

No. 632,417.

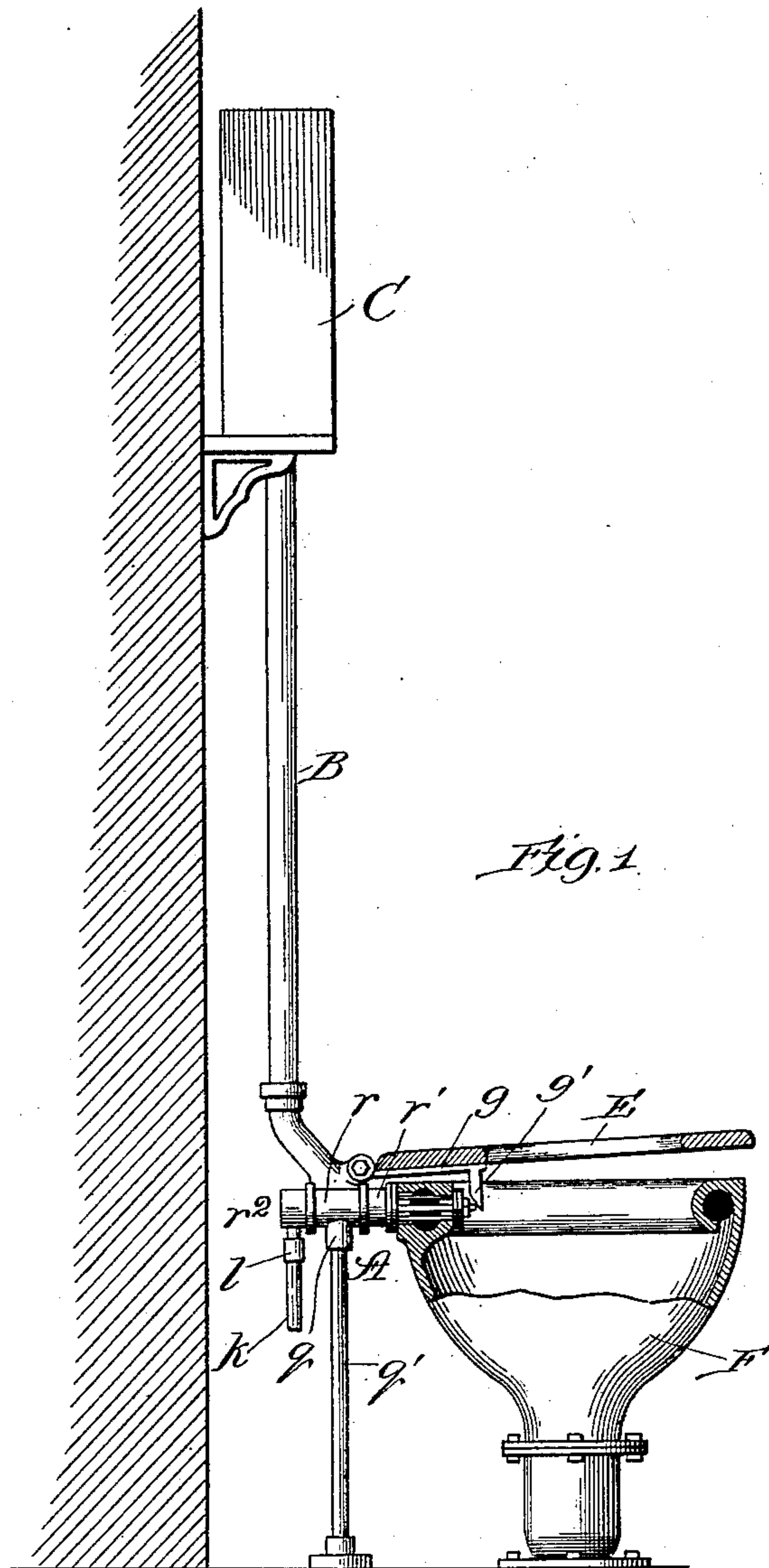
Patented Sept. 5, 1899.

J. KELLY.
VALVE DEVICE.

(Application filed Mar. 27, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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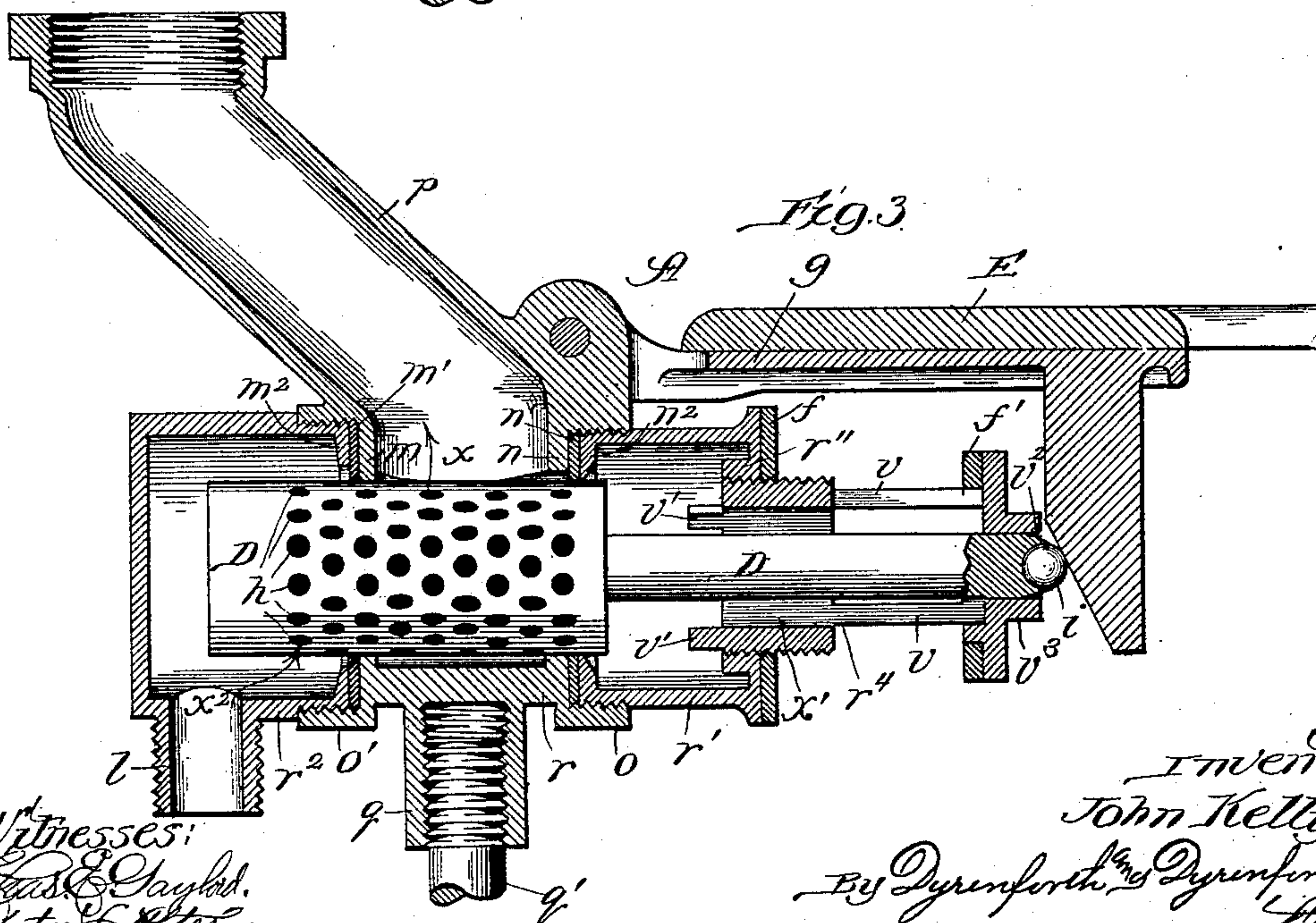
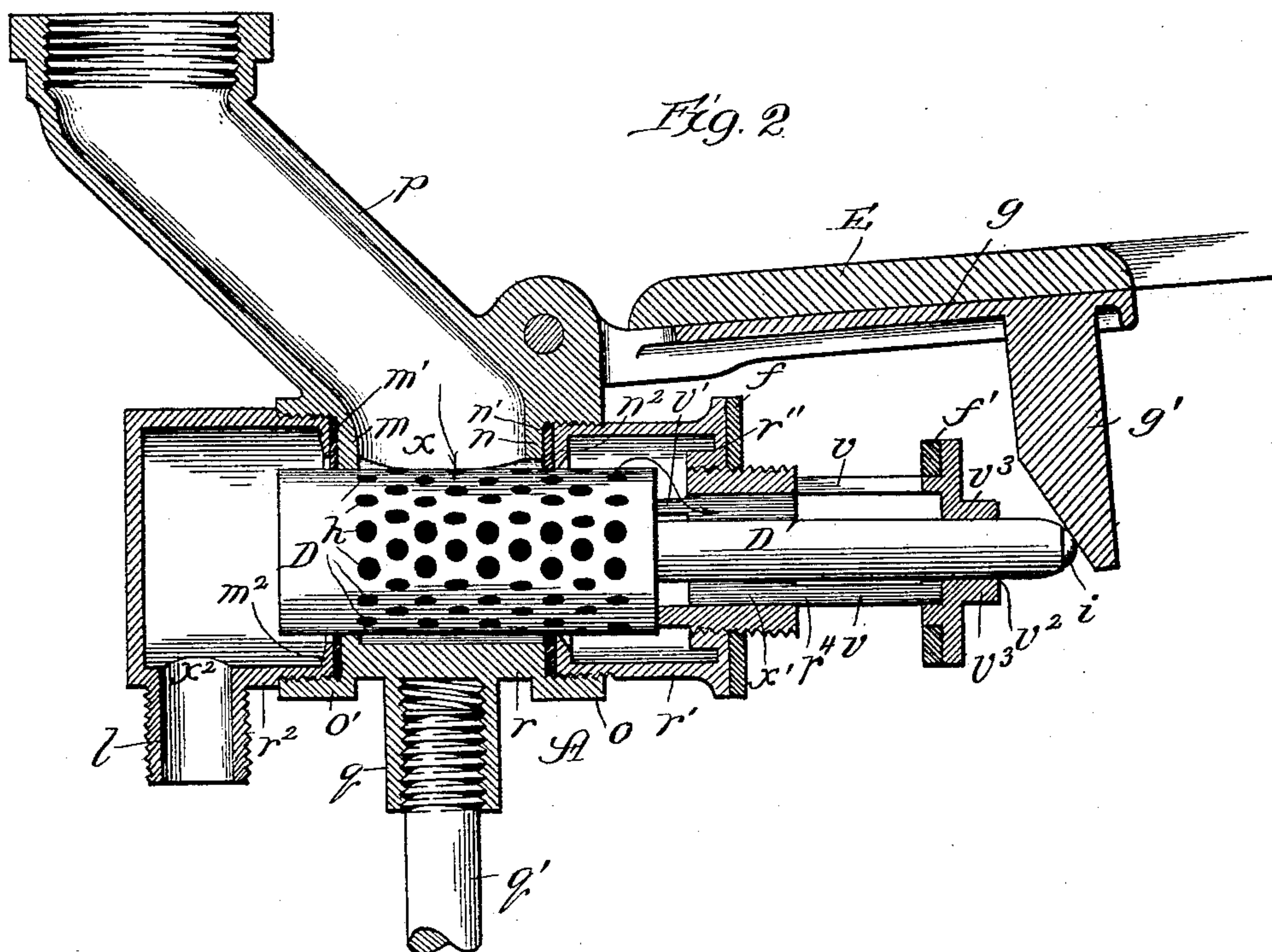
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(Application filed Mar. 27, 1897.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JOHN KELLY, OF CHICAGO, ILLINOIS.

VALVE DEVICE.

SPECIFICATION forming part of Letters Patent No. 632,417, dated September 5, 1899.

Application filed March 27, 1897. Serial No. 629,597. (No model.)

To all whom it may concern:

Be it known that I, JOHN KELLY, 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 Valve Devices, of which the following is a specification.

The object of my invention is to provide a valve device devoid of any weight or spring for operating it for use, primarily, as an automatic valve in connection with a water-closet to extend through the wall of the bowl and the flushing-rim therein with its stem projecting inside the bowl and afford means for controlling, through the medium of the seat, the supply of flush-water to a reservoir and the discharge from the latter into the bowl to flush it. My improvement is applicable, however, with more or less slight modification, to other purposes than that specified, such as to a stop and waste-valve; but inasmuch as I have particularly devised it for the water-closet use referred to the description thereof hereinafter contained is confined to that use, and it is shown in that connection in the accompanying drawings, in which—

Figure 1 is a partly broken and sectional view of a water-closet provided with my improvement; Fig. 2, a longitudinal sectional view of my improved valve device, showing the piston-valve in its position of opening communication between the reservoir and discharge and closing that between the supply and reservoir; and Fig. 3, a similar view of the same, showing the piston-valve in its other position of opening communication between the supply and reservoir and closing that between the reservoir and discharge.

A is the valve-shell, formed, preferably, by way of affording convenience of access to its interior, as for repacking the valve, hereinafter described, in the three sections r , r' , and r'' illustrated.

The intermediate section r has shown as extending from its upper side the tube-section p of the flush-pipe B, leading from an outlet-port x in the section to the overhead reservoir C and is provided on its lower side with an internally-threaded nipple q to receive a prop-rod q' . At the opposite ends of the section r , about which it is provided with

the annular threaded flanges o and o' , are the internal annular shoulders n and m , against which respectively abut the packing-rings or gaskets n' and m' , formed, preferably, of leather.

The section r' is threaded to engage with the threaded flange o and terminates in an annular internally-threaded head r^{11} , affording the discharge-port x' , into which is screwed the threaded end of the spud r^4 , having the side openings v , the studs v' at its inner end, and the central opening v^2 in the head v^3 at its outer end, and at the inner end of the section r' may be provided the annular shoulder n^2 to cooperate with the shoulder n in clamping the gasket n' .

The section r'' is shown in the form of a cap threaded to engage with the threaded flange o' , and may have an annular shoulder m^2 at its inner end to cooperate with the shoulder m in clamping the gasket m' , the cap being closed at its outer end and provided on its lower side with the nipple l about the inlet-port x^2 for connection with the water-supply pipe k , leading from the pressure-main. (Not shown.)

D is a tubular piston-valve closed at both ends and open through the wall or shell of its body portion, and from its inner end there extends the stem D' , terminating in a socket, in which is rotatably confined a hard-metal (as steel) antifriction-ball i . The open condition of the tubular piston-valve D is shown to be afforded by numerous perforations h about the shell between its ends. It is immaterial, however, how this open condition is afforded provided a sufficient portion of the shell near each end be imperforate, so that when the piston is in its forward position (shown in Fig. 2) only the imperforate portion at its outer end shall be exposed to the water-pressure supply through the cap r'' and the perforate portion shall be exposed to the passage through the tube p and to the discharge in the section r' , and that when the piston-valve is in its retracted position (shown in Fig. 3) only the imperforate portion of the inner end of its shell shall be exposed to the discharge and the perforate portion exposed to the supply through the cap and to the passage through the tube p . To afford these conditions, therefore, it is essential that the

open portion of the tubular piston or portion thereof provided with openings shall, in the limits of play of the valve, be sufficiently extensive or that the openings shall be so disposed as to open the shell to the inlet-pipe *l* and the tube *p* in one position of the valve, and thus extend at opposite sides of the gasket *m'* and short of the gasket *n'* and to open the shell to the tube *p* and to the discharge in the section *r'* in the other position of the valve, with the perforate portion extended at opposite sides of the gasket *n'* and short of the gasket *m'* to close the tubular valve to the inlet *l*.

To apply my improved valve device into operative connection with a water-closet, the wall of the closet-bowl *F* is provided, preferably at its rear side, with an opening extending through both walls of the flushing-rim, about the outer end of which opening the end of the section *r'* is pressed against an interposed gasket *f*, and the spud is inserted through the opening from within the bowl and screwed into the section *r'* till the flange about the head *v*² of the spud bears, with an interposed gasket *f'*, against the inner surface of the bowl about said opening. The valve device may be propped from the floor by the rod *q'*.

On the tube *p*, adjacent to its junction with the section *r*, I show hinged a plate *g*, having near its outer end a pendent finger *g'*, to engage at its inner beveled side with the outer end of the stem *D'*, for a purpose hereinafter described. The plate affords a bearing for the closet-seat *E*, fastened to it, so that the seat with its hinged plate-connecting medium affords a bent lever for automatically operating the valve, the operation of which is as follows: The normal position of the valve is that in which it is shown in Fig. 2, wherein the pressure behind it, from the inlet *l*, tends to force the stem *D'* against the finger *g'* and thereby raise the seat. When the seat is occupied or pressed down, the engagement of the finger *g'* with the ball-bearing end of the stem *D'* forces the valve *D* inward to the position in which it is shown in Fig. 3, thereby bringing the perforations *h* short of the gasket *n'* and to cross the gasket *m'* and permitting the supply of water from the pipe *l* to enter the tubular shell of the valve at the outer side of the gasket *m'* and escape therefrom at the inner side of that gasket into the tube *p* and thence through the pipe *B* into the reservoir *C*. On releasing the pressure upon the seat *E* the valve *D* need not immediately jump forward or shut off the supply to the reservoir, for the counter-pressure of the water passing through the valve and of that which has passed through it will tend to counteract or yieldingly obstruct the supply-pressure behind the valve. Hence mere momentary pressure against the seat *E* to force the valve *D* back, as may be exerted after such use of the closet as requires the seat to be raised for it, will suffice to effect the sup-

ply of a flushing charge through the valve from the inlet *l* into the reservoir *C*. By the release of the pressure against the seat the pressure behind the valve will more or less rapidly, according to the size or arrangement of the openings *h*, force it to the position in which it is shown in Fig. 1, in reaching which the stem *D'* lifts the seat, and in which the flush-water may discharge from the reservoir into the valve-shell at the outer side of the gasket *n'* and escape from the shell at the inner side of that gasket into the section *r'*, whence it enters the flushing-rim of the closet-bowl *F* by way of the spud *r*⁴.

By the described sectional construction of my improved valve device the valve may be readily removed, as for repacking or otherwise repairing parts, either through the outer end of its chamber, on unscrewing the cap *r*², or at the inner end thereof, from within the bowl *F*, on unscrewing and withdrawing the spud *r*⁴.

Of course if the valve device is constructed for use as a stop and waste cock, while it would require the same ports in the same or substantially the same relations as those of the device adapted for the water-closet purpose described, other parts, including the valve-stem and spud, would be omitted, and the hinged plate for supporting the closet-seat is not an essential feature even in connection with the water-closet use of the device. Instead of being hollow the piston-valve may obviously be solid or fluted.

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

1. In a valve device, the combination with a valve-chamber having an inlet-port and a discharge-port respectively near its opposite ends and an intermediate outlet-port, of annular shoulders in said chamber flanking said outlet-port and provided with packing, a piston-valve reciprocally confined in said chamber to extend beyond said shoulders and having closed ends and being open between imperforate end portions, said open portion exceeding the distance between said shoulders, one of said closed ends being presented to the inlet-port to cause the valve to be normally impelled forwardly by fluid-pressure to bring the open portion of the valve at the outlet and discharge ports to open the latter and close the inlet-port, and means for retracting said valve against said pressure to bring said open portion at the outlet and inlet ports to open the latter and close the discharge-ports, substantially as described.

2. In a valve device, the combination with a valve-chamber having an inlet-port and a discharge-port respectively near its opposite ends and an intermediate outlet-port, of annular shoulders in said chamber flanking said outlet-port and provided with packing, a hollow piston-valve reciprocally confined in said chamber to extend beyond said shoulders and having perforations in the body portion of its shell between imperforate end portions,

said perforated portion exceeding the distance between said shoulders, and having closed ends, one of which is presented to the inlet-port to cause the valve to be impelled forwardly by fluid-pressure to bring the perforated portion of the valve at the outlet and discharge ports, and means for retracting said valve to bring said perforated portion at the inlet and discharge ports, substantially as described.

3. In a valve device, the combination of a valve-chamber formed in three separable sections, one end section having an inlet-port and the other end section a discharge-port and the intermediate section having an outlet-port and containing annular shoulders flanking said port, a spud separately connected with said section containing the discharge-port, a hollow piston-valve reciprocally confined in said chamber to extend through the intermediate section and into the end sections and having closed ends and perforations between imperforate end portions, the perforated portion exceeding the distance between said shoulders, one of said closed ends being presented to the inlet-port to cause the valve to be impelled forwardly by fluid-pressure to bring the perforated portion of the valve at the outlet and discharge ports, and a stem

extending from the other end of the valve through the spud, substantially as and for the purpose set forth.

4. In a water-closet valve device, the combination of a valve-chamber having an inlet-port and a discharge-port respectively near its opposite ends and an intermediate outlet-port, annular shoulders in said chamber flanking said outlet-port, a spud connected with said discharge-port, a hollow piston-valve reciprocally confined in said chamber to extend beyond said shoulders and having closed ends one of which is presented to the inlet-port to cause the valve to be impelled forwardly by fluid-pressure, and having a perforated portion between imperforate end portions which perforated portion exceeds the distance between said shoulders and is normally brought at the outlet and discharge ports, a stem extending from the valve through the spud and carrying an antifriction device at its end, and a seat-plate hinged upon the chamber and having a depending finger to end the stem end, substantially in the manner and for the purpose set forth.

JOHN KELLY.

In presence of—

J. H. LEE,

RICHARD SPENCER.