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HYDRAULICALLY OPERATED VALVE.
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947,311.

Patented Jan. 25, 1910.

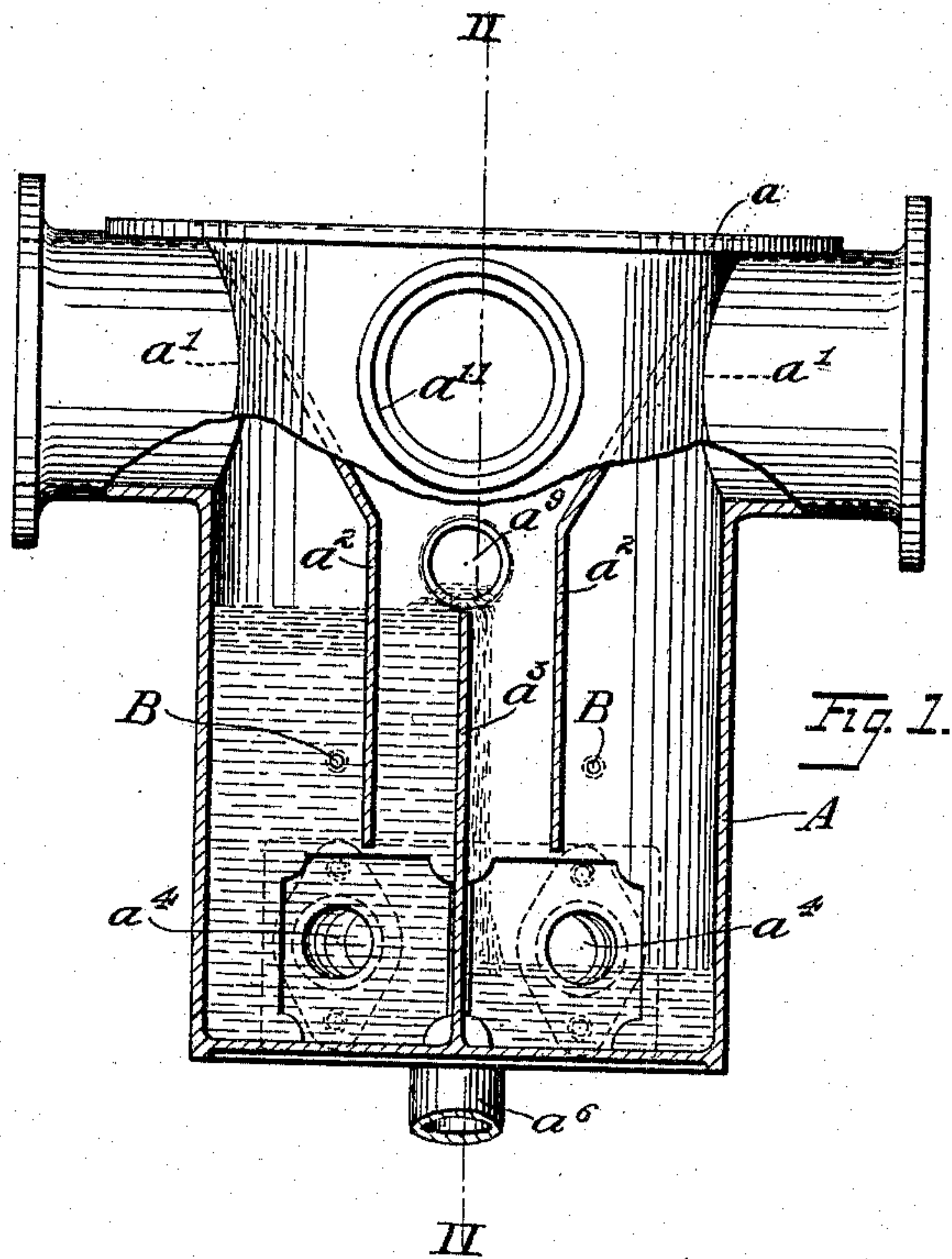


Fig. 1.

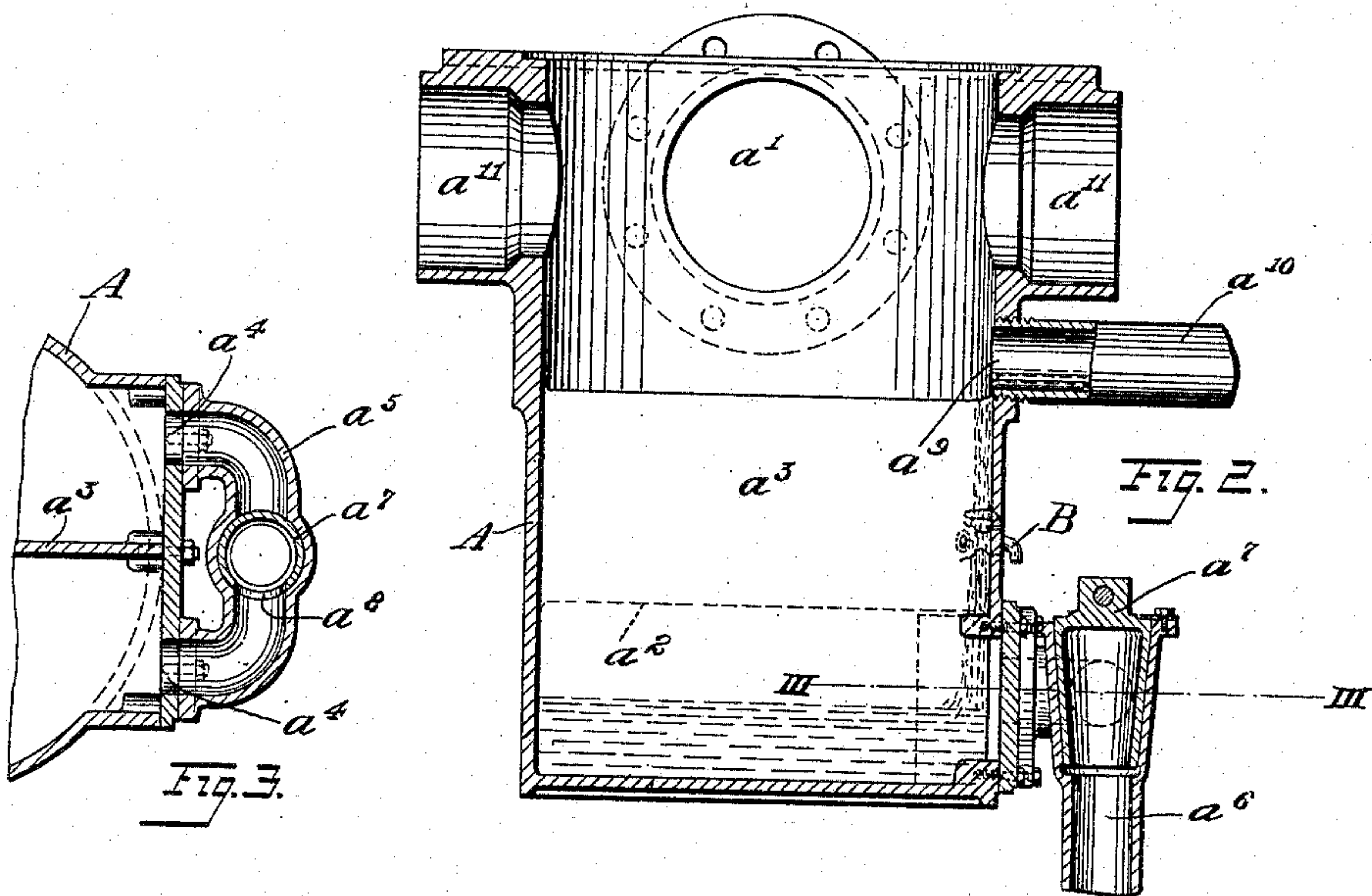


Fig. 2.

Fig. 3.

Witnesses
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HYDRAULICALLY-OPERATED VALVE.

947,311.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ERICH SANDNER, a subject of the Emperor of Germany, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Hydraulically-Operating Valves, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to means for controlling the flow of gas, and particularly to such means as employ a body of liquid for such control.

The object of the invention is to provide means of the above described character which will be simple in its operation and effective in the performance of its function.

The said invention consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawing and the following description set forth in detail certain means embodying the invention, the disclosed means however constituting but one of various mechanical forms in which the principle of the invention may be applied.

In said annexed drawing:—Figure 1 is a partial axial section and elevation of a device embodying my invention. Fig. 2 is a second axial section taken upon the plane indicated by line II—II, in Fig. 1. Fig. 3 is a detail horizontal fragmentary section taken upon the plane indicated by line III—III in Fig. 2.

The casing A is open at the top and preferably formed with a flange a by means of which the casing may be secured to a duct (not shown) communicating with the source of gas whose flow it is desired to control; such open top therefor forms an inlet for the gas into the interior of the casing.

Located at different points and usually near the upper portion of the casing are two outlet openings a' through which the gas is educted from the interior of the casing, as will be hereinafter described. Upon the interior of the casing and extending downwardly from above the openings a' are two partitions a^2 and a^2 , which terminate some distance from the bottom of the casing. These two partitions cut off direct communi-

cation between the inlet opening and either of the outlets, any gas or fluid passing into the one and out of the other being under the necessity of first flowing downwardly and around the lower end of said partitions.

Extending upwardly from the bottom of the casing and terminating some distance from the top thereof, parallel with the partition a^2 a^2 is a partition a^3 which divides the lower portion of the interior casing into two oppositely disposed chambers, into which the partitions a^2 a^2 project as shown. These latter partitions therefore divide the two chambers to permit of communication between the divisions of the respective chambers at the lower part thereof. Near the bottom of each chamber is formed an outlet a^4 connected with a U-shaped pipe a^5 , Fig. 3, whose central portion is connected with a downwardly extending discharge pipe a^6 , Figs. 1 and 2. Intermediately of the two branches of the pipe a^5 and the pipe a^6 is a three-way valve a^7 , by mean of which the one branch of pipe a^5 may be opened to communication with the discharge pipe a^6 and the other branch simultaneously closed to such communication. This valve is preferably made with a single opening a^8 so that it will be necessary, in order to reverse the communication, to cause the handle of the valve to turn through an angle of 180 degrees.

Immediately above the top of the partition a^3 is connected an opening a^9 connected with a pipe a^{10} , Fig. 2, through which latter a supply of water may be introduced into the interior of the casing. The said opening a^9 is located centrally above the partition a^3 , that is, its axis is substantially parallel therewith, so that when a supply of water is introduced, part of it will flow upon one side of the partition and part upon the other.

The operation of the above described device is as follows:—Assuming that it is desired to permit gas to flow through the casing and out of the right hand outlet opening a' , the valve a^7 is turned so as to shut off the communication of the left hand chamber with the discharge pipe a^6 , that is, caused to assume the position shown in Fig. 3. Water now being introduced through the opening a^9 , part of same will flow into said left hand chamber and the remainder into

the right hand chamber. Left hand chamber being closed to communication with the discharge duct or pipe, it will be caused to fill with said water until the level thereof reaches the height of the partition a^3 . The right hand chamber being open to communication with the discharge duct at this time, the water flowing from the pipe directly into said right hand chamber, as well as the water which is discharged over the partition a^3 from the left hand chamber is discharged out of the right hand chamber through the said discharge duct. The level of the water therefore in the right hand duct, during such described operation, never reaches the lower extremity of the right hand partition a^2 and an unobstructed communication is therefore afforded between the inlet and the right hand outlet a' .

When it is desired to shut off communication with the right hand outlet and establish same with the left hand outlet, the position of the valve a^7 is reversed. The water in the left hand chamber is discharged through the discharge duct and falls beneath the level of the lower extremity of the left hand partition a^2 , thereby establishing the desired communication between the left hand outlet and the inlet. Communication between the right hand chamber and the discharge duct a^6 having been concomitantly cut off, said right hand chamber fills with water so as to immerse the lower extremity of the right hand partition a^2 , thereby cutting off communication between the inlet and the right hand opening a' . The water rises in right hand chamber until it reaches the level of the upper edge of the partition a^3 and is thereafter discharged from same into the left hand chamber.

By providing a continuous flow of water through the opening a^9 it will be seen that the reversal of communication between the inlet and outlets may be effected at any time and at periods limited only by the time of the discharge and required filling of the two chambers.

In order to determine from the exterior the condition of the water level within either of the chambers, two cocks B B are provided as shown, which may be operated by hand to control two corresponding openings into said chambers whereby the presence or absence of water at the required level may be definitely shown.

In the construction illustrated in the drawings, two additional openings a^{11} a^{11} are provided in the top of the casing in order to comply with the requirement of the device in its use in connection with a gas producing apparatus. The specific purpose of these openings is to admit a steam coil, (not shown) which however has no bearing upon the principle of the invention, it being merely necessary to bear in mind that these

openings are closed against any escape of gas from the interior of the casing to the exterior thereof.

What I claim therefore and desire to secure by Letters Patent is:—

1. In a device of the character described, the combination of a casing provided with an inlet and two outlets, partitions separating said inlet from said outlets; a partition forming two chambers within said casing; said first two partitions projecting into said chambers, so as to divide same but permit communication between such divisions; an outlet for each of said chambers; means for controlling the flow of liquid from said outlets; and means for supplying liquid to said chambers.

2. In a device of the character described, the combination of a casing provided with an inlet and two outlets, two partitions separating said inlet from said outlets, and a partition forming two chambers within said casing, said first partitions projecting into said chambers to divide same, such divisions having intercommunication; each of said chambers provided with an outlet; means for controlling the flow of liquid from said outlets; and means for supplying liquid to both of said chambers simultaneously.

3. In a device of the character described, a casing provided with an inlet and two outlets, partitions located intermediately of said outlets and said inlet, whereby direct communication therebetween is prevented, a partition extending upwardly from the bottom of said casing and dividing the interior of the latter into two chambers, said first named two partitions extending downwardly into said two chambers to form divisions thereof, the divisions of each such chamber communicating with each other; each chamber provided with an outlet; means for controlling the flow of liquid from said outlets; and a water inlet located vertically above said upwardly extending partition so as to distribute water simultaneously upon both sides thereof.

4. In a device of the character described, a casing provided with an inlet and two outlets, partitions located intermediately of said outlets and said inlet, whereby direct communication therebetween is prevented, a partition extending upwardly from the bottom of said casing and dividing the interior of the latter into two chambers, said first named two partitions extending downwardly into said two chambers to form divisions thereof, the divisions of each such chamber communicating with each other; each chamber provided with an outlet; a discharge pipe connected with both said outlets; a three-way valve for simultaneously opening the one and closing the other of said openings to communication with said discharge pipe; and a water sup-

ply opening located vertically above said upwardly extending partition and adapted to discharge water upon opposite sides thereof simultaneously.

- 5 5. In a device of the character described, the combination of a casing provided with a gas inlet and two gas outlets; depending partitions adapted to prevent direct communication between said inlet and outlets,
10 but permitting indirect communication therebetween; means forming a water seal chamber around the bottom of each of said depending partitions, a valve-controlled

water outlet in each such water seal chamber and located below the lower extremity 15 of the corresponding depending partition; and a water inlet communicating with each of said seal chambers whereby water may be supplied thereto.

Signed by me, this 11th day of November, 1908.

ERICH SANDNER.

Attested by—

MABEL FLEMING,
EDWARD M. CUTLER.