

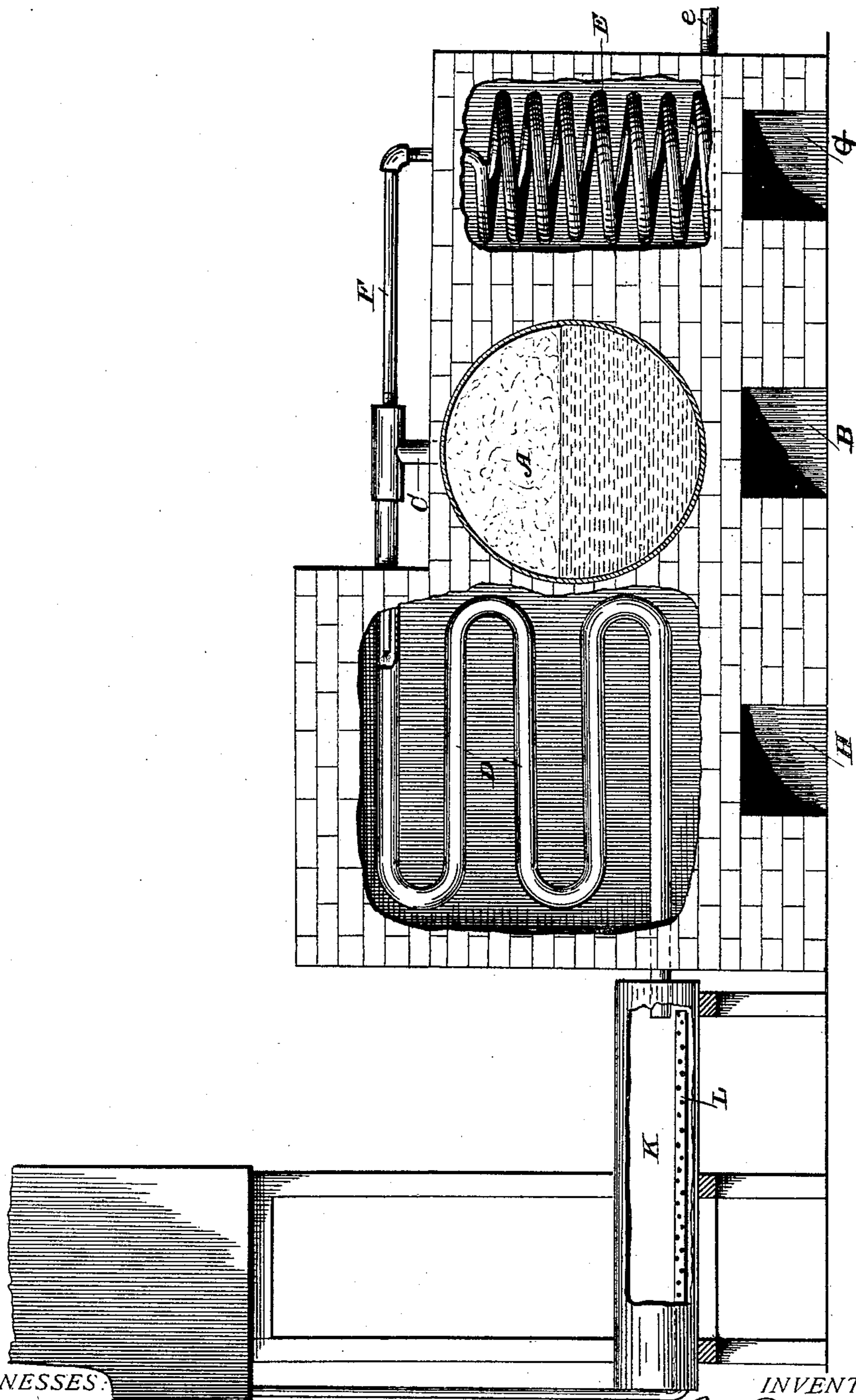
(No Model.)

J. B. HUSTON.

PROCESS OF REMOVING SULPHUROUS COMPOUNDS FROM OILS.

No. 486,406.

Patented Nov. 15, 1892.



WITNESSES:

J. C. Turner
Wm. Lecher

INVENTOR.

BY J. B. Huston
Hall and Tracy
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN B. HUSTON, OF CLEVELAND, OHIO, ASSIGNOR TO HIMSELF, J. BURTON PARSONS, AND EDWARD P. WILLIAMS, OF SAME PLACE, AND SULLIVAN B. LAMOREAUX, OF WHITING, INDIANA.

PROCESS OF REMOVING SULPHUROUS COMPOUNDS FROM OILS.

SPECIFICATION forming part of Letters Patent No. 486,406, dated November 15, 1892.

Application filed August 17, 1891. Serial No. 402,818. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN B. HUSTON, a citizen of the United States, and a resident of the city of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Processes of Removing Sulphurous Compounds from Oils, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The object of my invention is to perfect a process whereby the sulphurous compounds contained in oils—such as are produced in Western Ohio, Indiana, and Canada—may be entirely eliminated and the oil rendered fit for illuminating purposes.

It is well known that the oil produced in Western Ohio, known as "Lima" oil, is particularly refractory in its nature and hard to purify. This oil being characterized by the presence of a large amount of sulphur, it resists the action of chemicals employed in the usual process of refining oil, and hence requires special treatment with new agencies to give it the requisite purity and make it fit for illuminating purposes. Practical tests have shown that the sulphur contained in the oil is distilled over at the same temperature as the oil, varying from 200° to 600° Fahrenheit, and unless some chemical change is wrought in the sulphurous compounds while in the vapor state they will recombine in the oil while in the condenser and go off with the oil. Once re-established with the oil the sulphurous compounds are not removable by any chemical or other process now known and are variously offensive, causing the oil to emit disagreeable odors and unfitting it for domestic use.

Referring to the drawing, the figure is a diagrammatic view of means for carrying out my improved process.

The crude oil is suitably introduced into the primary retort A, where it is subjected to heat from the furnace B of a character adapted to vaporize the oil, such vapors of oil passing from out said primary retort through the in-

termediate connection C into the secondary retort D. Simultaneously with such passage of the oil-vapors into the secondary retort, superheated steam is passed from worm E through the intermediate connection F into the secondary retort D, a furnace G superheating the steam which is introduced into the worm E at its lower coil by steam-feed pipe e. Such superheated vapors of steam mechanically mix with the vapors of oil within the secondary retort, and the mixed vapors of oil and superheated steam are thereupon conjointly subjected to the high temperature (hereinafter specified) of the secondary retort. A furnace H, independent of the other furnaces, is of a character adapted to maintain the secondary retort D at a temperature of 900°, more or less, and the construction of said secondary retort is independent of the primary retort and is adapted to subject its contents of commingled oil-vapor and superheated steam to said constant temperature of about 900°. Under such conditions the oil-vapors are placed in suitable state for proper action thereon of the steam. The hydrogen of the superheated steam at the above-described temperature thereupon unites in chemical formation with the sulphurous compounds and forms sulphureted hydrogen, while the oxygen of the steam unites with the carbon of the remaining portion of the oil-vapors, which latter thereby becomes oxidized. The sulphureted hydrogen and the oxidized oil-vapors together pass from out the secondary retort into the condenser K, where they are subjected to a spray of water from perforated pipe L, the water thereby absorbing the sulphureted hydrogen and effectually completing the separation of the sulphurous compounds from the remaining portion of the oil-vapors. By this process the vapors of oil are reheated in a retort distinct from the initial retort which vaporizes the oil, and by reason of such secondary heating of the oil-vapors, free from the presence of oil or other liquid, said oil-vapors are superheated to about 900° as they pass in constant current from the primary retort to the condenser. The steam is likewise free from the presence of oil or other liquid while it is

treating the oil-vapors, such treating steam being itself superheated to about 900°, suitable for acting on the decomposed sulphurous compounds.

5 The result of many experiments and actual practice of mine have demonstrated that in order to completely and thoroughly remove the objectionable sulphurous compounds from the described class of oils it is essential and
10 absolutely necessary to subject the oil-vapors to the treatment of steam at the above-described high temperature under the above conditions.

I claim as my invention—

15 1. The process of removing sulphurous compounds from oil, consisting of, first, vaporizing the oil; second, superheating the oil-vapors conjointly with steam, free from the presence of oil or other liquid, to the temperature at which the sulphurous compounds are
20 decomposed from the remaining portion of the oil-vapors, so as to chemically unite with the hydrogen of the steam; third, separating

the resultant vapors, all substantially as set forth. 25

2. The process of removing sulphurous compounds from oil, consisting of the following steps in the following order: first, vaporizing the oil in a primary retort; second, conducting such oil-vapors, and also superheated
30 steam to a secondary retort; third, superheating such oil-vapors conjointly with such superheated steam in said secondary retort, free from the presence of oil or other liquid, to a temperature of about 900°; fourth, passing
35 out the resultant vapors into a condenser and absorbing the sulphureted hydrogen into water, all substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand
40 this 15th day of August, A. D. 1891.

JOHN B. HUSTON.

Witnesses:

WM. SECHER,
NATHAN ENGELMAN.