 348,400, dated August 31, 1886.

Application filed May 8, 1886. Serial No. 201,592. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH L. LAMM, a citizen of the United States, residing at Embarrass, in the county of Wampaca and State of Wisconsin, have invented certain new and useful Improvements in Water-Wheels; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Figure 1 is a vertical section through the center of my improved water-wheel. Fig. 2 is a top view of the water-wheel; and Fig. 3 is an external view in detail, showing a gate through the outer case leading from the winding or helical water-way. Fig. 4 is a vertical sectional view of the outer case, showing the winding passage.

This invention relates to improvements in turbine or vertical rotative water-wheels; and it consists in a novel mode of constructing and arranging a winding or helical channel between two circular shells, combined with impact-blades in said channel, as will be fully understood from the following description, when taken in connection with the annexed drawings.

Referring to the annexed drawings by letters, A designates the vertical central shaft of my improved water-wheel, which shaft is provided on its ends with metallic journals B B, that in practice will be sustained in boxes or a box, and a step mounted in a suitable frame, the power being transmitted from said shaft in any convenient manner.

C designates the outer cylindrical casing, and D the inner cylinder, both of which are concentric to the vertical axis of the shaft A, and of such diameters that the required width of space for a winding or helical channel or water-way is left between them. The casing C and the inner cylinder, D, if made of wood, are composed of matched staves, and the casing is strongly bound by means of hoops, as shown in Fig. 1. From the central shaft, A, radiate spokes or arms E, arranged in four or more series and rigidly secured to said shaft. These arms pass through the inner cylinder, D, into the water-way *a*, and extend nearly to the outer cylinder or casing, C, forming in the water-way a series of impact-blades or current-breakers, *b*, against which the descending current of water successively impinges, thereby transmitting great force to the wheel, not only by the gravity of the water-current, but also by its momentum and direct impact. The said helical or winding channel *a* is formed in part by the vertical walls of the two cylinders C D, and in part by a continuous winding floor, G, which extends from the tapered upper extremity at the inlet or point where the channel first receives the water from the flume to the point of discharge or outlet at the bottom of the wheel or cylinders C D. This floor G, which is continuous from one end to the other, is secured to the two cylinders C D by suitable fastenings, and the inner cylinder, D, and also the radial arms E are rigidly braced and strengthened by means of segments J, which are secured to said cylinder and arms, and take the same winding course inside of the cylinder D that the floor G takes between the two cylinders.

It will be observed by reference to Fig. 1 of the annexed drawings that those portions of the radial arms E which extend into the winding channel *a*, and which I have above denominated "impact-blades" or "current-breakers" *b*, are under-beveled or tapered at *c*. This is done for the purpose of modifying the interruption of the current and directing the same toward the circumference of the wheel.

In practice I employ one or more gates, K, located at or near the point of discharge of the water-way *a*, which gate or gates are through the casing C, or they may be through the floor G, and are preferably provided with valves for allowing the outflow of water from said channel to be regulated. I may also employ gates leading from the channel *a* through the casing C at other points between its extremities, and provide these gates with regulating or waste valves, similar to those of the gates K.

Having described my invention, I claim—

1. A vertical rotative water-wheel consisting of two concentric cylinders and a continuous floor forming a winding or helical water-way,

in combination with the central vertical shaft and radial supporting-arms extended into said water-way and forming impact-blades, substantially as described.

2. The combination, in a water-wheel having a winding or helical channel inclosed by two cylinders sustained by a central vertical shaft and radial arms, of current-impact blades *b*, arranged in said channel and beveled or tapered, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

FRIEDRICH L. LAMM.

Witnesses:
OTTO LADEWIG,
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