J. R. Richardson, 2. Sheets, Sheet. 1.

Water Wheel.

No. 106,962. Patented Aug. 30. 1870.

Fig. 1

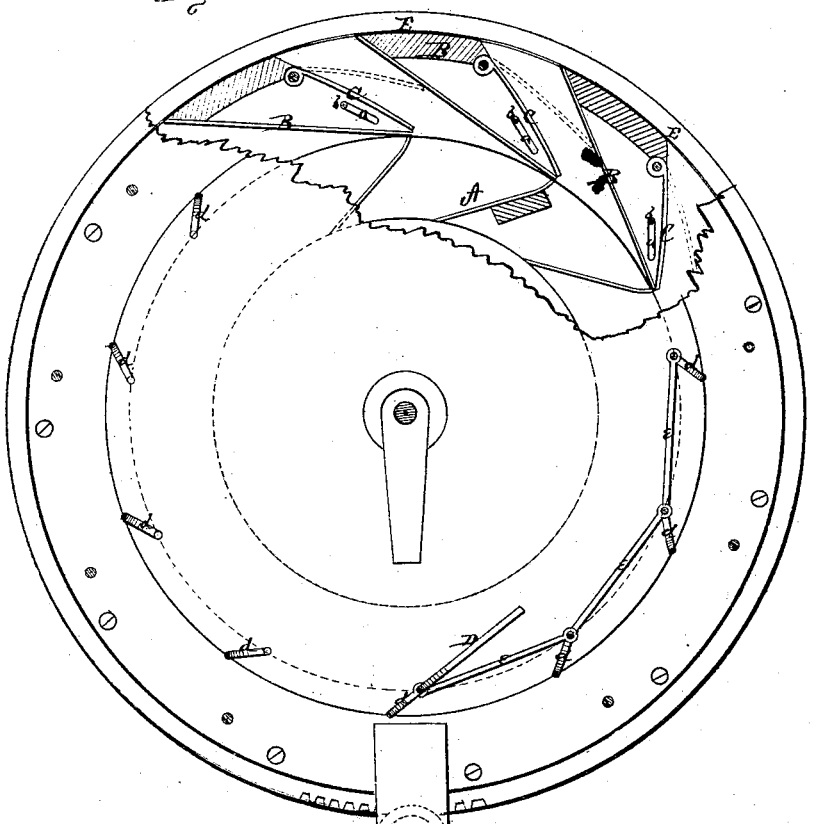
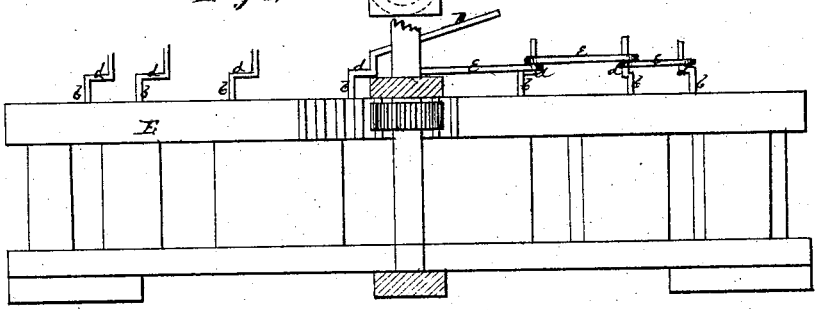


Fig. 2



Witnesses

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Jed. Ewert

Inventor

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per Alexander Mason

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2. Sheets. Sheet 2.

J. R. Richardson,

Water Wheel.

No. 106,962. Patented Aug. 30. 1870.

Fig. 3

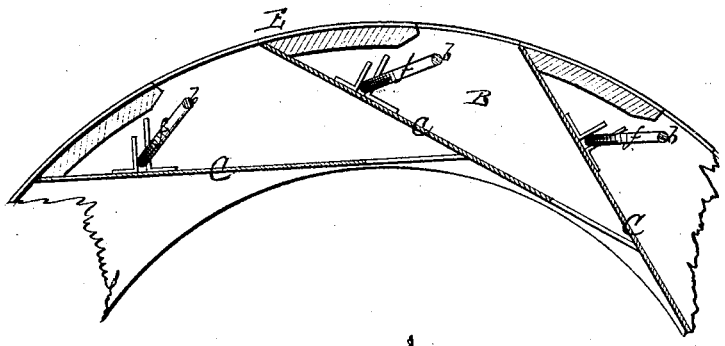
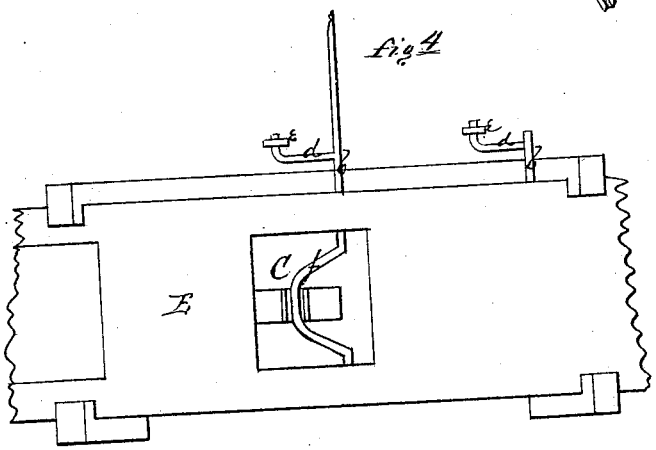


Fig. 4



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JOHN R. RICHARDSON, OF NEWCASTLE, PENNSYLVANIA.

Letters Patent No. 106,962, *dated August* 30, 1870.

IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN R. RICHARDSON, of Newcastle, in the county of Lawrence and in the State of Pennsylvania, have invented certain new and useful Improvements in Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a "water-wheel," as will be hereinafter fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a plan view, part in section, and

Figure 2 is a side view of my water-wheel.

Figure 3 is a section, showing a different mode of operating the wickets or gates.

Figure 4 is a side view of fig. 3.

A represents the wheel surrounded by the casing B, which is provided with suitable openings for the passage of water to the wheel.

In the openings in the casing B are placed gates or wickets, C C, which are hinged to the outer ends and operated by means of cams *a a*, upon vertical shafts *b b*.

These shafts pass through the casing A, with elbows or cranks, *d d*, or their upper ends with pins or wrists to connect them all together by the links *e e*.

One of the shafts *b* is provided with a lever, D, to operate them.

By turning the lever D the gates or wickets C C are all operated at once for the purpose of increasing or diminishing the openings or issues, regulating the amount of water necessary for a given amount of labor for the wheel to perform.

Outside of the casing B is the usual rim, E, which is only used to stop and start the wheel, and not to regulate the amount of water thrown on the wheel.

If anything should happen to the outside rim, so as to prevent its closing, the water can be shut off by the gates or water-guides C C.

I do not confine myself to any particular mode of operating the inside gates or wickets C C, as that may be done in various ways. For instance, as shown in figs. 3 and 4, where said gates are represented as moving in grooves in the casing on a tangent with the wheel. In this case, in place of the cams *a*, there is a crank or projection, *f*, on each shaft *b*, which works between two pins or ears on the wheel.

Having thus fully described my invention,

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

In combination with the wheel A, casing B, and outside rim E, the gates or wickets C C, arranged and operating substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing, I have hereunto set my hand and seal this 17th day of June, 1870.

JOHN R. RICHARDSON. [L. S.]

Witnesses:

J. W. REYNOLDS,

JEREMIAH COLE.