(No Model.) 2 Sheets—Sheet 1.

W. P. ELLIOTT & A. FARRAR.

GATE.

No. 406,577. Patented July 9, 1889.

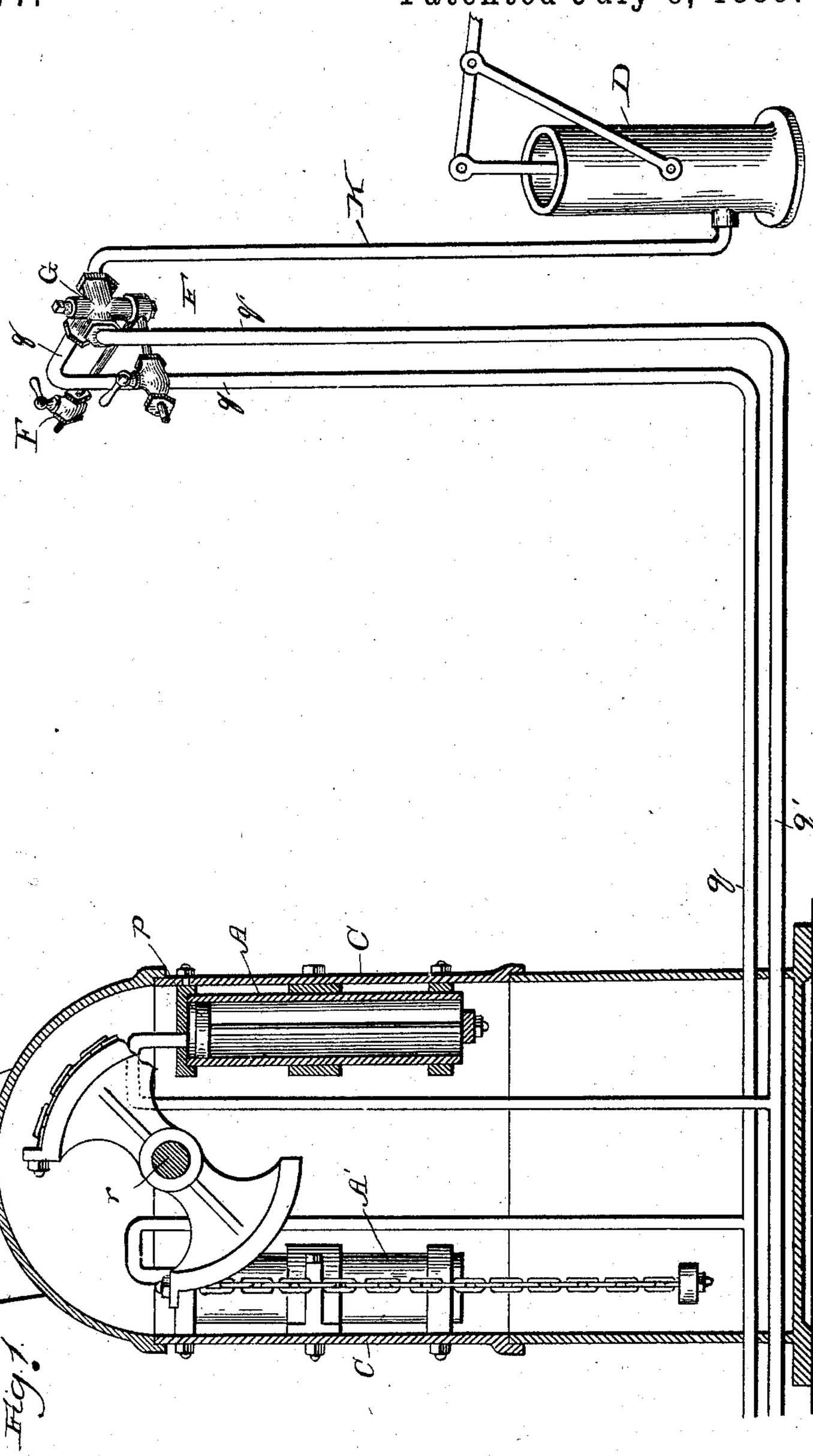

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

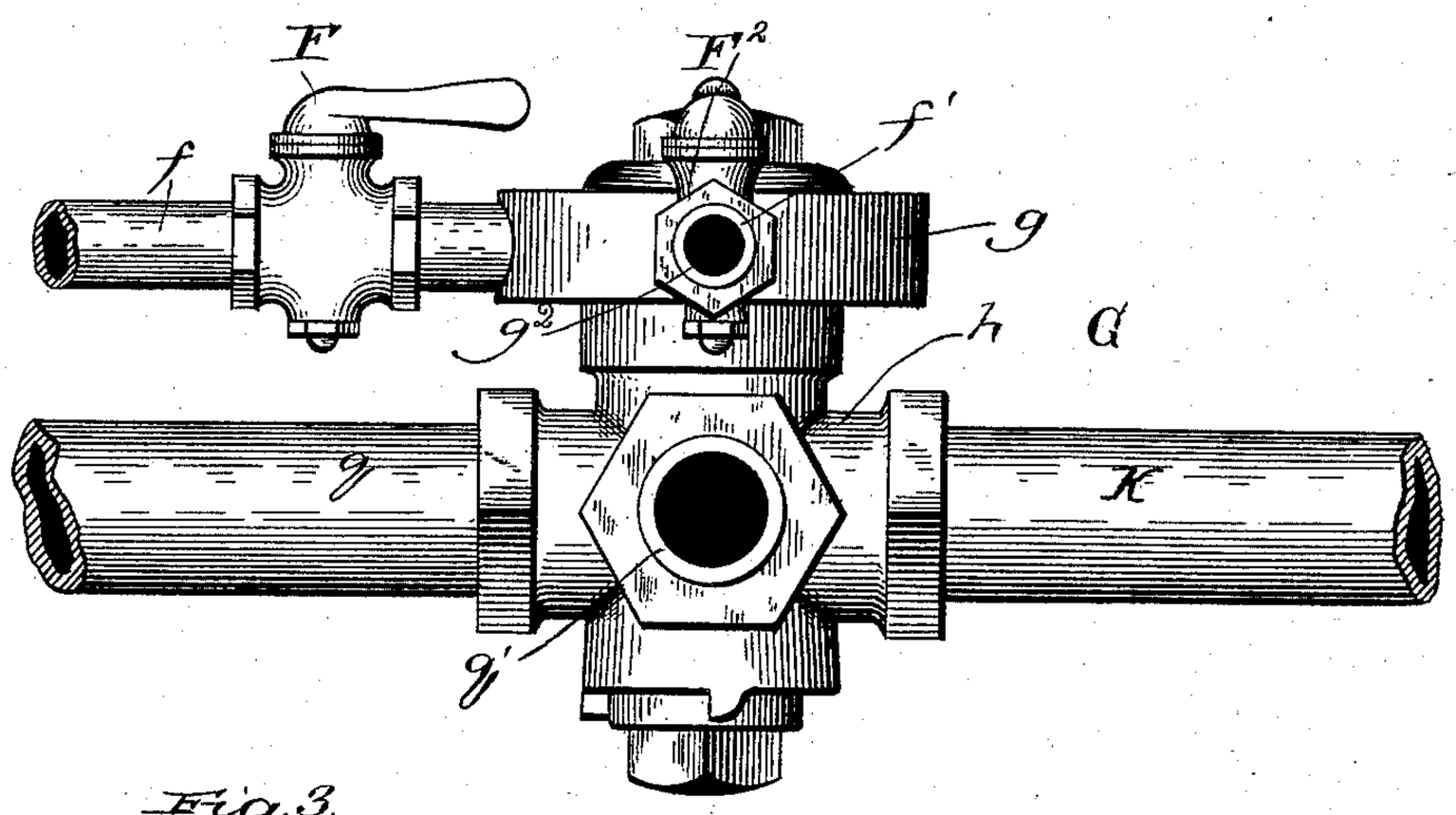


Fig. 3.

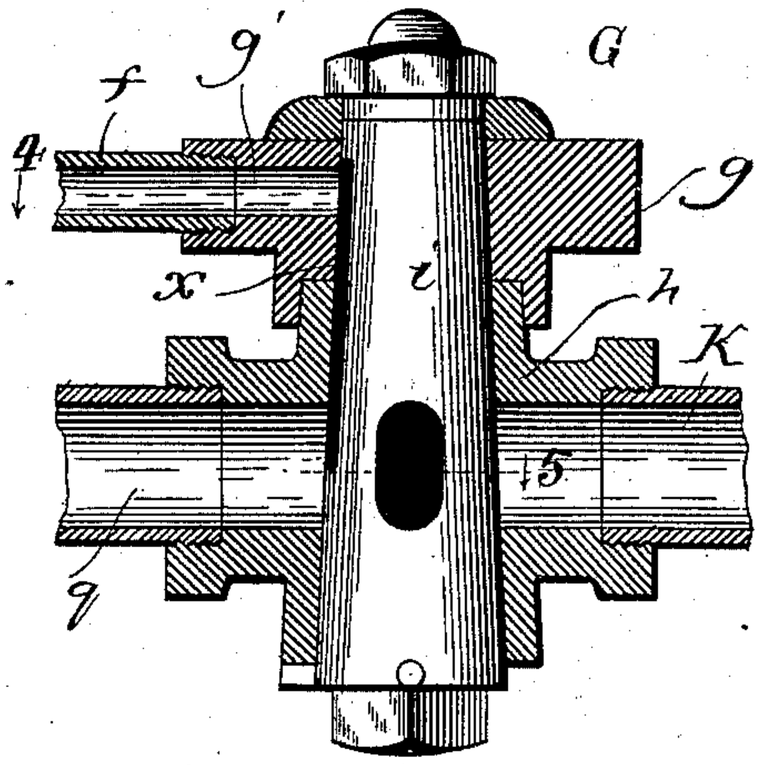


Fig. 4.

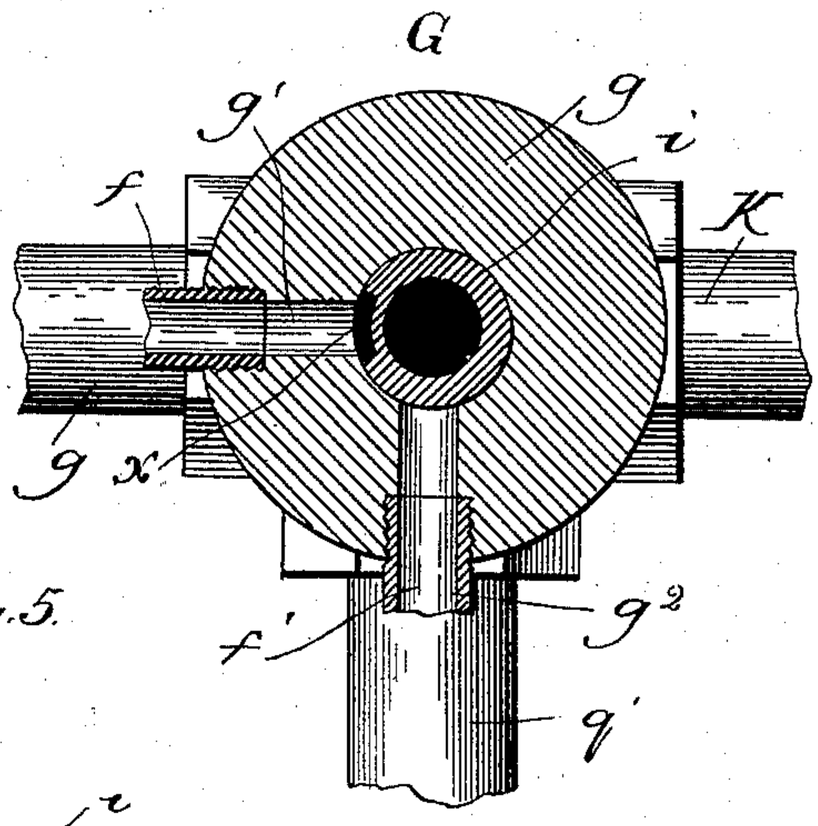
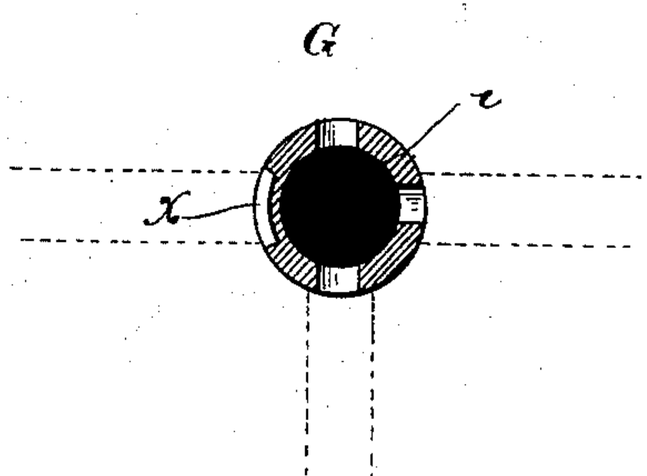


Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM P. ELLIOTT AND ARTHUR FARRAR, OF CHICAGO, ILLINOIS.

GATE.

SPECIFICATION forming part of Letters Patent No. 406,577, dated July 9, 1889.

Application filed March 29, 1887. Serial No. 232,862. ((No model).)

To all whom it may concern:

Be it known that we, WILLIAM P. ELLIOTT and ARTHUR FARRAR, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Gates; and we hereby declare the following to be a full, clear, and exact description of the same.

The devices forming the subject of the present application are designed for use upon the form of railway-crossing gates having swinging arms actuated by fluid-pressure—commonly air—exerted from a pump controllably communicating with air-pressure mechanism at each gate-post connected with the swinging bar on the same, to raise and lower it by the pressure exerted from the pump. The air-pressure mechanism referred to as being at each post may comprise piston and cylinder mechanism or collapsible and expansible bags; but whatever the form of such mechanism our present devices are applicable thereto to accomplish their purpose, hereinafter described, and this whether the gate involve a single post and swinging bar connected with the fluid-pump, or it be formed in pairs thereof, and several such pairs be provided in various positions relatively to the track, and all controllably communicating with the one pump. When several gate-bars are connected for the necessary simultaneous operation of, at least, those forming a pair to constitute the barrier, it is customary to produce the connection in a manner to cause the rise or descent of one swinging bar to raise or lower with it the other by air or other means. Whatever the form or construction of gates of the present class, they all involve the principle of operation that fluid-pressure exerted from the pump upon the mechanism connected with the swinging bar moves the latter in one direction, while to permit it to move in the opposite direction the pressure introduced for the first operation must be allowed to escape.

Our object is to provide with our present devices, or equivalents of the same, means whereby the escape of such waste fluid may be controlled, in order that the fluid employed by its direct pressure to actuate the bar in one direction may be utilized by its resistance to the movement of the same in the opposite direction to afford regularity or uniformity in such opposite movement. The lack of such uniformity in devices unprovided with our improvement may be due to any one or more of several causes, principal among which are the wind and (where several bars are connected to cause the simultaneous rise or descent of all) unequal friction on the parts in the different gate-bar connections or defect in the air-pressure mechanism at a post.

Our invention consists in the general construction of our improvement; and it also consists in details of construction and combinations of parts, all as hereinafter more fully set forth.

In the drawings, Figure 1 is a partly sectional and broken diagrammatic view of a pneumatic railroad-gate provided with means for accomplishing our improvements; Fig. 2, a view in broken elevation of our improved three-way cock device; Fig. 3, a vertical section of the same, showing the tapering plug in elevation; Fig. 4, a sectional view of the same, taken on the line 5 of Fig. 3 and viewed in the direction of the arrow; and Fig. 5, a similar view taken on the line 5 of Fig. 3 and viewed in the direction of the arrow.

For convenience in explaining our improvement, we describe it in connection with the construction of gate involving the means of operation shown and described in Letters Patent of the United States to Mortimer B. Mills, No. 380,447, dated April 3, 1888, in which the gate-bar B is connected from its axis r with the pistons p of air-cylinders A and A′ on opposite sides of the axis at the gate-post C, the cylinders communicating from their upper ends—the lower ends being open—by separate pipes q and q' with an air-pump D, a three-way cock being provided at the junction of the pipes q and q' with the pipe K, leading therefrom to the pump. By setting the three-way cock, which is in convenient reach of the operator, to open communication between a cylinder A or A′ and the pump the other cylinder is caused to communicate with the open air, so that when air is forced, by actuating the pump, into one cylinder—say A′—it forces down the piston therein and elevates the gate-bar B to the position shown. The movement of this piston, owing to its con-

nection with the piston in the cylinder A, raises the last-named piston and incidentally forces out through the three-way cock the air previously introduced into such cylinder A for the purpose of lowering the gate-bar.

It is in connection with the actuating operations of the gate-bar that our improvement is used.

The means for controlling the waste air is illustrated in Figs. 2 to 5, inclusive, of the drawings, wherein is shown a particular construction of three-way cock G, which is located at the junction of the pipes q and q' with the pipe K. The three-way cock G is recessed on one side of the tapering plug i, as shown at x, the recess extending from the level of communication of the pipes q and q' with the valve-shell h to a stationary disk or head g, having lateral openings g' and g^2, respectively coinciding with the pipes q and q', whereby, when the recess x is made to coincide with a pipe q or q', it will simultaneously coincide with the opening g' or g^2 above it, and thus permit the waste air to escape into space by way of the recess x through the respective opening in the head. To control this escape, we extend from the openings g' and g^2 tubes f and f', in each of which we adjust any suitable form of valve device F, to permit regulation of the opening for the return or waste fluid to any desired size to control the rapidity of escape of the return or waste air, and thereby afford controllable resistance to the movement of the gate-bar.

A desirable form of valve F, for controlling the escape of air through the pipes f and f', is set forth in Letters Patent of the United States, No. 395,885, granted us on the 8th day of January, 1889.

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

1. In a gate having a swinging bar on a post and actuated by fluid-pressure exerted from a pump, the combination, with the fluid-pressure mechanism at the post and the fluid-pump, of a cock G, in the communication between the said fluid-pressure mechanism and pump, having a recess x in its plug, a head g, provided with openings g' and g^2, and valves for controlling the said openings, substantially as described.

2. In a gate having a swinging bar on a post and actuated by fluid-pressure exerted from a pump, the combination, with the fluid-pressure mechanism at the post and the fluid-pump, of a cock G, in the communication between the said fluid-pressure mechanism and pump, having a recess x in its plug, a head g, provided with openings g' and g^2, and tubes f and f', extending from the said opening, and provided with valves, substantially as and for the purpose set forth.

WILLIAM P. ELLIOTT.
ARTHUR FARRAR.

In presence of—
FRANK L. DOUGLAS,
J. W. DYRENFORTH.