No. 610,086. Patented Aug. 30, 1898.

V. SARDI.

ACETYLENE GAS GENERATOR.

(Application filed Dec. 29, 1897.)

(No Model.)

Fig. 3.

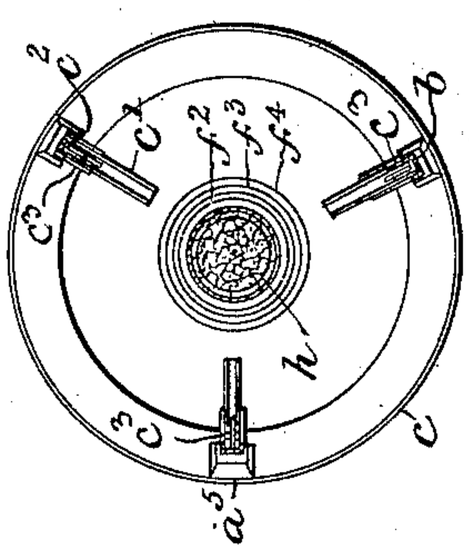

Fig. 4.

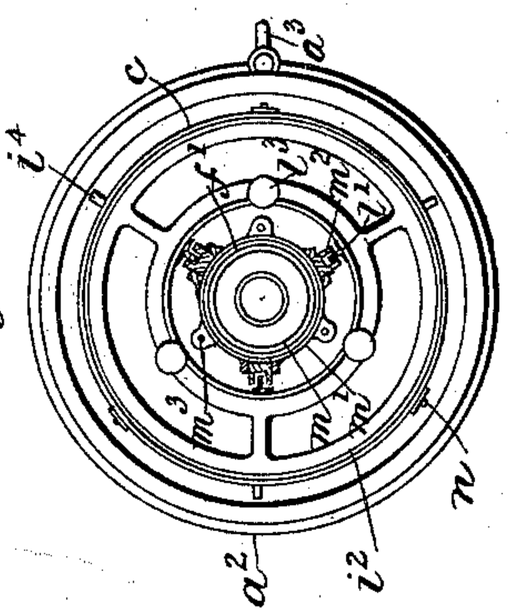

Fig. 2.

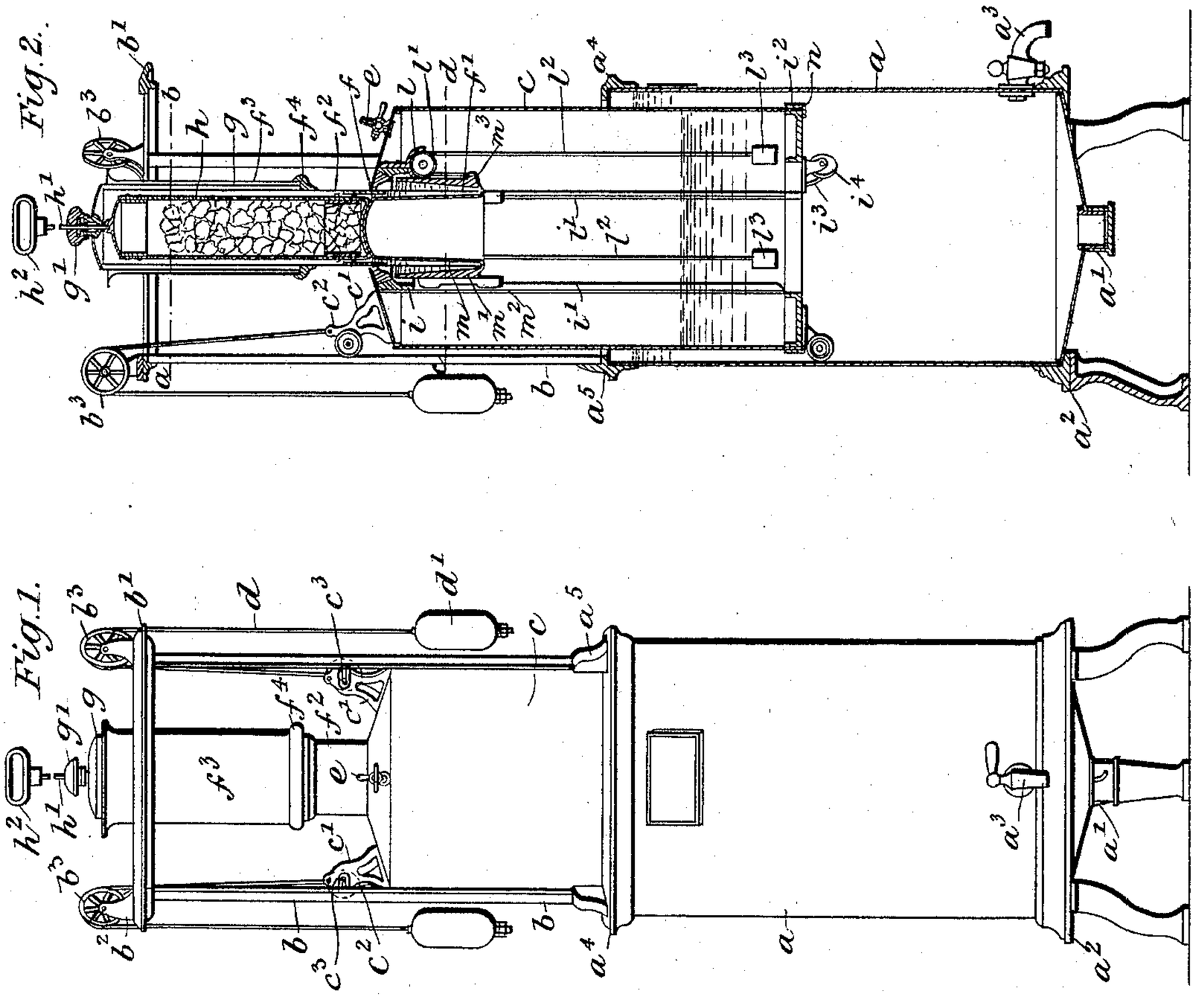

Fig. 1.

Witnesses
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UNITED STATES PATENT OFFICE.

VINCENZO SARDI, OF TURIN, ITALY.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 610,086, dated August 30, 1898.

Application filed December 29, 1897. Serial No. 664,264. (No model.) Patented in Italy March 16, 1896, LXXX, 320, April 29, 1896, LXXXI, 185, and September 4, 1896, LXXXIII, 239; in Belgium September 17, 1896, No. 122,720; in England September 21, 1896, No. 20,903; in France November 16, 1896, No. 258,473; in Spain November 20, 1896, No. 19,464; in Austria November 28, 1896, No. 46/6,777; in Hungary January 2, 1897, No. 7,441; in Switzerland January 31, 1897, No. 12,804, and in Portugal February 20, 1897, No. 29.

To all whom it may concern:

Be it known that I, VINCENZO SARDI, a subject of the King of Italy, residing at Turin, in the Kingdom of Italy, have invented a certain new and useful Improvement in Apparatus for the Manufacture of Acetylene Gas, (for which I have received Letters Patent in Great Britain, No. 20,903, dated September 21, 1896; in Belgium, No. 122,720, dated September 17, 1896; in France, No. 258,473, dated November 16, 1896; in Spain, No. 19,464, dated November 20, 1896; in Hungary, No. 7,441, dated January 2, 1897; in Austria, No. 46/6,777, dated November 28, 1896; in Switzerland, No. 12,804, dated January 31, 1897; in Portugal, No. 29, dated February 20, 1897, and in Italy, No. 239, Vol. 83, dated September 4, 1896, also No. 320, Vol. 80, dated March 16, 1896, and also No. 185, Vol. 81, dated April 29, 1896,) of which the following is a specification.

This invention relates to an apparatus for producing acetylene gas automatically and continuously.

It is known that acetylene gas is produced by the contact of carbid of calcium with water.

The invention will be described in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of the apparatus. Fig. 2 is a vertical section of same. Fig. 3 is a horizontal section on line *a b*, Fig. 2. Fig. 4 is a horizontal section on line *c d*, Fig. 2.

a is an iron vessel with a cone-shaped bottom provided with an exit-tube *a'* (having a screw-tap) for discharging the deposit. The inside of the vessel may be tinned or leaded or varnished, and the vessel may rest on a cast-iron support having three feet a^2, the feet being secured thereto by screws, so that they may be removable.

a^3 is a cock to remove the water from the vessel.

a^4 is a cast-iron ring with three vertical projections a^5.

b are three iron uprights fixed to projections a^5 and also to a top cast-iron ring *b'*, on which are fixed three double brackets b^2, carrying pulleys b^3.

c is a gas-bell, which may be tinned, leaded, or varnished, on the top of which are fixed three double brackets *c'*, carrying pulleys c^2, whose pivots are adjustable in horizontal slots c^3 of the brackets *c'*.

d are three ropes passing on pulleys c^3, attached by one end to projections *c'* and by the other end to balancing-weights *d'*.

e is a small cock fixed on top of bell *c* to draw off the gas.

f is a compound white-metal collar situated centrally of the bell *c*.

f' is a metal tube fixed to collar *f* and passing downward.

f^2 is another metal tube fixed to collar *f* and passing upward.

f^3 is a metal tube having a bell mouth fixed by a cast-iron ring f^4 to tube f^2.

g is a metal bell having a gland *g'* at its top.

h is a tube with an adjustable movable top and bottom containing the carbid of calcium, said tube having its surface perforated with holes. To the top of this tube is fixed a metal rod *h'*, passing through the gland *g'* and having a handle h^2.

i is a cast-iron ring to which are attached three T-iron or similar bars *i'*, fixed at their lower end to a channel-shaped cast-iron ring i^2, carrying three double brackets i^3, with wheels i^4.

l are three cast-iron hanging brackets fixed to ring *i* and carrying each a pulley *l'*, over which passes a rope l^2, attached to balancing-weights l^3.

m is a bell-shaped conical valve, with a reversed compound white-metal collar or tube *m'* secured to it (in which water is contained, as shown, and into which tube *f'* passes) and three compound hard-metal guides m^2, which work against the bars *i'*. The collar or tube *m'* has three projections m^3, to which are attached the ropes l^3.

n are three L angle-iron pieces attached by screws to the bottom of bell *c* to carry the ring i^3, water-valve, and frame inside of the bell in such a way that by taking off these pieces *n* the water-valve and its frame may be

taken out and cleaned when necessary. The counterweights l^3 slightly overbalance the valve m; but when the carbid-tube h is resting on said valve the extra weight will keep it at the bottom. When the carbid-tube is withdrawn for recharging, the valve m follows it and closes the opening in the bell, as it is then overbalanced by the weights, and it remains up until it is forced down again by the tube h with its fresh charge of carbid.

The vessel a being filled with water up to, say, three or four inches from the top and the exit-tube a' and cock a^3 being closed, as well as the cock e on top of the gas-bell, water is introduced in the space between tubes f^2 f^3 and the bell g is plunged in the vessel, air is removed from bell c by opening cock e, after which it is closed, and by means of handle h^2 and rod h' the carbid-of-calcium tube is forced down, so that its bottom touches the water contained in vessel a, and the production of the gas commences. The gas that is thus produced causes the bell c to rise, together with the tube containing the carbid of calcium, which is thus removed from contact with the water, so that no more gas is produced. If the gas produced is drawn out by cock e, the bell c will drop and the carbid of calcium will touch the water again, and consequently more gas will be produced, and so on.

When the charge of carbid of calcium is consumed, a new supply is put in tube h without stopping the operation of the apparatus, because when the tube h is taken out the water-valve m, which has been previously forced down, rises to the position shown in the drawings, and the gas contained in bell c cannot come out on account of the seal produced.

If the apparatus be left charged and idle for several days in such a position that the carbid of calcium is out of contact with water, a small quantity of gas will still be produced on account of the evaporation of the water, and the bell c will consequently rise gradually and reach the top of the frame, after which the excess of gas that may still be produced will, on account of overpressure, force its way across the water and expand out, the peculiar smell of the gas giving the alarm before any danger of accident might arise.

The advantages of the apparatus as described are that the charging of the carbid of calcium may be effected quite safely without stopping the working of it even during the burning of the gas produced; that the pressure of gas in the apparatus is quite constant and continual and its production proportional to the amount consumed, so that by simply shutting the exit-cock the production of gas is stopped automatically, and that the apparatus is quite safe, and in no way is there danger of explosion.

What I claim is—

1. In apparatus for the production of acetylene gas and in combination, a water vessel, an air-bell, a counterbalance for the latter, an extension-tube on such bell, a perforated tube for the carbid, means for supporting and guiding the carbid-tube in such extension, a water seal between the extension and the air-bell, a movable bell-shaped valve for holding the water forming the seal, on which the carbid-tube rests, means for lowering the carbid-tube into the water of the main vessel, and means for guiding the bell-shaped valve as it descends with the carbid and leaves the extension-tube which forms part of the seal substantially as described.

2. In apparatus for the production of acetylene gas the combination with the gas-bell and carbid-tube of a valve m and tube f' forming a water seal and means for counterweighting and guiding such valve in the bell, substantially as described.

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

VINCENZO SARDI.

Witnesses:

HUGO PIZZOTTI,

E. M. WARALCH.