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M. GOLDSTEIN.

ACETYLENE GAS GENERATOR.

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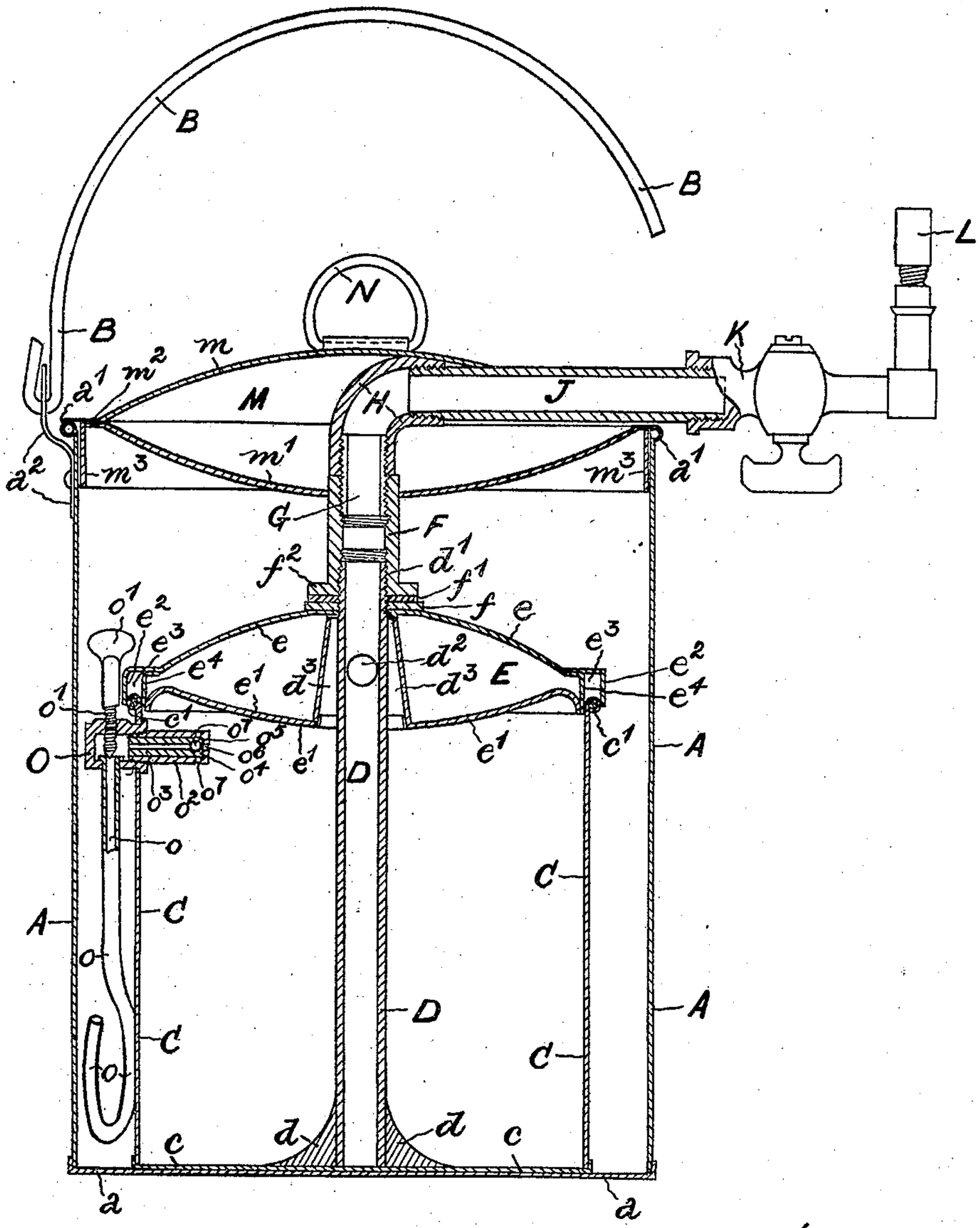

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ACETYLENE-GAS GENERATOR.

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To all whom it may concern:

Be it known that I, MYER GOLDSTEIN, a citizen of the United States, residing at Johannesburg, Transvaal, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

This invention relates to acetylene-gas generators and lamps.

It is designed with the object of producing a generator which may be made in different sizes either for large or small lighting installations or as a street, table, or hand lamp for domestic, mining, or other purposes.

A generator or lamp constructed in accordance with my invention is of extremely simple, compact, and efficient construction and is adapted to receive, if desired, a large charge of calcium carbid. Further, it is very readily taken apart to clean it or to remove the spent calcium-carbid charge and renew it when necessary. The volume or quantity of gas generated is automatically regulated by the demand or quantity consumed. The internal pressure set up when the quantity of gas generated exceeds the demand operates a valve which shuts off the water-supply.

The construction and arrangement of a generator and lamp embodying my invention is illustrated in the accompanying drawing, forming part of this specification, and I will now proceed to describe the same in detail by aid thereof.

The drawing represents a sectional elevation of a generator and lamp designed more particularly for miners' use. It is adapted to be carried in the hand or to be suspended in the underground workings of a mine.

In the drawing, A represents an outer cylindrical or other suitably-shaped vessel which constitutes the water-holder of the generator. The outer cylinder A is closed at the bottom *a* and at the upper end is formed with an external bead or rim *a'*. To the outside and at the top of the cylinder A are soldered, riveted, or otherwise suitably fixed brackets a^2, to which is attached the handle B. In the case of a portable lamp the handle B serves as a convenient means for suspending the lamp; but it will be evident that the handle may be fixed to the side of the cylinder A or in any other convenient position. In the case of a stationary generator the handle B would be dispensed with, and in the case of a table or other similar lamp the cylinder A may form part of or be arranged inside an ornamental stand or base. Inside the cylinder A is arranged another and preferably concentric cylinder C, which constitutes the holder for the calcium carbid. The cylinder C is closed at the bottom *c* and at the upper end is constructed with the external bead or rim *c'*.

Arranged inside the calcium-carbid holder C is the vertically-disposed pipe D. The pipe D is rigidly fixed by means of the conical piece of metal *d* or otherwise to the bottom *c* of the cylinder C. The pipe D is closed at the bottom and at its upper end projects for some distance above the level of the top of the cylinder C. At its upper extremity it is formed with an external screw-thread *d'*. The pipe D, which serves for taking off the gas from the interior of the cylinder C, is constructed with one or more holes d^2, forming inlets into the pipe D.

The calcium-carbid holder C is closed by means of a cover E, consisting of the top and bottom concavo-convex plates *e e'*. The cover E is constructed round the rim e^2 with a recess e^3, formed between the flange or turned-down rim e^2 of the top plate *e* and an internal ring e^4, soldered or otherwise fixed to the top plate *e*. The bottom plate *e'* is soldered or otherwise fixed round the inside of the ring e^4. In the recess e^3, formed round the rim e^2 of the cover E, is placed a packing-ring of rubber or other suitable resilient material which serves for making a gas-tight joint with the bead, rim, or upper edge *c'* of the calcium-carbid holder C.

The vertical pipe D projects through the cover E, and the latter is constructed to form a recess d^3 round the pipe D, which recess communicates with the interior of the cylinder C and through the hole or holes d^2 with the interior of said pipe D. The recess d^3 serves as the passage along which the gas flows out of the cylinder C through the hole or holes d^2 of the pipe D.

Round the upper end of the vertical pipe D and above the top of the cover E is placed a metal washer *f*, and over the metal washer *f* a washer *f'*, of leather or other suitable material, which makes a gas-tight joint between the cover E and the upper end of the vertical pipe D.

Over the externally-screwed upper extrem-

ity of the pipe D is screwed a socket F, formed with a flange f^2 at its lower end for retaining the washers $f\,f'$ in position and forcing them tightly into the junction between the cover E and the upper end of the vertical pipe D. The socket F at its upper extremity is constructed with an internal screw-thread, and into it is screwed a nipple or externally-threaded cylindrical piece G. Over the outer extremity of the nipple G is screwed an elbow-piece H, into which is screwed a pipe J, which serves as the outlet for the gas. On the outer extremity of the pipe J is screwed a tap K, to which is fixed the burner L. The gas entering the vertical pipe D through the hole or holes d^2 is free to pass through the socket F, nipple G, and elbow-piece H to the pipe J and from the latter through the tap K to the burner L.

A cover M is fitted into the upper end of the external cylinder A. This cover comprises the top and bottom concavo-convex plates $m\,m'$, which are soldered or otherwise connected at the rim m^2. The top plate m is constructed to project over the top of the bead or rim a' of the cylinder A, and the bottom plate m' is turned downward to form an inner ring m^3, which fits the upper end of the cylinder A.

The upper end of the socket F projects through a hole at the center of the bottom plate m', to which it may be soldered or otherwise attached. The elbow-piece H is located between the top and bottom plates $m\,m'$ of the cover, and the gas-outlet pipe J passes through a hole in the top plate m, to which it may be soldered or otherwise suitably connected. In this manner the socket F, nipple G, elbow-piece H, gas-outlet pipe J, tap K, and burner L are all attached to the cover M for the outer cylinder A. A handle N is attached to the top plate m of the cover M, which serves for removing said cover and with it the calcium-carbid holder C from the water or external cylinder A.

At or in proximity to the top or upper edge of the cylinder C is attached the device which serves for controlling the admission of the water to the calcium-carbid charge. This consists of a casing O, to which is attached a pipe o, which serves for conducting the water into said casing. The pipe o is preferably bent up for a suitable distance at the bottom.

The casing O is formed with a screw-threaded hole, through which is screwed a valve or screw o', which serves for closing or adjusting the area of the opening forming the inlet for the water in the casing O. Into the casing O on the inside of the cylinder C is screwed a cylindrical piece o^2, in which is fitted a tubular piece o^3. The tubular piece o^3 communicates at one end with the interior of the casing O and at the other end with a space o^4, formed between it and the end of the cylindrical piece o^2. In this space o^4 is placed a ball-valve o^5, which has a seating provided for it in the end of the tubular piece o^3 round the hole communicating with the casing O. A hole o^6 is formed in the end of the cylindrical piece o^2, and a number of small holes o^7 are formed round the end of said cylindrical piece o^2, which permit the water which passes from pipe o, casing O, tubular piece o^3 into the space o^4 to pass from said space into the calcium-carbid holder C.

To remove the spent charge from the calcium-carbid cylinder C, the cover M of the water-holder A is raised, which lifts with it the cylinder C. The cylinder C is then detached from the cover M by screwing the upper end of the vertical pipe D out of the lower end of the socket F. This allows the leather and metal washers $f\,f'$ and the cover E of the cylinder C to be removed. The spent charge is then removed from the cylinder C and the cylinder washed out and a fresh charge inserted. The upper end of the vertical pipe D is then screwed back into the socket F, and after turning the valve or screw o' to open the water-inlet into the casing O the water-holder A is partially filled with water. The calcium-carbid holder is then lowered into the water-container A and the cover M fitted in position in said container A.

Sufficient water is placed in the water-holder A for the level to rise above the level of the inlet controlled by the valve o^5. The tank or cylinder A is preferably nearly filled. When the cylinder C has been placed in position in the water-container A, the water is then free to pass by the pipe o into the casing O and along the hole in the tubular piece o^3 and to enter the calcium-carbid holder C by the holes o^7 in the cylindrical piece o^2, whereupon the acetylene gas is evolved. The gas then passes into the recess d^3 in the cover E and hole or holes d^2 in the vertical pipe D to the interior of said pipe and from the latter through the socket F, nipple G, and elbow-piece H to the pipe J, and from the latter under the control of the tap K to the burner L. In the event of too large a quantity of the gas being generated it forces the ball-valve o^5 onto its seat in the end of the tubular piece o^3 and so closes the hole and prevents any more water entering the carbid-container until the pressure falls, and thus the quantity of gas generated is automatically regulated.

To put the lamp out of operation, the carbid-holder C is removed from the vessel A and the valve or screw o' screwed down onto its seating in the end of the pipe o, which prevents the admission of any more water to the vessel C when the latter is placed back in the vessel A. It will also be evident that the valve or screw o' will serve as a means for regulating or controlling the admission of the

water to the casing O, although its primary function is to shut off the water-supply.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. In an acetylene-gas generator the combination with a water-holding vessel and an internal calcium-carbid-holding vessel, said latter vessel being closed and provided with an exit in communication with the gas-supply pipe, a valve-casing consisting of two parts attached to the internal vessel, one part comprising an external cylindrical piece formed with a plurality of holes at the inner end in communication with the internal vessel and an internal tubular piece in said cylindrical piece arranged so that it forms a chamber at one end, the tubular piece being recessed to form a valve-seat, a ball-valve located in said chamber adapted to close the passage through said tubular piece when the pressure of the gas rises owing to the quantity generated exceeding the quantity consumed, the other part of said valve-casing being located exteriorly of said calcium-carbid-holding vessel, a pipe located inside the water-container which at one end admits the water from said vessel and at the other end communicates with and conducts the water from said vessel to the casing, and a screw-valve screwed through the outer portion of the casing and adapted to close the inner end of the supply-pipe to shut off the water-supply, substantially as described.

2. In an acetylene-gas generator, the combination with an external water-containing vessel, of an internal calcium-carbid-holding vessel, an outlet-pipe for the gas provided with an aperture in said internal vessel, a cover for the internal vessel forming a recess round the gas-outlet pipe in communication with the interior of the pipe through the aperture in the latter, a valve-casing fixed to said internal vessel, a water-pipe for conducting the water to said casing, a screw-valve for closing the water-inlet into the casing and a ball-valve in the valve-casing which is operated by the pressure of the gas when the volume being generated exceeds the volume being consumed, substantially as described.

3. In an acetylene-gas generator, the combination of a water-containing vessel, an internal calcium-carbid-holding vessel, a cover for said vessel, packing between the cover and vessel for making a gas-tight joint, said cover being constructed to form a central recess, a gas-outlet pipe provided with an aperture in communication with the recess in the cover of the calcium-carbid-containing vessel, a valve-casing comprising two parts one within and the other without said calcium-carbid-holding vessel, the tubular piece inside the casing forming a chamber in communication with the calcium-carbid vessel, a ball-valve located in said chamber and adapted to close the passage through said tubular piece, a pipe connected to the external part of the casing for conducting the water from the water-holder into said casing and a screw-valve carried by said casing and adapted to close the end of the water-pipe to shut off the water-supply to the valve-casing, substantially as described.

4. In an acetylene-gas generator, the combination of the water-containing vessel and the internal calcium-carbid-holding vessel, covers for each of said vessels, a vertically-disposed outlet-pipe for the gas fixed inside the calcium-carbid holder and projecting through the cover having a hole in communication with the calcium-carbid holder, a socket screwed over the outer extremity of the vertical pipe, packing between said socket and the cover for making a gas-tight joint with the latter, the cover being constructed to form a chamber round the gas-outlet pipe inclosing the aperture and placing it in communication with the calcium-carbid holder, pipes connecting said socket to the gas-supply pipes or mains, packing carried by the cover of the calcium-carbid holder forming a gas-tight joint between the cover and holder, a valve-casing fixed to the calcium-carbid holder, a pipe carried by and communicating with said casing for conducting the water from the water-holder to said casing, a screw-valve for closing the inlet from the pipe to the casing to shut off the water-supply, a ball-valve in the casing which operates to close the water-inlet when the quantity of gas being produced exceeds the quantity being consumed, substantially as described.

5. In an acetylene-gas generator and lamp, the combination of the water-holder A, the cover M comprising the plates $m\,m'$, the latter forming the ring m^3 and the former the rim fitting the upper edge of the vessel A, the brackets a^2 the handles B and N, the internal vessel C for the calcium carbid, the vertical outlet-pipe D and the cone d for fixing said pipe inside the vessel C, the cover E comprising the plates $e\ e'$ and the ring e^4, the packing e^3 arranged in the annular recess in the cover E, said packing forming a gas and water tight joint with the rim c' of the vessel C, said cover being constructed with the recess d^3 and the pipe D with the aperture d^2, said aperture and recess placing pipe D in communication with vessel C, the socket F screwed over the upper end of pipe D above cover E and the packing $f\,f'$ for forming a gas and water tight joint between the socket and top of cover E, the nipple G, elbow H, pipe J, tap K and burner L, the casing O fixed to the vessel C, the cylindrical piece o^2 screwed into the casing O and the tubular piece o^3 in the piece o^2 arranged to form the chamber o^4, the piece o^2 being formed with the holes $o^6\ o^7$ placing the interior of the ves-

sel C in communication with the chamber o^4, the ball-valve o^5 in the chamber o^4, the pipe o curved upward at the bottom fixed to and communicating with the casing O, and the screw-valve o' carried by casing O and adapted to close the pipe o, substantially as described and shown in the drawing.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

MYER GOLDSTEIN.

Witnesses:

CHAS. OVENDALE,

R. OVENDALE.