

No. 637,683.

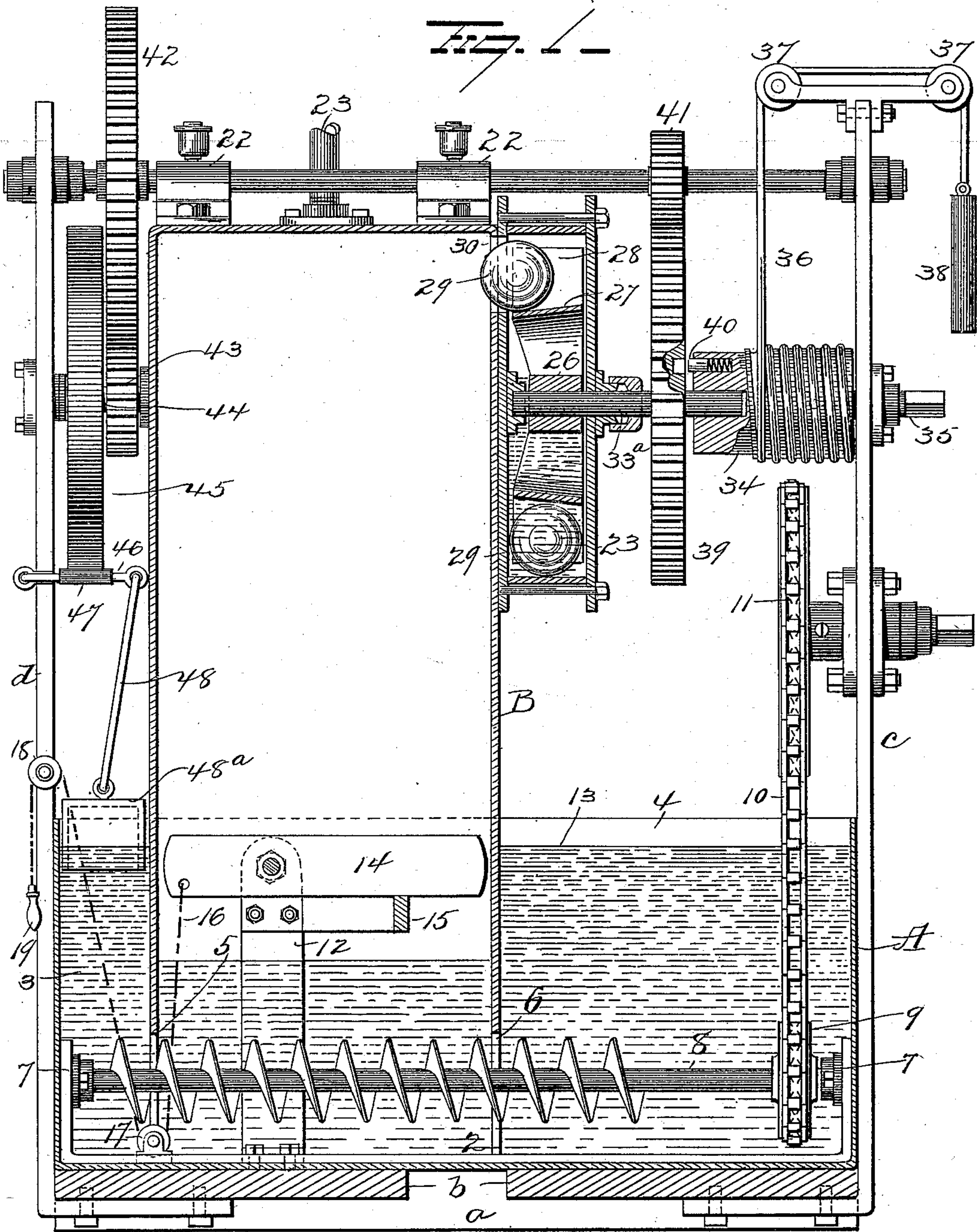
Patented Nov. 21, 1899.

T. G. TURNER.  
GAS APPARATUS.

(Application filed Apr. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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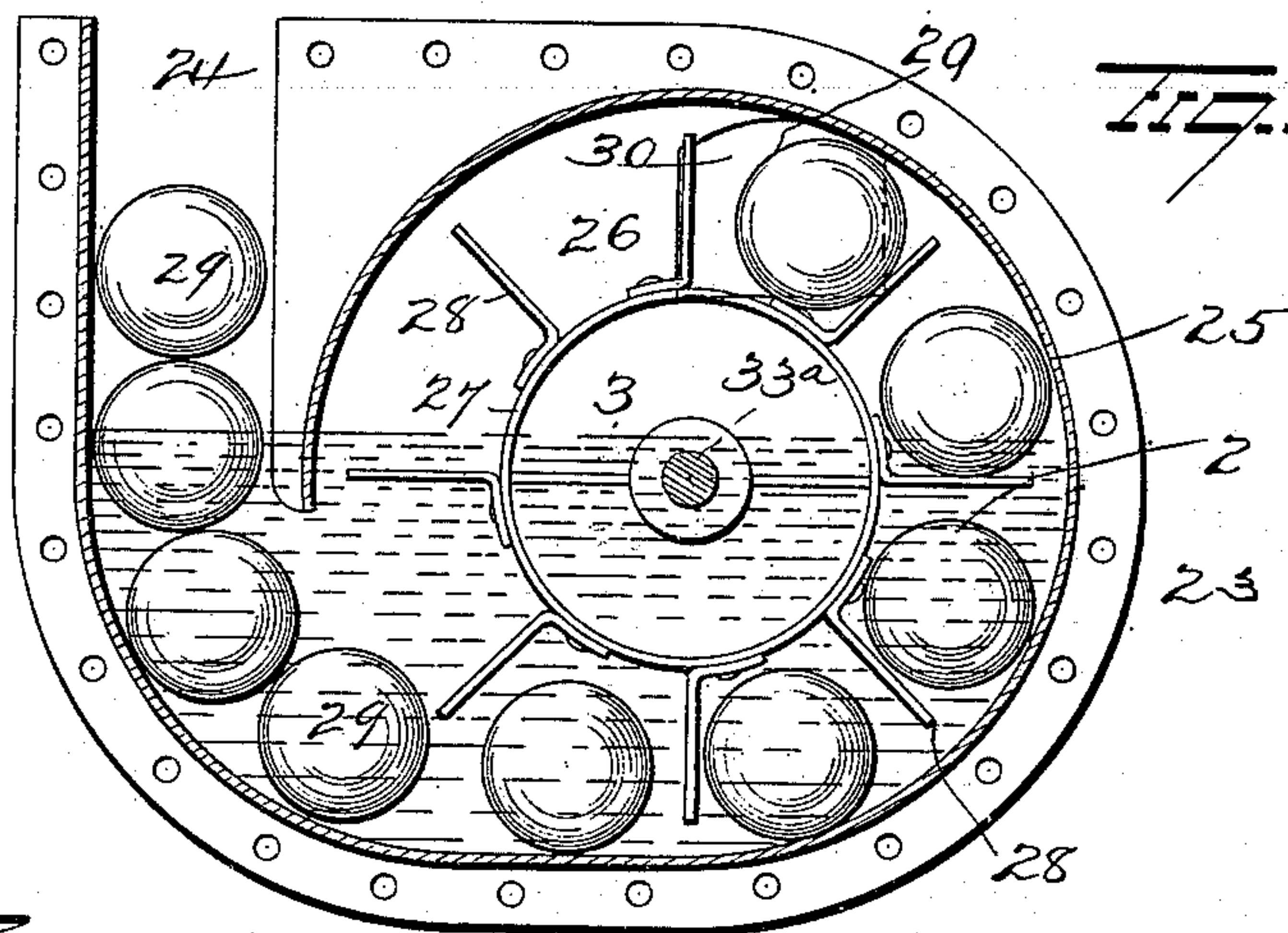


FIG. 3.

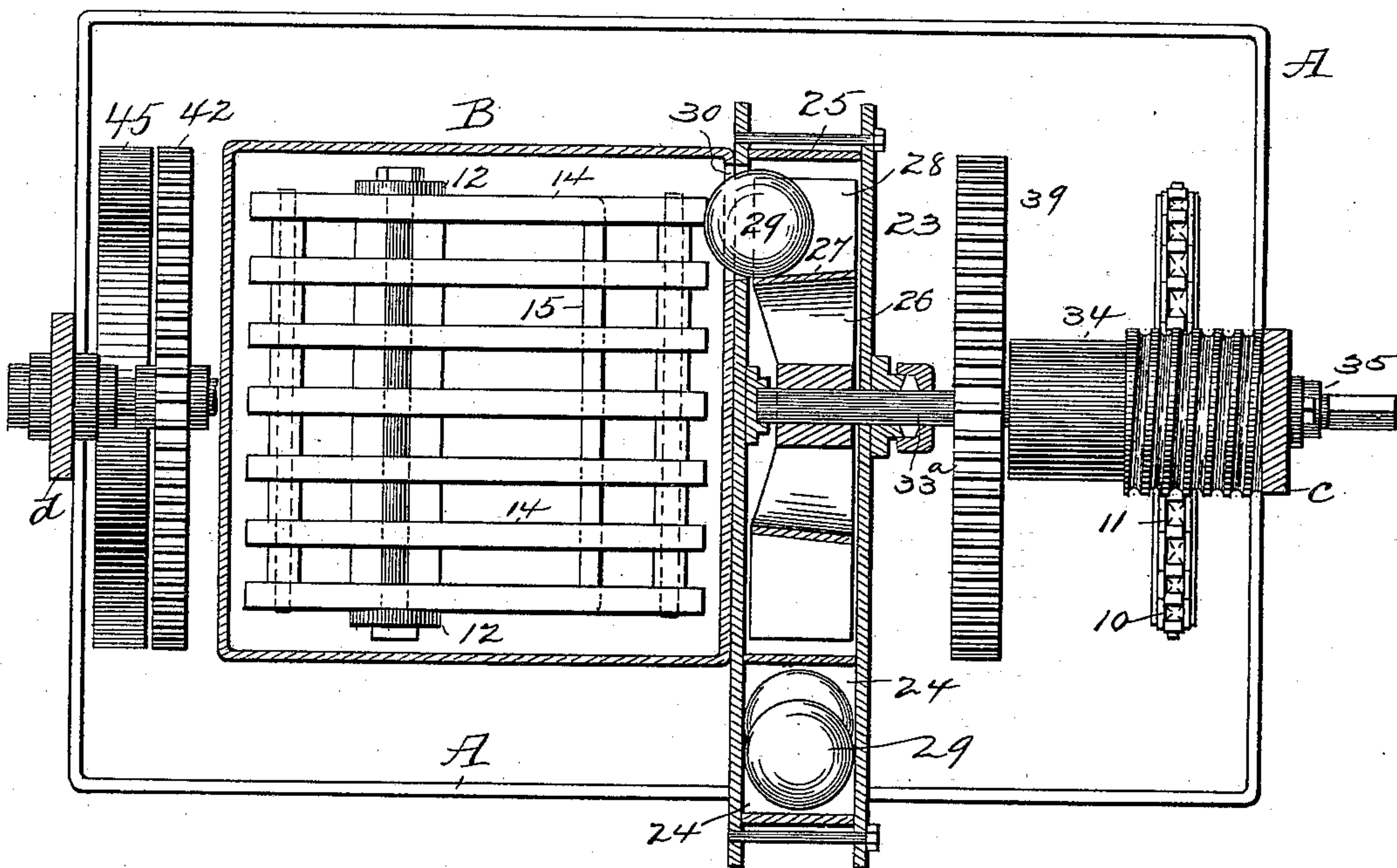
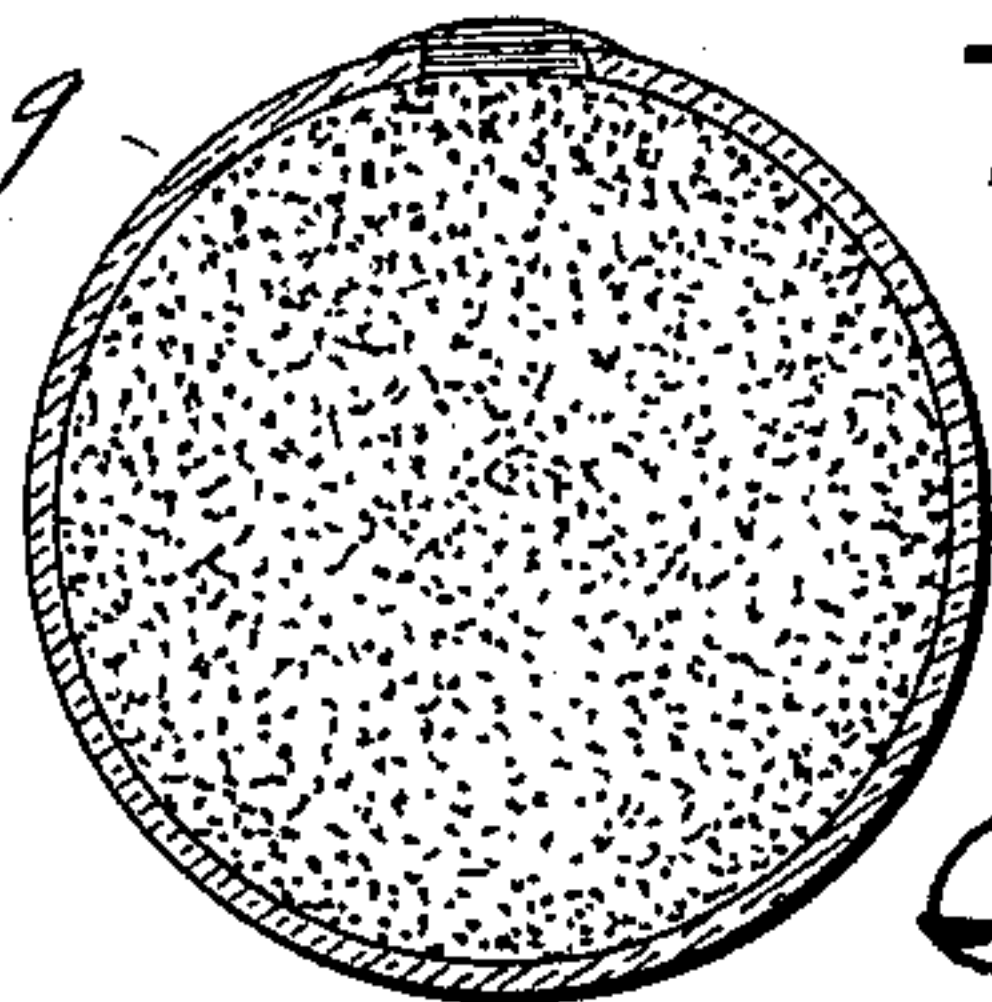


FIG. 4.

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# UNITED STATES PATENT OFFICE.

THOMAS G. TURNER, OF NEW YORK, N. Y.

## GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 637,683, dated November 21, 1899.

Application filed April 27, 1899. Serial No. 714,735. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS G. TURNER, of New York, in the county of New York and State of New York, have invented certain new  
5 and useful Improvements in Gas Apparatus; 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  
10 the same.

My invention relates to an improvement in gas apparatus, and more particularly means for generating acetylene gas.

Heretofore much difficulty, waste, and annoyance have been occasioned in the manufacture of acetylene gas on account of the premature decomposition of the calcium carbide employed in the process of generation and the consequent escape of the gas. It has been  
15 proposed to feed the carbide to the water through the medium of valved hoppers, movable buckets or receptacles, and other discharging means; but with such constructions the mounting of the movable discharging appliances cannot be made sufficiently tight to prevent the escape of gas from the generator and still allow the automatically-operated devices by means of which the discharging means are manipulated to accurately perform  
20 their functions with a necessary degree of certainty. Furthermore, in handling the carbide to transfer it from the original packages to the apparatus and depositing it into the hoppers of the discharging devices the carbide will be attacked by the moisture contained  
25 in the atmosphere and be slaked to a greater or less extent, causing it to set free the gas, to discomfort and injury of the manipulators and loss to the operator of the plant; and, again, the handling, storage, and shipment of calcium carbide are attended with much danger on account of fire, and for this reason insurance companies have refused to permit the use of acetylene-gas apparatus on insured  
30 property and railroads have refrained from assuming the great risk arising from the dangers incident to the handling of calcium carbide.

It is the object of my invention to obviate  
35 all of these dangers and annoying difficulties by providing appliances with the use of which

the calcium carbide will be tightly inclosed from the time of packing for shipment until it is subjected to the action of water in the generator.

A further object is to provide appliances  
55 for feeding carbide into a generator by means of which the premature and also the subsequent escape of gas will be prevented.

A further object is to provide devices for  
60 feeding carbide to a receptacle which shall be automatic in their operation and which shall avoid all possibility of leakage of gas without depending upon closely-fitting packing devices between moving parts.

A further object is to so construct apparatus for the manufacture of acetylene gas that the carbide will be liberated from its container automatically and entirely after it shall have been deposited into the generator.

A further object is to so construct appliances for making acetylene gas that the carbide will be automatically liberated by the mutilation of its container upon its arrival within the generator.

A further object is to produce apparatus for manufacturing acetylene gas which shall be simple in construction, safe and automatic in operation, and effectual in all respects in the performance of its functions.

With these objects in view the invention consists in the combination of a tank or receptacle and means for liberating the whole of a charge of gas-producing material immediately after its arrival within the tank or receptacle.

The invention further consists in the combination, with a generator-tank and a fragile carbide-container, of means for automatically mutilating said container after it shall have  
90 entered said tank or receptacle.

The invention further consists in a gas apparatus comprising a tank or receptacle, a fragile container for producing material, and means within the tank or receptacle for breaking  
95 said container to liberate its contents.

The invention further consists in the combination, with a tank or receptacle and sealed fragile devices containing carbide, of a feeding device for such containers, means for controlling the operation of the feeding devices, and means within the tank or receptacle for  
100



breaking said containers immediately after they shall have been discharged into the tank or receptacle.

The invention further consists in the combination of a tank or receptacle, fragile devices containing carbid, a feed device for said fragile devices, means for breaking said fragile devices, and a water seal through which said fragile devices pass for preventing the escape of gas through the feed device; and the invention also consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional view of an apparatus embodying my improvements. Fig. 2 is an enlarged view showing the feed-wheel, its casing, and water seal. Fig. 3 is a horizontal sectional view. Fig. 4 is a detail sectional view of one of the fragile containers.

A represents a basin, preferably rectangular in form and disposed upon a base 1, composed of slats or boards *a b*. A vertically-disposed generator-tank B (preferably square in cross-section) is disposed at its lower open end within the basin A, a short distance from one end thereof, and rests upon a plate 2, secured in the bottom of the basin. The tank B thus forms within the basin a comparatively small chamber 3 and a larger chamber 4, the interior of the tank communicating with the former through an opening 5 and with the latter by means of an opening 6. The ends of the plate 2 are bent up alongside the end walls of the basin and serve to support bearings 7 for the journals of a screw conveyer 8, extending practically from end to end of the basin and through the openings *a b* of the tank, by means of which ash and broken particles of the carbid-containers can be withdrawn into the chamber 4 of the basin, wherefrom they can be readily removed. To provide ready means for operating the conveyer, the shaft thereof may be provided with a sprocket-wheel 9, to which motion may be imparted by a chain 10 from a larger sprocket-wheel 11, mounted in a standard *c*, which projects upwardly from one end of the basin, and said last-mentioned wheel can be readily rotated by means of a crank or key attached to the projecting end of the journal thereof.

Uprights 12 are secured to the bottom of the basin and project upwardly within the lower end of the tank B, the upper ends of said uprights terminating a short distance above the normal water-line 13. The uprights 12 are spaced apart a distance about equal to the diameter of the tank and serve to pivotally support a grate 14, upon which the fragile containers of carbid fall and by means of which said containers are broken or mutilated in a manner hereinafter more fully explained. The grate consists of a frame comprising a series of parallel bars spaced apart, and said grate or frame is pivotally supported to one side of its center by the up-

rights 12, so that the preponderance of weight of the grate will be to one side of its pivotal support. The grate, however, is normally supported in a horizontal position by means of a bar 15, disposed under the heavier part thereof and secured at its ends to the uprights 12. A chain 16 or similar flexible device is attached at one end to the shorter end of the grate and extended downwardly to the bottom of the basin, where it passes over a pulley 17, then through the opening 5, and then extended upwardly through the chamber 3, and finally over a pulley 18 at the edge of the basin, and provided at its free end with a knob 19. By means of the chain 16 the grate may be shaken to dislodge any fragments of the broken carbid-containers or of carbid.

A standard *d* is located at the end of the basin opposite the standard *c*, and said standards are bent inwardly under the base and secured thereto. The standards *c d* project upwardly slightly above the closed upper end of the generator-tank B and are provided at their upper ends with bearings for the ends of a shaft 21, said shaft also having bearings in journal-boxes 22, located on the top of said tank. The shaft 21 serves to hold the tank B firmly down upon its seat in the bottom of the basin and also serves for other purposes which will be fully explained farther on.

A feed-receptacle 23 is secured to one side of the generator-tank and provided with an inlet-chute 24 for carbid-containers, the body portion of said feed-receptacle having a circular periphery 25. A feed-wheel 26, having an inwardly inclining or beveled periphery 27, is mounted centrally within the feed-receptacle and provided with a series of radial arms 28, which project from the periphery of the wheel and cooperate with each other and with the peripheral wall of feed-receptacle to form a series of pockets for the reception and conveyance of the carbid-containers 29. At 30 the inner wall of the feed-receptacle and the wall of the generator-tank are made with aligned inlet-openings through which the carbid-containers are discharged into the generator. Each carbid-container 29 is made of glass or other fragile or frangible material, into which the calcium carbid is packed at the place of manufacture and hermetically sealed, so that the carbid can be transported from the place where it is made to the place of consumption without possibility of being deteriorated or in anywise affected by atmospheric moisture, during transit or when being handled in charging a generator. When one of the fragile containers arrives at the inlet 30, it will roll laterally off the inclined periphery of the feed-wheel and drop into the generator-tank. The container will fall upon the grate near the bottom of the tank just over the water and be broken or mutilated, thus immediately liberating its entire contents of carbid, and permit carbid to drop through the grate and be discharged onto the water and result in



the generation of acetylene gas in a manner well understood. The gas thus generated will rise within the tank B and will be conveyed by a suitable pipe 33 to a place of consumption.

In order to prevent possibility of escape of gas through the feed devices, the feed-receptacle is supplied with water so that the level thereof will be above the lower end of the inlet-chute, the level of the water being preferably located as indicated at *z*. A water seal is thus formed, and through it the carbid-containers pass on their way to the generator.

It is desirable to render the discharge of the carbid-containers into the tank B automatic and commensurate with the diminution of the gas-pressure in said tank. For this purpose the devices now to be described will be employed.

The spindle 33<sup>a</sup> of the feed-wheel is extended some distance beyond its bearing and projects into a drum 34, so as to form one bearing for the latter. The other bearing for the drum consists of a spindle 35, secured to the drum and mounted in the standard *c*. The drum is grooved for the reception of a cord or chain 36, one end of which is secured thereto. The cord or chain 36 is passed over pulleys 37 and provided at its free end with a weight 38 for driving the drum. A gear-wheel 39 is secured to the spindle 33<sup>a</sup> between the drum and the feed-receptacle and is provided in one face with a socket for the reception of a spring-actuated dog 40 on the drum, so that the gear-wheel will be propelled in one direction by the drum, but so that the drum can be turned (by the application of a key to the spindle 35) in the other direction to wind the weighted cord without turning said gear-wheel. The gear-wheel 39 meshes with a pinion 41 on the shaft 21, and said shaft is provided near its opposite end with a gear-wheel 42, which transmits motion to a pinion 43, secured to a short shaft 44. The shaft 44 is mounted in boxes secured to the standard *d* and the generator-tank B and has secured to it a friction-wheel 45. Just below the friction-wheel a brake-arm 46 is pivotally attached to the standard *d* and provided with a brake-shoe 47. A rod 48 is attached to the free end of the brake-arm 46, and the lower end of said rod is connected with a float 48<sup>a</sup>, disposed on the water in the narrow chamber 3 of the basin. The gearing is preferably so timed that the feed-wheel will move the width of one pocket during two revolutions of the friction brake-wheel. The feed-wheel may be conveniently made with eight pockets, and when constructed of that size it will make one complete revolution to sixteen revolutions of the friction or brake wheel. From the construction and arrangement of parts above described it will be seen that the pressure of gas within the generator-tank upon the water will cause a displacement of the water in the basin, and thus cause the float to rise and

press the brake-shoe against the friction-wheel, so as to hold the feed mechanism at rest. When the pressure of gas in the generator-tank diminishes, the water-level in the basin will descend, thus permitting the float to move downwardly and in consequence remove the pressure of the brake-shoe from the friction-wheel, thereby releasing the latter and permitting the motor devices to turn the feed-wheel and discharge a sealed charge of carbid into the generator-tank, wherein the carbid-container will be promptly mutilated by contact with the grate and the carbid liberated, as before described. The coöperation of the fresh charge of carbid with the water will replenish the depleted gas-pressure in the generator and the feed mechanism will be stopped by the application of the brake, as previously explained.

Numerous slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details herein set forth.

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

1. The combination with a tank or receptacle and a fragile carbid-container, of means for automatically mutilating said container after it shall have entered said tank or receptacle.

2. A gas apparatus comprising a tank or receptacle, a fragile container for gas-producing material and means within the tank or receptacle adapted to receive said container after it shall have entered the tank or receptacle and break it to liberate its contents.

3. The combination with a tank or receptacle and sealed fragile devices containing carbid, of a feeding device for said fragile devices and means in the tank for breaking said fragile devices when they are discharged into the tank.

4. The combination with a tank and sealed fragile devices containing carbid, of a feeding device for said fragile devices, means for automatically controlling said feeding device and means within the tank for breaking the fragile containers as they are fed into the tank.

5. The combination of a tank, fragile devices containing carbid, a feed device for the fragile containers, means in the tank for breaking said fragile containers and a liquid seal in the feed device, through which said containers pass.

6. The combination in an acetylene-gas apparatus of a tank, a breaker therein, and impervious fragile devices containing carbid adapted to be discharged upon the breaker in the tank.

7. The combination in an acetylene-gas apparatus, of a tank a breaker therein, sealed impervious fragile devices containing carbid



and means for feeding said impervious devices to the upper part of the tank and permit them to drop upon the breaker.

8. The combination in an acetylene-gas apparatus, of a tank, a grate or breaker therein, a feed device, a water seal in the feed device and hermetically-sealed glass devices containing carbid adapted to be passed through said water seal by the feed device and dropped upon the grate or breaker in the tank.

9. The combination in a gas apparatus, of a generator-tank, a float-chamber communicating directly therewith, a feed device, a friction-brake, a float in the float-chamber connected with said brake, a motor for the feed device and gearing between the motor and brake.

10. The combination in a gas apparatus, of a generator-tank, a feed device, a motor for the feed device, a friction-brake, gearing between the motor and brake, and means actuated by gas-pressure within the generator for applying said brake.

11. In an acetylene-gas apparatus, the combination with a generator-tank, of a feed-wheel having pockets with bottoms beveled toward the generator, said generator having an inlet-opening for the passage of charges of carbid from the pockets of the feed-wheel.

12. In an acetylene-gas apparatus, the combination with a generator-tank, fragile carbid-containers and means for feeding said containers to the tank, of a grate in the tank for breaking said containers as they are fed into the tank and means for shaking said grate.

13. In an acetylene-gas apparatus, the combination with a generator-tank, of a grate pivotally supported to one side of its center in said tank, a support for the heavier side of said grate, a flexible device attached to said grate for shaking it and fragile carbid-containers adapted to be discharged upon said grate.

14. In a gas apparatus, the combination of a basin, a generator-tank having its lower end open and seated in said basin, standards extending upwardly from the ends of the basin and a shaft connecting the upper ends of said standards and serving to hold the tank in place in the basin.

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

THOMAS G. TURNER.

Witnesses:

R. S. FERGUSON,  
C. S. DRURY.