No. 746,545. PATENTED DEC. 8, 1903.

S. MERTENS.

VALVE.

APPLICATION FILED NOV. 24, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

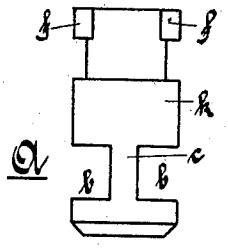


FIG. 1.

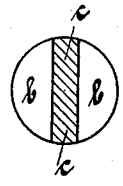


FIG. 2.

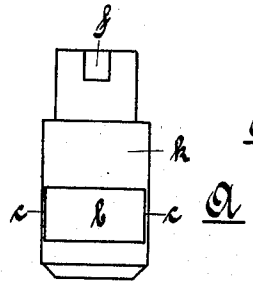


FIG. 3.

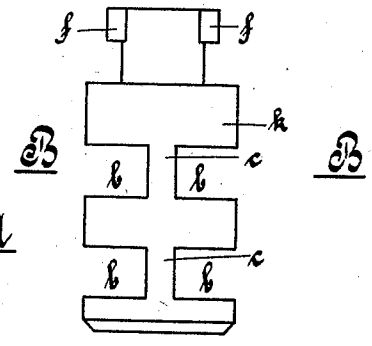


FIG. 4.

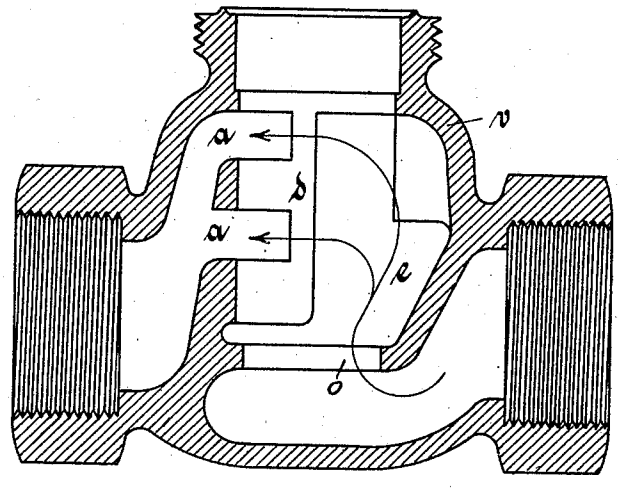


FIG. 8.

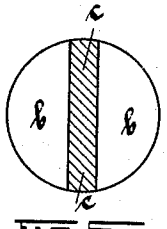


FIG. 5.

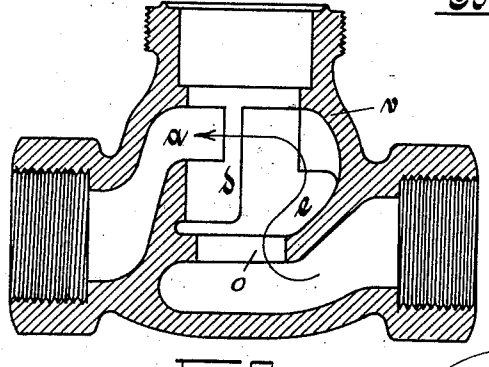


FIG. 7.

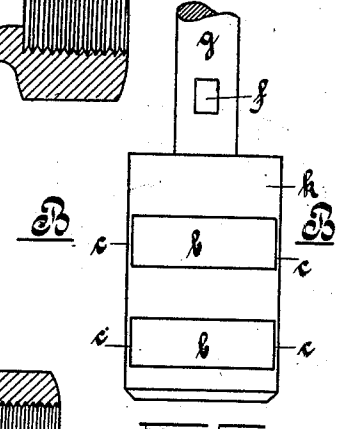


FIG. 6.

WITNESSES

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ATTORNEYS

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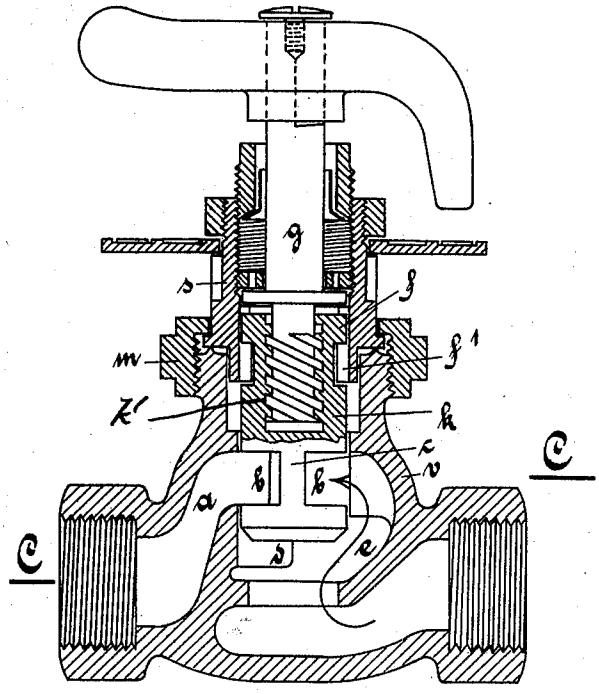


FIG. 9.

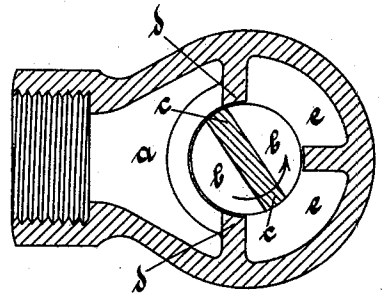


FIG. 11.

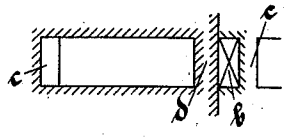


FIG. 14.

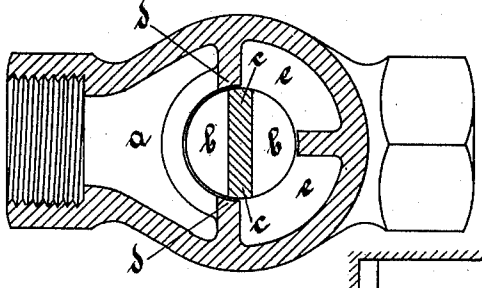


FIG. 10.

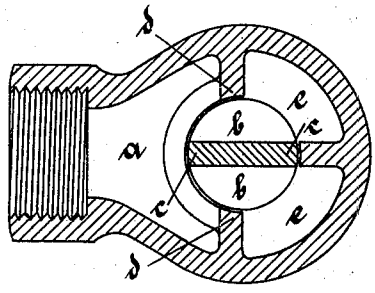


FIG. 12.

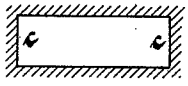


FIG. 13.

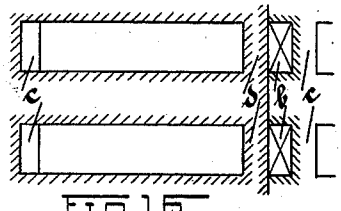


FIG. 16.

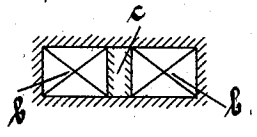


FIG. 15.

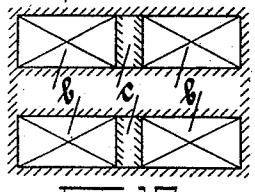


FIG. 17.

WITNESSES

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VALVE.

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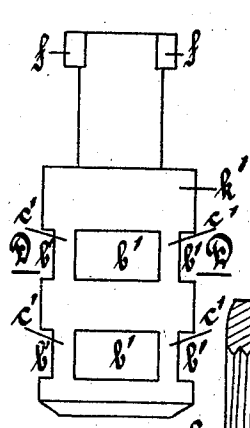


FIG. 18.

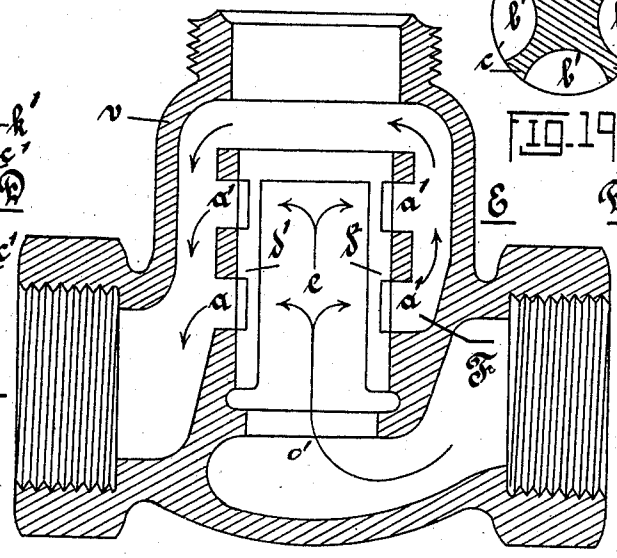


FIG. 21.

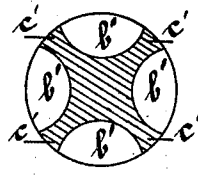


FIG. 19.

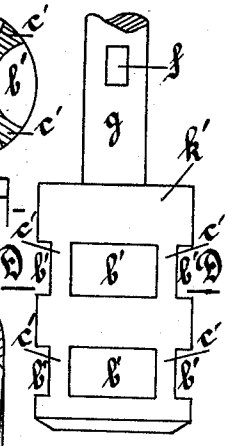


FIG. 20.

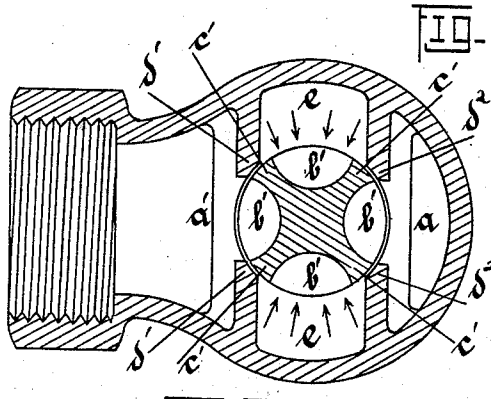


FIG. 22.

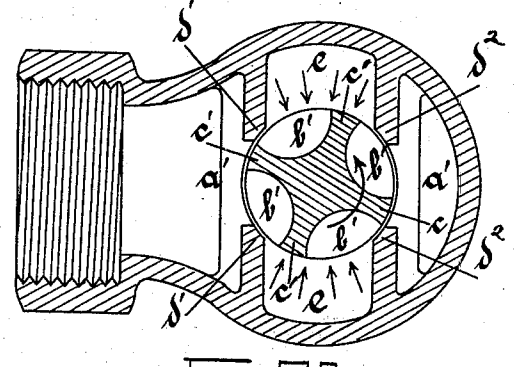


FIG. 23.

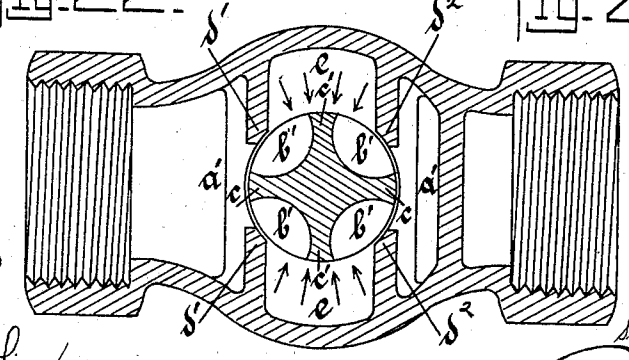


FIG. 24.

WITNESSES

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INVENTOR

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By Richards & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 746,545. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

SIEGFRIED MERTENS, OF CHARLOTTENBURG, GERMANY.

VALVE.

SPECIFICATION forming part of Letters Patent No. 746,545, dated December 8, 1903.

Application filed November 24, 1902. Serial No. 132,618. (No model.)

To all whom it may concern:

Be it known that I, SIEGFRIED MERTENS, a subject of the Emperor of Germany, and a resident of Charlottenburg, Germany, have invented certain new and useful Improvements in Valves, of which the following is a description.

The present invention relates to valves which may be employed either as regulating, throttling, or reducing valves.

The invention consists, essentially, in the peculiar construction of the valve and valve-housing by means of which it is rendered possible to open or close the valve by raising and lowering it in the housing and also to attain a very exact adjustment of the fluid allowed to pass through the same by turning it in the housing.

In order to render the present specification easily intelligible, reference is had to the accompanying drawings, in which similar letters of reference denote similar parts throughout the several views—

Figure 1 is a front elevation, Fig. 2 a section on line A A, Figs. 1 and 3, and Fig. 3 a side elevation, of the valve in its simplest form. Fig. 4 is a front elevation, Fig. 5 a section on line B B, Fig. 4, and Fig. 6 a side elevation, of a double valve. Fig. 7 is a longitudinal section through the housing for the single valve, and Fig. 8 a similar elevation through the housing for the double valve. Fig. 9 is a vertical longitudinal section through a complete single valve and housing. Figs. 10, 11, and 12 are sections on the line C C of Fig. 9, showing the valve in three different positions; and Figs. 13 to 17 are a set of projected diagrams showing the openings for the fluid in the various positions of the valves as hereinafter particularly set forth. Fig. 18 is a front elevation, Fig. 19 a section on the line D D of Figs. 18 and 20, and Fig. 20 a side elevation, of a modified form of valve. Fig. 21 is a longitudinal section through the housing for this valve; and Figs. 22, 23, and 24 are horizontal sections, the first two on the line E E of Fig. 21 and the last on the line E F of Fig. 21, showing the valve in three different positions of its adjustment by turning in its seat.

The valve consists of the cylindrical body *k*, the lower part of which closes down onto the seat, and the recessed portions *b b*, leaving the vertical partition-wall *c*. The upper part of the valve-body is advantageously reduced in diameter and carries the guide-lugs *f*, by means of which the valve is guided, as hereinafter set forth, when it is to be raised or lowered from or onto its seat. The upper part of the valve-body may be provided with a screw-thread for the valve-spindle or it may be reduced to form the said spindle, as indicated at *g* in Fig. 6.

The valve shown in Figs. 4, 5, and 6 is merely a duplication of the valve illustrated in Figs. 1 to 3, and the same reference-letters are employed in connection with it.

The single valve is provided with the housing shown at Fig. 7, having the seat *o* formed in the housing *v*, the space *e* above the valve-seat and the partition-wall *d* leading to the outlet *a*. The housing shown at Fig. 8 for the duplicated valve is constructed exactly in the same manner, but with two outlets *a*, one above the other, corresponding to the form of the valve shown in Figs. 4, 5, and 6.

In Fig. 9 the whole valve is illustrated in vertical longitudinal section, the simplest form being chosen, and the valve being a hand-operated one.

The valve-body *k* is provided with a boring having an interior thread in which the threaded lower end of the spindle *g* engages. The spindle *g* is mounted in the stuffing-box in the usual manner and is further inclosed in a sleeve *s*, having interior vertical guide-ribs forming spaces *f'*, in which the lugs *f* of the valve-body are guided to prevent the valve from turning and to enable it to be raised and lowered in the housing when the spindle *g* is turned. The sleeve *s* has an external annular flange over which the nut *m* engages, which is screw-threaded onto the housing. When this nut is loosened, the sleeve, and with it the valve, may be turned on its vertical axis, and thus the valve may be adjusted in this manner, and when the nut *m* is tightened up the valve will be guided vertically and will consequently be raised and lowered when the spindle *a* is turned. This operation of the valve is immaterial, as it might be operated by a governor or by a membrane or in any other manner.

An essential feature of the valve is that

the lateral partition-walls of the housing, as indicated at *d*, are eccentrically arranged as regards the web or partition-wall *c* of the valve-body. Thus, as will be seen from Figs. 10 and 11, when the valve is turned to adjust the amount of the throughlet, Fig. 11, one side only will be opened at first and then after further turning the other side of the partition-wall, so that a very fine adjustment of the passage of the fluid through the valve is attained. When the valve is turned into the position shown in Fig. 12, the partition-wall *c* is at right angles to the walls *d* of the housing and the valve is fully opened when it is raised off its seat.

Fig. 13 is the projected diagram belonging to Fig. 10, showing the wall *c* entirely closed. Fig. 14 is the projection of Fig. 11, showing the opening *b*, and Fig. 15 the projection of Fig. 12, showing the opening *b* entirely free.

Figs. 16 and 17 are diagrams showing the positions of a double valve when the valve is adjusted to the positions corresponding to those of Figs. 11 and 12.

In the device shown in Figs. 18 to 24 a double valve is shown having four recesses *b'* in each tier, while the housing is provided with two pairs of partition-walls d' d^2, which are located eccentrically, as will be best seen from Fig. 23, so that on turning the valve *k'* in the housing two wings will first be opened and afterward the other two wings. In the position shown in this figure the wings entirely throttle the throughlet, while in that of Fig. 24 the throughway is entirely open. The operation of this valve will be evident from the foregoing description and needs no further explanation.

In use the valve may be opened by raising it off its seat, and then the wings or partition-walls *c* or *c'* may be adjusted on loosening the nut *m* to the required amount to properly throttle the fluid passing the valve, after which, when the nut *m* has been again tightened up, the valve may be closed and opened and the adjustment of the throttle-wings will always remain the same, provided the nut *m* has been left untouched.

I claim as my invention—

1. In combination with a casing *v* having the outlets *a*, the seat *o* and the space *e*, a valve having an end to fit on the seat *o* and provided with cylindrical portions adapted to close the outlets *a* and having also a partition connecting the said cylindrical portions, the said casing having also partition-walls *d* arranged eccentrically in relation to the valve and its partition whereby when the valve is turned the outlet is opened first at one end of the said partition and then at both ends, and means for raising and lowering the valve to open and close all the ports simultaneously, and means for turning the valve to regulate the size of the ports, substantially as described.

2. In combination with a cylindrical valve-body having a port in the wall thereof and a valve-surface at its end to form a closure for a port, a casing having a seat for the said end valve-surface and a port to be closed thereby and having also partition-walls eccentrically arranged as regards the axis of the valve-body and with ports through said partition-walls, means for raising and lowering the valve-body and means for adjusting the same about its axis and fixing it in adjusted position, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

SIEGFRIED MERTENS.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.