A Practical Guide to 'Free Energy' Devices

Part PatE9: Last updated: 28th January 2006 Author: Patrick J. Kelly

Please note that this is a re-worded excerpt from this patent. It describes an electrolyser system where air is drawn through the electrolyte to dislodge bubbles from the electrodes. This is a very efficient style of electrolyser.

United States Patent 4,124,463 7th November 1978 Inventor: Archie H. Blue

ELECTROLYTIC CELL

ABSTRACT:

In the electrolytic production of hydrogen and oxygen, air is pumped through the cell while the electrolysis is in progress so as to obtain a mixture of air, hydrogen and oxygen.

CLAIMS:

1. A process for producing, Through the electrolysis of an aqueous liquid, a combustible mixture of hydrogen, oxygen and air. This is achieved in an electrolytic cell having a gas-tight casing, a substantially central tubular post mounted in the casing and having an air inlet at its upper end, and a several electrodes supported on the post and axially spaced along it, alternate electrodes being connected to a first electrical terminal and to a second electrical terminal respectively connected to a respective poles of a current source and being mutually insulated, the post having an air outlet below the electrodes out of which flows air from the air inlet into the cell and over the electrodes; and a source of air under pressure connected to the said air inlet forcing a flow of air through the aqueous liquid contained in the cell; the cell having in its upper region a common outlet exhausting the combustible mixture comprising air forced through the cell, along with hydrogen and oxygen produced by electrolysis in the cell.

2. The process according to claim 1 wherein the electrodes are discs each having a several holes through them.

3. The process according to claim 1 further including a dish-shaped air deflector plate supported on the post below the air outlet.

4. Apparatus for producing by electrolysis of an aqueous liquid, a combustible mixture of hydrogen and oxygen, comprising: an electrolytic cell having a gas-tight casing, a substantially central tubular post mounted in the casing and having an air inlet at its upper end, and a plurality of electrodes supported on the post and axially spaced along it, alternate electrodes being connected to a first electrical terminal and to a second electrical terminal respectively for connection to respective poles of a current source and being mutually insulated, the post having an air outlet below the electrodes for flow of air from the air inlet into the cell and over the electrodes; a dish-shaped air deflector supported on said post below said air outlet; and a source of air under pressure connected to the said air inlet for forcing a flow of air through the aqueous liquid contained in the cell in operation thereof; the cell having in its upper region a common outlet for exhausting the combustible mixture comprising air forced through the cell and hydrogen and oxygen produced by electrolysis of the liquid in the cell.

5. The apparatus according to claim 4 wherein the electrodes are discs each having a several holes through them.

BACKGROUND AND BRIEF DESCRIPTION OF THE INVENTION:

This invention relates to the production of gases which can be utilised primarily, but not necessarily, as a fuel.

To decompose water electrically, it is necessary to pass direct current between a pair of electrodes which are immersed in a suitable electrolyte. During such electrolysis, it is normal to place some form of gas barrier between the two electrodes, in order to prevent the gases produced forming an explosive mixture. However provided suitable precautions are taken, it has been found that the gases can be allowed to mix and can be fed into a storage tank for subsequent use. Because the gases when mixed form an explosive mixture, it is possible for the mixture to be utilised, for instance, as a fuel for an internal combustion engine. In such circumstances it is desirable that the gases should also be mixed with a certain proportion of air in order to control the explosive force which results when the gases are ignited.

One of the difficulties encountered with electrolysis is that bubbles of gas are liable to remain on the electrodes during the electrolysis thus effectively limiting the area of electrode which is in contact with the electrolyte and preventing optimum current flow between the electrodes. Because it is desirable that the gases evolved during the electrolysis be mixed with air, it is possible for air to be passed through the cell while electrolysis is in progress. The passage of air through the cell can be directed past the electrodes so as to pick up any gas bubbles on the electrodes.

Accordingly, the invention comprises an electrolytic cell with a gas tight casing, several electrodes supported on a central post within the cell, spaced apart and electrically insulated from each other, each alternative electrode being connected to a positive direct current source or a negative direct current source respectively and wherein the central post is in the form of a tube, one end of which is extended out of the cell and connected to a source of air under pressure, with the other end of the central post terminating in an air outlet below the electrodes. The cell also includes a gas outlet to carry the air forced into the cell through the central post and to exhaust the gases produced by electrolysis.

DETAILED DESCRIPTION OF THE INVENTION:

Various forms of the invention will now be described with the aid of the accompanying drawings wherein:

Fig.1 is a diagrammatic elevational view partly in section of one form of the invention,

FIG. 1

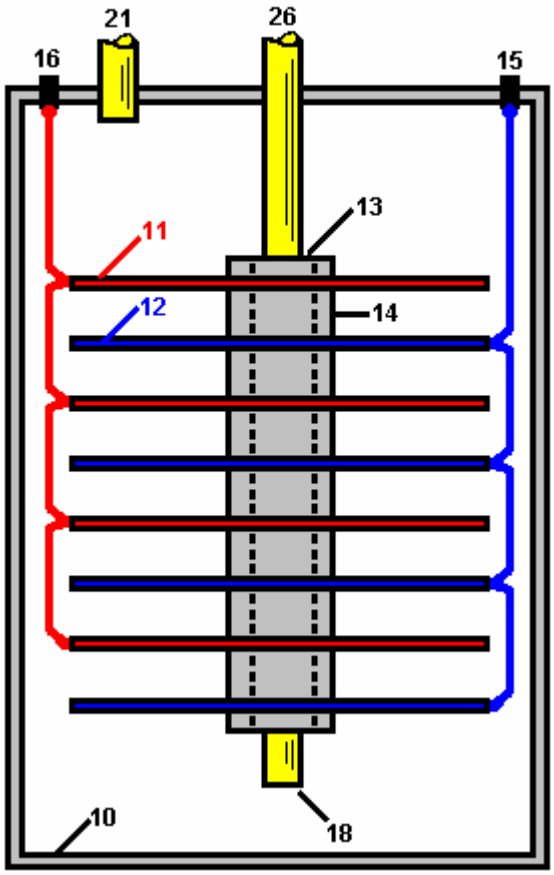


Fig.2 is a diagrammatic elevational view partly in section of a modified form of the invention,

FIG. 2

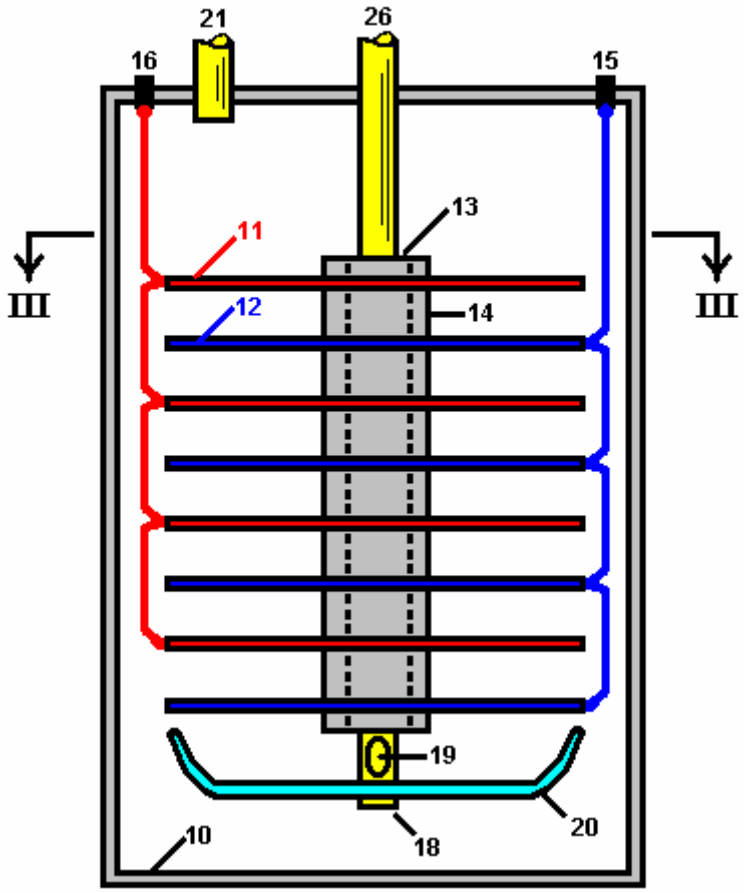
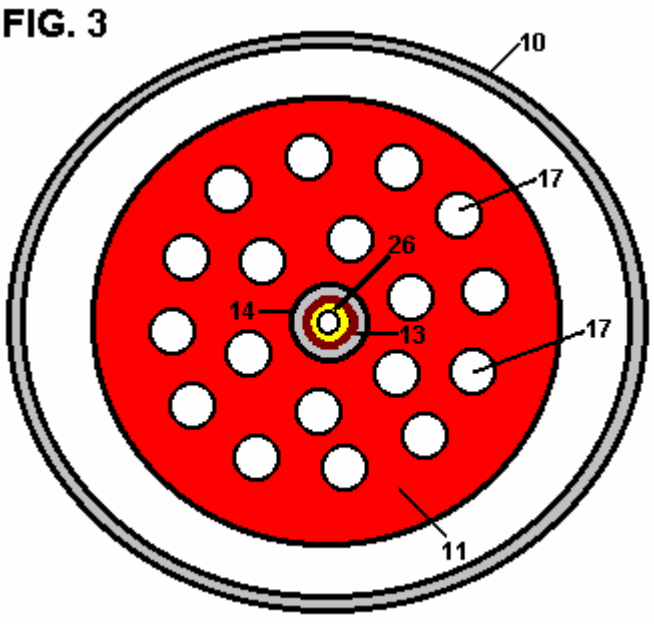


Fig.3 is a section along the line **III--III** of **Fig.2**.

FIG. 3



Section III - III

The cell as shown in **Fig.1** comprises a gas-tight casing **10** which is formed from a material incapable of corrosion, such as plastic. Several cathode plates **11** and several anode plates **12** are supported within the cell on an electrically insulating central post **13**, with the cathode plates and anode plates being spaced apart by means of insulating spacers **14**. The anode plates **12** are all connected in parallel to a positive terminal post **15** while the cathode plates are all connected in parallel to the negative terminal post **16**, these connections being indicated in dotted lines in the drawings. The cathode and anode plates are preferably in the form of discs made from a metal suited to the electrolyte, thus ensuring a satisfactory cell life. These plates may be shaped to conform with the shape of the walls of the cell which may be circular in cross section as indicated or any other desired shape.

The central post **26** is preferably in the form of a tube which extends out of the cell. The lower end of the tube **18** is open so that air can be pumped into the cell through the central post **26** and enter the cell via the lower end **18** where it will pass up through the electrolyte. This keeps the electrolyte in constant motion which assists in the rapid removal of any gas bubbles which may be adhering to the electrode plates.

In the modification shown in **Fig.2** and **Fig.3**, each electrode plate is provided with holes **17.** The central post **26** is also provided with at least one air hole **19** adjacent to its the lower end. A deflector plate **20** is also supported by the central post **26**, this plate being dish shaped so as to deflect air issuing out of the air hole **19** up through the holes **17** in the electrodes. This further assists in dislodging any bubbles of gas clinging to the electrode plates.

The cell also includes a gas outlet **21** so that the air which enters the cell, together with the gases produced by electrolysis, can be taken out of the cell into a suitable storage tank (not shown in the drawings). If desired, such storage tank can be arranged to accept the gases under pressure and for this purpose the air pumped into the cell will be pumped in under the required pressure. A gas drier (not shown in the drawings) can also be interposed between the gas outlet **21** and the storage tank.

Although the electrolysis will naturally produce considerable heat, nevertheless it can be found advantageous to install a heater in the cell, preferably in the bottom of the cell, to assist and facilitate the warming up of the electrolyte so that the cell reaches its most efficient operating conditions as quickly as possible.

Preferably also, a current-control device should be employed so that the intensity of the electrolytic action can be controlled.

A mechanism may also be provided for the automatic replenishment of water within the cell as the level of the electrolytic drops during use.

While it is recognised that the mixing of hydrogen and oxygen will create a dangerous explosive mixture, nevertheless by carrying out the invention as described above, the risk of explosion is minimised. The gases produced can be utilised, for instance, as a fuel to power an internal combustion engine and for this purpose it is desirable, as already mentioned, to mix a proportion of air with the gases produced during electrolysis, so that when the mixture is ignited within the cylinder or cylinders of the engine, the explosive force so created can be of the desired amount.

While in the foregoing description reference is made to the utilisation of the mixed gases as a fuel, it will of course be understood that the gases can be separated for individual use.