(168.)

G. W. RUSSELL & C. J. BRADBURY.

Gates for Turbine Water Wheels.

No. 122,739. Patented Jan. 16, 1872.

Fig. 1.

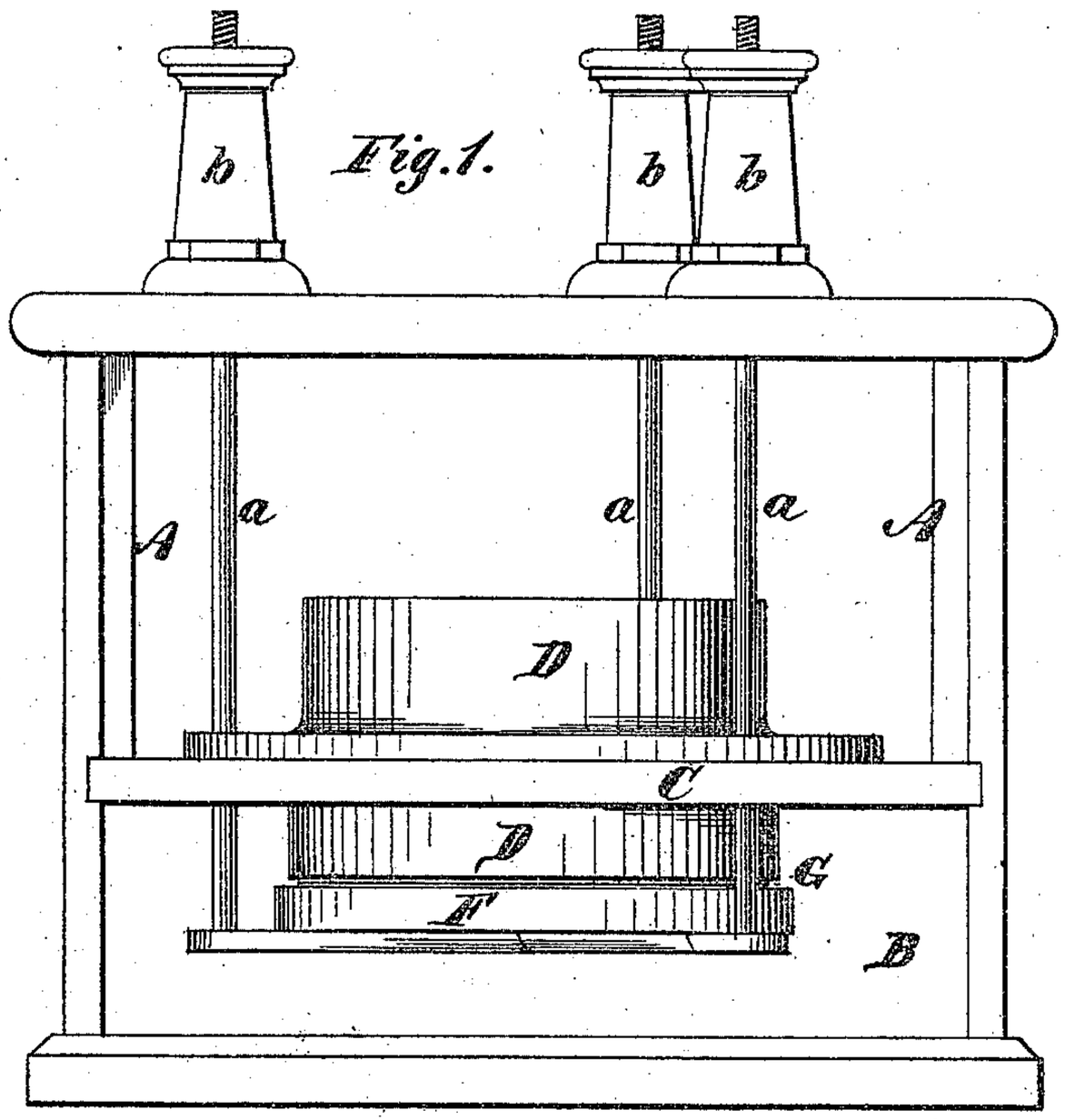
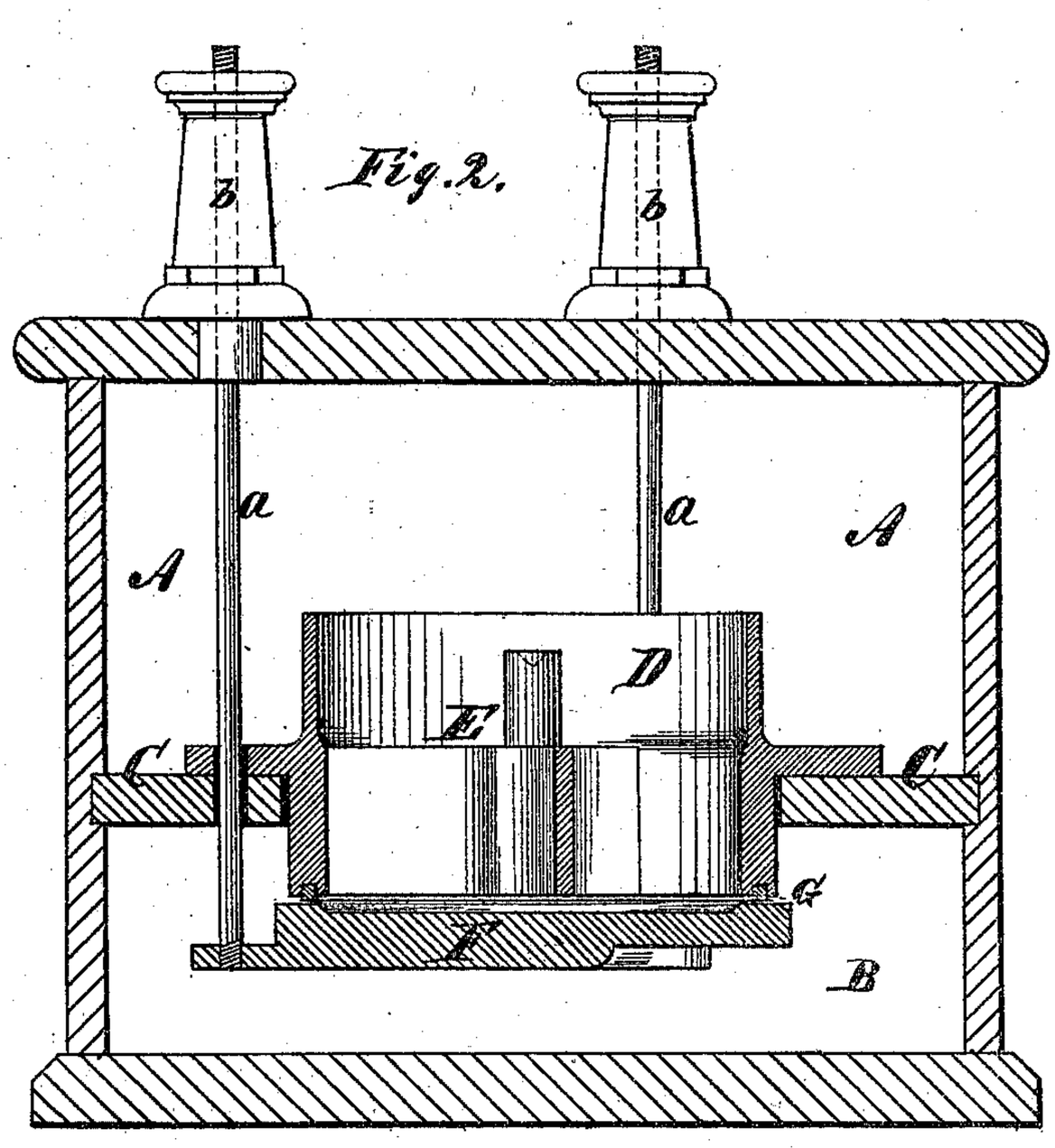


Fig. 2.



WITNESSES.

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by Atty A. Lowe

122,739

UNITED STATES PATENT OFFICE.

GEORGE W. RUSSELL AND CHARLES J. BRADBURY, OF LAWRENCE, MASS.

IMPROVEMENT IN GATES FOR TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. 122,739, dated January 16, 1872.

To all to whom these presents may come:

Be it known that we, GEORGE W. RUSSELL and CHARLES J. BRADBURY, of Lawrence, in the county of Essex and Commonwealth of Massachusetts, have made an invention of a new and useful Improvement relating to Turbine Water-Wheels; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawing making part of this specification, and in which—

Figure 1 is an elevation, and Fig. 2 a vertical section of the flume of a water-wheel embracing our improvements.

This invention relates to certain improvements in turbine water-wheels, whereby the water in the flume and about the wheel, which is submerged in it, may be removed, and the water outside shut off from further entrance to the flume and the wheel, the purpose of the invention being to avoid the labor and time now consumed in repairing or inspecting water-wheels of the class to which our invention appertains. We are aware that this has been heretofore attempted, and we do not, therefore, claim, broadly, an arrangement of devices for shutting off communication between the flume and race-way. Our invention consists in the combination, with the flume, of a gate located below and covering the bottom central opening of the same, and arranged so that in order to be opened it must be lowered away from the flume into the water in the race-way below. This arrangement of the gate is possessed of great advantage, as thereby the gate is under water, except at the immediate time its services are required, and ice is prevented from forming or gathering about it so as to prevent it from being used.

The accompanying drawing represents at A the flume or well of a center-discharging turbine water-wheel, the shelf or floor constituting the bottom thereof, and separating it from the race-way B, being shown at C. D in the drawing represents the cylindrical casing or flange which constitutes the water discharging outlet of the flume, and which contains and supports the step E, in which the shaft of the water-wheel is stepped, such casing being upheld above the race-way by the floor C or by any other suitable support, which permits free delivery through it of the waste water.

In carrying our improvements into practice we employ a large flat disk or cap-plate, F, whose smallest diameter is somewhat larger than that of the discharging-mouth G of the casing D, and we dispose this disk or plate below the mouth, and attach to its circumference several rods, *a a a*, &c., which extend upward through the flume and rise to such a position above the top of the latter as to be readily accessible. These rods may vary in number, and may be operated in various ways, the mode herein shown, however, being to conduct them individually through columns or posts *b*, erected upon the top of the flume, and screw upon their extremities a hand-wheel or nut, by which they may be raised or lowered, and with them the gate or disk F.

In availing ourselves of our invention we first shut the head or inlet-gates which admit water to the flume from the pen-stock. The rods *a a a*, &c., are then to be raised until the gate or plate F abuts against and effectually closes the lower or discharging mouth of the casing D, and by this means excludes water from the flume or well from below. We next, by a pump or other means, exhaust the flume of its contents of water, and the wheel remains exposed and accessible. In the present construction and operation of turbine water-wheels, in which no provision is made for exhausting the water from the flume or well in which the wheel wallows, it is a matter of much time, labor, and loss of money to carry out examinations or repairs, or to remove ice, stones, or obstacles of any nature which may find their way to the flume and injure or clog the wheel. In our present invention we find a remedy for these difficulties, and a simple, inexpensive, and efficient method of enabling access to be had to the wheel at any time, and our invention will especially commend itself to paper-manufacturers and mill-owners in general, to whom this specification is chiefly addressed, and who are aware of the numerous delays and expenses attendant upon repairs of water-wheels at the present time. In some instances the casing D may not protrude below the floor C, and in such an event we should affix to the floor and circumscribing the discharging-out-outlet thereof an annular flange, which would constitute a seat for the gate F, although if a sharp rib be formed upon the upper surface

of the latter the annular flange might be dispensed with.

We claim—

The combination, with the flume or inclosing case of a turbine water-wheel, of a gate for closing water communication between the same and the race-way or discharge-sluice, when said gate is located below and so as to cover the bottom central opening of the flume or case, and arranged to move towards or away from said opening, substantially as herein shown and set forth.

G. W. RUSSELL.
CHARLES J. BRADBURY.

Witnesses:
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