J. W. Bookwalter,

Water Wheel.

No. 87,625. Patented Mar. 9. 1869

Fig 2.

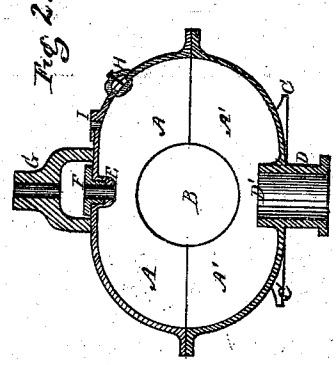


Fig 3.

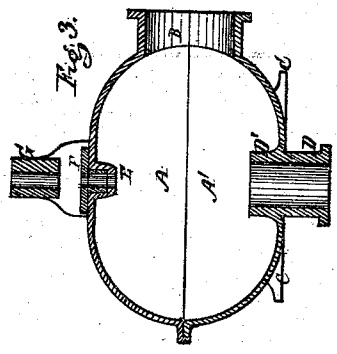
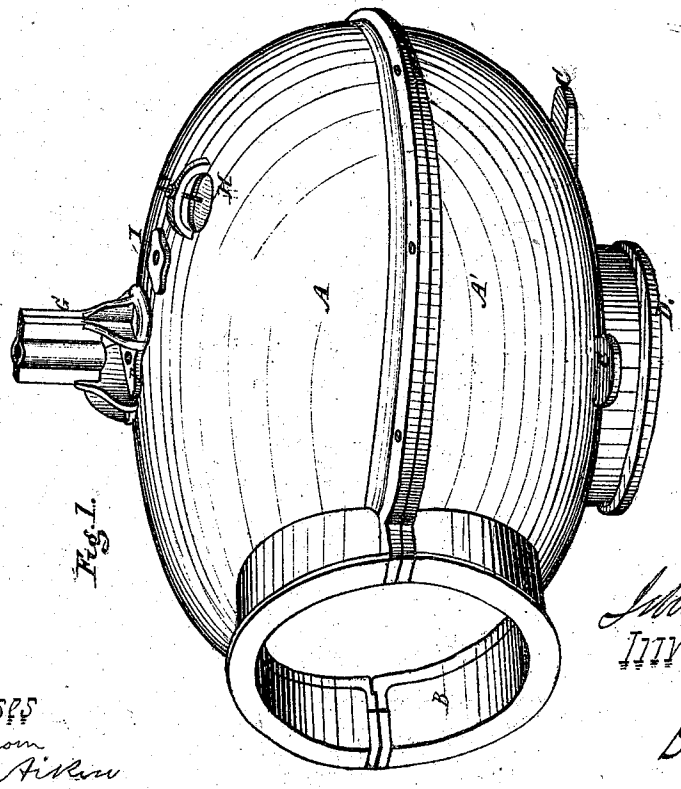


Fig. 1.



Witnesses
C. F. Clarom
Henry Aiken

John W. Bookwalter
Inventor
by
D. P. Holloway Jr
his attys.

UNITED STATES PATENT OFFICE.

JOHN W. BOOKWALTER, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN EXTERIOR CASINGS FOR TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **87,625**, dated March 9, 1869.

To all whom it may concern:

Be it known that I, JOHN W. BOOKWALTER, of Springfield, in the county of Clarke and State of Ohio, have invented a new and useful Improvement in Portable Forebays or External Casings for Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view. Fig. 2 is a vertical section, and Fig. 3 is a vertical longitudinal section.

The same letters in all the figures indicate identical parts.

My invention relates to portable metallic forebays or external casings for water-wheels, and is especially designed for that class of turbines which are inclosed in a casing composed of a cylinder and crown-plate with parallel flanges, between which are placed guide-plates, which, receiving the water horizontally, discharge it, centrally or vertically, through the wheel, and into a pipe leading into the tail-water.

The external casing is made of cast-iron, and is in form an oblate spheroid. This form gives the greatest diameter to that plane in which the water flows upon the wheel, and, by reducing the altitude, enables the casing to be constructed with the least weight of metal.

The casing is constructed in two parts, A and A′, formed with flanges, by means of which the two parts can be bolted together. The lower part is formed with lugs C, through which bolts may pass, fastening it to the frame on which the portable forebay is to be supported. A tubular bearing, D, is formed in the bottom, the upper part of which, D′, projects upward into the chamber, to receive and support the lower flange of the wheel-casing.

As the tubular bearing is raised above the bottom of the external casing, the wheel and its case may be conveniently adjusted in position by taking hold of the flange projecting over the top of the bearing D.

The cylinder which incloses the wheel may conveniently be keyed in position by driving wedges between it and the downwardly-projecting portion of the tube D.

The water enters through a pipe attached to the opening B, placed in the side of the external casing, and is discharged through an opening in the bottom D, already described.

The top of the casing has, centrally placed, an opening at E, through which the wheel-shaft passes; and into this opening is fitted a stuffing-box, F, to prevent the escape of water around the shaft. A bridge, G, with movable cap, is cast or bolted upon the top of the case, and properly finished to form a bearing for the shaft. An arm-hole, H, is placed in convenient position, and closed by a cap held in position in the usual manner. Another hole and stuffing-box are arranged for the introduction of a rod to operate the gates when such a rod is employed.

I am aware that portable external casings have been used for water-wheels. These have generally been made, in whole or in part, of wrought-iron, and in a cylindrical form, so that metal was wasted, and the weight to be handled increased unnecessarily by creating an extension of the water-chamber in a direction in which no extension was required. I do not claim, therefore, a casing broadly, but limit my claim to the peculiarities of construction as invented by me.

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

1. As a new article of manufacture, a portable metallic forebay or external casing for a turbine of the class mentioned, having a tubular bearing, D′, projecting into the chamber for the support of the wheel-case, substantially as described.

2. Such a casing, combining in its construction the following elements, viz: two pieces which, when bolted together by their flanges, form an oblate spheroid; an induction-pipe, B, in the side, and an eduction-pipe, D, in the bottom, and an upper bearing for the wheel-shaft, substantially as described.

3. Such a casing, in combination with a stuffing-box, F, and elevated box or bearing for the wheel-shaft G, attached to the top plate A, substantially as set forth.

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

JOHN W. BOOKWALTER.

Witnesses:

R. MASON,

D. P. HOLLOWAY.