

No. 613,976.

Patented Nov. 8, 1898.

J. F. DOUGHERTY.
ACETYLENE GAS GENERATOR.

(Application filed Sept. 14, 1897.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 4-

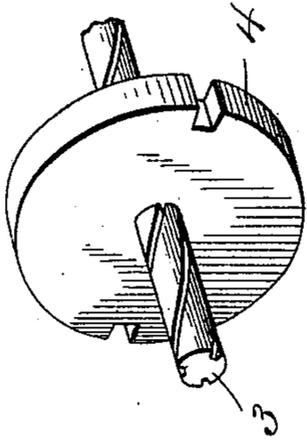


FIG. 5-

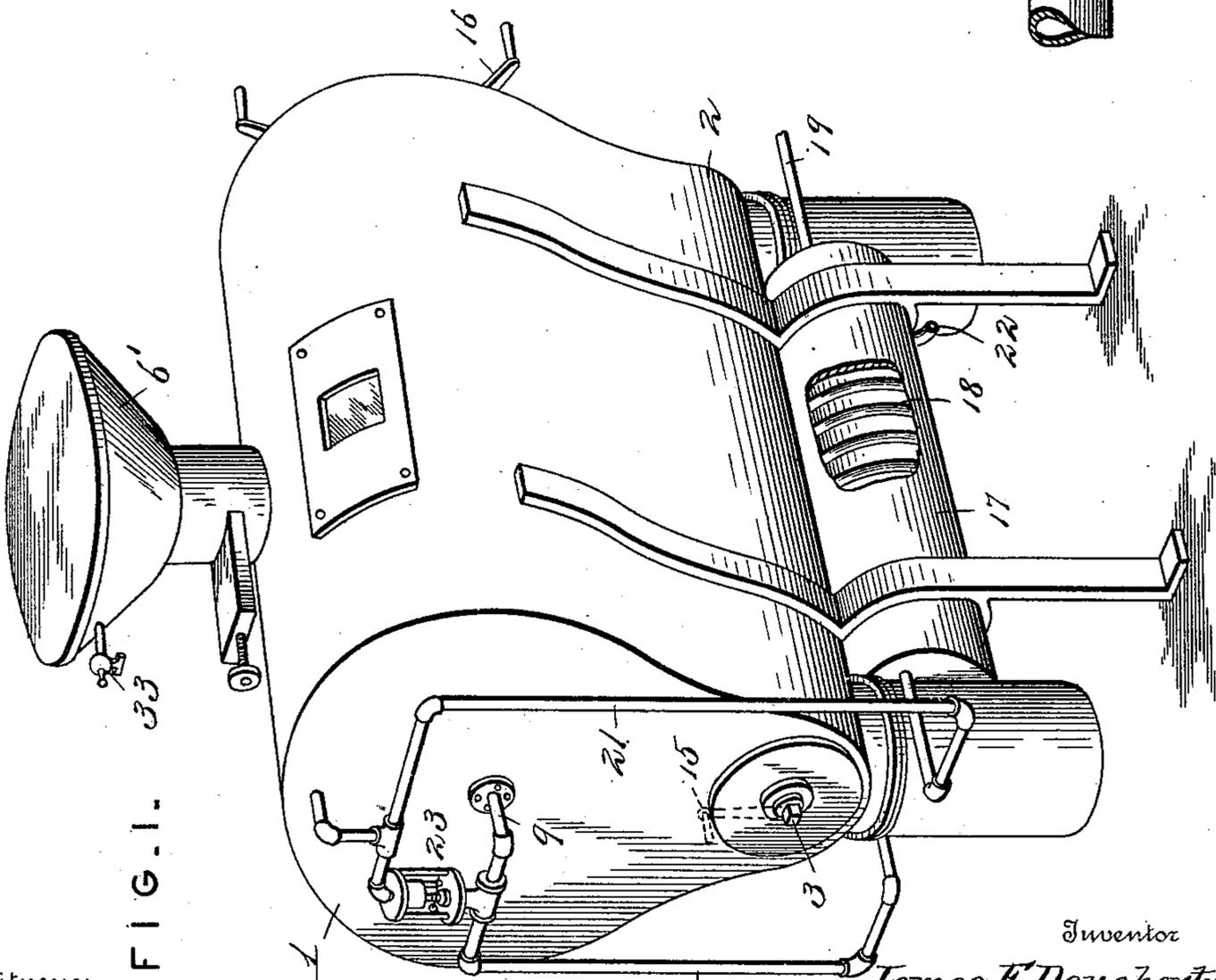
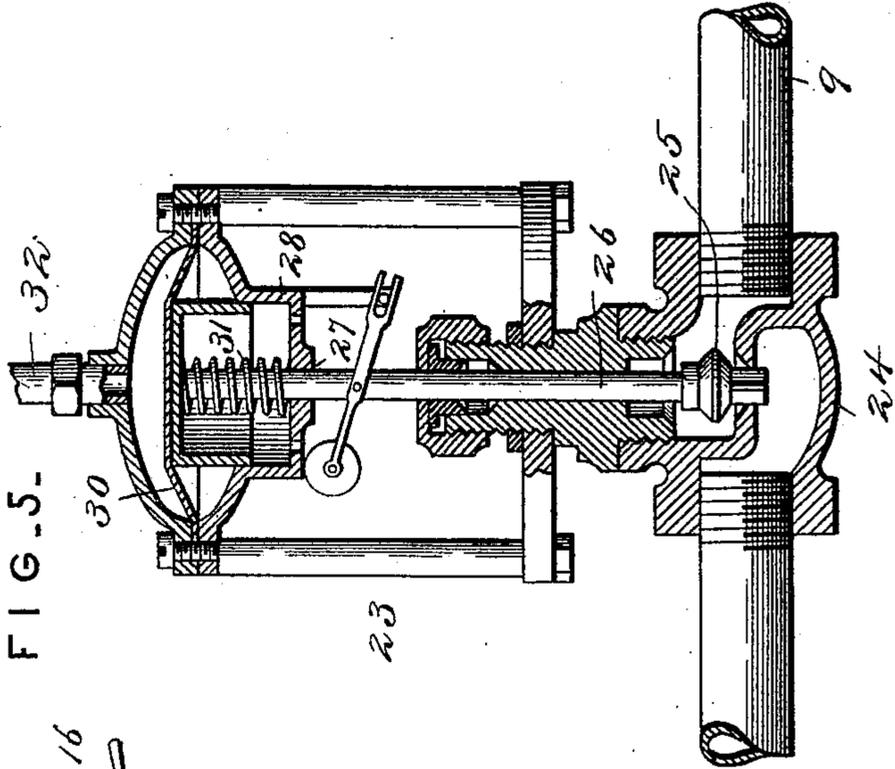


FIG. 1.

Witnesses

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FIG. 3-

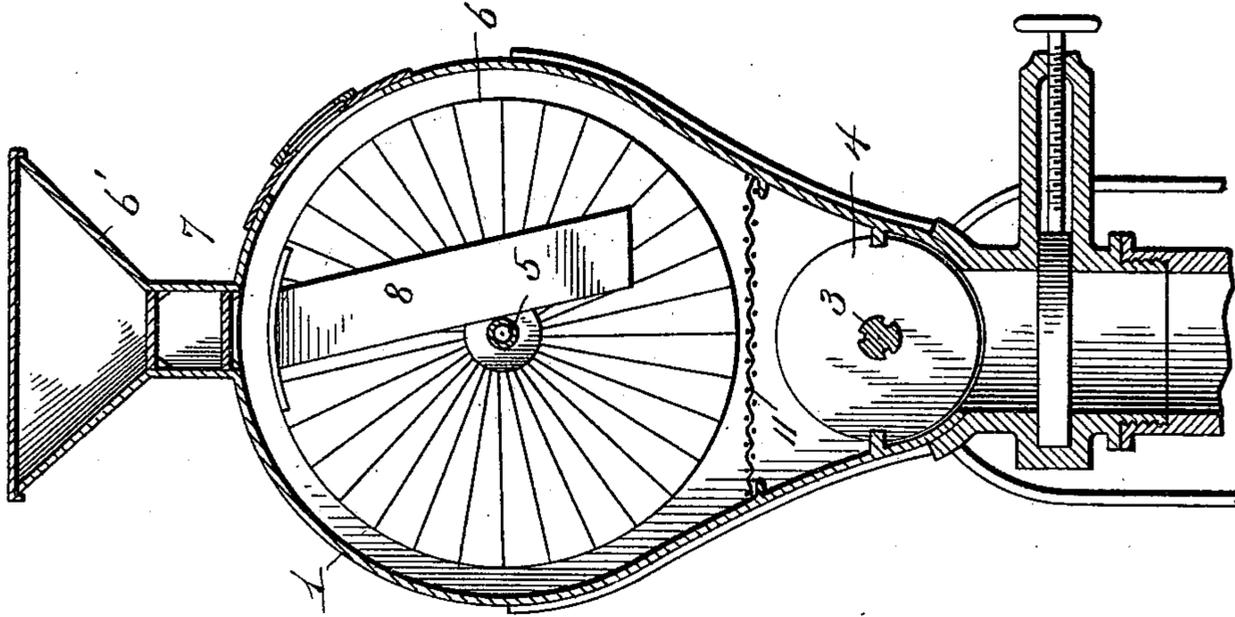
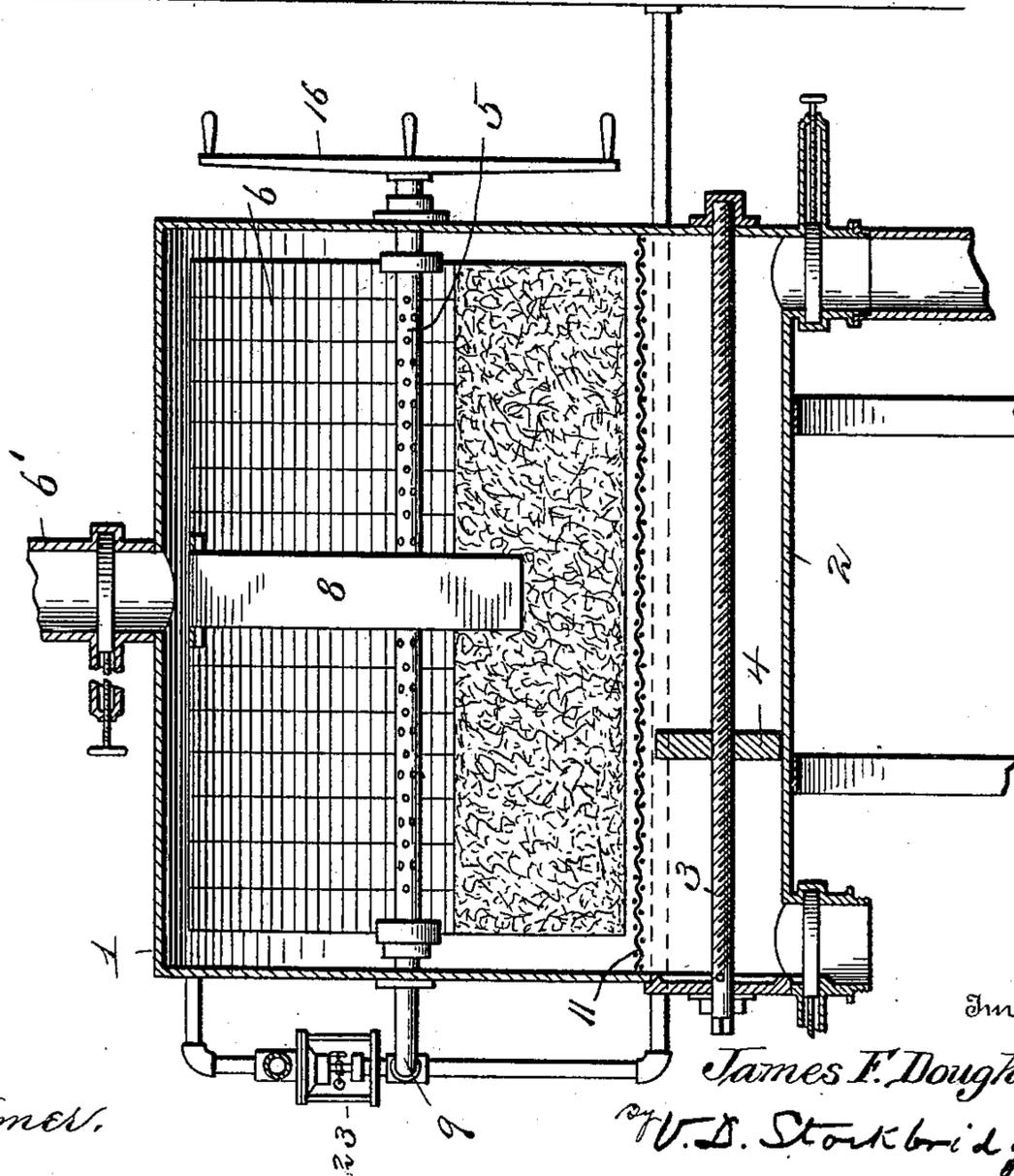


FIG. 2-



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 613,976, dated November 8, 1898.

Application filed September 14, 1897. Serial No. 651,627. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. DOUGHERTY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Acetylene-Gas Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to novel and useful improvements in acetylene-gas generators; and the primary object of the invention is to provide a means whereby the calcium carbide is fed to the generator in such quantities and at such times that the generation of gas will be uniform through the entire process of generation.

The invention further contemplates the provision of an improved means whereby the water is fed to the carbide, the same being controlled by the pressure of the generator.

With these and other objects in view, which will become apparent in the course of the following description, all looking toward improving and simplifying machines of this character generally, my invention consists in the novel combination and arrangement of simple mechanical parts, that will be hereinafter fully described, and the points of novelty will be particularly set forth in the claims.

I am enabled to accomplish the objects of my invention by the simple means illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a generator constructed in accordance with my invention. Fig. 2 is a longitudinal central sectional view showing the generator in connection with a gasometer, said gasometer being in elevation. Fig. 3 is a transverse central section. Fig. 4 is a detail perspective view of the means for carrying the calcium hydrate or refuse to the points where it is removed, and Fig. 5 is a central vertical section of the valve for controlling the admission of water to the generator.

Referring to the drawings, the numeral 1 indicates the generator, which is preferably cylindrical and provided on its under side with a trough 2, having mounted in suitable

bearings at either end thereof a worm-shaft 3, having a traveling disk or plunger 4 thereon, the purpose of which will presently become apparent. Suitably mounted upon a perforated shaft 5, in suitable bearings in each end of the casing and extending longitudinally therethrough, is a cylindrical cage or screen 6, adapted to contain calcium carbide. Mounted upon the cylinder is a hopper 6', adapted to be filled with carbide, and said hopper communicates with the interior of the casing through an opening closed by a valve 7. This opening is adapted to register from time to time with the upper end of a chute 8, into which the carbide passes and is delivered into the cage. Connected with the end of the perforated shaft is a water-supply pipe 9, leading from any suitable source of water-supply, and in practice the water is fed to the perforated shaft 5 and passes through the perforation therein and falls onto the carbide in the cage after passing through an automatic supply-regulating valve 23, the details of construction of which will be presently described.

In carrying out my invention I provide in the hopper 6' a valve 7', which is adapted to control the delivery of a certain predetermined amount of calcium carbide to the generator, and while this valve could be made automatic in its operation by gearing the same on the movable portion of the machine the same is not so shown in the drawings, but is adapted to be operated by hand at proper intervals to deliver the carbide to the generator.

It will be seen that by reason of the constant rotation of the screen the carbide therein will be agitated, thereby separating the refuse therefrom and causing it to pass through the cage and through a grating 11 into the trough 2, from which it is carried to the legs or wells 12 by the plunger or disk 4 as the same travels through the trough, from which legs or wells it is removed through openings 13, normally closed by doors 14.

As a means for rotating the worm-shaft 3 I preferably provide a crank-handle, which may obviously be rotated in either direction for the purpose mentioned.

As a means for rotating the perforated shaft 5 I provide a plurality of radial han-

dles 16, which handles it is obvious can be substituted by a crank, or, if found desirable, a band-wheel could be placed upon the shaft and with such connections that the shaft would be slowly rotated.

Attention being particularly called to Fig. 1 of the drawings, the numeral 17 indicates a condenser which I preferably place immediately below the generator and between the wells, and said condenser contains the usual coil-pipe 18, surrounded by water, through which pipe the gas passes and is thereby cooled.

The numeral 19 indicates the water-inlet pipe, and the numeral 20 indicates the pipe through which the water is conducted to the generator.

The numeral 21 designates the pipe through which the gas leaves the generator and is conducted through the condenser and to the burners by means of a pipe 22.

In the form shown in Fig. 1 it will be noted that no gasometer is used, the same being rendered unnecessary by the condenser. From Fig. 2 it will be seen that the generator can also be used in connection with a gasometer of any well-known or approved construction.

Provided in the pipe 9, which connects with the pipe 20, is an automatic valve 23, (see Fig. 5,) which is adapted to be automatically operated by the pressure from the generator to control the admission of water to the carbide to govern the extent of generation of gas.

The numeral 24 indicates a globe-valve with a valve proper, 25, therein connected to a valve-stem 26, which extends through a perforation 27 in the bottom of a chamber 28 and is provided at its upper end with a piston-head 29, which normally engages a diaphragm 30 in the upper portion of said chamber. Interposed between the floor of the chamber 28 and the under side of the piston-head is a spiral spring 31, which is of sufficient strength to keep the valve normally open and permit the water to enter the generator. The normal pressure of said spring will equal or nearly equal the pressure on the other side of the piston-head, so that when the pressure of gas on the diaphragm, entering the chamber 28 through an outlet-pipe 32, has gone below the normal pressure of the spring it operates to open the valve and permit the water to pass to the generator. If, on the other hand, the pressure of the gas in the generator has gone above the normal or desired point, it is obvious that the pressure on the diaphragm and piston-head will seat the valve 25 and cut off the water-supply.

As a means for ascertaining the position of a valve—*i. e.*, when the water is being admitted to the generator or the same has been cut off—I provide a semaphore, which is connected to the valve-stem in the usual manner and is adapted to be raised or lowered by the reciprocation of the valve-stem.

The numeral 33 indicates the petcock, which I provide upon the hopper for the ob-

vious purpose of relieving the pressure on the hopper, for a purpose that will be made apparent in the description of the operation of the device.

Having thus described the mechanism wherein my invention lies, I will now proceed to describe the operation of the generator in making gas.

When it is desired to charge the hopper, the gas is exhausted therefrom through the petcock thereon into an elastic bag, and when the hopper has been recharged the elastic bag is compressed, thus returning the gas to the hopper. A sufficient quantity of calcium carbide is placed in the hopper, and as the cage is rotated the valve 7 is opened, admitting a known quantity of material to be fed to the hopper, which material passes through the chute and into the cage. The quantity of carbide thus permitted to enter the cage is just sufficient to take the place of the quantity decomposed through the prior revolution of the cage. The refuse of calcium hydrate will fall through the cage into the circular box or trough 2; but it will be noted that before said refuse enters said trough it passes through the grating 11, arranged immediately below the lowest point of its edge. The refuse is carried to the ends of the generator, where it falls into the wells or receptacles provided for that purpose. The gas passes from the generator through the pipe 21 to the condenser 17 when the same is used, and when not to the gasometer. I do not deem it necessary to further describe the operation of the valve controlling the admission of water to the perforated shaft.

It is obvious that the invention herein set forth is susceptible of many minor changes and modifications involving mechanical skill which may be made within the scope of the invention without departing from the spirit thereof. I do not therefore desire to be understood as limiting myself to the precise construction shown in the drawings.

Having thus described my invention, what I claim as new is—

1. In a gas-generator of the character described, the combination with a suitable casing, of a hollow perforated shaft journaled therein, a rotatable screen or cage upon said shaft, a chute secured to said cage and having open ends, a suitable gas-tight carbide-receptacle upon the casing, provided with an opening adapted to register with the opening in the chute for the purpose set forth, means for regulating the quantity of material delivered from said receptacle, and a pressure-regulator for controlling the admission of the water by the pressure from the generator, substantially as set forth.

2. In a gas-generator of the character described, the combination with a suitable casing, of a perforated shaft therein, a rotatable cage or screen mounted upon the shaft and having a chute secured thereto open at both ends, a hopper upon the casing for the recep-

tion of the carbid, said hopper being provided with an opening or openings adapted to register with the chute, means for regulating the amount of carbid delivered to said
5 chute, suitable water connections with the perforated pipe, a pressure-regulated valve in said pipe having communications with the generator, whereby water is admitted to and cut off from the generator, substantially as
10 described.

3. In a gas-generator of the character set forth, the combination with a suitable casing, of a perforated shaft journaled in suitable bearings therein, a rotatable screen or cage
15 mounted upon said shaft and having a chute open at both ends connected therewith, a hopper upon the casing for the reception of the carbid, said hopper having an opening

therein adapted to register with the opening in the chute at predetermined points during
20 the revolution of the cage, means for controlling the admission of the carbid to the cage and separated therefrom by a grating, a spirally-cut shaft journaled in suitable bearings below the grating and having a travel-
25 ing plunger or disk thereon adapted to carry the refuse and moisture to suitable receptacles provided therefor.

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

JAMES F. DOUGHERTY.

Witnesses:

JACOB F. KOLB,
BENJAMIN ATKINS.