APPLICATION FILED JULY 1, 1912.

1,038,077. Patented Sept. 10, 1912.

Fig. 1.

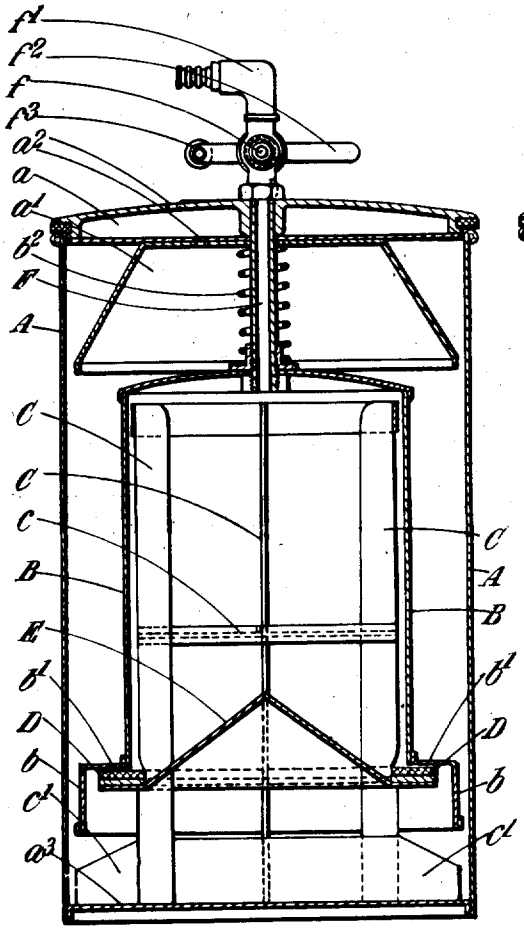
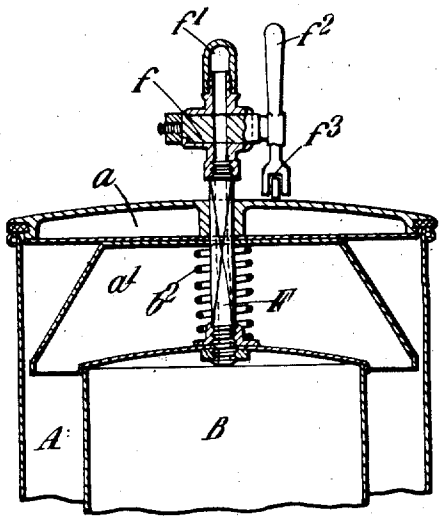


Fig. 2.



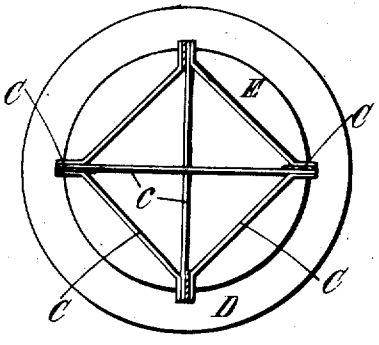


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES BINGHAM, OF LONDON, ENGLAND.

GAS-GENERATOR.

1,038,077. Specification of Letters Patent. Patented Sept. 10, 1912.

Application filed July 1, 1912. Serial No. 707,076.

To all whom it may concern:

Be it known that I, CHARLES BINGHAM, a subject of the King of Great Britain, residing at 11 Queen Victoria street, in the city and county of London, England, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

This invention relates to gas generators such as are used for the production of acetylene, of the type in which the gas generating material is inclosed in a bell within a liquid container, into the interior of which bell the liquid rises in order to reach the said material and from which it may be partly or wholly expelled on a rise of pressure of the generated gas, a valve closing the lower end of the bell when the apparatus is not in use.

According to my invention the bell valve is a peripheral one extending around the lower end of the bell so as to provide (when the apparatus is not supplying gas to the burners) an opening of large area for the escape of gas on the internal pressure exceeding a predetermined limit. I prefer to use the open mouthed bell itself as the valve and to make it vertically movable, with a spring at the upper side, which, when the generator is not in use, keeps the bell down on its seat until the internal pressure is sufficient to lift it against the spring, when the liquid in the lower part, with or without any excess gas, is forced out through the valve opening into the exterior casing.

The gas generated may pass to the burner through a central tube leading through the cover of the casing and carrying the bell, and I propose to employ the gas cock at the upper end of this tube to open the bell valve automatically on turning on the gas. For this purpose the handle of the cock is provided with an extension which, when the cock is turned into open position, bears on the top of the casing and lifts the bell so as to allow of free communication between its interior and the outer casing.

The gas generating material, which may be in the form of a cake, is carried in the upper part of a cage covered by the bell, the cage being of open construction to give ready access of the liquid to the whole of the gas generating material. The cage has a conical bottom with a rim on which is a valve seat of india-rubber or other suitable material and the lower edge of the bell is enlarged to form a shoulder adapted to rest on the seat and constitute the valve, with a lip which incloses the valve and projects a short distance below it when the bell is down. The cage bars project some distance below the conical bottom and rest on the bottom of the casing, the projecting part forming stirring vanes or blades which when the cage is rotated to and fro operate to stir up the deposit accumulating in the lower part of the casing and allow it to be poured off with the liquid.

In order that the said invention may be clearly understood and readily carried into effect I will describe the same more fully with reference to the accompanying drawings in which:—

Figure 1 is a vertical section of a generator constructed according to my invention. Fig. 2 is a section of the upper part of the generator, taken at right angles to Fig. 1, and Fig. 3 is a detail view of the cage, showing it in horizontal section.

A is the outer casing, having a detachable cover a with a conical deflecting plate a' and small holes a^2 to prevent the collection of gas in the upper part of the casing.

B is the gas bell, C the cage carrying the generating material and resting on the bottom a^3 of the casing, and D is the valve seat, preferably of rubber or other soft material, placed on the outer edge or flange of the conical bottom E carried by the cage C. A central tube F (which may be square externally to prevent turning) leads from the top of the bell B through the cover a and is provided with a cock f and a nose piece f' by which connection may be made with a gas supply pipe leading to a burner.

The cage C is built up of a number of thin vertical bars with horizontal connect-

ing bars or wires at top and bottom and cross pieces or connections c at short distance above the conical bottom E, which cross pieces serve to support a cake of gas generating material. The bottom connecting bars are extended at c' so that the cage may serve as a stirrer when emptying from the casing the liquid together with the deposit which sinks to the bottom. It will be understood, of course, that when the casing is to be emptied of the deposit, the top and the bell will be removed, after which the cage may be rotated or oscillated by hand to stir up the deposit accumulating in the lower part of the casing and allow it to be poured off with the liquid.

The lower end of the gas bell B is enlarged at b to encircle the valve seat D and the shoulder b' is adapted to meet the said seat when the bell is in its lowest position and to form a seal which prevents communication between the external liquid in the outer casing and the contents of the bell. A spring b^2 around the tube F bears on the top of the bell and maintains it in closed position when the apparatus is not in use but allows it to rise to relieve any pressure which may exceed that adapted to be overcome by the spring. The handle f^2 of the cock f' is provided with an arm f^3 terminating in a roller so arranged as to meet the top of the cover a and to lift the bell against the pressure of the spring b^2 when the cock is turned into open position as shown in Fig. 2, the tube F sliding in its bearing in the cover a. Thus when the gas is permitted to escape from the bell the bell valve is automatically opened and liquid is allowed to enter and attack the gas generating material.

The operation of the apparatus is as follows:—When the gas is being used, the bell valve is held open by the arm f^3 of the cock F and the liquid in the surrounding casing A is able to occupy the lower part of the bell B and reach the gas generating material. As the under layer of this material disintegrates, the particles fall on to the cone E and are directed to the outer edge, where they slide over the valve seat D and finally fall into the bottom of the casing. On turning off the gas cock the bell valve closes by the pressure of the spring b^2. The after generation of gas increases the pressure in the bell B but when it exceeds that necessary to overcome the spring the bell is lifted and some of the liquid is driven out of the bell. This is repeated at intervals, until the chemical action subsides. The intermittent flow thus produced effectively clears the valve of any deposit which may rest upon the seating. When the gas cock is turned on, a supply of gas under pressure is at once available and as the pressure falls the liquid rises in the bell through the opened valve until it reaches the bottom of the gas generating material, when the generation proceeds in a normal manner.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a gas generator, an outer casing to contain liquid, an open mouthed gas bell within the casing, a spring controlled valve adapted to close the mouth of the bell and to provide escape for gas above a predetermined pressure around the full periphery of the bell, and means for holding the valve open during supply of gas by the apparatus.

2. In a gas generator, an outer casing to contain liquid, a sliding open mounted gas bell in the casing, a spring acting on the bell, a valve seat adapted to close the mouth of the bell when the latter is pressed down upon it by the spring and to provide escape for gas above a predetermined pressure around the full periphery of the bell, and means for holding the bell clear of the valve seat during supply of gas by the apparatus.

3. In a gas governor, an outer casing to contain liquid, a sliding open mouthed gas bell in the casing, a spring acting on the bell, a valve seat adapted to close the mouth of the bell when the latter is pressed down upon it by the spring and to provide escape for gas above a predetermined pressure around the full periphery of the bell, a gas supply tube leading from the bell through the casing, a gas cock on the said tube, and means operated by the gas cock for lifting the bell and holding it open against the pressure of the spring during supply of gas by the apparatus.

4. In a gas generator, an outer casing to contain liquid, a sliding open mouthed gas bell in the casing, a spring acting on the bell, a valve seat adapted to close the mouth of the bell when the latter is pressed down upon it by the spring and to provide escape for gas above a predetermined pressure around the full periphery of the bell, a gas supply tube leading from the bell through the casing, a gas cock on the said tube, a handle operating the said cock and an extension on the handle adapted to bear on the top of the casing and to lift the bell against the pressure of its spring when the cock is opened.

5. In a gas generator, an outer casing to contain liquid, a sliding open mouthed gas bell in the casing, a spring acting on the bell, an internal cage carrying the gas generating material, and provided with a conical bottom having a valve seat at its periphery adapted to close the mouth of the bell, and means for holding the bell clear of the seat during supply of gas by the apparatus.

6. In a gas generator, an outer casing to contain liquid, a sliding open mouthed gas

bell in the casing, a spring acting on the bell, an internal cage carrying the gas generating material, and provided with a conical bottom having a valve seat at its periphery adapted to close the mouth of the bell, an extension of the cage below the bell having stirring blades adapted to stir the liquid and deposited material in the bottom of the casing, and means for holding the bell clear of the seat during supply of gas by the apparatus.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES BINGHAM.

Witnesses:
R. WENAM,
J. F. CRAWFORD.

Correction in Letters Patent No. 1,038,077.

It is hereby certified that in Letters Patent No. 1,038,077, granted September 10, 1912, upon the application of Charles Bingham, of London, England, for an improvement in "Gas-Generators," an error appears in the printed specification requiring correction as follows: Page 2, line 88, for the word "governor" read *generator;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of November, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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