No. 680,969 Patented Aug. 20, 1901.

A. C. EINSTEIN.

ACETYLENE GAS GENERATOR.

(Application filed June 18, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. I.

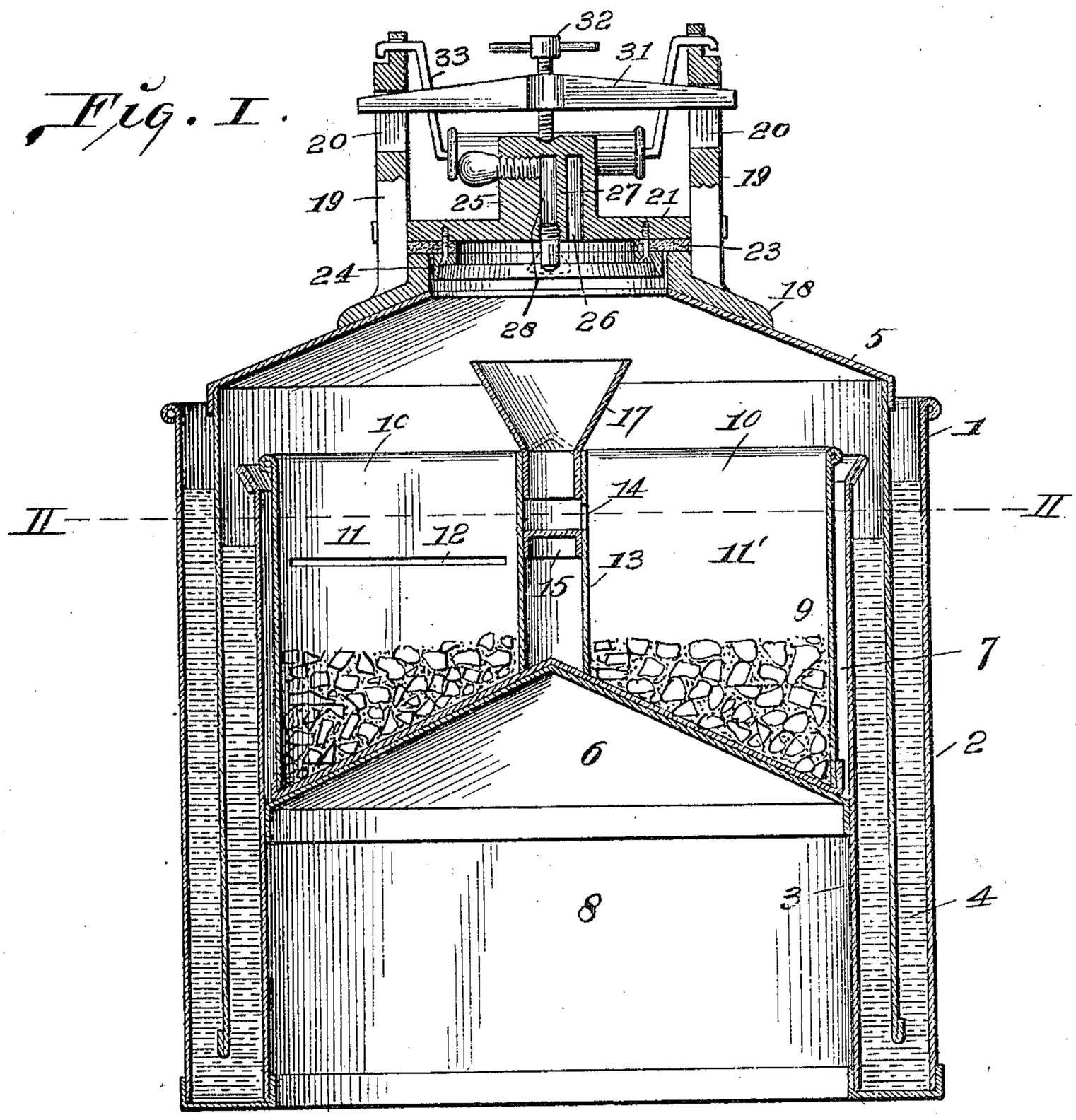

Fig. II.

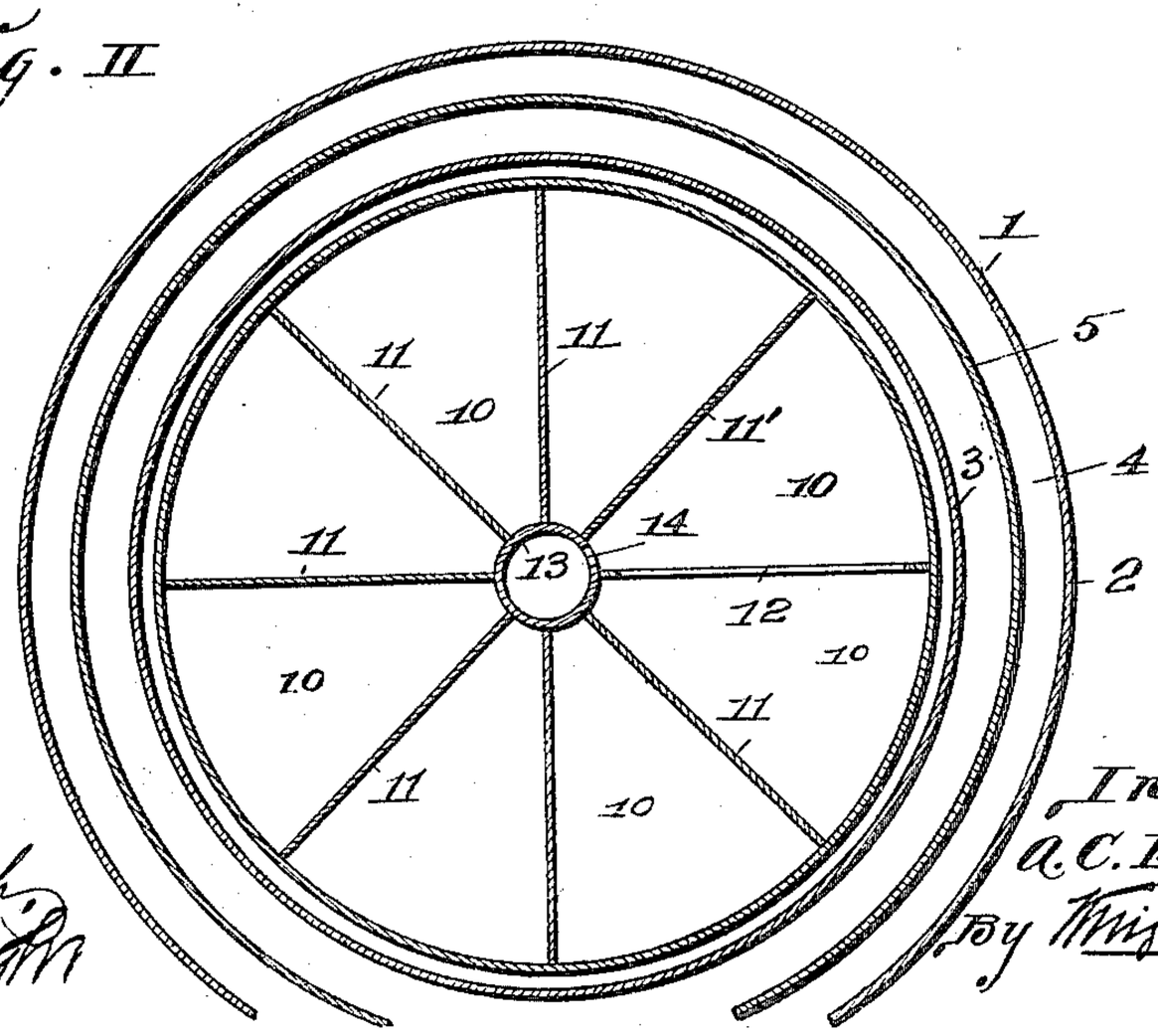

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Fig. III.

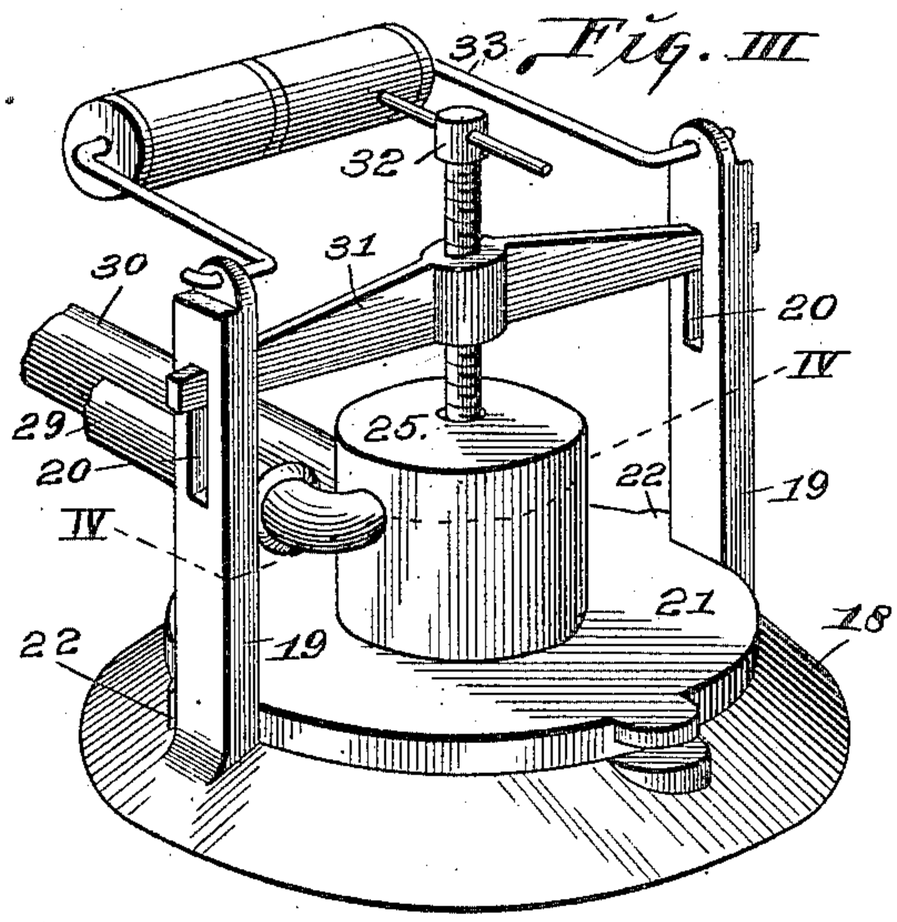


Fig. IV.

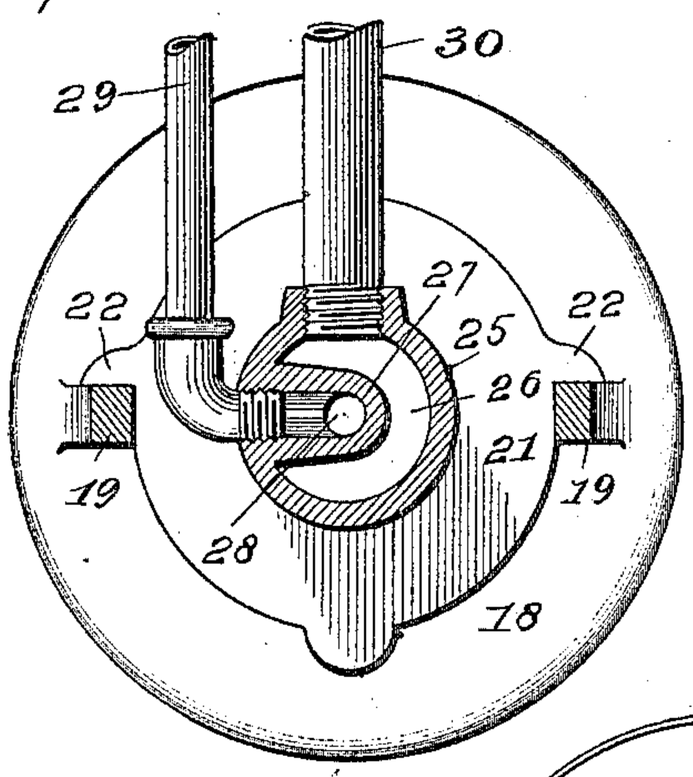


Fig. V.

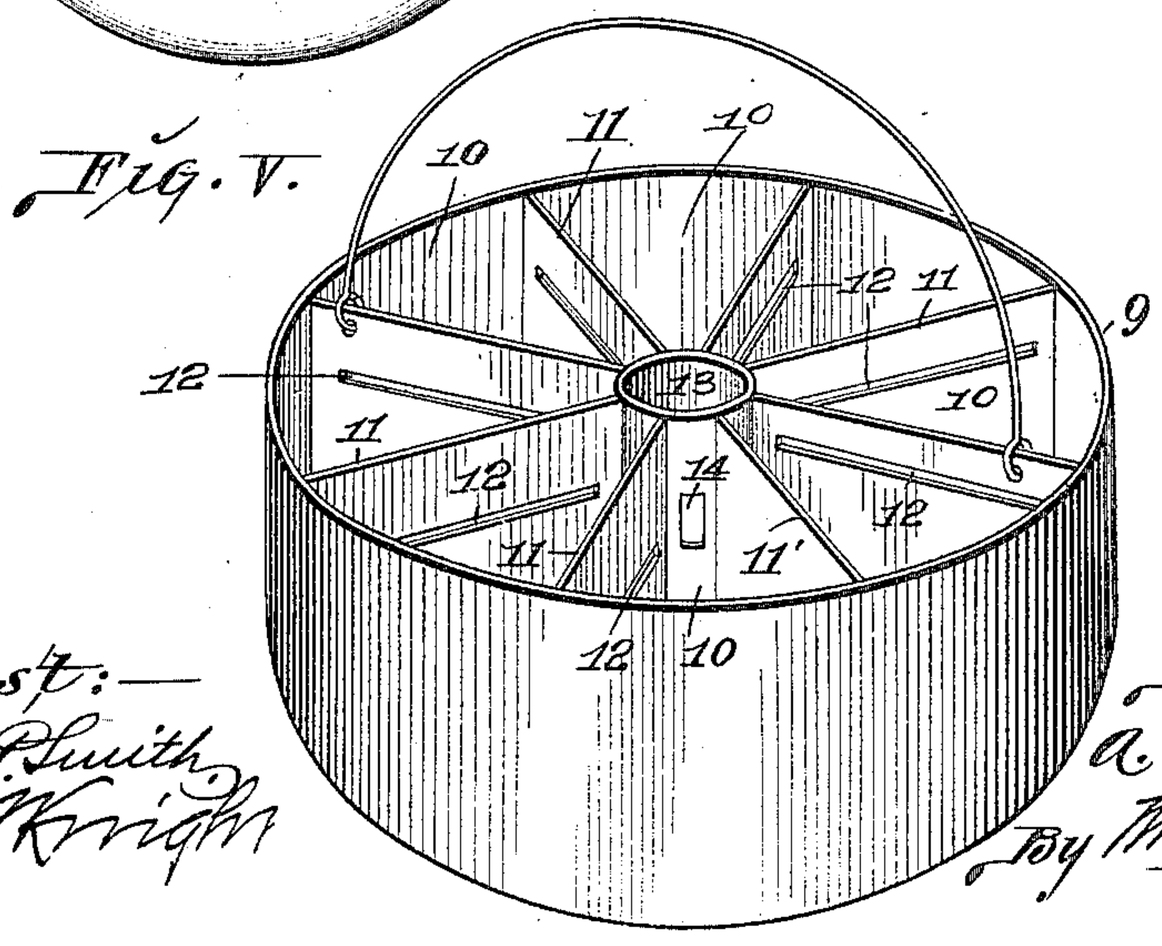


Fig. VI.

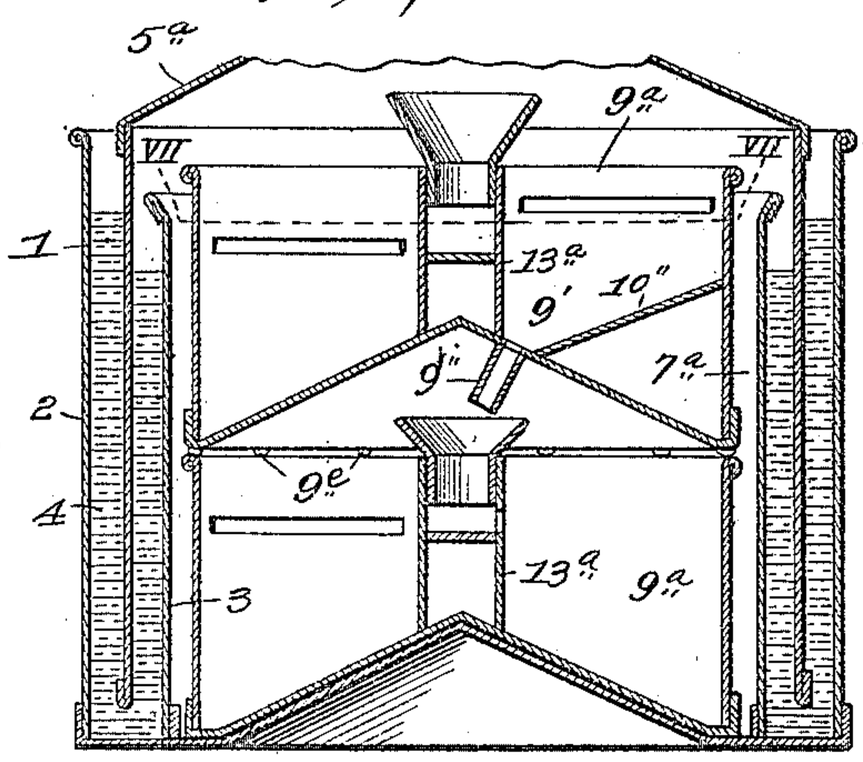
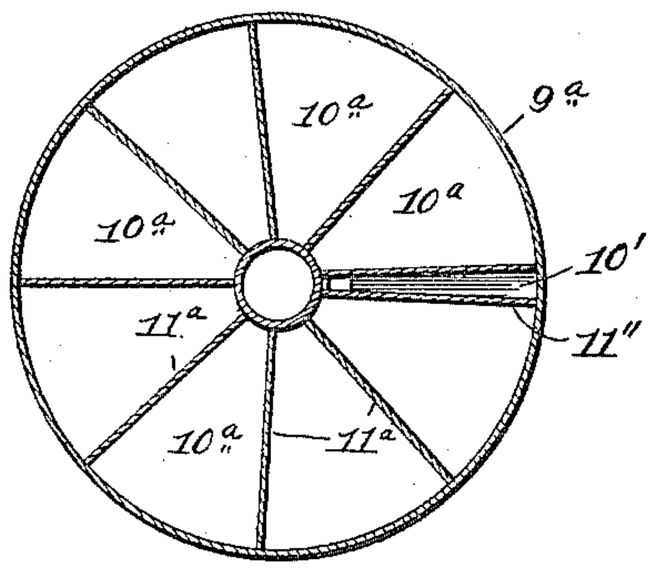


Fig. VII.



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No. 680,969. Patented Aug. 20, 1901.

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ACETYLENE GAS GENERATOR.

(Application filed June 18, 1900.)

(No Model.) 3 Sheets—Sheet 3.

Fig. VIII.

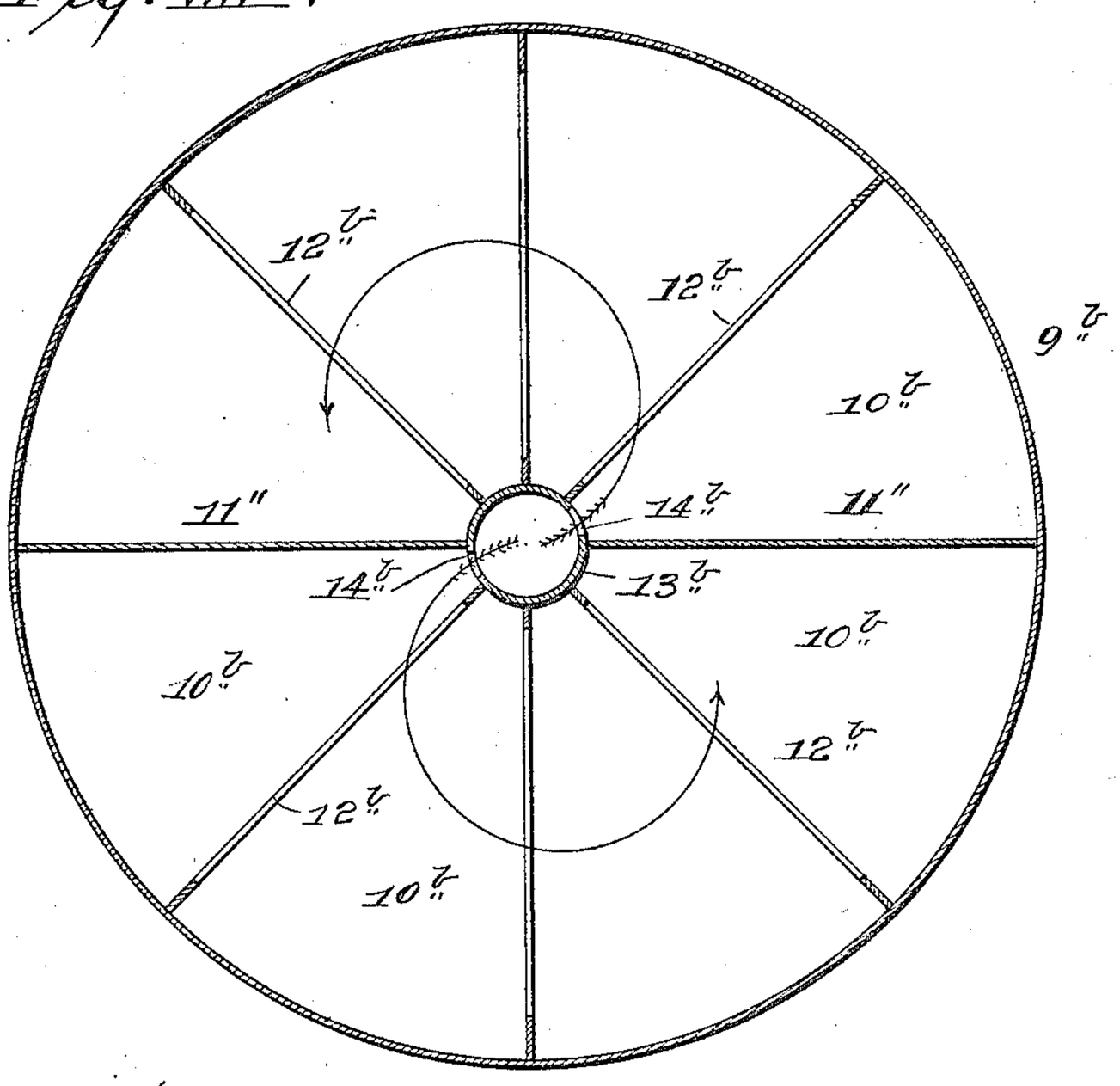
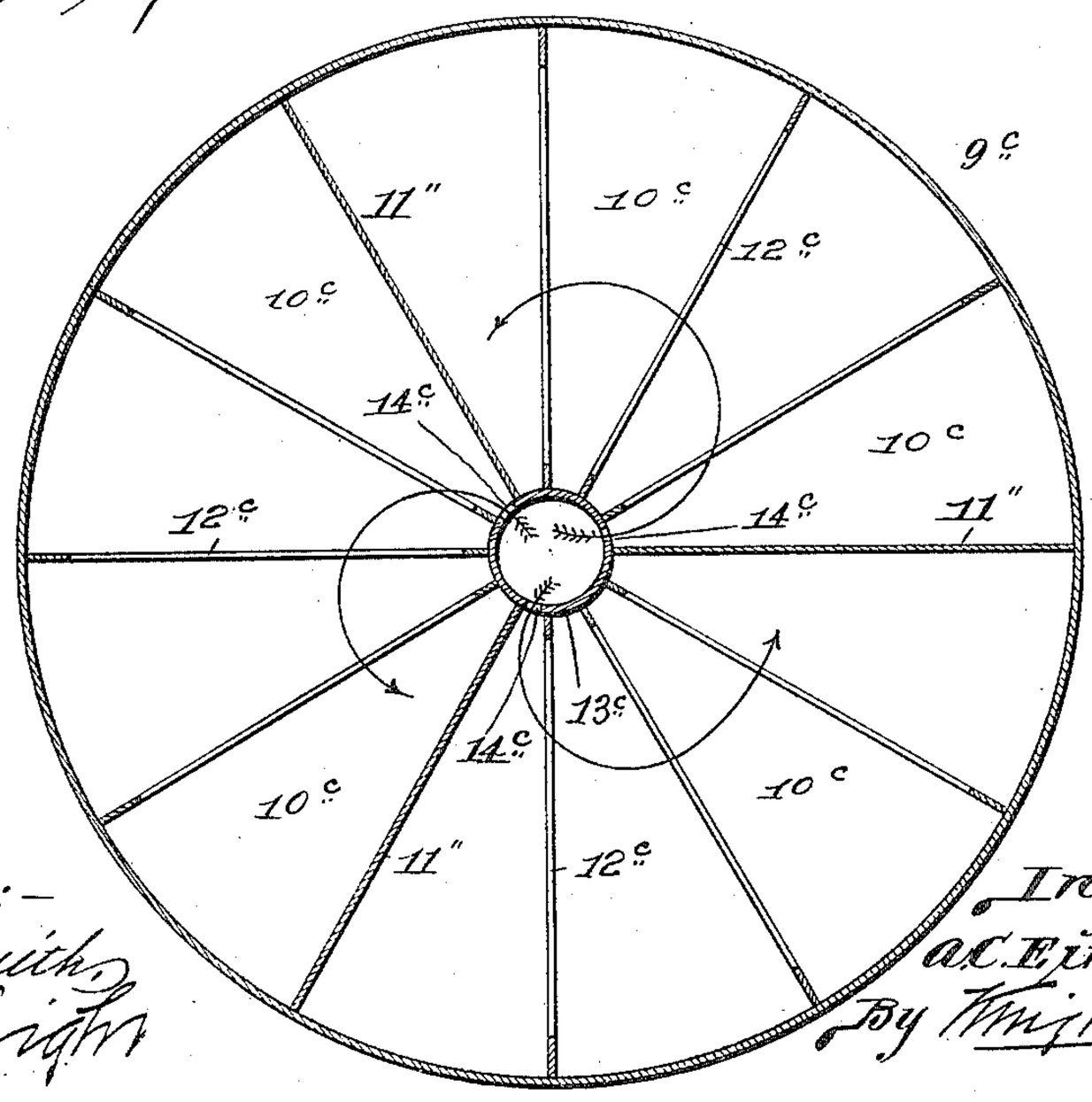


Fig. IX.



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UNITED STATES PATENT OFFICE.

ALFRED C. EINSTEIN, OF ST. LOUIS, MISSOURI.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 680,969, dated August 20, 1901.

Application filed June 18, 1900. Serial No. 20,628. (No model.)

To all whom it may concern:

Be it known that I, ALFRED C. EINSTEIN, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of apparatus used for generating acetylene gas by the application of water to calcium carbid; and the invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a vertical sectional view taken approximately on a central line through a gas-generator constructed in accordance with my invention. Fig. II is a horizontal sectional view taken on line II II, Fig. I. Fig. III is an enlarged perspective view of the cap or cover of the generator and the means whereby said cover is held. Fig. IV is a view, partly in plan, of the cover and its holding means and partly in transverse section, taken on line IV IV, Fig. III. Fig. V is an enlarged perspective view of the carbid-container. Fig. VI is a vertical sectional view of the generator, showing a multiplicity of carbid-containers therein. Fig. VII is a cross-sectional view taken on line VII VII, Fig. VI, through the upper carbid-container. Figs. VIII and IX are cross-sectional views of modifications of the carbid-container.

1 designates the tank of the generator, having the outer wall 2 and inner wall 3, between which is the annular water-seal chamber 4.

5 is a water-seal bell open at its lower end and fitting in the chamber 4. Within the cylindrical inner wall 3 of the tank 1 is a support 6, that is suitably fixed to the wall 3 and separates the interior of the tank 1 within said wall into a generating-chamber 7 above the support and an air-space 8 beneath the support.

9 designates a carbid-container adapted to fit within the chamber 7 and rest upon the conical support 6. This container is subdivided into a series of compartments 10 by a series of partitions 11, as clearly seen in Fig. V, said compartments being designed to each receive an individual quantity of calcium carbid (for illustration, one pound) from which gas is evolved on the introduction of water thereinto in the operation of the apparatus, as will hereinafter appear. The partitions 11 are, with the exception of one of them—viz., 11′—each provided with a slot or aperture 12 therein, that provides communication from each compartment 10 to the next succeeding one in rotation.

13 designates a water-feed tube centrally located in the container 9 and to which the partitions 11 all lead and are connected. The tube 13 is provided with an opening 14, through which water introduced into the tube may obtain access into the compartment 10, located between the imperforate partition 11′ (see Fig. V) and the first partition 11, containing the slot or aperture 12. The slot or aperture 12 in the said first partition next to that 11′ is positioned nearer the bottom of the container than is the slot in either of the other partitions, and the slot or aperture in each succeeding partition is higher in position than the one next preceding it.

As the water is fed into the feed-tube 13 intermittently, as is usual in this class of generators, and through the means hereinafter stated, the water first enters the compartment 10, into which communication is provided by the opening 14. The water attacks the carbid located in said first compartment and decomposes it, causing gas to be evolved during the act of such decomposition. The carbid in the first compartment receives and absorbs the water introduced so long as the quantity of carbid therein is capable of absorbing it; but as soon as the water reaches the location of the slot or aperture 12 in the first slotted partition 11 the water passes to the next succeeding compartment and attacks the carbid therein to generate gas from the second body of carbid, as in the first instance. When the quantity of water passing to the second compartment is no longer fully taken up by the carbid therein, the water reaches the level of the partition at the far side of such compartment and passes through the slot or aperture 12, located at a higher elevation than the slot or aperture in the first partition. This procedure is kept up by the water in its passage from one compartment

to another as fast as the carbid in the succeeding compartments is decomposed; but until the water reaches such compartment the carbid therein is not deteriorated or consumed until the requirements of the apparatus cause the water to pass thereto, and therefore only such of the individual quantities of carbid in the compartments is attacked as is necessary to produce the quantity of gas required by the user, the remainder of the carbid retaining its full virtues until the water reaches the various compartments. The slots or apertures 12 in the partitions 11 are all located at a sufficient elevation to permit the calcium carbid to occupy a position beneath their level. By this arrangement I avoid liability of the carbid obstructing the slots or apertures, and the water in each compartment above the carbid is permitted to remain clear to pass to the next succeeding compartment.

The container 9 is removable from the chamber 7 and is provided with a bail 16, by which it may be lifted. The central water-tube 13 is preferably provided with a partition 15 at the location of the opening 14 that forms the bottom of the well therein.

The upper end of the water-seal bell 5 is apertured, (see Fig. I,) and applied to the bell surrounding its aperture is a ring 18, provided with standards 19, containing slots 20.

21 designates a gasket-seal cover, to which the water-seal bell is removably fitted. The cover 21 is provided with stop-lugs 22, adapted to bear against the standards 19 when the cover 21 is seated to the ring 18 of the bell 5. The cover 21 carries a gasket 23, that may be held thereto by a ring 24.

25 is a head formed upon the cover 21 and provided with a cavity 26, that communicates with the interior of the bell 5. The head also contains a neck 27, provided with a duct 28, that communicates with the interior of the bell 5.

29 designates a water-conveying pipe that leads to the head 25 and communicates with the duct 28 and through which water is introduced from said pipe to said duct and therefrom to fall into the funnel 17, (see Fig. I,) that is seated in the upper end of the water-tube 13. The gas generated in the apparatus passes into the cavity 26 in the neck 25 and therefrom through the gas-conveying pipe 30, that communicates with said cavity, as seen in Fig. IV. The water-pipe 29 and the gas-conveying pipe 30 both remain stationary at all times and the gasket-seal cover 21 always remains fixed to said pipes, while the generator-tank 1 and water-seal bell 5, mounted therein, are capable of being removed from beneath said cover upon the performance of the simple operation of freeing the cover from the bell 5.

The cover 21 is held to the ring 18 by a cross-bar 31, that fits in the slots 20 in the standards 19, and a set-screw 32, that passes through said cross-bar and bear upon top of the head 25. The standards 19 are equipped with a bail 33, through means of which the water-seal bell 5 may be lifted from the generator-tank when the tank and bell have been withdrawn from beneath the gasket-seal cover, and on the removal of the bell access is obtained to the carbid-container 9, and when the bell is removed from the tank the interior of the generator is completely exposed to permit cleansing or other operations.

In Figs. VI and VII, I have shown a pair of carbid-containers 9^a, one located beneath the other. These two containers are adapted for use where it is desired to obtain a greater capacity of gas production without increasing the size of the apparatus, the two containers being substantially the same in construction as that hereinbefore described, with the exception that the upper one is provided with a narrow compartment 10′, located between the last compartment 10^a and the imperforate partition 11″. The compartment 10′ contains an inclined bottom 10″, that leads to an aperture 9′ in the bottom of the upper carbid-container, that communicates with a spout 9″, through which the water passes from the compartment 10′ into the central feed-tube 13^a of the lower carbid-container when it has made the circuit of the upper container. The water then passes into the various compartments in succession in the lower container the same as in the upper one. The upper container rests upon the lower container and is supported slightly above the rim of such lower container by feet 9^e in order to permit egress of the gas generated in the lower container therefrom into the generating-chamber 7^a.

With a carbid-container constructed in accordance with my invention it is possible to feed the water to one continuous series of compartments, or to any number of independent series of compartments in which latter instance the gas generation is rendered more rapid.

In Figs. VIII and IX, I have shown the containers designated by 9^b and 9^c divided, respectively, into two and three series or divisions by the imperforate partitions 11″. In the container illustrated in Fig. VIII the water passes from the water-feed tube 13^b through the two openings 14^b into the first compartment 10^b of each series and passes therefrom, as required, through the slots or apertures 12^b, as indicated by the arrows, until it reaches the dividing imperforate partitions 11″ at the end of its course. In the instance of the container shown in Fig. IX the water passes from the water-tube 13^c, through the three openings 14^c, into each of the three divisions of the container, entering the first compartment of each series and passing therefrom through the slots or apertures 12^c in the various series, as indicated by the arrows. By these constructions the water is fed to a multiplicity of the container-compartments in unison, thereby providing for

an increased capacity in gas generation within a specific period, while the general plan of operation in the apparatus is maintained.

I have shown and described a construction whereby the water is fed into the compartments of the container in succession in the manner described; but it is possible to feed the water to all of the compartments simultaneously, and such feeding may be accomplished by removing the funnel 17 and introducing a stopper, such as shown in dotted lines in Fig. I, into the water-feed tube 13, so that the water will descend into all of the compartments at the same time. In such instance it is preferred to apply a spray-nozzle to the nipple leading from the water-inlet duct 28, as shown by dotted lines in Fig. I.

I claim as my invention—

1. In an acetylene-gas generator, the combination of a tank, a carbid-receptacle centrally positioned in said tank and separated from the walls of said tank to provide a water-well, a water-seal bell arranged to inclose said carbid-receptacle and seated in the water in said water-well, said water-seal bell being free from connection to said carbid-receptacle, and a cover supported by means outside of the generator surmounting said bell through means of which it is held depressed, substantially as described.

2. In an acetylene-gas generator, the combination with water and gas pipes, a gasket-seal cover immovably fixed to said pipes and provided with water and gas passage-ways, a water-seal bell having an open upper end and adapted to be connected to said cover, and a water-tank in which said water-seal bell is removably located, substantially as described.

3. In an acetylene-gas generator, the combination of a double-walled water-tank, a carbid-container centrally located in said tank, a water-seal bell removably mounted in said tank and having an open upper end, a gasket-seal cover immovably supported and provided with passage-ways for water and gas, and means for clamping said water-seal bell to said cover when the bell is slipped thereunder, substantially as described.

4. In an acetylene-gas generator, the combination of a water-tank, a carbid-container centrally located in said tank, a water-seal bell removably mounted in said tank and having an open upper end, slotted standards carried by said bell, a gasket-seal cover immovably supported and provided with passage-ways for water and gas therethrough, and a clamping cross-bar and screw having connection with said standards and cover and adapted to draw the open upper end of said water-seal bell to said cover, substantially as described.

5. In a gas-generator, the combination of an upper carbid-container having a central water-feed tube with a closed bottom and a series of intercommunicating compartments, said feed-tube being provided with communication into one of said compartments, one of said compartments being provided with an aperture at the bottom thereof, and a lower carbid-container having a series of intercommunicating compartments and a central water-feed tube into which the water is received from the said aperture in the upper container, substantially as described.

ALFRED C. EINSTEIN.

In presence of—
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M. P. SMITH.