No. 716,933. Patented Dec. 30, 1902.

A. S. PHELPS, JR.

ACETYLENE GAS GENERATOR.

(Application filed Mar. 10, 1902.)

(No Model.) 3 Sheets—Sheet 1.

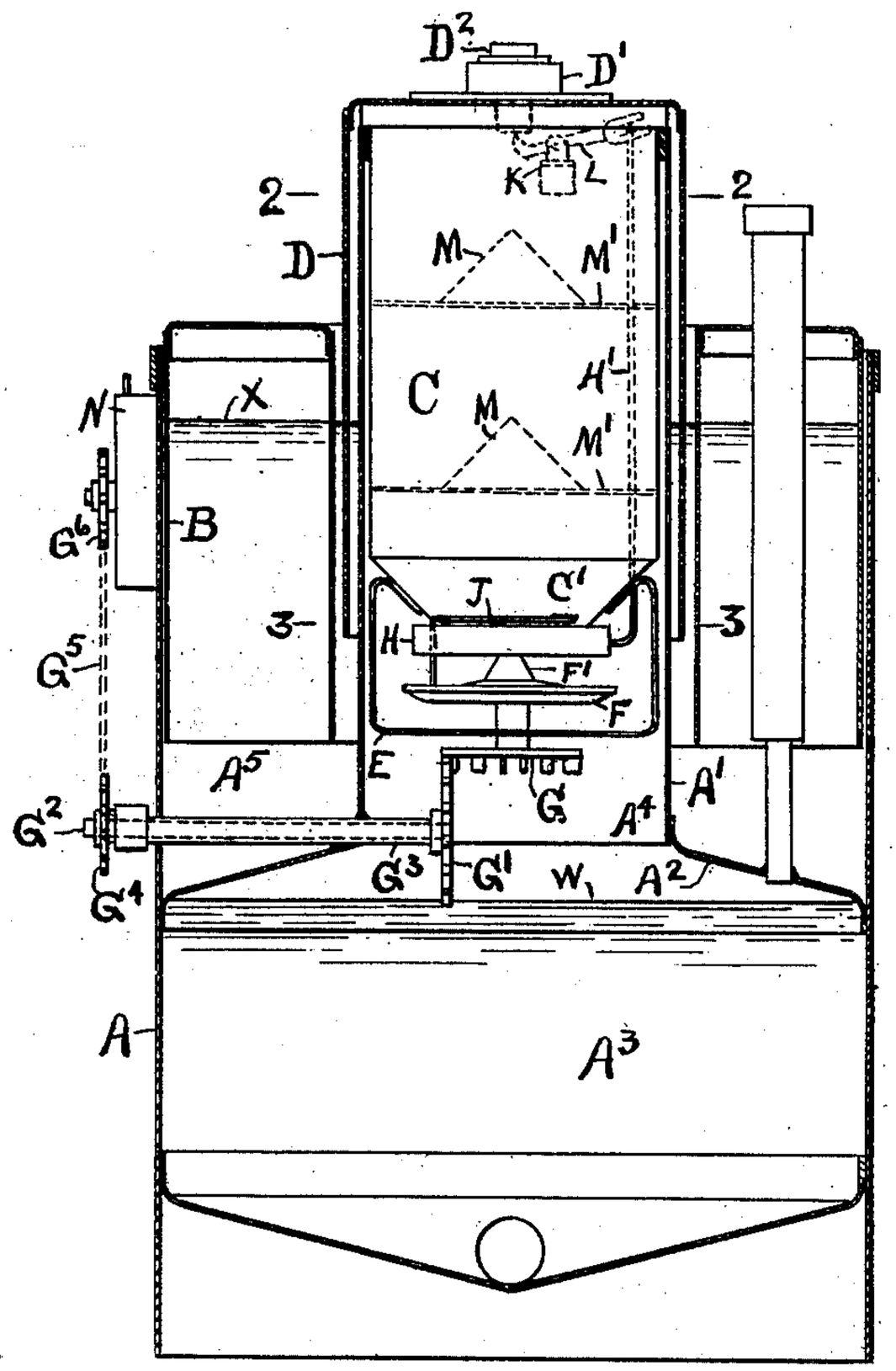

FIG. 1.

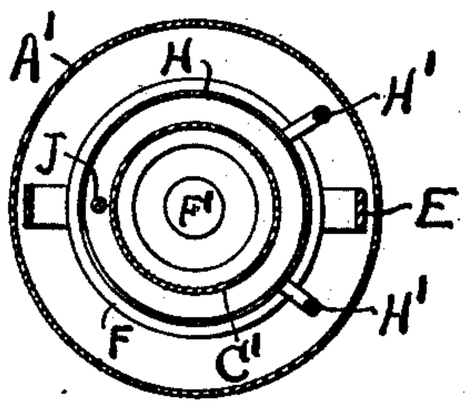

FIG. 3.

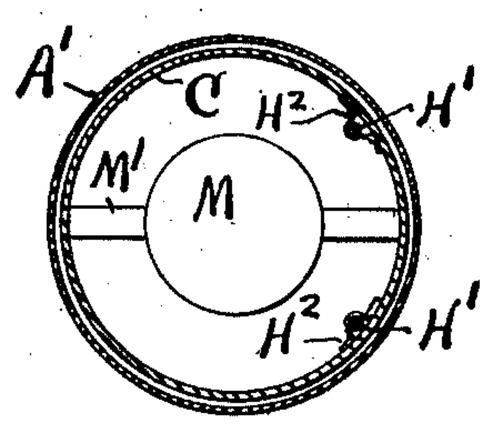

FIG. 2.

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(No Model.) 3 Sheets—Sheet 2.

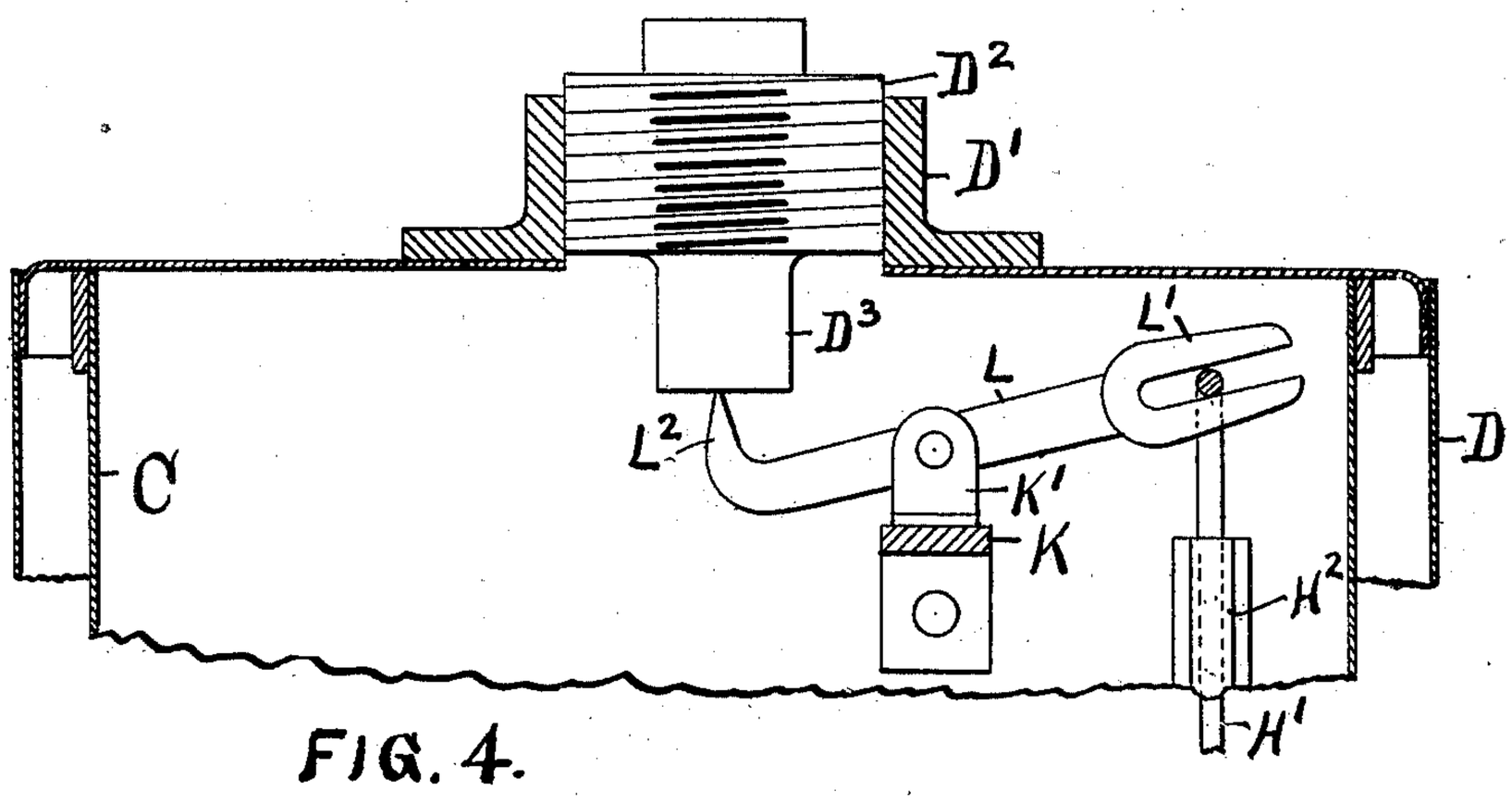

FIG. 4.

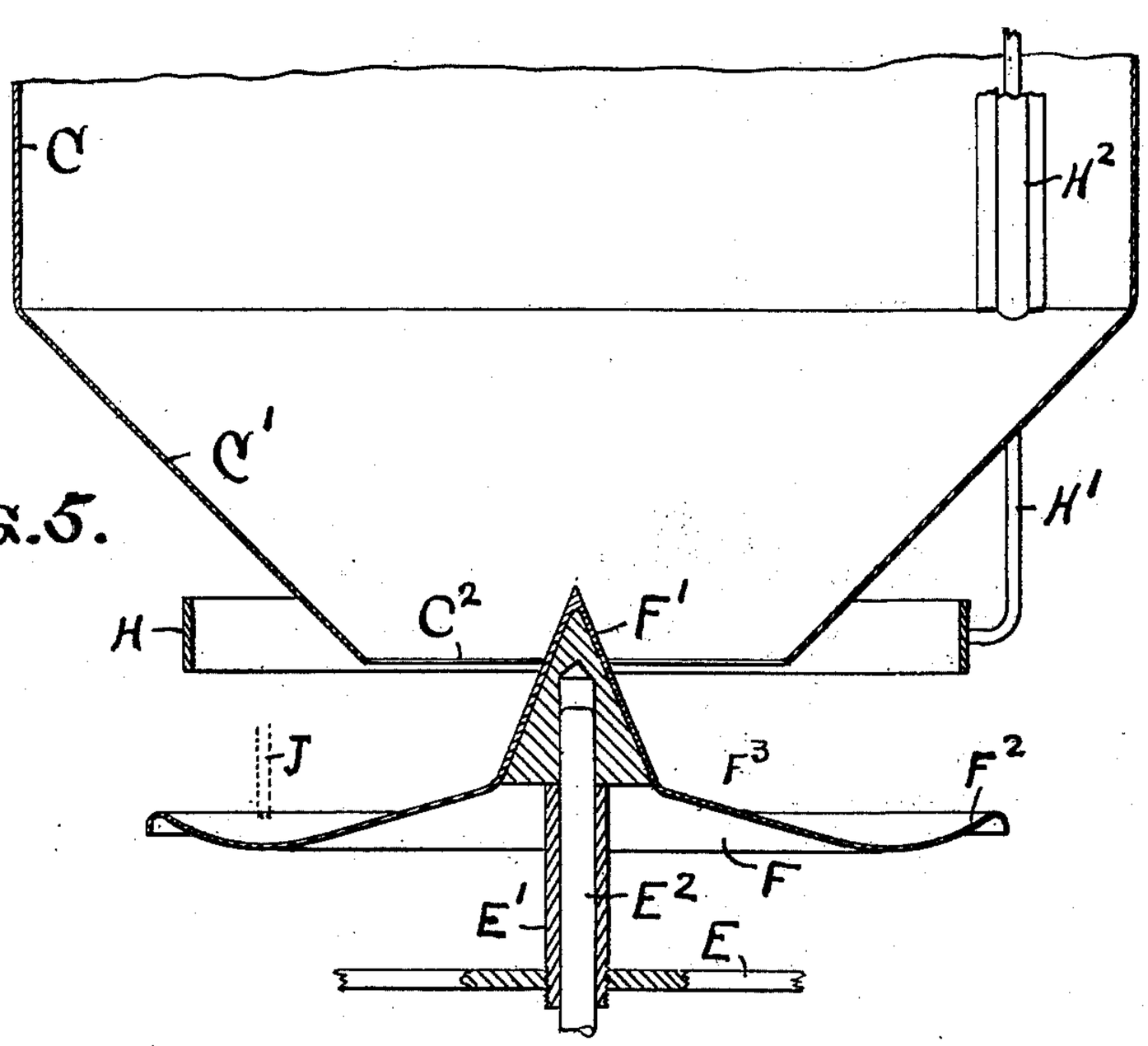

FIG. 5.

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(Application filed Mar. 10, 1902.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 6.

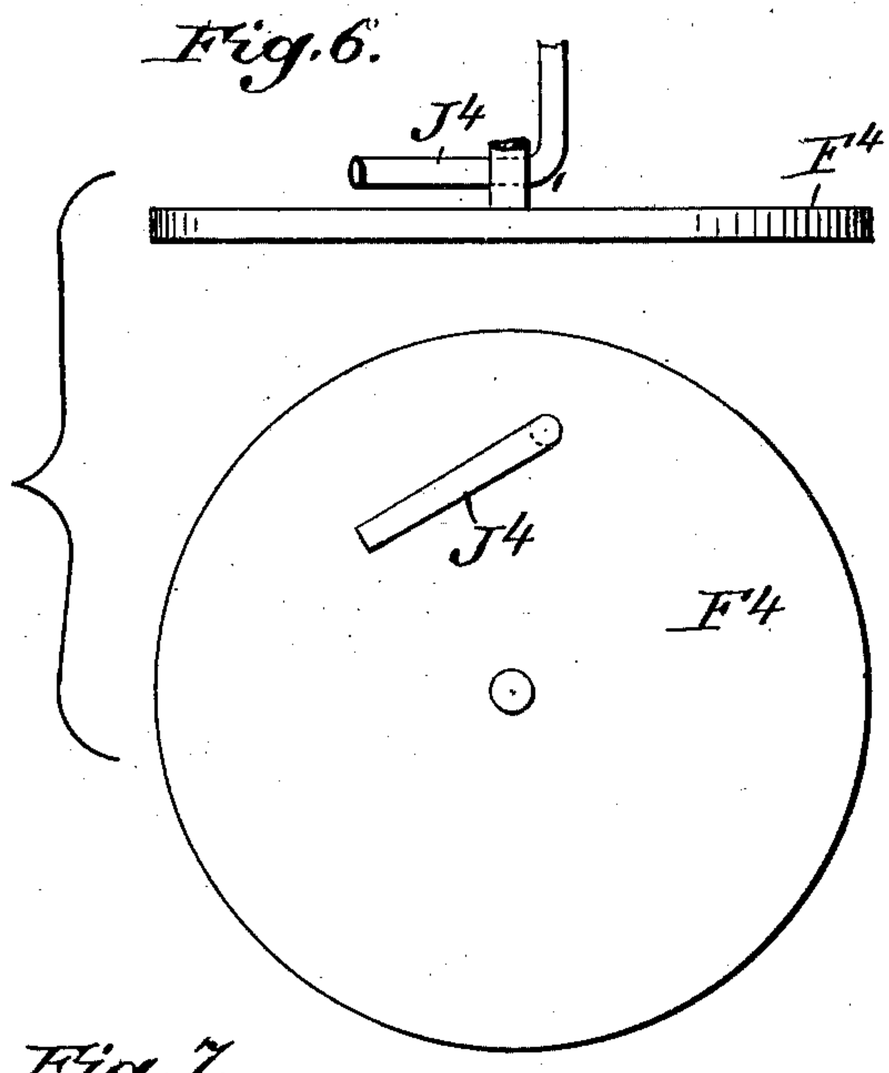


Fig. 7.

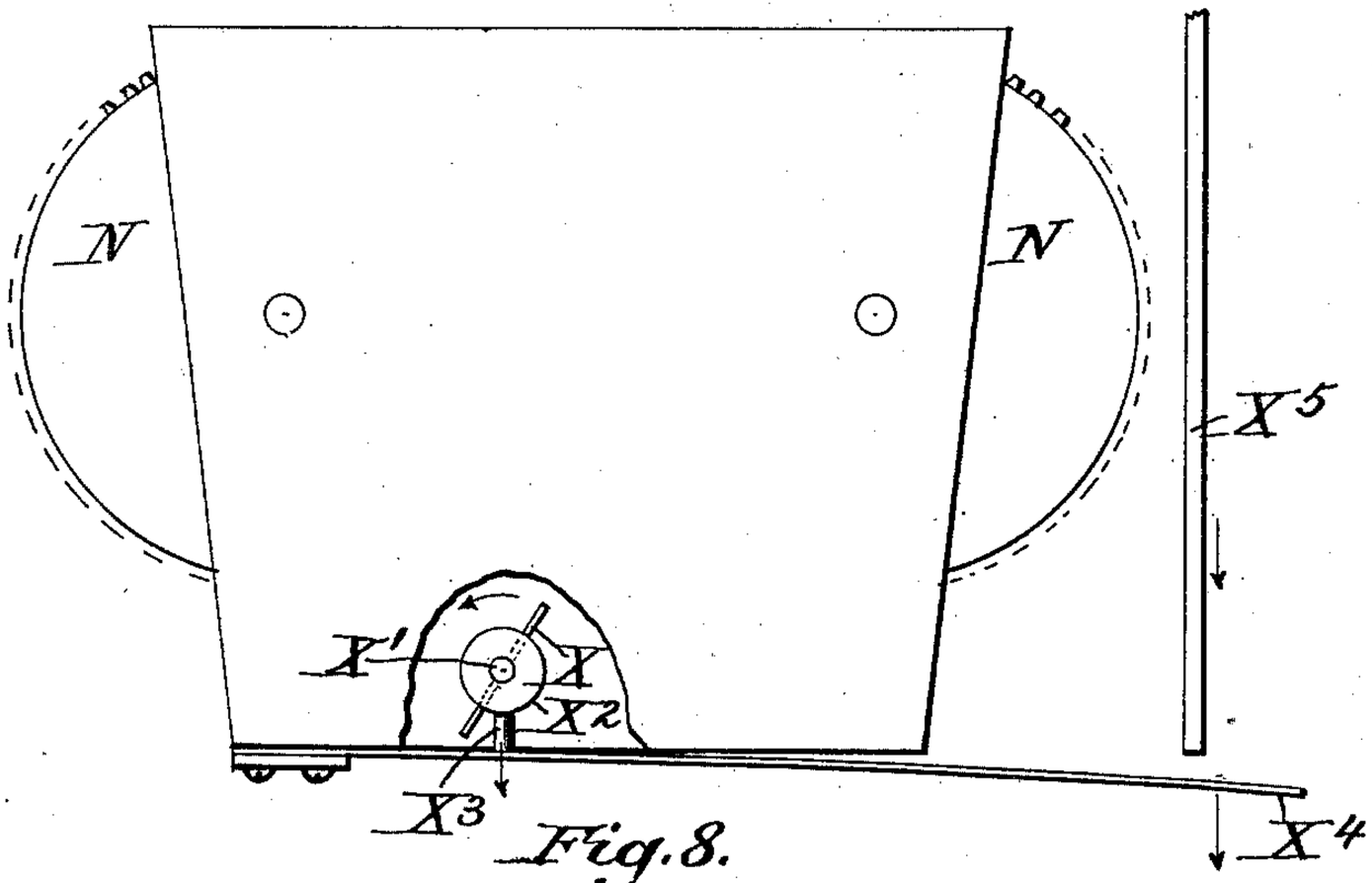
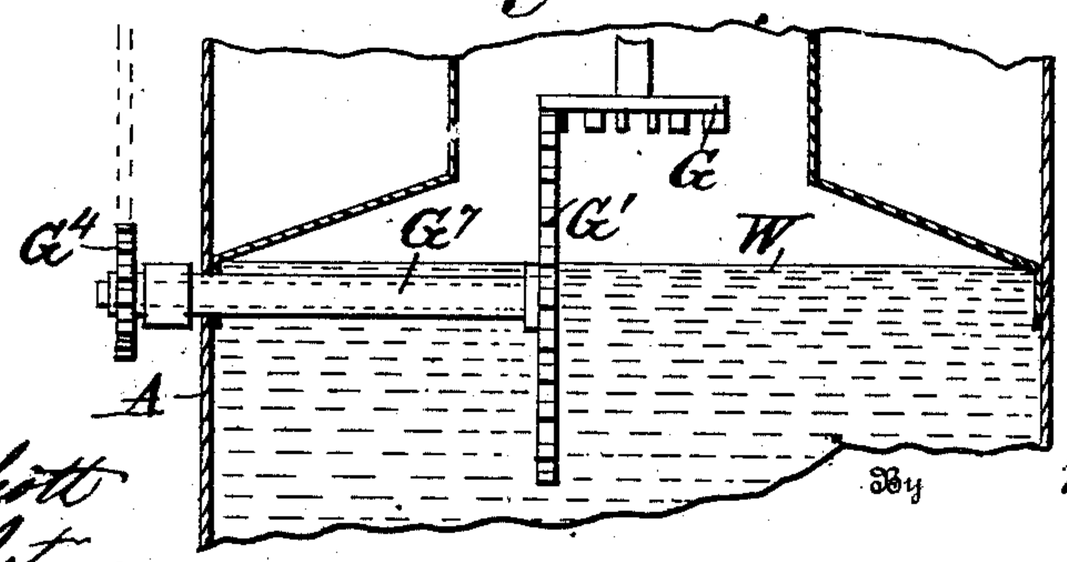


Fig. 8.



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his Attorney.

UNITED STATES PATENT OFFICE.

ALGERNON S. PHELPS, JR., OF CHICAGO, ILLINOIS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 716,933, dated December 30, 1902.

Application filed March 10, 1902. Serial No. 97,452. (No model.)

To all whom it may concern:

Be it known that I, ALGERNON S. PHELPS, Jr., a citizen of the United States of America, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Acetylene-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 improvements in gas-generators, and in particular to acetylene-generators.

The object of my invention is to provide an acetylene-generator which will comply with all the well-known requirements of the Underwriters' Association and which will be capable of automatically adjusting itself so as to use various sizes of calcium carbid with equal facility, while at the same time giving a close regulation of the gas-pressure.

My invention consists in the features, details of construction, and combination of parts which will first be described in connection with the accompanying drawings and then particularly pointed out in the claims.

In the drawings, Figure 1 is a section of a generator, a magazine and its connected parts being in elevation; Fig. 2, a section on the line 2 2 of Fig. 1; Fig. 3, a section on the line 3 3 of Fig. 1; Fig. 4, a vertical section of the magazine and its seal; Fig. 5, a similar section of the lower end of the magazine and the parts connected thereto; Fig. 6, a detail view of a modification of my invention; Fig. 7, a similar view of a motor-controlling mechanism embodying one feature of my invention, and Fig. 8 a detail view of a modified arrangement of the driving-shaft.

Supported within the tube A′ and resting upon its upper edge is a magazine C, the upper end of which is open and the lower end of which converges into a conical portion C′, the end of which is open, so as to form a discharge-opening, as shown by C^2 in Fig. 5. Secured to C′ is bail or bracket E, which is provided with a bearing E′ directly beneath the opening C^2. Within the bearing E′ is a shaft E^2, and on this shaft is secured the distributing device in the form of a disk F, so located as to receive the discharge from the discharge-opening of the carbid-magazine. This disk is so made that the central portion thereof extends upward into the form of an acute cone F′, the base of which merges into an obtuse cone F^3, and the base of which last cone merges into an upwardly-extending flange F^2. This leaves between the cone F^3 and the flange F^2 an annular pocket, within which rests the carbid discharged through the opening C^2. The conical portion F′ is preferably made so that it will extend upward far enough to project through the opening C^2 and a short distance into the conical portion C′ of the magazine C. When carbid is discharged downward through the opening C^2, the cone F′ tends to deflect the carbid from the center of the disk toward its periphery.

Secured to the lower end of the shaft E^2 is a gear G, which meshes with the gear G′ on a shaft G^2, which extends through a tubular bearing G^3 to the exterior of shell A. On the outer end of the shaft G^2 is a sprocket-wheel G^4, which is connected by means of a chain G^5 to another sprocket-wheel, G^6, which last wheel is driven by a motor located within the box N of Fig. 1. This motor will be more particularly referred to hereinafter. It will be apparent that the operation of the motor will cause the distributing device F to rotate under the opening C^2, carrying around with it whatever material may rest upon it after being discharged from the magazine C.

Secured to the conical portion C′ is a displacing device, in the present case in the form of a spring bar or finger J, which bends downward just over the pocket in the disk F. The bar or pin J is therefore stationary, but is of yielding character, and is arranged to engage pieces of carbid resting upon and being carried around by the rotation of the disk F. The result of this action is the displacement of the pieces of carbid on the disk F by the finger J, thus causing the pieces to be pushed over the edge of the disk F one at a time. This gives a gradual dropping of pieces of carbid into the water located in the generating-chamber A^3.

In connection with the distributing device I employ an adjustable guard or shield device, whereby escape of carbid from the distributing device may be controlled, so that,

if necessary, the flow of carbid to the water-tank can be entirely prevented, as when the magazine is being refilled. The preferred form of this guard or shield device will be understood from the following: Surrounding the lower end of the magazine C, adjacent to the opening C^2, is a guard device in the form of a ring H, which is supported on rods H′, extending upward in guides H^2, within the magazine C, to the upper portion thereof. At the upper end these rods unite into one and are engaged by a fork L′ on the lever L. This lever is pivoted on a bracket K′, which is mounted upon a bridge K, secured to the walls of the magazine C. The lever L and rods H′ form the mechanism for adjustment of the guard device. The other end of the lever L terminates in a projection L^2, which is engaged by projection D^3 on a plug D^2, which forms a closure for the carbid-magazine and closes an opening in the cap D′ on the top end of the seal D. This seal D covers the top of the magazine C and projects down into the water in the annular space A^5. When the plug D^2 is in the position shown in Fig. 4, contact between the projection D^3 and the point L^2 of the lever L causes said lever to raise the rods H′, and consequently the ring H, so as to hold it in the position shown in Fig. 5. The magazine is filled by removing the plug D^2, the effect of which removal is to permit the forked end of the lever L to drop, together with the rods H′ and the ring H. The limit of this drop brings the ring H down in close proximity to the disk F. In this position the ring H prevents material dropped into the magazine from being thrown outward over the edge of the disk F into the water in the chamber A^3. When the magazine has been filled, the closing of the opening by means of the plug D^2 again causes the ring H to rise to the position shown in Fig. 5, so that the pin J may push pieces of carbid off of the disk F when the said disk is rotated. In the interior of the magazine C are located suitable supporting devices, such as the two cones M, located one above another and at the axis of the said magazine. These cones are carried on bridges M′, secured to the walls of the magazine. When the magazine is full of material, the weight would naturally rest heavily upon the distributing device or disk F, and consequently make it hard to turn. The weight also of such a large column of material would have a tendency to push the material outward over the edge of the disk F, which tendency would vary according to the amount of material within the magazine. The cones M, supported in the center of the magazine, deflect the material outward from the center and also furnish a resistance to a high column of material, and consequently equalize the weight upon the disk F and the tendency of material to flow outward over its edge.

The disk F is shown as made up of cones F′ and F^3, merging into each other, but having an angle at their point of intersection, which angle is located approximately at a point which would be intersected by continuation of the conical sides C′ of the magazine C. Instead of making these cones F′ and F^3 of straight sides I may make them of a continuous and gradual curve extending from the apex of F′ to the pocket between cone F^3 and the rim F^2. In either case the action of the cone is to deflect the material from the center to near the periphery of the said disk. Furtheremore, instead of making the distributing device in the form of a cone and the displacing device in the shape of a pin I may employ, for example, a flat disk, as shown at F^4, Fig. 6, in which case the displacing device is in the form of a small plow or scraper J^4, in order that the direction in which the carbid is displaced will always be outward.

A further feature of my invention to which I attach importance is the means employed by me for actuating the distributing device. This means consists in a suitable motor—as, for example, a clock mechanism N, Figs. 1 and 7—connected to and arranged to actuate the distributing device, the operation of the motor being controlled by the bell or gasometer. In the preferred form of such construction, as shown in the drawings, the spring-motor has the usual fan X and fan-shaft X′, on which is located a brake-wheel X^2, arranged to be engaged by a spring-pressed brake-shoe—as, for example, the pin X^3—carried by a leaf-spring X^4, which is fixed at one end and arranged to be engaged at the other end by a tripping device—as, for example, a rod or arm X^5—secured to the bell, this arm being so arranged as to engage the leaf-spring before the bell has completely sunken to its lowest position, whereby it results that before all the gas has been emptied from the bell the pressure of the brake on the brake-wheel is somewhat reduced to an extent sufficient to allow the motor to start in operation, thus causing the rotation of the distributing device to distribute the carbid to the water-tank. At the same time during the first operation of the motor the brake-shoe still contacts with the brake-wheel to an extent sufficient to cause some friction, and thereby retard the speed of the motor. In this way a governing action of the motor is obtained and the slow feeding of the carbid takes place. If, however, the consumption of gas is so great that such slow feeding does not suffice to keep up the supply, the bell will continue to sink, and thus finally entirely remove the brake-shoe from the brake-wheel, whereupon the motor will run at full speed and discharge the carbid rapidly to the tank. The variation in pressure of the shoe on the brake-wheel thus causes a variation in the rate of feed. Another advantage of this construction is that the movement of the bell is very responsive to the variations in the gas-pressure, because the buoyancy of the bell is not de-

pended upon to directly operate the distributing device. When all the carbid has been discharged from the magazine and the gas exhausted from the bell, the latter will release the brake mechanism of the motor and the motor will continue to operate until it has completely run down. When the carbid-magazine has again been filled, the motor is wound up, and this starts in operation the means whereby carbid is discharged and gas generated, thus raising the bell and gradually shutting off the speed of the motor, which is finally stopped when the bell approaches its highest position.

In Fig. 8 I have shown a modification of the arrangement of the horizontal driving-shaft which constitutes one feature of my invention and consists in placing said shaft below the water-line of the water-tank in order that the escape of gas may be readily prevented without causing excessive friction upon such shaft, it being understood that it is easier to pack the shaft against the escape of water than against the escape of gas.

What I claim, and desire to secure by Letters Patent, is—

1. In a feeding apparatus, a disk provided with a conical center and an upturned periphery, and means for rotating said disk.

2. In a feeding apparatus, a disk having its center raised into an acute cone, the base of which acute cone merges into an obtuse cone, and the base of which obtuse cone merges into an upwardly-turned rim or flange.

3. In a feeding apparatus, a disk having its center rising into the form of an acute cone, which cone has its exterior surface spreading out into a disk-like form and terminating in an upwardly-inclined rim.

4. The combination with a carbid-holding magazine provided with an opening through which carbid is discharged from said magazine, of a disk located opposite said opening and provided with a conical center extending into said opening and with an upturned periphery, and means for rotating said disk.

5. The combination with a magazine provided with a discharge-opening, of a feeding-disk having an upturned periphery and arranged to deflect material from its center to near its periphery, means for rotating said disk, and a stationary vertical finger or pin arranged to engage and displace material resting upon said disk.

6. The combination with a rotary disk having an upturned periphery and arranged so that material discharged thereupon will be moved by gravity to and caused to rest upon that portion of the disk adjacent to its periphery, of a stationary yielding pin or finger arranged to engage material resting upon said disk when rotating.

7. The combination with a carbid-magazine having receiving and discharge openings, and a closure for the receiving-opening, of a distributing device arranged at a fixed distance from the discharge-opening and adapted to receive the discharge of carbid from said discharge-opening, said distributing device having means for assisting the flow of carbid toward the periphery of the distributing device, and also provided with means connected with the closure for preventing the discharge of carbid from said periphery during the recharging of the magazine.

8. The combination with a carbid-magazine provided with a discharge-opening, of a distributing device consisting of a disk located below and extending beyond said opening and serving to receive the carbid discharged therefrom and to distribute the same to the water-tank, and a movable-guard device arranged around but at a distance laterally from said opening and out of contact with the magazine so as to not interfere at any time with the discharge of carbid from the magazine and adapted for movement to and from the disk in such manner as to control the distribution of the carbid from the disk to the water.

9. The combination with a carbid-magazine provided with receiving and discharge openings, and a closure for the receiving-opening, of a distributing device located so as to receive the discharge of carbid from said opening, and a movable-guard device connected with the closure and arranged to prevent the escape of carbid from said distributing device during the recharging of the magazine.

10. The combination with a carbid-magazine provided with receiving and discharge openings, a closure for the receiving-opening, and a water-tank, of a distributing device arranged at a fixed distance from the opening and adapted to receive the discharge of carbid from said opening and to distribute the said carbid to the water-tank, and a guard device connected with the closure and arranged to prevent the escape of carbid from said distributing device during the recharging of the magazine.

11. The combination with a carbid-magazine provided with a discharge-opening and with a receiving-opening, of a closure for the receiving-opening, a water-tank, a distributing device arranged to receive the carbid from the discharge-opening of the magazine and to distribute it to the water-tank, a guard device arranged to control the escape of carbid from said distributing device, and means operated by the magazine-closure and arranged to adjust the guard device.

12. The combination with a magazine provided with receiving and discharge openings, and a closure for the receiving-opening, of a disk located opposite said opening, and a ring surrounding said disk and connected with the closure and arranged to be moved toward and from said disk by the opening and closing of the magazine.

13. The combination with a magazine provided with receiving and discharge openings,

of a ring surrounding the discharge-opening, a plug closing the receiving-opening, and means whereby the position of said ring is controlled by the insertion and removal of said plug.

14. The combination with a magazine provided with openings for the reception and discharge of material, and a disk located opposite the discharge-opening and arranged to deflect outward the material passing through said discharge-opening, of a ring surrounding the discharge-opening and movable toward and from said disk, a plug closing the receiving-opening, and means for controlling the position of said ring by said plug.

15. The combination with a carbid-magazine provided with receiving and discharge openings, of a distributing device arranged to receive the discharge of carbid from the discharge-opening, a guard device arranged to control the escape of carbid from the distributing device, a rod carrying said guard device, a bearing secured to the magazine and arranged to support the rod, a lever engaging said rod, and a closure for the receiving-opening of the magazine and arranged to operate the lever.

16. The combination with a cylindrical magazine provided with an opening for the reception of material at its upper end and an opening for discharge at its lower end, and a rotary disk located below and opposite the discharge-opening, of two or more cones located in the axis of said magazine and having their apexes pointing toward the opening for the reception of material.

17. The combination with a magazine provided with a discharge-opening at its lower end, and a rotary disk located opposite said opening and arranged to support a column of material above it, of two or more superimposed cones located directly above said opening.

In testimony whereof I affix my signature in presence of two witnesses.

ALGERNON S. PHELPS, JR.

Witnesses:
M. C. MASSIE,
ANTON GLOETZNER.