No. 698,722. Patented Apr. 29, 1902.

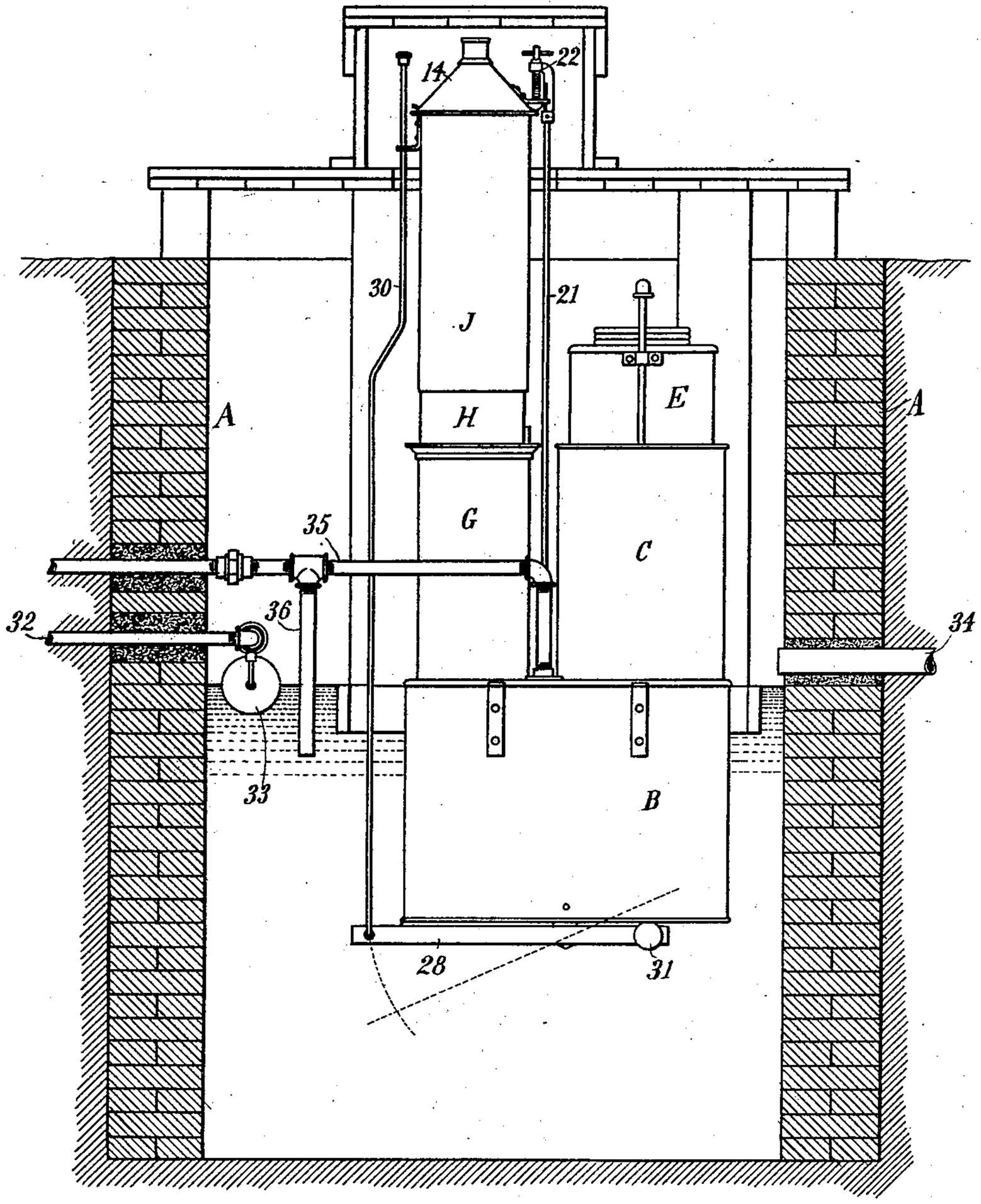
F. H. MERRILL & F. HICKMAN.

ACETYLENE GAS GENERATOR.

(Application filed Jan. 2, 1902.)

(No Model.) 3 Sheets—Sheet 1.

Fig.1



Witnesses
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Frank H. Merrill
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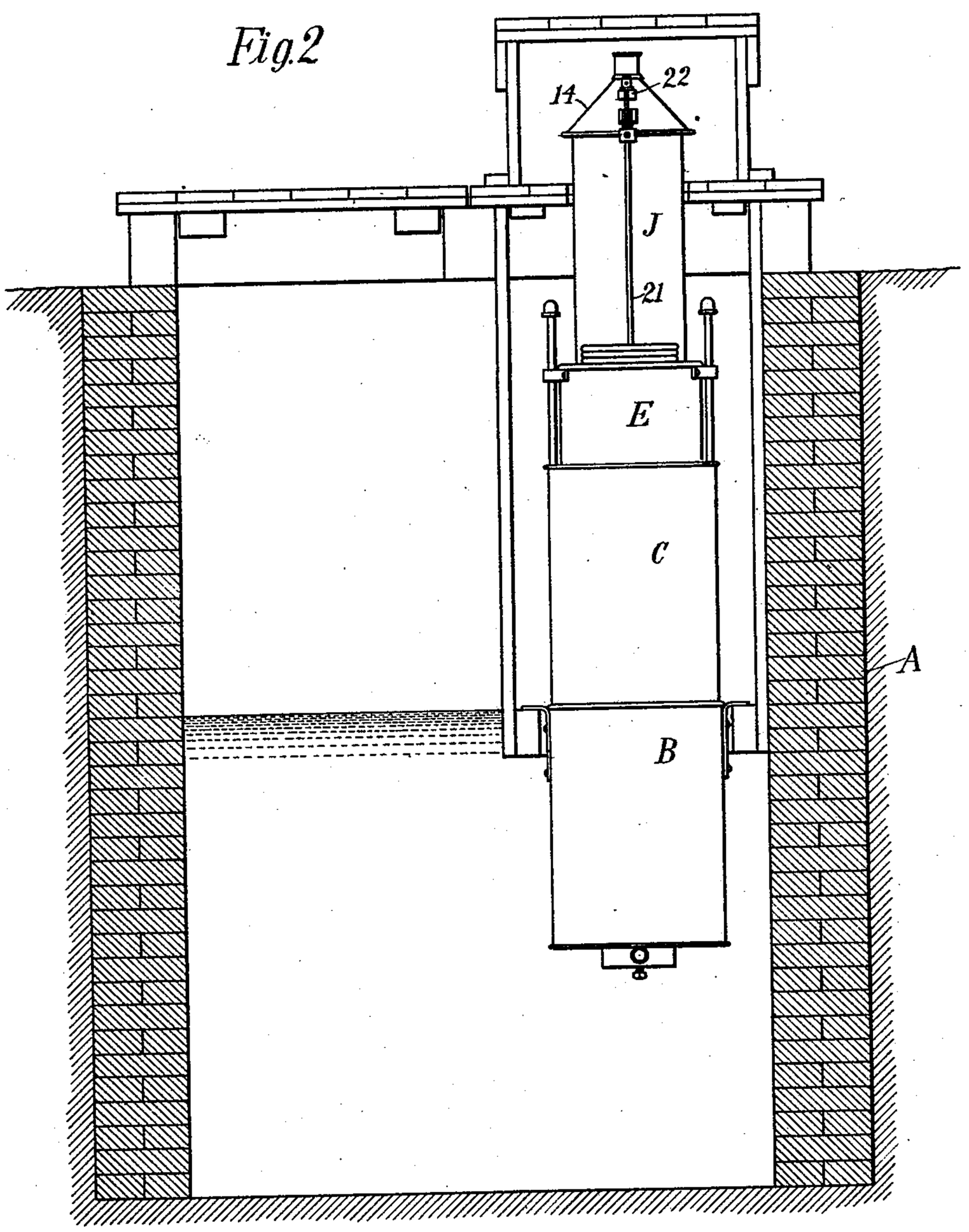
(No Model.) 3 Sheets—Sheet 2.

Fig.2



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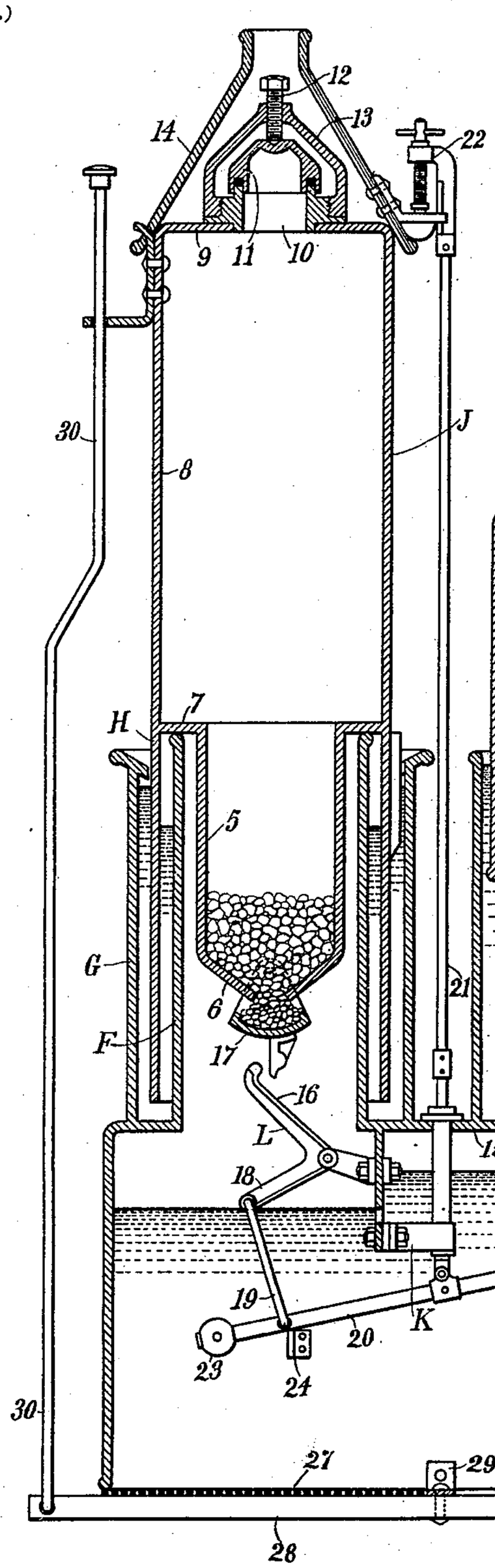

Fig. 3

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UNITED STATES PATENT OFFICE.

FRANK H. MERRILL, OF PLAINFIELD, AND FRANCIS HICKMAN, OF BOUNDBROOK, NEW JERSEY.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 698,722, dated April 29, 1902.

Application filed January 2, 1902. Serial No. 88,167. (No model.)

To all whom it may concern:

Be it known that we, FRANK H. MERRILL, of Plainfield, Union county, and FRANCIS HICKMAN, of Boundbrook, Somerset county, New Jersey, have invented a new and useful Acetylene-Gas Generator, of which the following is a specification.

Our invention relates to improvements in acetylene-gas generators; and it consists in the features of construction hereinafter specifically described and claimed.

Acetylene-generators are usually designed to be placed in the cellar or basement of the building to be lighted. Such machines are necessarily limited in carbid capacity. They require frequent attention in recharging, removing the residue, washing out, and renewing the water, and there is more or less escape of gas. In case of accidental damage to the apparatus—such as freezing, rusting out, breakage, flooding of cellars, or other unforeseen causes—sufficient gas may be liberated to be ignited by the furnace of the heating plant or otherwise, resulting disastrously.

Our invention is designed particularly to provide a construction whereby the apparatus is adapted to be placed in a cistern entirely outside of the building to be lighted. A large carbid capacity is obtained, and the disposal of residue and supply of water automatically effected, thereby dispensing with frequent attention, eliminating possible accidents and annoyance from escaping gas. The mechanism is also simplified, as the cistern forms the lower portion of the apparatus and a receptacle for the residue. The water-level is automatically maintained in the cistern by a float-actuated valve, whereby the consumption of water is greatly economized. The apparatus being immersed in a comparatively large body of water there is no heating during generation. As the water-level is necessarily maintained below the line of frost, the carbid-holder is elongated to reach above the surface, the carbid contained in same being non-freezing. Greater carbid capacity and convenience in refilling are thus obtained.

In the drawings forming part of the specification, Figures 1 and 2 are elevations of the apparatus shown in position in the cistern, taken from points at right angles to each other, the walls of the cistern being shown in section; and Fig. 3 is a vertical section of the apparatus removed from the cistern.

In the drawings, A represents the cistern, designed to be partially filled with water, as shown, into which the lower part of the generating apparatus is submerged. This apparatus belongs to the class in which an excess of water is used—that is, the water of the cistern entering the lower part of the generator receives the carbid as it is dropped to furnish the required supply of gas, the feeding of the carbid being automatically regulated by the rising and falling of the gasometer-bell.

The generating-chamber and the gasometer are both mounted upon a hollow base or bell B, the gasometer being of the usual form and consisting of a water-tank C and a bell E, which fits within the water-tank, so that it may freely rise and fall therein, the water forming a seal to prevent the escape of gas. Upon the upper part of the bell B is the conical projection 3, which extends upward into the bell E and has openings or vents 4, through which gas can freely pass from the bell B into the bell E. The object in making the projection 3 in the form of a hollow cone is to narrow the space between it and the walls of the tank C to reduce the amount of water required for the water seal.

The generating-chamber comprises a cylinder with double walls F and G, the space between the walls constituting a water-tank into which the bell H of the carbid-holder J fits, the water in the tank serving as the seal for the same. The carbid-holder J is removable from the apparatus, and consists of a cylindrical portion 5, extending downward into the generating-chamber, having a conical lower end 6, provided with a central discharge-opening. At the top of the cylindrical portion 5 is an annular ring 7, connecting the part 5 with the bell H and serving as a support for the carbid-holder upon the wall F. The upper or larger portion 8 of the carbid-holder is provided with a head 9, having a central opening 10, through which the carbid is supplied to it, this being closed by means

of a cap or seal 11, held in place by means of a screw 12, threaded into the conical cap 13, which has a screw-thread connection with the head 9 of the holder. The holder is surmounted by a conical open head or cover 14.

To provide for the automatic feeding of the carbid from the holder into the water of the cistern within the bell B, we provide a hanger or bracket K, depending from the upper wall 15 of the bell B, to which is pivoted a bell-crank lever L, the upper arm 16 of which in operation trips the swinging valve 17, covering the opening of the carbid-holder, so as to permit the flow of carbid therefrom. The lower arm 18 of the bell-crank lever is connected by means of a link 19 with the lever 20. This lever has pivotal support upon the rod 21, which extends upward through the bracket, and has an adjustable screw connection 22 with the cap 14, whereby the position of the lever 20 may be adjusted at will. The lever 20 carries a weight 23, which tends to depress the end of the lever connection with the bell-crank lever L, the downward motion of the lever, however, being limited by means of a stop 24. The power end of the lever 20 is provided with a rod 25, which extends upward from the cone 3, projecting into the bell E to such a distance that as the bell E descends its head 26 will strike the end of the rod 25, depressing the lever 20, operating the bell-crank lever L to actuate the bell 17 and discharge the carbid from its holder.

In order to prevent the dropping of the carbid through the bell B into the cistern, whereby gas generated therefrom could pass out of the cistern around the bell B, we provide a grating 27 underneath the carbid-holder and mounted upon the lever 28, which has pivotal support at 29 upon the bell B. This lever is turned by means of a rod 30, extending upward into convenient position above the apparatus, the grating being held normally in horizontal position, as shown in Fig. 3, by means of a counterweight 31. The feed-pipe having an inlet-valve (not shown) controlled by the float 33 serves to supply the cistern with water, the overflow-pipe 34 limiting the height of the water.

The device for retarding the carbid within the gas-generating space until it is slaked is an important feature of the apparatus, as it prevents pieces of carbid from falling to the bottom of the cistern, whence the gas would escape to the outer air and be wasted. As the carbid contains some pieces which are unslakable, the retarding device can be dumped by the hand-rod 30. The counterweight 31 normally holds the retarder closed, thus preventing careless or unskilled persons from leaving the retarder in open or dumping position.

It is obvious that if the carbid were exhausted and the gasometer in the lowest position the swinging carbid-feed valve would be full open. In this condition the renewal of carbid would be accompanied with great danger and waste, as the carbid would flow through the feed-valve into the gas-generating chamber, causing a rapid generation of gas, which would escape through the filling-cap on top of the carbid-holder. To prevent the possibility of such an occurrence, the hood 14 is provided to cover the caps 11 and 13 and engage the screw 22, which with the rod 21 controls the mechanism which actuates the carbid-feed valve. It is so arranged that the hood 14 cannot be removed without closing the carbid-feed valve. After the removal of the hood 14 the cap or seal 11 can be opened. The hood then forms a convenient filling-funnel in reversed position. After filling the carbid-holder, the caps 11 and 13 and the hood 14 are replaced, the latter being engaged with the screw 22, which can be actuated to open the carbid-feed valve 17 very slowly, preventing an excess of carbid to flow into the generating-chamber before the gasometer rises and permits the feed-valve to close.

The operation of the apparatus can be readily understood from the drawings and foregoing description. The cistern being supplied with the requisite quantity of water, the carbid-chamber is filled. The bell E being at bottom position, the rod 25 is depressed and, through the connected mechanism, would trip the valve 17 and permit the flow of carbid into the water in the bell B were not the mechanism supported upon the rod 21, which in lowered position prevents such action, as above described. When the caps 11 and 13 and hood 14 are restored to place, the screw 22 is actuated to gradually lift the valve-operating mechanism and permit gradual flow of carbid into the generating-chamber. As the carbid sinks into the water its escape from the bell is prevented by the grating 27, upon which it rests, gradually crumbling as acted upon by the water and falling through the grating. Any excess accumulations or unslaked portions can be quickly dumped by operating the rod 30, the inert material sinking to the bottom of the cistern. 35 is the gas-pipe by means of which gas is conveyed from the apparatus to the point of consumption. The branch pipe 36 has its open end beneath the surface of the water in the cistern a sufficient distance to prevent escape of gas under usual pressure, but permitting escape when the apparatus is filled and excess gas continues to be generated. Meanwhile the gas fills the apparatus above the water and flows through the hollow cone 3 into the bell E, lifting the same and releasing the rod 25, whereupon the weight 23 in falling releases the valve 17, allowing it to close and cut off the flow of carbid from the holder. Escape of gas from the apparatus except through the pipe 35 is prevented by the water seals in the tanks C and G, the branch pipe 36 serving as a safety-vent for excess gas. As the contents of the apparatus are drawn off in use the bell E gradually falls until it again actuates the rod 25, when, in the

manner above described, carbid is again allowed to flow into the water and gas is generated therefrom to replenish the supply.

We claim—

1. In an apparatus of the class described, the combination with an inverted bell common to generator and gasometer, a water-cistern for receiving said bell, and means controlled by the position of the gasometer for automatically delivering carbid into said bell, of means for receiving and suspending such carbid within said bell and for discharging the sludge therefrom into said cistern.

2. In an apparatus of the class described, the combination with an elongated carbid-holder, a carbid-feeder, a gas-generating chamber and a gasometer, of a water-cistern, having means for automatically maintaining a predetermined level of water therein, means controlled by said gasometer for automatically delivering carbid into said generating-chamber, and means for receiving and holding said carbid within said chamber while being slaked, and for discharging the residue into the cistern.

3. An apparatus of the class described, adapted for outdoor and subsurface installation, comprising in combination a cistern; a carbid-holder; a gas-generating chamber submerged in the water of the cistern; a gasometer connected therewith; means controlled by the gasometer for automatically feeding carbid into said chamber; and means for receiving and holding such carbid within said chamber and beneath the water-level while being slaked, and for discharging the residue thereof into the cistern.

Signed at Boundbrook, New Jersey, this 10th day of December, 1901.

FRANK H. MERRILL.
FRANCIS HICKMAN.

Witnesses:
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W. H. WEARL.