

UNITED STATES PATENT OFFICE.

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SLUICE-GATE FOR WATERWAYS.

SPECIFICATION forming part of Letters Patent No. 689,771, dated December 24, 1901.

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To all whom it may concern:

Be it known that I, JAMES EDWARD WHITING, a subject of the King of Great Britain, residing and having my post-office address at
5 general post-office, Bombay, India, have invented a certain new and useful Improvement in Sluice-Gates for Waterways, of which the following is a specification.

This invention relates to sluice-gates for
10 waterways; and it consists in an arrangement or combination of sluice-gates such that the water-pressures on them nearly but do not quite neutralize each other, so that the resultant excess of pressure is independent of
15 the superficial area of the system and not proportional thereto, but to the difference of gate-surfaces and to the head of water, and is capable of independent variation. This excess of pressure is utilized to make close
20 joints at one or more of the sluice-gates, and its independent variability permits of adjustment suitable for that purpose without imposing large frictional resistance to the opening and shutting of the gates.

25 In the annexed drawings, Figure 1 is a plan view, and Fig. 2 an elevation, showing a pair of gates in which both the gates are held in close contact with their respective frames by the resultant excess of pressure.

30 M represents a tower. P' P² are the two inlet-ports, and P³ is the free outlet-port. The inlet-ports are placed opposite to each other, and the gates thereto A and B are parallel and opposite to each other; but the gate
35 A is somewhat larger than the gate B and the inlet-port P' larger than P², so that there will be a resultant pressure proportional to the head of water and to the difference in area of exposed surfaces of A B tending to
40 press the gates on their frames.

G is one of the guides, through which the regulating-rod R moves. The flanges of the frames will guide the gates.

45 The gates A and B illustrated in the drawings are cast separately, and they are to be attached to a central open frame C, which is also of cast-iron. The gates A and B are attached by bolts D and lugs E to the central frame C and can manifestly be adjusted by
50 filing their meeting surfaces and insertion of packing, so as to be exactly parallel to one another and to the central lifting-rod R. The

frames H I, against which the gates A B will move, are also of cast-iron of suitable sections. The frame of the larger gate A will
55 have its upper bar or lintel H' placed sufficiently forward to allow the gate to move between it and the rest of the frame. This bar or lintel H' can be attached to the soffit L of the inlet-port by Lewis bolts J and also be
60 connected by cast-iron arms H² at each side of the frame H, to which it is bolted. The gate A for this opening has a projecting flange A', which rests on the top of the lintel H' when the opening is closed, and the flange
65 will project also sidewise, so as to rest on the arms H², connecting the lintel H' with the gate-frame H. In this way a complete joint will be effected, since the sides of the gate A will, as already specified, press against and
70 work on the gate-frame H. The smaller frame I may be of the usual type and will be fixed to the quoins K of the smaller inlet-port. The two frames H I are fixed in position exactly parallel to each other and at the approximate
75 distance proposed for the faces of the two gates. When the frames H I are erected, the gates A B will be fastened to their frame C and adjusted and then let down into position and then the masonry tower M built to full height.
80 The larger gate may, if desired, move in its frame like a piston, the joints between its sides and that of its frame being made as close and true as may be possible with suitable roller or other packing without causing
85 too much friction. In this case there may be no doubt some slight leakage at the sides of the larger gate; but the top and bottom will close on the projecting lintel and on the bottom of the gateway, which will be flat. The
90 advantages of this plan are that the adjustment of the two gates will be simplified, for the whole system will be free to move in the direction of the excess pressure, and the whole of this will be available to press the smaller
95 gate against its frame.

The form and materials to be adopted for these sluice-gates and the arrangements and materials for interconnecting them, as well as the details of their frames and for the regu-
100 lating apparatus for raising and lowering the gates, may vary according to circumstances. The excess in size of the outer gate is generally to be secured by making it longer—i. e.,

at each end—or, in other words, making its sill at a lower level and its top or lintel at a higher level than those of the inner or smaller gate.

5 The regulating apparatus must be sufficiently strong to overcome the upward pressures on the bottoms of the two gates and on the projecting flange of the outer gate, as well as the resistances due to friction between the gates and the frames. The weight
10 of the gate will assist closure.

In cases where arrangements are to be made at outlet instead of inlet ports of towers or metal pipes it will be easily understood that
15 the larger gate will be placed on the inside of its frame and the smaller one on the outside or will work within its frame like a piston.

I claim—

1. In a sluice-gate, the combination, with
20 a tower or casing having two waterways arranged opposite each other, of two slidable gates secured together and controlling the said waterways, one of the said gates having an effective area slightly in excess of that of
25 the other gate, whereby both gates are pressed gently upon their seats by the water, and

means for sliding the said gates connected with them at a point between them and operating to slide them transversely of the direction of the currents of water passing through
30 the said waterways, substantially as set forth.

2. In a sluice-gate, the combination, with a tower or casing, and two gate-frames secured thereto and provided with seats which are arranged opposite to each other and provided with waterways of unequal area; of
35 two slidable gates secured together and controlling the said waterways, the said gates being arranged upon the same sides of their respective seats and pressed gently upon them
40 simultaneously by the water-pressure, and means for sliding the said gates connected with them at a point between them and operating to slide them transversely of the direction of the currents of water passing through
45 the said waterways, substantially as set forth.

In witness whereof I have signed this specification in the presence of two witnesses.

JAMES EDWARD WHITING.

Witnesses:

EMILY EDITH ADA WHITING,
SHAIK EBRAHIM BABUN.