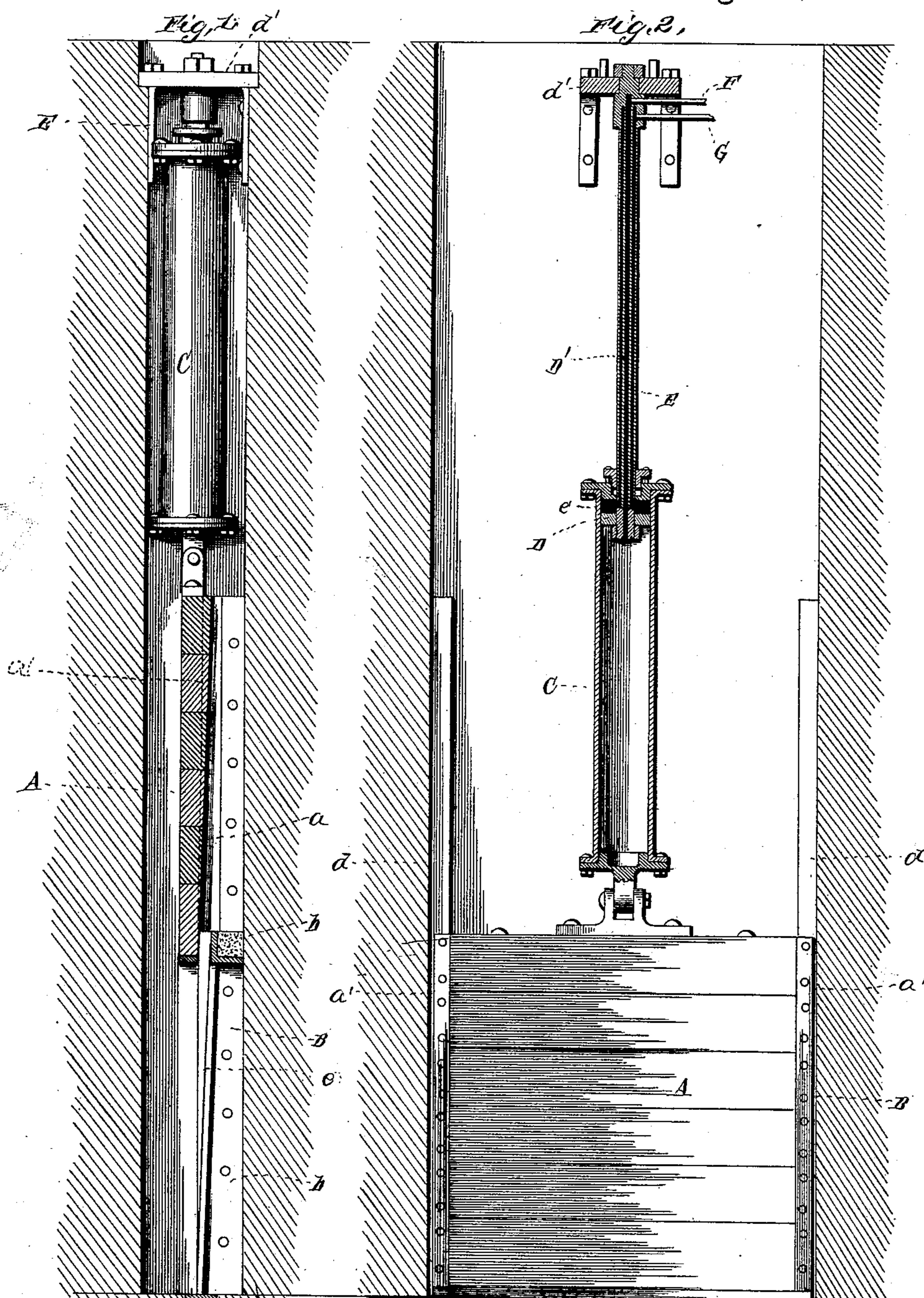


(No Model.)

J. P. FRIZELL.
RECIPROCATING HYDRAULIC GATE.

No. 435,298.

Patented Aug. 26, 1890.



WITNESSES: C

Chas. L. Taylor,
Phillemasi.

Fig. 3.

Fig. 4.

INVENTOR

J. P. Frizell

By E. W. Anderson
his Attorney

his Attorney

UNITED STATES PATENT OFFICE.

JOSEPH P. FRIZELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO AINSLIE, COCHRAN & CO., OF LOUISVILLE, KENTUCKY.

RECIPROCATING HYDRAULIC GATE.

SPECIFICATION forming part of Letters Patent No. 435,298, dated August 26, 1890.

Application filed February 24, 1890. Serial No. 341,534. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. FRIZELL, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Reciprocating Hydraulic Gates; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a side elevation, partly in section. Fig. 2 is a front elevation, partly in section; and Figs. 3 and 4 are sectional details.

This invention relates to certain improvements in vertically-sliding hydraulic gates, especially designed for use in filling and emptying the locks of canals and water-ways; and it consists of the novel construction and combination of parts, as will appear from the following description and accompanying drawings.

In the drawings, A refers to the gate, which has an inclined face *a*, the taper being toward the bottom edge, and at each side of said face bearing-surfaces *a'* are provided.

B is a cast-iron frame, which is bolted in position in the water-way, and has at its side edges, extending from top to bottom, offset closures *b*, which are packed with cement, and through which are passed the securing-bolts of said frame. At its bottom the frame B is provided with a web or plate-like extension *c*, which is anchored or embedded in a bed of cement. This frame has at its sides vertical bearing-surfaces *d* and inclined surfaces *e*, which correspond to and are engaged by the vertical and inclined surfaces, respectively, of the gate. By this arrangement it will be seen that, the bearing-surfaces of the gate being out of the plane of the closing-face, wear of said face will be avoided, and when the gate reaches the bottom of the gate frame or seat said face will close tightly throughout its engaging-surface against the inclined surfaces of said frame or seat.

C is a hydraulic cylinder, which is connected, as shown, at its lower end to the gate A, and within this cylinder is arranged a stationary piston D, whose piston-rod D' is tubular and arranged within a second tube or jacket E. The lower end of the tube or jacket E is also connected to the piston D, and its upper end, together with the upper end of the piston-rod D', is connected to a cross-head *d'*, suitably bolted to the masonry just below the upper end of the gateway. This disposition of parts permits ready access to the upper ends of the cylinder for the convenient adjustment of the stuffing-box and packing of the piston-rod. The lower end of the tubular piston-rod D' opens into the cylinder C below the piston D, and its upper end connects with a water-pipe F. The jacket-tube E communicates at its lower end through ports *e'* with the cylinder C above the piston D and connects at its upper end with a water-pipe G. It will therefore be seen that by properly adjusting a three-way cock arranged to control the passage of the water through the pipes F G the water passing from the pipe F will enter the piston-rod and the cylinder C below the piston D, and thus act to lower the cylinder and its attached gate, closing the latter. By reversing the cock the water in the cylinder will pass out through the piston-rod and be discharged by the pipe F, and water from the pipe G will enter the cylinder above the piston, and consequently act upon the cylinder so as to elevate it, and with it the gate, opening the latter. The reversal of the flow of water into and out of the cylinder, it is obvious, will take place when the three-way cock is again shifted to effect the reversal of the latter operation or movement of the cylinder and gate.

When the gate is not in use in freezing weather, the water is cut off and the cylinder, piston-rod, and jacket filled with air to avoid damage from freezing, which would otherwise occur.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

In a hydraulic gate, the combination, with the cylinder and its attached gate, of the sta-

tionary tubular or hollow piston-rod and its
piston and the jacket or tube around said
piston-rod, said piston-rod and jacket com-
municating with said cylinder at opposite
5 sides of said piston, and the water-pipes con-
necting with said piston-rod and jacket, re-
spectively, substantially as set forth.

In testimony whereof I affix my signature in
presence of two witnesses.

JOSEPH P. FRIZELL.

Witnesses:

A. CHURCHILL,

F. MONPLAISIR.