

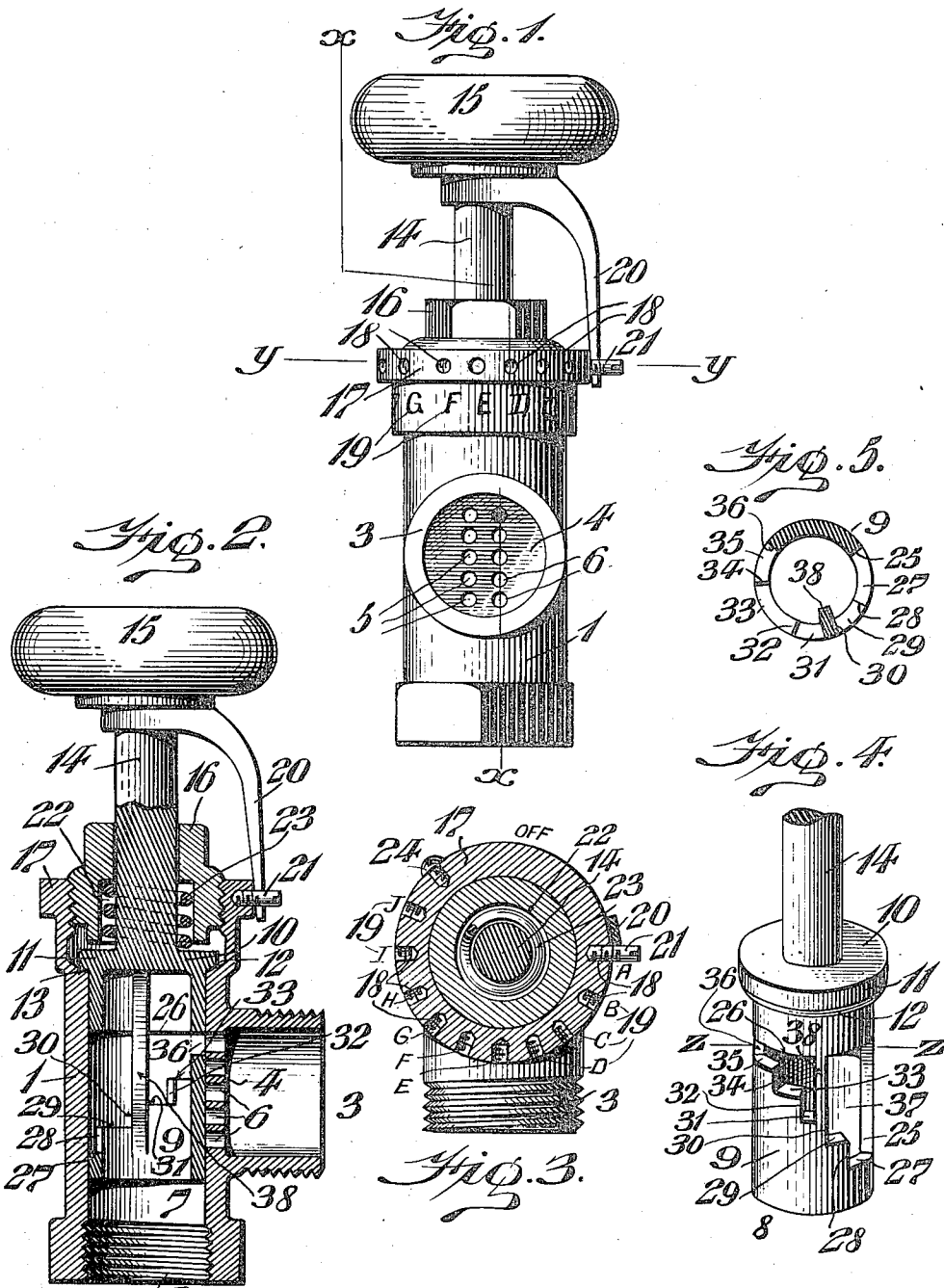
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VALVE.

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1,015,164.

Patented Jan. 16, 1912.



WITNESSES

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WILLIAM T. FOWDEN, OF CHESTER, PENNSYLVANIA.

VALVE.

1,015,164.

Specification of Letters Patent.

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Application filed April 25, 1911. Serial No. 623,247.

To all whom it may concern:

Be it known that I, WILLIAM T. FOWDEN, a citizen of the United States, residing at Chester, Delaware county, State of Pennsylvania, have invented a new and useful Valve, of which the following is a specification.

In a prior patent granted to me December 21st, 1909, No. 944,026, I have shown, described and broadly claimed a novel construction of a valve for controlling vapor, gas or other fluids, wherein I dispense entirely with packing devices and wherein provision is made for enabling my valve when used, as in one embodiment thereof, in connection with a system of radiators, to admit determinate or predetermined quantity of fluid to one, two, three or more sections of a radiator.

In my prior patent I employed a hollow valve body having tiers of perforations or small ports therein adapted for effecting a determinate regulation of the amount of gas, steam, water or other fluid designed to pass therethrough while in my present invention I have devised a novel construction of hollow valve body or valve proper, which has a cut out portion therein, said cut out portion being narrowest at one end or at its top as shown for illustration and the recessed portion increasing in area toward the other end of the valve or downwardly by a series of stepped or similarly shaped surfaces, so that as the valve is set or rotated into the desired position, there will be a free and unobstructed flow to the desired point of the fluid or gas through the desired determinate successively increased port area of the hollow valve body.

To the above ends my invention consists of a novel construction of hollow valve wherein the valve body is provided with a free, unobstructed passage which successively increases the port area from one end to the other of the valve, whereby as the latter is rotated an increasing amount of the fluid or gas may be permitted to pass therethrough, according to predetermined requirements.

For the purpose of illustrating my invention, I have shown in the accompanying drawing one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which

my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a front elevation of a valve embodying my invention. Fig. 2 represents a section on line $x-x$ Fig. 1. Fig. 3 represents a section on line $y-y$ Fig. 1. Fig. 4 represents a perspective view of the hollow valve in detached position, showing the stepped or similar passage therethrough of gradually increasing area. Fig. 5 represents a section on line $z-z$ Fig. 4.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings. 1 designates my novel valve casing, the same being preferably angle-shaped and provided with the inlet passage 2, interiorly threaded, and the outlet passage 3, exteriorly threaded, although it will of course be evident that the passage 3 may serve as the inlet and 2 as the outlet, if desired.

4 designates a partition in the valve casing intermediate the passages 2 and 3 and having the ports 5 and 6 therein, in the present instance preferably arranged in two substantially parallel rows, as will be evident from Fig. 1.

7 designates the valve chamber in which the valve 8 is located, the latter consisting of the hollow cylindrical or shell-like body 9, which is open at its lower portion and closed at its top by the partition 10, which is provided with the flange 11, whose under side is beveled as at 12, to coact with the inclined seat 13, said top or partition of said valve having the stem 14 to which is secured the hand-wheel 15 for operating the same, said stem 14 passing through the cap or closure 16, which is in threaded engagement with the upper portion 17 of the valve casing 1, the outer periphery of said upper portion being provided with the recesses or seats 18, which are suitably numbered as from A to J, as seen at 19.

20 designates a spring or finger secured to the hand wheel 15 or its stem 14 and adapted to rotate therewith, the lower or free end of said finger being adapted to coact or register with said seats 18 and to be limited in its extreme movement by the stops or abutments 21 and 24.

22 designates a chamber in the cap or closure 16 within which is contained the coil

or other spring 23, one end of which bears against said cap, while the other or lower end thereof contacts with the top 10 of the valve and serves to hold the beveled under-
 5 side of the flange 11 tightly to its seat, as will be evident from Fig. 2. The construction of the valve body 9 will be apparent from Figs. 2 and 4 wherein it will be seen that said body consists of a hollow cylinder
 10 closed at one end and open at the other, while a side of said valve is recessed in a novel manner which will now be described.

The valve is provided with a vertical or longitudinal cut 25, from the top of which
 15 extends the cut 26, while from the bottom of said cut 25 extends the cut 27 in a line substantially parallel with the cut 26. From the cut 27 extends upwardly the cut 28, then the lateral cut 29, the vertical cut 30, the
 20 lateral cut 31, the vertical cut 32, the lateral cut 33, the vertical cut 34, the lateral cut 35 and the vertical cut 36, which latter meets the lateral cut 26, whereby a port or opening
 37 is formed, of irregular area, bounded on
 25 one side by the wall 25, at the top and bottom by the walls 26 and 27, while the wall opposite to the wall 25 presents a stepped surface, as will be understood from Figs. 2
 and 4, so that when the valve is assembled
 30 in its casing and rotated by the hand-wheel, it can be set at various determinate points, as may be desired, as indicated by the position of the finger 20 with respect to the seats 18,
 so that a narrow or wider portion of the
 35 irregular port 37 may register with the desired number of ports 5 or 6, so that the port area for the discharge of fluid controlled by the valve may be successively increased or
 diminished according to requirements, to
 40 provide the proportionate or predetermined flow desired.

In one application of my invention I employ the same in connection with a radiator
 45 system, so that by the proper manipulation of the valve generally as described in my prior Patent No. 944,026, one, two, three, four, etc., radiator sections may be filled with steam by causing the finger 20 to register
 with the seat A, B, C, D, etc., it being ap-
 50 parent that when the finger 20 reaches the stop 24, the valve is then opened to its widest extent and all of the radiator columns are then being heated.

It will of course be understood that the
 55 contiguous surfaces of the valve and the casing may be ground or otherwise finished so as to fit nicely and exactly and by reason of the beveled face 12 of the valve co-acting
 with the contiguous beveled seat of the cas-
 60 ing, the spring 23 always holding said valve in desired position, I have produced a valve wherein all packing is dispensed with and
 which can be cheaply manufactured and readily assembled and disconnected for the
 65 purpose of inspection and repairs. The

spring 23 will at all times automatically take up the wear on the valve proper and by the employment of the locking devices 20 and 21, the valve can be temporarily retained or
 70 set in various positions, whereby more or less vapor, steam or other heating medium or fluid can be introduced into the radiating columns when my invention is applied thereto.

I am aware that it has heretofore been
 75 proposed, as in my prior Patent No. 944,026, to employ a hollow valve having ports or perforations therein to successively increase the port area and it has also been heretofore
 80 proposed to construct valves without packing but my present invention is differentiated from the prior art by reason of the novel construction and location of the port 37
 which permits a much freer and unobstructed
 85 passage of the medium to be controlled by reason of the employment of the cut-away portion and, in addition, friction between the valve and its casing is considerably re-
 duced by reason of the large cut-out or cut-
 90 away area of the irregular shaped port having the upper and lower terminals substantially parallel and joined by the straight
 and stepped sides respectively, as will be understood from Fig. 4, and to none of the
 95 constructions of the prior art do I herein make my claim. It will further be apparent that by the employment of the finger 20 and the abutments 21 and 24, I am enabled to secure a very convenient adjustment of the
 valve by moving the abutment 21 according
 100 to requirements. For example, I may locate the finger 20 between the abutments 21 and 24, as shown in Fig. 3, the "off" position being at the point indicated, which means
 that when the finger 20 is in alinement with
 105 said "off" position, the valve is then closed. When the finger 20 is turned into contact with the stop 21, in the position indicated, then only the two upper ports 4 and 5
 will be open, while by turning the finger 20
 110 into contact with the stop 24 then an entire row of ports, as 5, will be open so that the valve is susceptible of being adjusted at a predetermined point under its various require-
 ments. I preferably provide the shell 9 with
 115 a reinforcing rib 38 which extends across the irregular shaped port 37 in order to strengthen the walls of the shell 9.

It will now be apparent that I have de-
 120 vised a novel and useful construction of a valve which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present in-
 125 stance, shown and described a preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is
 susceptible of modification in various par-
 130 ticulars without departing from the spirit

or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a device of the character stated, a valve casing, a valve therein consisting of a cylinder open at one end and closed at the other and having a port whose transverse area is increased successively step by step from each end thereof, said port having a reinforcing rib extending thereacross, a closure for said casing and a spring intermediate said closure and valve.

2. In a device of the character stated, a casing having an inlet and an outlet, a partition in said casing having a plurality of ports therein, and a valve in said casing consisting of a cylinder open at one end and closed at the other, said cylinder having a port therein provided with an irregular-shaped wall at one side thereof, whereby a port of successively varying unobstructed area is formed, which has its widest and narrowest portions at each extremity thereof, the transverse area of said port being increased successively step by step from end to end thereof and said valve having a reinforcing rib extending across said port.

3. In a device of the character stated, a valve casing, a valve therein consisting of a cylinder open at one end and closed at the other and having a port whose transverse area is increased successively step by step from each end thereof, said valve having a reinforcing means extending across said port, a closure for said casing, a spring intermediate said closure and valve, said valve

having also a beveled wall at the outer upper portion thereof, and a similarly beveled wall on said casing coacting therewith, in combination with a closure for said casing, and a tension device intermediate said closure and valve.

4. In a device of the character stated, a valve casing, a valve therein consisting of a cylinder open at one end and closed at the other and having a port whose transverse area is increased successively step by step from end to end thereof, a finger rotatable in unison with said valve, a series of indices consisting of screw-threaded seats near the extremity of said valve casing with which said finger is adapted to register and a plurality of stops engaging said seats, said casing having indicating data in proximity to each of the indices, one of said stops being removably connected with said threaded seats.

5. As an improved article of manufacture, a valve consisting of a hollow cylinder open at one end and closed at the other by a top 10, having a beveled wall 12, said cylinder having a port provided with end walls 26 and 27, a side wall 25, and an opposite side wall formed by the cuts 28, 29, 30, 31, 32, 33, 34, 35 and 36, whereby a port is formed having its transverse area increased successively step by step from end to end thereof, and said cylinder having a reinforcing rib extending across said port.

WILLIAM T. FOWDEN.

Witnesses:

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