No. 686,966. Patented Nov. 19, 1901.

J. GROUVELLE & H. ARQUEMBOURG.

VALVE OR COCK.

(Application filed Sept. 27, 1900.)

(No Model.)

Fig. 1.

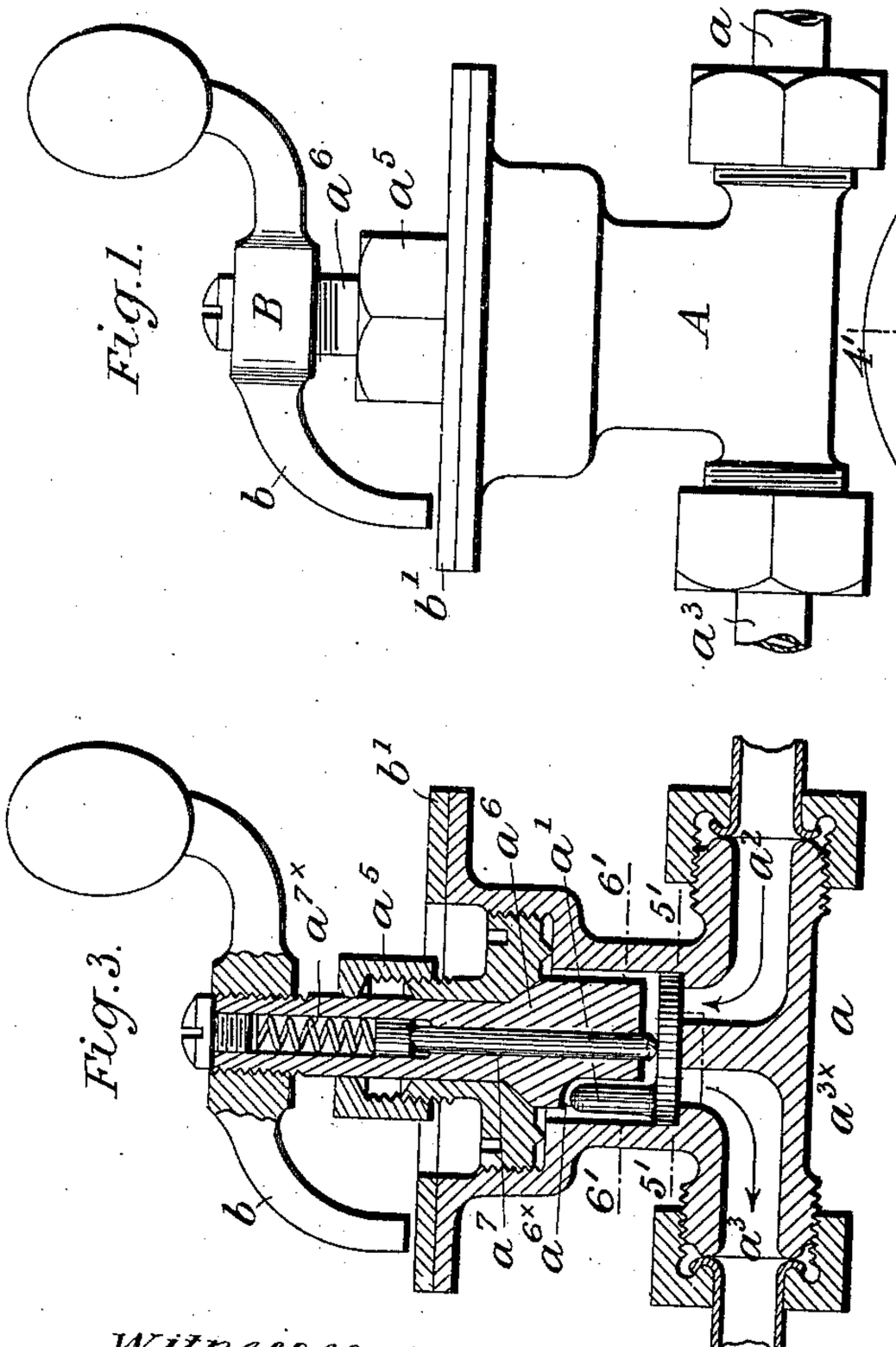


Fig. 2.

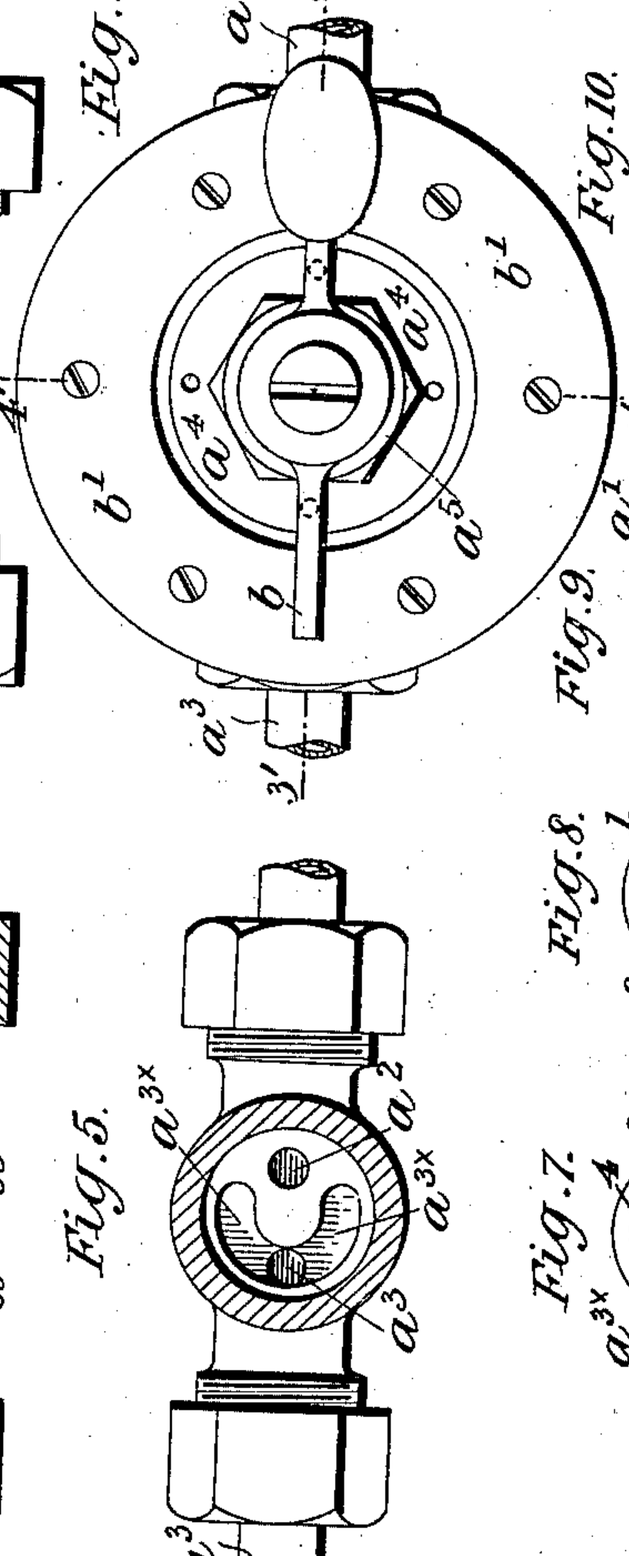


Fig. 3.

Fig. 4.

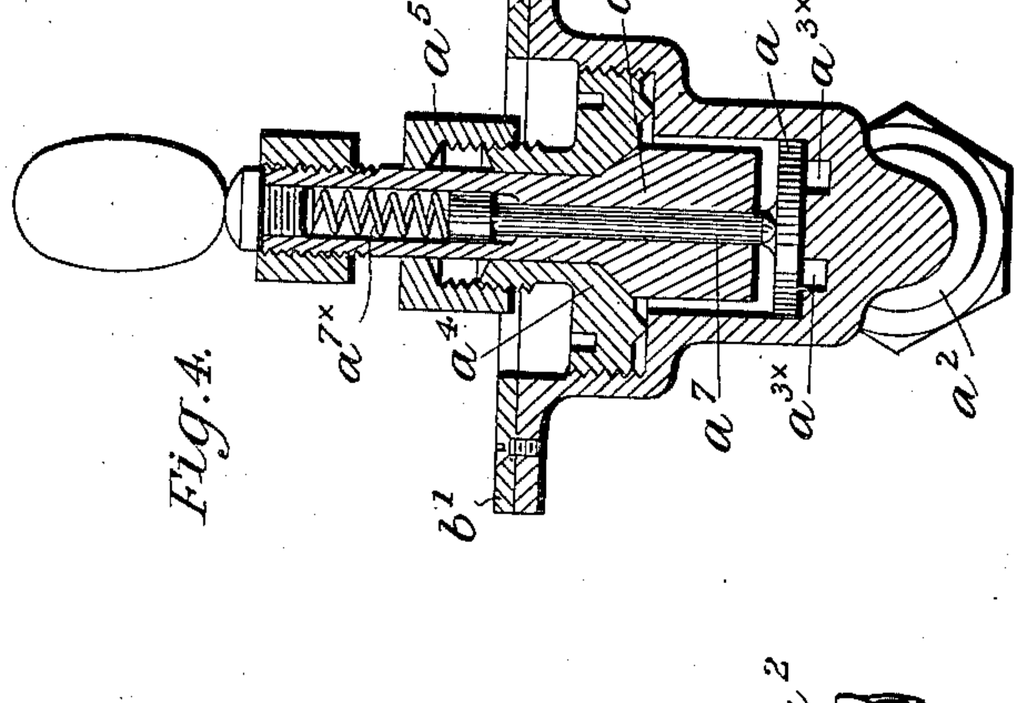


Fig. 5.

Fig. 6.

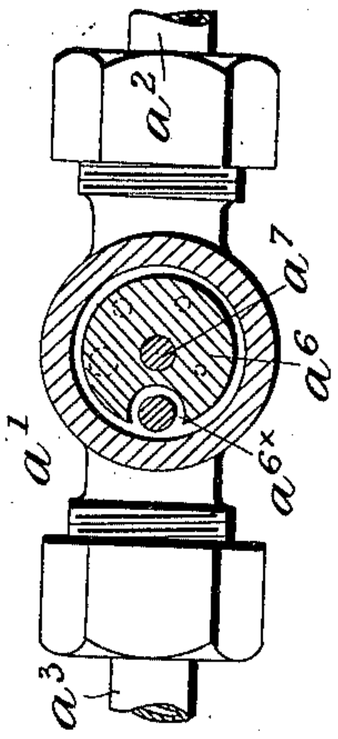


Fig. 7.

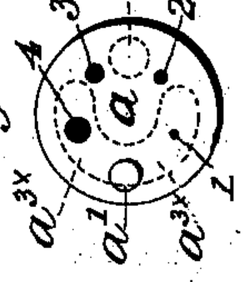


Fig. 8.

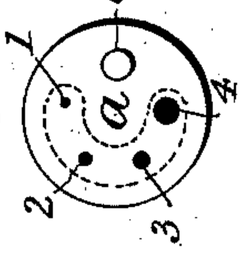


Fig. 9.

Fig. 10.

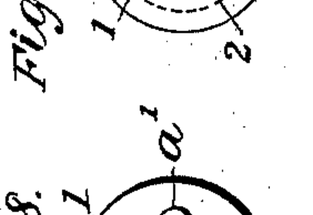


Fig. 11.

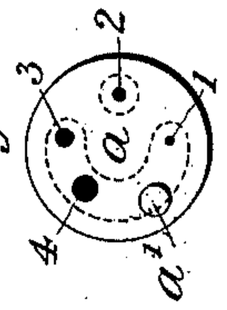
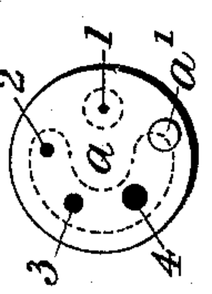


Fig. 12.



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UNITED STATES PATENT OFFICE.

JULES GROUVELLE AND HENRI ARQUEMBOURG, OF PARIS, FRANCE.

VALVE OR COCK.

SPECIFICATION forming part of Letters Patent No. 686,966, dated November 19, 1901.

Application filed September 27, 1900. Serial No. 31,249. (No model.)

To all whom it may concern:

Be it known that we, JULES GROUVELLE and HENRI ARQUEMBOURG, trading as La Société Jules Grouvelle et H. Arquembourg, citizens of the French Republic, residing at 71 Rue du Moulin-Vert, Paris, in the French Republic, have invented Improvements in Valves or Cocks, (in respect whereof we have applied for Letters Patent in Switzerland, dated March 3, 1900; in Germany, dated March 9, 1900, and in Great Britain, dated August 20, 1900, No. 14,891,) of which the following is a specification.

The object of this application for Letters Patent is to describe with reference to the accompanying drawings and to a special arrangement shown therein as an example and to claim as our property certain improvements in valves or cocks adapted for use generally in regulating the flow of fluids, but more particularly in connection with steam heating apparatus which cannot receive a larger quantity of steam than that which they are able to condense during the lowest temperature ever foreseen, it being assumed that the steam-pressure in the feeding pipe or pipes of the said heating apparatus is either normal when the pressure in the steam-generator is constant or at its maximum when the pressure in the steam-generator is variable.

Figures 1 to 12 of the accompanying drawings represent a mode of carrying out our invention. Fig. 1 is a side elevation. Fig. 2 is a plan corresponding with Fig. 1. Fig. 3 is a vertical section taken on the line 3′ 3′ in Fig. 2. Fig. 4 is a transverse section taken on the line 4′ 4′ in Fig. 2. Figs. 5 and 6 are plans of portions, partly in section, taken on the lines 5′ 5′ and 6′ 6′, respectively, in Fig. 3. Figs. 7, 8, 9, 10, 11, and 12 are detached views in plan of the rotary disk, illustrating the various positions of the several small orifices therein in relation to the passages for feeding and discharging the steam.

Referring to the annexed drawings, the shell or body A is formed with a cylindrical chamber, in which a disk valve a is mounted, the latter resting upon a circular seating and carrying at its back a stud a'. Within the shell A are two passages a^2 and a^3, both of which are directed upwardly at their inner ends and lead to the said seat of the disk, the one, a^2, serving for feeding and the other, a^3, for discharging the steam.

Within the upper portion of the shell A is screwed a cap a^4, which is provided with a gland and stuffing-box a^5. Through the cap a^4 and the stuffing-box a^5 is passed a hollow spindle a^6, whereof the upper and lower portions are of cylindrical form, while the intermediate portion is of truncated conical form, the inner walls of the cap a^4 being adapted to fit the upper cylindrical and conical portions. The hollow spindle a^6 incloses and guides the rod a^7, the latter being rounded at its lower extremity, where it is maintained in contact with the upper surface of the disk a by means of a spiral spring $a^{7\times}$, situated at the upper end of the said rod a^7, and the upper end of the rod a^7 being formed somewhat like a piston.

At the upper extremity of the hollow spindle a^6 is screwed and soldered the operating-handle B, the pointer or indicator b whereof passes when the handle is rotated over a dial b', mounted upon the flange of the shell A. The lower end of the spindle a^6 is formed with a notch $a^{6\times}$, which serves to engage and to keep in position the stud a' of the disk a, so that the latter is compelled to turn in the same direction as the spindle a^6 when this is operated by means of the handle B, the contact-surfaces of the disk a and of its seat being rendered smooth with a view to facilitating the rotation of the said disk.

In the example the disk a is pierced with four circular orifices 1 2 3 4, whereof the sectional areas are proportionately varied, so that each of the sectional areas taken alone is smaller than the sum of the other three areas, the orifice of largest area causing the disk to discharge the maximum quantity of steam under the conditions indicated in the first paragraph of this specification. Moreover, the said smaller orifices are so disposed in the disk a that each of the intervening solid portions is capable of covering the mouth of the feeding-passage a^2, and we have indicated the small orifices by the numerals 1 2 3 4, this being a ready means of distinguishing their effective relative areas. The upper part of the vertical bend of the passage a^3, which discharges the steam, opens into a cres-

cent-shaped groove or channel $a^{3\times}$, formed in the seating of the disk a, and of which the dimensions are carefully determined with respect to the conditions of working hereinafter described, it being understood that the said groove or channel $a^{3\times}$ must be capable of forming a chamber for collecting the steam discharged through all the orifices 1 2 3 4 less any one of them.

As may be readily seen from the drawings, the mounting and the dismemberment of the appliance may be accomplished with facility, all the parts being capable of passing through the central opening in the dial b'. The assembling of the parts can, however, be accomplished only while the stud a' is in engagement with the notch $a^{6\times}$, since it is only possible to screw the cap a^4 against the seating in the shell A while the said stud a' is so engaged. Upon screwing the cap a^4 against the coned surface of the spindle a^6 the spring $a^{7\times}$ is brought into operation, so as to maintain the lower end of the rod a^7 in bearing contact with the upper face of the disk a.

Assuming the foregoing description to be understood, the mode of operation will be readily perceived upon reference to Figs. 7 to 12, of which figures an explanation is given in the following table:

Figures.	Small orifice of disk a in communication with the steam-feeding passage a^2.	Small orifices of disk a in communication with the groove $a^{3\times}$, which forms a collecting-chamber for the steam before being discharged into the pipe a^3.	Condition of the appliance, whether open or closed.
Fig. 7	None.	4, 1	Closed.
Fig. 8	None.	1, 2, 3, 4	Closed.
Fig. 9	4	1, 2, 3	Fully open.
Fig. 10	3	4, 1, 2	Three-fourths open.
Fig. 11	2	3, 4, 1	One-half open.
Fig. 12	1	2, 3, 4	One-fourth open.

It will of course be understood that the dial b' is furnished with a graduated scale, whereby the degrees of closure or opening of the device may and must be accurately indicated by the pointer b, the said pointer being operated by means of the handle.

As may be gathered from the description of the working of the apparatus, the improved method of working admits of the supply to heating apparatus of heating medium—steam—being regulated according to requirements and in a certain predetermined degree. Moreover, it must be borne in mind that the regulation of the feed is no longer dependent upon the nice adjustment with regard to one and the same steam-admission orifice, as hitherto required, the sectional area of the said orifice having formerly been enlarged or diminished by means of a movable cover or screen, while according to our improved method of working it is rendered possible to utilize the required orifice apart from all the others and to maintain the rotary disk valve open as regards this orifice as long as may be desired.

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

1. A rotary disk valve, constructed or operating substantially as herein described, and comprising a casing, a rotary disk seating in said casing and formed with concentrically-arranged orifices each being of such an area that, when taken alone, it is less than the sum of the areas of the remaining orifices, feeding and discharging passages for the steam each opening beneath the rotary disk, means for maintaining the disk upon its seating by a yielding pressure, a groove or channel for collecting the steam prior to its entering the discharging-passage, and means for rotating the disk and for indicating the relative positions of the several orifices with regard to the steam-feeding passage.

2. In a rotary disk valve, the combination with the shell or body having a valve-seat provided with an inlet-port, an outlet-port, and a crescent-shaped groove or channel at the outlet-port, of the disk on said seat and having in it orifices arranged and proportioned substantially as herein described, and means for rotating said disk on the seat to bring the orifices therein into the required relation with the said ports in the seat, substantially as set forth.

3. In a rotary disk valve, the combination, with the disk a, of the stud a', hollow spindle a^6, handle B, indicator b and dial b', substantially as herein described.

4. In a rotary disk valve, the combination of the disk a, hollow spindle a^6, rod a^7 and spring $a^{7\times}$, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JULES GROUVELLE.
HENRI ARQUEMBOURG.

Witnesses:
EDOUARD CARÉNON,
GABRIEL THOREAU.