No. 677,334. Patented July 2, 1901.

G. W. BENEDICT & J. J. GRAF.

ACETYLENE GAS GENERATOR.

(Application filed Nov. 5, 1900.)

(No Model.)

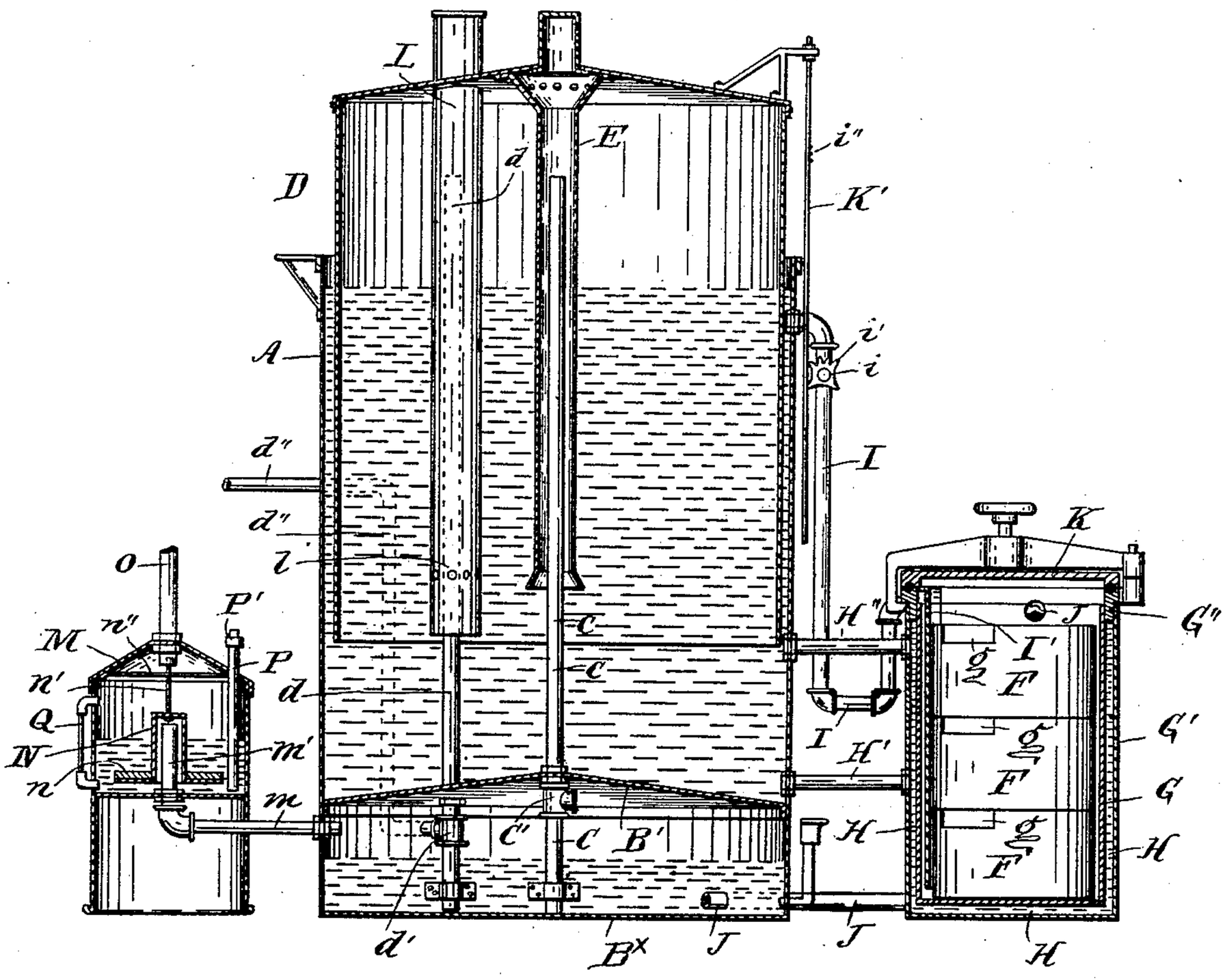

Fig. 1.

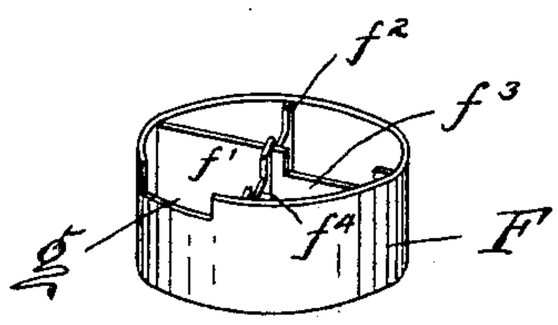

Fig. 2.

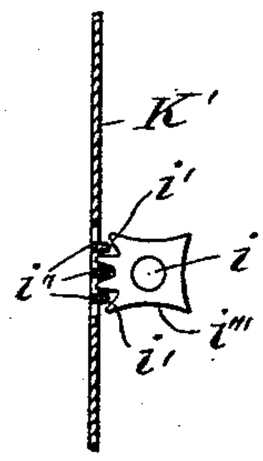

Fig. 3.

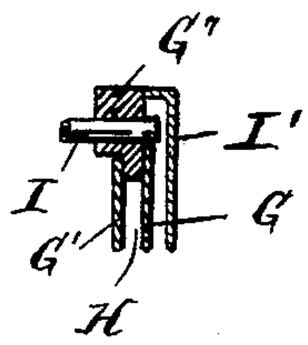

Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE W. BENEDICT AND JOHN J. GRAF, OF CINCINNATI, OHIO, ASSIGNORS TO THE UNION LIGHT & HEAT COMPANY, OF SAME PLACE.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 677,334, dated July 2, 1901.

Application filed November 5, 1900. Serial No. 35,479. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. BENEDICT and JOHN J. GRAF, citizens of the United States, and residents of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Acetylene-Gas Generators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of the specification.

Our invention relates to that class of acetylene-gas generators in which the water is admitted to the carbid when it is desired to generate gas; and it consists of the novel construction and combination of parts hereinafter fully described and claimed.

The object of our invention is to furnish a machine for the generation of acetylene gas provided with certain novel improvements, which will appear more fully as we proceed with our specification.

Figure 1 is a section of our improved machine. Fig. 2 is a perspective view of one of the carbid-holders. Fig. 3 is a view of the valve-cock and means for operating the same, and Fig. 4 is a detail of the pipe I.

A is an ordinary tank, made of sheet metal, preferably galvanized, having a false bottom B′ and a vertical pipe C, secured in any convenient manner at the center and running from the true bottom B to a slight distance above the top of the tank. The false bottom B′ divides the tank into an upper and lower compartment, and these compartments are filled with water up to about the points shown by the broken lines. A bell D fits within said tank A and is provided with a pipe E, slightly flared at the top and secured to the top of the bell, which pipe E fits over the pipe C and serves as a guide for the bell D as it rises and falls. A T-joint C′ in the pipe C allows the entrance or exit of gas from said pipe.

The carbid is contained in buckets F F F, (which will be described more particularly later,) resting one upon the other in a small tank G, which is supported in another tank G′ by means of a flanged ring G″, the two tanks G and G′ being riveted to said ring at the top. A space H is thus left around the inner tank G, which is kept filled with water by means of the pipes H′ H″, connecting said jacket-space with the upper compartment of the tank A. A water-jacket is thus formed about the carbid-buckets which keeps down their temperature, and the two pipes H and H″ permit a circulation of water in said jacket, the cold water flowing through H′ and pushing out the warm water through H″. A pipe I leads from the upper part of the tank A through the flange G″, as seen in Fig. 4, to the inner tank G and is intended to conduct water from said tank A to the carbid. A narrow strip of metal I′, secured in any convenient manner at the top of the vessel G—as, for instance, by means of an offset resting on a lug on the inside of the flange G″—passes down in front of the exit of the pipe I and prevents the water from reaching the upper buckets F F, so that the tank fills from the bottom and the water reaches the lower bucket first. A pipe J leads from the upper part of the tank G down to the lower compartment of tank A and has entrance to said compartment near its bottom. This pipe J is for the passage of the gas from the tank G to the tank A. The tank G is provided with a top K, which is locked gas-tight in place in any convenient manner, preferably by means of a spider hinged at one side, as seen in Fig. 1.

The pipe I is provided with a valve *i*, which is controlled by a wheel having teeth *i′*, adapted to engage with openings *i″* in the rod K′, which latter is secured in any convenient manner to the top of the bell D.

A pipe L is rigidly secured to the bell D and fits over a second pipe *d*, which is secured to the tank A. The pipe L has holes *l* near its bottom, and the pipe *d* is provided with a T-joint *d′*, which connects with the pipe *d″*, leading out of the tank A to the open air. The purpose of the pipes L and *d* is to provide an exit for the gas in case too much is generated for the bell to hold. If the bell D rises so high that the holes *l* rise above the surface of the water in the tank A, the gas in the bell enters the holes *l*, thus entering the pipe L and from thence passing through the pipe *d* to the open air. The pipes L and *d* act as a safety-valve.

A tank M is connected with the lower compartment of the tank A by means of a pipe *m*, having a vertical leg *m'* projecting up into the tank M. The tank M is partially filled with any of the distillates of crude oil having a specific gravity of from 70° to 90° Baumé, such as gasolene. A short pipe or hood N fits over the pipe *m'* and is fitted at its lower end with a float *n*, made of any suitable material, which floats at some distance below the surface of the oil. A rod *m'*, fitted to the upper end of the closed pipe N, passes up through guides *n''* and into the pipe O and serves to hold the pipe N in a vertical position. A pipe O is secured to the upper part of the tank M and leads thence to the burners, where it is desired to burn the gas. A pipe P, provided with a removable cap P', serves to fill the tank M with gasolene when required. A gage Q is also provided to show the height of oil in the tank.

The buckets F are divided into four compartments by means of plates, as seen in Fig. 2. Said buckets and dividing-plates are cut away at the top at $g\, f^4\, f^3\, f^2$, so that the water entering at the point *g* will fill first one compartment, then pass through the opening f^4 and fill the next compartment, and so on, the carbid thus being exhausted in one compartment before the water passes to the next. We find that this arrangement is very economical and prevents waste of the carbid.

Having thus described our invention, we will now describe its operation.

With the passing of the gas from the bell D the said bell D descends, and when nearly all the gas is expelled the openings *i'''* in the rod K' engage the teeth *i'* of the valve *i* and open the valve. Water then passes from the tank A to the inner tank G and enters one of the compartments in one of the buckets F, the water entering the lower bucket first. Gas is immediately formed and passes through the pipe J into the lower compartment of the tank A. It then bubbles up through the water in said lower compartment and enters the pipe C, whence it passes up through the openings in the pipe E to the bell D. The water in the lower compartment of the tank A simply serves to seal the pipes J and *d* and also to wash the gas. As the bell D rises the rod *k* also rises, closing the valve *i*, and the rod *k'*, coming opposite the space *i'''*, where there are no teeth, serves to lock said valve. As the gas passes from the bell D through the pipe C and T-joint C' it enters the pipe *m*, whence it passes out through the service-pipe to the burners.

Having thus described our invention, what we desire to claim as new, and to cover by Letters Patent, is—

1. In an acetylene-gas generator of the class described, as a means for regulating the intermittent flow of water to the carbid-holder, a rod K', attached to the bell and provided with a series of teeth *i'''*, a four-sided valve-cock *i*, one of whose sides is provided with a series of teeth *i'* to correspond with teeth *i'''*, on the rod K', the arrangement of the teeth being such that when the teeth are out of engagement, one side of the valve-cock without teeth will be in contact with the rod K', and so lock the valve-cock in this position, substantially as described.

2. In an acetylene-generator of the class described, a carbid-holder consisting of an outer tank, an inner tank, the two being secured at the top to a flanged ring, the two tanks being separated by the thickness of the flanged ring and the inner tank being of less depth than the outer tank, thus leaving a water-jacket completely surrounding the sides and bottom of the inner tank, a lid fitting on top of said flanged ring with means for holding the same gas-tight in place in combination with a series of buckets for holding the carbid, substantially as and for the purpose described.

3. In an acetylene-generator of the class described, an outer tank, an inner tank of less depth than that of the outer tank, a ring provided with a flange which fits between the upper edges of said tank, said tanks being riveted to the same in such a way that a space is left surrounding the sides and bottom of said inner tank, an opening in said ring for the admission of water and a second opening for the exit of gas, in combination with a series of buckets resting one upon the other for containing the carbid, and a top resting on said ring, with means for securing said top gas-tight in place and connections between said water-space whereby water is allowed to circulate, substantially as and for the purpose described.

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