

No. 700,537.

Patented May 20, 1902.

J. D. MOORE & F. M. MARTIN.
APPARATUS FOR GENERATING SULFUR DIOXID.

(Application filed May 22, 1901.)

(No Model.)

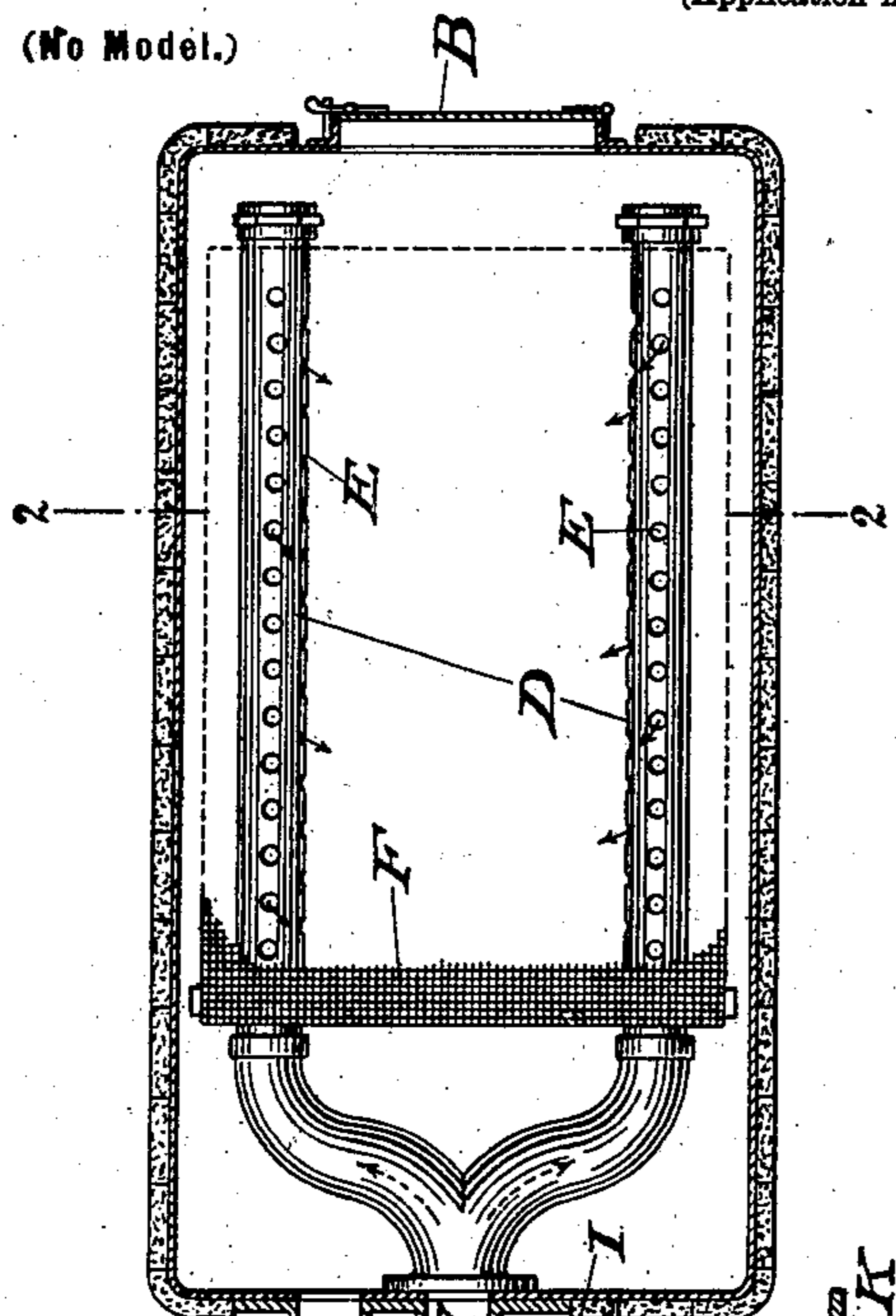


Fig. 1

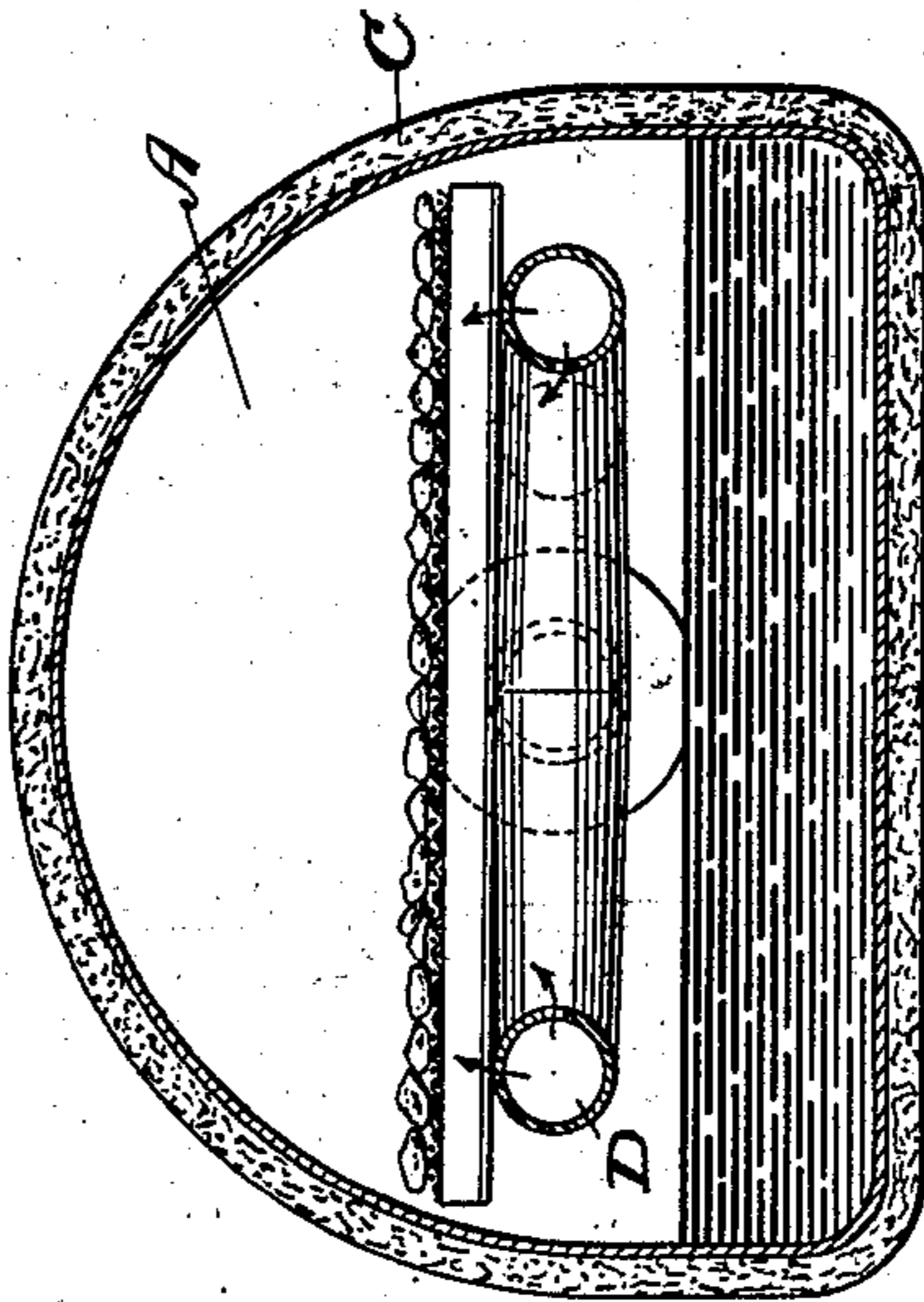


Fig. 2

Witnesses:

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by Kerr, Page & Cooper Attys

UNITED STATES PATENT OFFICE.

JOHN D. MOORE, OF NEW YORK, AND FRED M. MARTIN, OF BROOKLYN, NEW YORK; SAID MOORE ASSIGNOR TO THE CLAYTON FIRE EXTINGUISHING & DISINFECTING COMPANY, A CORPORATION OF WEST VIRGINIA.

APPARATUS FOR GENERATING SULFUR DIOXID.

SPECIFICATION forming part of Letters Patent No. 700,537, dated May 20, 1902.

Application filed May 22, 1901. Serial No. 61,342. (No model.)

To all whom it may concern:

Be it known that we, JOHN D. MOORE, of the borough of Manhattan, in the city and county of New York, and FRED M. MARTIN, of the borough of Brooklyn, in the county of Kings, in the city and State of New York, citizens of the United States, have invented certain new and useful Improvements in Apparatus for Generating Sulfur-Dioxid Gas, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The invention subject to our present application is an improvement in the general class of generating apparatus described in the patents to Thomas A. Clayton, No. 633,807, dated September 26, 1899, and No. 661,496, dated November 13, 1900, and, like that of the said patents, is designed to generate gas suitable for purposes of fumigating, preventing or extinguishing fires in closed compartments, such as the holds of ships and the compartments of warehouses, or for other and similar purposes for which such a gas is useful.

The improvements have for their primary object the provision of an apparatus capable of more rapidly obtaining a strong gas and maintaining and controlling its strength in large quantities for any considerable period of time, and involve certain novel features in the construction and operation of such apparatus, which will be described in detail by reference to the accompanying drawings, in which—

Figure 1 is a view of our improved generator, a controller, a cooler, and pump or blower connected in operative relation, the generator and cooler being shown in horizontal section; and Fig. 2 is a vertical section of the generator on line 2 2 of Fig. 1.

The generator consists of a receptacle A, of metal or suitable refractory materials, provided with a door B, through which the gas-generating material is introduced and which may be tightly closed, and with one or more outlets and intake pipes or passages, as hereinafter described. The generator is surrounded, preferably on top, sides, bottom, and ends, as far as practicable with a wrapping of asbestos, mineral wool, or other suitable adiathermanous material C, or is otherwise

insulated to prevent the radiation of heat. Within the generator is a system of pipes D, arranged in any convenient manner and containing perforations E, preferably in the tops and sides only, as shown, and above said pipes there is arranged a foraminous support F for the substances used for the generation of gas. The construction and arrangement of this support may be greatly varied, the drawings showing for purposes of illustration a shelf or partition of ordinary wire-netting.

The device for cooling the gases is represented at R and consists of a receptacle having two chambers at its opposite ends connected by a series of pipes, around which air, water, or other cooling medium is caused to circulate in the usual way, the inlet and outlet pipes for the cooling medium being designated by T T. From the cooler R a pipe U leads to the intake of a fan or blower V.

In connection with the generator there is employed a controller, consisting of valves for commanding the inlet and outlet to a chamber or chambers, by the operation of which the air and gases passing to and from the generator are regulated; but inasmuch as these parts are or may be of any suitable construction and will be more readily understood by a statement of their function than by a detailed reference to their specific character or form they will be described in connection with the following exposition of the operation and manner of using the apparatus as a whole.

Let it be assumed that a gas, such as sulfur dioxide, is to be generated for any required purpose. A quantity of material, such as sulfur, by the combustion of which the gas is produced, is placed in the bottom of the generator and on the perforated support F and ignited by introducing beneath the perforated support a handful of burning waste saturated with oil or other inflammable substance. The generator is then closed by the door B. At the same time the fan or blower V is started and communication established from the outside air to the generator by closing the valve J and opening the valve H, these valves being on a common spindle and operated by a lever O. The valves P and G are opened by the hand-wheel Q, which simultaneously

closes the valve N, these valves also being mounted on a common spindle. The course of the air is now through valves H and G and passage Y to the perforated pipes D, which distribute it over the burning sulfur, forming sulfur-dioxid gas, which is sucked through the passage M, valve P, to and through the cooler, and thence to the fan or blower, and is delivered through the pipe W. This operation, if continued, would lead to the production of flowers of sulfur in the pipes and valves, as the increase in temperature of the molten sulfur and generator volatilizes more sulfur than the supply of oxygen entering the generator with the atmospheric air can change to sulfur-dioxid gas. In order to obviate this condition, the valve N is partially opened, thus dividing the current of air coming through the valve H, so that a portion of it passing through the chamber L unites with the hot gases and uncombined sulfur-vapor coming from the generator through the passage M, and thus eliminates the flowers of sulfur. It has been found that the valves N and G may be so operated by the hand-wheel Q that all traces of flowers of sulfur disappear and that the strength of sulfur-dioxid gas in the gaseous mixture leaving the controller may be regulated to a fraction of one per cent.

If it be desired to deliver atmospheric air through the pipe W, valves P and G are closed, thus cutting out the generator, and all the air entering through the valve H passes through the valve N and the passage L to the cooler and blower.

The object of the passage K and valve J is as follows: When this generator is used in the system of fumigation and fire-extinguishing, as covered by these patents of Thomas A. Clayton, above alluded to, the pipes W and K are connected to a closed compartment. In this case the air or gases in the closed compartment may be returned to the generator through the passage K and valve J, either to the gas-generating receptacle A or through the valve N and passage L to the cooler and blower and the pipe W to the compartment. The object attained by passing these gases through the receptacle and over the molten sulfur contained therein is the changing of the oxygen in them to sulfur-dioxid gas. Our object in conducting these gases through the valve N and passage L and through the cooler is to lower their temperature, and consequently the temperature of the inclosed compartment.

The special purpose of the foraminous support F in the generator is to enable us to distribute a large amount of sulfur in a comparatively finely divided condition and by means of the perforated pipes D to effect its combustion in a very short time. By this means we are enabled to generate a large volume of gas very quickly. It will be understood that the ignition of the sulfur may be effected in any other way than by introducing ignited combustibles into the generator. For exam-

ple, the plan heretofore followed by using the receptacle A as a retort and heating it externally may be adopted, but less advantageously.

A specific advantage is secured in protecting the generator by an adiathermanous covering. It will be understood that the combustion of the sulfur raises the interior of the generator to a high temperature, and we have found that if this heat is not permitted to radiate off gases containing a small amount of sulfur dioxid when passed through the generator are increased in strength for considerable periods of time.

Having now described our invention, what we claim is—

1. In an apparatus for generating sulfur-dioxid gas, the combination with a generator in which the gas is produced by the action of air on a suitable substance in a heated state, of a system of outgoing and intake pipes, a valve in the intake-pipe for controlling the passage through the same, and a second valve, in operative connection therewith, for simultaneously controlling the admission of outside air into the intake, and a pump connected with the system of pipes, as set forth.

2. In an apparatus for generating sulfur-dioxid gas, the combination with a generator in which the gas is produced by the action of air on a suitable substance in a heated state, of outgoing and intake pipes connected by a pipe or passage forming a by-pass, a valve mechanism for simultaneously controlling the passage through the intake-pipe and the admission of outside air thereto, and a second valve mechanism for simultaneously controlling the passage through the outgoing pipe and the by-pass connection of the intake-pipe therewith, as set forth.

3. In an apparatus for generating sulfur-dioxid gas, the combination with a generator of the kind described, outgoing and intake pipes, a by-pass connection between the same, a valve adapted to simultaneously close the inlet and outlet of the generator and open communication through the by-pass, a cooling device in the circuit of said pipes, and means for maintaining a circulation of gas through the same, as set forth.

4. In an apparatus for generating sulfur-dioxid gas, the combination with a generator consisting of a receptacle for containing the substance to be burned, and having inlet and outlet pipes for the circulation of air and gas through the same, the receptacle being surrounded and protected by an adiathermanous covering to prevent the radiation of heat, a by-pass connection between the inlet and outlet pipes, and means for maintaining a circulation of gas through the circuit of said pipes, as set forth.

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Witnesses:

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