B. B. DOWNS.

Sluice and Flood-Gate.

No. 207,955. Patented Sept. 10, 1878.

Fig. 1

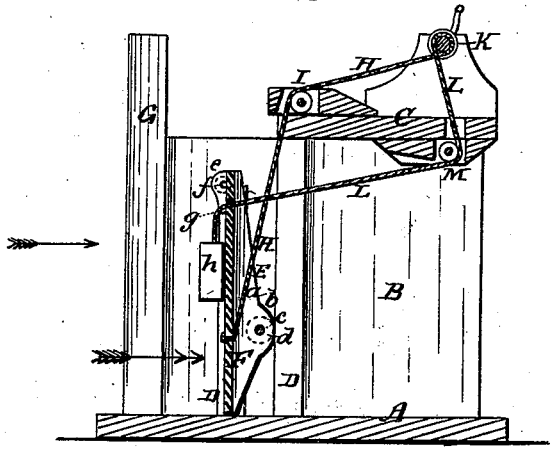


Fig. 2.

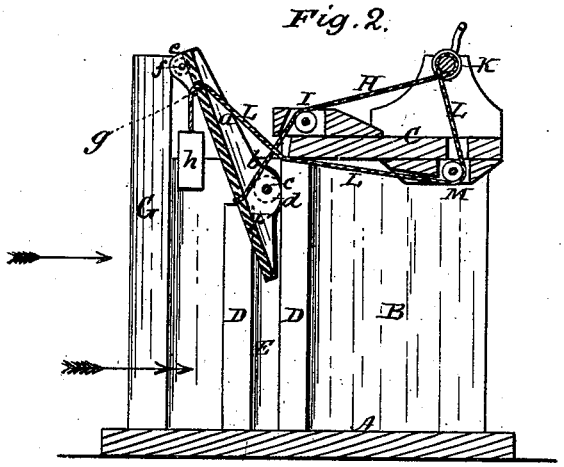
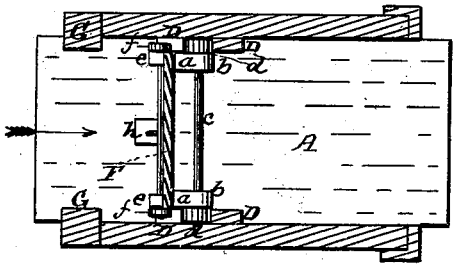


Fig. 3



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BURAGE B. DOWNS, OF EAU CLAIRE, WISCONSIN.

IMPROVEMENT IN SLUICE AND FLOOD GATES.

Specification forming part of Letters Patent No. **207,955**, dated September 10, 1878; application filed July 27, 1878.

To all whom it may concern:

Be it known that I, BURAGE B. DOWNS, of Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented certain new and useful Improvements in Sluice and Flood Gates; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, forming part thereof, is a full, clear, and complete description of my said invention.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of a sluiceway embracing my improvements, the gate being shown as closed. Fig. 2 is a similar view, the gate being shown as opened; and Fig. 3 is a horizontal section above the gate.

In the drawings, the arrow indicates the flow of the current in the sluice, and the double-barbed arrow indicates the point of greatest pressure of the water when at its height.

Various constructions of flood and sluice gates have been devised to avoid the binding of the gate in its ways by reason of the pressure of water when raised vertically; but, so far as I am aware, only the most cumbrous devices have been used or proposed to obviate this difficulty, such as racks upon the gate itself, connecting with heavy operating-beams, crank-movements, and the like, requiring almost the same amount of labor in manipulating them as does the ordinary rack-and-pinion arrangement of the old sluice-gate.

I avoid the difficulty referred to by running the gate upon rolls in ways through the agency of chains or ropes over pulleys, and notably by pivoting the gate at a point nearer its bottom than its center, and upon a cross-shaft which it carries, journaled in anti-friction bearings or rolls, which ride in vertical ways and permit of the gate's tilting angularly at the proper moment of pressure.

While the result sought is the raising and the closing of the gate with the least possible exertion and without difficulty, the specific object of my improvements is to provide such a construction of the gate and means for operating it as shall attain said object in the simplest possible manner. This construction is hereinafter fully described with reference to the accompanying drawings, and the particular features of invention are pointed out in the claims.

Referring to the drawings, A is the bottom sluice wall or way, B the sides, and C the deck. Upon the inner faces of the two sides B are cleat-like posts or guides D D. The space E between these posts or guides forms the guideway for the cross pivot-shaft roll, which is upon the outer side of the gate F, or on that side which does not bear the brunt of the current, and extends beyond its edges and bears upon the adjacent faces of the posts or guides D.

The gate is of the usual plain construction, except that upon the side which does not bear the brunt of the current are side or cheek beams *a a*, in which, at a point below the center of the gate, are boxes *b b*, for a cross-shaft, *c*, which shaft is journaled or terminates in anti-friction rolls *d d*, which move in the guideway.

Upon the opposite side of said gate F, at its top, are, in suitable boxes *e e*, anti-friction rolls *f f*, designed to bear upon and move up and down the posts G G in the opening and closing of the gate.

At or slightly below the pivotal line of the gate is attached a rope or chain, H, which passes up over a pulley or sheave, I, in a suitable box upon the deck of the sluice, and connects with the operating-winch K, while another rope or chain, L, passes from the same winch through the deck, around a pulley, M, on the under side of the deck, through an opening near the middle top of the gate F, as at *g*, which rope or chain should be weighted, as at *h*, to take up the slack. The rope or chain H is employed for raising the gate, and the rope or chain L for lowering it, one by the direct and the other by the reverse turning of the winch, as will be hereinafter described. The bearing-surfaces of the different posts or guides are preferably sheathed with metal.

The operation of opening and closing the gate is as follows: Viewing the invention as illustrated in Fig. 1, the crank of the winch is directly turned, and the gate rises in the guideway E, the bottom rolls, *d d*, bearing upon the posts or guides D, and the current or force of water at the point indicated by the double-barbed arrow operating to tilt the pivoted gate, and as the turning of the winch

continues, the rolls *f f*, by reason of the tilting of the gate, bear upon the posts G G, as seen in Fig. 2; and when the bottom rolls, *d d*, reach the top of the posts or guides D, the gate is open, and is held in position by its bearing upon the posts G and D. Reverse the turning of the winch and the gate again closes, as in Fig. 1.

The main shaft *c* of the gate being placed at a point near the center of pressure of the water when at its height, it follows that the gate F will then maintain its vertical position with little assistance. The shaft *c* is also placed a little above the center of pressure and below the middle of the gate, so that when the rope or chain, attached as at *g*, is released, the gate takes a position parallel to that shown in Fig. 2, and the pressure of the water, being then perpendicular to the gate so inclined, greatly assists in raising the gate to the position shown in Fig. 2.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A sluice and flood gate moving in ways upon anti-friction rolls, and adapted to swing on a line below its center, substantially as and for the purposes described.

2. The gate F, having rolls *d d* at its pivotal point, and rolls *f f* at its top, in combination with the guideways E and posts or guides D D, substantially as described, whereby said gate assumes an angular position when rising and when opened, as set forth.

3. In a sluice or flood way, the gate F, provided with cheek-beams *a a*, pivot-rolls *d d* below its center and near its base, and rolls *f f* on its opposite side at the top, in combination with guideways E, posts G G, and a raising and a lowering cord or chain, H and L, substantially as and for the purpose described.

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