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G. W. MacKENZIE.

ACETYLENE GAS GENERATOR.

APPLICATION FILED DEC. 26, 1900. RENEWED JAN. 10, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

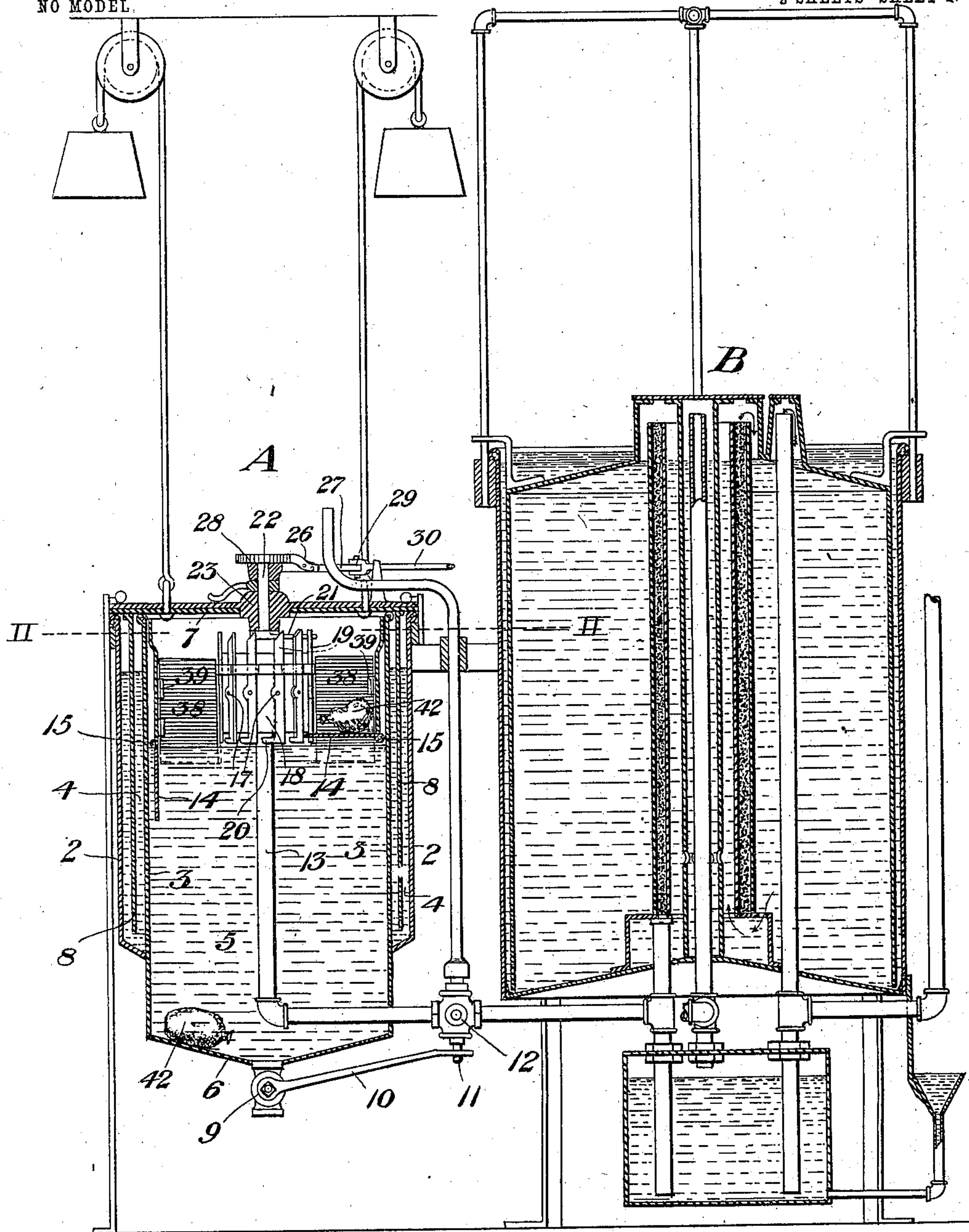


Fig. 1.

Witnesses:

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Inventor:

George W. MacKenzie  
by C. M. Clarke  
his attorney

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2 SHEETS—SHEET 2.

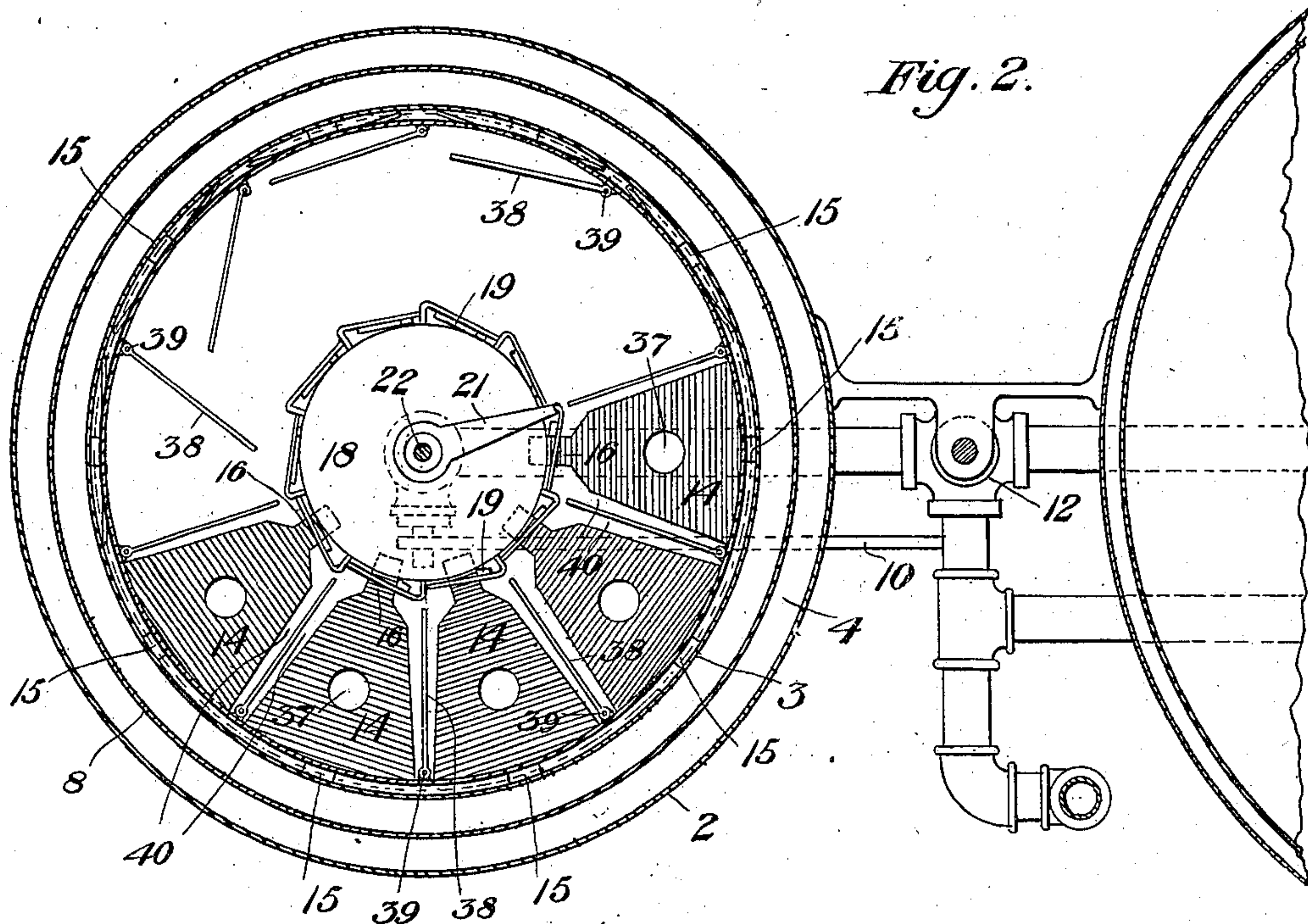


Fig. 4.

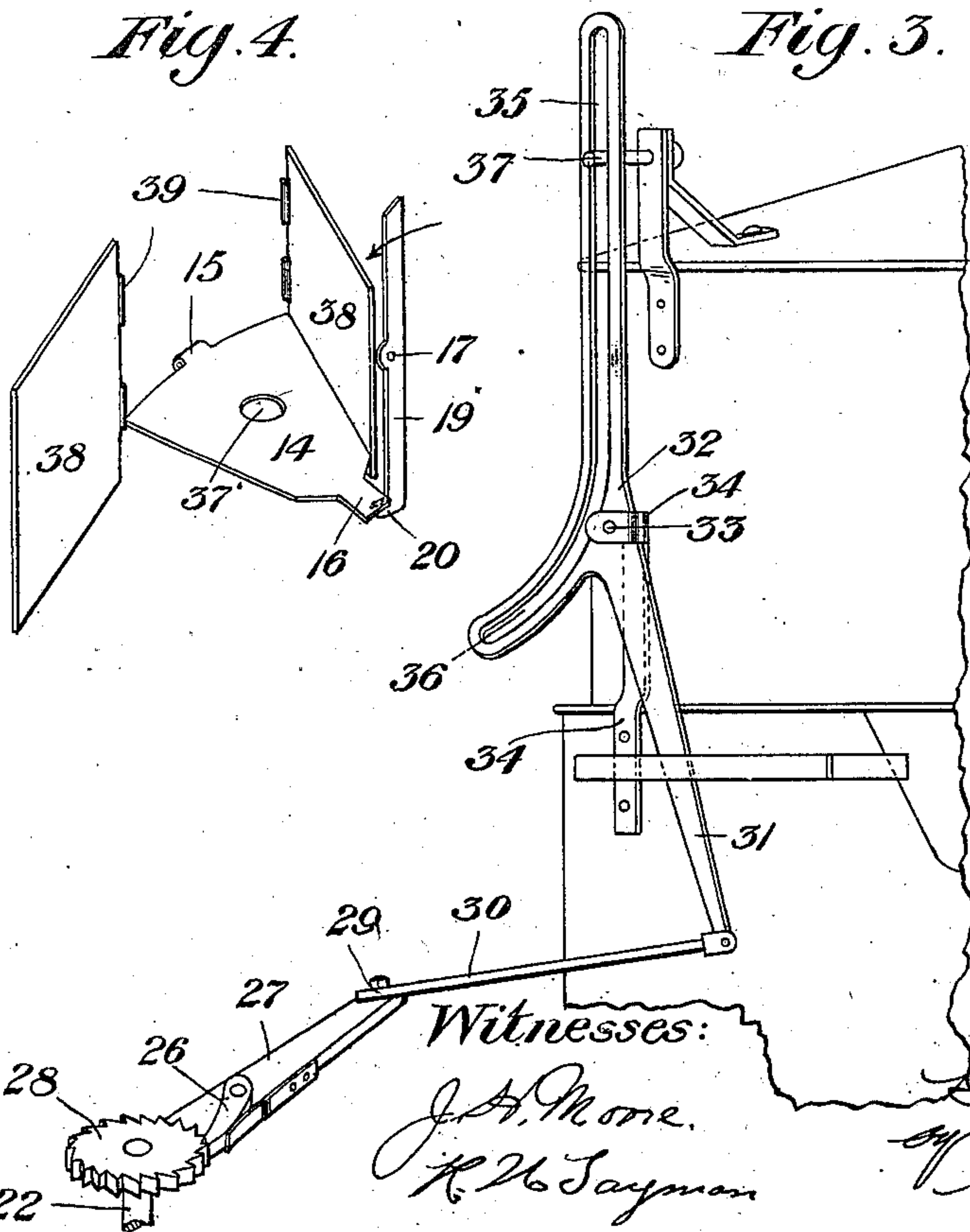


Fig. 3.

Fig. 5.

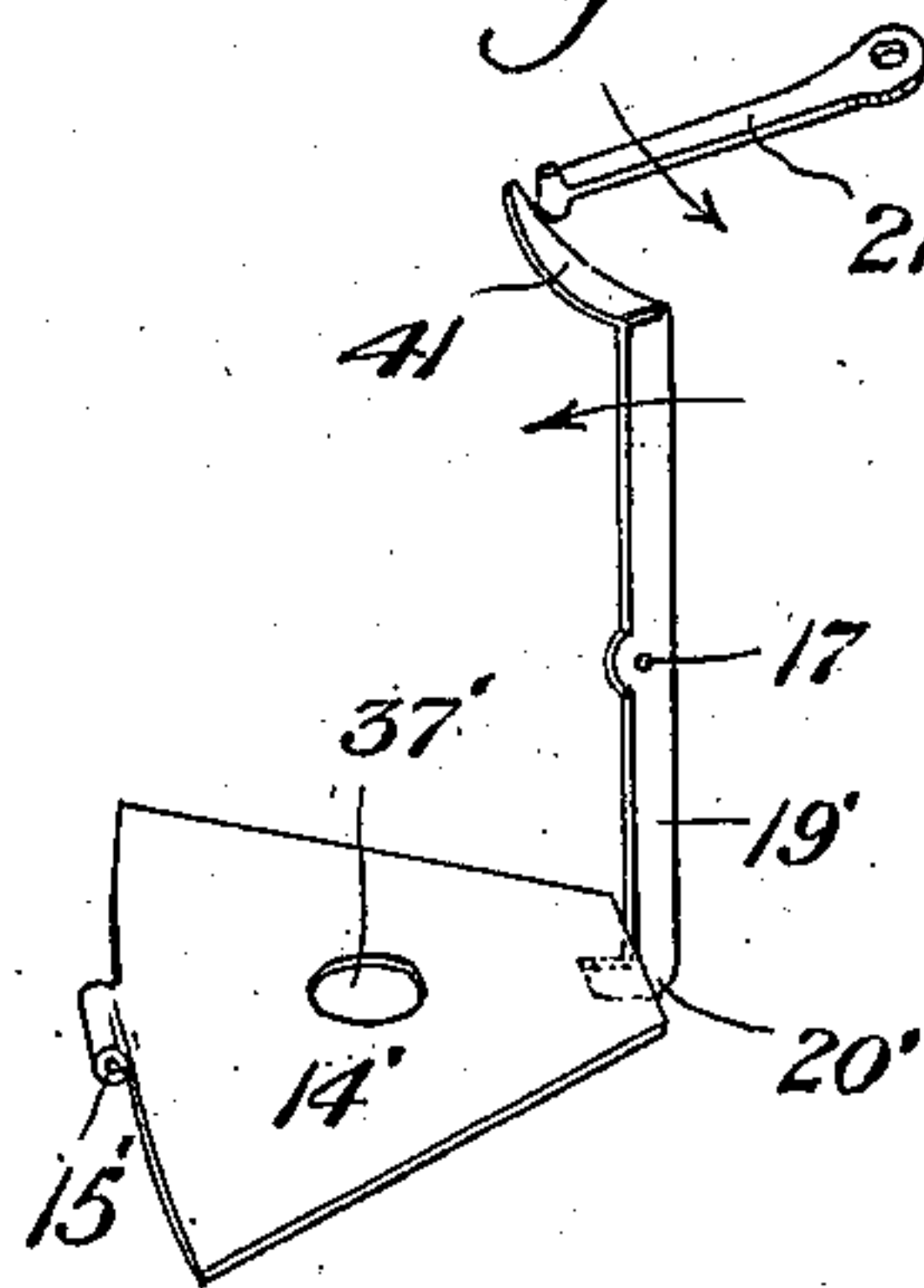
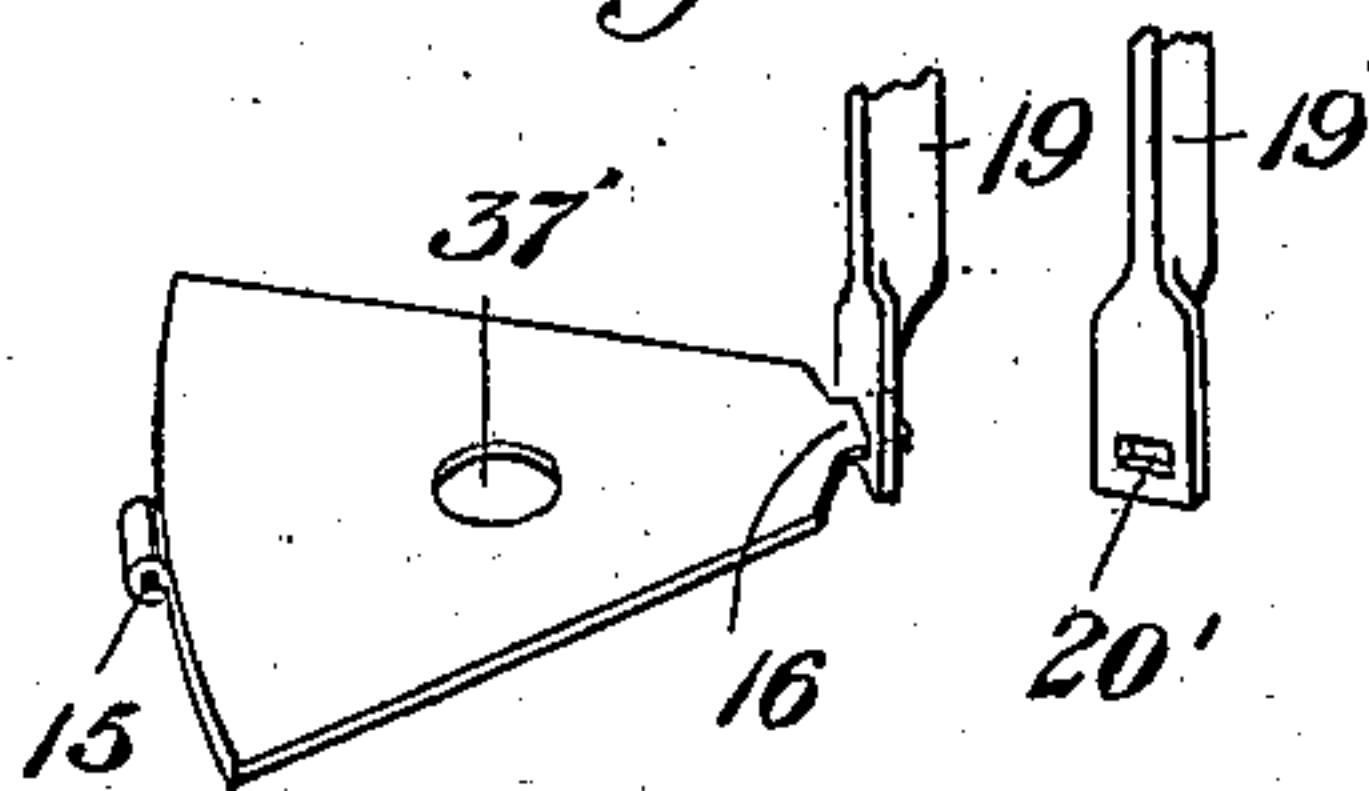


Fig. 6.



Witnesses:

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# UNITED STATES PATENT OFFICE.

GEORGE W. MACKENZIE, OF BEAVER, PENNSYLVANIA.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 723,778, dated March 24, 1903.

Application filed December 26, 1900. Renewed January 10, 1903. Serial No. 138,519. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. MACKENZIE, a citizen of the United States of America, and a resident of Beaver, county of Beaver, State of Pennsylvania, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central vertical sectional view through the apparatus comprising the generator and holder. Fig. 2 is a horizontal cross-section, on an enlarged scale, indicated by the line II II of Fig. 1. Fig. 3 is an exterior detail view of a portion of the holder and bell, showing the devices for automatically discharging a cartridge into the bath when the bell falls. Fig. 4 is a perspective detail view showing the hinged partitions, the drop-gate, and its supporting-lever. Fig. 5 is a similar view showing a modified construction of lever. Fig. 6 is a detail view illustrating a modification.

My invention relates to the class of acetylene-gas generators wherein the carbide is submerged in the water in measured quantities; and it consists in improvements in the means for supporting the cartridges, immersing them in the water of the bath, isolating each cartridge by projecting swinging gates, and in such other details of construction as shall be more particularly hereinafter set forth.

Referring to the drawings, the entire apparatus consists generally of a generating-compartment A and a storage and cooling compartment or holder B, provided with a rising and falling bell. The generator is designed to operate in conformity with the consumption of the gas and is automatically governed by the fall of the bell due to the exhaustion of its contents.

The generator A is composed of a cylindrical chamber having outer and inner walls 2 3, an intervening water-seal space 4, and an interior water-bath and gas-generating chamber 5, closed by a bottom 6. The entire generator is covered by a circular top 7, provided with a cylindrical downwardly-extending shell 8, adapted to be immersed in the water contained in space 4, thus forming an effective water seal to prevent escape of gas. A

drain cock or valve 9 is provided to draw off water, sediment, &c., the bottom tapering downwardly to the valve. The valve is provided with a handle or operating-lever 10, which in the closed position of the valve projects into range of and is engaged by a swinging locking-arm 11 on the lower side of a three-way cock 12, through which the gas may pass either to the holder or to the atmosphere.

Arranged centrally in the interior of the generating-chamber is a gas-pipe 13, the upper open end of which terminates above the water-line, the pipe leading down and through the lower side of the chamber over to the gasometer through valve 12.

Surrounding the upper interior of the gas-producing chamber, regularly spaced on a concentric common level, are a series of cartridge-supporting shelves 14, hinged at 15 to the interior of the shell 3 in any suitable manner and segmentally shaped and arranged, as shown, so as to practically form a continuous supporting sectional platform across the area above the bath when elevated to support the cartridges. One of these shelves is shown thus supported in Fig. 1, while the one on the opposite side is shown dropped. Each shelf is provided with an inner extension 16, or the shelf may be simply tapered toward its end, as shown in Fig. 5, the object of such extension being to provide a portion for engagement by the supporting-lever.

Pivotally mounted at 17 on the outside of a space-filling drum 18 or to any suitable base are a series of supporting-levers 19, having at their lower ends lips 20, adapted to engage and support the inner end of the hinged gate, each gate having its corresponding lever, as shown, and the top of each lever projects upwardly into the circular path of an intermittently-actuated dislodging-arm 21, secured to the bottom of a vertical stem 22, having an elongated bearing in a cross-bar 23 on the generator-top. Intermittent partial rotations of the stem 22 are imparted to it through the movement of a pawl 26, pivoted to the lever 27 and adapted to engage a ratchet-wheel 28, secured to the upper end of stem 22. The lever 27 is journaled on the stem, projects outwardly, and is separably connected at 29 with the shifting rod 30, which



at its other end is attached to the lower end of a lever 31, made integral with and extending downwardly from a swinging shifting arm 32, pivoted at 33 to a bracket 34, secured to the outer case of the holder. This shifting arm is provided with an upper straight slot 35, terminating in a lower curved slotted cam portion 36, in which slot engages a pin 37, projecting outwardly from and moving in conformity with the rising and falling bell of the holder. As the holder falls, due to exhaustion of gas, the pin enters the curved portion 36, throwing the lever 31 back, shifting lever 27, and rotating shaft 22 and with it the arm 21. As this arm 21 is intermittently thrown around it engages the top of each lever 19 in succession, tipping it over in the direction of the arrow in Fig. 4, by which movement the inner end of each shelf 14 is released, permitting the shelf to drop and allowing the cartridge to fall into the bath. Each shelf is provided with a finger-hole 37', by which it may be easily raised to be reset, such operation being very easily accomplished by simply tipping each lever back to its supporting position as each shelf is held up. In the act of immersing the cartridge it sometimes happens that water is splashed up, and for the purpose of protecting the next adjacent cartridge the supporting-shelves and their cartridges are isolated from each other by a vertical partition 38, which is hinged at 39 to the inner shell in such manner as to permit movement in either direction on the hinge or to fold back against the side, as indicated in Fig. 2. These partitions extend below the water-line and for a considerable distance above it and effectually prevent any water from reaching the other cartridges. It will be noted that by reason of the width of each shelf being somewhat narrower than its space considerable clearance is left on each side of each partition, as at 40, permitting of lateral movement of the partition in either direction when the shelves are horizontal, so that if for any reason a cartridge should become partially slaked and swell the partitions are free to move sufficiently to provide room. This, however, does not ordinarily occur in the operation of the machine. A further advantage in having the partitions hinged is that in recharging the apparatus the partitions may be swung around, as shown in Fig. 2, providing clearance for the hand or any suitable utensil used in raising the shelves to horizontal position.

In the modified form shown in Fig. 5 the lever 19 is replaced by the lever 19', supported at 17 and provided with an upper cam extremity 41, against the inner tapered edges of which the end of the lever 21' bears, acting to force the upper end of the lever out, the lower supporting end being retracted. Such lower end is provided with a lip 20', adapted to support the free end of the bottom 14', hinged at 15', preferably provided with finger-hole 37' and adapted to support the car-

tridge in the same manner as has been already described.

The carbid for this apparatus is contained in bags of muslin, comprising cartridges 42 of suitable size to generate gas to the capacity of the holder, one cartridge being placed on each shelf, and I have found excellent results from such form of cartridges, as the slaked carbid is securely contained in the bag, greatly facilitating its removal in an easy and cleanly manner.

In its construction and operation my invention is very simple and reliable, not liable to get out of order, the objectionable features of danger—trouble in changing and cleaning, as well as the necessity of frequent attention—have been overcome, and the apparatus will generally commend itself to those skilled in this art.

It will be understood that changes and variations may be made by the skilled mechanic without departing from my invention, and all such changes are included in the following claims.

What I claim is—

1. In an acetylene-gas generator, the combination with a cylindrical shell constituting a water-bath, of a series of concentrically-arranged cartridge-supporting shelves pivotally supported at their outer ends within the shell, a corresponding series of pivoted levers adapted to support the inner ends of the shelves in horizontal position, an intermittently-operated rotating arm adapted to tip the levers to release the shelves, with intervening vertical swinging partitions between the shelves adapted to fold against the shell.

2. In an acetylene-gas generator provided with a water-bath, and a series of cartridge-supporting hinged shelves adapted to be maintained above the water-line; vertical separating hinged partitions between the shelves, substantially as set forth.

3. In an acetylene-gas generator provided with a water-bath, and a series of cartridge-supporting hinged shelves adapted to be maintained above the water-line; vertical separating hinged partitions between the shelves, extending below and above the water-line, substantially as set forth.

4. In an acetylene-gas generator provided with a water-bath; the combination of a hinged cartridge-supporting shelf, a pivoted lever adapted to support the free end of the shelf, an intermittently-rotating arm adapted to tip the lever to release the shelf, a stem therefor provided with a ratchet-wheel, a lever and pawl engaging the ratchet-wheel, a cam-lever adapted to be actuated by the rising and falling bell of a holder, and a connection between such cam-lever and the pawl-lever with vertical hinged protecting-partitions at each side of the shelf, substantially as set forth.

5. In an acetylene-gas generator provided with a water-bath, the combination of a series of hinged cartridge-supporting shelves, ver-



tical intervening hinged partitions, pivoted  
levers adapted to support the free end of the  
shelves, an intermittently-rotating arm adapt-  
ed to tip the levers to release the shelves, a  
5 stem carrying the arm provided with a ratchet-  
wheel; a lever and pawl engaging the ratchet-  
wheel, a cam-lever adapted to be actuated by  
the rising and falling bell of a holder, and a  
connection between such cam-lever and the  
10 pawl-lever, substantially as set forth.

6. In an acetylene-gas generator provided  
with a water-bath, and a hinged supporting-  
shelf for the cartridge; a pivoted lever adapt-

ed to support the free end of the shelf pro-  
vided with a cam extension at its upper end 15  
and an intermittently-actuated rotating lever  
adapted to make contact with the cam ex-  
tension to tip the lever with vertical pro-  
tecting-partitions at each side of the shelf,  
substantially as set forth. 20

Signed at Pittsburg this 13th day of Octo-  
ber, 1900.

GEORGE W. MACKENZIE.

Witnesses:

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