

(No Model.)

3 Sheets—Sheet 1.

A. SEIGLE.

APPARATUS FOR TREATING HYDROCARBONS.

No. 567,752.

Patented Sept. 15, 1896.

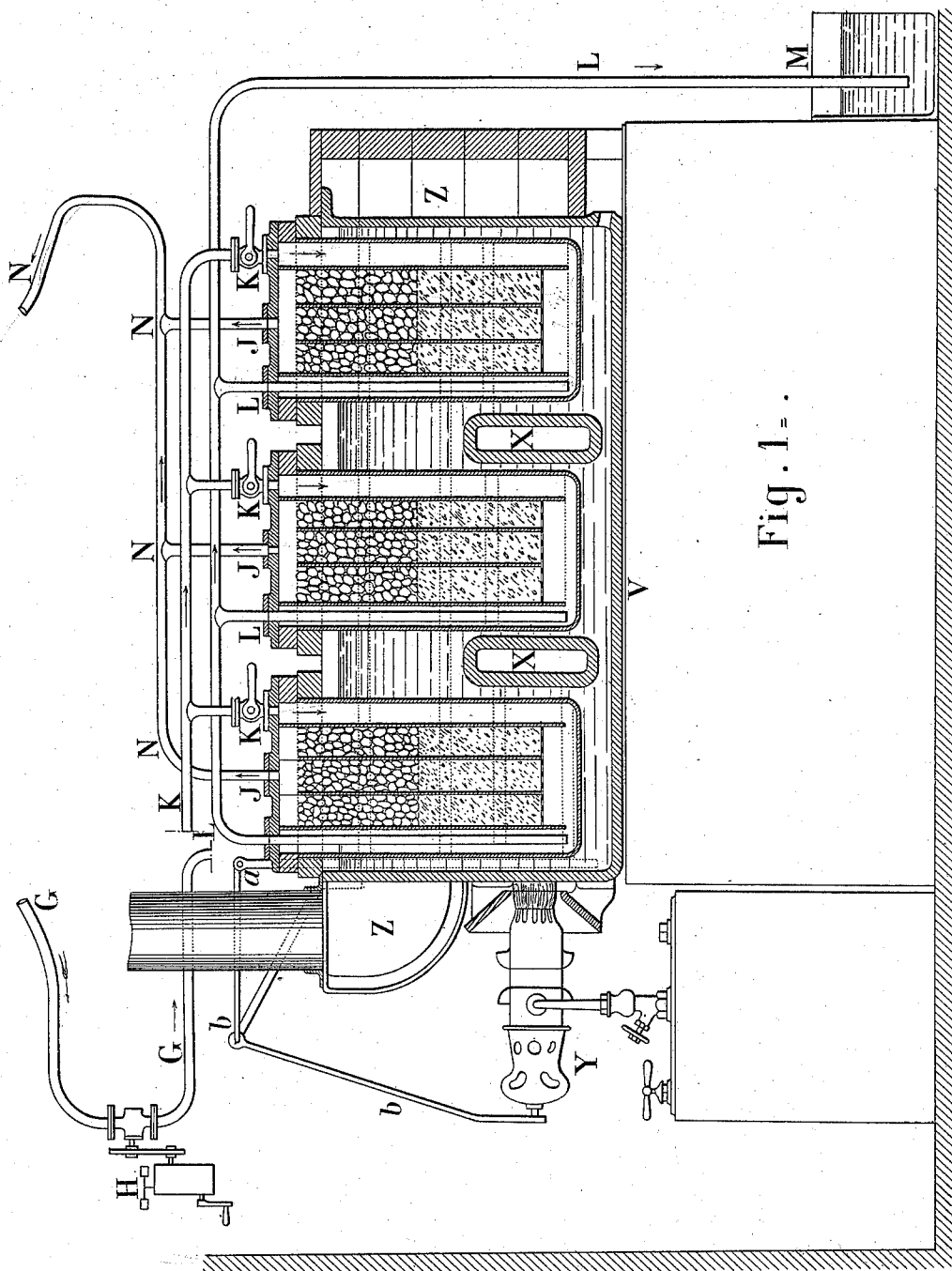


Fig. 1.

Witnesses:

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Wilhelm Vogt

Inventor:

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(No Model.)

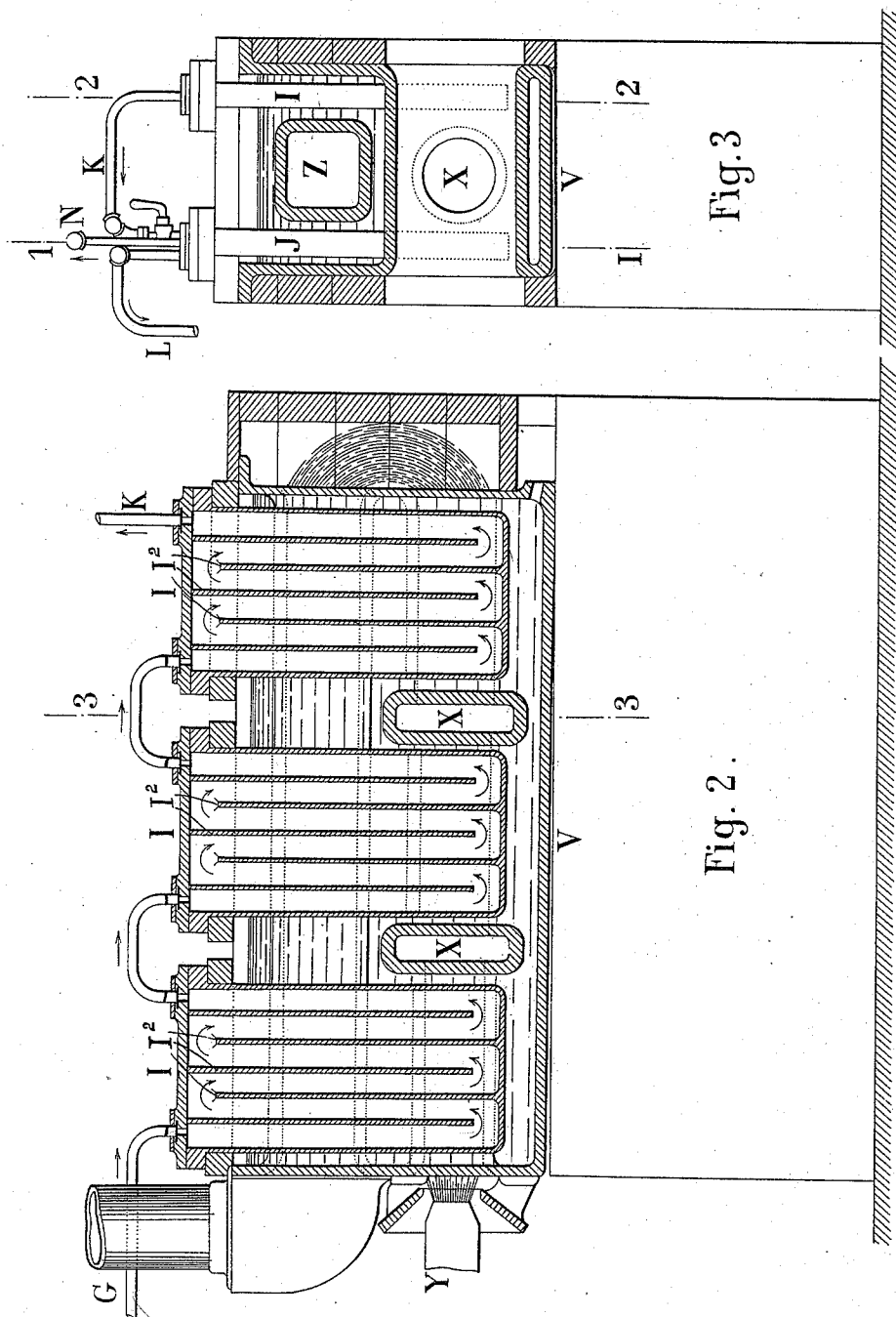
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Witnesses:

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3 Sheets—Sheet 3.

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Fig. 4.

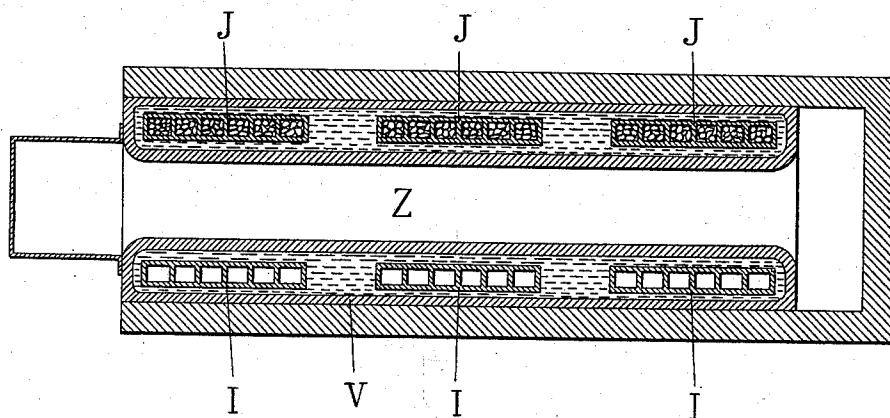
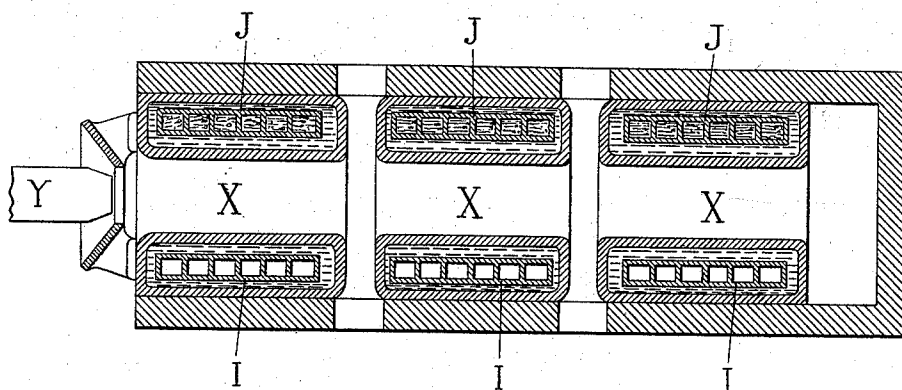


Fig. 5.



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UNITED STATES PATENT OFFICE.

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

APPARATUS FOR TREATING HYDROCARBONS.

SPECIFICATION forming part of Letters Patent No. 567,752, dated September 15, 1896.

Application filed January 17, 1896. Serial No. 575,839. (No model.) Patented in France November 29, 1895, No. 252,068; in Belgium November 30, 1895, No. 118,630; in England December 4, 1895, No. 23,235; in Austria December 18, 1895, No. 45/4,956; in Hungary January 26, 1896, No. 5,301; in Luxemburg February 10, 1896, No. 2,451; in Tunis February 18, 1896, No. 171; in Turkey February 19, 1896, No. 497; in Brazil March 23, 1896, No. 2,032, and in Italy March 31, 1896, LXXX, 54.

To all whom it may concern:

Be it known that I, ADOLPHE SEIGLE, a citizen of France, residing at Paris, in the Republic of France, have invented certain new and useful Improvements in Apparatus for Treating Hydrocarbons, (for which I have obtained French Letters Patent, No. 252,068, dated November 29, 1895; Belgian Letters Patent, No. 118,630, dated November 30, 1895; British Letters Patent, No. 23,235, dated December 4, 1895; Austrian Letters Patent, No. 45/4,956, dated December 18, 1895; Hungarian Letters Patent, No. 5,301, dated January 26, 1896; Italian Letters Patent, LXXX, 54, dated March 31, 1896; Letters Patent in Turkey, No. 497, dated February 19, 1896; Letters Patent in Luxemburg, No. 2,451, dated February 10, 1896; Letters Patent in Brazil, No. 2,032, dated March 23, 1896, and Letters Patent in Tunis, No. 171, dated February 18, 1896,) of which the following is a specification.

My invention has relation to an apparatus wherein heavy hydrocarbons may be transformed into light hydrocarbons, being especially adapted to the distillation of hydrocarbons in the manufacture of oil-gas and similar valuable products; and in such connection it relates to the general construction and arrangement of such apparatus.

The principal object of my invention is to provide a simple and efficient apparatus wherein heavy hydrocarbons, such as heavy oils, coal-tars, schist-oils, petroleum of various grades, and the like may be transformed or broken up into lighter and more valuable hydrocarbons by means of heat.

My invention, stated in general terms, consists of an apparatus for the transformation of heavy hydrocarbons into lighter and more valuable products when constructed and arranged in substantially the manner herein-after described and claimed.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a longitudinal section taken on line 1 1 of Fig. 3, illustrating the construction and arrangement of the vaporizing and super-heating apparatus embodying features of my invention. Fig. 2 is a similar view of a portion of the apparatus on the line 2 2 of Fig. 3. Fig. 3 is a cross-sectional view on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section taken above the middle line of Fig. 2, and Fig. 5 is a similar sectional view taken below the middle line of Fig. 2.

Referring to the drawings, G represents a pipe leading from a suitable reservoir containing the crude hydrocarbon to a series of vaporizing-chambers, hereinafter described. The pipe G is controlled by a meter or regulator H of suitable construction, by means of which the flow of hydrocarbon through the pipe G to the vaporizing-chambers may be regulated at will. The vaporizing-chambers I, I, and I are arranged, preferably, as shown in Figs. 2, 3, 4, and 5, that is to say, each chamber I is separated into six compartments by a series of staggered partitions I², Fig. 2, the heated hydrocarbon passing into each of these compartments successively, as indicated by the arrows in Fig. 2. The vaporizing-chambers I, I, and I are connected together in series, that is to say, the heated heavy hydrocarbon is obliged to successively traverse each of the said vaporizing-chambers before it can enter by the pipe K into a series of the heating-chambers J. These heating-chambers J are arranged substantially as illustrated in Fig. 1, that is, each chamber J is provided with a separate inlet from the pipe K and with a separate outlet. These chambers J, unlike the vaporizing-chambers I, are filled with obstructive or inert matter, such as iron chips, pumice-stone, or the like, through which the heated hydrocarbon vapors must percolate before they escape into the outlet-pipe N.

At the bottom of each heating-chamber J is an open space wherein the vapors collect, and leading to this space in each chamber J is a branch pipe L, adapted to remove the vapors through the pipe L from the chambers

J to a receptacle M. The outlet-pipe N conducts the highly-heated hydrocarbon vapors to a suitable condenser or other apparatus. (Not shown.)

5 The heating-chambers J and vaporizing-chambers I are suspended in a bath of molten lead or similar metal contained in a vat or boiler V. This vat or boiler is permeated or pierced by a series of heating or combustion
10 flues X, which convey hot gases from a spray-like burner or gasifier Y through the molten metal to maintain the same at a uniform temperature. The gases pass from the flues X to a flue Z, and from thence to a chimney.
15 (Not shown.)

In the bath of molten metal is plunged a pyrometer *a* of ordinary construction, connected by means of a bent lever *b* to the inlet to the burner Y. The inlet is controlled
20 or automatically regulated by the pyrometer *a* and lever *b* in such a manner as that variations in the temperature of the molten bath will increase or decrease the size of the jet of combustible liquid, such as heavy hydro-
25 carbon, delivered to the burner Y. As shown in the drawings, both the heating-chambers J and vaporizing-chambers I are immersed in the same bath of molten metal, but it will be found advisable in practice to immerse
30 each in separate baths in order to heat the two chambers to the different temperatures which is necessary. If desired, the vaporizing-chambers may be heated by different means than that of the molten bath, but in
35 all cases the heating-chambers J must be heated by the same bath.

As hereinbefore explained, the present apparatus for the treatment of hydrocarbons is
40 characterized by the following essential elements: first, a bath of molten lead or similar material to maintain the heating-chambers at a constant temperature, and, second, the use in the apparatus of heating-chambers and vaporizing-chambers, the vapors circulating
45 through all the chambers previous to their treatment in the heating-chambers.

The operation of the apparatus hereinbe-

fore described is as follows: The burner Y is first lighted and the metallic bath thereby fused and brought to required temperature. 50 The crude hydrocarbon is then delivered from the pipe G to the chambers I, wherein the hydrocarbons are heated and a certain portion vaporized, and from the chambers I the hydrocarbons are conducted to the chambers J, 55 wherein the vapors are both separated and superheated. The vapors from the chambers J are drawn off through the pipe N to a suitable reservoir or condenser.

It will be obvious that the size, shape, materials, and various details of the apparatus may be modified without departing from the spirit of my invention. 60

If desired, the cold hydrocarbon may be introduced directly to the vaporizing and heating elements by means of a pump, injector, or other forcing apparatus with either a periodic or continuous action. 65

Having thus described the nature and objects of my invention, what I claim as new, 70 and desire to secure by Letters Patent, is—

In an apparatus of the character described, a series of vaporizing-chambers and a series of superheating-chambers containing inert material, an inlet to the first in series of said 75 vaporizing-chambers for the reception of the hydrocarbon and an outlet from the last in the series of vaporizing-chambers communicating directly with each superheating-chamber, both series of vaporizing and superheating chambers being immersed in a bath of 80 molten metal, all arranged so that the hydrocarbons are successively heated in the vaporizing-chambers, and the vapor from the last in series of vaporizing-chambers is conducted 85 to each separate superheating-chamber to be further heated, substantially as and for the purposes described.

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

ADOLPHE SEIGLE.

Witnesses:

G. DE MESTRAL,

CLYDE SHROPSHIRE.