

**No. 661,496.**

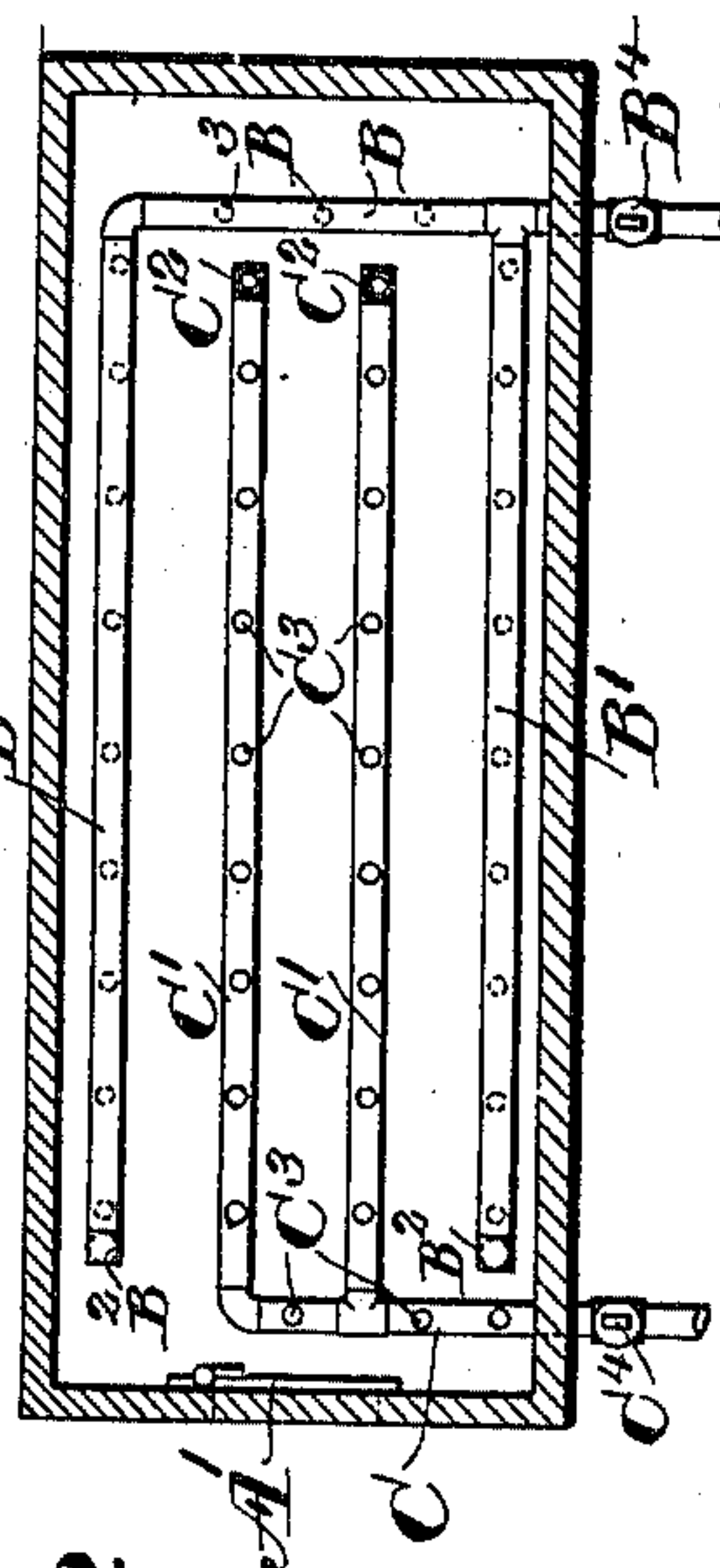
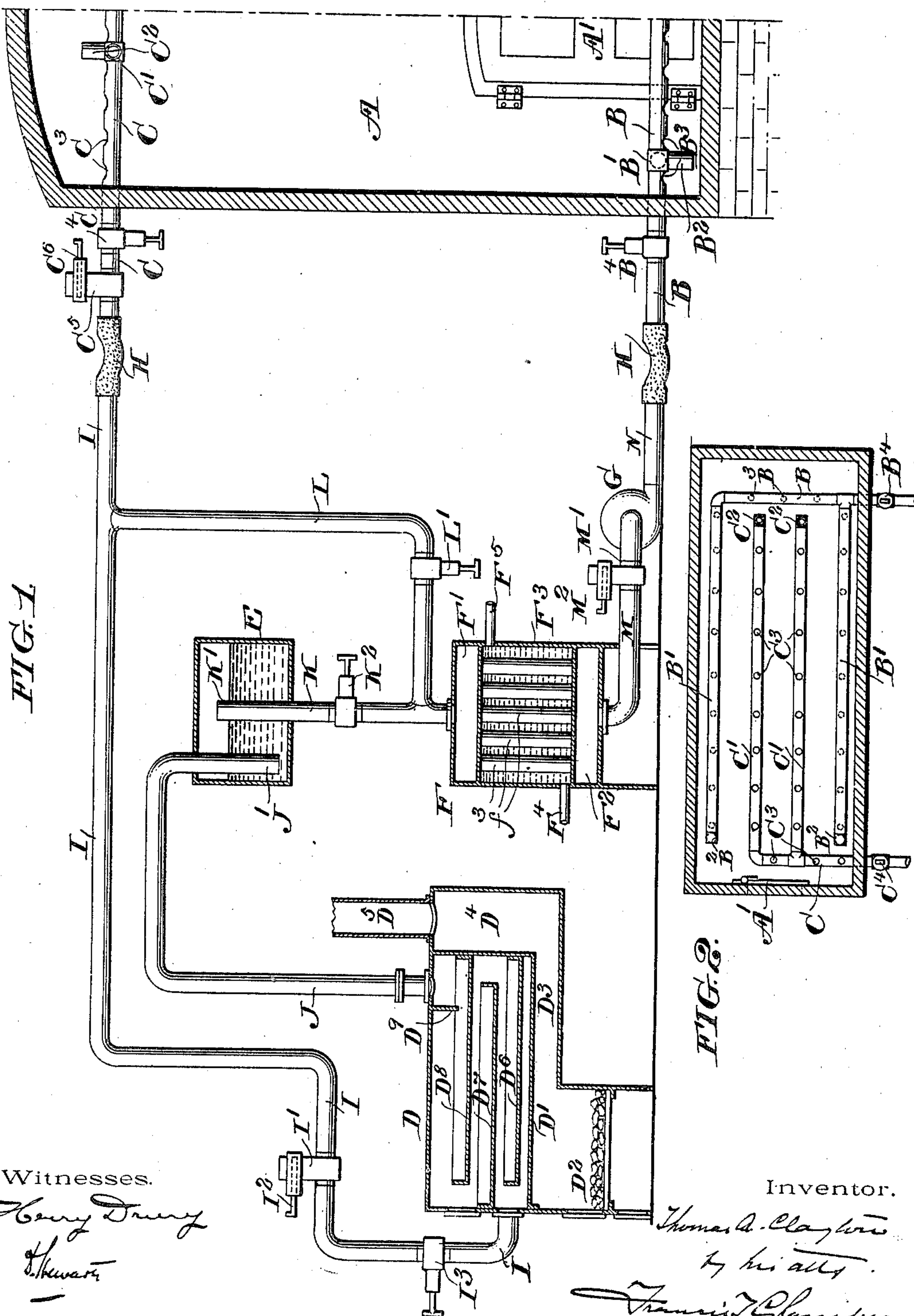
**Patented Nov. 13, 1900.**

**T. A. CLAYTON.**

## MECHANISM FOR CHARGING CLOSED COMPARTMENTS WITH GAS.

(Application filed July 21, 1899.)

(No Model.)



Witnesses.

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# UNITED STATES PATENT OFFICE.

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MECHANISM FOR CHARGING CLOSED COMPARTMENTS WITH GAS.

SPECIFICATION forming part of Letters Patent No. 661,496, dated November 13, 1900.

Application filed July 21, 1899. Serial No. 724,660. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS A. CLAYTON, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Mechanism for Charging Closed Compartments with Gas, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates, primarily, to apparatus of the general character described in the patent to Samuel R. Olliphant and myself, No. 490,981, dated January 31, 1893, and in my pending application, filed July 21, 1899, Serial No. 724,659, and also in the patent issued to me September 26, 1899, No. 633,807.

My present invention consists, primarily, in the arrangement of an inlet-pipe provided with a series of openings in its under side, so that the gases forced into the chamber through it are forced downward on entering the chamber. Preferably, also, the inlet-pipe is situated close to, but somewhat above, the floor of the chamber, this position being desirable because the pipe should not be actually on the floor, but should be close to the bottom of any inflammable material with which the chamber is filled. In combination with such an inlet-pipe I use an outlet-pipe situated near the top of the chamber and preferably having openings in its top through which the gases are drawn from the chamber.

Another feature of my invention consists in providing a cooling apparatus situated in the circulating system between the furnace in which the gas is generated and the opening of the inlet-conduit in the chamber and by means of which the gases are cooled after issuing from the furnace and before they enter the chamber, said cooler being situated in the inlet-pipe between the furnace and the chamber and also connected with the by-pass connecting the inlet and outlet pipes, so that the gas may be passed directly from the furnace through the cooler into the chamber or circulated through the by-pass and cooler without going through the furnace, as may be desired.

I prefer to construct the apparatus with a by-pass, as described in my Patent No.

633,807, above referred to, by which the circulation can be maintained through the chamber and cooling device, but not through the furnace, in this way enabling any excess of temperature in the closed compartment to be diminished after it is no longer necessary to generate additional gas. Reference being now had to the drawings, in which my invention is illustrated, Figure 1 is a sectional elevation of an apparatus embodying my invention; and Fig. 2, a plan view of the compartment, showing the arrangement of inlet and outlet pipes therein.

A indicates the closed compartment, having, as shown, a door A'.

B is the inlet-pipe, situated, as shown, a slight distance above the bottom of the chamber and having branches B' B', the pipe B and its branches being formed with openings on their under sides, as indicated at B<sup>3</sup>, and the branches also having downwardly-turned open ends, as indicated at B<sup>2</sup>.

B<sup>4</sup> is a valve for closing the inlet-pipe when for any reason it is desired to disconnect it with the generating and circulating apparatus.

C is the outlet-pipe, having branches C' and formed, as shown, with openings C<sup>3</sup> in the upper part of the pipe and its branches C<sup>2</sup> indicating upwardly-turned open ends of the branches, and C<sup>4</sup> a valve for closing the outlet-pipe. As shown, I have also provided this outlet-pipe with an open lateral extension C<sup>5</sup>, having a valve C<sup>6</sup> for closing or regulating it.

D is the gas-generating furnace, here shown as being similar in construction to the furnace in the patent to Olliphant and myself before mentioned. The furnace is provided with a fire-box D<sup>2</sup> and the flues D<sup>3</sup> and D<sup>4</sup>, leading to a stack D<sup>5</sup> and around a retort-compartment D', in which is situated a series of shallow pans D<sup>6</sup> D<sup>7</sup> D<sup>8</sup>, arranged to make a tortuous passage through the chamber and each of which is filled with sulfur, which is melted by the heat of the furnace.

D<sup>9</sup> is a deflecting-diaphragm.

E is a trap for intercepting flowers of sulfur; F, a cooling device, having heads F' and F<sup>2</sup> at either end, connected by a series of pipes F<sup>3</sup>, passing through a water-compartment F<sup>3</sup>, F<sup>4</sup> indicating an inlet-pipe for water, and F<sup>5</sup> an outlet-pipe for water.



G is a fan for maintaining circulation; H, hose-couplings for connecting the pipes B and C with the pipes pertaining to the gas generating and cooling apparatus.

5 I is a pipe connecting with the outlet-pipe C and leading to the bottom of the retort-chamber D'. As shown, it is provided with a lateral open extension I', having a regulating-valve I<sup>2</sup>, and also with a valve (indicated  
10 at I<sup>3</sup>) by which it can be closed.

J is a pipe leading from the upper part of the retort D' into the trap E, its end J' opening near the bottom of the trap.

15 K is a pipe leading from the trap, its end K' opening near the top thereof into the water-cooler F, having in it a valve K<sup>2</sup> for closing the pipe.

20 L is a by-pass leading from the pipe I to the pipe K, as shown, and having in it a valve L', by which it can be closed.

M is a pipe leading from the cooling device F to the fan G, having an open lateral extension M', with a regulating-valve M<sup>2</sup>.

25 N is a pipe leading from the fan G to the inlet-pipe B, as shown.

In use the valves C<sup>4</sup>, I<sup>3</sup>, K<sup>2</sup>, and B<sup>4</sup> are opened and the valves C<sup>6</sup>, I<sup>2</sup>, L', and M<sup>2</sup> closed. Fire being in the furnace D, the fan G is set  
30 in operation and the air in the chamber A forced to circulate through the retort D', trap E, cooler F, and chamber A. The oxygen in the air combines with the sulfur in the retort, forming sulfur-dioxid gas. The fume of sulfur is caught in the trap E, the gases cooled  
35 in the device F and forced into the chamber A through the perforations B<sup>3</sup> of the inlet-pipes, and the contact of the richly-impregnated gas with the material in the lower part of the chamber thus insured.

40 When it is desired to cool the gases in the chamber without increasing their percentage of sulfur dioxid, the valve L' is open and the valves I<sup>3</sup> and K<sup>2</sup> closed. The circulation of the gas is then maintained through the cooler, but not through the furnace. When it is desired  
45 to increase the amount of air going to the retort, the valve I<sup>2</sup> may be opened to the necessary extent. When it is desired to free the chamber A from the sulfur dioxid, the  
50 valves I<sup>3</sup> and L' can be closed and the valves M<sup>2</sup> and C<sup>6</sup> opened. The fan will then draw air through the lateral opening M', force it into the chamber A through the inlet-pipe, while the gas in the chamber will pass through  
55 the outlet-pipe C through the lateral opening C<sup>5</sup>. Again, in using the sulfurous-acid gas for extinguishing fires I have found that even after the fire is extinguished and the chamber cooled down there is still danger of reig-  
60 nition on the admission of large volumes of air to the charred material, and I have found that this danger can be avoided by admitting air gradually. Thus the circulating apparatus being in use, a regulated admission of air  
65 can be secured by partially opening valves C<sup>6</sup> or M<sup>2</sup>, or, if the furnace is not heated, by opening valve I<sup>2</sup>.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

70 1. A device for charging closed compartments with gas having in combination, an inlet-pipe leading into the compartment said inlet-pipe having a series of outlet-openings formed through its under side, an outlet-pipe  
75 leading from the top of the compartment, a gas-generating furnace, conduits connecting the inlet and outlet pipes aforesaid with the furnace and means, as a fan, for maintaining a circulation through the furnace and closed  
80 compartment.

2. A device for charging closed compartments with gas having in combination, an inlet-pipe leading into the compartment, said inlet-pipe having a series of outlet-openings  
85 formed through its under side, an outlet-pipe leading from the top of the compartment having a series of openings in its upper side, a gas-generating furnace, conduits connecting the inlet and outlet pipes aforesaid with the  
90 furnace and means, as a fan, for maintaining a circulation through the furnace and closed compartment.

3. A device for charging closed compartments with gas having in combination, an inlet-pipe leading into the lower part of the  
95 compartment a short distance above its floor, said inlet-pipe having a series of outlet-openings formed through its under side, an outlet-pipe leading from the top of the compartment, a gas-generating furnace, conduits connecting the inlet and outlet pipes aforesaid with  
100 the furnace and means, as a fan, for maintaining a circulation through the furnace and closed compartment.

4. A device for charging closed compartments with gas having in combination, inlet and outlet pipes leading into and from the  
105 compartment, a gas-generating furnace connected with said inlet and outlet pipes, means for maintaining circulation through said pipes, a cooler for gases situated in the inlet-pipe between the furnace and the chamber, a by-pass connecting the inlet and outlet  
115 pipes through the cooler and not through the furnace and suitable valves whereby gases that are generated in the furnace may be passed directly into the compartment through the cooler, and by means of which the further generation of gases may be discontinued  
120 by cutting out the furnace, and the gases already formed may be circulated through the cooler and compartment only.

5. A device for charging closed compartments with gas having in combination, inlet  
125 and outlet pipes leading into and from the compartment, a gas-generating furnace connected with said inlet and outlet pipes, means for maintaining a circulation through said pipes, a cooler for gases situated in the inlet-  
130 pipe between the furnace and the chamber, a by-pass connecting the inlet and outlet pipes through the cooler and not through the furnace, suitable valves whereby the gases



that are generated in the furnace may be passed into the compartment through the cooler, and by means of which the generation of gases may be discontinued by cutting out the furnace, and the gases already formed may be circulated through the cooler and compartment only, and suitable other valves whereby a circulation of fresh air may be maintained through the compartment for the purpose of driving out the gases.

6. A device for charging closed compartments with gas having in combination, inlet and outlet pipes leading into and from the compartment, a gas-generating furnace connected with said inlet and outlet pipes, means

for maintaining a circulation through said pipes and furnace, a cooler for gases situated in the inlet-pipe between the compartment and furnace, a by-pass connecting the inlet and outlet pipes through the cooler and not through the furnace, and valves, C<sup>6</sup>, K<sup>2</sup>, L' and M<sup>2</sup>, whereby the gases may be passed through the cooler, either by way of the furnace or the by-pass, as desired, or a circulation of cold air may be obtained through the compartment.

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Witnesses:

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