

No. 725,198.

PATENTED APR. 14, 1903.

D. BARNARD.  
ACETYLENE GAS APPARATUS.  
APPLICATION FILED JULY 16, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 4.

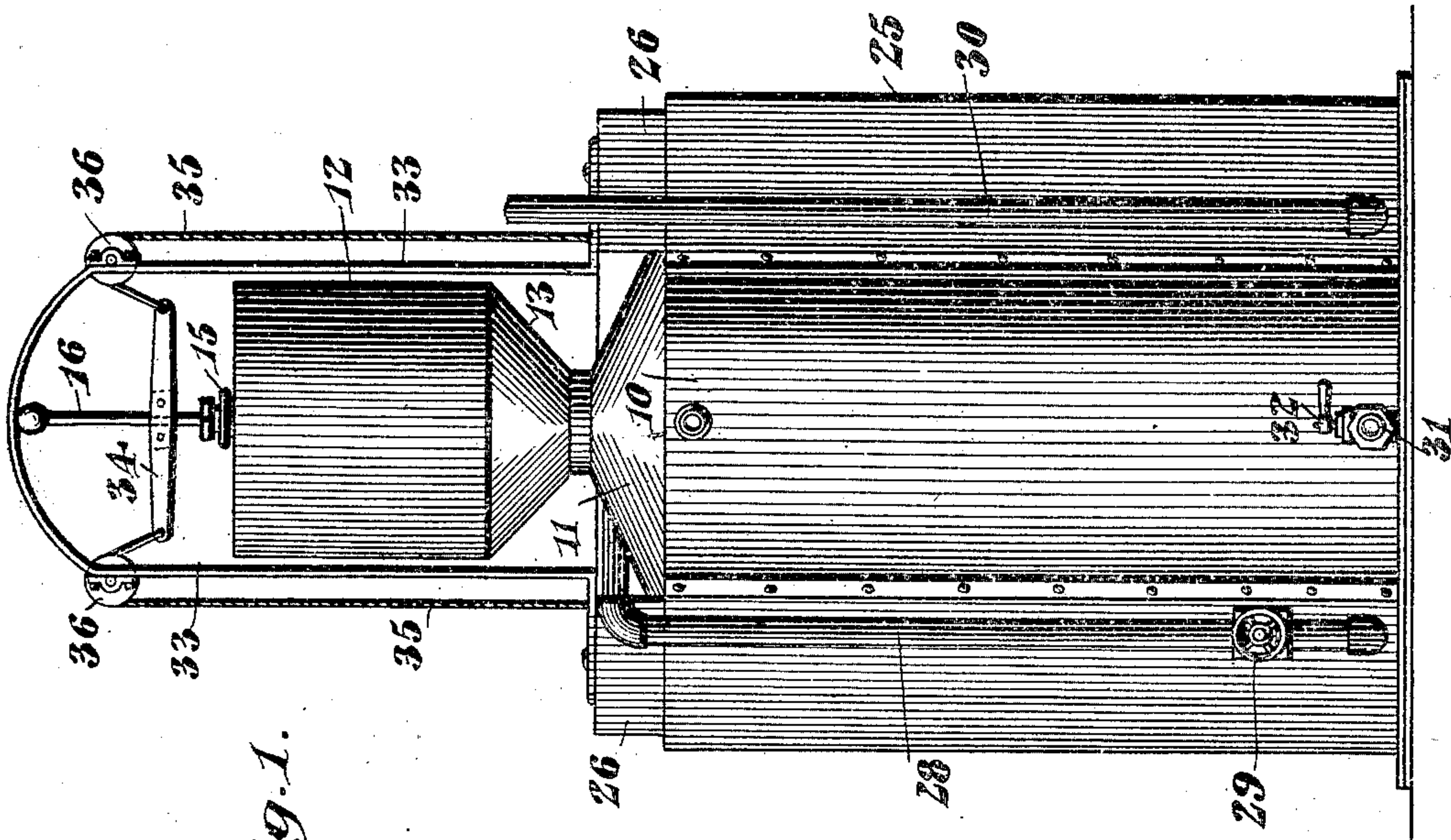
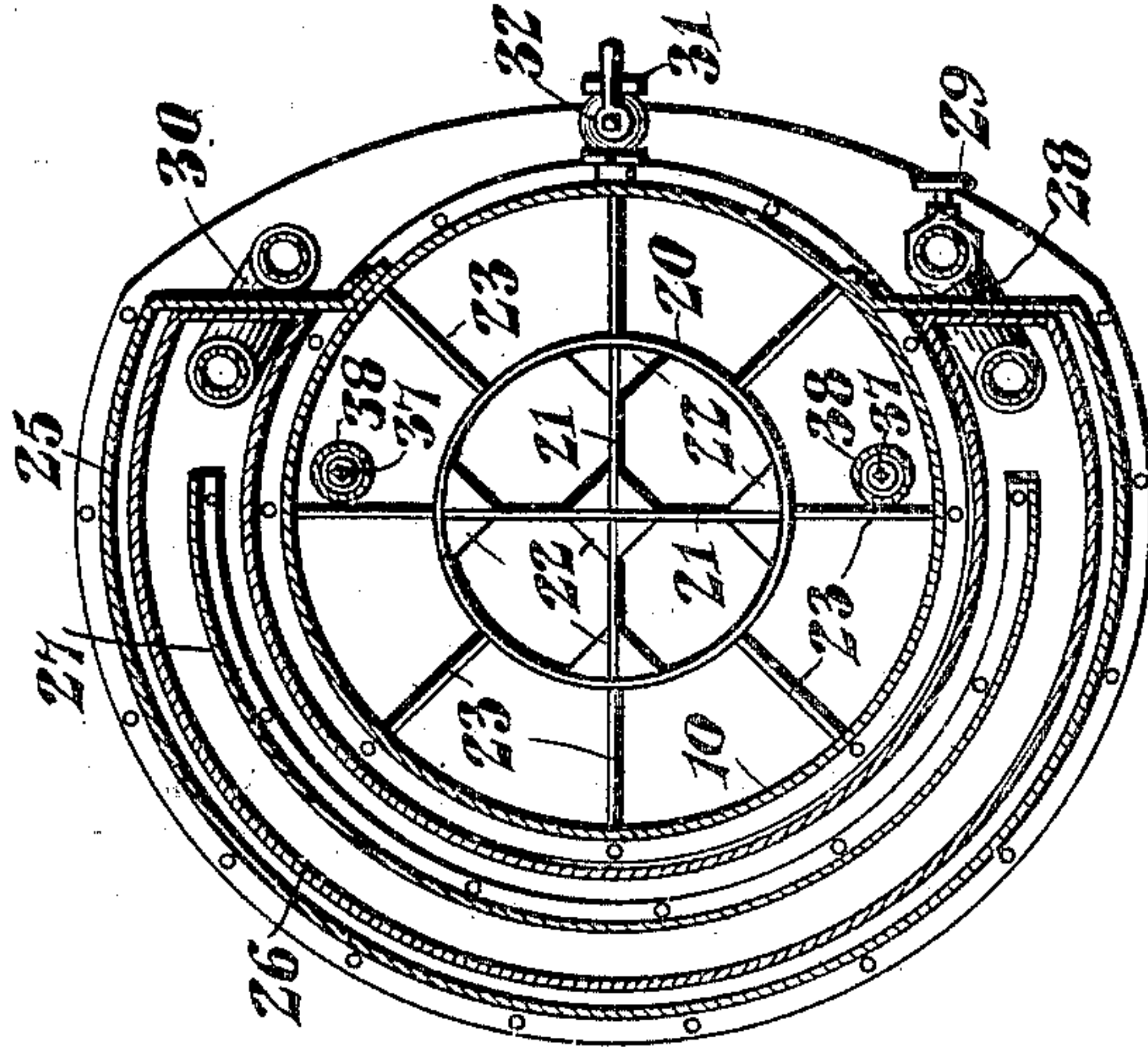


Fig. 1.

Davis Barnard, Inventor

By

*B. G. Siggers*

Attorney

Witnesses  
*Jas. E. McLathran*  
*B. G. Foster*

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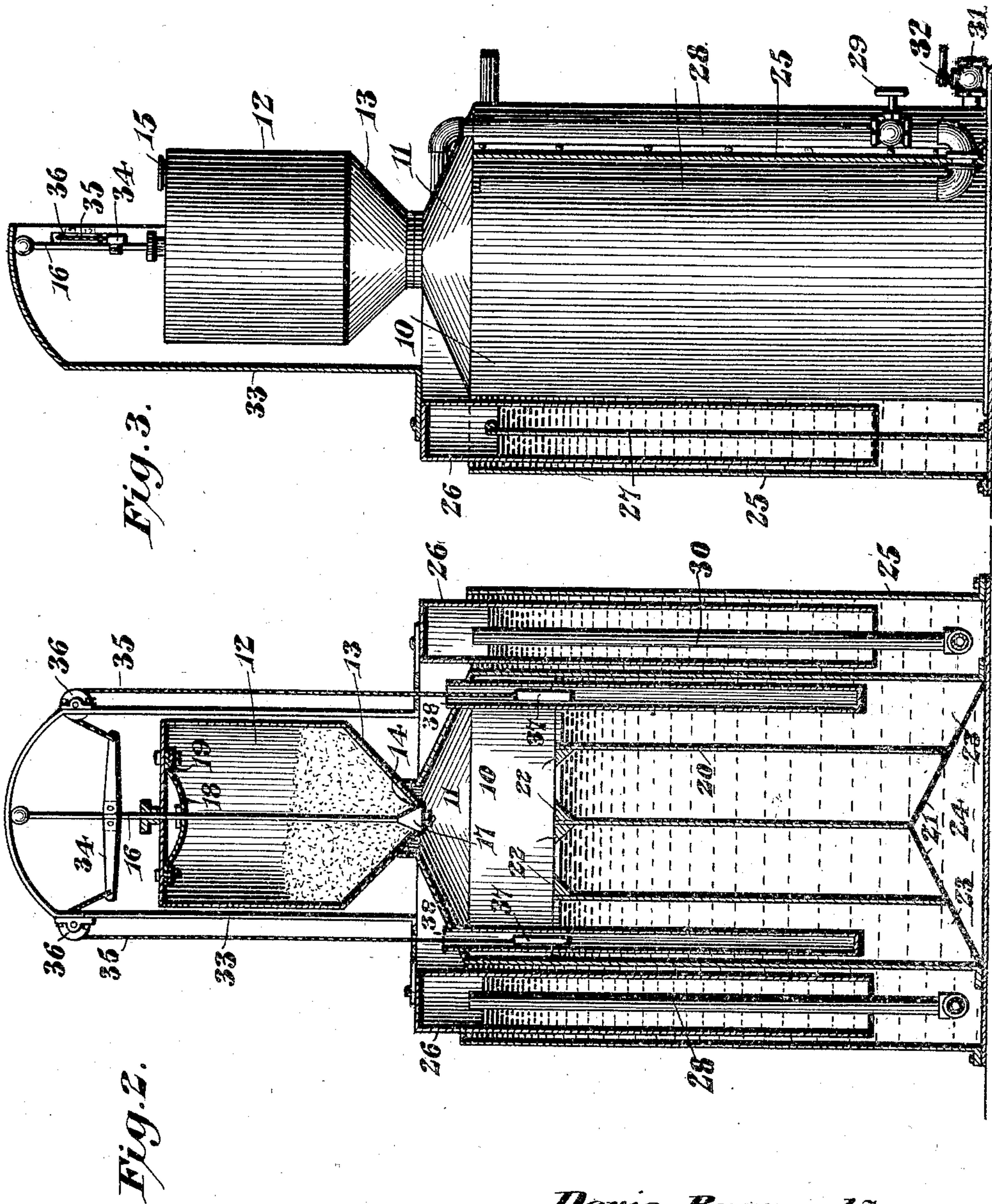
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2 SHEETS—SHEET 2.



*Davis Barnard, Inventor*

By

*B. G. Siggers*

Attorney

Witnesses  
*Jas. E. McArthur*  
*B. G. Foster*



# UNITED STATES PATENT OFFICE.

DAVIS BARNARD, OF BAKERSFIELD, CALIFORNIA, ASSIGNOR TO DAVE BARNARD & CO., OF BAKERSFIELD, CALIFORNIA.

## ACETYLENE-GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 725,198, dated April 14, 1903.

Application filed July 16, 1902. Serial No. 115,839. (No model.)

*To all whom it may concern:*

Be it known that I, DAVIS BARNARD, a citizen of the United States, residing at Bakersfield, in the county of Kern and State of California, have invented a new and useful Acetylene-Gas Apparatus, of which the following is a specification.

This invention relates to acetylene-gas generators, and more particularly to that class in which the calcium carbide is fed to the water.

The primary object of the invention is to provide a structure especially applicable for use upon cars and other moving vehicles; and to this end it is so constructed that the swash of the water due to the swaying of such vehicles is prevented, while the structure is very compact and occupies comparatively little space.

The preferred form of construction is illustrated in the accompanying drawings, wherein—

Figure 1 is a view in elevation of the improved apparatus. Fig. 2 is a longitudinal sectional view through the same. Fig. 3 is a sectional view taken at right angles to that shown in Fig. 2, the gas-generator being shown in elevation. Fig. 4 is a horizontal sectional view through the apparatus.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

In the embodiment of the invention as shown a generator is employed comprising a cylindrical generating-chamber 10, having a conical top 11, upon which is secured a carbide-reservoir 12, the bottom 13 of which is tapered and has communication with the generating-chamber by means of a central opening 14. The reservoir has a suitable filling-opening closed by a plug 15, and it is, furthermore, provided with a central opening, through which is passed the vertically-sliding stem 16 of a cone-shaped valve 17, that controls the feed-opening 14. In order to prevent the escape of gas, a diaphragm 18 is secured to the valve-stem 16 within the carbide-reservoir, this diaphragm being attached to the top of the reservoir and held in place by a metallic collar, as 19.

Within the generating-chamber there is ar-

anged a cylindrical partition 20, spaced from the walls of said generator and extending slightly above the water-line, but terminating short of the top of said chamber. Radial partitions 21 are disposed within the cylindrical partition, and inclined triangular blocks 22 are arranged in the angles formed by and are secured to said partitions, these blocks being located at the upper ends of the partitions. Other radially-disposed partitions 23 extend from the cylindrical partition 20 to the side walls of the chamber. These partitions are all of the same height and their lower ends terminate short of the bottom of the chamber to provide an open space, as 24. (Clearly shown in Fig. 2.) As a result the generating-chamber is subdivided into a plurality of small open-ended compartments, which divide the body of water and prevent the swash of the same.

The gasometer partially surrounds the generator and comprises a water-tank 25 of arcuate shape, as shown in Fig. 4, and a similarly-shaped gas-bell 26, movably arranged in said water-tank. A curved partition 27 is arranged within the water-tank, being spaced from the opposite walls thereof and terminating short of the ends of the tank. This partition is secured to the bottom of said tank and terminates short of the top thereof. The purpose of the partition is to divide the body of water, and thus prevent its free movement when the machine is swayed. The gas is conducted from the generating-chamber to the gasometer by means of a substantially U-shaped pipe 28, one end of which is in communication with the upper end of the generating-chamber, the lower portion or bend passing through the wall of the water-tank and the other end extending above the top of the water-level in said tank. The passage-way through this pipe is controlled by a suitable valve, as 29. A supply-pipe 30 leads from the opposite portion of the gasometer, this pipe being also substantially U-shaped, one end being disposed vertically within the gasometer, the other end being arranged exterior of the same and connected with the gas-main. A residue-discharge 31 is connected with the lower portion of the generating-



chamber below the lower edges of the partitions, this discharge being controlled by a valve, as 32.

The valve-actuating mechanism will now be described. A hood 33, secured to opposite portions of the gas-bell 26, partially covers the carbid-reservoir 12 and is arranged to contact with the upper end of the valve-stem 16 when said gas-bell is lowered. A cross-arm 34 is secured to the exposed end of the valve-stem, and cords 35, attached to the ends of this cross-arm, pass over pulleys 36, journaled upon opposite portions of the hood, the free ends of these cords carrying weights 37, which are preferably arranged in suitable wells 38, depending within the generating-chamber.

The operation of the apparatus is substantially as follows: When the gas-bell lowers by reason of the exhaustion of gas therefrom, the hood will be brought into contact with the valve-stem, thereby depressing the valve and permitting the carbid to gravitate into the generating-chamber. This carbid coming into contact with the water in said chamber will form acetylene gas, which, passing through the pipe 28, will be thereby conducted into the gasometer. The pressure will cause the bell to rise, carrying the hood out of engagement with the valve-stem, whereupon the valve will immediately close by reason of the weights. As the gas is used the gas-bell will again lower and the operation be repeated. It will be observed that a large body of water is located directly beneath the carbid, though this water is contained in small compartments, which dividing the volume will prevent swash or spattering, thus preventing the wetting of the valve. The residue from the carbid can gravitate through the water to the lower chamber 24, where it may be readily removed by opening the valve 32. It will therefore be seen that the apparatus is especially applicable for use on cars and other bodies which are swayed back and forth, for, as already described, the movement of the water in both the generator and gasometer is to a great extent prevented. In the gasometer this is due to the curvature of the water-tank and the partition therein, for as the water in its movement naturally attempts to follow straight lines and there being no such lines of any great length in the tank very little movement of water can take place before the position of the apparatus will be changed. In the generator the body of water is more compact and necessarily greater. A cylindrical partition, as 20, by itself would still permit the movement of comparatively large amounts of water in every direction. In like manner straight lines of considerable length could be drawn were radial partitions alone used. By the combination shown, however, the body of water is subdivided in such a manner that the objections are to a great extent overcome. At the same time the partitions do not interfere with the successful operation of the generator,

for as they radiate from a line directly beneath the discharge of the carbid said carbid will gravitate into a plurality of the chambers or compartments, this general distribution being, furthermore, assisted by the shape of the valve. Another advantageous feature to be noted is the employment of the blocks 22 in the upper ends of the angles formed by the partitions. As is well known, waves of water rushing into tapering channels pile up and constitute what are technically known as "bores," which accumulate tremendous force. During the swaying of the apparatus practically the same action takes place on a small scale in the inner compartments of the generator, wherein the partitions are necessarily located at acute or right angles. The force thus created would throw the water to a considerable height, thus wetting the valve and portions of the walls thereabout were it not for the blocks which check the upward rush and direct the water toward the center of the chamber. The use of weights in the manner shown and described is also advantageous. If a coiled spring were employed about the valve-rod 16 to maintain the valve in closed position, it will be evident that a downward jar would tend to compress said spring and allow the valve to open. By employing the weights, however, such jars will likewise be delivered to them, and the effect will be to more securely hold the valve closed. The wells in which the weights are located serve as guideways which prevent the same swinging about and throwing the cords or cables off their pulleys.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In gas apparatus, the combination with a generating-chamber, of a carbid-reservoir located above and having communication with an intermediate portion of the top of the generating-chamber, and an upright swash-preventing partition located within the generating-chamber and forming separate water-compartments therein, said partition having its upper edge located in a vertical plane that intersects said communication, whereby carbid fed therethrough will pass into the various compartments.

2. In gas apparatus, the combination with a generating-chamber, of a carbid-reservoir located above and having communication with an intermediate portion of the top of the generating-chamber, and upright swash-preventing partitions located within the generating-



chamber and forming separate compartments therein, said partitions being located in intersecting relation and having their line of intersection located directly beneath said communication, whereby carbid fed there-through will pass into the various compartments.

3. In gas apparatus, the combination with a generating-chamber, of a carbid-reservoir located above the generating-chamber, a passage-way leading from the reservoir to the top of the generating-chamber, a plurality of upright radially-disposed partitions located in the chamber and forming separate compartments therein, the line of convergence of said partitions being located directly beneath the passage-way, and a depending cone valve controlling the passage-way.

4. In gas apparatus, the combination with a cylindrical generating vessel, of a carbid-reservoir located above and having communication therewith, a valve controlling said communication, a cylindrical partition arranged within the generating vessel in spaced relation to the walls thereof, and radial partitions extending from a line directly beneath the reservoir communication, said partitions being attached to the cylindrical partition.

5. In gas apparatus, the combination with a gas-generator including a generating-chamber, of a gasometer comprising a water-tank partially surrounding the generating-chamber, a partition arranged within the tank, said partition conforming to the shape of and spaced from the side walls of the water-tank, and a gas-bell movable in the water-tank and having its walls located on opposite sides of the partition.

6. In gas apparatus, a water-chamber, a plurality of partitions located within the chamber and subdividing the same into a plurality of compartments the upper ends of which are open, and blocks secured to the side faces of the upper portions of the partitions.

7. In gas apparatus of the character described, a generating-chamber, a cylindrical partition arranged within the chamber and spaced from the walls thereof, radial partitions located within the cylindrical partition and secured to the side walls thereof, and other radially-disposed partitions extending from the cylindrical partition to the side walls of the chamber, all of said partitions terminating short of the top and bottom of the chamber.

8. In gas apparatus of the character described, a generating-chamber, a cylindrical partition arranged within the chamber and spaced from the walls thereof, radial partitions located within the cylindrical partition and secured to the side walls thereof, other radially-disposed partitions extending from the cylindrical partition to the side walls of the chamber, all of said partitions terminating short of the top and bottom of the cham-

ber, and blocks located in the angles formed by said partitions.

9. In gas apparatus of the character described, the combination with a gas-generator including a generating-chamber, a carbid-reservoir having communication therewith, and a valve controlling said communication and having a stem projecting above the reservoir, of a gasometer including a movable gas-bell, a hood rigidly secured to the gas-bell and extending over the generator, said hood being movable into engagement with the valve-stem, a pulley attached to the hood, a cord secured to the valve-stem and running over the pulley, and a weight attached to the cord.

10. In gas apparatus of the character described, the combination with a gas-generator including a generating-chamber, a carbid-reservoir communicating therewith, and a valve controlling said communication and having a stem projecting above the generator, of a gasometer extending about the generator and including a movable gas-bell, a hood secured at its ends to the bell on opposite sides of the generator, said hood extending over the carbid-reservoir and being movable into engagement with the valve-stem upon the downward movement of the gas-bell, pulleys journaled upon the opposite portions of the hood, a cross-arm attached to the valve-stem, cords secured to the ends of said arm and passing over the pulleys, and weights attached to the ends of the cords.

11. In gas apparatus, the combination with a gas-generator including a generating-chamber, a carbid-reservoir having communication therewith, and a valve controlling said communication and having an exposed stem, of a gasometer including a movable gas-bell having a portion movable into engagement with the stem of the valve, a pulley attached to the gasometer, a cord or cable secured to the valve-stem and passing over the pulley, a weight fastened to the cord, and means for preventing the swinging of said weight.

12. In gas apparatus, the combination with a gas-generator including a generating-chamber, a carbid-reservoir having communication therewith, and a valve controlling said communication and having a stem projecting above the reservoir, of a gasometer including a movable gas-bell, a hood secured to the gas-bell and extending over the generator, said hood being movable into engagement with the valve-stem, a pulley attached to the hood, a cord secured to the valve-stem and running over the pulley, a weight attached to the cord, and a well located upon the apparatus and comprising a guideway in which the weight slides.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

DAVIS BARNARD.

Witnesses:

T. V. DOUB,  
W. D. YOUNG.