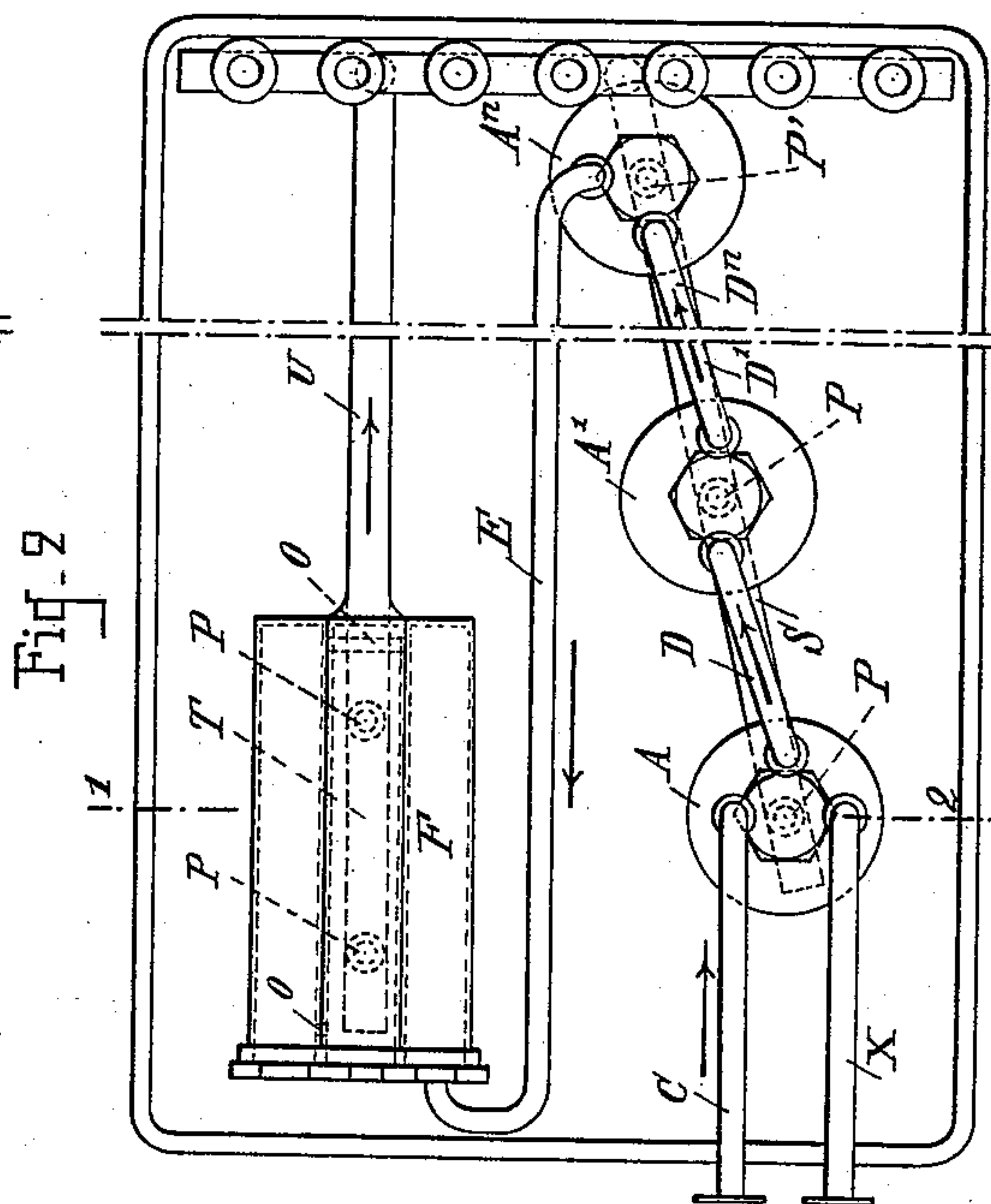
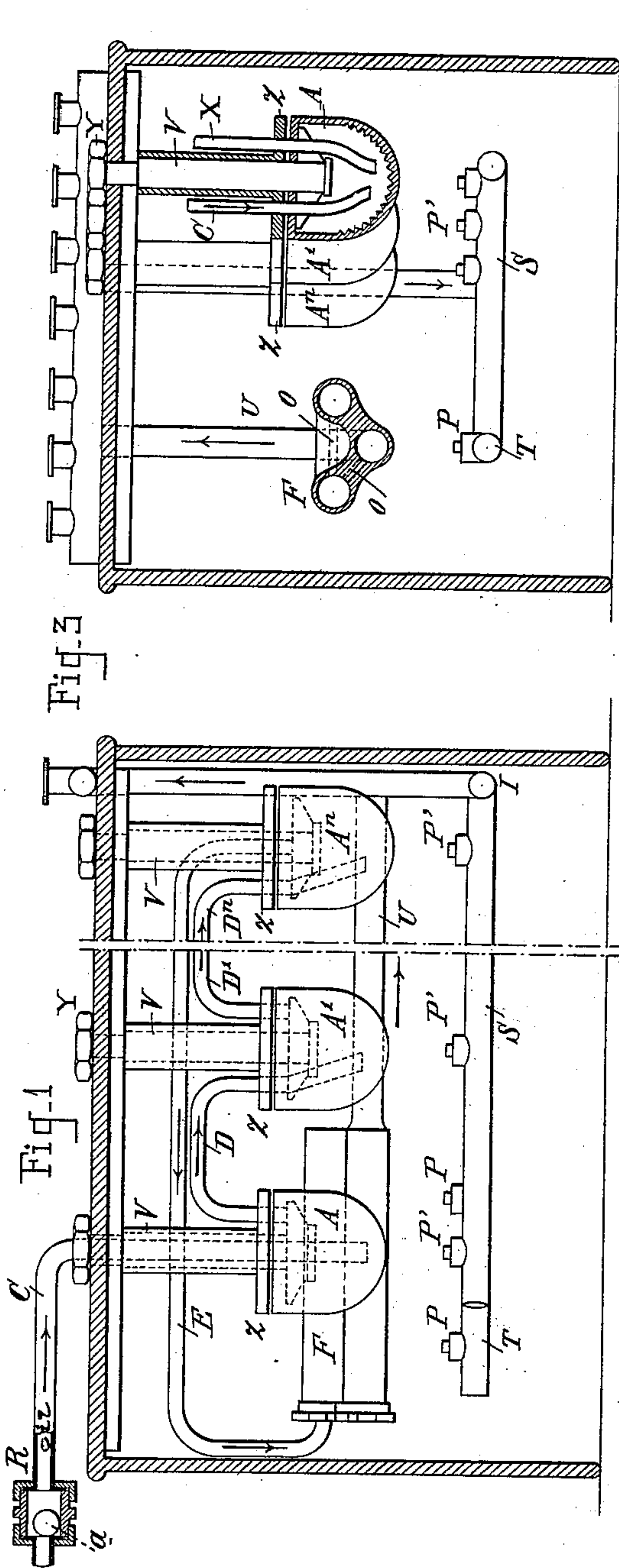


(No Model.)

L. E. FRAIPONT.  
APPARATUS FOR VAPORIZING OILS.

No. 605,865.

Patented June 21, 1898.



Witnesses:

E. B. Rolton

Old Monk

Inventor:

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By

Renard & Co.

his Attorneys.



# UNITED STATES PATENT OFFICE.

LOUIS ERNEST FRAIPONT, OF PARIS, FRANCE.

## APPARATUS FOR VAPORIZING OILS.

SPECIFICATION forming part of Letters Patent No. 605,865, dated June 21, 1898.

Application filed May 20, 1897. Serial No. 637,390. (No model.) Patented in France September 4, 1896, No. 259,439.

*To all whom it may concern:*

Be it known that I, LOUIS ERNEST FRAIPONT, a citizen of the Republic of France, residing at Paris, in the Department of the Seine, France, have invented a certain new and Improved Apparatus for the Vaporizing of Petroleum, Heavy Oils, Tar-Oils, and Hydrocarbons Generally, of which the following is a full, clear, and exact specification.

The invention has been patented in France, No. 259,439, dated September 4, 1896.

The object of my invention is to provide a distilling and gasifying apparatus intended for reducing into gas by a series of successive fractional distillations and simultaneous gasifications all volatile substances contained in either crude or refined petroleum or in the fat rock-oils, schistose oils, coal-tar oil, and generally in all hydrocarbons, the gases so obtained being fit for immediate use either for heating or lighting purposes. This complete gasification is more or less easy, according to the quality and specific gravity of the hydrocarbons used. The fat, schistose, and coal-tar oils leave after distillation considerable quantities of residue and are impracticable in the gas-generators now in use, which gasify the oil in one manipulation and almost instantaneously. It happens, in fact, that after a very short time the heaviest substances, which do not volatilize at ordinary temperatures, condense on the pipes and finally foul them. In my system the gasification is effected gradually and can be divided in any desired number of fractions, according to the nature of the oil used, in order to obtain the gasification of the whole product.

Every retort is provided with a drain-pipe penetrating to the bottom, whereby when the apparatus is in operation the residues of distillation can be evacuated by means of the pressure obtained in the retorts. These drain-pipes permit of crude hydrocarbons being burned and prevent an otherwise unavoidable fouling as also all formation of coke in the retorts.

The apparatus consists, essentially, of a series of retorts of any suitable number and shape intercommunicating by pipes. These retorts are heated independently from each other by a source of heat of any description, or, simpler still, they can be heated by the

gas supplied by the apparatus itself when working. The hydrocarbons to be distilled are fed into the first retort in liquid state. When they are in ebullition, the escaping vapors pass into the second retort. In the latter the vapors are overheated, and according to the nature of the oils used the lightest among these vapors are already reduced to gas. This mixture of vapor and gas passes into a third retort, where another part of vapor is reduced to gas, and so forth, the same operation being repeated in the subsequent retorts and recommenced as often as necessary to obtain the complete gasification of all distillable elements. The non-distillable elements remain at the bottom of each retort, from where they are evacuated from time to time by means of the drain-pipes fitted to the retorts. In this manner a series of successive distillations and gasifications are obtained, whereby hydrocarbons of any kind are reduced to gas in a complete manner, the non-distillable products being evacuated as soon as formed.

For the better understanding of the specification I will now refer to the accompanying drawings, in which—

Figure 1 shows the invention in elevation and partial longitudinal section. Fig. 2 is a plan view of Fig. 1; Fig. 3, a transverse section along the line 1 2 of Fig. 2 of a practical apparatus for gasifying ordinary fat oils.

The same reference characters are applied to the same elements in the different figures.

The invention consists of a first retort A, into which the hydrocarbons are fed up to the central part by means of the pipe C, provided with a regulator consisting, as shown in Fig. 1, of a cylindrical chamber R, containing a movable ball *a*, which regulates by its displacement the admission of hydrocarbons and prevents them being driven back by the pressure coming from the apparatus. The heavy vapors escaping from the retort A pass through the tube D into the retort A' and successively through the tubes D' D'' into the other retorts until A<sup>n</sup> is reached. In these successive retorts the vapors are overheated, and even the most volatile elements are gasified. The retorts A A' A<sup>n</sup> are heated when the apparatus is in operation by means of the burners P' P', mounted on the tube S and fed by means of the gas produced by the apparatus itself.



This mixture of overheated vapors and gases already formed is fed in dry state into a gas-superheater F by means of the pipe E. This superheater consists of three cylinders inter-communicating by means of the conduit-pipes O, Figs. 2 and 3, and heated directly by means of the burners P, fed by the gas emerging from the superheater through the conduit-pipes I T. This construction of the superheater compels the vapors to pass in the first place through the two least-heated upper cylinders and lastly into the one most heated, because it is in direct contact with the flame from the heating-burners.

The retorts and cylinders are fitted on the inside with wings, serving to increase the heating-surface. On top of the retort A is arranged a drain-pipe X, Figs. 2 and 3, penetrating to the bottom, with the object of effecting while the apparatus is in operation by means of the pressure produced by the vaporization of the hydrocarbons the evacuation of the residues of crystallization. By means of these drain-pipes, which prevent all fouling and all formation of coke, it becomes possible to burn crude hydrocarbons.

The retorts are provided with a lid Z. The pipes C X D D' extend through these covers. The body of the retort is kept pressed against the lid Z by a shaft V and a screw-nut Y. This arrangement permits of the quick removal of the spherical part of the retort for the purpose of cleaning it without touching the other organs of the apparatus. The same system of closure and joint is applied to the cylinders. The gas produced on leaving the generator is delivered by the pipe V into a receiver, from where it can be distributed to

the heating or lighting apparatuses of whatever kind for which it is destined.

I claim—

1. In combination, the casing, the plurality of retorts connected in series, each being a complete retort in itself, means for feeding hydrocarbon to the first retort of the series, a drain-pipe connected with the retorts, a superheater connected with the last retort of the series and arranged to receive the volatilized hydrocarbon therefrom, a gas burner or jet beneath each retort and the superheater for independently heating said retorts and superheater, said burners being supplied with gas from the superheater, substantially as described.

2. In combination, the casing, the plurality of retorts, each complete in itself, said retorts being connected in series, means for feeding hydrocarbon to the first retort of the series, a drain-pipe connected with the retorts, the superheater comprising three tubes, two above and one centrally below and connected in series, connections from the last retort of the series to one of the upper tubes, the gas flowing thence through the second upper tube and finally into the lower one, the gas-jet beneath each retort, the jets beneath the superheater adapted to impinge against the said lower tube, and the pipe connections from the superheater to the burners, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

LOUIS ERNEST FRAIPONT.

Witnesses:

EDWARD P. MACLEAN,  
JULES FAYOLLET.