

P. PLANTINGA.
GAS PURIFYING APPARATUS.
APPLICATION FILED SEPT. 26, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

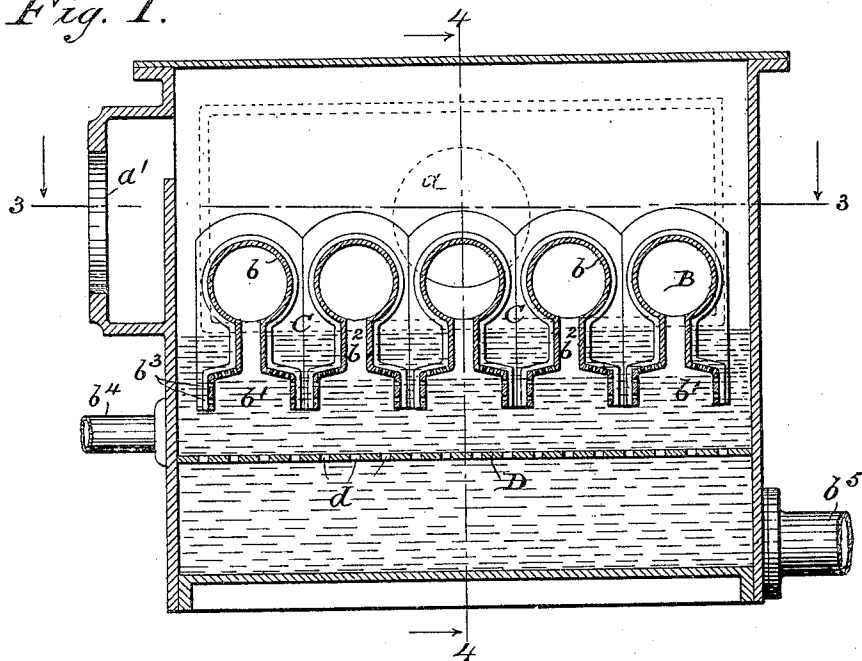
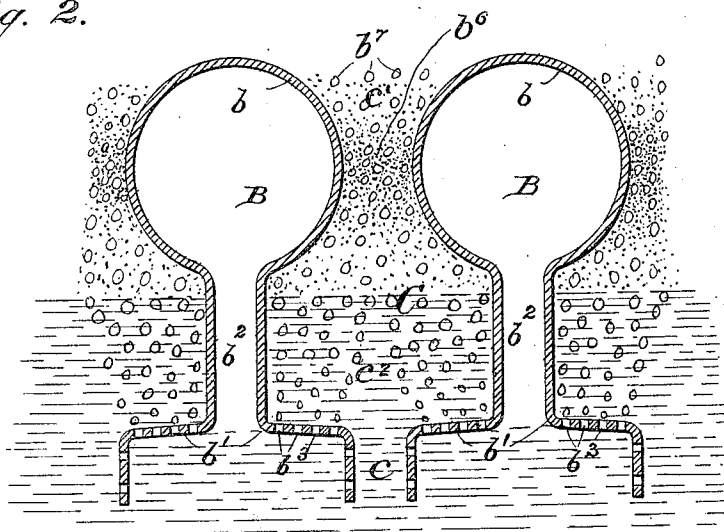


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

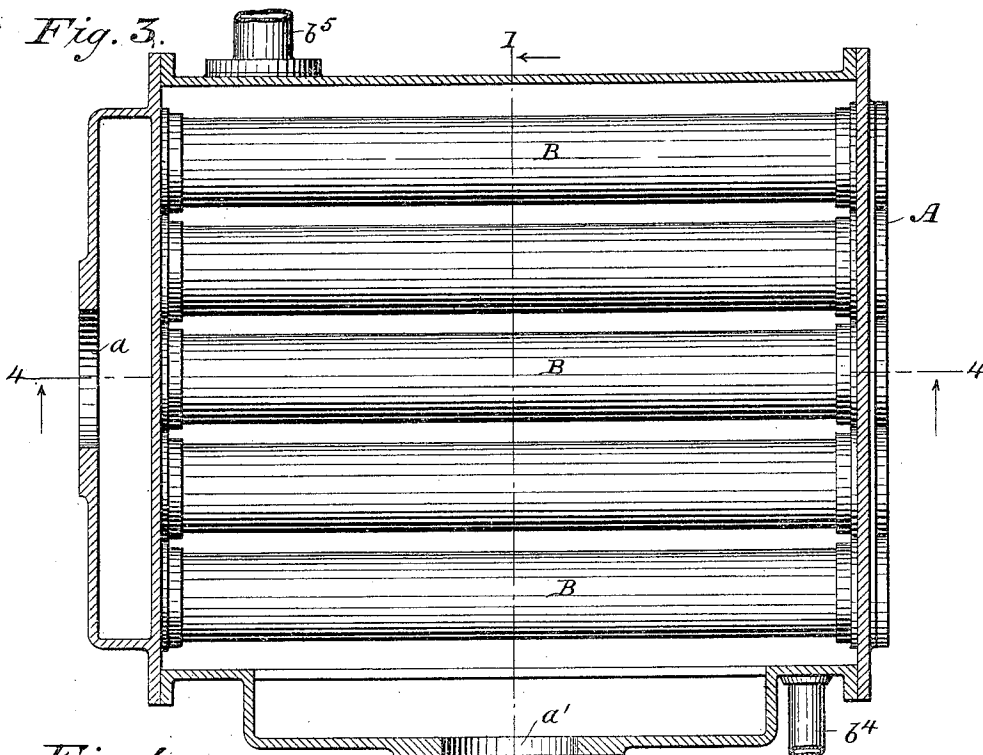
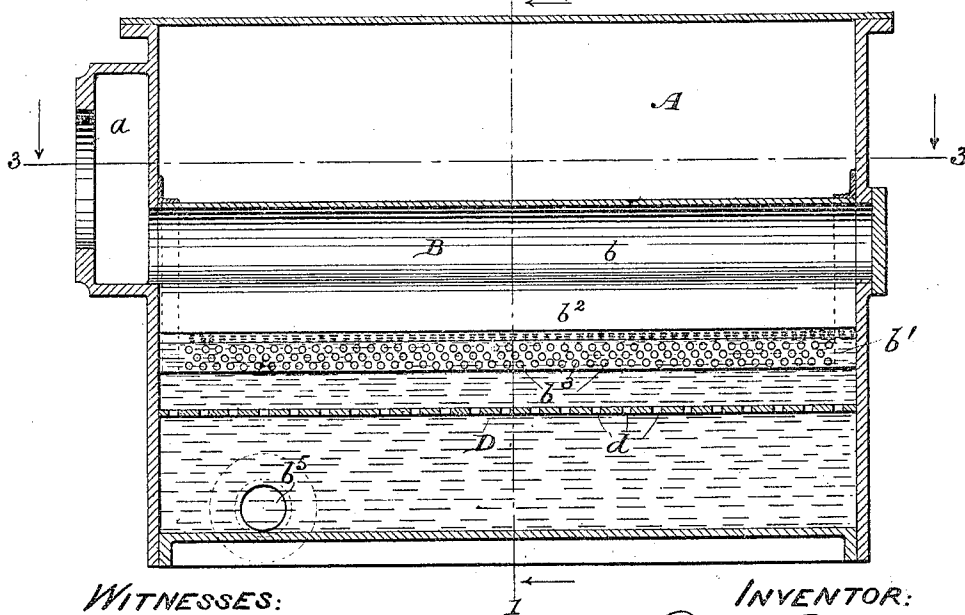


Fig. 4.



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UNITED STATES PATENT OFFICE.

PIERRE PLANTINGA, OF CLEVELAND, OHIO.

GAS-PURIFYING APPARATUS.

No. 803,068.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed September 26, 1904. Serial No. 225,933.

To all whom it may concern:

Be it known that I, PIERRE PLANTINGA, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Gas-Purifying Apparatus, 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 devices for purifying gases, and particularly to devices for removing ammonia and tar from gases intended to be used for illuminating purposes.

The object of said invention is to provide means for removing such ammonia and tar from such gases in an efficient and economical manner.

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

The annexed drawings and the following description set forth in detail certain mechanism embodied in the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure 1 represents a vertical transverse cross-sectional view of the purifying apparatus embodying my invention, taken upon the plane indicated by line I I of Figs. 3 and 4. Fig. 2 represents on an enlarged scale a detail transverse cross-sectional view of two adjacent ducts embodied in said apparatus. Fig. 3 represents a horizontal section of such apparatus, taken upon the plane indicated by the line III III of Figs. 1 and 4; and Fig. 4 represents a longitudinal central section of said apparatus, taken upon the plane indicated by the line IV IV of Figs. 1 and 3.

The apparatus embodied in my invention is constructed as follows:

A gas-tight purifying-chamber A is provided with a gas-inlet a at one end and a gas-outlet a' at one side, as plainly shown in Fig. 3. Extending longitudinally of the interior of said chamber A are a series of parallel gas-ducts B B B, &c., one end of each of which is closed and the other end of each of which is in communication with the gas-inlet a , Figs. 3 and 4. Each such duct is formed with an upper longitudinal imperforated portion b , Figs. 1 and 2, the lower laterally-extending portions b' , and an intermediate markedly contracted

neck b^2 . The lower laterally-extending portions b' are open at the bottom, and their upper and lateral walls are provided with perforations b^3 , Fig. 2. It will be noted that said construction of ducts forms a space C between each two contiguous ducts, each space having lower and upper markedly contracted portions $c c'$, respectively, Fig. 2, and an intermediate extended portion c^2 , such space C being entirely unobstructed by any connections joining two contiguous ducts. A suitable inlet and outlet $b^4 b^5$, respectively, are provided in any well-known manner, whereby a mass of liquid of required volume may be kept moving through said chamber A, such inlet and outlet being arranged to prevent exit of gas from the latter, as will be readily understood by those skilled in the art.

Intermediately of the bottom of the chamber A and the bottom of the ducts B is secured and fixed a transversely-placed horizontal silencing-plate D, Fig. 1, provided with perforations d , this plate extending completely across the chamber A and dividing the latter into an upper and lower compartment, as shown.

A purifying fluid, preferably water, is caused to circulate through the chamber A by means of any suitable pumping device, the volume of such water being maintained at a level such that its upper surface will be located above the extended lower portion of the ducts B, as shown in Fig. 1, when no gas is flowing from the apparatus. Gas being now admitted into the ducts B, it flows into the enlarged imperforate upper portion thereof b and presses upon the upper surface of the water. Such pressure causes the surface of the water in the ducts to become depressed, the water itself being forced out of the perforations b^3 in the walls of the ducts and also out of the bottom thereof into the free intermediate spaces C. Such depression is continued until such level falls below the said perforations b^3 , whereupon the gas escapes from the latter and passes upwardly in an inclined direction through the water, as indicated in Fig. 2.

The above-described construction presents the following advantages in so far as pertains to the form and arrangement of the ducts: By enlarging the cross-sectional area of the upper portion b of the ducts the latter are caused to be of sufficient volume to permit the pressure therein to be substantially equal throughout the interior thereof, thus insuring a sub-

stantially equal and uniform discharge from the ducts throughout their length and in that manner effecting a maximum flow of gas from the water, and hence a maximum capacity of the apparatus. By providing a contracted neck and an adjacent extended perforated portion the upper enlarged imperforate portion is caused to extend over and beyond a part of the perforations b^3 to form a contracted portion c' . The gas passes upwardly through the water with such velocity and volume as to form an upwardly-moving spray of the water, as indicated by the dots b^6 in Fig. 2, the circular figures b' representing gas-bubbles. This spray upon reaching the contracted portion c' is condensed and forms a secondary washing medium through which the gas must pass, as indicated, thus still further subjecting the latter to a purifying process or washing. Such construction further permits the ducts to be placed closely together and still allow the space c^2 to be of sufficient volume to hold the requisite amount of water necessary for properly purifying the gas. By providing a free unobstructed space between each two adjacent ducts B and contracting the upper parts c' of such space the solid matter may pass freely between such ducts and settle in the liquid. The upper walls of the lower extended portions b' of the ducts B are slightly inclined in order to cause the solid matter that may settle thereon to be more effectually discharged into the lower contracted portion c of the space C. Such solid matter is thus effectually prevented from commingling with

the gas after the latter has been washed. The silencing-plate D permits the solid matter, and particularly the tar, to pass through it and settle as sediment and prevents the formation of currents at the bottom of the chamber A such as will cause the water to carry off such sediment and tar, thus effectually removing such solid matter and tar.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the means herein disclosed provided the means stated by the following claim or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention—

In a gas-purifying apparatus, the combination with a purifying-chamber, of a series of adjacent disconnected gas-ducts each having an upper enlarged imperforate portion, a lower laterally-extending perforated portion open at the bottom, and an intermediate imperforate portion of markedly less width than that of said upper and lower portions, thereby providing between each two contiguous ducts an entirely free space which comprises upper and lower contracted portions and an intermediate enlarged portion.

Signed by me this 16th day of September, 1904.

PIERRE PLANTINGA.

Attest:

E. M. NORLING,
G. W. SAYWELL.