

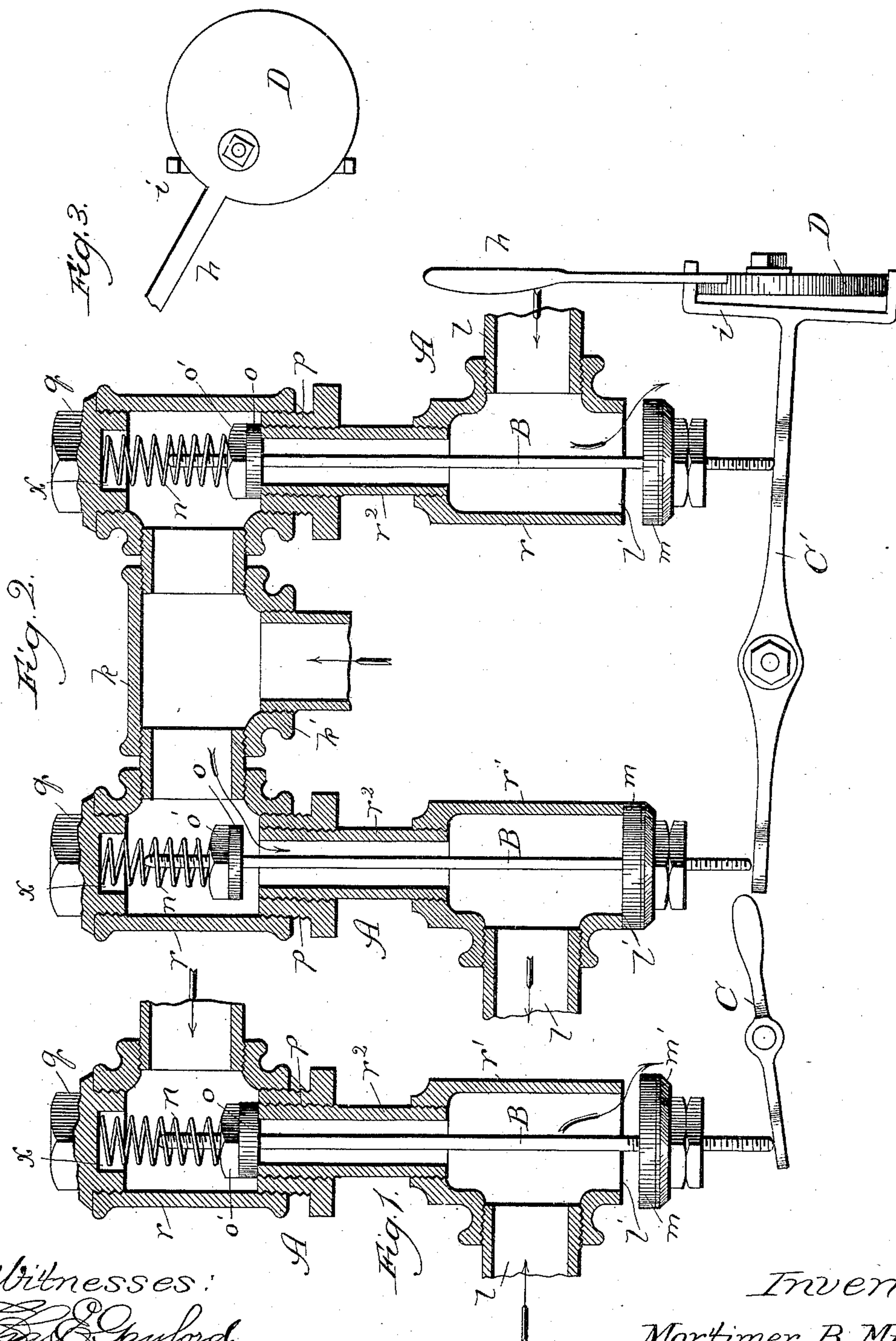
(No Model.)

M. B. MILLS.

VALVE.

No. 395,501.

Patented Jan. 1, 1889.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## VALVE.

SPECIFICATION forming part of Letters Patent No. 395,501, dated January 1, 1889.

Application filed August 2, 1888. Serial No. 281,790. (No model.)

*To all whom it may concern:*

Be it known that I, MORTIMER B. MILLS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Valves, of which the following is a specification.

The particular purpose for which I design my improvement is to afford a substitute for the three-way or four-way cock in the various connections in which the latter is used for admitting fluid under pressure from a supply into one passage with the valve turned to close the said passage from another passage, and, by re-turning the valve, for shutting off the supply and producing communication of the two passages. In practice these valves get to leak with use, either by wearing out of the metal parts, when the valves have to be discarded, or when they are packed, by wearing out of the packing, which then has to be renewed, in either event causing inconvenience and trouble.

My object is to provide a construction of valve in which no packing whatever shall be required, and in the operation of which there shall be no friction by rubbing together of the parts, and consequently no frictional wear.

In the drawings, Figure 1 shows my improvement in sectional elevation, together with means for operating it. Fig. 2 shows the same in duplicate, with suitable operating means; and Fig. 3 is an end view of the operating means shown in Fig. 2, with the handle broken off.

A is the shell, comprising, preferably, as parts, a T-section,  $r$ , having a screw-cap,  $q$ , in one end and recessed, as shown at  $x$ , in its under side, and a T-section,  $r'$ , connected with the part  $r$  by a narrower section of pipe,  $r^2$ , the connection of the latter with the part  $r$  being effected by means of a threaded gland or reducer,  $p$ .

B is a rod extending from the chamber afforded by the interior of the section  $r$  through the sections  $r^2$  and  $r'$ , and provided near its extremity in the shell  $r$  with the gasket  $o$ , forming a valve held by a nut,  $o'$ , and sufficiently wide to cover the mouth of the section  $r^2$ , which affords the valve-seat, and against which the valve is normally held

by gravity, which may be and preferably is (especially if the device is not used in an upright position) assisted by a spring,  $n$ , surrounding the adjacent projecting end of the rod B and confined between the cap  $q$  and valve  $o$ . The opposite end of the rod B, which extends beyond the section  $r'$ , is provided with a gasket forming a valve,  $m$ , and sufficiently wide to cover the adjacent mouth of the section  $r'$ , the edge of which affords the seat for the valve  $m$ , which is provided with a washer,  $m'$ , and a nut,  $m^2$ , supports the valve and washer on the rod B, which thus affords the stem for the two connected valves  $o$  and  $m$ .

To use the device, it is connected at the section  $r$  with the fluid-supply, the head or pressure of which, by impinging against the valve  $o$ , adds to the weight of the valves and their common stem and of the force of the spring  $n$  in maintaining a tight closure of the valve upon its seat. When fluid is to be drawn from the supply, the valve  $o$  is raised from its seat by pressure exerted against the outer end of the stem B through the medium of a suitable and convenient device—such as the lever C—whereby the valve  $m$  is forced against its seat and the fluid is permitted to flow through the outlet-passage  $l$ , which may be an ordinary faucet-spout, a pipe leading to a receiver to be expanded, or the like. When it is desired to shut off the supply, the lever C is manipulated or released to permit the valve  $o$  to resume its seat, thereby opening the valve  $m$  and causing any fluid which may be in the shell A and passage  $l$  to escape through the opening  $l'$  in the section  $r'$ , which may communicate with the open air, with a waste-pipe, with a receiver to be expanded by the exhaust-pressure, or the like. Thus in the case of water as the fluid, the device may be effectively drained of the waste water whenever the supply is shut off and by the act of shutting off after the draining operation, whereby freezing is prevented.

A particular application, and the especial one for which I have invented my improved valve device, is that of controlling the air-pressure employed as the actuating medium in pneumatic railroad gates and switches. Therein the section  $r$  may communicate with



the air-pump and the section  $r'$  from the passage  $l$  with the collapsible receiver or piston mechanism for operating the gate or switch. When applied to either of the purposes last  
 5 stated, however, owing to the fact that the pressure is frequently required to be applied to two sets of gate-arms, or has to move a switch in two opposite directions, it may be desirable to duplicate the valve device by con-  
 10 necting the sections  $r$  through the medium of a T-joint,  $k$ , Fig. 2, the stem  $k'$  of which then affords communication with the fluid-supply of either valve device.

The duplicate form should be provided  
 15 with means whereby the opening of a valve,  $o$ , and closing of a valve,  $m$ , in one will simultaneously produce the opposite effects on the valves of the other. This may be accomplished by means of a lever,  $C'$ , fulcrumed  
 20 between and beyond the two connected valve devices in a position to extend at opposite sides of its fulcrum against the projecting extremities of the valve-stems  $B$ , and terminating at one end in a fork,  $i$ , embracing a  
 25 cam,  $D$ , having a handle,  $h$ , connected with it. By turning the cam in one direction the valves  $o$  and  $m$  in one of the duplicate devices are respectively opened and closed, permitting the flow through it of fluid from the  
 30 supply, while the valves of the other are respectively and at the same time closed and opened, shutting off the pressure-supply and permitting the fluid previously passed through a passage,  $l$ , to escape through a passage,  $l'$ .  
 35 The reverse movement of the cam produces the contrary operations of the valves in the respective valve devices.

It will thus be seen that the construction affords a simple valve device which possesses  
 40 the qualities of durability and effectiveness and convenience in its purpose. Of course the details of the construction may be vari-

ously modified without thereby departing from my invention, as hereinafter claimed. For example, the shell  $A$  may be of any suitable  
 45 form and construction.

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

1. A valve device comprising, in combination, a shell having a chamber at one end  
 50 provided with an inlet-opening and containing a valve-seat, and a chamber at its opposite end having an outlet-opening,  $l$ , and a discharge-opening,  $l'$ , a rod,  $B$ , extending from the first-named chamber through and beyond  
 55 the discharge-opening  $l'$ , and having a valve,  $o$ , at one end normally against the said valve-seat, and a valve,  $m$ , toward its opposite end normally away from its seat and beyond the  
 60 discharge-opening  $l'$ , substantially as and for the purpose set forth.

2. A valve device comprising, in combination, two shells,  $A$ , each having a section,  $r$ , provided with an inlet-opening, a section,  $r'$ , communicating with the section  $r$  through a  
 65 reduced passage,  $r^2$ , and having a discharge-opening,  $l'$ , and an outlet-opening,  $l$ , between the inlet and discharge openings for waste or return fluid, a valve,  $o$ , normally maintained against its seat in the section  $r$ , a valve,  $m$ ,  
 70 normally maintained away from its seat at the discharge-opening  $l'$ , and a rod,  $B$ , connecting the two valves, a pipe,  $k$ , connecting the sections  $r$  of the two shells and having an opening,  $k'$ , and a lever,  $C'$ , fulcrumed in po-  
 75 sition to engage with the valves  $m$  at opposite sides of its fulcrum and provided with a fork,  $i$ , at one end, and a cam,  $D$ , in the fork, substantially as described.

MORTIMER B. MILLS.

In presence of—

M. J. BOWERS,  
 J. W. DYRENFORTH.