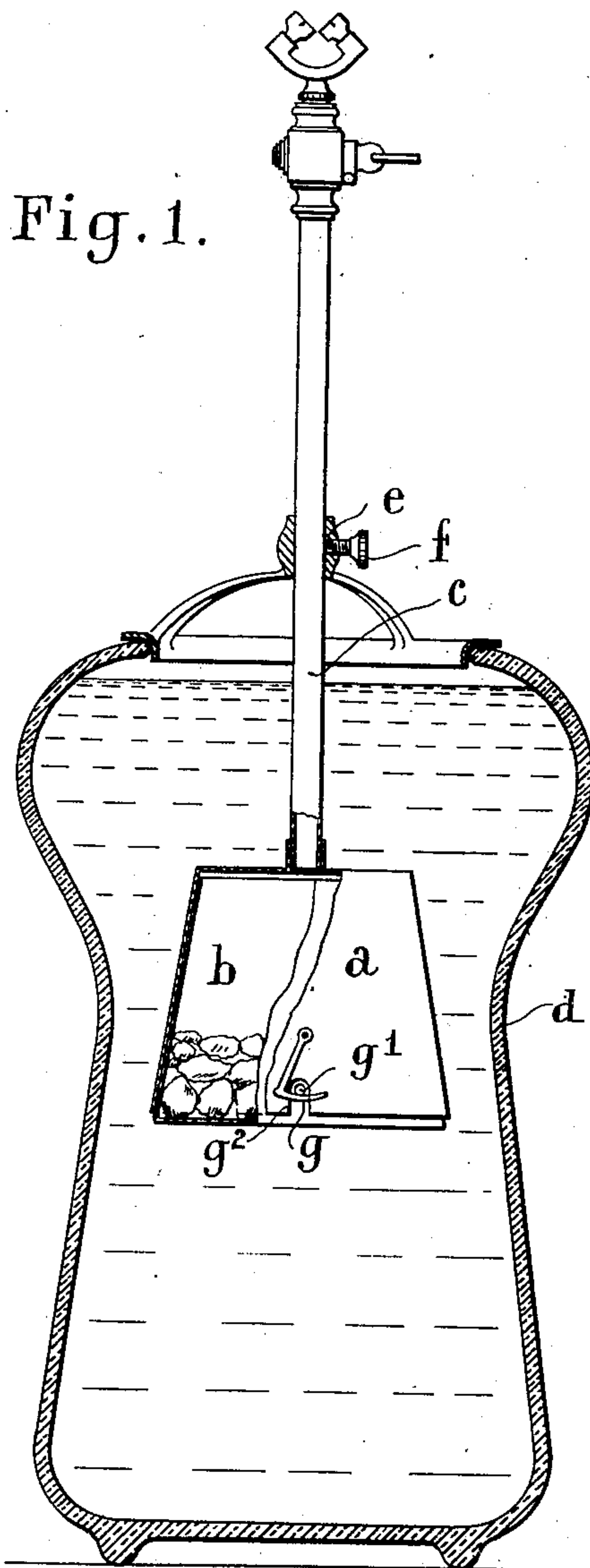


T. G. ALLEN.
ACETYLENE GAS GENERATOR.
APPLICATION FILED OCT. 25, 1910.

997,944.

Patented July 18, 1911.

2 SHEETS—SHEET 1.



WITNESSES:

Fred White
J. F. Wallace

INVENTOR:

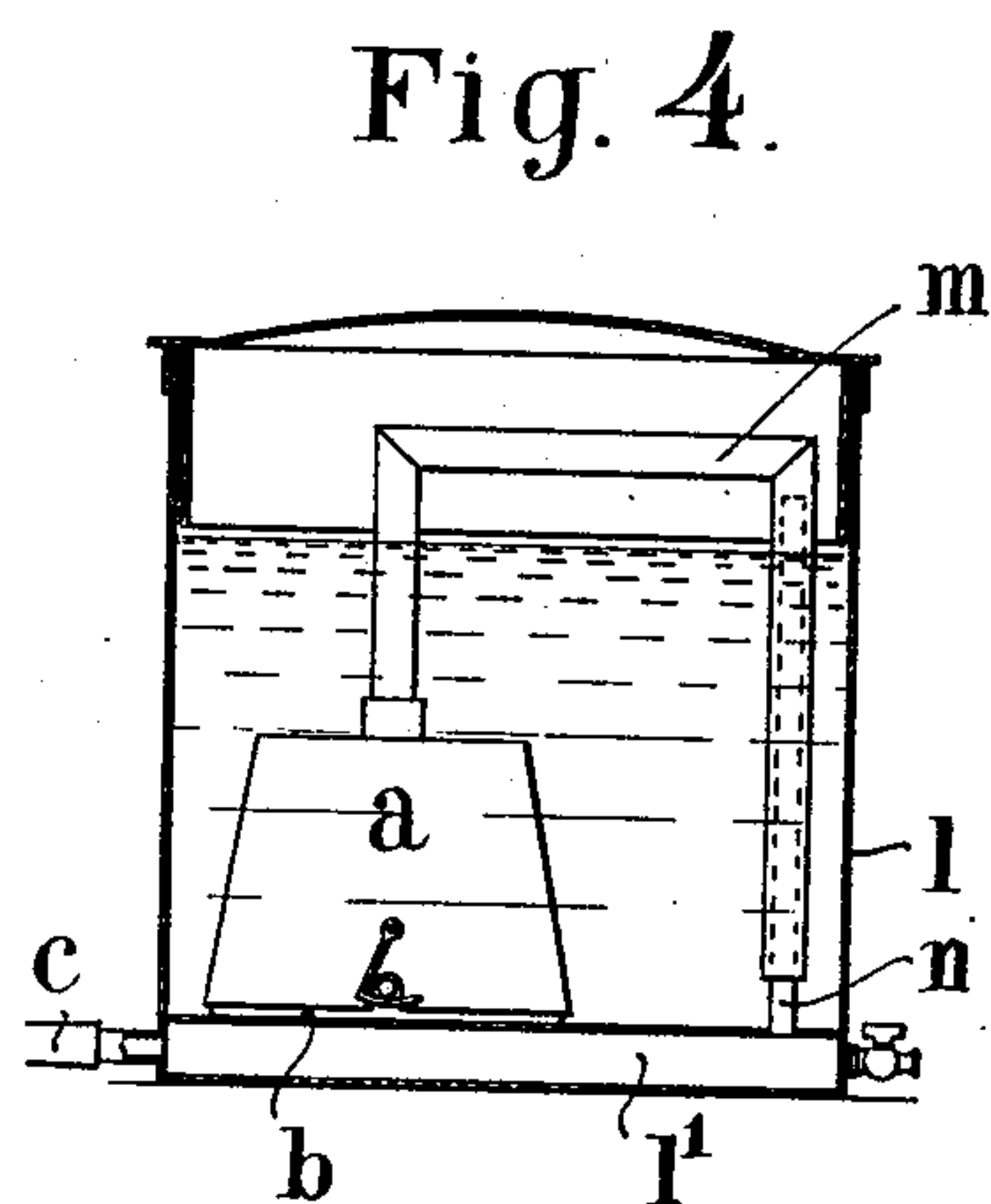
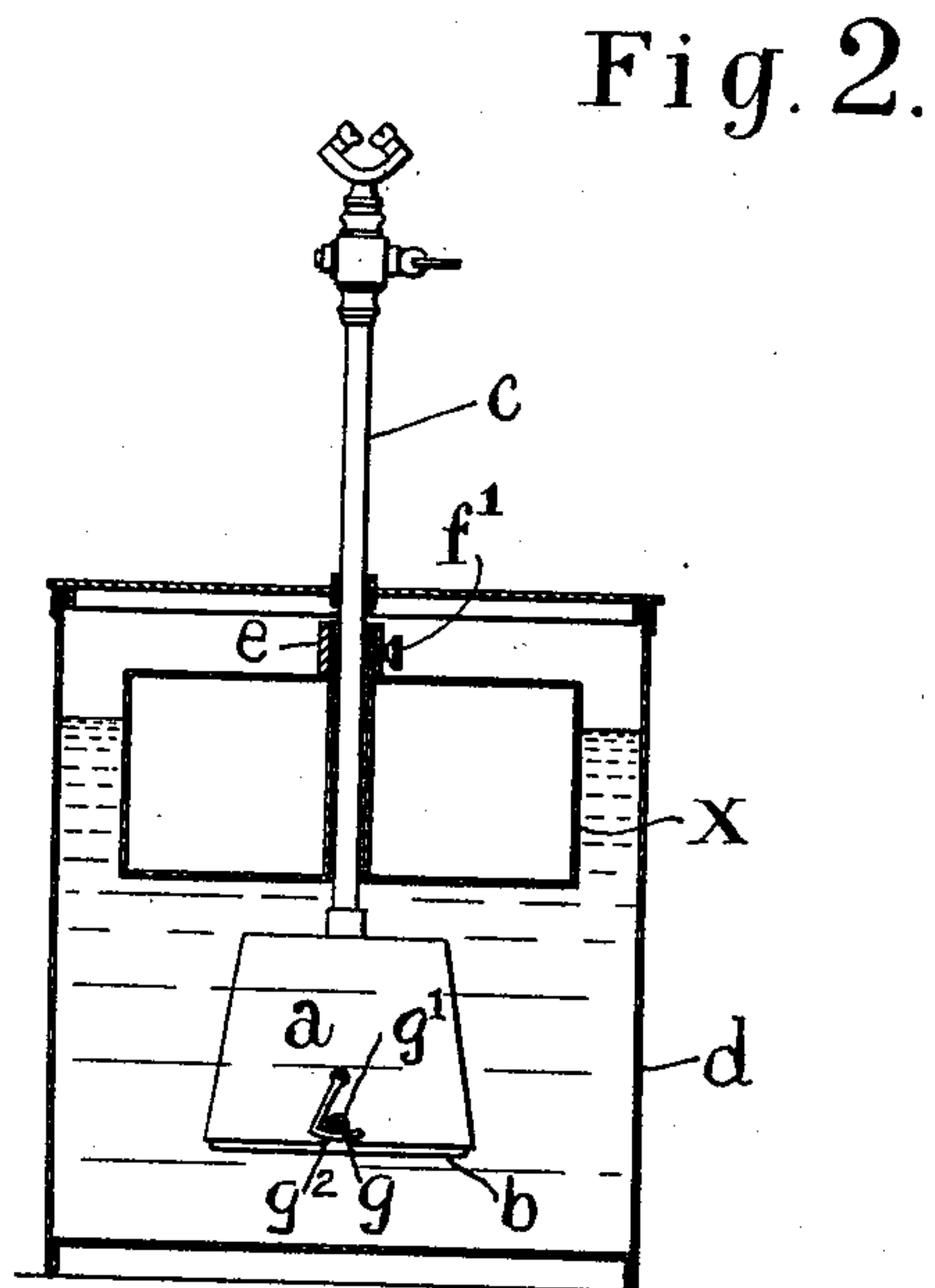
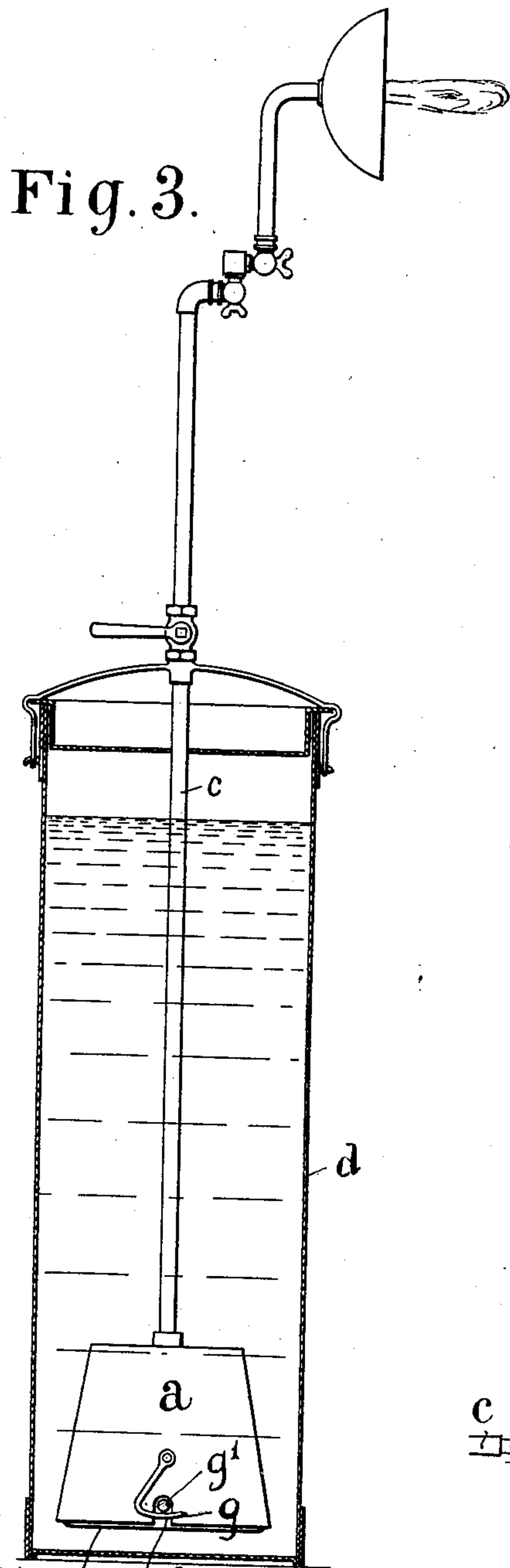
Thomas Gaskell Allen,
By his Attorneys
Fraser, McPherson & Co.
Henry M. Smith

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By his Attorneys
Frank C. Myers
Hennrich, Inc.

UNITED STATES PATENT OFFICE.

THOMAS GASKELL ALLEN, OF LONDON, ENGLAND.

ACETYLENE-GAS GENERATOR.

997,944.

Specification of Letters Patent. Patented July 18, 1911.

Application filed October 25, 1910. Serial No. 588,959.

To all whom it may concern:

Be it known that I, THOMAS GASKELL ALLEN, of 106 Victoria street, Westminster, London, England, engineer, have invented certain new and useful Improvements in or Relating to Acetylene-Gas Generators, of which the following is a specification.

This invention relates to acetylene gas generators of the automatic type wherein a predetermined pressure of gas in the generating chamber acts upon the water supply to regulate the admission of water according to the requirements.

The invention is obviously applicable for use in the generation of gases other than acetylene where liquid is added to material in the generating chamber for producing the gas. The invention will, however, be hereinafter described with reference to acetylene, the other uses being held to be included.

The object of the present invention is to provide an improved construction of generator or of that part of it which admits the water supply, whereby the controlling and regulating action of the pressure of generated gas may be rendered more efficient and reliable for securing an even generation and a regular supply of gas at a uniform pressure.

The invention is particularly applicable to small generators, such as those employed for lighting vehicles or for portable and domestic use, although the invention may be applied to larger plant.

It has been proposed to make a non-automatic acetylene generator of a carbid receptacle having a plate or supplemental receptacle clamped in the base thereof and provided with spacing projections or indentations to prevent too close a contact of the wall of the plate or supplementary receptacle and the wall of the carbid receptacle so as to form a capillary feed under the control of a needle valve and not dependent on an external pressure or head of water. The water passing through said space between the carbid receptacle, and the plate or supplementary receptacle, soaked into or through the adjacent carbid or spent carbid which covered the said plate or supplementary receptacle and the water inlet space when in use, and a continuous and uniformly acting wick of spent lime was thereby produced.

According to this invention I provide for

the generating chambers of acetylene generators of the automatic type a water feeding aperture or inlet hereinafter referred to as the "water feeding closure" consisting of two surfaces of such dimensions as to form an extended inlet adapted to be brought and held so tightly together that the water can only seep or ooze into the carbid chamber under a pressure of water-head in excess of the pressure which it is necessary to maintain in the generator for proper combustion at the burner; the tightly fitting surfaces permitting throughout the extended narrow annular or linear inlet a sufficient volume of water to pass between them for the purpose of generation, but in such slowly moving and minute quantities at any given point that an immediate and exact regulation of the water feed is effected by the slightest tendency to back pressure, without any appreciable disturbance being caused in the equilibrium between the opposing internal and external pressures. Evenness of generation and a uniform pressure at the burner are thereby insured.

The apparatus or that part of it which constitutes the generating chamber may be of any suitable shape or size.

It is preferable that the two surfaces which form the water feeding closure should be as even as possible and that one at least should be so far free or flexible as to conform or accommodate itself to the other coacting surface under pressure, so that any slight difference in contour or configuration is obliterated and a substantially uniform closure and water inlet throughout are insured. The two coacting surfaces may be of conical, part spherical, parabolic, or other curved or suitable formation which will allow of their being brought close together in the manner specified. The closure hereby obtained prevents the escape of the gas while permitting the requisite amount of water to be fed. Such closure occurs by the film of water held between the two surfaces and this is very useful when it is desired to discontinue the generation of gas. The apparatus may then be withdrawn from the water, thereby stopping the water feed whereupon the water film will continue to oppose the escape of gas through the inlet although the water head has been removed by such withdrawal and the gas will continue to pass through the burner until the after make is exhausted.

The invention also gives facility for obtaining the different pressures which may be required by different burners or different apparatus merely by increasing or decreasing the depth at which the closure is immersed.

The substantially high pressure required for a flare light may readily be obtained by the provision of a water tank of suitable depth.

Further means may be provided for adjusting the position of the generating chamber to compensate for the diminished head of water when a narrow water receptacle is employed.

The accompanying drawings illustrate some forms of the invention.

Figure 1 is an elevation partly in section showing the invention applied as a table lamp; Fig. 2 shows a modification; Fig. 3 shows a similar construction to that illustrated in Fig. 1 applied as a flare light; Fig. 4 is a vertical section showing one form of the invention suitable for use on vehicles.

In the construction shown in Fig. 1 the generating chamber consists of two truncated conical members *a* and *b*. The inner member *b* is open above and forms the carbide chamber, and the other member *a* is open below and forms the cap which is fitted with an eduction pipe *c* of suitable diameter leading to the burner. The said members *a* and *b* are adapted to fit one over the other so as to form the generating chamber, and the overlapping surfaces constitute the improved water feeding closure. For efficient operation the carbide in the member *b* is kept below the upper edge thereof so that there shall not at any time be a medium for capillary attraction between the water inlet and the unspent carbide. The generating chamber thus provided is immersed in a surrounding water tank of suitable dimensions which may conveniently be a vase or bowl *d* as shown. It will be seen that the upper edge of one conical member and the lower edge of the other are open and free to conform to the configuration of the opposing surface when pressed one into the other. If necessary the eduction pipe may be led through the lower receptacle or cone.

If required the water container may be made with an enlarged upper part to secure the maximum water supply with a minimum diminution of head of water during the process of exhaustion. I may also provide a suitable means for adjusting the position of the generating chamber to suit the diminished head of water. For instance, as shown in Fig. 1, a socket *e* is adapted to rest upon the water vessel and is provided with a set screw *f* whereby the depth of immersion of the generating chamber may be regulated.

Fig. 2 shows a modified construction wherein the generator is adjustably mounted upon a float *x* which, when the parts are fixed at the proper level by a set screw *f*¹, will keep generating chamber immersed at a substantially uniform depth throughout the process of exhaustion of the supply of carbide, the depth of immersion varying only to a small extent by the decrease of buoyancy resulting from the increased weight of the residue left by the carbide when spent.

Suitable means are provided for holding the conical cover *a* upon its seat, for example as shown, a catch such as *g* on the outer member may be provided to engage under a pin *g*¹ on the inner member, said pin being preferably recessed in a notch *g*² in the edge of the outer member to insure that the parts are always assembled and kept in proper position. The conical surfaces will readily come apart when released, although making a tight fit when assembled. The generating chamber may therefore be conveniently recharged by unclamping and removing the part *a*. As this operation is performed at each recharging of the apparatus, the water feeding closure is constantly cleansed and kept in a state of efficiency.

Fig. 3 shows the invention adapted for use as a flare light, the pressure necessary to produce the flare being obtained by immersing the generator to a depth which will give sufficient head of water. Fig. 4 shows one form of the invention adapted for use on vehicles. In this form the generator, consisting of parts *a* and *b* as before, is immersed in a suitable water tank *l*. The gas is led off from the generating chamber by a bent tube *m* mounted on the upper part of the conical member *a*. The free end of the bent tube *m* is adapted to telescope over the vertical tube *n* fixed in the false bottom *l*¹ of the water tank *l*, whereby a water sealed connection is at once obtained. The false bottom *l*¹ forms a condensing chamber at the base of the apparatus from which the gas is taken for use by the pipe *c*. The telescoping tube *m* allows of the carbide containers being removed and recharged without the use of cocks or valves.

In a modified form, not illustrated, a gas tap and disconnectible union joint may conveniently be provided above the water level with a U-shaped connecting pipe such as shown in Fig. 4, but in this case the tube need not be telescopic.

If required, as for example in the case of a large plant, I may provide a number of generating chambers such as described adapted to be immersed in a suitable tank and suitably connected to the discharge or storage gasometer or the like.

Heretofore in this specification it has been stated that the surfaces constituting the water feeding closure are adapted to be

brought and held so tightly together that the water can only seep or ooze into the carbide chamber under a pressure of water head in excess of the pressure which it is necessary to maintain in the generator for proper combustion at the burner. Such holding together causes a contact between the said surfaces as follows, to wit:—In the employment of ordinary metal surfaces produced by rolling or stamping a contact between them will be such a relation as will cause the said surfaces to touch at innumerable points and to become in apposition at all points without sensible intervening space but still permitting water to seep or ooze through such spaces under pressure of water head or its equivalent, due to the slight inequalities of the surface so produced. Obviously the extended inlet having this minute thickness may be provided by other means than those described, within the limits of the appended claims, and the water feeding pressure may be obtained or supplemented by other means than water head, such as pressure of air or other fluid, upon the water.

What I claim and desire to secure by Letters Patent is:—

1. An automatic acetylene generator comprising a water container and a generating chamber, said generating chamber adapted to be placed in said water and provided with an extended slit-like water inlet and with a separate gas outlet, said inlet formed of two substantially vertical surfaces located in contact with one another to form a water feeding closure through which the water can only seep or ooze under pressure and providing a sealing film of water against the escape of gas at working pressure.

2. An automatic acetylene generator comprising a water container and a generating chamber, said generating chamber adapted to be immersed in said water and provided with an extended slit-like water inlet and with a separate gas outlet, said inlet formed of two substantially vertical surfaces located in contact with one another to form a water feeding closure through which the water can only seep or ooze under pressure and providing a sealing film of water against the escape of gas at working pressure, and adjustable means for immersing said generating chamber in said water which are adapted to withdraw the same therefrom.

3. In an automatic acetylene generator comprising a water container for the generating chamber, a carbide chamber adapted to be placed in said water container, and means for closing same, a water feed device for said carbide chamber having an extended slit-like water inlet formed of surfaces in contact, said inlet having its intake end at all points below the surface of the water and having an upwardly extending portion whereby the water must rise during its pas-

sage through said inlet, and providing a water feeding closure through which the water can only seep or ooze under pressure and forming a sealing film of water against the escape of gas at working pressure, and a separate gas outlet from said generating chamber.

4. In an automatic acetylene generator comprising a water container for the generating chamber, a carbide chamber adapted to be placed in said water container, and means for closing same, a water feed device for said carbide chamber having an extended slit-like water inlet formed of surfaces in contact, said inlet having its intake end at all points below the surface of the water and having an upwardly extending portion whereby the water must rise during its passage through said inlet, and all parts of the outlet end of said inlet being located above the said intake end, and providing a water feeding closure through which the water can only seep or ooze under pressure and forming a sealing film of water against the escape of gas at working pressure and a separate gas outlet from said generating chamber.

5. In an automatic acetylene generator comprising a water container for the generating chamber, a carbide chamber adapted to be placed in said water container, and means for closing same, a water feed device for said carbide chamber having an extended slit-like water inlet formed of surfaces in contact, said inlet having its intake end at all points below the surface of the water and having an upwardly extending portion whereby the water must rise during its passage through said inlet, and all parts of the outlet end of said inlet being located above the said intake end and below water level, and providing a water feeding closure through which the water can only seep or ooze under pressure and forming a sealing film of water against the escape of gas at working pressure and a separate gas outlet from said generating chamber.

6. In an automatic acetylene generator comprising a water container for the generating chamber, a carbide chamber adapted to be placed in said water container, and means for closing same, a water feed device for said carbide chamber having an extended slit-like water inlet formed of surfaces in contact, one of said surfaces being flexible to conform to the other surface under pressure, said inlet having its intake end at all points below the surface of the water and having an upwardly extending portion whereby the water must rise during its passage through said inlet, and providing a water feeding closure through which the water can only seep or ooze under pressure and forming a sealing film of water against the escape of gas at working pressure and a

separate gas outlet from said generating chamber.

7. An acetylene generator comprising a water container, and a generating chamber
5 consisting of two truncated conical members and means for clamping said members together in such manner that their conical surfaces overlap and are in contact, forming
10 an extended inlet having its outlet at the upper part of said chamber and providing a water feed closure through which the water may only seep or ooze under pressure and forming a sealing film of water against the
15 escape of gas at working pressure, and means for immersing the said generating chamber in water and withdrawing the same therefrom and a separate gas outlet from said generating chamber.

8. An automatic acetylene generator comprising a water container and a generating
20 chamber adapted to be placed in said water, said generating chamber comprising a lower member closed at its base and having walls converging upwardly and an upper member
25 closed at its top and having correspondingly shaped walls forming a generating chamber, one of said members adapted to be placed over the other and said walls adapted to be brought into contact, forming an extended
30 water inlet between said contacting surfaces, having its intake wholly below its outlet and

providing a water feeding closure through which water can only seep or ooze under pressure and providing a sealing film of water against the escape of gas at working
35 pressure and a separate gas outlet from said generating chamber.

9. In an acetylene generator comprising a water container, a generating chamber
40 adapted to be inserted in the water, and having walls extending downwardly below its top whereby to form an inverted receptacle for the gas and adapted to have its lower edges immersed in the water, thereby forming a water trap for the gas, said generating
45 chamber being provided with an extended slit-like inlet formed by contacting surfaces of said chamber, said surfaces forming a water feeding closure through which the water can only seep or ooze under pressure
50 and providing a sealing film of water against the escape of gas at working pressure, and a separate gas outlet from said generating chamber.

In witness whereof, I have hereunto
55 signed my name in the presence of two subscribing witnesses.

THOMAS GASKELL ALLEN.

Witnesses:

ROBERT MILTON SHEARPOINT,
HERBERT D. JAMESON.