

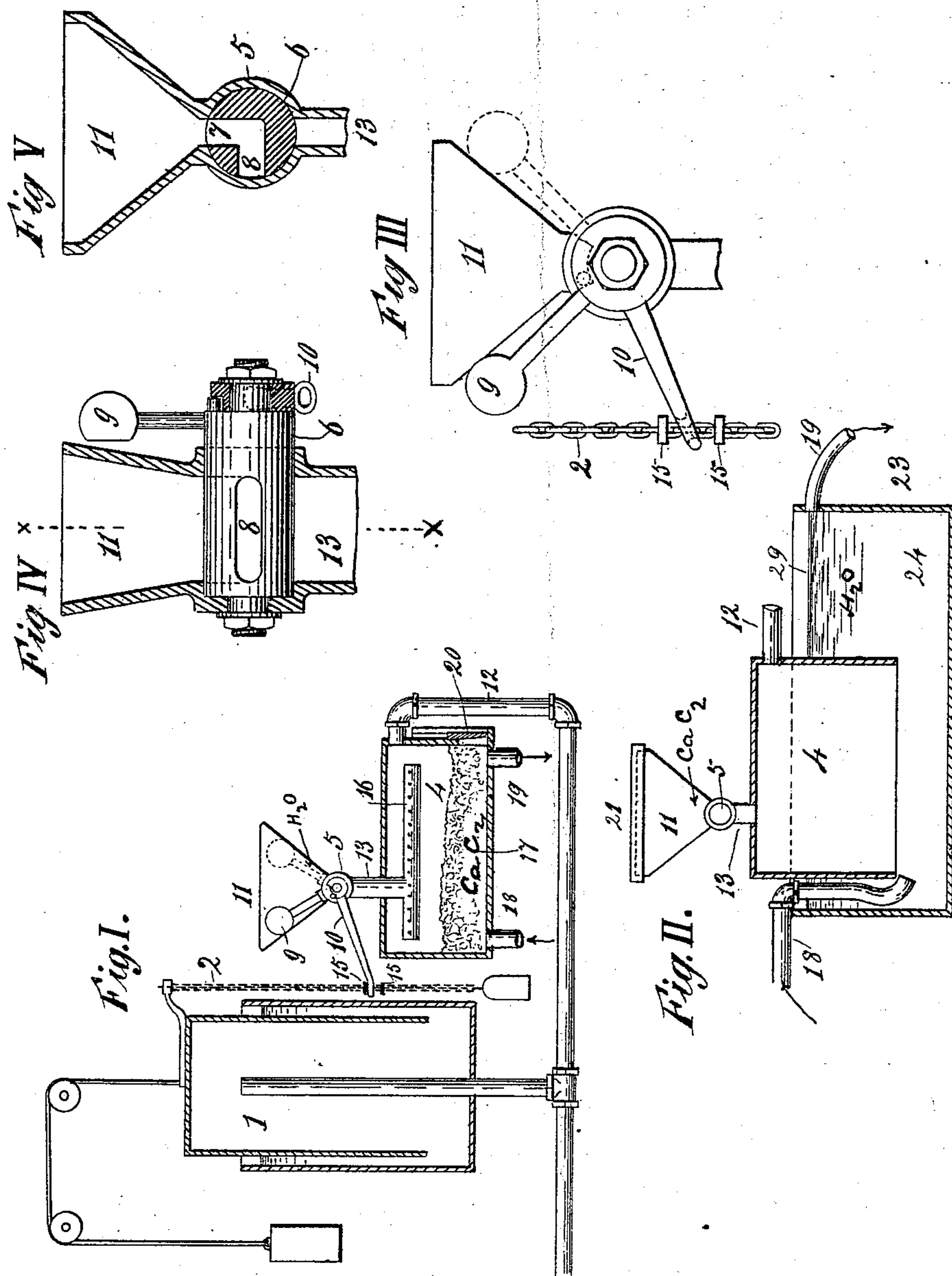
(No Model.)

E. N. DICKERSON.

PROCESS OF AND APPARATUS FOR MANUFACTURE OF GAS.

No. 541,526.

Patented June 25, 1895.



WITNESSES:

Thomas Littlejohn

H. Conner

INVENTOR

E. N. Dickerson

UNITED STATES PATENT OFFICE.

EDWARD N. DICKERSON, OF NEW YORK, N. Y.

PROCESS OF AND APPARATUS FOR MANUFACTURE OF GAS.

SPECIFICATION forming part of Letters Patent No. 541,526, dated June 25, 1895.

Application filed December 26, 1894. Serial No. 532,908. (No model.)

To all whom it may concern:

Be it known that I, EDWARD N. DICKERSON, of the city, county, and State of New York, have invented a new and useful Improvement in Processes of and Apparatus for the Manufacture of Combustible Gas, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

This invention relates to an improvement in processes of and apparatus for the manufacture of combustible gas produced by bringing together two combining materials, which by their chemical action produce the resulting gas, and is especially applicable to the production of acetylene gas by bringing together calcium carbide and water.

My apparatus is arranged to feed the water to the calcium carbide or the calcium carbide to the water intermittently as such feeding may be necessary to supply the gas consumed, and in order to accomplish this result I operate said feeding devices by a governor which causes the operation of such feeding devices intermittently as the gas is consumed. As shown, a governing holder is provided which receives the excess of gas due to the feeding in of the gas producing material. It would be disadvantageous in devices of this kind to connect the feeding device, say the water feeder intended to spray the water upon the calcium carbide, directly with the governor in such way as that the water-cock might stand open, because the generation of gas is not instantaneous, and an excess of water beyond the capacity of the holder might be fed into the carbide before the governor operated. By my device I propose, therefore, to feed in only so much water as will not fill the holder to its capacity, and no other charge can be fed to the holder until the holder has become emptied to the desired point. The operation both of feeding the water to the carbide and of feeding the carbide to the water is substantially the same in principle. By my device, also, I provide for removing the products of decomposition of the carbide, principally lime, without stopping the operation of the machine.

My invention will be readily understood from the accompanying drawings, in which—

Figure I represents a vertical elevation,

mostly in cross-section; Fig. 2, a modification of the generating-chamber, showing a different method of removing the refuse; Fig. III, 55 an end elevation of the feeding-in valve; Fig. IV, an elevation of the same at right angles to Fig. III, mostly in section; Fig. V, a section through Fig. IV on the line *x x*.

In my drawings similar numbers refer to 60 similar parts.

I will first describe the operation of the apparatus with reference to Figs. I, III, IV and V.

1 represents the governing gas holder of any suitable construction; 4, the generating 65 chamber; 11, hopper or water supply connected with the generating chamber by pipe 13 and spraying device 16; 12, pipe connecting generating chamber with gas holder; 5, 70 tumble-bob stop-cock intermittently operating and alternately communicating with the hopper 11 and generator 4; 10, arm for operating the tumble-bob stop-cock; 2, chain connected with the gas holder and operating the arm 10.

In the operation, as shown in Figs. I, III, 75 IV and V, the water is designed to be fed upon a body of calcium carbide 17 in generator 4. The feeding-in cock 5 is provided with plug 6 having therein an angular channel 7, 8. 80 This cock is operated through a right angle by any well-known form of tumble-bob contrivance controlled by governing holder 1. In the position shown in Fig. V, the gas holder has risen and thrown the tumble-bob weight 85 9 to the position shown in dotted lines in Fig. I. At this point, therefore, a charge of water fills the chamber 7, 8 of the cock. This chamber may be made oblong, as shown in Fig. IV, to increase its capacity, if desired. In the posi- 90 tion shown in full lines in Figs. I and III, the channel 8 is connected with the delivery pipe 13 and the charge of water has been delivered to the carbide, the entry of the water to the cock being of course shut off by the revolution 95 of the cock. When the water is delivered gas is generated from the carbide 17 in generator 4 thereby raising the gas-holder 1, which enables the plug 6 of cock 5 to receive an additional charge of water which is retained in the 100 cock until the holder has again descended to the position shown in Fig. I, when it is delivered upon the carbide. The amount of water which the cock will contain is not suffi-

cient when entirely converted into gas to produce gas in excess of the capacity of the holder and as no additional water can be received in the holder until after the holder has again been discharged, the apparatus is entirely safe from any over-production of gas. When the carbide 17 is used up it may be discharged by door 20, or preferably washed out by water pipe 18 through delivery pipe 19. The various pipes in this apparatus are, of course, provided with suitable stop-cocks to open and close them as desired. A subsequent charge of carbide is then placed in the generator 4 and the operation recommences.

15 In Fig. II, the same device is shown as in Fig. I, excepting that in this case it is intended to feed the carbide to the water. In this case, of course, it is necessary that the carbide shall be reduced to a powdered condition. It is then placed in the hopper 11 which may be provided with cover 21 to prevent accidental escape of gas. In this case the bottom of the hopper 4 is open and is sufficiently below the level of the water 22 to furnish the pressure necessary to deliver to the gas holder 1 through pipe 12. The generated gas rises through the water and the lime settle to the bottom of the water receiver 23, whence it can be continuously removed by a flow of water through pipe 18, which water escapes through the over-flow 19. The lime itself will mostly settle in the part 24 of the water chamber 23, whence it can be removed as desired, without stopping the operation of the device.

35 What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process of producing illuminating gas without the addition of heat, which consists in intermittently bringing in contact with each other a determined quantity of a liquid or a solid, which, by their union, produce a fixed gas, the said intermittent addi-

tions producing determined quantities of gas, substantially as described.

2. The process of producing illuminating gas without the addition of heat, which consists in intermittently bringing in contact with each other a determined quantity of a liquid or a solid, which, by their union, produce a fixed gas, the said intermittent additions producing determined quantities of gas, and of determining the frequency of said production of determined amounts of gas by the consumption of the gas, substantially as described.

3. The combination of the gas-holder 1, the valve 5 having a chamber therein of determined capacity, and a connection between the holder and the said valve for operating the same, the said valve having a chamber of fixed capacity alternately connecting with the feed and the delivery, thereby at each operation feeding the measured contents of the chamber into the gas generating chamber 4, substantially as described.

4. The combination of the gas-holder 1, operating a feeding in valve containing a chamber alternately connecting with the feed and delivery of the apparatus, and delivering the contents of the chamber at each operation, of the generating chamber 4 connected therewith located in the water chamber 23 having its open bottom at a sufficient distance above the bottom of the chamber 23 to allow of the withdrawal of the material fed through chamber 4 by the valve 5, and means for withdrawing said material, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

E. N. DICKERSON.

Witnesses:

H. CORTANT,

C. E. DAVIDSON.