

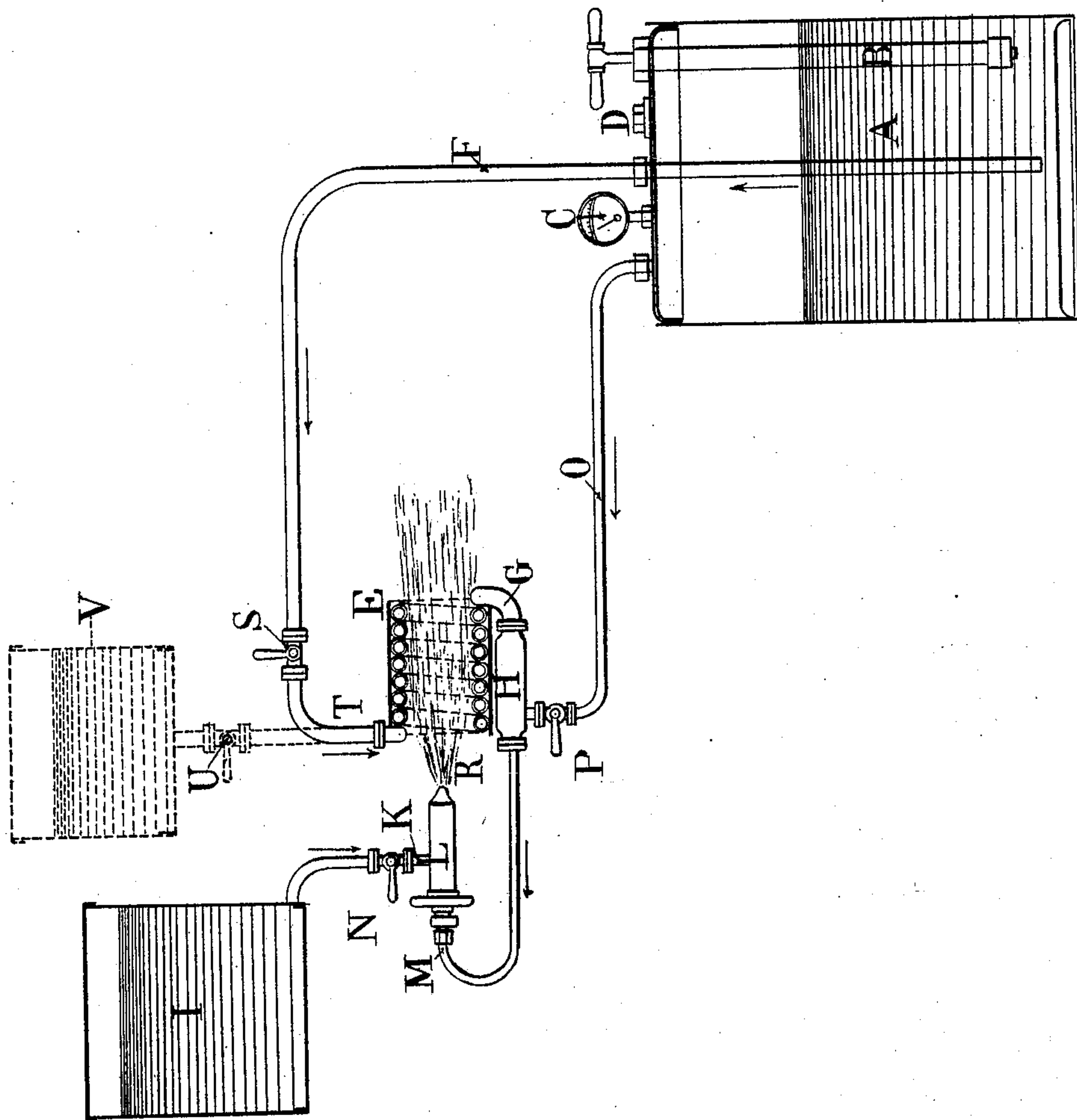
(No Model.)

J. A. RAMBAUD.

APPARATUS FOR HEATING BY MEANS OF LIQUID HYDROCARBONS.

No. 603,658.

Patented May 10, 1898.



Witnesses:
Richard C. Maxwell.
Thomas M. Smith.

Inventor:
Jean Albit Rambaud,
By J. Walter Douglas
Attorney.

UNITED STATES PATENT OFFICE.

JEAN ALBERT RAMBAUD, OF PARIS, FRANCE, ASSIGNOR TO THE COMPAGNIE INTERNATIONALE DES PROCÉDÉS ADOLPHE SEIGLE, OF SAME PLACE.

APPARATUS FOR HEATING BY MEANS OF LIQUID HYDROCARBONS.

SPECIFICATION forming part of Letters Patent No. 603,658, dated May 10, 1898.

Application filed July 16, 1897. Serial No. 644,830. (No model.)

To all whom it may concern:

Be it known that I, JEAN ALBERT RAMBAUD, a citizen of France, residing at Paris, in the Republic of France, have invented certain new and useful Improvements in Apparatus for Heating by Means of Liquid Hydrocarbons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which forms a part of this specification.

My invention has relation to an apparatus for producing heat from liquid hydrocarbons; and in such connection it relates particularly to the construction and arrangement of such an apparatus.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawing, wherein the apparatus embodying main features of my invention is diagrammatically illustrated.

Referring to the drawing, A represents a tank or other suitable reservoir containing water and air. This air is adapted to be compressed, preferably, by means of an air-pump B. The gage C, suitably connected with the reservoir A, indicates the pressure within the reservoir, and D is the plug closing the inlet to the reservoir.

The vaporizing apparatus or retort consists of a metallic tube E, coiled in a helix, and from this tube extends the pipe T, controlled by the cock or valve S and connected with the pipe F, terminating in the reservoir A below the water-level. The coil E terminates in a pipe G, leading to a chamber or receiver H, wherein a mixture of steam from the retort E and air from the reservoir A may be stored.

The reservoir I, containing the hydrocarbon in liquid form, communicates by the pipe K, controlled by a cock or valve N, with an atomizer or sprayer L, and this sprayer also communicates by a pipe M with the receiver H.

From the receiver H extends a pipe O, controlled by a cock or valve P and leading to the air-chamber of the reservoir A.

The operation of the apparatus is as follows: The reservoir A is filled with water up to a certain level and the air in the reservoir is then compressed by the hand-pump B or other suitable means. The cocks N and P are first opened, the cock S being closed, whereupon there is introduced into the sprayer L hydrocarbon from the reservoir I and compressed air from the reservoir A. The hydrocarbon mixes with and is atomized by the air and issues at R from the sprayer L in a finely-divided or spray-like form, which when ignited will give a flame of intense heat, passing through the vaporizing apparatus or retort and highly heating the helical tube E. When this tube has reached a temperature sufficient to vaporize water, the cock P is closed and the cock S is opened. Water under pressure is then forced from the reservoir A by the pipe F to and through the tube E and is almost instantly vaporized and passes out at G into the receiver H in the form of steam or vapor and enters the atomizer L, in which it is mixed with the hydrocarbon from the reservoir I. The consumption of this mixture maintains the tube E at the required temperature to constantly vaporize the water from the reservoir A. The hot flame passing out of the retort is intensely hot and may be utilized for heating purposes in any desired manner.

As a modification the reservoir A may, if desired, be replaced by a reservoir V, communicating directly and only with the pipe of the coil E, which pipe is controlled by a valve U, the construction and arrangement of which are indicated by the dotted lines in the drawing. By this arrangement air, steam, or other fluid is introduced directly into the retort E and there superheated prior to its delivery to the atomizer L. It is to be understood that in this instance communication between the reservoir A and the retort E is cut off by closing the valve S, and the communication between the reservoir A and the receiver H, which latter is adapted to receive a mixture

of steam from the retort and air from said reservoir, is likewise cut off by closing the valve P.

5 Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

10 In combination, a reservoir adapted to contain water and air, a pump for maintaining constant or substantially so the air under pressure in said reservoir, a retort connected with said water and air reservoir, a hydrocarbon-fluid reservoir, a sprayer or atomizer in connection with said hydrocarbon-fluid res-

ervoir, a receiver wherein steam from said retort and air from said reservoir are adapted to 15 be stored, and valves whereof one is in the pipe leading to said receiver and whereof the other is in the pipe leading from said water and air reservoir, substantially as and for the purposes described. 20

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

JEAN ALBERT RAMBAUD.

Witnesses:

G. DE NESTRAD,

EDWARD P. MACLEAN.