No. 624,011. Patented May 2, 1899.

J. J. GRAF & C. KECK.

ACETYLENE GAS GENERATOR.

(Application filed July 9, 1898.)

(No Model.) 3 Sheets—Sheet 1.

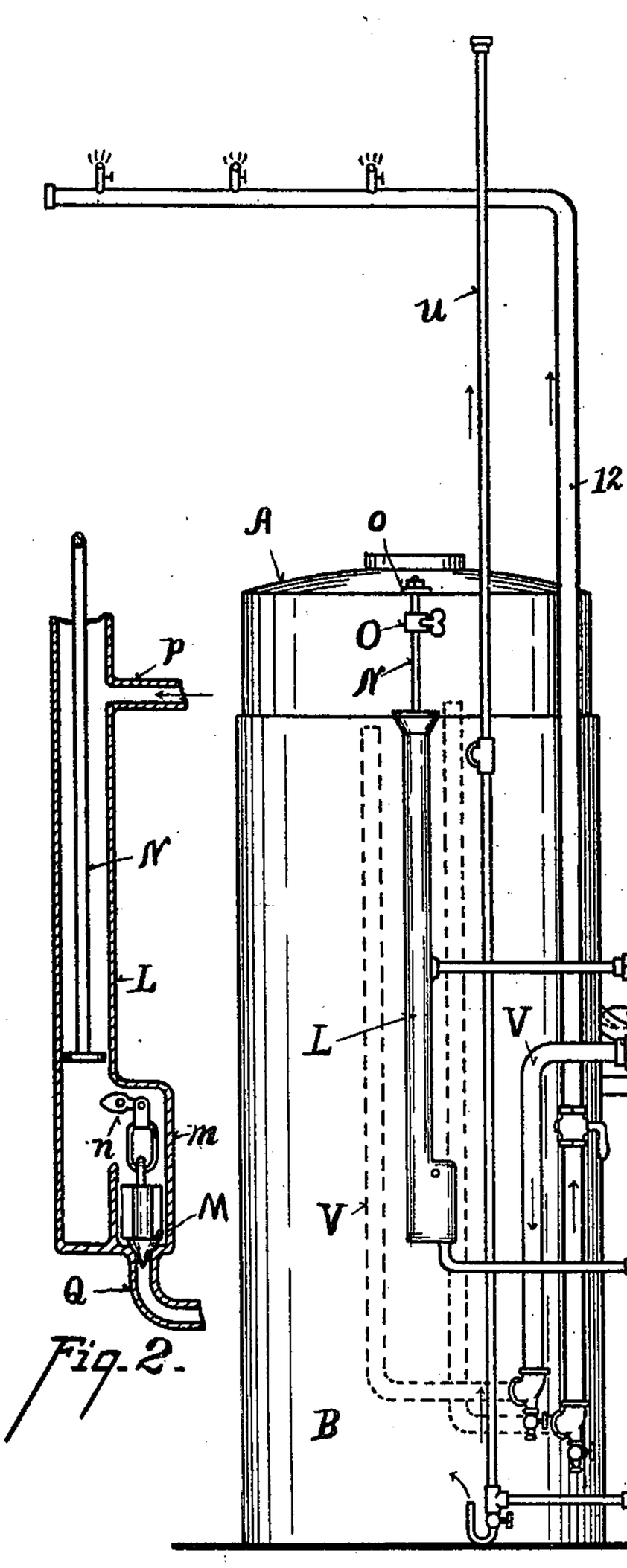

Fig. 2.

Fig. 1.

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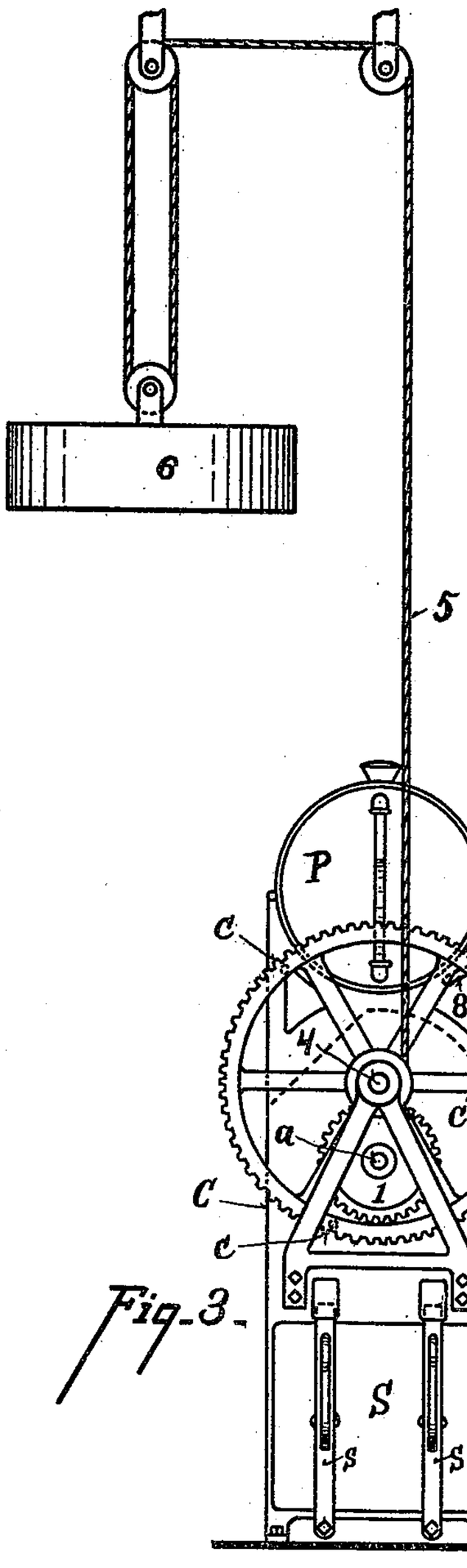


Fig. 3.

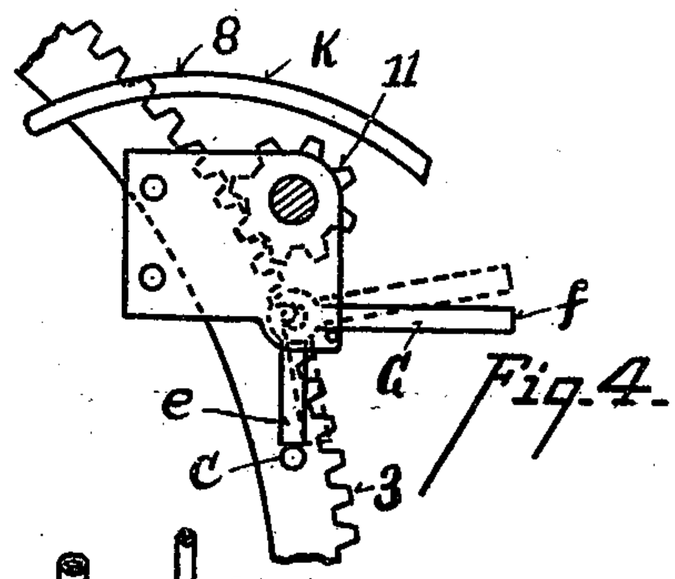
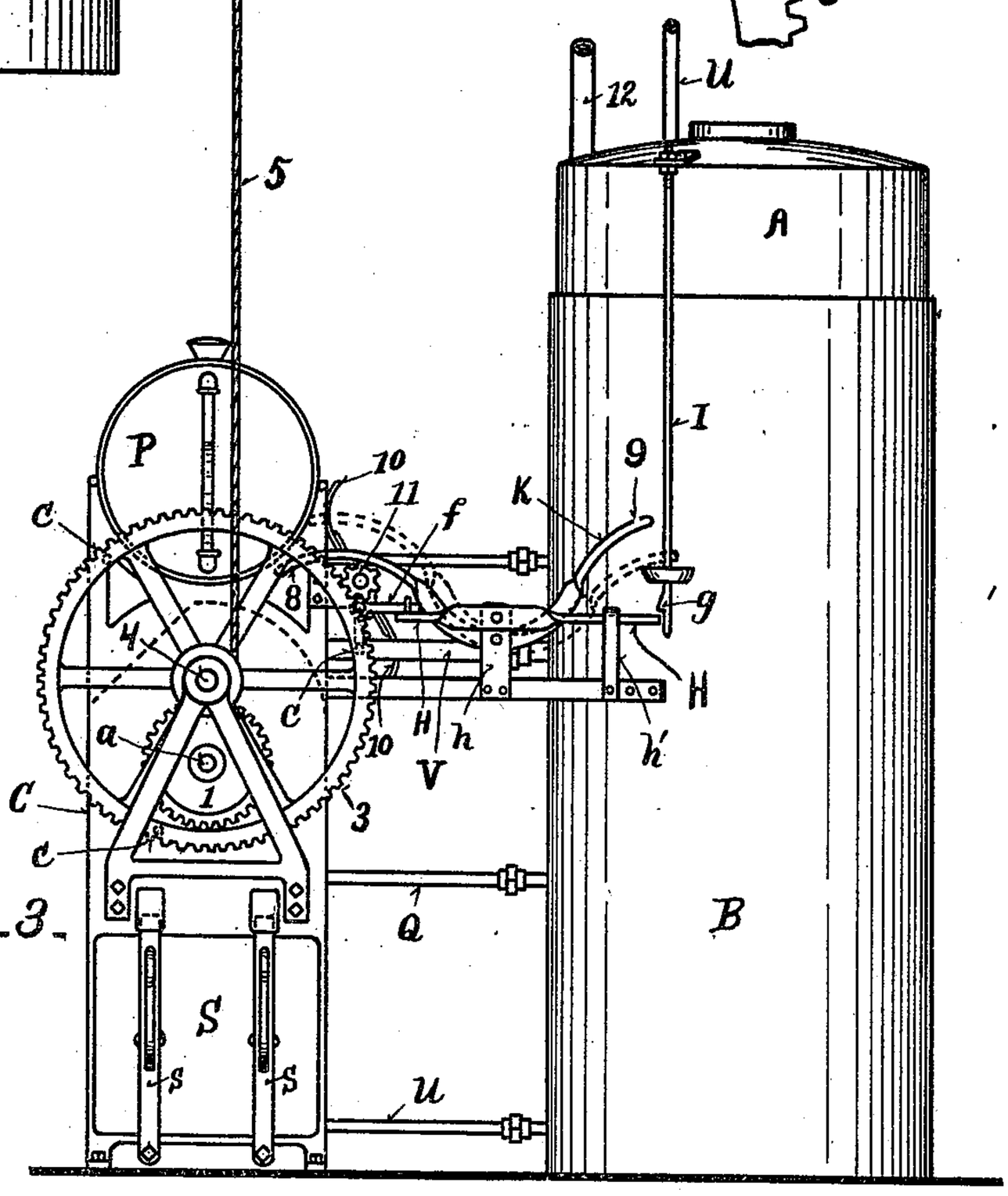


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

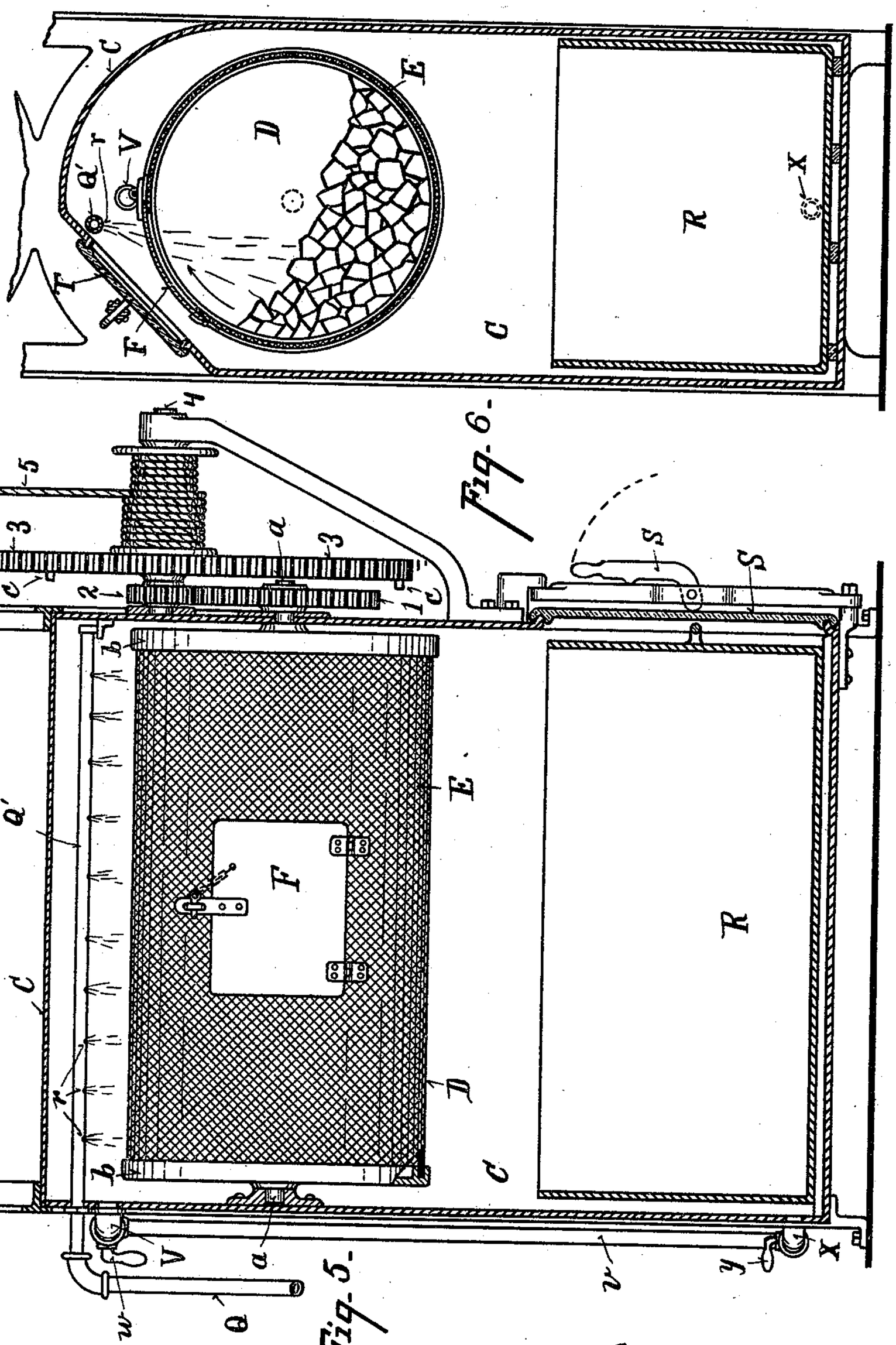

Fig. 6.

Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN J. GRAF AND CHRISTIAN KECK, OF CINCINNATI, OHIO, ASSIGNORS TO W. E. BLETSCH, OF SAME PLACE.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 624,011, dated May 2, 1899.

Application filed July 9, 1898. Serial No. 685,521. (No model.)

To all whom it may concern:

Be it known that we, JOHN J. GRAF and CHRISTIAN KECK, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

The objects of our invention are, first, to provide an acetylene-gas generator which works automatically, the parts being so constructed and the water so applied that no appreciable amount of heat is evolved in the generation of the gas, and, second, to apply the water so that it is practically all utilized in the generation of the gas.

Another object of our invention is to provide a revoluble carbid-holder adapted to be operated by power with stop and tripping mechanisms actuated by the gasometer, so as to intermittingly generate small quantities of gas, thereby avoiding undue pressure and heat.

Another object of our invention in employing the revolving carbid-holder is to sift out the ash or decomposed product of the carbid after the gas is formed. By this means the water can be positively applied to the carbid, and thereby avoiding surplus of water and producing a dry ash or residuum.

Various other new and useful results are obtained by our invention, which will be more fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a rear elevation of our improvement, showing end view. Fig. 2 is a sectional elevation of the water-feed pipe and trip. Fig. 3 is a front end elevation of our improvement. Fig. 4 is a detailed view of the power tripping devices. Fig. 5 is a sectional elevation of the carbid-chamber, showing the carbid-holder in elevation and the ash-pan in section. Fig. 6 is a cross-section of Fig. 5.

A represents an ordinary gasometer provided with the usual water-seal tank B.

C represents the carbid-generator compartment. Within this compartment is placed the carbid-holder D. This is mounted upon journals *a*, affixed to the cylindrical heads *b b*. E represents a perforated cylindrical shell, preferably made of wire cloth or gauze and secured to the heads *b b*. F represents a feed-door closing an opening in said chamber. This carbid-holder is revoluble upon its journals and driven by a train of gears 1 2 3. 4 represents a shaft which forms the axis of the gears 2 3. The gears are driven, preferably, by a cord 5 and weight 6, as shown in Fig. 1. This carbid-holder is intermittingly revolved. It is controlled by a stop and tripping mechanism operated by the rise and fall of the gasometer in the following manner: *c* represents a stop-pin in the rim of the large gear-wheel 3. As many pins may be employed as are desired. Their distance apart regulates the travel of the carbid-holder. G represents a controlling-lever. (See Fig. 4.) Its arm *e*, resting upon the stop-pin *c*, arrests the travel of the gear-wheel. *f* represents a tripping-arm which is operated by the tripping-lever H, pivoted to the bracket *h*. The forward end of said lever H engaging with the tripping-lever *f*, the rear end projects backward and is engaged by a vertical tripping-rod I, carried by the gasometer. When the gasometer descends, so that the catch *g* engages with the tripping-lever H, the lever G is rocked, releasing the engagement of the pin *c*, and the weight 6 drops and revolves the carbid-holder. K represents a resetting-lever. The forward end 8 projects forward in the path of pin *c*. The rear end 9 is in line with the vertical rod I. When the pin *c* comes in contact with the forward end 8 of said lever, it rocks the same on its shaft *k'*, as seen in dotted lines, Fig. 3, and its rear end 9 engages the vertical rod I and releases the catch *g* from its engagement with lever H, thereby allowing the arm of lever G to drop back into the path of pin *c* and stop the further movement of the carbid-holder by thus arresting the movement of the weight.

In order to prevent the lever-arm H from rising, a ring or link *h'*, serving as a guide, is projected from the bracket *h*, through which the arm H passes, its vertical travel in either direction being limited by the ends of the link. So after the catch *g* has tripped lever H and as the gasometer rises, carrying rod I upward, the catch *g* engages its inclined surface against the end of lever H; but as this lever cannot rise on account of the link the

incline on catch *g* throws the rod I out, allowing the catch to pass into position for the next tripping operation.

In order to prevent a too sudden movement of the gears and to take up shocks and jars, we provide a regulator or cushioning mechanism which preferably consists of fan-blades 10, mounted upon a shaft driven by a gear 11, meshing with the gear 3.

The water-feed is likewise controlled by the rise and fall of the gasometer. L represents the water-feed pipe, mounted upon the outside of the seal-tank B. M represents a valve seating in the valve-chamber *m*. *n* represents a tripping-lever operated by a vertical tripping-rod N and having a link connection with the stem of valve M. This rod projects up through the ear *o* on the gasometer. O represents an adjustable trip-block secured to said rod N, against which the ear *o* strikes to move the rod N downward and raise the valve M. This allows the water to pass into the carbid-holder.

The method of arranging the water-feed devices is as follows: P represents the water-reservoir, preferably for convenience arranged above the generating-chamber. It is connected to the regulating feed-pipe L by the branch pipe *p*. Pipe Q, below the valve, connects with pipe Q′, which is projected into the carbid-compartment above the revoluble holder. This supply-pipe is pierced with a series of small orifices *r* at intervals along its length within the carbid-chamber, so as to allow the water to be applied in drops upon the top surface of the carbid through the perforated holder, thereby causing a uniform and slow feeding of the water and a consequent steady production of gas until the amount of water fed in is entirely consumed.

It is desirable to have the carbid-holder revolved, so as to sift out the dry ash and to present a new surface of the carbid before the water is admitted. To accomplish this, the set-block O is adjusted so as not to be tripped until after the stop mechanism has arrested the travel of the carbid-holder.

A very important advantage is derived from this method of employing an intermittingly-revolving carbid-holder and supplying the water in small quantities at the top of the carbid-holder. Practically all the water is decomposed and the gas passes into the gasometer. As soon as this gas is consumed sufficiently the gasometer drops and trips the lever G, which allows the weight to partially revolve the holder, sifting out the residuum and presenting a new surface of carbid to the action of the water which will be admitted shortly after as the gasometer drops a little more. The ash sifted out is deposited into a pan R underneath the holder. The generating-chamber is provided with a door S for the removal of this pan. *s* represents levers for locking said door firmly in position to prevent the escape of gas from the generating-chamber. This ash is not only dry, as the water has been consumed, but it is free from the obnoxious gas smell incident to the residuum in all machines hitherto used, as its entire capacity for producing gas has been utilized. T represents a similar door on the top of the generating-chamber, arranged convenient for access to door F of the carbid-holder. By reason of this construction the carbid-holder may be filled at any time, whether part full or otherwise, as the ash is continually sifted out and separated from the unconsumed charge.

In order to charge the generating-chamber with carbid and to prevent gas escaping back from the gasometer, the carbid-holder chamber is provided with a gas-pipe V, leading into the gasometer. Another gas-pipe X leads from the lower part of the generating-chamber and connects with an escape gas and air pipe U. An escape gas-pipe *v* connects pipe V with escape-pipe U. Pipes V and *v* are provided at their union with a two-way cock W. When it is desired to charge the carbid-holder, cock W is turned to shut off the supply of gas from the generating-chamber to the gasometer, which also admits gas from the generating-chamber through pipe V to pipe *v* and thence out of escape-pipe U. In order to escape the air admitted to the generating-chamber during the charging operation, stop-cock Y on pipe X is opened, valve W is turned, admitting gas to the gasometer, and shutting off pipe *v*. The back pressure of gas from the gasometer will then force the air and gas out of the generator through pipes X and U, which will be indicated by a slight drop of the gasometer, when cock Y is shut off again and the gas is supplied to the gasometer.

Having described our invention, we claim—

1. In an acetylene-gas generator, in combination with a gasometer, a water-reservoir, a generating-chamber and gas and water pipe connections, a perforated revoluble carbid-holder journaled in said generating-chamber, power mechanism connected to and adapted to revolve said holder, a tripping-lever and resetting-lever pivoted between said generating-chamber and the gasometer, stop mechanism mounted on the power devices and adapted to normally engage the outer ends of said levers, tripping devices mounted on the movable gasometer and adapted to engage the inner ends of said levers to revolve and automatically stop the carbid-holder at predetermined points of the gasometer travel, substantially as described.

2. In an acetylene-gas generator in combination with a gasometer, a water-reservoir and water-feed devices, a generating-chamber and gas and water pipe connections, a perforated revoluble carbid-holder journaled in said generating-chamber, power devices connected to said holder and adapted to revolve the same, a series of stops located on said power devices, tripping-lugs mounted on the movable gasometer, tripping and resetting lever mechanism connected to the

gasometer and generating-chamber, the said levers normally engaging the stop mechanism of the power device and locking the holder against rotation, and projected in the path of travel of the tripping-lugs mounted on the gasometer, whereby the power is automatically and consecutively applied and arrested at a predetermined point of the downward travel of the gasometer, substantially as described.

3. In an acetylene-gas generator the combination of a gasometer, a water-reservoir, a generating-chamber and gas and water pipe connections, a feed-water-control pipe connected respectively with the reservoir and the generating-chamber, a valve located in said control-pipe, a perforated revoluble carbid-holder journaled in said generating-chamber, power devices connected to and adapted to revolve said holder, stop mechanism mounted on said power devices, a tripping-lever and a stop-lever pivoted between the gasometer and generating-chamber, the forward ends of said levers normally engaging said stop mechanisms, tripping devices mounted on the gasometer and adapted to engage the inner ends of said levers, to automatically rotate and arrest the carbid-holder, tripping devices mounted on the gasometer and arranged to trip the valve in the water-pipe before the setting and stop levers are tripped, substantially as described.

4. In an acetylene-gas generator the combination of a gasometer, a water-reservoir, a generating-chamber, and gas and water pipe connections, a water-feed-control pipe connected to the reservoir and to the generating-chamber, a valve located in said pipe, a revoluble carbid-holder journaled in the generating-chamber, power devices for operating the same, stop mechanism mounted on one of the power devices, tripping and resetting mechanism adapted to normally engage said stop mechanism and prevent rotation of the carbid-holder, tripping mechanisms mounted on the gasometer and arranged to consecutively trip the valve in the feed-water-control pipe, the power applying tripping mechanism and the resetting at predetermined points of the gasometer travel, substantially as described.

5. In an acetylene-gas generator the combination of a gasometer, a generating-chamber, and a water-reservoir, gas-pipe connection from the generating-chamber to the gasometer, and water-pipe connections from the reservoir to the generating-chamber, a revoluble perforated carbid-holder journaled in the upper part of said generating-chamber and an ash-pan located under said holder, power devices connected to the axle of the holder, a train of gears driven by said power, and a cushioning device connected to and operated thereby, lever mechanism adapted to be engaged at one end by tripping mechanism mounted on the gasometer, and the other end with stop mechanism mounted on one of said gear-wheels, substantially as specified.

6. In an acetylene-gas generator the combination of a gasometer, a generating-chamber, a water-reservoir located above said generating-chamber, a perforated revoluble carbid-holder journaled in said generating-chamber, mechanism for revolving said holder adapted to be actuated by tripping mechanism mounted on the gasometer, water-pipe connections from said reservoir to a point above said carbid-holder in the generating-chamber, a valve located in one of said pipe connections, a reciprocating plunger located in said pipe adapted to trip said valve, a tripping-lug on the gasometer, an adjustable tripping-block mounted on said plunger and adapted to be engaged by said lug at any predetermined point of the fall of the gasometer, whereby the valve is tripped and water supplied to the generating-chamber, substantially as specified.

7. In an acetylene-gas generator the combination with a gas-generating chamber, a perforated revoluble carbid-holder journaled therein, power devices connected thereto for revolving the same, a train of gears driven by said power devices, stops mounted on one of said gear-wheels, fan-blades mounted on the axis of a gear-wheel in mesh with one of said train of gears, lever mechanism adapted to rest normally against said stop and adapted to be tripped by the gasometer in its descent, and lever mechanism adapted to be engaged by the stop-pin in its travel at one end, and adapted to engage the stop mechanism at its other end to reset the same, substantially as specified.

In testimony whereof we have hereunto set our hands.

JOHN J. GRAF.
CHRISTIAN KECK.

Witnesses:
OLIVER B. KAISER,
W. R. WOOD.