No. 692,213. Patented Jan. 28, 1902.

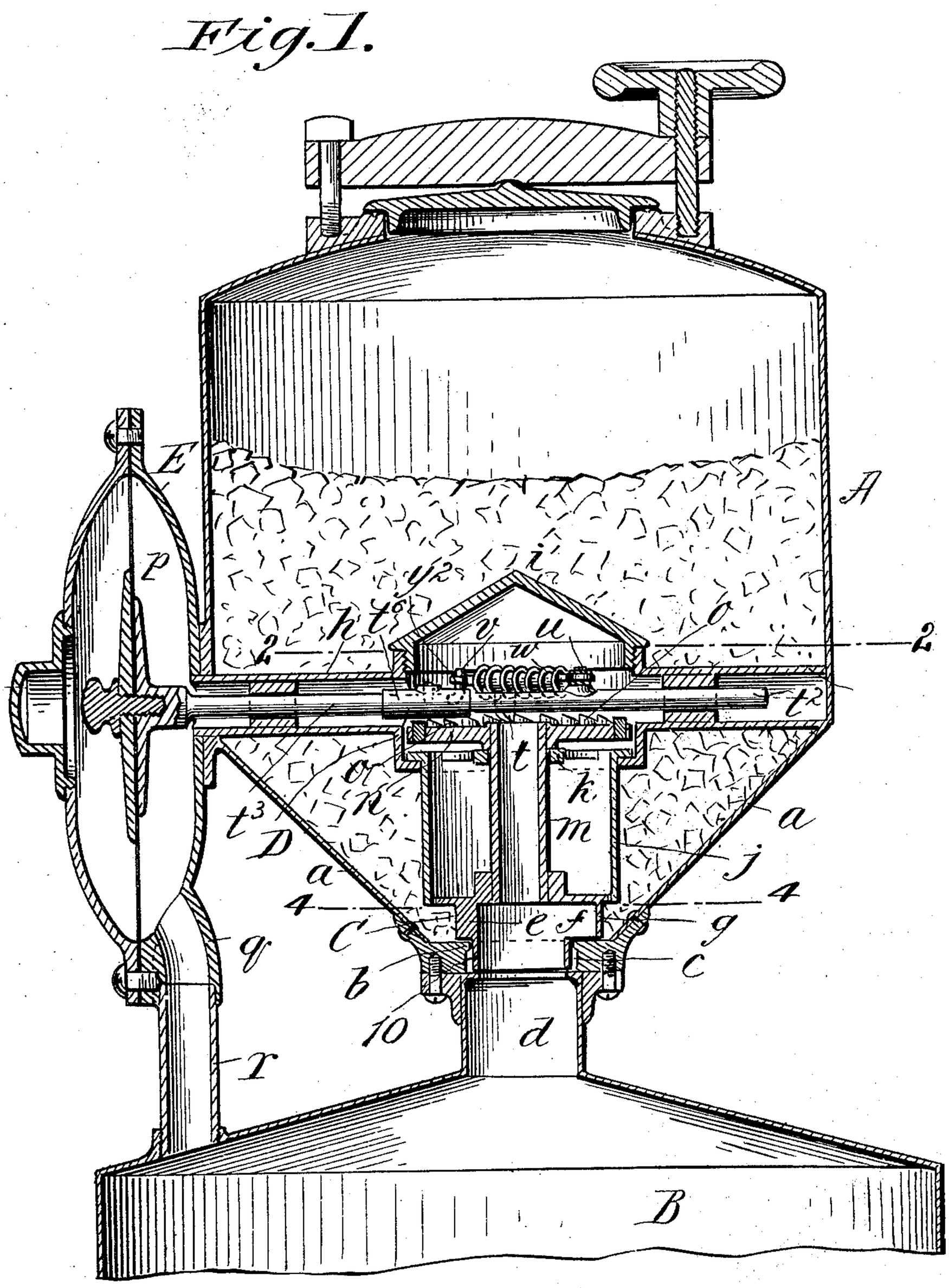
H. L. SALISBURY.

ACETYLENE GAS GENERATOR.

(Application filed Aug. 20, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



Witnesses
M. A. Campbell
F. C. Carrigan

Inventor
Hubert L. Salisbury
By his Attorney
Wm. F. Bellows

No. 692,213. Patented Jan. 28, 1902.

H. L. SALISBURY.

ACETYLENE GAS GENERATOR.

(Application filed Aug. 20, 1901.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

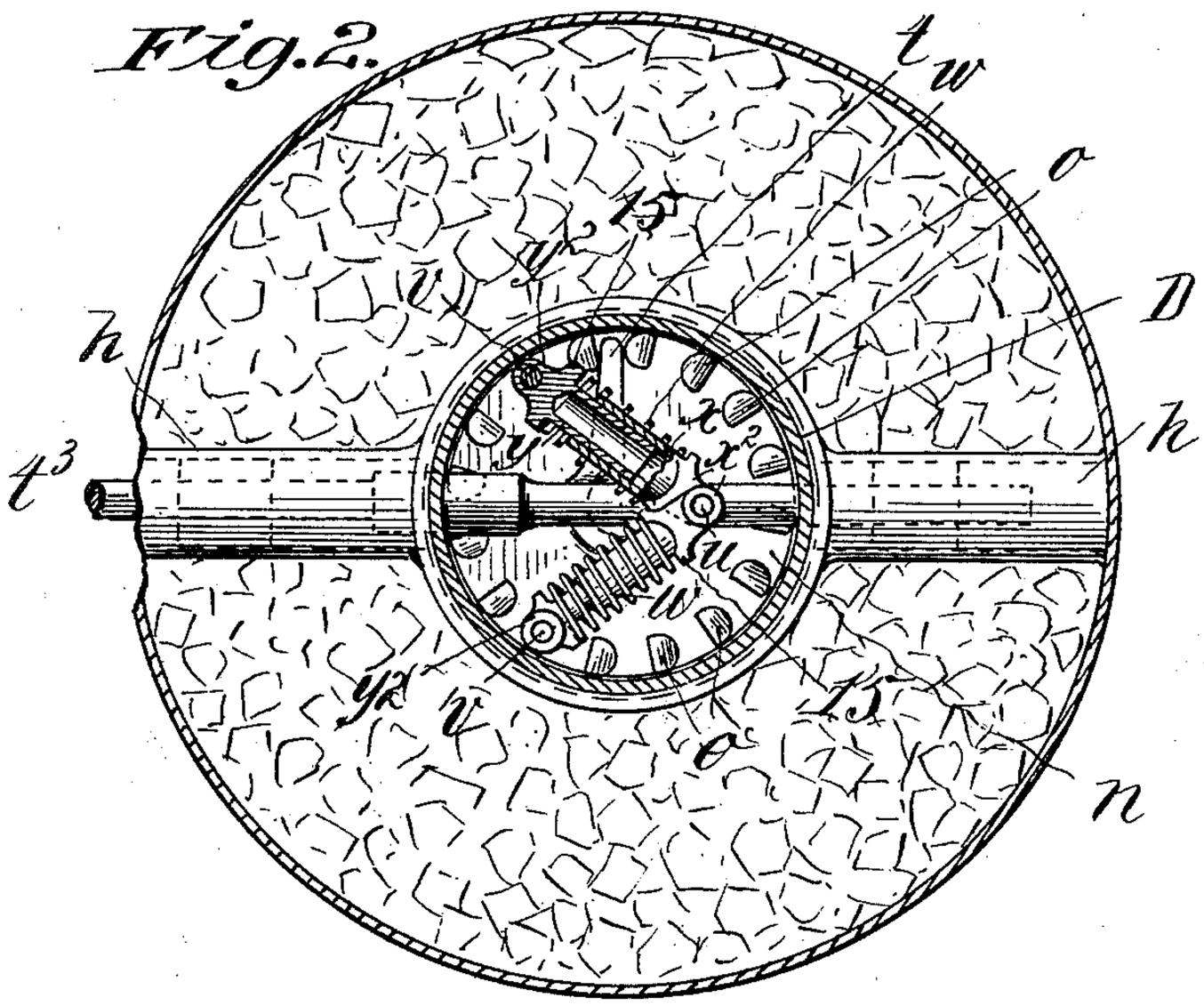


Fig. 3.

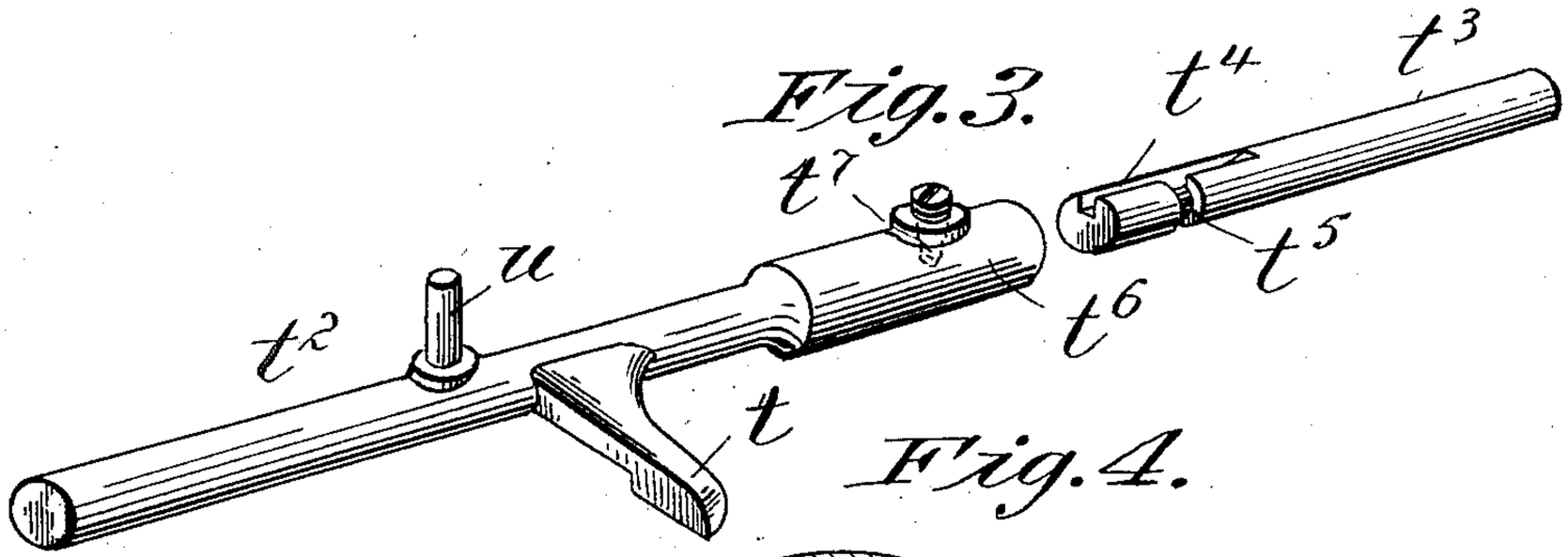
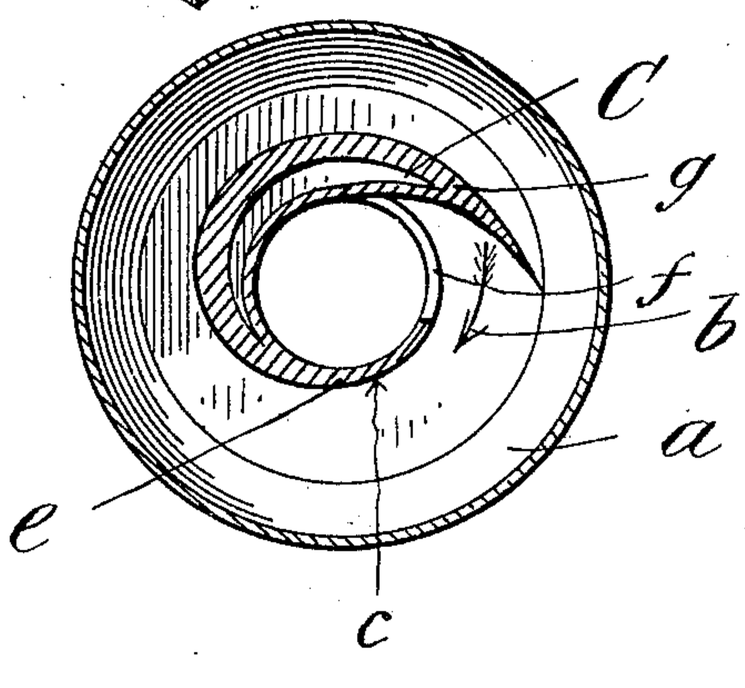


Fig. 4.



Witnesses
M. A. Campbell
F. C. Carrigan

Inventor
Hubert L. Salisbury
By his Attorney
Wm. C. Bellows

No. 692,213. Patented Jan. 28, 1902.

H. L. SALISBURY.

ACETYLENE GAS GENERATOR.

(Application filed Aug. 20, 1901.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 5.

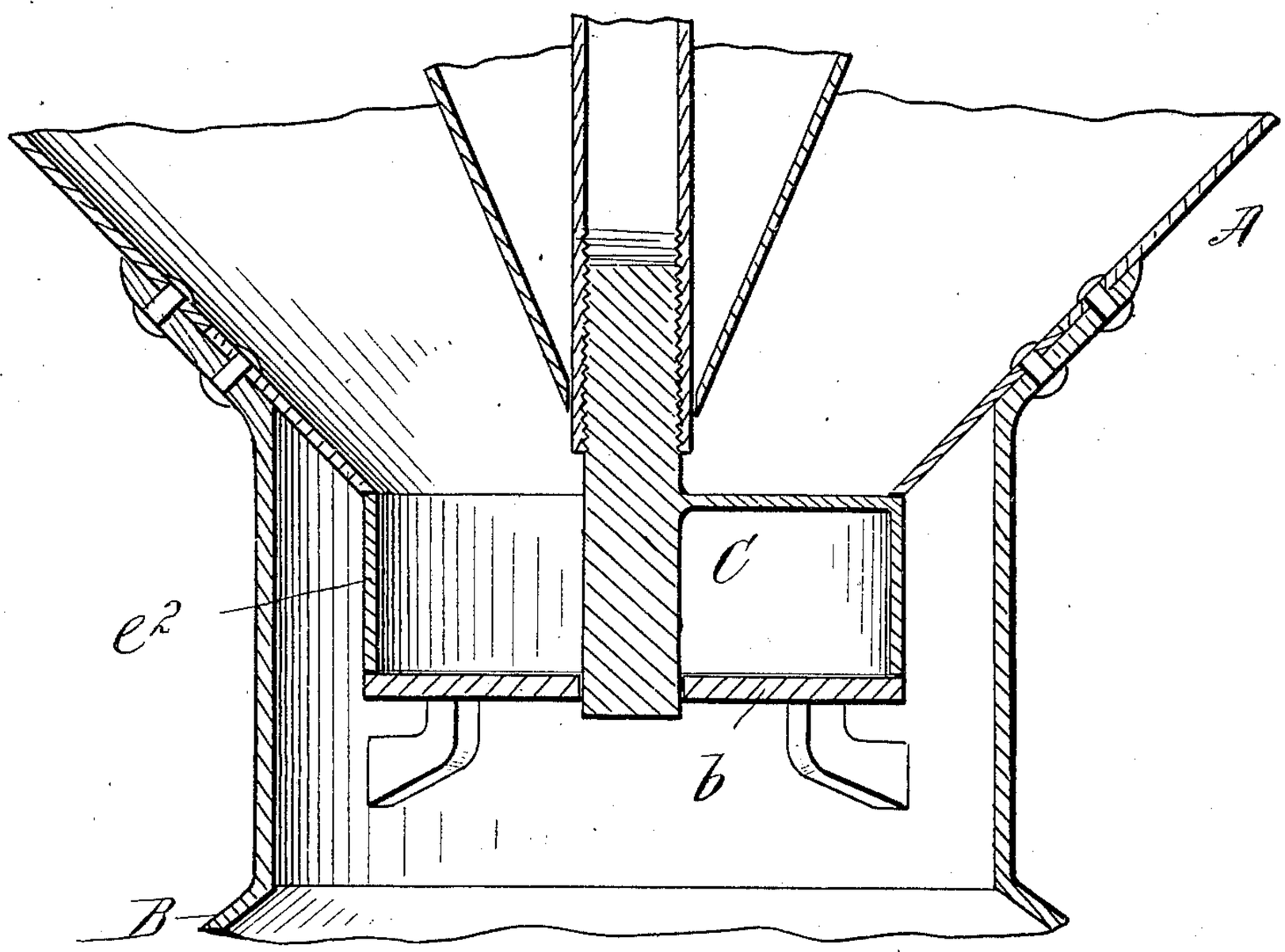
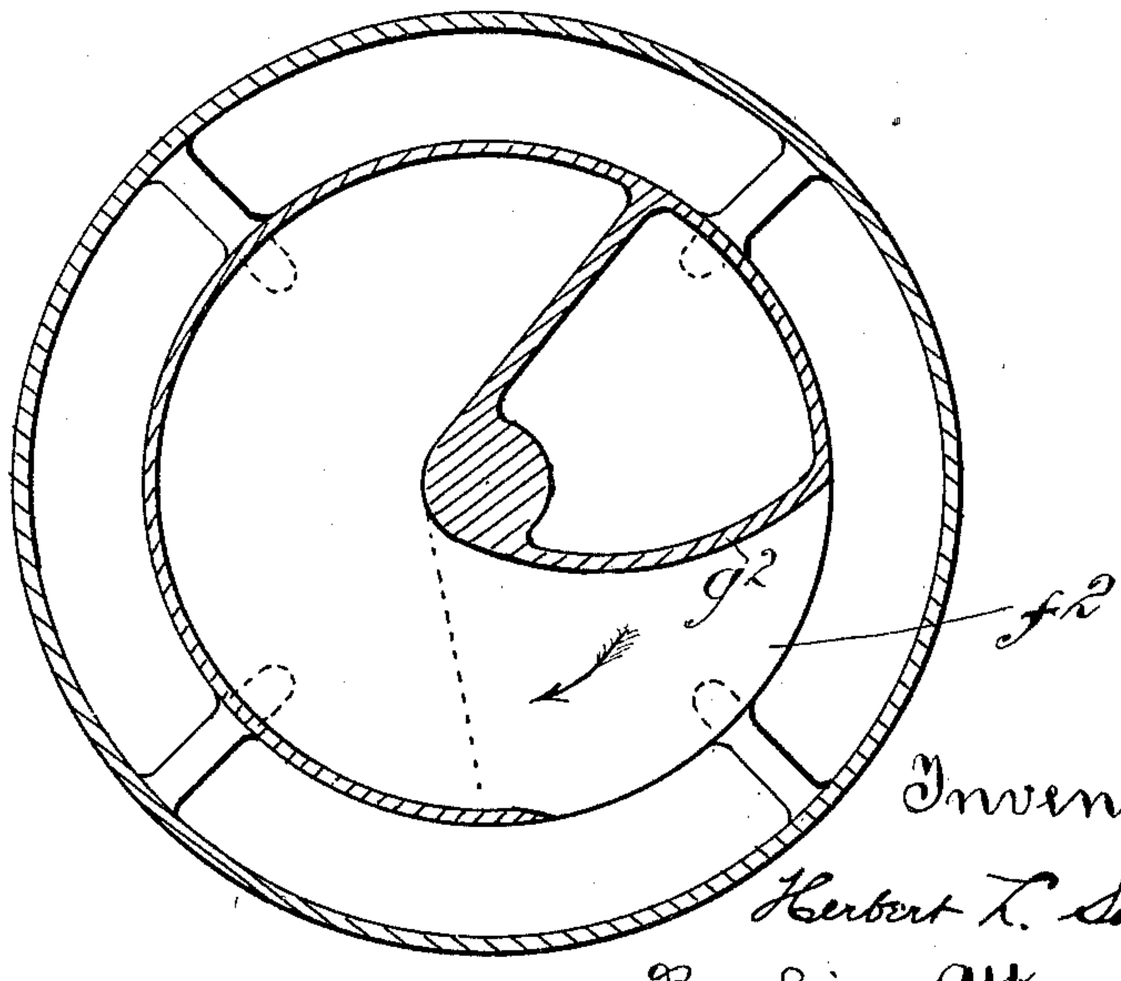


Fig. 6.



Witnesses
M. A. Campbell
M. L. Ryan

Inventor
Herbert L. Salisbury
By his Attorneys.
Wm. F. Bellows

UNITED STATES PATENT OFFICE.

HERBERT L. SALISBURY, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR OF ONE-THIRD TO WILLIAM WARING, OF SPRINGFIELD, MASSACHUSETTS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 692,213, dated January 28, 1902.

Application filed August 20, 1901. Serial No. 72,655. (No model.)

To all whom it may concern:

Be it known that I, HERBERT L. SALISBURY, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Generators and Feeders for Gas-Producing Material Therefor, of which the following is a full, clear, and exact description.

This invention relates to improvements in devices for feeding material—such, for instance, as calcium carbid—gradually and quantitatively uniformly and to apparatus for generating acetylene or other gas comprising an automatic feeding device for the gas-producing material which has various characteristics of novelty.

The objects are the production of a feeding mechanism for the material to be delivered which is simple and efficient and the production of a generator for acetylene gas which is so simplified and improved in its organization as to be of unusual desirability.

The invention consists in constructions and combinations of parts in a carbid-feeding and gas-generating apparatus substantially as hereinafter fully described, and set forth in the claims.

The feeding mechanism and a gas-generating apparatus in which it is embodied are illustrated in the accompanying drawings, in which—

Figure 1 is a substantially central vertical section. Fig. 2 is a horizontal section and plan view as taken on and seen below the plane indicated by the line 2 2, Fig. 1. Fig. 3 is a perspective view of the detailed construction of the pawl comprised in the feeding apparatus. Fig. 4 is a horizontal sectional view and plan as seen on and below the plane indicated by the line 4 4, Fig. 1. Figs. 5 and 6 are respectively a partial central vertical section and a horizontal section illustrating arrangements of parts of the apparatus hereinafter referred to. The arrows on Figs. 4 and 6 indicate the directions of movement of the rotatable parts.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the receptacle for the carbid or other material to be fed and delivered as required to the generator B or other place. The said receptacle has its bottom of funnel shape, as indicated at *a*, provided with the horizontal annular ledge *b*, in which is the central opening *c*, connected with which is the passage *d*, leading unobstructedly to the generator-chamber.

C indicates the feeding device, which is rotatable and is arranged on the aforementioned ledge *b* and comprises the shell or circular wall *e*, which forms in substance a partition marginally for the ledge *b*, said wall having a delivery-aperture *f* therethrough, and the same is provided with a wing *g*, which is inclined to a radial line extended from the axis of the shell which constitutes the body of the feeder, as shown in Fig. 4. This wing moves around as one with the shell and has its lower edge against the upper surface of the ledge and exerts a crowding or cam-like action against the material which has settled down by gravity upon the ledge. As shown in Fig. 4, the deflector or wing has the shape of a scroll or involute curve, although it may be in substantially the line of a tangent to the circumference of the shell *e*, the form essentially being one for impingement against the material which is on the ledge to crowd it, under the turning motion of the feeder, transversely of the ledge to be precipitated through the delivery-aperture *f*. As shown, the lower portion of the feeder is provided with the downwardly-extending annular portion 10, which fits into and forms a bearing at the inner surface of the wall at the base of the ledge *b*.

The receptacle A has centrally therewithin the casing D, of generally cylindrical form, located above and concentric with the axis of the feeder, said casing being supported by the diametrically opposite radial tubes *h h*, which are united to the side walls of the receptacle A. The said casing D is provided at its top with the removable screw-cap *i*, and it is constructed with the depending cylindrical shell *j*, the same having therein a spider-frame *k* to form a bearing for the tube *m*, which constitutes the axial shaft for the feeder, said tubular shaft having at its upper end affixed thereto the disk *n*, which is provided with the circularly-arranged series of ratchet-like teeth *o*, said teeth being in practice constituted by round pins set in vertical perforations around the

margin of the disk, said pins being backed off or inclined to give the ratchet form thereto.

E represents a chamber for the diaphragm *p*, the diaphragm-chamber being located and suitably supported at the side of the receptacle A and is connected by a depending hollow lug *q*, provided at its bottom, and by the pipe connection *r* with the chamber of the generator B, so that the diaphragm-chamber is in communication with, and the diaphragm is subject to the pressure of, the gas in the generator.

t represents the pawl for giving intermittently a rotational motion to the feeder by its coöperation with the ratchet-teeth of the disk *n*, which is as one with the feeder. Said pawl is actuated for its positive or feeder-rotating effect by the spring or springs operating on the pawl-carrying bar when the pressure against the diaphragm becomes lowered, so that the reactive power of the spring is not exceeded by the pressure in the reverse direction exerted by the gas on the diaphragm. As shown, the pawl-carrying bar is in two parts or sections, the one t^3 having engagement or connection with the diaphragm and working in a straight horizontal line without rotational movement, while the other member t^2 of the pawl-carrying bar is connected with the member t^3 in a manner to partake of its rectilinear motion and to be susceptible, furthermore, of a rocking motion, so that its pawl-arm may freely click over the ratchet-teeth when the pawl-bar is retracted in unison with the motion of the diaphragm as induced by a considerable or maximum gas-pressure thereagainst. As seen in Fig. 3, the member t^3 of the pawl-bar is provided with a longitudinal groove t^4 and a partially-encircling groove t^5, opening from the one t^4. This grooved end portion of the pawl-bar section t^3 is entered within the sleeve-like end portion t^6 of the other pawl-bar section t^2, through the wall of which latter is the detachable engagement-stud t^7, so that in the assemblage of parts the one is slid within the other and partially turned, so that the engagement of the inner protruding end of the stud t^7 is within the encircling groove t^5, and when the parts are so assembled and in use the rocking motion which the pawl-bar section t^2 has in relation to the section t^3 is such that the end of the stud t^7 is never in line with the longitudinal groove t^4. The pawl-bar section t^2 is provided with the upstanding pin *u*, and at opposite sides of the stationary casing D are the fixed abutment hooks or studs *v v*. The springs *w w* are in compression between the fixed abutment-studs *v v* of the casing and the pin *u* of the compound pawl-bar. As a provision of practical utility the springs are placed about telescopic core members *x* and *y*, which are most clearly shown in plan and horizontal section in Fig. 2. Each member *y* has a perforated ear y^2, which fits over one of the abutment-studs *v*, and its stem portion telescopes into the sleeve-like body of the other member *x*, which at its end has a perforated ear x^2, which fits over and engages the upstanding stud *u* of the pawl-bar. Both of the parts *x* and *y* at portions thereof adjacent their pivotal connections with the studs *u* and *v* have shoulders 15 to constitute rests for the opposite ends of the spiral springs, which, as before stated, are placed upon the telescopic cores therefor under compression, and when the gas-pressure in the generator becomes so reduced that the stress exerted on the pawl-bar by the diaphragm is less than the potentiality of the springs the latter will exert the pawl-moving action, and the rotation of the feed device will result in the delivery of such additional carbid into the generator as to result in replenishing the gas and again bringing up the pressure to the standard required, the action of which crowding the diaphragm in a leftward direction, Fig. 1, results in a drawing leftward of the pawl-bar, so that the pawl clicks or retracts over the ratchet-teeth and the springs become more compressed.

I may construct a feeder in such a manner that the part *e* having the delivery-aperture, *f* and which constitutes a marginal wall or partition for the ledge, may instead of being integrally formed with the deflector-wing be independently formed, and this wall may be located at the outer margin of the ledge or support for the material instead of at the inner margin, the revolution of the deflector being such that the crowding impingement against the material to be fed will be outward instead of inward.

In Figs. 5 and 6 the form of the feeding device arranged as above mentioned is illustrated, the cylindrical wall e^2, formed as a part of and to move in unison with the deflector-wing g^2, constituting the aforementioned outer marginal wall of the ledge or support *b*, and the aperture f^2, through which the deflector has the outward crowding action, has communication with the generator-chamber below the support or ledge *b*.

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

1. In an apparatus of the character described, in combination, a carbid-receptacle constructed with a horizontal circular supporting-ledge, and having a wall surrounding the outer marginal portion of said ledge, which wall has an aperture therethrough, and a part rotatable within said receptacle having an inclined wing or deflector which is movable on said supporting-ledge, and operative to force the material thereon outwardly, a generator-chamber with which the aforesaid aperture communicates, a movable part subject to the action of the gas generated in said chamber, and means between said movable part, and said rotatable part for causing, from the former, the rotational movements of the latter.

2. In an apparatus of the character described, in combination, a carbid-receptacle having at a lower portion thereof a horizontal

circular supporting-ledge; and a part rotatable within said receptacle having an inclined wing or deflector which is movable on said supporting-ledge, and operative to force the material thereon outwardly, and having as a portion thereof a substantially cylindrical wall, constituting a marginal outer boundary to said circular supporting-ledge, and having an aperture therein through which the material forced by the deflector may pass; and a generator-chamber with which the said aperture communicates.

3. In an apparatus of the character described the combination with a receptacle for a gas-generating substance, a generator-chamber in connection therewith, a rotatable feeding device controlling the delivery of the material from the receptacle to the generator, having a circular series of ratchet-teeth, a diaphragm-chamber having a diaphragm thereon subject to the pressure of the generated gas, a pawl-bar formed in two members, connected to move endwise in unison and the one to have a rocking motion relatively to the other and provided with an angularly-extended pawl-arm to engage said ratchet-teeth, said pawl-bar having a spring applied thereto for forcing it endwise in one direction, and said bar being in engagement with the diaphragm to be forced endwise thereby in the opposite direction against the spring.

4. In an apparatus of the character described, the combination with the carbid-receptacle having therein the studs *v v*, the generator, the diaphragm-chamber and diaphragm, and a rotatable feed-governing device having the ratchet-teeth and the pawl-bar having the stud *u*, of the paired telescopic spring-cores *x* and *y* having apertured end portions engaged over the said studs *v* and *u* and having seat rests or shoulders, and the spiral springs in compression surrounding said telescope cores and having their ends resting against the said shoulders, all whereby the distention of the diaphragm causes the pawl to retract over the ratchet-teeth against the pawl, the rotational driving of the feed device.

5. In an apparatus of the character described, the combination with the carbid-receptacle, the generator, the diaphragm-chamber, and diaphragm, and a rotatable feed device having the circularly-arranged series of ratchet-teeth, of the pawl-bar in engagement with the diaphragm consisting of two members, one having the longitudinal groove t^4 and an adjoining encircling groove t^5 and the other formed sleeve-like and provided with the stud t^7 to engage in said groove t^5, and one of said members having the angularly-extended pawl-arm *t* engaging with the ratchet-teeth, and a spring reacting on the pawl-bar against the stress of the diaphragm, whereby the distention of the diaphragm under the gas-pressure will cause the retraction of the pawl over the ratchet-teeth, leaving the pawl in position on its reverse movement to engage the rotatable teeth and rotate the feed device.

6. In an apparatus of the character described the combination with a carbid-receptacle having a diaphragm-chamber at its side, the casing inclosed within the receptacle and having tubular supports extended therefrom to the opposite walls of the receptacle and one thereof opening into the diaphragm-chamber, the generator having communication with the carbid-receptacle and also connected with the diaphragm-chamber, the diaphragm in the latter chamber, a rotatable feeding device having a disk provided with a circularly-arranged series of ratchet-teeth within the said casing, a pawl-bar guided for a reciprocatory movement within the said tubular supports one portion thereof being extended to engagement with the diaphragm, said bar having an angularly-extended pawl-arm and a spring or springs reacting against the pawl-bar transversely of the stress of the diaphragm.

7. In an apparatus for generating acetylene gas, the combination with the receptacle having a flaring lower portion, an annular ledge bottom having a marginal wall provided with an opening communicating with the generator, a diaphragm-chamber at the side of the receptacle having a diaphragm therein and connected with the generator-chamber, the casing D concentrically located within the carbid-receptacle above said ledge having the opposite tubular supports *h h* opening into said casing and one thereof into the diaphragm-chamber, the shaft *m* having at its lower portion a member provided with a deflector-wing operating upon the surface of said ledge, and said shaft *m* being provided at its upper portion within the casing with the circular series of ratchet-teeth, the pawl-bar mounted in the tubular supports *h* one end thereof in engagement with the diaphragm, and the same being formed in two members one of which has a rocking motion relatively to the other, both members being endwise movable in unison, and one of said members having the angularly-extended pawl-bar and the stud *u*, the studs *v v* fixed within the casing, the telescopic spring-cores engaged with the said studs *u* and *v* and the helical springs *w w*, all substantially as described and for the purposes set forth.

Signed by me at Springfield, Massachusetts, this 17th day of August, 1901.

HERBERT L. SALISBURY.

Witnesses:

WM. S. BELLOWS,

M. A. CAMPBELL.