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Patented Dec. 20, 1898.

N. LIKINS.

ACETYLENE GAS GENERATOR.

(Application filed Apr. 12, 1897.)

(No Model.)

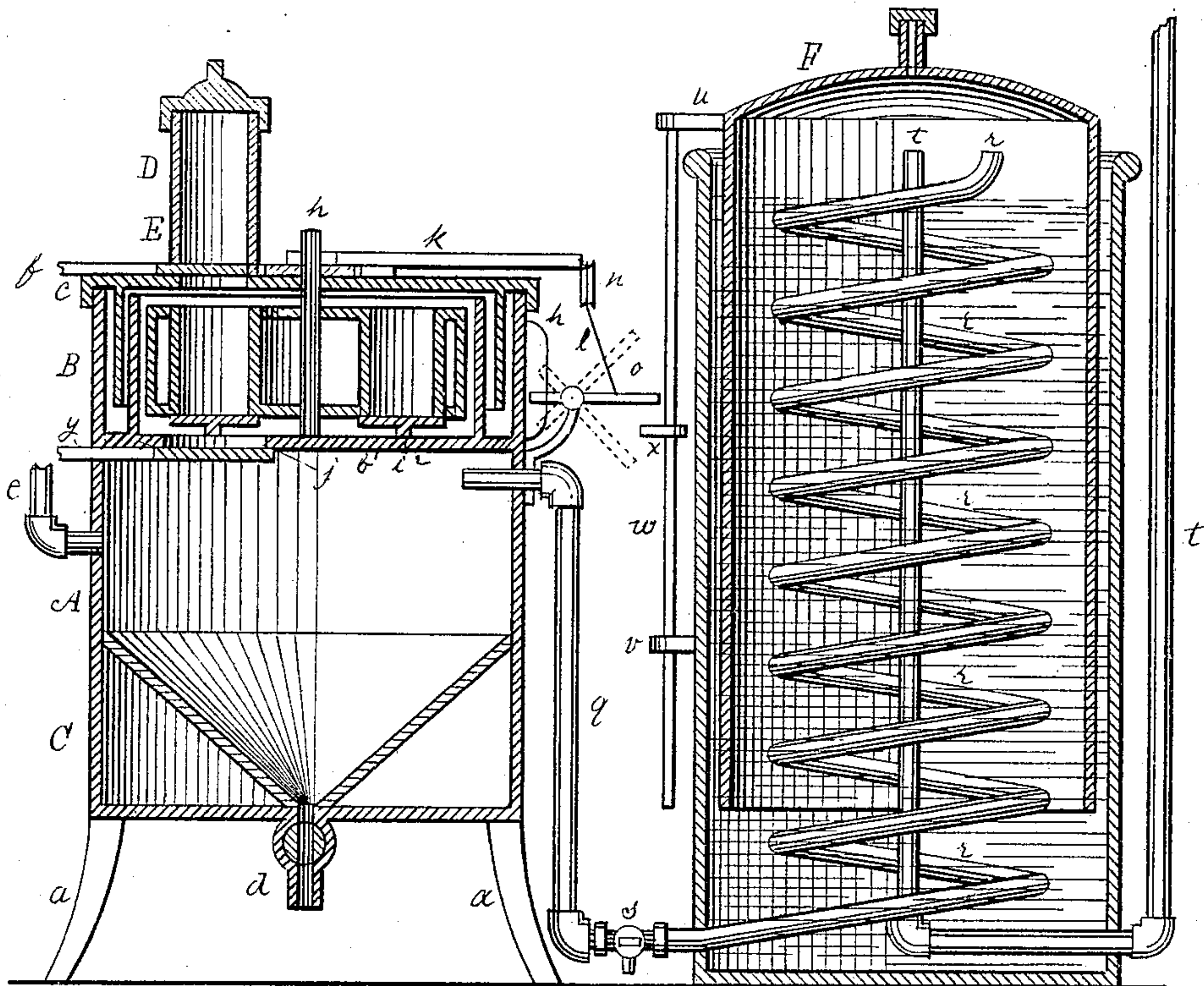


Fig. 1

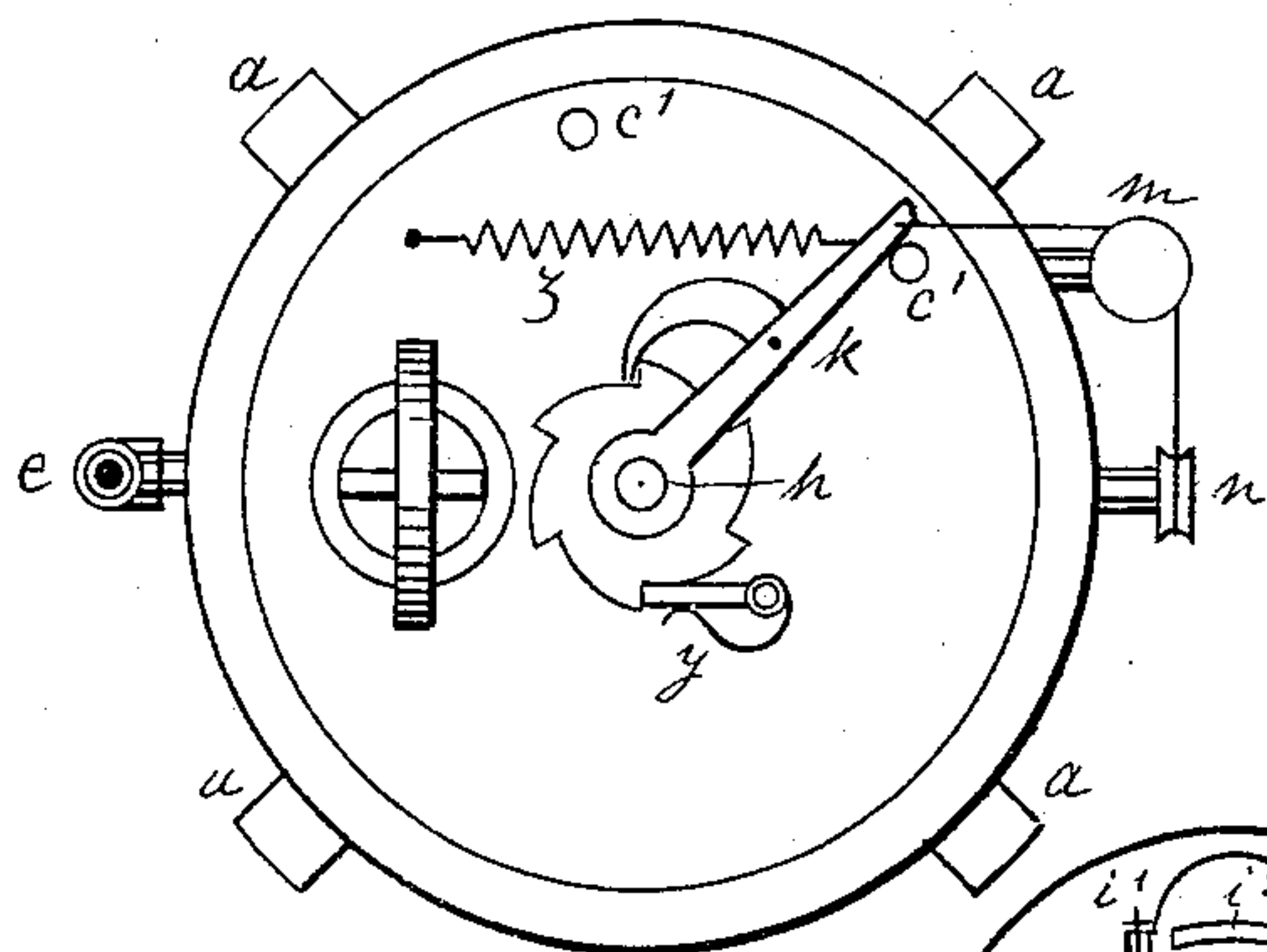


Fig. 2

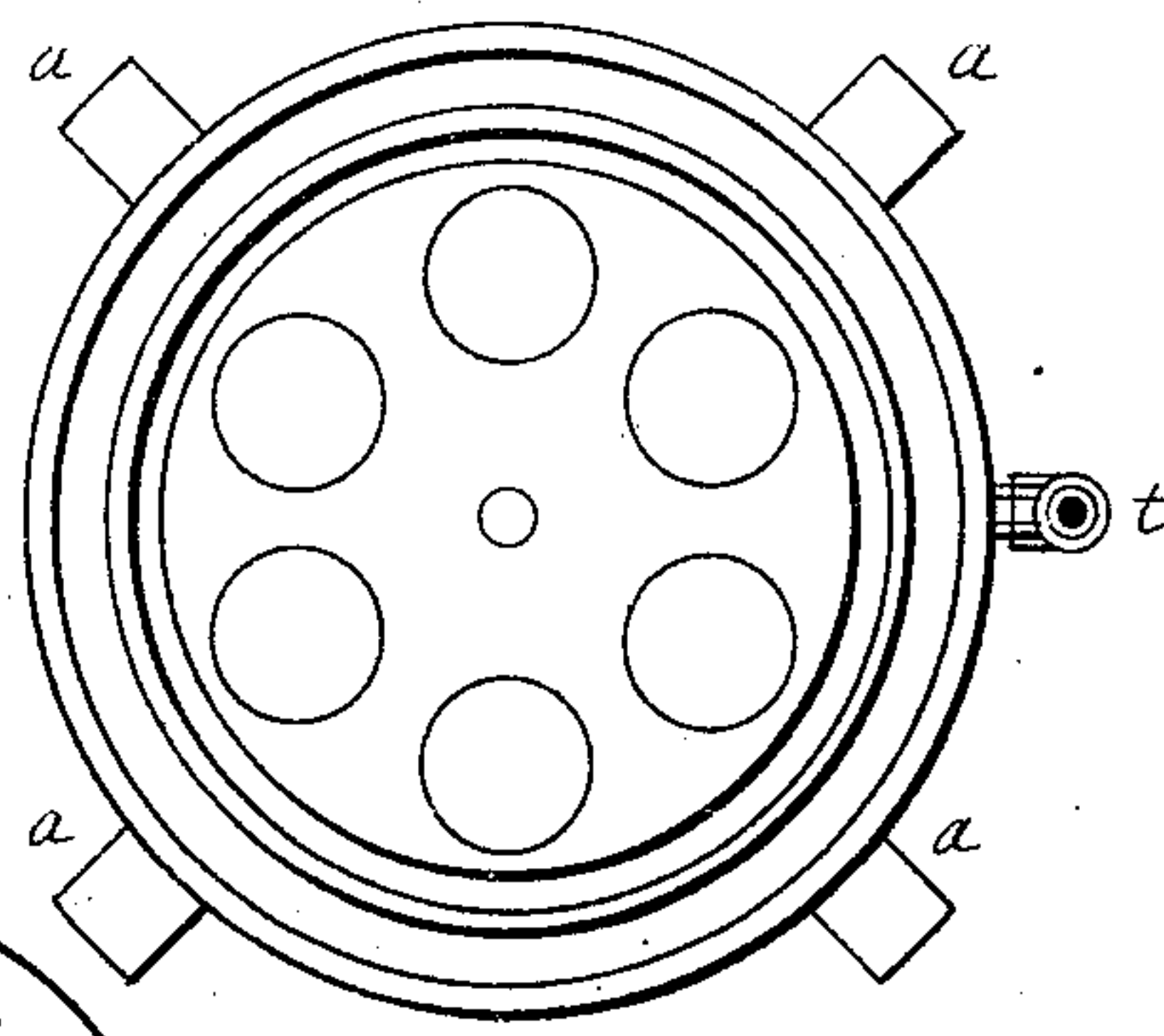


Fig. 3

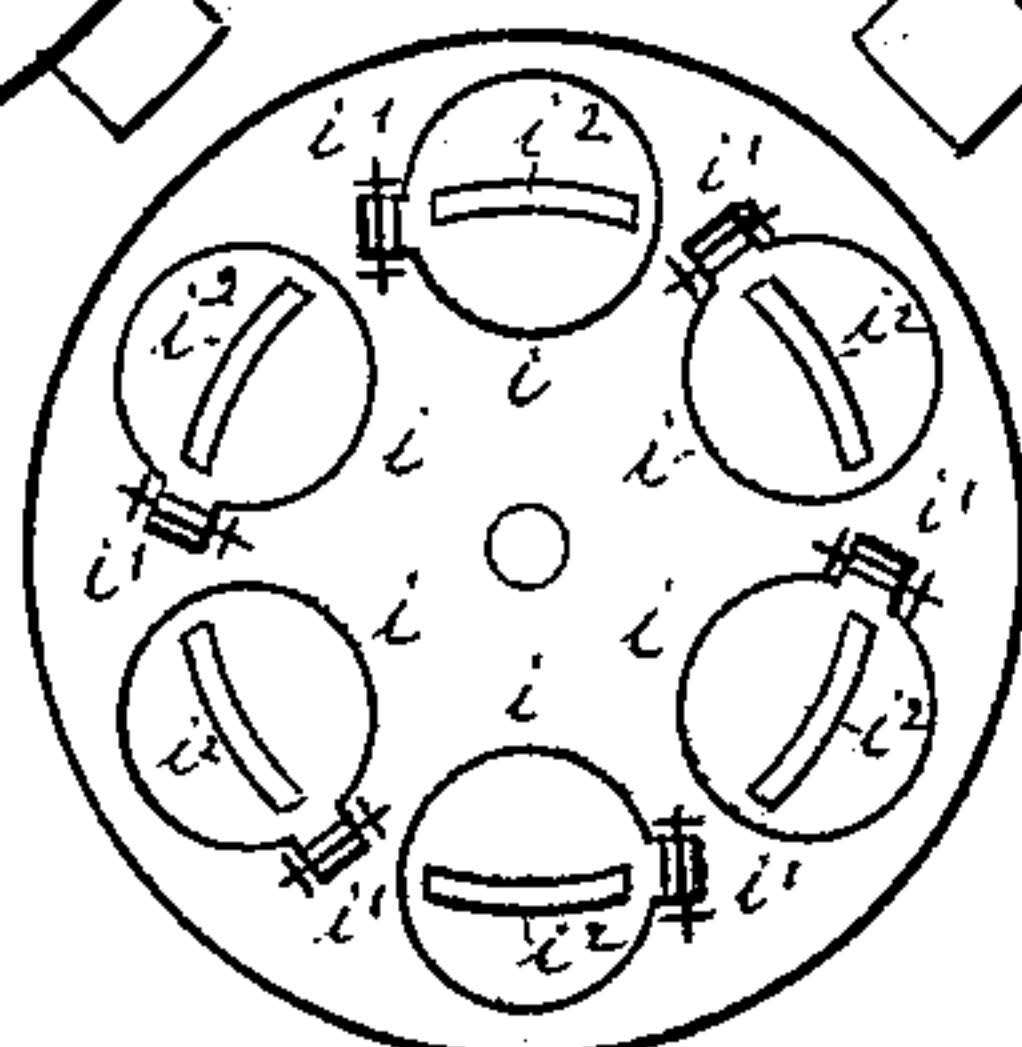


Fig. 4

WITNESSES

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NELSON LIKINS, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF TWO-FIFTHS
TO TILLMAN H. STEVENS, OF SAME PLACE.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 616,124, dated December 20, 1898.

Application filed April 12, 1897. Serial No. 631,875. (No model.)

To all whom it may concern:

Be it known that I, NELSON LIKINS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented new and useful Improvements in Gas-Generators, of which the following is a specification.

The purpose of my present invention is to provide a generator adapted to automatically generate acetylene or other illuminating gas in sufficient quantities to maintain any number of lights required and to automatically regulate the amount stored, to the end that there shall not at any one time be a dangerous quantity on hand.

My invention therefore consists of a generator embodying a charger adapted to receive a measured quantity of calcium carbide (or other gas-generating material) and means for emptying and refilling the same; of a magazine having a number of chambers, each of which has the capacity of the before-mentioned charger, and means for emptying and recharging the same, and of a water-tank wherein calcium carbide is saturated, and as a result acetylene gas is liberated therefrom, and means for replenishing the water when exhausted and for drawing off the residuum, all of which is fully illustrated in the accompanying drawings and fully described hereinafter.

In the drawings, Figure 1 is a transverse vertical section of my generator connected with a telescope gas-holder. Fig. 2 is a top view of my generator complete. Fig. 3 is a top view of my generator with its cover removed, showing the top of the magazine; and Fig. 4 is a bottom view of the magazine.

Similar letters refer to similar parts throughout the several views.

The case A is preferably cylindrical in form and for convenience in drawing off the residuum is mounted upon the legs *a*. Sheet metal is best adapted to its construction. It is horizontally divided into two chambers B and C by means of the floor *b*, having the opening *j* therein. The upper chamber B serves as a receptacle for the magazine, and the lower chamber C serves as a water-tank. The upper chamber is provided with a water-sealed cover *c*, supporting the charger D.

The lower chamber is provided with a funnel-shaped bottom terminating in a valve *d* for drawing off the residuum, with the pipe *e* for supplying it with water.

The charger D is located above and on a vertical line with the opening *j* in the floor *b*. It is provided with an air-tight cover held in place by means of a suitable clamp, while its lower end is closed by a gate-valve *f*. This valve *f* is drawn outward to alternately drop charges of calcium carbide into the chambers of a revolving magazine hereinafter described.

The magazine E is rigidly affixed to a vertical spindle *h*, extending through the cover *c* of the chamber B. It consists of a cylindrical case having two parallel heads, or it may consist of two circular heads without the circumferential side, said heads being connected by means of a number of tubes (like the flues of a steam-boiler) located equidistant from the vertical spindle *h*, thus forming a group of chambers adapted to pass alternately beneath the charger D when the said magazine E is revolved. These chambers are open at their upper ends, while their lower ends are closed by hinged bottoms *i*, opening downward. These hinged bottoms *i* are secured to the under side of the lower head of the magazine E by means of the hinges *i'* and are provided upon their under sides with runners or shoes *i''*, which ride upon the upper side of the floor *b*, as will hereinafter be understood.

The floor *b* of the case A is provided with an opening *j*, (preferably cylindrical,) so located that when the magazine E is revolved its several chambers will pass directly over it. This opening *j* is large enough to permit the hinged bottoms *i* of the magazine-chambers to alternately swing downward through it, thus precipitating the charges of calcium carbide carried by the magazine E into the water-tank C. Then when the magazine is again revolved the hinged bottoms *i* will be lifted into place by means of the before-mentioned runners or shoes. Thus in turn each and every chamber of the magazine E will contribute its quota of gas-generating material.

A ratchet-lever *k* rests upon the cover *c* of

the chamber B, is secured to the vertical spindle *h* by means of a feather and key, and rotates the magazine E. It is limited in its movement by the pins *c'*, affixed in the cover

5 *c*. A cord *l* is attached to the outer end of the ratchet-lever *k*, passes around the pulley *m* and over the pulley *n*, and thence extends to and is connected with the gravity-lever *o*. This lever is supported by an arm or bracket
10 extending from the circumferential side of the case A.

The telescope gas-holder F is not unlike those commonly used, and hence needs no description herein. It is connected to the generator by means of the pipe *q*. This pipe
15 serves to convey the gas from the generator through the coil *r* into the upper portion of the gas-holder F. It is provided with the three-way cock *s*, which serves both to shut off the
20 flow of gas and to draw off the condensation from the coil *r*. The pipe *t* conveys the gas from the gas-holder to the burners. Extending from the upper portion of the inverted case of the telescope gas-holder is an arm *u*,
25 and from the circumferential side of the lower part of the generator extends a guide *v*. Depending from the arm *u* and extending downward through the guide *v* is a rod *w*, carrying the lug *x*.

30 *y* is a spring-pawl to prevent the ratchet-lever *k* from revolving in the wrong direction, and *z* is a spring to throw the ratchet-lever *k* back into position.

I operate my device as follows: Closing the
35 drainage-valve *d*, I admit water to the lower chamber C through its supply-pipe *e*, filling it nearly to the floor *b*. I then water-seal the cover *c* of the upper chamber B and supply the gas-holder with water, nearly submerging the coiled pipe *r*, as shown. I next remove the cover of the charger D and place
40 therein a measured quantity of calcium carbide, which quantity may vary from one to ten pounds, according to the quantity of gas required, and replace the cover. I then open
45 the gate-valve *f* and transfer the charge of calcium carbide to the chamber of the magazine E directly beneath it. I then revolve the magazine E by means of the lever *k* to
50 bring another chamber beneath the charger. I now put another measured quantity of calcium carbide into the charger D, replace its cover, and again open the gate-valve *f*, thus transferring the second charge to another
55 chamber of the magazine E, and repeat the operation until all of the chambers of the magazine E are charged. I then open the gate-valve *g*, which is directly beneath the opening *j* of the floor *b*, thus letting the hinged
60 bottom *i* fall into the said opening *j*, thereby precipitating the charge of calcium carbide into the water-tank C, when acetylene gas will at once be liberated therefrom. The gas so liberated will flow through the pipe *q* and the
65 submerged coil *r*, whereby it will be robbed of a portion of its heat and moisture and will accumulate in the upper portion of the gas-

holder, where by its expansive force it will raise the inverted case, thus giving itself room therein. Then as the gas thus accumulated
7 is exhausted the inverted case of the gas-holder F will fall, carrying with it the rod *w*, when the lug *x* will be brought into contact with the outer end of the lever *o*, which it will depress, thus pulling downward upon the
7 cord *l*, attached thereto, which in turn will swing the ratchet-lever *k* and with it the magazine E, thus bringing another of its charged chambers over the opening *j* of the floor *b* and
8 letting its hinged bottom *i* fall, thereby precipitating the second charge of calcium carbide into the water-tank C, when the process of generating gas will begin, and again
8 raise the inverted case of the telescopic gas-holder F, lever *o* rising to let the lug *x* pass
9 it, the lever *o* falling by gravity to its horizontal position. Thus the process is repeated until all of the chambers of the magazine E are emptied, when they may be refilled, as before.

It is apparent that where few lights are to be maintained a small charge of calcium carbide is used in each charge, (for instance, one pound,) and where a larger number of lights are to be maintained a larger quantity is used.
9 Hence my generator is adapted to be used with good results in small or large houses, and as the gas generated from one charge of calcium carbide is practically exhausted before another charge can be precipitated it follows
1 that there cannot be a dangerous quantity of gas on hand at any one time. It will be understood that the gas-holder F is of a size to hold the gas generated from the heaviest charge of calcium carbide used.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A gas-generator embodying a lower chamber adapted to hold water for gas-generating purposes; said chamber being provided with a supply-pipe for filling, and a valve for draining it; an upper chamber adapted to serve as a receptacle for a revolving magazine; said chamber being separated from the lower chamber by a floor having an opening therein; a charger mounted upon the cover of the said upper chamber, adapted to receive charges of calcium carbide, and to transfer the same to the magazine; a magazine vertically journaled within said upper chamber; said magazine having a plurality of chambers, adapted in turn to pass directly over the said opening in the floor separating the upper and lower chambers; a ratchet-lever connected with the said vertical journal, said ratchet-lever operating to intermittently revolve the said magazine; a lever pivoted to an arm extending from the side of the said generator; and a rod attached to the rising-and-falling case of a telescope gas-holder, (with which the said generator is connected,) said rod carrying a lug; said lug being adapted to trip (when on its downstroke) the said lever;

whereby the said lever is deflected, the cord drawn downward, the ratchet-lever swung around, and the magazine revolved, substantially as described.

5 2. In a gas-generator, the combination with a lower chamber adapted to hold water for gas-generating purposes; an upper chamber adapted to serve as a receptacle for a revolving magazine; a magazine revoluble therein; 10 and a telescope gas-holder adapted to serve as a storage-chamber for the gas; of a charging mechanism, said mechanism consisting of a charger, mounted upon, and a chambered magazine journaled within the said upper 15 chamber; a ratchet-lever connected with, and revolving the said chambered magazine; a lever, supported from the side of the said generator; a cord connecting the said ratchet-lever and the said lever; and a rod depend- 20 ing from the rising-and-falling case of the said telescope gas-holder, substantially as shown and for the purposes specified.

3. In a gas-generator, the combination of a charger adapted to receive measured quantities of calcium carbid or other gas-making 25 material, and to transfer the same to a re-

volving magazine journaled within a chamber directly beneath the said charger; said magazine having a number of chambers adapted to in turn receive the charges of calcium carbid from the said charger, and, in turn, to discharge the same into a water-tank, located directly beneath the said magazine; said water-tank being separated from said magazine-chamber by means of a floor hav- 35 ing an opening therein; a ratchet-lever adapted to intermittently operate the said revolving magazine; said ratchet-lever, in turn, being actuated by the rising-and-falling case of a telescope gas-holder through the operation 40 of a vertical bar, attached to said rising-and-falling case, said vertical bar having a lug which, in its downward course, contacts with, and deflects, a lever extending from the side of the said generator, whereby a cord is drawn 45 downward, said cord connecting the said ratchet-lever and the said lever, substantially as shown and described.

NELSON LIKINS.

Witnesses:

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C. H. ROWE.