STOMBS & BRACE.

Coal Oil Retort.

No. 27,842. Patented April 10, 1860.

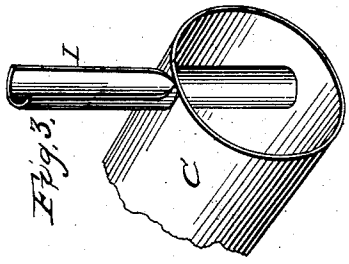


Fig. 3.

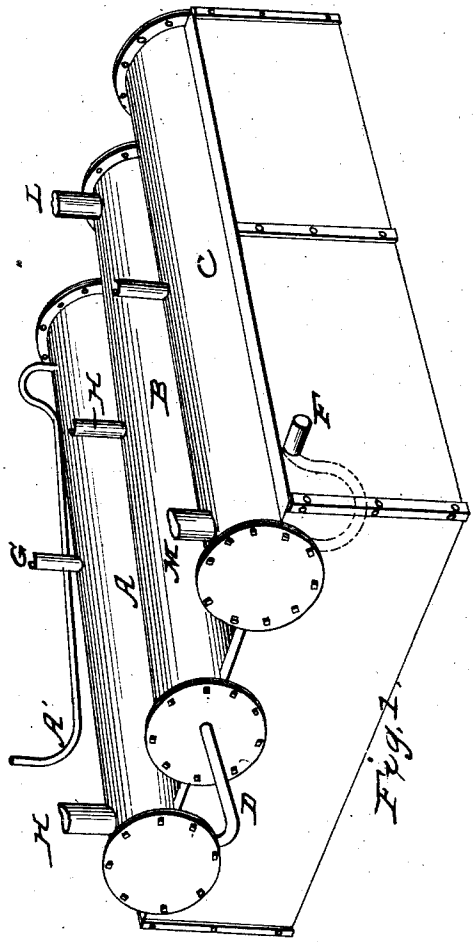


Fig. 1.

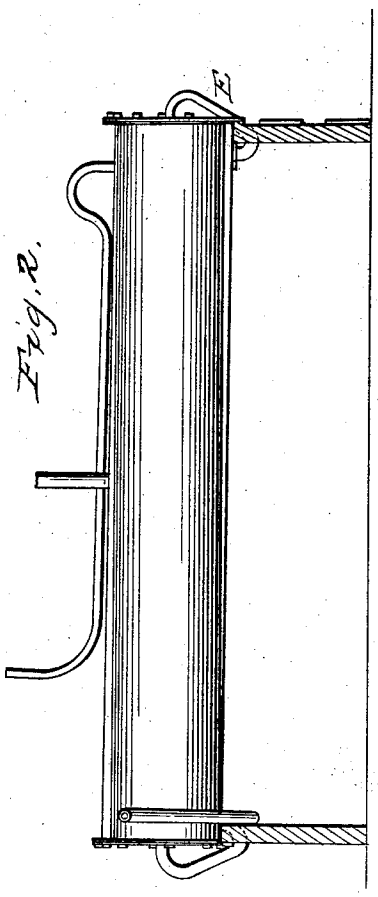


Fig. 2.

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UNITED STATES PATENT OFFICE.

D. S. STOMBS, OF NEWPORT, KENTUCKY, AND JULIUS BRACE, OF POINT CREEK, VIRGINIA.

IMPROVEMENT IN DISTILLATION OF COAL-OIL.

Specification forming part of Letters Patent No. **27,842**, dated April 10, 1860.

To all whom it may concern:

Be it known that we, D. S. STOMBS, of Newport, in the county of Campbell and State of Kentucky, and JULIUS BRACE, of Point Creek, in the county of Kanawha and State of Virginia, have invented a new and useful Improved Process or Method of Redistilling Crude Coal-Oil or other Oils; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Our invention relates to an improved method or process for separating the various products contained in crude coal-oil or other oils by a continuous successive distillation in such manner as that on the operation being once commenced and a fresh supply of crude oil regularly maintained a simultaneous discharge of several qualities of oils and of other products by a single process may be continued for an indefinite period of time without any interruption and without any care or trouble of removing the products from one receptacle to another or of clearing the distilling-vessel of the residuum, the same being performed by regular transference of the unfinished material from one retort to another, and the final discharge of the last waste product from the last retort in the apparatus without any mechanical aid whatever, the fluid discharging itself by the regular working of the apparatus; and the nature of our said invention consists in separating from the crude oil the various products contained therein by volatilizing it over the surface or upon, as it were, a bath of the fluid having a higher specific gravity and heated to a degree of temperature at which the fluid to be separated from the crude oil volatilizes. When the more volatile products become thus evaporated, the crude oil attains a higher degree of specific gravity, and sinking down commingles with the fluid of the bath, and while fresh crude oil is slowly poured in over the surface of the bath the unfinished material of the first bath passes gradually over upon another bath of the fluid having a still higher specific gravity, and heated to a higher degree of temperature, and so on successively and continuously until the separation of the various products is completed. The final residuum discharges itself then from the bottom of the last retort.

To enable others skilled in the art to use our process, we will now proceed to describe it in detail, and in order to illustrate the same more clearly we shall first give the description of an apparatus suitably constructed and arranged to carry it into effect.

In the accompanying drawings, Figure 1 represents a view in perspective of the apparatus; Fig. 2, a side elevation of the same; Fig. 3, a sectional view of a retort.

The apparatus as here represented is designed for securing at a single operation, continuous and self-directing, the whole manufacture of three characteristic merchantable products from the first crude distillate—to wit, light volatile oil, lubricating-oil, and paraffine.

The apparatus consists of three retorts, A B C, which may be made of any suitable shape. In this instance they are represented as being cylindrical and supported on a suitable brick-work. These retorts are heated independently of each other, in order to be heated respectively to various degrees of temperature. The tubes G H I, extending down near to the bottom of the retorts A B C, in which they are respectively arranged, are closed at the bottom but open at the top. They serve as thermometers, by means of which the temperature in each of the retorts is indicated. The first retort, A, is furnished with a pipe, A′, leading into the upper part of said retort. Through this pipe the crude oil is to be supplied to the apparatus. At the opposite end and lowest part of the said retort A is connected the pipe D, the other end of which is connected to the next retort, B, at a point somewhat above the middle line of said retort. In like manner from the opposite lower extremity of the retort B a pipe, E, leads to the third retort, C. The last retort, C, is provided with a similarly-arranged pipe, F, leading from the bottom of said retort, but at the end opposite to where the pipe E′ is arranged.

The pipes K L M, with which the retorts A B C are respectively provided, are to be connected with other pipes leading to separate condensers or receivers.

It is well known that in coal-oil distillation

from bituminous coal several distinct products come over of various specific gravities, each having a distinct boiling-point, and that several of the boiling-points are very wide apart—thus, light volatile oils boiling below 200° Fahrenheit, heavy oils between 250° and 350°, and paraffine at about 400°. In giving in the following the description of the operation it will be, therefore, unnecessary to explain any further the principle upon which the whole *modus operandi* is based. When the operation is to be commenced, crude oil is first poured into the retort A through pipe A′ until it reaches to a level with the point of discharge of the pipe D into the retort B. Meanwhile the retort A is heated, say to about 170° to 200°, so as to drive off in vapor state the light volatile oils, which, passing through the pipe K, are then conducted by another pipe into a condensing-receiver. After the light volatile oils have been thus separated from the crude product, the specific gravity of the remaining fluid becomes greater and its boiling-point more elevated. On pouring in, then, slowly fresh crude oil through the pipe A, the specific gravity of the fresh crude oil being less than that of the fluid already contained in the retort, the former will be floating upon the surface of the latter, and as the fresh crude oil traveling along upon the surface of the bath becomes gradually heated it will continue to give off the more light and volatile products until it shall attain a specific gravity equal to that of the bath. By the continuous slow supply of fresh crude oil the level of the fluid in the retort A becomes gradually raised, and when it becomes raised above the discharge-point of the pipe D the fluid of the first bath commences to pass over from the bottom of retort A into the retort B. The retort B is meanwhile heated, say, to about 300° Fahrenheit, in order to volatilize the heavy oils, which are then driven off through the pipe L into any suitable receptacle. The first unfinished material passing over into the retort B, as it becomes deprived of the heavy oils increases in specific gravity and has its boiling-point more elevated. It serves then as a bath, upon which the fluids subsequently passing from the bottom of the retort A float. When the fluid in the retort B rises above the level with the point of discharge of the pipe E into the retort C, it commences to pass over from the bottom of retort B through pipe E into the retort C. This retort is to be heated to an insipient dull-red heat in order to volatilize the paraffine and drive it off through pipe M into a proper receiving-vessel. The residuum or pitch remaining in the retort serves as a bath for the other unfinished material passing over from retort B, and it (the residuum) is regularly discharged from the last retort C through a pipe, F, when the fluid in the said retort becomes raised above the level of the discharge of the pipe F, which leads into any suitable receptacle.

From the foregoing description it will be readily perceived that the operation may be continued for an indefinite period of time, as long as the regular supply of fresh crude oil is maintained and the retorts kept at the required respective temperatures.

Instead of having only three retorts, a greater number may be arranged on the same principle, should it be desired to have more grades of products from the crude oil.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The herein-described process of redistilling crude coal-oil or other oils by means of an apparatus constructed on the principle substantially as specified.

In testimony of which invention we have hereunto set our hands in presence of witnesses.

D. S. STOMBS.
JULIUS BRACE.

Witnesses:
H. E. CLIFTON,
CHARLES L. FISHER.