(No Model.) 2 Sheets—Sheet 1.

A. FIGGE.

WATER WHEEL.

No. 271,824. Patented Feb. 6, 1883.

Fig. 1.

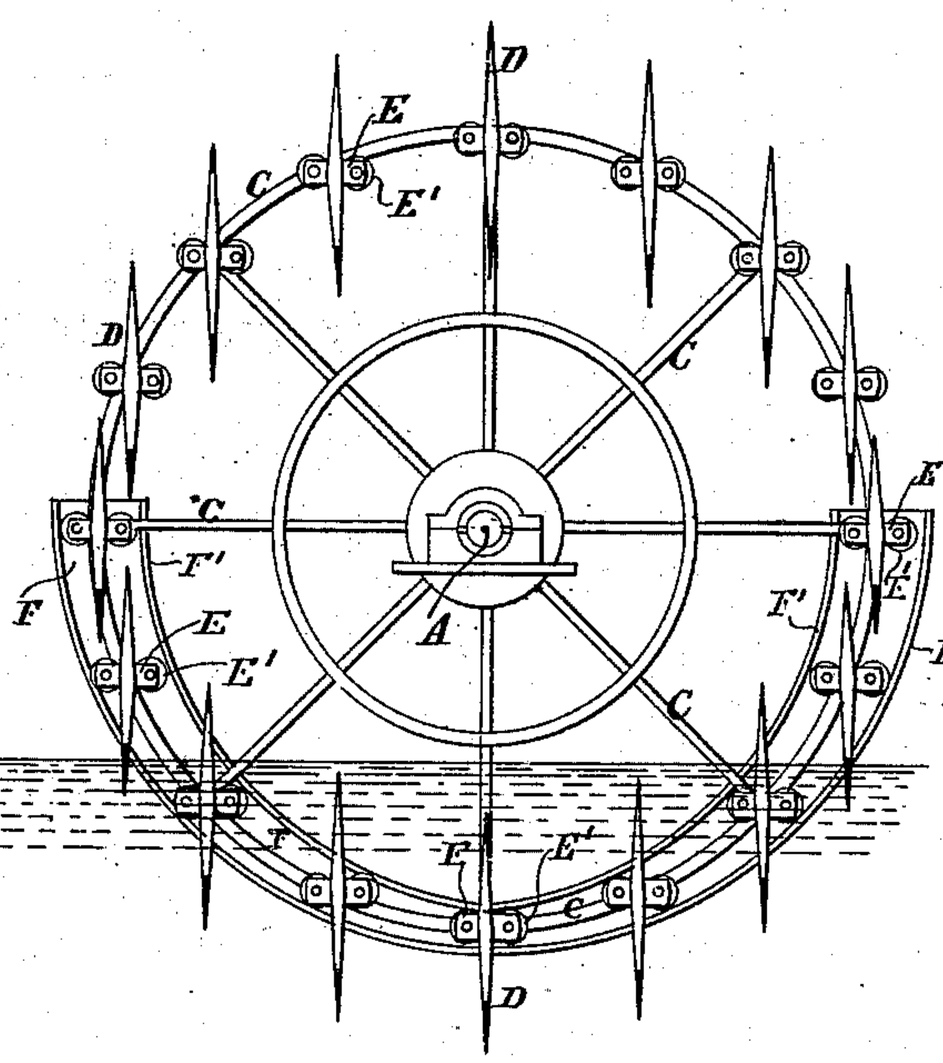
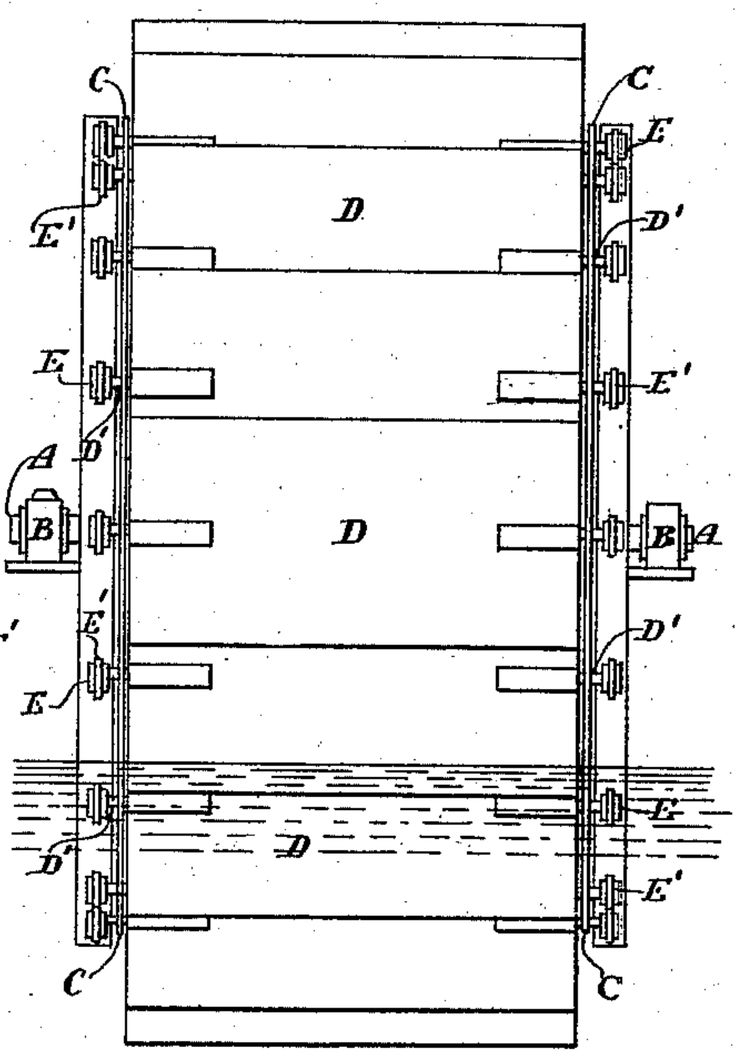


Fig. 2.



Witnesses:
Nellie Holmes,
James Young.

Inventor:
Augustus Figge
by his attorneys—
Baldwin, Hopkins & Peyton.

(No Model.) 2 Sheets—Sheet 2.

A. FIGGE.

WATER WHEEL.

No. 271,824. Patented Feb. 6, 1883.

Fig. 3.

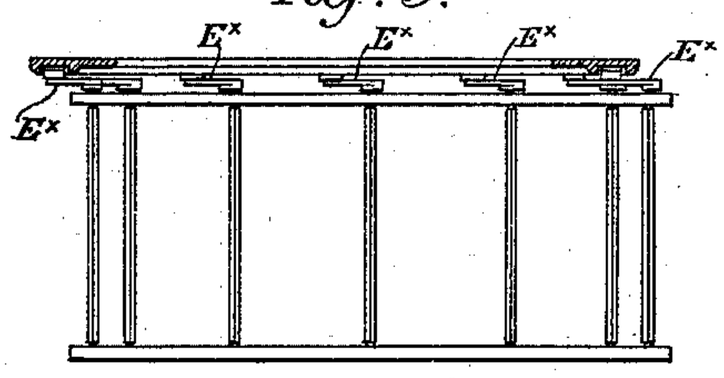


Fig. 4.

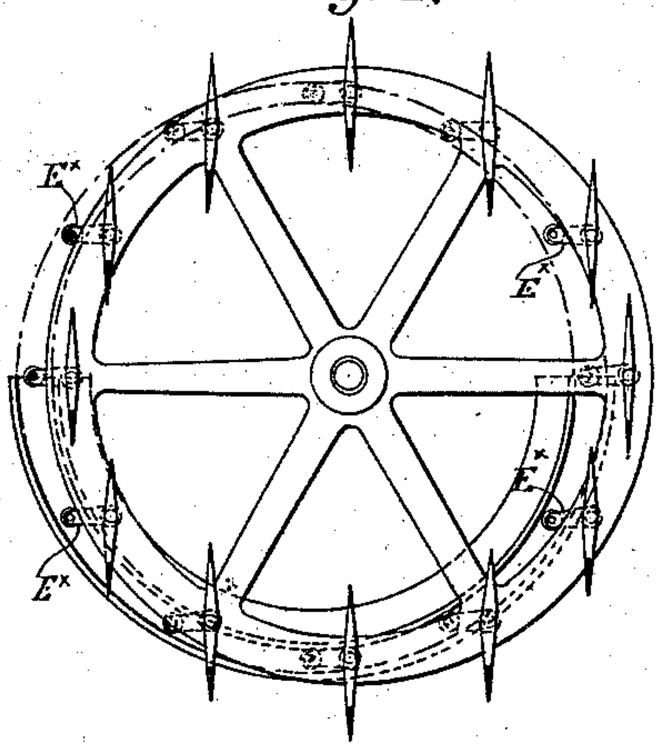


Fig. 5.

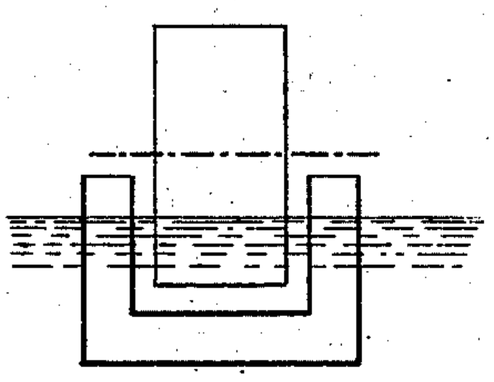
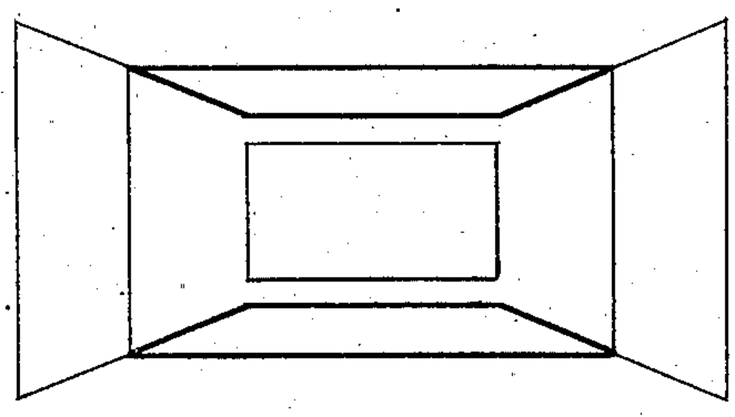


Fig. 6.



Witnesses:
Nellie Holmes.
James Young.

Inventor:
Augustus Figge,
by his attorneys -
Baldwin, Hopkins & Peyton.

UNITED STATES PATENT OFFICE.

AUGUSTUS FIGGE, OF NO. 14 BAKER STREET, COUNTY OF MIDDLESEX, ENGLAND.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 271,824, dated February 6, 1883.

Application filed July 11, 1882. (No model.) Patented in England May 17, 1882, No. 2,320.

To all whom it may concern:

Be it known that I, AUGUSTUS FIGGE, a subject of the Emperor of Germany, residing at No. 14 Baker Street, in the county of Middlesex, England, civil engineer, have invented certain new and useful Improvements in Water-Wheels and Paddle-Wheels, (for which I have received Letters Patent in Great Britain, No. 2,320, dated 17th May, 1882,) of which the following is a specification.

This invention has for its object improvements in water-wheels and paddle-wheels. The purpose which I have in view is more especially to obtain motive power from the flow of water in rivers by means of water-wheels of peculiar construction carried upon floats, floating structures, or otherwise. The motive power can be advantageously applied in pumping water for irrigation and in generating electricity to be applied to operate plows or for other purposes. My improved wheel can also be used as a propeller. The wheel is provided with floats analogous to those of an ordinary paddle-wheel; but they are free to turn upon axes or pivots. They are weighted so as to preponderate slightly one side over the other, and tend consequently to assume a vertical position. I make the floats of large area, and in order to secure lightness I form them of rectangular frames of iron tube, covered with canvas; or they may be of other suitable shape and material. Each pivot or axis is provided with a short cross-head, armed at its extremities with small wheels or pulleys, to lessen friction against the guides by which the floats are controlled. There are two guides—one on either side of the wheel. Each consists of a fixed plate formed to the curvature of the wheel, and extending around it or around the lower half of it. The plate is provided along its edges with inwardly-directed flanges. The cross-heads upon the pivots or axes of the floats enter between the flanges of the guides at about the level of the main axis and before the floats enter the water. The flanges are here at a distance apart exceeding the length of the cross-heads, so that the friction wheels or pulleys do not at once come into contact with the guide-flanges. In descending, however, the flanges approach each other, and when the float is directly under the axis of the wheel, in the most efficient position to be acted upon by the stream, it is controlled by parts of the flanges, which are so close together that there is but just room for the friction wheels or pulleys of the cross-head to pass between them, and consequently the float is compelled to retain its vertical position; but nearly to this point the distance between the guide-flanges is such that a certain freedom is left to the float to admit of its accommodating itself to the stream in entering and leaving the water, so that it may do so with as little disturbance and expenditure of power as is possible. The guides may consist of rails fixed against the sides of the ponton or floating structure. In some cases, in place of providing the axes or pivots of the floats with cross-heads, I provide simple arms carrying but one friction wheel or pulley, which works in a guide-course set eccentrically to the axis of the wheel. This is the form which is most suitable when the wheel is used as a propeller. The water into which the floats of the wheel dip is contained in a water-course which is closed on both sides and at the bottom. This is the case both with water-wheels and paddle-wheels or propellers.

In order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 is a sectional side elevation, and Fig. 2 is a front elevation, of a stream-wheel constructed according to my invention. Similar wheels may be used as propellers. Figs. 3 and 4 are views showing a wheel of modified construction, and Figs. 5 and 6 are respectively a vertical and a horizontal section of a float with its water-course and wheel.

A is the main shaft, upon which the wheel is mounted and through which the power is conveyed to the machinery which it is intended to drive.

B B are the bearings of the main shaft upon the ponton or barge or other structure.

C C are the arms and rings which compose the frame-work of the wheel.

D D are the floats held by their pivots D′ D′ to the outer rings or periphery of the wheel. The floats are so weighted or hung that they tend to assume a vertical position.

E E are cross-heads upon the pivots, and E′ E′ wheels or pulleys with which the cross-heads may be provided to reduce friction.

F F are the fixed guide-plates on either side of the wheel, and F′ F′ their flanges, by which they act upon the wheels or pulleys E′ E′ and control the floats. The guides do not interfere with the floats so long as they maintain the vertical position which the preponderance of their lower ends tends to bring about; but the guides prevent any deviation from this position at the time when the floats pass beneath the shaft and are in efficient action. In this arrangement there is very little friction in the guides. Figs. 3 and 4 show the arrangement in which, in place of the cross-heads E E, there are arms E× E×, each carrying a single friction wheel or pulley. A corresponding alteration is made in the form of the guide-course.

When I mount my wheels upon floating pontons the arrangement which I adopt is that indicated by Figs. 5 and 6. Fig. 5 shows to a small scale a transverse section of the ponton, and Fig. 6 shows a horizontal section. As will be seen, the wheel works in a water-course, which is provided through the body of the ponton, and this water-course is bounded at the bottom and sides by compartments which give buoyancy to the structure. The entrance to this water-course and the exit from it are widened out, so as on the entrance side to lead the water in and on the exit side to deliver this water with as little disturbance as possible. With the same objects I also provide at each end of the ponton a hinged platform, which, when raised, closes the mouth, but when lowered forms a continuation of the bottom. This platform also is provided with sides forming continuations of the fixed sides of the mouth and increasing the width of the opening.

Where great regularity of motion is required, as when using dynamo-electric machines for electric light, I arrange the wheels to work pumps raising water into elevated tanks upon the ponton, and from these tanks I draw water to actuate turbines, which drive the dynamo-electric machines.

I arrange the dynamo-electric machines vertically, that they may more readily be driven from the vertical shaft of the turbine.

Having thus described the nature of my said invention and the manner of performing the same, I would have it understood that I claim—

1. The combination, in a water-wheel, of the swinging or freely-pivoted floats, each preponderating on one side of its pivot, and means by which they are held vertically when in position for efficient action, these parts being constructed and operating substantially as hereinbefore set forth.

2. The combination of the arms and rings composing the frame-work of the wheel, the floats pivoted to the rings and weighted or preponderating, as described, the rollers connected with the pivots of the floats, and the guide controlling the floats by acting upon the rollers when beneath the level of the wheel-shaft, substantially as and for the purpose hereinbefore set forth.

AUGUSTUS FIGGE.

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