

(No Model.)

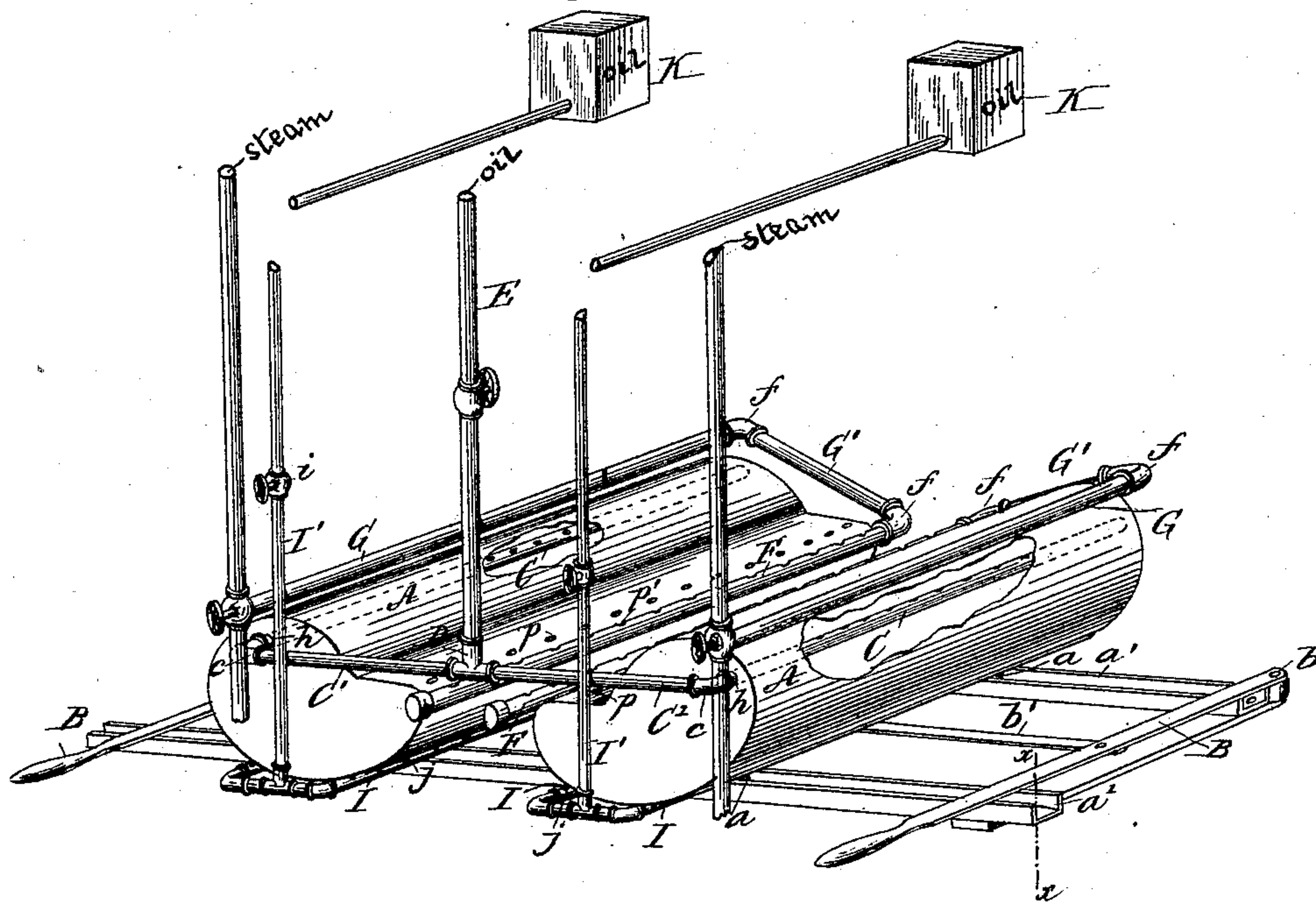
J. LOCKE & S. O. RICHARDSON, Jr.

APPARATUS FOR MAKING AND BURNING GASEOUS FUEL.

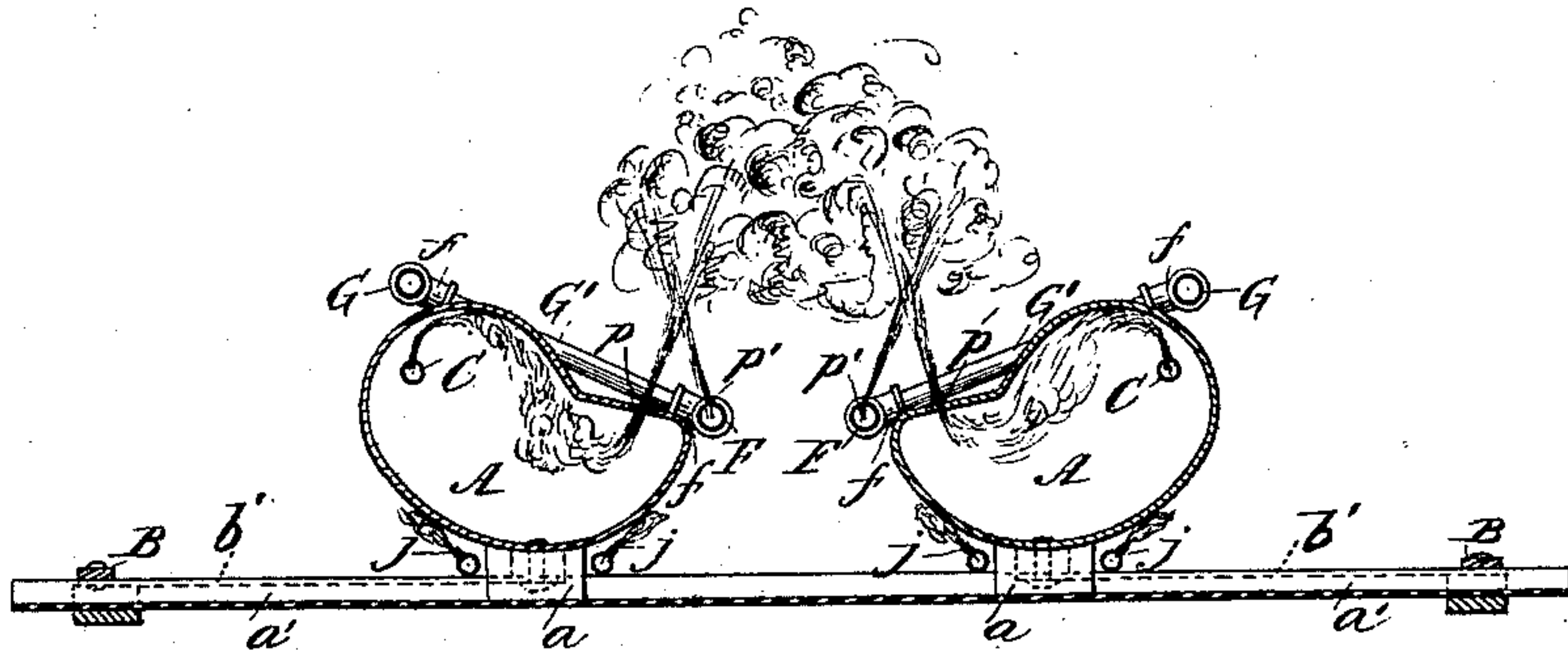
No. 349,228.

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*Fig 1*



*Fig 2.*



Witnesses:

John H. Rennie.  
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their Atty.



# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR MAKING AND BURNING GASEOUS FUEL.

SPECIFICATION forming part of Letters Patent No. 349,228, dated September 14, 1886.

Application filed April 2, 1886. Serial No. 197,590. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH LOCKE and SOLON O. RICHARDSON, Jr., respectively of Glenwood (Medford) and Wakefield, both in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Making and Burning Gaseous Fuel, of which the following is a specification.

10 This invention has for its object to provide a simple and efficient apparatus in which oil may be vaporized and burned and steam superheated and mingled with the flame of the vaporized oil, thereby producing perfect combustion and a high degree of heat at a small expense.

15 The invention also has for its object to provide convenient means for regulating the degree of heat by either concentrating or diffusing it.

20 To these ends our invention consists in an apparatus which in its simplest form includes, first, an externally-heated oil vaporizing chamber or retort having means for the discharge of oil in jets against its inner surface, the oil being vaporized within an externally-heated retort, and orifices for the escape and combustion of the vaporized oil; and, secondly, a steam-pipe communicating with a suitable steam-generator and extending for a portion of its length substantially parallel with and in close relation to the orifices in the vaporizing-retort, whereat the vaporized oil is discharged and consumed. Said steam-pipe is highly heated by the heat supplied by the apparatus, so that the steam therein is superheated. The steam-pipe is provided with orifices or nozzles for the escape of the steam in jets coinciding with the jets of flame from the vaporized oil, so that the hydrogen and other gases of the decomposed steam enter the flames of the vaporized oil and make the combustion of the latter more perfect and produce a very high degree of heat. The union of the steam with the flame and products of combustion of the vaporized oil takes place after the latter is ignited.

Our apparatus, as we prefer to organize it, includes two oil-vaporizing retorts and two independent steam-pipes arranged side by side, each chamber and its accompanying

steam-pipe being preferably adjustable independently of the other, so that the heat produced by the two sets may be either concentrated or diffused by decreasing or increasing the distance between the sets, all of which we will now proceed to describe.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of an organized apparatus embodying our invention, the chambers or retorts being partially broken out to show the perforations in the oil-pipes which lead into the said chambers. Fig. 2 represents a transverse section of the same taken on the dotted line *x*.

The same letters of reference indicate the same parts in all the figures.

In the drawings, A A designate two iron chambers or retorts placed side by side at the required distance apart, and made, preferably, in the form shown in the drawings, the said retorts being preferably supported upon sliding blocks *a a*, adapted to move in ways or guides *a' a'* by the operation of levers B, one for each chamber. These levers are fulcrumed at *b*, and are connected by the rods *b'* to each of the chambers or retorts A A. The movement of these levers in the one direction or the other serves to so move the chambers or retorts as to place them closer together or farther apart, and thereby either concentrate or diffuse the heat, as circumstances may require. Each chamber or retort is provided in the direction of its length with a series of perforations or openings, *p*, and at one end with a hole, *h*, into which is passed a perforated pipe, C, the said pipes C extending from one end to the other of the chambers or retorts on the inside, and being connected on the outside by the elbows *c c* to the short pipes C' C'. These short pipes C' C', having their free ends inclosed within the T-coupling D, are capable of being moved within the said T-coupling when the chambers or retorts are moved toward or from each other. The pipe E, leading from a reservoir or source of supply of oil, (not shown in the drawings,) is joined to the T-coupling D, through which and the pipes C' C' oil is passed to the pipes C C through the perforations or openings, in which it is discharged against the heated inner sur-



faces of the chambers or retorts A A, where it becomes vaporized. The vapor passes out through the openings *p*, and is ignited at said openings, the flames rising from the chambers or retorts, as shown in Fig. 2.

Immediately in front of the chambers or retorts A A, and preferably about on a level with the openings *p* in them, are placed two pipes, F F, one for each chamber or retort, and each being provided with a series of openings, *p'*, corresponding in number with the openings *p* in the chambers or retorts. These pipes F F are joined by the elbows *f/f* to the pipes G G', which practically surround the chambers or retorts A A and connect with the steam-supply pipes H H, which lead from a suitable steam-generator. The steam passing through said pipes becomes superheated and escapes through the openings *p'*, said openings coinciding with the openings *p*, so that the jets of steam intersect and mingle with the jets of flame from the retorts, as indicated in Fig. 2.

As a means of heating the retorts A A before the apparatus is in operation, we provide pipes I I below each of the retorts and extending along the full length of the latter, said pipes being shown in the drawings as provided with a series of small perforations or jets, *j*. At one end these pipes are closed by caps, plugs, or other suitable means, and at the other ends they are connected to pipes I' I', which lead from small tank K, containing oil or petroleum, the supply of oil or petroleum to the jets or perforations *j* in the pipes I I being regulated by the valves *i* in the pipes I' I'. The distance between the chambers or retorts A A having been determined upon by the attendant and duly regulated by the levers B B, the valves *i* are turned to supply the pipes I I with oil from the tanks K, and the oil after passing to the jets or perforations *j* is ignited, which ignition effects the rapid heating of the retorts. The oil or petroleum from the tanks or other source of supply from which the pipes H H lead is then allowed to pass into the heated retorts, where it is vaporized, as before

described. After the retorts have become sufficiently heated to vaporize the oil the use of the pipes I I may be discontinued, and said pipes may be removed, if desired, the heat from the combustion of the vaporized oil, accelerated by the admixture of the decomposed steam therewith, being sufficient to continuously vaporize the oil supplied to the retorts and the steam supplied to the pipes H H.

We claim—

1. The combination, in an apparatus for making and burning gaseous fuel, of an externally-heated chamber or retort having a series of burners or orifices, a smaller pipe connected with a hydrocarbon supply and extending into said chamber or retort, and provided with a series of orifices to discharge the hydrocarbon in jets against the inner surface of said retort, a steam-supply pipe arranged external to said chamber or retort and having a series of orifices coinciding with those of the retort, the arrangement being such that the hydrocarbon becomes vaporized in said retort and ignites at the jets or orifices thereof, so that the heat of the retort is maintained and the steam superheated and mingled with the retort-flames, substantially as set forth.

2. In an apparatus for making and burning gaseous fuel, the combination of two retorts located side by side, each having a series of burner-orifices, and means for delivering oil in jets against its inner surface, two steam-pipes, one for each retort, said pipes having orifices arranged to deliver decomposed steam to the jets of flame from the retorts, and means for varying the distance between each retort, with the steam-pipe accompanying it, and the other retort and steam-pipe, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 30th day of March, 1886.

JOSEPH LOCKE.

SOLOMON O. RICHARDSON, JR.

Witnesses:

C. F. BROWN,

A. D. HARRISON.