

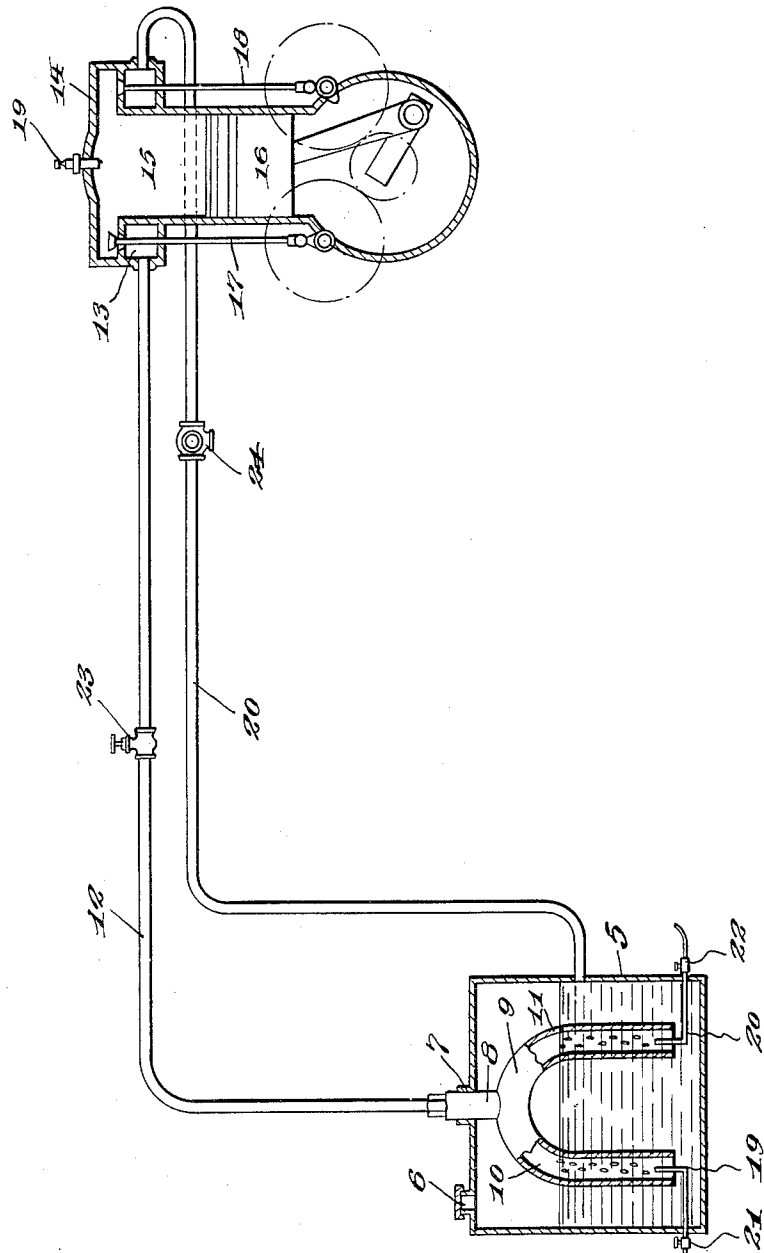
April 25, 1933.

W. HOLLAND

1,905,627

APPARATUS FOR ELECTROLYSIS

Filed Sept. 24, 1930



Inventor:  
Walter Holland.

34

Hartwell Balcom  
Attorney

## UNITED STATES PATENT OFFICE

WALTER HOLLAND, OF WASHINGTON, DISTRICT OF COLUMBIA

## APPARATUS FOR ELECTROLYSIS

Application filed September 24, 1930. Serial No. 484,147.

This invention relates to a method for converting molecular energy into mechanical energy, and an apparatus therefore.

Primarily, the object of the present invention resides in the provision of an apparatus of the above-mentioned character wherein the decomposition of a liquid, such as water, is effected by electricity, for the liberation of its gases.

Another object is to provide means whereby said gases, under control, may be introduced as a detonating mixture into a confined space, such as the explosive chamber of an engine, and subjected to the influence of an electric spark for the great disengagement of heat and acquired expansive force.

Still another object of the invention is to provide means whereby said liquid may be decomposed, as aforesaid, and the liberated gases collected for passage to said confined space.

A still further object resides in the provision of means whereby the products of the detonating mixture may be returned to its source of supply or exhausted into the atmosphere.

With these objects in view, together with others which will appear as the description proceeds, the invention resides in the novel formation, combination, and arrangement of parts, all as will be described more fully hereinafter, illustrated in the drawing and particularly pointed out in the claims.

The drawing illustrates an elevation of the apparatus, partly in section, and diagrammatically showing the arrangement of parts.

Referring now more in detail to the accompanying drawing, let 5 indicate a receptacle of suitable proportions and adapted to contain a supply of liquid, such as water, said receptacle having a filling opening 6 for the replenishment of its contents as needed.

It will be noted that said receptacle is suitably apertured, as indicated at 7, through which projects the extension 8 of the vessel 9, the latter including members 10 and 11 having their lower ends open and spaced from the bottom of said receptacle 5. Dur-

ing the fabrication of said receptacle, said vessel may be built therein if desired.

Leading from said extension 8, of said vessel 9, is a conduit 12, its other end being suitably connected to the intake chamber 13 of an engine, generally denoted by the numeral 14, and it will be observed that said engine includes the usual chamber 15, piston 16, intake valve mechanism 17 and exhaust valve mechanism 18. While the drawing shows a well-known type of internal combustion engine, it will be understood that the same is illustrative, rather than restrictive, in that my improvement is operable in connection with any type of engine adapted to be operated by the expansive force of a gas or the like.

Reverting now to said receptacle 5, it will be observed that electrodes 19 and 20 are fitted within said members 10 and 11, which extend to binding posts 21 and 22 respectively, to which latter may be connected suitable wires leading from a convenient source of electricity, (not shown). In view of this arrangement the interposition of the above in an electric circuit causes a decomposition of the water and the liberation of hydrogen at the negative electrode 20 and the liberation of oxygen at the positive electrode 19. As the bubbles of these gases rise in said vessel 9 they are collected within the extension 8 and passed, under control, to said inlet chamber 13 by way of conduit 12, valve 23 being interposed in the latter to regulate the passage of said gases.

As heretofore pointed out, the gases are introduced as a detonating mixture of hydrogen and oxygen into said inlet chamber for subsequent passage into the chamber 15 of said engine 14, and as is well-known said mixture comprises two volumes of hydrogen and one of oxygen.

When said mixture is subjected to an electric spark a great disengagement of heat ensues, said liberation of heat amounting to 68,924 thermal units, and since each unit is equivalent to over 1300 foot-pounds, the acquired expansive force may be utilized to operate a moving body such as a piston.

In the drawing the piston is shown as op-

erating to draw in the above-mentioned detonating mixture, and it will be observed that the inlet valve mechanism 17 is operated to permit the passage of said mixture into the chamber 15. As the piston rises to compress this mixture, both valve mechanisms 17 and 18 are operated to close the inlet and exhaust ports and shortly after the piston reaches its highest point, the charge of the mixture is subjected to a spark from the plug 19, which is connected to a suitable source of electrical energy, (not shown), and the working stroke then takes place, both valves remaining closed. After said working stroke, the piston rises and the exhaust valve opens to permit the products to escape through the conduit 20 back to the receptacle 5, said products being now in the form of a steam. If desired a three-way valve 24 may be interposed in said conduit 20, which is susceptible of operation to discharge the products into the atmosphere.

Having thus fully described this invention, I hereby reserve the benefit of all changes in form, arrangement, order, or use of parts, as it is evident that many minor changes may be made therein without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. A device of the class described comprising a receptacle, a supply of liquid within said receptacle, a vessel positioned within said receptacle, said vessel including a pair of members having their open ends extended into the liquid and spaced from the bottom of said receptacle, said members uniting to present a gas-collecting chamber with the receptacle and electrodes of opposite polarity, one electrode being positioned within each of said members of said vessel.

2. An electrolyzer adapted to be positioned in a receptacle containing a liquid, and comprising a U-shaped body portion presenting a pair of members having their open ends extended into the liquid, there being a gas-collecting chamber positioned above the top of said members, an extension leading from said chamber and electrodes of opposite polarity, one electrode being positioned within each of said members.

In testimony whereof I affix my signature.  
WALTER HOLLAND.

55

60

65